P C 2 3 0

PERSONAL COMPUTER
USER MANUAL

P C 2 3 0

PERSONAL COMPUTER
USER MANUAL

Second Edition (August 1988)

Version 1.2

MICRO BYTE SYSTEMS Co. Pty. Ltd. provides this manual on an "as is" basis without warranty of any kind, either express or implied, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose. MICRO BYTE SYSTEMS may make changes and or improvements to this manual and/or to the equipment described herein at any time without notice.

While every effort has gone into checking the drafts, this manual could contain typographical errors and technical inaccuracies. The computer system described in this manual is undergoing constant development and changes will occur on a regular basis. Future editions of this publication will incorporate these changes.

MICRO BYTE SYSTEMS Co. Pty. Ltd. 1988

This manual was compiled by the Customer and Technical Support Departments of MICRO BYTE SYSTEMS Co. Pty. Ltd.

Contents

Page

Introduction

YOUR PC230 is a very powerful computer designed for business and professional use. For any application where speed and accuracy is demanded of a personal computer the PC230 must surely be a leader.

In addition to its efficiency and speed, the PC230 incorporates very high resolution screen addressing and brilliant colour presentation. These factors combine to make this computer an ideal tool for education and training purposes.

Your PC230 runs all the normal software better than most other computers on the market. In addition all the common add-on cards are already built into the mother board. This allows the sleek design of the PC230 and keeps your add-on cost to a minimum.

Here is a summary of the features which help to make the PC230 one of the most outstanding PC's available.

1. NEC V30 CPU

    The heart of your PC230 is a V30 CPU (Central Processing Unit) running at 5, 7 or 10MHz. (At 10MHz the PC230 is 5 times faster than the conventional IBM PC XT which runs at 4.77MHz). The V30 is a 16-bit CPU capable of addressing up to 1Mb of physical memory. This CPU is fully code compatible with the Intel 8088, 8086 family.

    To enable your PC230 to be compatible with time critical operations, such as games programs, emulation and telecommunication operations, we have enabled you to switch from 5 to 7 MHz or 10MHz through both keyboard commands and permanent set up commands. Refer to Section 3 (Configuring the System).

2. RAM and ROM

    Your PC230 has 1 Mb of standard memory (RAM). There is one ROM socket, holding Micro Byte Systems' own BIOS. There are also 114 bytes of CMOS RAM with battery back-up. The CMOS RAM holds the system configuration details.

3. Internal Clock/Calendar

    There is a real-time clock/calendar with battery back-up for maintaining the correct time and date.

4. Expansion slots

    There are 2 slots for expansion cards which are compatible with the PC/XT expansion slots. These will accommodate cards providing extra facilities such as an internal modem, a bus mouse or networking ability.

5. Floppy disk drives

    Your PC230 can be fitted internally with up to two 720kb or 1.44Mb 3.5 inch floppy disk drives and either a 360kb or a 1.2Mb external 5.25 inch floppy disk drive.

6. Keyboard

    Your PC230 comes fitted with either a 101 key AT style keyboard or an 84 key XT style detachable keyboard.

7. Power supply

    Your PC230 is fitted with a 60 Watt, 220/110 Volt switching power supply. This is more than adequate as your PC230 requires only 30 watts, with two floppy disk drives and a hard drive fitted.

8. Operating system

    Your PC230 is compatible with the IBM PC XT, which means it can run all those programs, operating systems, and languages that XT's and compatibles can run.

Unpacking and Setting Up

Hints for new users

WHEN SELECTING the location for your new PC230 computer system, keep the following points in mind:

- Avoid brightly lit areas where strong back-lighting or glaring reflections on the screen could make reading the monitor difficult and possibly cause eye strain.

- Avoid built in or enclosed areas which could restrict free air movement around your PC230.

- Try to select an area which will reduce the amount of dust reaching your PC230. This will extend the life of the PC230 computer system and reduce the need for maintenance.

- It is unwise to set up your PC230 computer system in a room which has a plastic or a nylon carpeted floor. Your body could generate enough static electricity, especially during dry weather, for a single touch to damage your PC230 computer system.

The components

PC230 Computer

Unpack your PC230 from the packaging box and place it securely on a firm table. With your computer you should find the following:—

1. PC230 User Manual (this booklet)
2. Approved Power Cord (Australian)
3. MS-DOS 3.30 Diskettes
4. MS-DOS 3.30 User Manual
5. PC230 Computer System Warranty Card
6. GW-BASIC User Manual (if purchased)
7. External Disk Drive (if purchased)

Take the time to read and understand the WARRANTY card. Now is as good a time as any to fill it out and return it to MICRO BYTE SYSTEMS Co. Pty. Ltd.

KEYBOARD
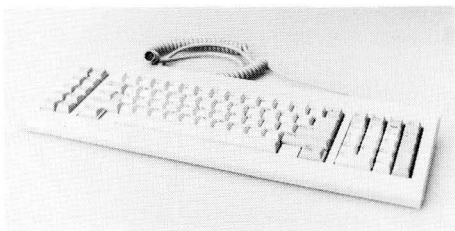
84 Key XT keyboard   *101 Key AT keyboard*

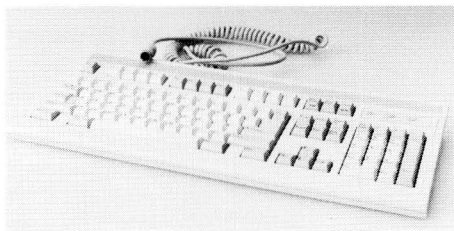You will have ordered either the 84 key XT style or the 101 key AT style keyboard. Open the box carefully and remove the keyboard. You will find the keyboard and its cable wrapped in clear plastic. Remove the plastic taking care not to damage the round cable connector.

MONITOR
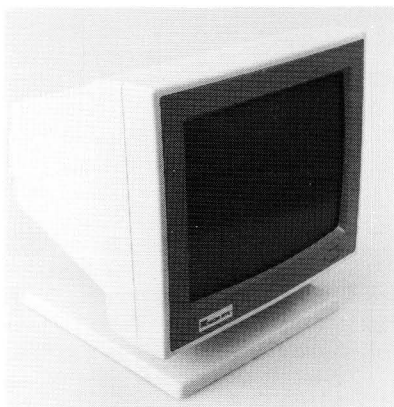
Monochrome monitor

Locate the monitor shipping box and open it carefully. Inside you should find directions to assist you to unpack and use your monitor.
Place the monitor on top of your PC230. Ensure that the monitor's base is fully supported by your PC230's top.

FLOPPY DISK DRIVE
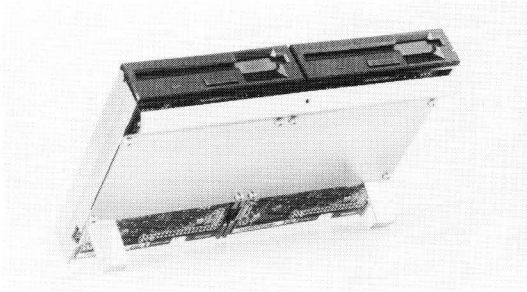
Dual floppy drive assembly front view
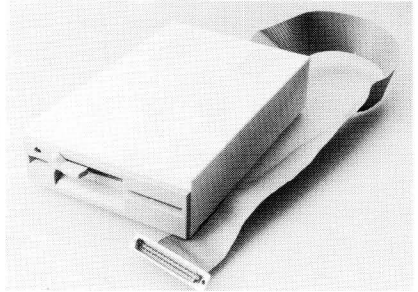
External 5.25 inch drive

Your PC230 can support two 3.5 inch internal floppy disk drives (720kb or 1.44Mb) or one 3.5 inch internal floppy disk drive and one 5.25 inch external floppy disk drive (360kb to 1.2 Mb).

Looking from the front, the left drive is referred to as DRIVE A and, if fitted, the right drive is referred to as DRIVE B. If you have purchased an external 5.25 inch floppy disk drive you can configure it to be DRIVE A either temporarily or permanently.
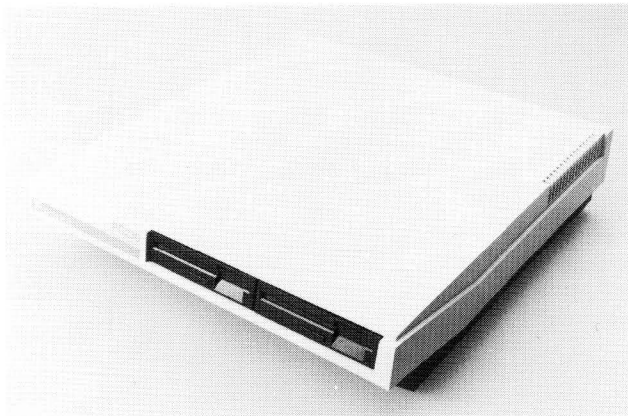
Drives A & B fitted

Rear panel ports and connectors

Your PC230 is a feature-rich machine with all its ports and connectors located on the rear panel.
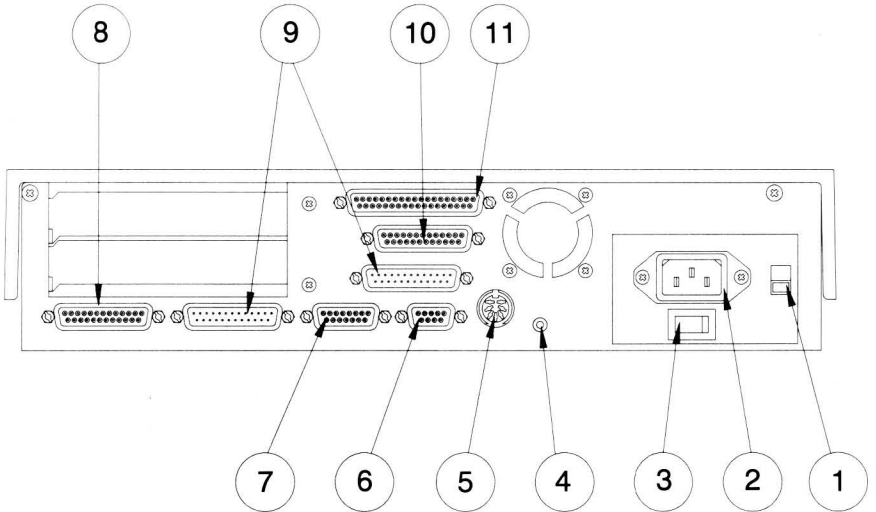
Looking at the rear of your PC230 you will notice:

1. International Voltage Selection switch

    This switch allows your PC230 to operate on either 110-120 Volts AC or 220-240 Volts AC at 50Hz or 60Hz. In Australia the switch is factory set to 240 Volts AC. To protect against accidental movement the switch is covered with a protective strip which may be removed and replaced if you take your PC230 to a country using the lower voltage. DO NOT confuse the international voltage selection switch with the power ON/OFF switch.

2. AC Input Connector (3-pin IEC Plug)

    You should only connect a cable approved by your local electrical authority. The cable supplied with your PC230 is approved for use in Australia.

3. Power ON-OFF Switch

    This switch allows you to control the power supplied to your PC230.

4. Reset Push button

   The Reset button allows your PC230 to be re-started as though the power had just been switched ON. If you encounter software programs which cause your PC230 to freeze or to lose control, press the Reset button to halt the current program and RE-BOOT your PC230.

   BUT. . .when the Reset button is pressed any work which was in your PC230's memory will be lost! Any disk-based data files which are open at the moment of pressing the Reset button may be corrupted!

   You should only push the Reset button as a last resort.

5. Keyboard connector (5-pin DIN socket)

   The cable connected to the keyboard supplied with your PC230 is plugged into this round connector. For proper operation the keyboard should be connected before the power is switched on or the Reset button is pushed.

6. Video connector (9-pin D type socket)

   Your PC230 can be interfaced to a range of PC-compatible monitors. The list includes monochrome, medium resolution colour (CGA) and high resolution colour (EGA) monitors. It is important to set up your PC230 to handle the monitor you wish to use. Damage may result if the internal video mode setting does not match your monitor. Refer to Section 3 (Configuring the System) for further details.

7. Games (joystick) port (15-pin D type socket)

   PC-compatible joysticks may be connected to this connector for use with recreational software programs. For proper operation the joystick MUST be plugged in BEFORE switching on the computer or before pressing the Reset button.

8. Printer connector (25-pin D type socket)

   The printer connector, also known as the PARALLEL port allows PC-compatible printers to be attached to your PC230 computer system .

9. COM1 and COM2 connectors (25-pin D type plugs)

   The COM connectors, also known as SERIAL or RS232 ports, allow a wide range of PERIPHERAL equipment to be used by your PC230. COM1 and COM2 can accept a modem, a plotter, a scanner, a digitizer, a serial mouse and several other add-on peripherals.

10. SCSI connector (25-pin D type socket)

    SCSI (Small Computer Systems Interface) can be used to connect external hard disks, tape backup units, etc. Check with your PC230 dealer or MICRO BYTE Customer Support for information about this connector.

11. External Floppy Disk connector (37-pin D type socket)

    An external 360kb, 720kb or 1.2Mb 5.25 inch disk drive can be attached to your PC230 via this connector. External drives are available from your PC230 dealer.

**Choosing
a monitor**

There are 3 types of monitors that can be attached to your PC230 - Mono, CGA or EGA.

MONOCHROME Monitor (Mono)

The Mono monitor can display text and graphics at high resolution (720 x 348 pixels), and is therefore best suited for long hours of text processing. It can, however, only display one foreground colour - green, amber or white - on a black background.

COLOUR GRAPHICS (CGA) Monitor

The CGA monitor can display text and graphics in colours at medium resolution (320 x 200 pixels). There are many educational and games programs which make good use of a CGA monitor.
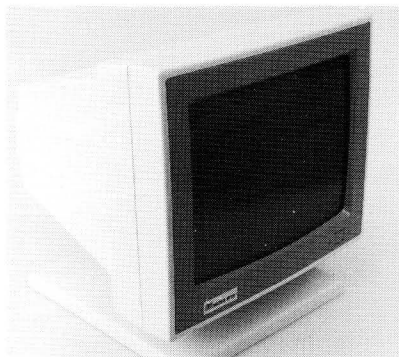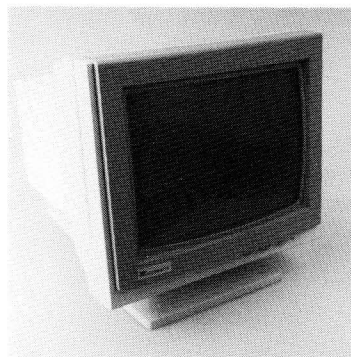
Monochrome monitor   *EGA/CGA monitor*

ENHANCED GRAPHICS (EGA) Monitor

The EGA monitor can display text and graphics in 16 colours at high resolution (640 x 350 pixels) and is an ideal monitor for long hours of work.

Your PC230 has an auto-switching graphics controller which will drive any of the above monitors. You must ensure your PC230 is configured for the type of monitor you intend to use, or you could damage your monitor. Refer to Section 3 (Configuring the System) for more information.

Assembling your PC230 computer system

1. Locate the monitor's video cable and connect it between the monitor and your PC230's rear VIDEO connector. Refer to the monitor's User Manual to ensure the power switch is OFF and that any voltage selection switch is set to the local voltage. Selecting the wrong voltage will almost certainly damage the monitor.

2. Unpack your keyboard and place it in front of your PC230. Remove any protective cap from the end of the keyboard plug and insert the plug into the KEYBOARD connector at the rear of your PC230. Insert the keyboard connector so that the indented mark in the round outer casing is facing upwards. This will line up the pins with the correct holes.

3. Ensure your PC230's power switch is OFF and the voltage selection switch is set to the local voltage. Selecting the wrong setting will DAMAGE your PC230. If purchased in Australia your PC230 and your monitor should be set to 220-240 volts AC 50Hz.

4. Connect the supplied MAINS power cables into your PC230's rear power connector and the monitor's power connector. Then plug the cords into the wall power socket.

5. Switch ON the monitor and wait 20 seconds for it to warm up. Now switch on your PC230.
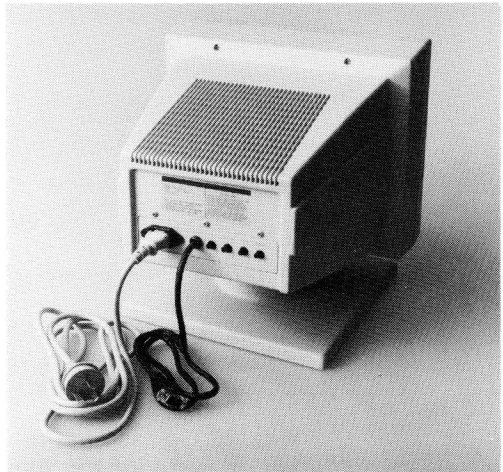
Monitor rear view

**Choosing
and fitting
a printer**
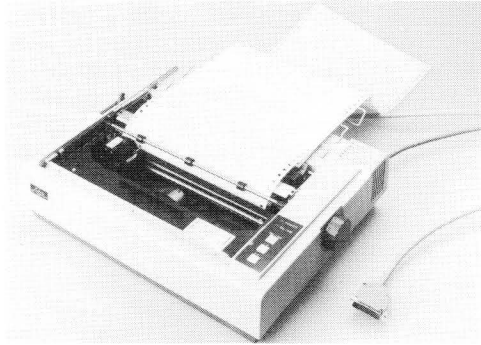
Dot matrix printer

There are so many choices for printers that selecting one is not easy. The list includes daisy wheel, dot matrix, laser, thermal and ink jet. Each type of printer has been designed for a different purpose.

When choosing a printer, define clearly what you want it to do, then narrow down the choice to those printers which meet your requirements. Ask your dealer to demonstrate the specific features of each printer on sale before you buy.

Take particular care if you wish to use graphics software with a 24-pin printer. The software and the printer must match each other before you can print your documents with the desired effect.

PRINTER INTERFACES

There are 2 types of printer interfaces.

1. Parallel/Centronics (PC230 printer port).

2. Serial/RS232 (PC230 COM1, COM2 ports).

PARALLEL Interface

Most printers use the parallel interface, which, in the microcomputer world, is typically Centronics. In theory the parallel interface is faster than serial since data is sent in characters 8 bits at one time from the computer to the printer rather than 1 bit at a time.

In practice, speed is determined by many other factors, the most critical being the speed of the printer head and the associated circuits that drive it. The faster the printer head, the higher the print speed.

Parallel printer cables should be no longer than three metres. Cables longer than this can cause errors in data transmission to your printer.

SERIAL or RS232C Interface

The serial or RS232C interface is more often used for communications than for printers, although some printers use this interface. As the name implies, data travels from the computer bit after bit to the printer.

Most printers have parallel as standard and serial as an option. Connecting a serial printer is very demanding, since you have to fully understand data communication protocols and hand-shaking. Contact your dealer for more information.

Your PC230 assumes that you are attaching a parallel printer.

CONNECTING A PRINTER

1. Follow the printer's instructions for unpacking and initial set up. Make sure the printer is well supported so that it does not fall.

2. Ensure the printer is switched OFF.

3. Your printer cable comes with a connector on each end. Ensure the cable is correct for connecting your PC230 to the particular printer you have. The cable is normally supplied by the dealer when you purchase the printer.

4. Place the printer close to the PC230 so that the paper will feed freely without obstructing your use of the computer. Connect the power cable to a power outlet and the printer interface cable to your PC230. Ensure that the cables do not interfere with the movement of fan-fold paper through the printer.

5. Following the printer's instructions switch ON the printer, load and adjust the paper and carry out a test print.

Starting the system

HARD DISK SYSTEM

If your PC230 has been purchased with a hard disk installed, the computer will automatically start-up (boot) from the hard disk when you switch it on. In this case skip the following paragraphs and turn to the next section of the User Manual.

FLOPPY DISK SYSTEM

If your machine is fitted with one or two floppy disk drives, insert the MICRO BYTE supplied MS-DOS 3.30 Diskette (marked MICROSOFT MS-DOS Version 3.30) into DRIVE A. Ensure the disk label is facing upward and the sliding dust shield is inserted first.
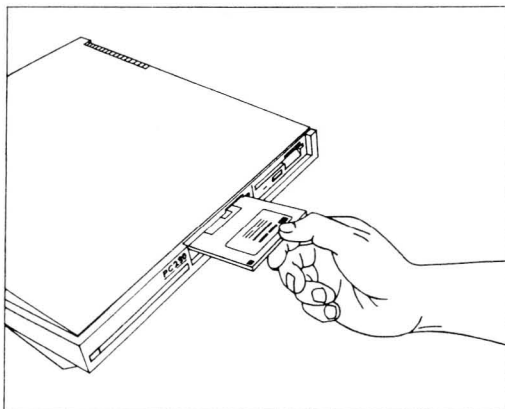
Insert disk correctly

1. Push the diskette into the drive until a 'klunk' is heard. Notice that the small button just below the slot is now extended. The disk can be ejected later by pushing this button.

2. Press the Reset push button. Your PC230 should now start-up (BOOT) by reading the MS-DOS programs from the diskette and initializing your PC230. Several messages will be displayed on the screen. You are now ready to begin using your PC230.

You are advised to read the supplied MS-DOS 3.30 User Manual to learn more about MS-DOS 3.30 functions and facilities. Your PC230 dealer may be able to assist you with courses on using your PC230 and PC software programs.

Configuring the System

YOUR PC230 can be started or re-started in three ways. The POWER SWITCH can be turned on, the Reset button can be pressed or you can do what is called a soft reset by holding down the ALT and CTRL keys together and then pressing the DEL key. In each case your PC230 reads the battery backed-up CMOS RAM to discover how you have decided to configure (set up) the system.

The SETUP program has been written to allow changes to be made to this configuration, either on a temporary or permanent basis.

WARNING: Do not switch on your PC230 immediately after switching off. Allow at least 10 seconds in between switching off and on.

Permanent changes

To change the configuration of your PC230 permanently, the SETUP program must be used in the menu-driven mode.

HARD DISK SYSTEM

Type. . .

   C:

to take you to the hard disk, then type. . .

   CD \ DOS33

to take you to the sub-directory where the system files are stores.

FLOPPY DISK SYSTEM

If you have a single or twin floppy drive system, place the system disk in DRIVE A
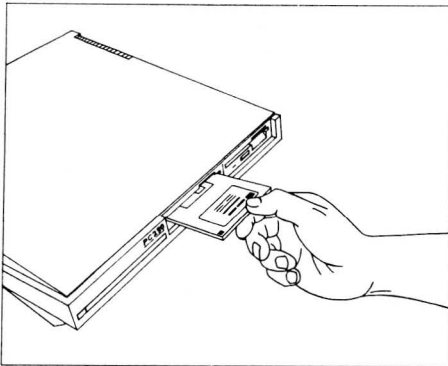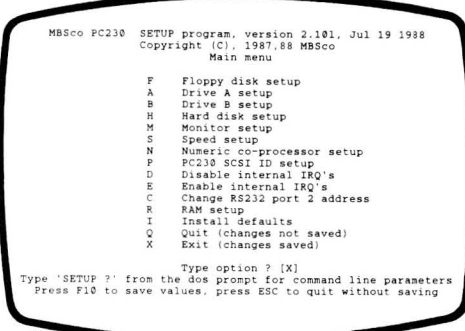
Enter the configuration mode by typing. . .

SETUP

and pressing the ENTER key.

The following list of options should appear.

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
             Copyright (C), 1987,88 MBSco
                         Main menu

             F    Floppy disk setup
             A    Drive A setup
             B    Drive B setup
             H    Hard disk setup
             M    Monitor setup
             S    Speed setup
             N    Numeric co-processor setup
             P    PC230 SCSI ID setup
             D    Disable internal IRQ's
             E    Enable internal IRQ's
             C    Change RS232 port 2 address
             R    RAM setup
             I    Install defaults
             Q    Quit (changes not saved)
             X    Exit (changes saved)

                         Type option ? [X]
   Type 'SETUP ?' from the dos prompt for command line parameters
   Press F10 to save values, press ESC to quit without saving
```

To select an option, type the CAPITAL LETTER shown before the desired option and then press the ENTER key.

F   Floppy disk setup

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
             Copyright (C), 1987,88 MBSco
                         Floppy menu
             Present number of floppies: 2




                   New number (0-2) ? [2]






   Press F10 to save values, press ESC to quit without saving
```

Enter the number of floppy disk drives installed in your PC230. It is possible to have up to two (0 - 2) floppy disk drives operating at one time (default 2).

A   Drive A setup

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
               Copyright (C), 1987,88 MBSco
                    Drive A setup menu
Drive currently internal 720kb disks in 720kb drive, step rate 3ms


              I    Show internal drive list

              E    Show external drive list

              3    Change drive to 3ms (fast)

              6    Change drive to 6ms (slow)

              X    Exit

                   Type option ? [X]


   Press F10 to save values, press ESC to quit without saving
```

Enter the desired operation mode for DRIVE A. You can choose to make DRIVE A either an internal drive or the external drive (if fitted). By choosing [I] DRIVE A will be the left internal 3.5 inch floppy disk drive. [E] selects the external 5.25 inch disk drive as DRIVE A. You may then choose the capacity of each drive from an extensive menu.

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
               Copyright (C), 1987,88 MBSco
                    Drive A setup menu
Drive currently internal 720kb disks in 720kb drive, step rate 3ms


              A    720kb disks in 720kb drive
              B    1.4Mb disks in 1.4Mb drive
              C    720kb disks in 1.4Mb drive
              D    360kb disks in 360kb drive
              E    360kb disks in 720kb drive
              F    1.2Mb disks in 1.2Mb drive
              G    720kb disks in 1.2Mb drive
              H    360kb disks in 1.2Mb drive
              X    Exit

                   Type option ? [A]


   Press F10 to save values, press ESC to quit without saving
```

B   Drive B setup

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
               Copyright (C), 1987,88 MBSco
                      Drive B setup menu
     Drive currently 360kb disks in 1.2Mb drive, step rate 3ms

               A     720kb disks in 720kb drive
               B     1.4Mb disks in 1.4Mb drive
               C     720kb disks in 1.4Mb drive
               D     360kb disks in 360kb drive
               E     360kb disks in 720kb drive
               F     1.2Mb disks in 1.2Mb drive
               G     720kb disks in 1.2Mb drive
               H     360kb disks in 1.2Mb drive
               3     Change drive to 3ms (fast)
               6     Change drive to 6ms (slow)
               X     Exit

                      Type option ? [X]


    Press F10 to save values, press ESC to quit without saving
```

Enter the desired operating mode for DRIVE B. The default is
720kb.

STEP RATE

The step rate of drives is the track to track movement time of
the read/write heads in milliseconds.

The manufacturer's specification are as follows:

    5.25 inch 360kb - 6 milliseconds
    5.25 inch 1.2Mb - 3 milliseconds

    3.5 inch 720kb - 3 milliseconds
    3.5 inch 1.4 Mb - 6 milliseconds

Drives can be set faster and even though outside the
manufacturer's specification, may work.

The default step rate in the SETUP program is 6 milliseconds,
which is also the MS-DOS default step rate.

Diskettes

The recommended diskettes for use in the various floppy disk drives supported by the PC230 are:

DRIVES	DISKETTES
3.5" 720Kb	DS/DD 80 Tracks 135 TPI
3.5" 1.44Mb	DS/HE 80 Tracks 135 TPI
3.5" 1.44Mb at 720kb	DS/DD 80 Tracks 135 TPI
5.25" 360Kb	DS/DD 40 Tracks 48 TPI
5.25" 1.2Mb	DS/HE 80 Tracks 96 TPI
5.25" 1.2Mb at 360kb	DS/DD 40 Tracks 48 TPI
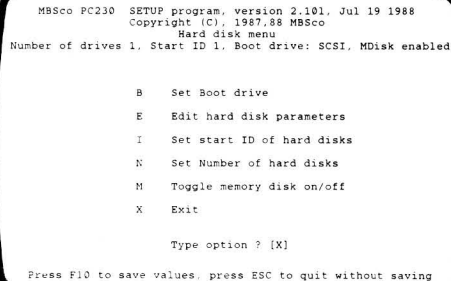
DS/DD is Double Sided/Double Density
DS/HE is Double Sided/High Energy

Some manufacturers label DS/HE diskettes as DS/HD. Other manufacturers label DS/DD diskettes as DS/HD. This rather confusing situation requires that you check the density of the diskette is correct when purchasing.

THE WRONG DENSITY MEDIA WILL NOT RELIABLY FUNCTION!

H   Hard disk setup

Your PC230 can be fitted with fast and efficient SCSI (pronounced "Scuzzy" to rhyme with "fuzzy") hard disks. The computer is able to address up to seven SCSI hard disks. Each SCSI hard disk has its own individual address or identity number. SCSI hard disks supplies by MICRO BYTE are factory set to identity number "1" (SCSI ID 1).

```
 MBSco PC230  SETUP program, version 2.101, Jul 19 1988
                 Copyright (C), 1987,88 MBSco
                        Hard disk menu
 Number of drives 1, Start ID 1, Boot drive: SCSI, MDisk enabled


           B      Set Boot drive

           E      Edit hard disk parameters

           I      Set start ID of hard disks

           N      Set Number of hard disks

           M      Toggle memory disk on/off

           X      Exit


                  Type option ? [X]

 Press F10 to save values, press ESC to quit without saving
```

First enter the SCSI hard disk ID. Option I - Set start ID of hard disks. Possible values can range from 0 to 7 with a default value of 0. Set this to 0 if your PC230 is not fitted with a SCSI hard disk.

```
        MBSco PC230   SETUP program, version 2.101, Jul 19 1988
                   Copyright (C), 1987,88 MBSco
                        Hard disk menu
     Number of drives 1, Start ID 1, Boot drive: SCSI, MDisk enabled




     Hard disk start ID (0..7)   [ ]




        Press F10 to save values, press ESC to quit without saving
```

Next enter the correct values in the 'Edit hard disk parameters' sub-menu. The default values are for a 20Mb hard disk as follows:
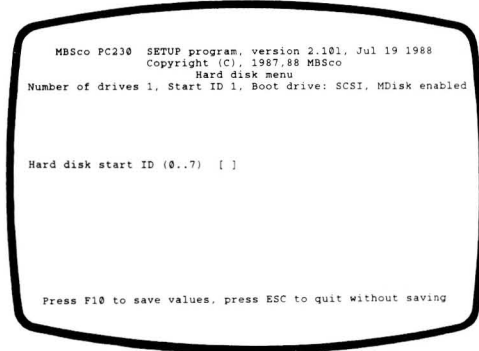
```
        MBSco PC230   SETUP program, version 2.101, Jul 19 1988
                   Copyright (C), 1987,88 MBSco
                        Hard disk menu
     Number of drives 1, Start ID 1, Boot drive: SCSI, MDisk enabled


        Total number of cylinders    (1..1023) [603 ]

        Total number of heads        (1..255) [4  ]

        Sectors per track            (1..63) [17]




        Press F10 to save values, press ESC to quit without saving
```
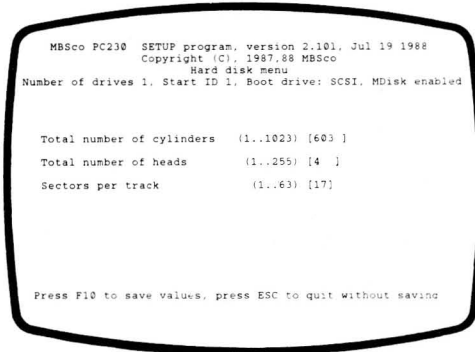
The 40Mb hard disks supplied by MICRO BYTE will be shipped
with the following values:

Total number of cylinders	(1--1023)	[603]
Total number of heads	(1--255)	[4]
Sectors per track	(1--63)	[34]

The 80Mb hard disks supplied by MICRO BYTE will be shipped
with the following values:

Total number of cylinders	(1--1023)	[603]
Total number of heads	(1--255)	[8]
Sectors per track	(1--63)	[34]

[B] Boot drive
Select [S] for SCSI hard disk and [E] for non-SCSI hard disk
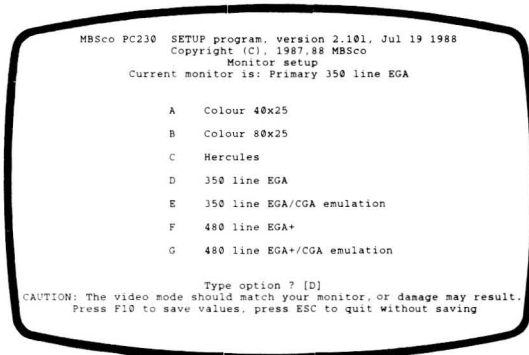
[N] Set Number of hard disks
Enter the number of SCSI hard disks installed in your
PC230.

[M] Toggle memory disk ON/OFF
The PC230 comes standard with 1Mb of memory. The
memory above 640Kb is set up for use as a memory disk.
You may turn OFF this feature, if required. e.g. Networked
systems.

M   Monitor setup

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
               Copyright (C), 1987,88 MBSco
                      Monitor setup
          Current monitor is: Primary 350 line EGA


          A     Colour 40x25

          B     Colour 80x25

          C     Hercules

          D     350 line EGA

          E     350 line EGA/CGA emulation

          F     480 line EGA+

          G     480 line EGA+/CGA emulation


                Type option ? [D]
CAUTION: The video mode should match your monitor, or damage may result.
    Press F10 to save values, press ESC to quit without saving
```

The Monitor parameters should be set to match the monitor
you intend connecting to your PC230.

NOTE: Damage may result if the Video Mode does not match
your monitor.

S   Speed setup

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
            Copyright (C), 1987,88 MBSco
                    Speed setup
        Current value is: 10 MHz no extra wait states.


            A     5 MHz operation

            B     7 MHz operation

            C     10 MHz operation

            T     Toggle wait states

            X     Exit


                  Type option ? [X]


Press F10 to save values, press ESC to quit without saving
```

Select the desired CPU speed and wait states from the menu.

N   Numerics co-processor setup

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
            Copyright (C), 1987,88 MBSco
                    8087 setup
                  8087 not present




        Is 8087 present (Y/N) ? [N]




Press F10 to save values, press ESC to quit without saving
```

Enter Y for YES if your PC230 has an 8087 numeric co-processor installed, or N for NO if an 8087 is not present.

P   PC230 SCSI ID setup

```
MBSco PC230   SETUP program, version 2.101, Jul 19 1988
              Copyright (C), 1987,88 MBSco
                     SCSI setup



SCSI ID of PC230  (0..7) [0]




     Press F10 to save values, press ESC to quit without saving
```
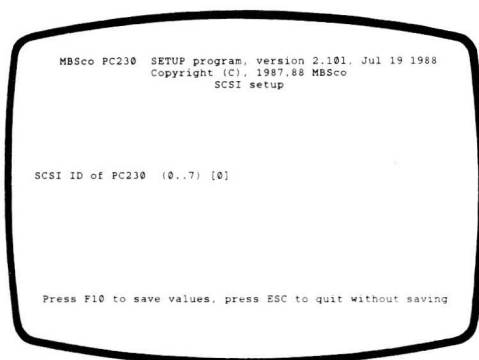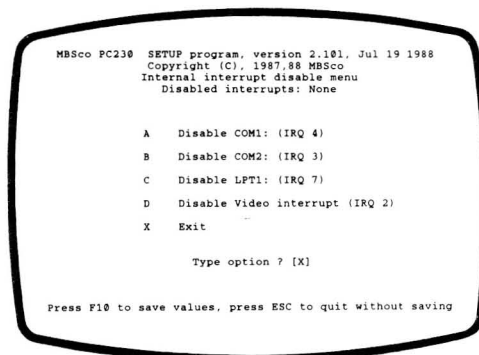
All devices attached to a SCSI Bus must have a SCSI ID, so you must assign a SCSI ID for your PC230. The possible values range from 0 to 7 (Default 0).

The PC230 SCSI ID selected should be different from the SCSI ID selected for the SCSI hard disk.

For more information on your PC230's in-built SCSI Bus call your PC230 dealer or MICRO BYTE Customer Support.

D   Disable Internal IRQ'S

```
MBSco PC230   SETUP program, version 2.101, Jul 19 1988
              Copyright (C), 1987,88 MBSco
              Internal interrupt disable menu
                Disabled interrupts: None

        A      Disable COM1: (IRQ 4)

        B      Disable COM2: (IRQ 3)

        C      Disable LPT1: (IRQ 7)

        D      Disable Video interrupt (IRQ 2)

        X      Exit

                Type option ? [X]

     Press F10 to save values, press ESC to quit without saving
```

As your PC230 is fully configured and uses ALL interrupts, it is not normally possible to add a card which requires the use of an interrupt. Your PC230 can however disable interrupts from some non-essential internal devices and make the freed up interrupt available to an add-in card.

You should consult the documentation supplied with the add-in card to determine which interrupt should be disabled. If you require further assistance you should consult your PC230 dealer or MICRO BYTE Customer Support.

E   Enable internal IRQ'S

What you disable, you should be able to re-enable. If an interrupt has been disabled using the above procedure, it can be reset to normal from this menu option.

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
             Copyright (C), 1987,88 MBSco
             Internal interrupt enable menu
                Disabled interrupts: None


        A    Enable COM1: (IRQ 4)

        B    Enable COM2: (IRQ 3)

        C    Enable LPT1: (IRQ 7)

        D    Enable Video interrupt (IRQ 2)

        X    Exit


                Type option ? [X]


Press F10 to save values, press ESC to quit without saving
```

C   Change RS232 port 2 address

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
             Copyright (C), 1987,88 MBSco
             RS232 port 2 setup menu
             RS232 port 2 is COM2



        A    Set RS232 port 2 to COM2: address

        B    Set RS232 port 2 to COM3: address

        X    Exit


                Type option ? [X]


Press F10 to save values, press ESC to quit without saving
```
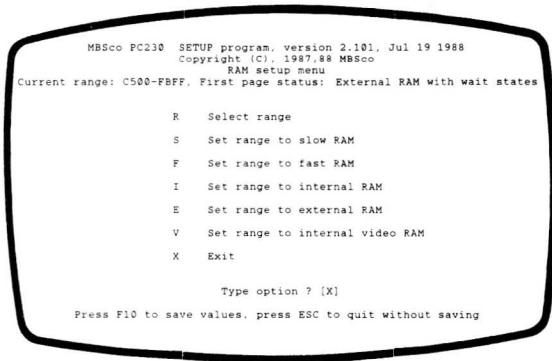
The second Serial Port address can be changed if an Expansion Card uses the normal Com 2 address.

R   RAM setup

```
MBSco PC230  SETUP program, version 2.101, Jul 19 1988
              Copyright (C), 1987,88 MBSco
                    RAM setup menu
Current range: C500-FBFF, First page status: External RAM with wait states


              R    Select range

              S    Set range to slow RAM

              F    Set range to fast RAM

              I    Set range to internal RAM

              E    Set range to external RAM

              V    Set range to internal video RAM

              X    Exit


                    Type option ? [X]

     Press F10 to save values, press ESC to quit without saving
```
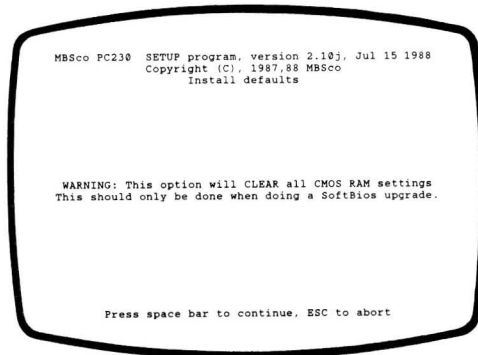
You can get advice from your PC230 dealer or MICRO BYTE
Customer Support concerning the configuration of this section
to support add-in cards.

I   Install defaults

If selected, the following screen is displayed:

```
MBSco PC230  SETUP program, version 2.10j, Jul 15 1988
              Copyright (C), 1987,88 MBSco
                    Install defaults




     WARNING: This option will CLEAR all CMOS RAM settings
    This should only be done when doing a SoftBios upgrade.




           Press space bar to continue, ESC to abort
```

If ESC is pressed, you will be returned to SETUP main menu.
If the space bar is pressed, a further screen is displayed.

```
MBSco PC230  SETUP program, version 2.10j, Jul 15 1988
              Copyright (C), 1987,88 MBSco
                     Install defaults




     Defaults set, please configure system before exiting SETUP




              Press space bar to return to main menu
```

From the main menu, select each option and change as necessary to match your particular configuration.

On exit from SETUP, you will be asked to reboot your PC230.

Temporary changes via the KEYBOARD

Thanks to your PC230's advanced design, CPU speed can be controlled via the keyboard while programs are running!

Ensure you press the CTRL and ALT keys together and while they are held down, press the desired key (1, 2, 3, − or +) on the numeric keypad.

5MHz	CTRL/ALT,1
7MHz	CTRL/ALT,2
10MHz	CTRL/ALT,3
Add wait states	CTRL/ALT,−
No wait states	CTRL/ALT,+

Even if you select 5 MHz with wait states your PC230 will still out-perform most PC XT computers on the market. At 10 MHz no wait states, the PC230 really flies!

Temporary changes via SETUP

Temporary changes can be made by typing command line options. The command line is the directory prompt (eg. C:\DOS33>).

First change to the drive or directory where the SETUP program is stored.

HARD DISK SYSTEM

If you have a hard disk system type. . .

C:

to change to the hard disk and then type. . .

CD\DOS33 to enter the system files directory.

FLOPPY DISK SYSTEM

For single and twin floppy disk drive systems insert the system disk in DRIVE A and type. . .

A:

Now type SETUP followed by a command from the following list. For example, if you typed. . .

SETUP MHz7

you would temporarily set the CPU Speed to 7 MHz but would not alter the permanent CMOS RAM configuration.

Valid options can be displayed by typing SETUP ? at the command line prompt.

SETUP sets the mode of the PC230 and takes the following arguments:
        SETUP n
Where n is one or more of:
EMUOFF, shut off emulation completely
EMUCGA, enable colour graphics adaptor emulation,
EMUHGA, enable Hercules graphics emulation,
MHZ5, change to 5 MHz cpu speed,
MHZ7, change to 7 MHz cpu speed,
MHZ10, change to 10 MHz cpu speed,
DRIVEx = 720i, change drive (where x is A or B) hardware type to internal, 720kb,
DRIVEx = 1.4i, change drive (where x is A or B) hardware 1.4Mb,
DRIVEx = 360e, change drive (where x is A or B) external, 360kb,
DRIVEx = 720e, change drive (where x is A or B) external, 720kb,
DRIVEx = 1.2e, change drive (where x is A or B) external 1.2Mb,
DISKx = 360kb, change drive (where x is A or B) media type to 360kb,
DISKx = 720kb, change drive (where x is A or B) 720kb,
DISKx = 1.2Mb, change drive (where x is A or B) 1.2Mb,
DISKx = 1.4 Mb, change drive (where x is A or B) 1.4Mb,
STEPFASTx, tell drive x (A or B) to seek at faster rate,
STEPSLOWx, tell drive to step at slower rate.
COMx: baud, par, bit, stop   set com 'x' to baud rate 'baud', parity 'par', bits per character 'bit', stop bits 'stop'

Note: Drive B cannot be changed from Internal to External using this method. This requires a hardware change.

Set up COMx: will perform the same functions as the DOS command MODE COMx, but allows up to 57600 BAUD.

Setup changes at boot

Changes to SETUP can be made by depressing one of the following keys when the computer powers up.

Hold down the required key and press the RESET button. Keep the required key held down for approximately five (5) seconds after releasing the RESET button.

MONITOR

With a BIOS Version 2.02 or greater ROM installed in your PC230, the following PERMANENT change will be made:

'C' CGA Monitor
'E' EGA Monitor
'M' Hercules/Mono Monitor

DRIVE A

With a BIOS Version 2.10 or greater ROM installed in your PC230, the following TEMPORARY change will be made:

'I' Internal 720kb Drive
'X' External 360kb Drive

Please note the BIOS versions required in ROM are necessary to make changes to SETUP at boot.

Formatting and setting up your hard disk

After using the SETUP program to inform your PC230 that a hard disk has been installed, you now need to format the hard disk.

FORMATTING PROCEDURE
The physical formatting of the new hard disk is not supported by MS-DOS, however it is supported by the BIOS through the DEBUG utility.
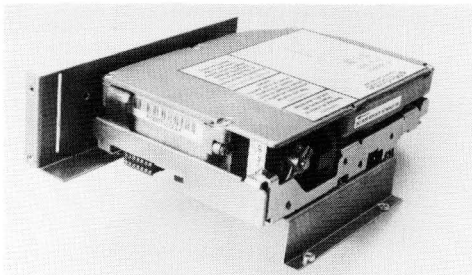
Hard disk assembly

1. Insert the system disk in DRIVE A and turn on the computer or press the Reset button to boot the system.

2. Type. . .

   DEBUG

   then press ENTER and wait until a dash appears.

3. Type. . .

   G = C400:5

   and press ENTER. On the screen you should see:

   FORMAT: all data will be lost. Do it (Y/N)?
        [Answer Y]
   FORMAT: which drive to format (1-n)?
        [Answer 1]
   FORMAT: what is desired interleave (1-9)?
        For 20Mb [Answer 2]
        For 40Mb [Answer 3]
        For 80Mb [Answer 1]
   FORMAT: keep bad sector re-map (Y/N)?
        [Answer Y]

   The BIOS will then take over and format the hard disk for you.

4. When the formatting has been completed, continue to the partitioning of the hard disk. Use the MS-DOS FDISK utility to create a primary DOS partition by typing. . . .

   FDISK

   and press ENTER.

   Select [1] (Create DOS Partition) and then press ENTER.

   Select [1] again (Create Primary DOS Partition) and again press ENTER.

   Then answer [Y] to make the whole disk a primary DOS partition and press ENTER. After a short time the screen should display:

   System will now restart

   Insert DOS diskette in Drive A

   Press any key when ready. . .

5. When your PC230 has re-started continue to the logical formatting of the disk. This is done using the MS-DOS utility FORMAT by typing the following command. . .

   FORMAT C:/S

   then press ENTER.

   The screen should now display. . .

   WARNING, ALL DATA ON NON-REMOVABLE DISK DRIVE C: WILL BE LOST!
   Proceed with Format (Y/N)?

   Type Y then press ENTER.

   The format program will now format the hard disk and transfer the system from the system disk. When complete the screen will display a message showing. . .

   • the total disk space
   • any space marked as defective
   • the space used by the operating system
   • the space available for your files.

6. Copy the MS-DOS utility files from your system floppy disks. Insert each diskette and type the following command. . .

   XCOPY *.* C:/S

   Then press RETURN

If you have a 40Mb or 80Mb Hard Disk installed you can now create a second partition.

40Mb AND 80Mb HARD DISK SYSTEMS SECOND PARTITION

1. Use the MS-DOS FDISK to create an extended DOS partition by typing. . .

   FDISK

   and press ENTER.

2. Select [1] (Create DOS partition) and then press ENTER.

3. Select [2] (Create extended DOS partition) and again press ENTER.

4. Press ENTER again to allocate the remainder of the disk space to the second partition.

5. Press ESC.

6. On a 40Mb hard disk press ENTER to allocate all this space to the logical drive.

7. On a 80Mb hard disk press enter twice to allocate the extended partition into two logical drives i.e. Drive D and Drive E.
    Press ESC to return to the FDISK options.

8. Press ESC to return to DOS. The following message will be displayed:—
    System will now restart
    Insert DOS diskette in Drive A
    Press any key when ready. . .

9. Now perform the logical formatting of the second partition by typing. . .

    FORMAT D:

    If you have an 80Mb hard disk, then type. . .

    FORMAT E:

The hard disk is now formatted and ready for your use. Whenever the PC230 is re-booted in the future by turning on the power switch, by pressing the Reset button or by using the CTRL/ALT DEL soft boot from the keyboard, the system files will be read from the hard disk.

If any problems are encountered, contact your PC230 dealer or MICRO BYTE Customer Support.

Upgrading and Expanding your PC230

Keeping up to date

The team at MICRO BYTE are keen that PC230 owners and users should have the best available system at all times. The Product Development staff will continue to improve the PC230 features. You will be offered these developments in the form of upgrade system disks which include the latest version of SOFTBIOS. See below for installation instructions.

As your use of the PC230 increases you may find it desirable or even necessary to expand your computer system by the addition of an extra floppy disk drive or a hard disk. This section of the User Manual explains how to fit these extra drives.

You may want to expand your system even further by including a third-party function card such as a Bus Mouse card, an internal Modem or a networking interface. In this case you would need to add an expansion adapter. Fitting this extra option is also described in Section 4.

What is SOFTBIOS

All PCs have a BIOS (Basic IN/Out System). The BIOS is a collection of instructions designed to set up the computer for operation every time it is turned on. The BIOS also controls much of the housekeeping while the computer is running.

The BIOS instructions are normally housed in a ROM chip on the mother-board of the computer. Like all other PCs the PC230 has a ROM-BIOS chip. The PC230 BIOS however is more advanced in two ways.

Firstly the PC230 BIOS contains extra instructions which provide more contol over the way in which the internal memory (RAM) of the computer is used.

Secondly the PC230 BIOS can be upgraded. This can be done in two ways. It is possible to extract the old BIOS chip and replace it with an improved BIOS chip. This process should be done by your PC230 dealer.

The upgrades can also be provided by means of SOFTBIOS. In this case you will be provided with two new system disks containing all the new instructions. With a single or twin floppy drive system, these new disks can be used to update your old system disks. If you have a hard disk system these upgrade disks can be used to place the new instructions on the hard disk.

Software upgrading procedure

Upon receiving your two (2) new SOFTBIOS 2.10 diskettes, which include the release of MS-DOS 3.30A, perform these steps to upgrade your PC230.

1. Turn on the power and put the new diskette labelled 1/2 into the left hand side drive (DRIVE A).

2. Restart your PC230 from the new diskette:

   Press the RESET button on the rear of the Base Unit
   or
   Press the CTRL and ALT keys together and while holding them down, press the DEL key.

   Your PC230 will go through a normal Boot routine and is finished when the DOS A:\> prompt appears.

3. Use the SETUP program to select the correct options for your PC230's particular configuration.

   At the DOS A:\> prompt type:

   SETUP

   then press Enter

4. If your current BIOS version is earlier than 2.00 then all SETUP options in CMOS RAM need to be returned to their default settings.

   Select 'Install defaults' in the main menu. ('I' key followed by Enter).
   Press space as required on both screens shown by 'Install defaults'.

   You may skip this step if you already have BIOS version 2.00 or later.

5. Select each option, and change as necessary to match your particular configuration.

   Refer to the PC230 User Manual for assistance.

   If you do not have a Hard Disk system, go to Point 10.

6. If you have a Hard Disk system, the System files and the Utility files must be transferred to Drive C:

   The SYS Command transfers the two Hidden System files: MSDOS.SYS and IO.SYS, as well as the Hidden Softbios file: SOFTBIOS.COM.

   At the DOS A:\> prompt, type:

   SYS C:

   then press Enter.

   SYS has transferred the files when the SYSTEM TRANSFERRED message and the DOS A:\> prompt is displayed.

7. All Utility files must be transferred to Drive C:

   The XCOPY Utility copies all files and subdirectories and their files

   At the DOS A:\> prompt, type:

   XCOPY * . * C:/s

   then press Enter.

8. Replace the diskette in drive A: with the diskette labelled 2/2.

9. Copy the CPI files to drive C:

   At the DOS A:\> prompt, type:

   XCOPY * . * C:/s

   then press Enter.

10. If you have a Single or Dual Floppy Disk system, you can start using the two new diskettes.

   Make a copy of them as Master Diskettes and store in a secure place.

    If any problems are encountered contact your PC230 dealer or MICRO BYTE Customer Support.

Adding a floppy disk drive

Your PC230 comes fitted with either a 720kb or 1.44Mb internal 3.5 inch floppy disk drive. A second internal floppy disk drive may be installed. This second drive may also have a capacity of either 720kb or 1.44Mb.

The floppy disk mounting kit consists of:

4 x 3mm diameter x 6mm long screws
1 x floppy disk drive
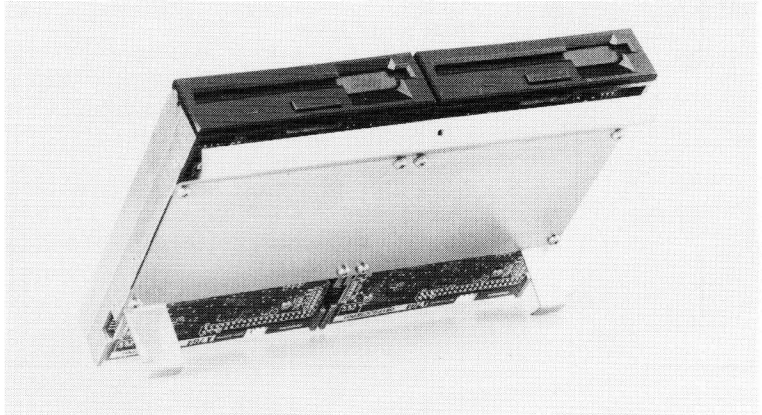
Floppy disk assembly

INSTALLATION PROCEDURE

1. Switch off all power switches on your PC230 computer system and your peripherals and unplug all cords.

2. Unscrew the two top cover fastening screws at the rear of your PC230 and remove the top cover by lifting the back upwards and then sliding the cover forward (towards the front of the computer). Notice the front of the top cover is held in place by the floppy disk drives.

3. Unplug the floppy disk cable from the mother board.

4. Remove the front mounting bracket screw and lift out the floppy disk mounting bracket. Unscrew the blanking plate.

5. Locate the spare connector on the floppy disk interface ribbon cable and connect it to the new floppy drive.

6. Use the 3mm screws to mount the floppy drive to the mounting bracket and re-install the assembly into your PC230 base.

7. Plug the floppy disk cable back onto the mother board.

8. Replace your PC230 top cover and fasten it in place. Connect all cables.

9. You are now ready to set up your PC230 to handle the second floppy drive. Refer to Section 3 (Configuring the System) for instruction on resetting the system to use the new floppy drive.

Adding a hard disk

Since your PC230 was designed with built-in controllers for both hard and floppy disks, installing a hard disk is relatively easy, but there are some precautions to be taken:

WARNING.

ALWAYS handle your hard disk with CARE.

NEVER drop it or throw it around.

DO place your hard disk on a soft padded surface, and

DON'T subject it to any unnecessary shock or vibration.

PREVENT static discharge from reaching your hard disk. This is particularly important during dry weather.

DON'T connect the power supply or turn on the power UNTIL you are certain that you have installed the hard disk successfully.

All these procedures are necessary because your hard disk is a complex and delicate piece of equipment. The magnetic heads which read data from and write data to the disks are resting on the disks much like a hovercraft resting on a cushion of air. Shock or vibration may cause these heads to scratch the disk's surface and cause irreparable damage!

Depending on the brand and the capacity, a 20Mb hard disk may have one or two disks (2 or 4 surfaces where an equal number of heads are resting).

The hard disk mounting kit should include the following:
    4 x 6/32" diameter x 3/16" long screws
    1 x 50-way ribbon cable

INSTALLATION PROCEDURE

1. Switch off all power switches on your PC230 computer system and your peripherals. Unplug all cords.

2. Unscrew the two top cover fastening screws at the rear of your PC230 and remove the top cover by lifting the back upwards and then sliding the cover forward (towards the front of the computer). Notice the front of the top cover is held in place by the floppy disk drives.

3. Unplug the floppy disk cable from the mother board. Remove the front mounting screw and lift out the floppy disk mounting bracket. Lay the floppy disk assembly on its back on top of the power supply to the left of the mother board.

4. Remove the hard disk mounting bracket by unscrewing the 2 screws on the back panel and two screws on the base.

5. Use the four 6/32" diameter by 3/16" long screws to mount the hard disk onto the bracket supplied. Place the hard disk onto the mounting bracket as shown:
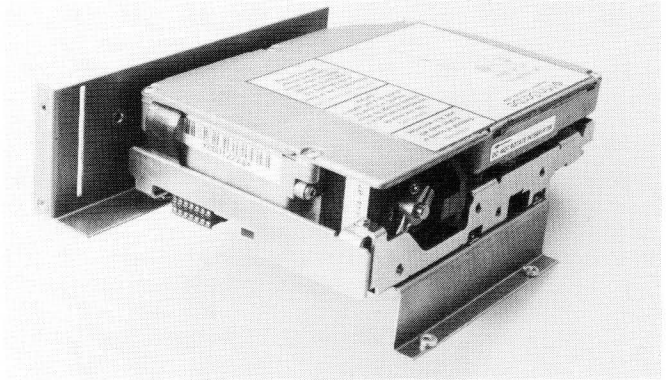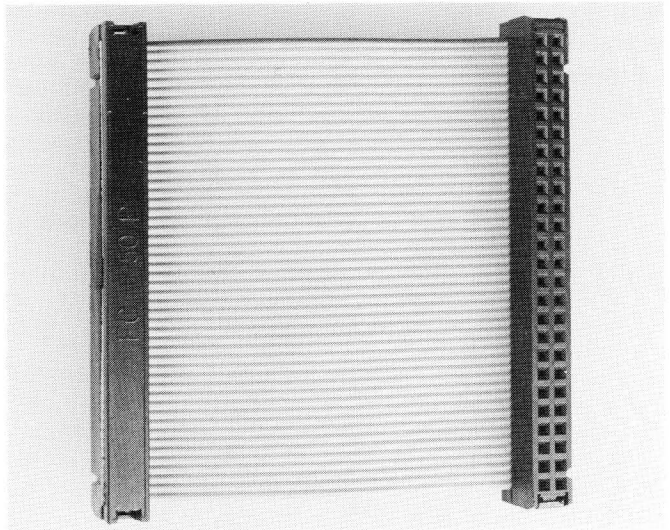
Hard disk assembly

Line up the mounting bracket holes and the hard disk holes and fasten the two together.

6. Locate the 50-way hard disk cable.

50-way hard disk cable

Notice that the connectors on each end are the same and that they are polarized by a small location ridge in the middle of one side. Plug one end of the cable into the large 50-way connector on the hard disk observing the polarizing slot/ridge. Plug the other end of the cable into the 50-way connector on your PC230 mother board which can be found adjacent to and at right angles to the power supply.

7. Taking care, position the hard disk bracket into your PC230 base so that the foot of the bracket is next to the power supply. Replace the four screws to secure the hard disk bracket, two through the base and two through the back of the case.

8. Locate the hard disk power cable and connect it to the hard disk power connector.

9. Place the floppy disk assembly back into the machine and replace the mounting screw.

10. Replace the floppy disk cable back onto the mother board.

11. Replace your PC230 top cover and fasten it in place. Plug in the power, keyboard and monitor cables. You are now ready to format your new hard disk. Refer to Section 3 (Configuring the System) for directions.

Adding the expansion adapter

Your PC230 can have two PC/XT compatible expansion slots added. These are located on a vertically mounted board that accepts two PC expansion cards. If your PC230 has two floppy disk drives then two half-length cards may be fitted. If your system has only one floppy disk drive then the expansion adapter can accept one full-length card and one half-length card.

The expansion adapter mounting kit consists of:

2 x 3mm diameter x 8mm long screws.
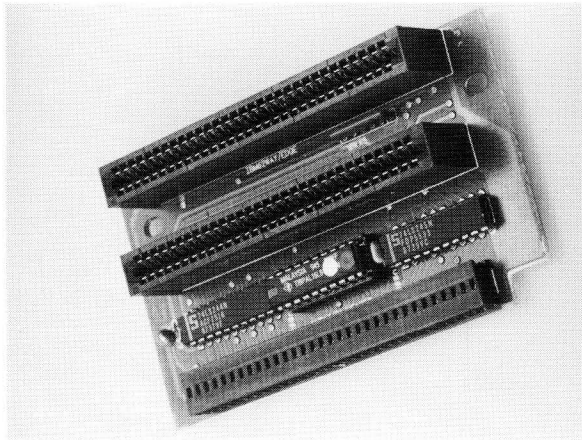
Expansion adapter

INSTALLATION PROCEDURE

1. Switch off all power switches on your PC230 computer system and your peripherals. Unplug all the power cords to prevent shock.

2. Unscrew the two top cover fastening screws at the rear of your PC230 and remove the top cover by lifting the back upwards and then sliding the cover forward (towards the front of the computer). Notice the front of the top cover is held in place by the floppy disk drives.

3. Insert the expansion adapter with the edge connectors facing away from the hard disk mounting bracket, then fix it to the bracket using the supplied screws.
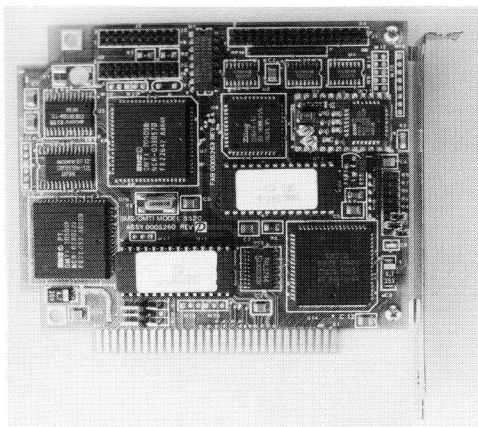
Expansion board

4. A PC expansion board can now be mounted onto the expansion adapter by removing the relevant slot cover and fitting the board into the slot chosen and fastening it with the supplied screw.

5. Replace your PC230's top cover and fasten it in place. Attach the power, keyboard and monitor cables.
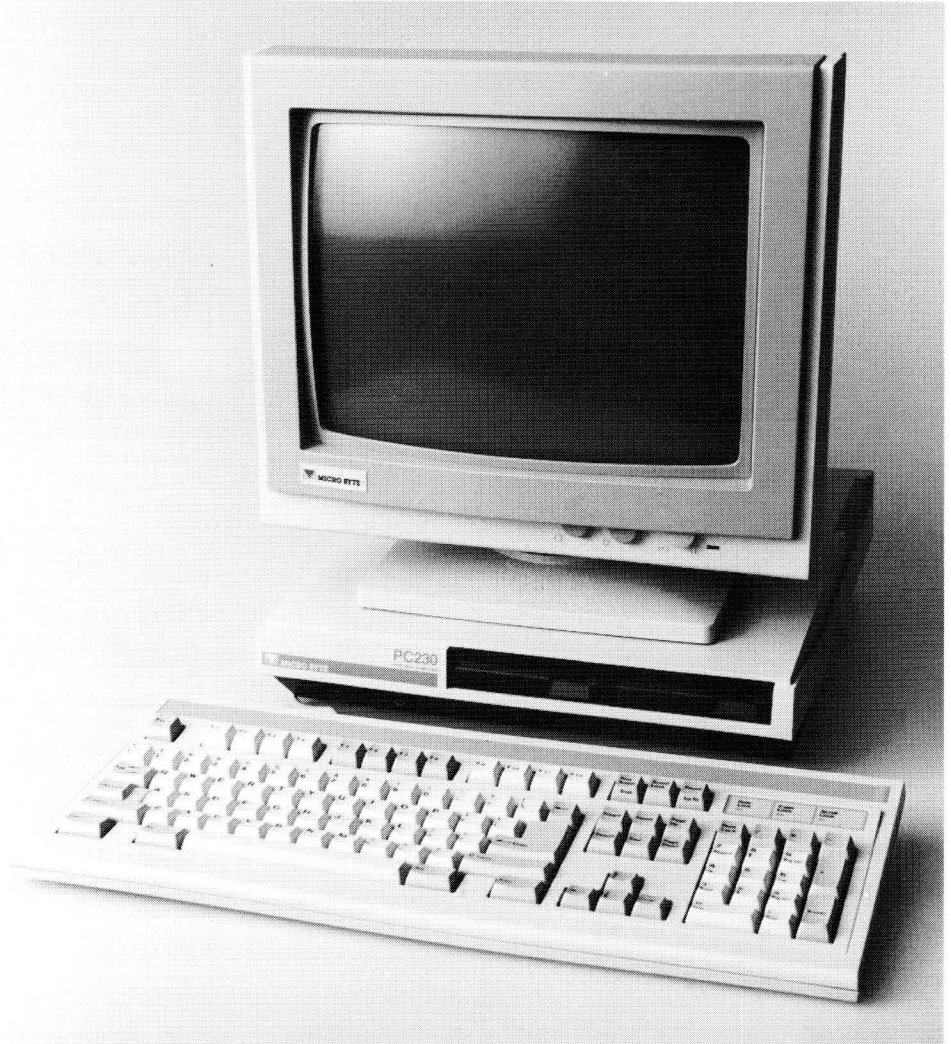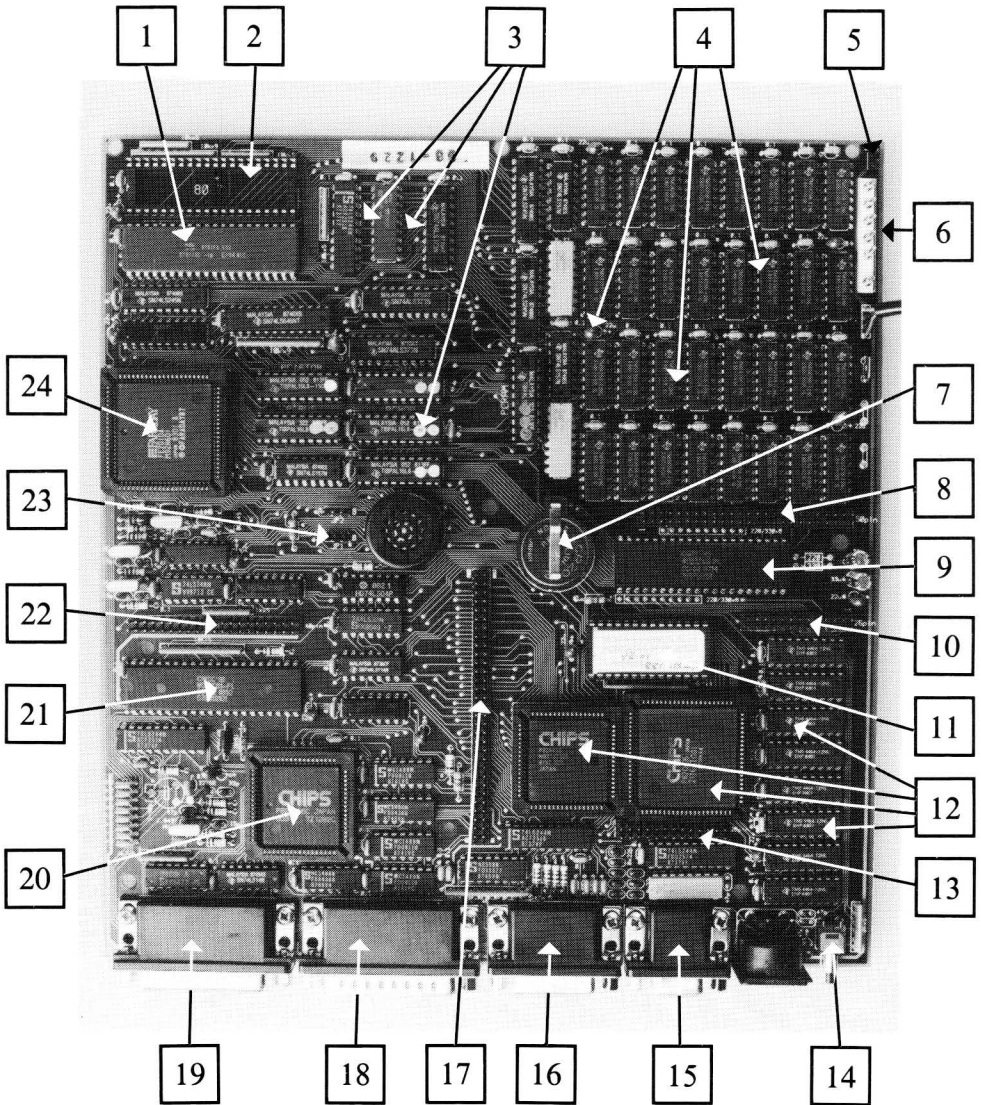
Inside your PC230

IF THE top cover of your PC230 is removed, extreme CARE must be exercised to avoid damaging the components inside.

WARNING!

Your PC230's power supply is NOT SERVICEABLE in the field and should only be opened by qualified service personnel. Attempting to open the power supply could result in death by electrocution.

PC230 Mother Board

**PC230
Mother Board**

Your PC230's mother board is a 4-layer high quality PCB (Printed Circuit Board) which contains the following:

1. NEC V30 16-bit processor running at 5, 7 or 10 MHz

2. 8087 Math Processor socket

3. Micro Byte developed advanced memory manager and Bus converter

4. 1 Mb (1,000kb) of 16-bit zero wait state memory

5. Fan power via 2-pin connector

6. PCB power via 6-pin connector

7. Lithium battery for time, date and set-up memory back-up

8. SCSI port via 50-pin header

9. Western Digital 33C93 SCSI hard disk controller

10. Macintosh compatible SCSI port via 26-pin header

11. 32kb of MICRO BYTE developed BIOS (27C256)

12. Chips & Technology 82C435/82A436 auto switching graphics controller with 256kb of 8-bit video RAM

13. COM2 port via 26-pin header

14. Reset switch

15. TTL video port via 9-pin D type socket

16. Games (joystick) port via 15-pin D type socket

17. XT Bus adapter port via 64-pin header

18. COM1 port via 25-pin D type plug

19. Printer port via 25-pin D type socket

20. Chips & Technology 82C606 multi-function controller

21. Western Digital 37C65 floppy disk controller

22. Floppy port via 40-pin header

23. Monitor selection jumpers for Mono (Hercules), CGA and EGA monitors

24. Faraday 2010A XT core logic

**PC230
Address
Maps**

I/O Address Map

Address (HEX)	Use
00-0F	DMA controller
20-21	Interrupt controller
40-43	Timer
60-61	Keyboard data & control registers
62-63	2010 configuration registers
80-83	DMA page registers
A0	NMI enable register
E0-E7	Configuration bits
E8-E9	SCSI controller
200-201	Games port
2F8-2FF	COM2
378-37F	Printer
3B0-3BF	Monochrome display adapter registers
3C0-3DF	EGA & CGA display adapter registers
3F0-3F7	Floppy Disk controller
3F8-3FF	COM1

Note:(1) No external cards can occupy the I/O addresses
00-FF or any of the above listed addresses.
(2) Earlier machines had the games port at 200-20F,
the SCSI controller at 280-29F, and COM2 at
2FO-2FF.

Interrupt Map

Int. Number	Use
IRQ0	Timer
IRQ1	Keyboard
IRQ2	Video - Not used by BIOS
IRQ3	COM2
IRQ4	COM1
IRQ5	SCSI/External Hard Disk
IRQ6	Floppy Disk
IRQ7	Printer

DMA Map

DMA Number	Use
DRQ0	Refresh
DRQ1	Unused
DRQ2	Floppy Disk
DRQ3	SCSI/external Hard Disk

On Board RAM

Thanks to the MICRO BYTE developed Memory Manager, each 4kb block of memory in the V30's 1Mb address range can be assigned to 1 of 3 different memory areas.

These areas consist of 16-bit internal (system) RAM, 8-bit internal (video) RAM or 8-bit external (XT Bus) RAM.

Each block can also be write-protected and/or have 4 wait states inserted in each memory cycle.

The Memory Manager allows your PC230 to have a 342kb memory drive and 256kb of video memory. It also allows the PC230 to support XT Bus add-in cards. Refer to MICRO BYTE System Support for further information on the Memory Manager.

By the use of LIM 4.0 memory add-in cards, your PC230 can have its memory extended. Software Link's PCMOS-XM operating system can use this memory and give your PC230 multi-user and multi-tasking capabilities. Contact MICRO BYTE for further information.

Monitor type selection jumpers:

For HERCULES standard the jumpers should be in the following configuration:

A O | O   O | B   A O | O   O | B
          J P 2   J P 1
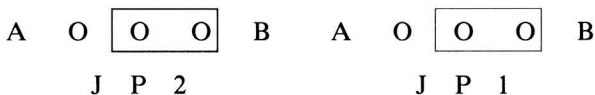
For CGA standard and 80 column mode:

A O | O   O | B   A | O   O | O B
          J P 2   J P 1
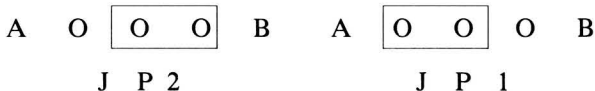
For CGA standard and 40 column mode:

A | O   O | O B   A O | O   O | B
          J P 2   J P 1

For EGA standard:

A | O   O | O B   A | O   O | O B
          J P 2   J P 1
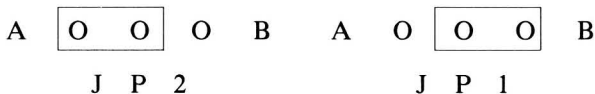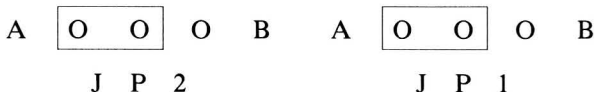
Connector pin assignments

Keyboard connector

Type: 5-pin DIN female

Pin –	Assignments
1	Keyboard clock
2	Keyboard data
3	Spare
4	Ground
5	+ 5V

Serial port connectors (COM1 and COM2)

Type: 25-pin D type male

Pin –	Assignments
8	Carrier detect
3	-Receive data
2	-Transmit data
20	Data terminal ready
7	Signal ground
6	Data set ready
4	Request to send
5	Clear to send
22	Ring indicator

Parallel port connector (PRINTER)

Type: 25-pin D type female

Pin –	Assignments
1	-Strobe
2	D0
3	D1
4	D2
5	D3
6	D4
7	D5
8	D6
9	D7
10	-Ack
11	Busy
12	Pe
13	Select
14	-Auto feed XT
15	-Error
16	-INIT
17	-Select in
18-25	Ground

External floppy drive connector

Type: 37-pin D type female

Pin –	Assignments
20	-300 RPM
23	-Index
24	-DSO
25	-DS1
26	-DS2
27	-MO1
28	-Dirin
29	-Step
30	-Wdata
31	-Wgate
32	-Trck00
33	-Wprot
34	-Rdata
35	-Side
1-18	Ground
19	+ 12 Volts
37	+ 5 Volts

Games connector

Type: 15-pin D type female

Pin –	Assignments
2	-A1
3	-Ax
6	-Ay
7	-Az
11	-Bx
13	-By
14	-Bz

SCSI Connector

Type: 25-pin D type female

Pin –	Assignments
1	-Req
2	-Msg
3	-I/O
5	-Ack
6	-Bsy
7	Gnd
8	-DB0
9	Gnd
10	-DB3
11	-DB5
12	-DB6
13	-DB7
14	-Gnd
15	-C/D
16	Gnd
17	-Atn
18	Gnd
19	-Sel
20	Dbp
21	-DB1
22	-DB2
23	-DB4
24	Gnd ←→ 5v
25	Gnd

Video Connector

Type: 9-pin D type female

Pin –	Assignments
1	-Gnd
2	-R'
3	-R
4	-G
5	-B
6	-I/G
7	V/B'
8	-HRTC
9	-VRTC

NOTES:

LEVEL 6 BOARDS - SCSI IN ~~NOT~~ NO LONGER PIN COMPATIBLE
WITH EARLIER LEVEL ~~BOARDS~~.

PIN 24 ON SCSI BUS IS NOW 5V NOT
GROUND. THIS IS ~~DUE TO~~ DUE TO MACINTOSH
CHANGING THEIR STANDARDS. IF TWO R230
ARE TO BE CONNECTED VIA THE SCSI PORTS
THEN PIN 24 MUST ~~BE~~ CUT OR DISABLED.

1010   A
1011   B
1100   C
1101   D
1110   E
1111   F

MICRO BYTE®