User Manual for Chicony NB5620 Notebook PC

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>> Start Up the System <<

Your notebook is an advance, high performance system designed to run today's wide variety of software packages. It includes system unit, AC adapter and power cord.

A. General description

The notebook package contains the following items:

The 386SX-20-based notebook PC
This user's guide
One AC autosensing adapter and power cord
External keyboard adapter
One NiCad battery pack (inside the system)
One 20-MB hard-disk drive (inside the system)
A carrying bag

B. The following options are also available for the system:

Math coprocessor (80387SX)
Expansion memory module (RAM card)
External 5.25-inch, 1.2-MB diskette drive
17-key numeric keypad
2400-bps modem
Additional NiCad battery pack

C. Connecting the Notebook PC

Make sure the system power switch is OFF before you start. Plug the single-jack end of the ac adapter into the system, and the other end into a power outlet . The AC adapter is auto-sensing and accepts 100V - 240 V AC power.

D. Booting the System
Follow the steps below to boot the system:

1. Open the LCD display by sliding the latches on both sides of the system case toward the front. Lift the LCD cover and tilt it to the most comfortable viewing angle. To close the display, gently push down on the LCD cover until the latches on both sides lock.
2. Power on the system. The power on/off switch is located on the left side of the system (facing you) on the rear panel.
3. Adjust the brightness and contrast controls (at the right side of the LCD panel) so that you can comfortably read the screen.
4. The system runs self-test to check major circuits and displays reports on the screen. If the system fails the self-tests, error message appear. See Chapterter 5 for details.
5. DOS is already loaded on the system hard disk before the system is shipped. After the system displays the power-on messages, the DOS prompt appears.
6. If you want to boot from drive A, power on the system and insert the DOS diskette in drive A , label side up. Gently push it into the drive until it locks in place. Drive A is a 3.5-inch, 1.44-MB, double-sided, high-capacity diskette drive. Press the disk eject button to eject or remove a diskette.

E. Resetting the System

There are two ways to reset the system:

Hard boot or cold boot
Turn off the system, wait for threeseconds, then turn it on again.

Soft boot or warm boot
Press the Ctrl-Alt-Del keys simultaneously.

>> System Features <<

System Features

Your notebook PC is a **386SX-20 based**, AT-compatible computer that run at switchable speeds of 20 or 10 MHz. Weighing about 6.9 lbs (3.1kgs) with a battery pack inside, this system incorporates the capabilitie of a powerful desktop computer into a compact, lightweight, notebook system the size of an A4 paper.

A. Front View

On the top panel of the system, you'll see the following LED indicators, from left to right:

1. **POWER**
   This LED lights up when the power is on.
2. **ADAPTER IN**
   This LED lights up when you use the AC adapter to power the system.
3. **BATTERY LOW**, **BATTERY CHARGE**
   These LEDs indicate the power level of the battery. If the battery is LOW, save whatever you are working on as soon as possible (within five minutes). Then connect the AC adapter to the system to recharge the battery. The battery CHARGE LED lights unit the battery is fully charged You may continue working while the battery is being recharged.
4. **TURBO**
   This LED lights up when the system is running at 20MHz turbo mode.
6. **FDD**, **HDD**
   These LEDs light up when the system accesses the diskette drive or hard-disk drive, respectively.

7. **SCROLL LOCK**, **CAPS LOCK**, **NUM LOCK**

   These LEDs ight up when the Scroll Lock key, the Caps Lock key, or the Num Lock key is presses (on), respectively.

B. Rear View

1.	Power switch	Turn the system unit on or off.
2.	Ext. CRT port	Connect an external analog monitor here.
3.	Ext. FDD port	Connect external diskette drive here.
4.	Power connector	Plug triple-jack end of the AC adapter here
5.	Printer port	Plug the parallel printer connector here.
6.	COM1 serial port	Connect any serial device,
7.	COM2 serial port	such as a mouse or modem, here.

C. Bottom View

1.	Battery cover	Open this cover to change or remove the battery pack.
2.	80387SX socket	Open this cover to install or remove the 80387SX math coprocessor.
3.	RAM card slot cover	Open this cover to install additional memory expansion (RAM) card.

WARNING
Make sure the power is turned OFF before removing these covers. The covers must be replaced before turning the power on again.

D. The LCD Screen

The LCD screen is VGA compatible with backward compatibility for EGA, CGA, MDA, and Hercules video standards. It offers excellent clarity, displaying text and graphics in 16 shades of gray in high resolution mode; (640 x 480). You can adjust display contrast and brightness (located on the right side of the LCD panel) for optimum readability. You can also connect an external VGA monitor to the system through the CRT port on the rear panel.

E. The Keyboard

The built-in keyboard has 83 full-sized keys and an emulated numeric keypad . The keyboard also has the following special features and control keys.

The **Fn** (function) key
Pressing this key together with color-labeled keys generates the functions or characters indicated on the labels. The table below lists these functions:

Fn key	Function
F1	F11
F2	F12
↑	+
↓	-
Scr Lock	Num Lock
PgUp	Fast 20MHz
PgDn	Slow 10MHz

The **Print Screen/SysRq** key
Pressing this key sends the data on the screen to the printer for printing. To generate a system request, press <Alt>+<SysRq>.

The **Pause/Break** key
Pressing this key stops the display temporarily.
Press any key to continue. Pressing the <Ctrl>+<Break> keys together generates a break command which usually halts commands or programs as they are running.

The **Num Lock** key
Pressing this key shifts the keyboard to numeric keypad mode.
The arrangement of the keypad is similar to a calculator keypad.

Internal Numeric Keypad Functions

Key	Numeric pad	with Shift Key
7	7	Home
8	8	↑
9	9	PgUp
0	/	
U	4	←
I	5	
O	6	→
P	*	
J	1	End
K	2	↓
L	3	PgDn
;	-	
M	0	Ins
.	.	Del
/	+	

Note: Without external keypad:

Num Lock off = lower case (upper case with shift key).
Num Lock on = numeric keypad
(cursor control pad with Shift key).

With external keypad:

Normal keyboard useage.

F. Power Management

The system's sleep mode helps to reduce power consumption. When this function is enabled, the CPU speed goes down to 3 MHz and the LCD panel backlight is switched off after a specified period of system inactivity.

Run the utility diskette and use the following
Fn key combinations to set the inactivity period:

Fn key and:	Sleeping mode
0	Disable (default)
1	1 minutes
2	2 minutes
3	3 minutes
4	4 minutes
5	5 minutes
6	6 minutes
7	7 minutes
8	8 minutes
9	9 minutes

Pressing any key wakes the system up to its original speed.

G. The Diskette Drive

The system has a 3.5-inch, 1.44-MB double-sided, high-capacity diskette drive on the right side panel, designated as drive A. It supports both 1.44-MB and 720-KB capacity diskettes. You can also connect an external 5.25-inch diskette drive to the external FDD port on the rear panel as drive B.

1. Diskette Do's and Don'ts

Always make backup copies of diskettes that contain important programs or data files.

Each time you finish creating or modifying an important file, back it up on a diskette.

Keep diskettes away from any magnetic fields.

Store diskettes between 0°C - 52°C (50°F - 198°F).

Do not touch the exposed portion of the diskette at the head aperture, or allow dust or moisture to collect on a diskette.

Do not remove diskettes from a drive when the diskette drive activity light is on.

When you remove a diskette from a drive, return it immediately to its envelope.

2. Write-Protecting Diskettes

To prevent erasing data on a 3.25-inch diskette, set the switch on the diskette to the READ ONLY position. To write data to the diskette, set the switch to the WRITE DATA position . To prevent erasing data on a 5.25-inch diskette, put a write-protect tab over the write-protect notch. To write data to the diskette, remove the write-protect tab.

H. The Hard Disk Drive

All hard disks must be physically formatted, partitioned, and logically formatted before use. Your system's hard disk has been partitioned and formatted at the factory.

NOTE:
Back up files on the hard disk on a regular basis. Also, do not attempt to format the hard disk unless absolutely necessary. Formatting the hard disk erases all data written on it!

I. Power Sources

The system comes with an auto-sensing 100V-240V AC, 50/60-Hz AC adapter that converts alternating current to direct current. For safety reasons, use only the adapter shipped with the system to connect the system to a wall outlet.

In addition to AC operation, the system has a rechargeable, NiCad battery pack. The battery pack supplies DC power over 2 hours of typical use on a single charge. If you use battery power a lot, you might want to keep a spare, fully-charged battery pack handy for extra flexibility.

>> How to Expand Your System <<

A. System Expansion

This section describes how to expand the system by adding peripherals and installing additional components. These include:

Memory expansion module (RAM card)

80387SX math coprocessor.

External 5.25-inch, 1.2-MB floppy disk drive.

External keypad.

External VGA monitor.

Parallel printer.

Mouse, modem, or other serial devices

WARNING
Before you install the system or add new components, make sure that the system unit power switch is off and that all power cords and cables are disconnected.

B. Connecting Peripheral Devices

A. Connecting an External Keyboard or External Keypad

Connect the external keyboard or external keypad to the 6-pin mini-DIN connector on the computer's left-hand side. Be sure to use the keyboard or keypad converter cable for proper connection.

B. Connecting a Printer

Before connecting your printer, study the printer manual and confirm that the printer accepts parallel communications.
Make sure the printer power switch is OFF.
Connect the printer cable to the 25-pin parallel port on the computer's rear panel.
Connect the printer to a power source.

C. Connecting an External Monitor

Connect the external monitor cable to the 15-pin external monitor port on the computer's rear panel. Use the monitor's brightness and contrast controls to adjust the screen display.

Note: Multisync monitors come with either 9-pin or 15-pin connectors. For a multisync monitor with a 9-pin connector, a special 9-pin to 15-pin converter cable must be used.

D. Connecting a Mouse

Connect the mouse's 9-pin connector to one of the computer's serial ports (COM1 or COM2).
Follow the instructions in the mouse manual to install the mouse driver.

E. Connecting a Modem

Connect the modem to one of the computer's serial ports (COM1 or COM2).

F. Connecting an External Floppy Disk Drive

Take out the 5 1/4" drive chassis shipped with the system unit from the carrying bag. Make sure that the connecting screws are in the carrying bag.

FDD BASE PLATE Remove the base plate of the 5 1/4" floppy disk drive's chassis . Remove the floppy disk drive from its container and connect it to the chassis .

Connect the drive's cable to the cable in the chassis. Make sure that the 5 1/4" drive is seated properly inside the chassis. Fasten the connecting screws in the base plate of the floppy disk drive. Connect the drive's cable to the 25-pin FDD connecter on the computer's rear panel.
Your 5 1/4" drive can now be accessed as drive B.

C. Installing Internal Components

Before you install any internal components, make sure that the computer is disconnected from any power source. Expansion cards and the coprocessor and BIOS chips are sensitive to electrostatic discharge (ESD). Take care not to touch the components and connectors of the boards when handling them.

A groundstrap should be used when handling the coprocessor or BIOS chips. These components are delicate and we recommend that you get your dealer to install them.

A. Numeric Coprocessor

The system board includes a socket for an 80387SX numeric coprocessor.

To install the coprocessor, turn the computer upside-down and remove the the cover plate <COPROCESSOR>.

This allows access to the coprocessor and BIOS sockets.

Align the coprocessor's pins with the inner pinholes on the socket. Press the chip firmly down until it is properly seated, taking care not to bend any of the pins. Put the cover back.

B. Installing Memory Expansion Card

A memory expansion card is available containing 1 MB or 4 MB of DRAM.

To install this board, slide open the cover in the base of the computer. <MEMORY CARD> Carefully align the pins of the memory board with the socket and press the board firmly into place. Put the cover back.

C. Changing the CPU Speed

The default setting of your system speed is 20 MHz.

The system's CPU automatically adjusts its operating speed while accessing diskettes, since some software packages (i.e., Game, or packages that use floppy disk protection method) may not operate correctly at 20 MHz. To change the CPU speed using the notebook's embedded keyboard,

use the **<Fn>** keys explained in the chapter 11.

>> The CMOS Setup <<

A. The Setup Program

The setup program allows you to easily configure your system to give the best performance. It resides permanently in a ROM (Read Only Memory) chip on the system board, so it is not necessary to have a particular operating system or use a special setup diskette to run the program.

The system prompts you to run the setup program under the following conditions:

CMOS options not set.
Display configuration mismatch.
Memory size mismatch.
Hard disk drive setup error.
CMOS battery is dead.
An additional hard disk is detected.
A hardware option was added or removed.

The setup program performs the following functions:

Displays a screen showing date, time, and the current configuration.
Allows you to accept current (default) values or enter different values f
or date, time and system configuration.
Shows detailed configuration options for each item selected.
Gives instructions on rebooting the system so that
the new settings can take effect.

Thereafter, whenever the system is booted, POST rechecks the setup information against the actual hardware configuration. If the data does not agree, the invalid configuration message will be displayed and the setup program will have to be run again.

The program also displays the following information:

Size of base and extended memory.
Presence or absence of a numeric coprocessor.
A calendar.

The configuration information is stored in a CMOS RAM powered by a small battery on the system board. When the battery expires (usually after about two years of use under normal conditions) the information is lost and the system must be reconfigured.

Note:
Early versions of DOS allow you to invoke the setup program any time, even while running another program. Later versions of DOS, however, may install its own keyboard handler, in which case the **<Del>** key combination may not work. In this event, you can use the setup program only when prompted during system power-on by pressing **<Del>**.

B. Running the Setup Program

During power-on, or after a system reset, you can invoke the setup program when the following message appears:

Press <<DEL>> if you want to run SETUP or DIAGS

The following screen is shown after you press **<Del>**

EXIT FOR BOOT
RUN CMOS SETUP
RUN DIAGNOSTICS

Use the <> or <> keys to highlight the desired option, and press <Enter>.

CMOS Setup

The main part of the screen lists the items that can be set up. The cursor highlights the item to be changed. The bottom line of the screen shows the keys that can be used to move around the setup screen and change the configuration. Above this line, a box shows the possible

configuration values for the highlighted item.

To change a particular item, use the (), (), () or () (arrow) keys to move the highlight to that item, and then scroll through the options using the <PgUp> and <PgDn> keys. When that item is set correctly, you can move on to the next item with the arrow keys.

Note:
The base memory size, extended memory size and numeric coprocessor cannot be altered by the setup program.

1. **Setting the Date and Time**
   If the date is incorrect, change the month, day and year values with the <PgUp> and <PgDn> keys. The day of the week is automatically calculated by the setup program.

   If the time is incorrect, enter the correct values by following the format shown on the screen. Note that the time is 24-hour format.

2. **Setting Floppy Drive Types**
   The setup program maintains information about two diskette drives (A and B). The drives include the embedded 3 1/2" diskette drive and the 5 1/4" external drive. If the information about either of these drives is incorrect, highlight the appropriate drive with the arrow keys and use <PgUp> or <PgDn> to select one of the following options:

   360 KB 5¼"
   1.2 MB 5¼"
   720 KB 3½"
   1.44 MB 3½"
   Not Installed

   If only one floppy disk drive is installed, it will always be drive A. In this case, drive B must be set to "Not Installed".

3. **Setting Hard Disk Drives and Format**
   The setup program contains specifications for 46 different hard disk

drive types. The default setting for drive C is "2",and drive D should set to "Not Installed". If the information for either of these drivesis incorrect, use the <PgUp> or <PgDn> keys to set the correct value.

Generally, the drive type is provided by the disk drive vendor and should be given in the hardware reference manual for the hard disk drive. However, in the event that the drive type is not known, by comparing the specifications in the setup program with the specifications in the disk drive's reference manual it should be possible to determine the correct drive type.

If none of the setup specifications matches the disk drive, selecting type "47" allows you to enter your own specifications under Cyln, WPcom, LZone, Sec and Size.

4. Setting Primary Display

The default is VGA or EGA and the following selections are available when you press the <PgUp> and <PgDn> keys:

Monochrome
Color 40 x 25
VGA or EGA
Color 80 x 25
Not Installed

5. Setting Keyboard

The default is "Installed" and the following selections are available when you press the <PgUp> and <PgDn> keys:

Installed
Not Installed

6. Setting Video BIOS Shadow

The BIOS (Basic Input/Output System) is a program normally stored in a ROM chip. This program handles many important functions for inputting and outputting information. When this option is enabled, the BIOS data is copied into local RAM for much faster access, thereby increasing the system performance.

7. Setting Scratch RAM Option

The default is "1" and the following selections are available when you press the <PgUp> and <PgDn> keys:

If required, BIOS will use 256 bytes of RAM
(1): Using BIOS stack area at 0030:0000
(2): Reducing base memory size by 1 KB

Some application programs use this address so if there is a software conflict, changing this value to "2" might resolve it.

8. Setting Main BIOS Shadow

To increase system performance, enable Main BIOS shadow.

9. Setting Power-on CPU Speed

This option can either have the value of "1" or "2".If you want to have high speed turbo mode when you power-on your system then choose <2>. Otherwise choose <1> for low speed non-turbo mode.

10. Exit Setup

When all the options have been set, press the <Esc> key to exit the setup program. The message will appear:

Write data into CMOS and exit (Y/N)?:

Type <Y> and press <Enter> to reboot the system with the new values, or <N> and <Enter> to continue setting up.

>> Diagnostics <<

This option lets you access some of the most advanced test utilities. For each function (e.g. Hard Disk Format), the fuller description (e.g. Preformat Hard Disk) appears on the bottom line of the screen. The line above shows the keys which you can use to run and exit diagnostics.

A. HARD DISK

Hard Disk Format
Lets you initialize the hard disk. This will erase all the data files written on your hard disk.

Auto Interleave
Auto interleave detects and preformats the hard disk with optimum interleave.

WARNING!!
You should take great care when you want to test your hard disk as you may accidentally erase all the data stored on the disk.

Media Analysis
Locates and marks bad sectors on the hard disk so that data will not be written onto the bad sectors.

Performance Test
Measures the overall performance of the hard disk.

Seek Test
Performs seek operations on the hard disk.

Read/Verify Test
This test tries to read all the tracks present on the disk using all the read heads and verify all the information.

Check Test Cylinder
Performs R/W operations on the highest cylinder.

Force Bad Tracks
Prepares a list of tracks to be marked as bad.

B. FLOPPY

Floppy Format
Lets you initialize the floppy diskette.

Drive Speed Test
Checks the floppy disk revolution speed.

Random R/W Test
Uses a scratch diskette to test the random R/W head of the floppy drive. In this test the R/W heads jump randomly from track to track.

Sequential R/W Test
This test lets you perform a R/W test track by track.

Disk Change Line Test
Checks the alignment of the head of the floppy drive.

C. KEYBOARD

Scan/ASCII Code Test
Scans all the keys of the keyboard and also checks the ASCII codes.

D. VIDEO

Run All Tests
Performs all the video tests except Sync Test.

Sync Test
Currently not available.

Adapter Test
Performs a test on the display memory.

Attribute Test
Checks all the attributes of the display adapter.

80 x 25 Display Test
Checks the 80 x 25 character set of the display adapter.

40 x 25 Display Test
Checks the 40 x 25 character set of the display adapter.

320 x 200 Graphics Test
Checks the 320 x 200 graphics mode of the display adapter.

640 x 200 Graphics Test
Checks the 640 x 200 graphics mode of the display adapter.

Page Selection Test
Checks each display page of the display adapter.

Color Test
Checks foreground, background and border colors.

E. MISCELLANEOUS

Printer Adapter Test
Attach a parallel printer to the parallel port of the computer. Run this option to test the printer controller.

Communication Adapter Test
Attach a loopback plug to the communication port and run this test.

>> Powering On the System <<

A. The BIOS POST

Make sure the system power switch is in the OFF (O) position.

Connect the power cord to the AC - DC adapter.

Plug the DC mini-jack of the adapter into the system unit power socket and the adapter power cord into a grounded AC power outlet.

Check that there is no drive protection card in the 3 1/2" floppy disk drive.

Press the power switch to the ON (I) position. The system performs a power-on self-test (POST). This test runs automatically every time the system is switched on. It checks the CPU, keyboard, display, system memory and most peripheral devices connected to the system. The first sign of the POST will be the keyboard status lights blinking on and off.

The screen will display the following:

Stingray Rev 4+, VGA BIOS Version 3.02
Copyright (c) Cirrus Logic Inc. 1989, 1990.
Copyright (c) Award Software Inc. 1984-1988. All right reserved

386-BIOS (C)1989 American Megatrends Inc.

XXXXX KB

Press <ESC> to bypass MEMORY

(C) American Megatrends Inc
D343-1116-XXXXXX-K0

The memory test displays the amount of memory tested on the screen as the test progresses. POST takes from 3 to 15 seconds to complete, depending on the amount of memory installed. If you want to skip the memory test press <Esc>. This is useful if the amount of memory being tested is very large.

Stingray Rev 4+, VGA BIOS Version 3.02
Copyright (c) Cirrus Logic Inc. 1989, 1990.
Copyright (c) Award Software Inc. 1984-1988. All right reserved

386-BIOS (C)1989 American Megatrends Inc.

01024 KB

Press <Del> If you want to run SETUP or DIAGS

(C) American Megatrends Inc
D343-1116-XXXXXX-K0

At this point you can invoke the setup program by pressing <Del>.

See CHAP. 4 - "SETUP" for details on running the setup program.

Note: If the power LED is lit but the screen remains blank, turn the brightness control until an image appears, then adjust the brightness and display angle for clarity.

After the test, the system will beep once if no configuration errors are detected. The system then displays the following message:

System Configuration Copyright 1985-1990,American Megatrends Inc.,			
Main Processor : 80386SX		Base Memory Size	: 640KB
Numeric Processor	: None	Ext. Memory size	: 384KB
Floppy Drive A:	: 1.44MB, 3½"	Hard Disk C: Type	: 2
Floppy Drive B:	: None	Hard Disk D: Type	: None
Display Type	: VGA or EGA	Serial Port(s)	: 3F8,2F8
ROM-BIOS Date:	: 09/24/90	Parral Port(s)	: 378

and the "C>" prompt appears on the screen.
The system is then ready for operation.

Note: An "A>" prompt appears when there is a system diskette in the diskette drive. A system diskette contains the COMMAND.COM and other hidden files.

If configuration errors are detected during POST, the system will beep twice and display an invalid configuration message. Pressing <F1> after an invalid configuration message causes the system to boot up with a minimum default system. As a consequence, the system will not operate at its full potential.

B. Using Battery Power

Recharging The Battery

The battery pack is automatically recharged whenever the NOTEBOOK PC is plugged into an AC power source. You have two options for charging the battery: normal charging, which takes 1.5 hours. You can operate the system for about two hours continuously in text mode when the battery is fully charged.

Fully charging and then discharging or depleting the battery is called one full cycle of battery life. The battery has a life of about 300 cycles.

WARNING!!
The battery Full/Low LED lights and a repeating sequence of two beeps is sounded to warn you when the battery power is low. Press any key to stop the alarm and save your work as soon as possible because the system shuts down approximately five minutes after the first beeps are sounded.

Removing the Battery
Power OFF the computer. Open the cover of the battery compartment at the oppisite side and pull out the battery. To replace the battery, simply slide it back into the compartment and put the cover back.

C. Using The Floppy Diskette Drive

Inserting/Removing Floppy Diskettes
Hold the diskette with the label side up and insert it gently into the drive until it clicks into place. For 5 1/4" drives, you must turn the drive latch lever down to close the drive door.
To remove a diskette from the drive, press the drive button (for 3 1/2" diskettes) or turn the drive latch lever up (for 5 1/4" diskettes).

Write-Protecting Floppy Diskettes
To prevent data on a diskette being erased or written over, place a write-protect label over the write-protect notch (on 5 1/4" diskettes) or slide the write-protect switch down (on 3 1/2" diskettes). If you cannot write data to a diskette it is usually because it has been write-protected.

Formatting the Hard Disk Drive
All hard disks must be physically formatted, partitioned, and logically formatted before use. The hard disk that comes with your system has been physically formatted. See your DOS documentation regarding the FDISK utility.

Remember: back up the data on your hard disk regularly!

D. Installing DOS

If you are using the system for the first time, you must install DOS before you can do anything else. You will probably want to install the operating system on your hard disk. The installation procedure is fully described in the DOS User's Manual.

>> Problem Solving <<

This section explains system troubleshooting. If the remedy involves opening the system top cover, send the system for repair.

Solving System Problems

Computer problems are usually caused by hardware, software, or both. Effective troubleshooting requires that you (1) list down the symptoms, and (2) localize the problem. Some problems may require the technical assistance of your dealer. Before calling for service, check for possible solutions in this section.

A. Initial System Power-On Problems

If you are having power-on problems, be sure that the system is connected to a properly grounded electrical outlet and all other peripheral devices are connected to the system.

B. Power-On Self Test (POST)

POST is a series of checks the system performs during power-on to verify proper operation of the system. After a successful POST, the system prompt is shown. POST does not test all areas, only those that allow the system to be operational.

Two kinds of errors may be detected during POST: critical (fatal) and non-critical errors. If the error is fatal, the system halts and cannot operate at all. Non-critical errors are those that cause incorrect results, which may not be apparent to the user. If the error is non-critical, the system continues after reporting the error. An example of a non-critical error would be a memory chip failure.

Whenever an error is encountered, you either hear a

few short beeps or see an error message.

Beep Count	Meaning
1	DRAM refresh failure
2	Conventional and extended test failure
3	Base 64 KB RAM failure
4	System timer failure
5	Processor failure
6	Keyboard controller - Gate A20 error
7	Virtual mode exception error
8	Display vertical and horizontal retrace test failured
9	ROM BIOS checksum failure

In such cases, proceed as follows:

I. Record any error messages and beep patterns.
II. Refer to the following sections for corrective action.
III. III.Restart the system.
IV. If the same error message/s and beep pattern occur, contact your dealer.

C. System Startup Problems

1. System does not beep when powered on.
2. Listen and determine if the fan is running. If the fan is not operating, check that the power cord is connected to a live power outlet and to the system. If your system does not work, take it to your dealer or an authorized service center to have the power supply checked.
3. System beeps, but no cursor appears on the monitor.
   Be sure the brightness control is adjusted properly. If this is the first time this system configuration is booted, make sure you are using the correct switch setting for the video adapter type.
   It should match your built-in VGA.

   System displays , MEM ERROR or PARITY CHECK.

   Take your system to your dealer or an authorized service center to have its RAM chips checked if memory problems are indicated.

4. System beeps, the cursor blinks on the monitor, but the FDD light does not go on. If your floppy controller cable is in place, take your system to the dealer or an authorized service center to have its controller card and floppy disk drive checked.

5. System beeps twice (or more), and monitor screen is blank.
   Send the system unit for repair.

6. System beeps, the FDD light goes on, but one of the following error messages appear:

   Disk Error
   This message indicates that no boot sector can be read. The reason is either no disk was inserted in the drive, the disk was not readable, or the disk drive lever has not been turned down.

   Disk Boot Failure
   This message is displayed when one or both of the DOS hidden system files is missing from the diskette.

   Bad or Missing Command Interpreter
   This error message represents a corrupt or missing COMMAND.COM on the diskette. In either case, attempt to boot again by pressing <Enter>. Repeat the boot operation with another copy of the system diskette. If the error persists, take your system to the dealer or an authorized service center.

7. Hard Disk Drive Problems
   System no longer boots from the hard disk drive
   even though the drive light is lit.

   Boot your system from drive A using a bootable diskette.
   Then try to read the directory on the hard disk by typing DIR C:. #
   If you can read the hard disk directory, reinstall the system onto drive C by typing SYS C:, then press <Enter>.
   If this does not make the system bootable, back up any files that are not already backed up, and reinstall DOS on your hard disk through the use of FORMAT and COPY. Detailed instructions for installing DOS on your hard disk can be found in your DOS Manual.

RESTORE your files to the hard disk from your most recent backup.
System does not boot from the hard disk and you cannot read a directory or files from it when booted from the floppy disk.
Reinstall DOS on your hard disk through the use of FORMAT and COPY. RESTORE your files to the hard disk from the most recent backup.
If your hard disk cannot be formatted, take your system to your dealer or an authorized service center to have the hard disk drive checked.

8. Problems With a Diskette Drive

Case 1
Diskette drive in-use light stays on.
If there is a diskette in the drive, check to see that:

The diskette is not damaged and is inserted correctly label up and metal-shutter end first. Try another diskette.

Your software program is okay.
If the problem persists, have the system unit serviced.

Case 2
Drive doesn't respond to boot command
(diskette drive in-use lightdoesn't come on).
Check to see that:

Disk drive cable is not defective (broken conductors) and is securely plugged in. If defective, replace cable.

Power supply cable is securely connected in the power case on the diskette drive.

If none of these is the cause, the FDC board or diskette drive logic board may be defective. Send the system for repair.

Case 3
Problems with inserting or removing diskettes may be due to:

Write-protect or other label stuck somewhere in disk pathway; or drive hub gummed up with adhesive from hub rings. Remove and

clean off adhesive from drive hub with lint-free cloth moistened with lighter fluid.
Drive head was not released from loaded position. Close the drive latch and release again (for 5 1/4" drive). If this does not work, insert a scratch disk and reset the system.
If the problem persists, send the system for repair.

Case4
Diskette drive in-use light turns on when boot command is given but disk will not boot.

Check the boot diskette. If error persists, send the system for repair.

D. Problems When Running a New Program

Application program is not running correctly.

Your computer must have the minimum memory space requirements to use the software. Refer to the software manuals for verification. If necessary, delete unnecessary files to accommodate the software and reinstall the application program.

System halts or an NMI error occurs.
A hardware-software incompatibility may cause the system to stop execution. This condition occurs when:

The serial and parallel port on the system board uses the same address as the serial/parallel port of an adapter card. Change the serial/parallel port address of the adapter card.

You specified the wrong type of printer for your application program. Reinstall the application program with the correct printer.

If these solutions do not work, the software may have been designed for a different type of computer.

The system may halt when there is a component (memory IC) defect. Turn off the system, then turn on again after a few seconds. Execute the diagnostics program to check the cause. If the problem persists, contact your dealer.

Problems After the System and Software are Running Correctly

If you receive error messages when using a software program, refer to the manuals supplied with the software for a description of the messages and solutions to the problem.

The screen shows random " garbage " (meaningless jumble of characters).

The diskette has some damaged sectors, the file is damaged, or the file is not a readable text file.

Problems with Peripheral Devices and Other Components

All or some keys on the keyboard do not work. If the testing programs on the diagnostics program cannot find the problem, have the system serviced.

The mouse or pointing device does not work. Check the instructions supplied with the mouse or pointing device for additional testing information. If no testing information is available, have the mouse or pointing device serviced.

External 5 1/4" floppy disk drive does not work. Check if all settings are correct and the cables are properly connected. If problem persists, consult your dealer.

The printer does not work. Check that the printer is turned on and is ON-LINE. Check that the printer signal cable is properly connected to the system unit.

>> Programming FNHELP.COM Functions <<

The FNHELP.COM functions can be programmed by
AX=01xxH;INT 18H, where xx=AL=(key scan codes).
You can program by MOV AX,01FFH; INT 18H to get
FNHELP.COM HELP messages.
The source code of the functions are listed below.

1. Function FNHELP = Displays help messages:

```
C:\DEBUG
-A
????:0100 MOV AX,01FF
????:0103 INT 18
????:0105 INT 20
????:0107 ^^C

-RCX
CX 0000
:7
-N FNHELP.COM
-W
-Q


C:\FNHELP
```

2. Function FAST: "Fn and PgUp" = Change Speed to Fast:

```
C:\DEBUG
-A
????:0100 MOV AX,0149
????:0103 INT 18
????:0105 INT 20
????:0107 ^^C

-RCX
CX 0000
:7
-N FAST.COM
-W
-Q

C:\FAST
```

3. Function SLOW: "Fn amd PgDn" = Change Speed to Slow:

```
C:\DEBUG
-A
????:0100 MOV AX,0151
????:0103 INT 18
????:0105 INT 20
????:0107 ^^C

-RCX
CX 0000
:7
-N SLOW.COM
-W
-Q

C:\SLOW
```

4. Function SW2LCD "Fn Home" = Switch Screen to LCD display:

```
C:\DEBUG
-A
????:0100 MOV AX,0147
????:0103 INT 18
????:0105 INT 20
????:0107 ^^C

-RCX
CX 0000
:7
-N SW2LCD.COM
-W
-Q

C:\SW2LCD
```

5. Function SW2CRT "Fn and End" = Switch screen to external monitor

```
C:\DEBUG
-A
????:0100 MOV AX,014F
????:0103 INT 18
????:0105 INT 20
????:0107 ^^C

-RCX
CX 0000
:7
-N SW2CRT.COM
-W
-Q

C:\SW2CRT
```

>> Power-On Self-Test Error Code <<

The following are some of the error messages that you may encounter during the Power-On Self-Test (POST).

Error Message	Probable Cause	Recommended Action
Memory error	Memory failure	Contact your dealer
System memory adress error	Memory failure	Contact your dealer
Keyboard error	Keyboard failure	Run setup program
Diskette drive controller error	System board error	Contact your dealer
Diskette drive error	Mismatch in drive type	Run setup program
Hard disk C error	Hard disk drive C error	Contact your dealer
Parallel prot error	Wrong setup or connection	Contact your dealer
Serial prot error	Added or removed board / wrong setup	Contact your dealer
Equipment configiguration error	Wrong configuration	Run setup program
Memory size mismatch	Configruation memory incorrect	Run setup program
Disk C extended type error	Mismatch in drive type	Run setup program
RAM parity error	Parity error	Contact your dealer
Hard disk controller	System board error	Contact your dealer
Keyboard interface error	Keyboard or system board error	Contact your dealer
Press F1 Key	Any failure	Press F1 and follow the instructions on the screen

A. Troubleshooting

System does not boot and does not display boot message

Check that the AC - DC power adapter is plugged into an AC outlet and the DC plug is connected to the system unit.

Check that the system power switch is in the ON (I) position.

Check the CMOS setup program. Check the hard disk drive type in the setup program.

Make sure the hard disk drive is formatted and contains operating system files.

Check for presence of a non-system disk in the diskette drive.

Check if the battery is empty through the LED indicator.

Power OFF and ON the system and press <Ins>.
If the screen does not display anything, contact your dealer.

System shows a Memory Size Mismatch

Every time the extended setup is changed, run CMOS SETUP to configure the system properly.

Check that the memory size is correct. Incorrect memory size can be caused by faulty DRAM or motherboard.

CMOS battery on the motherboard must have a voltage reading greater than 3 V.

Contact your dealer.

Hard disk drive fails

Check if the hard disk drive is correctly configured in the setup program.

Check the connection of the power cable and hard disk drive flat cable. Replace the hard disk drive if it still does not work after checking that all cables are connected properly.

Check if the system rebooted without problems. Drive C should be formatted when the operating system is not present anymore.

Contact your dealer

Floppy disk drive fails

Check if the floppy drive is correctly configured in the setup.

Check the connection of the power cable and floppy disk drive flat cable. Replace the floppy disk drive if it still does not work after checking that all cables are connected properly.

Check if the system rebooted without any problems.
Check that the floppy disk drive works with a system diskette.

Contact your dealer.

Keyboard fails

Check if the keyboard cable has good mating with the motherboard.

Check if all the keyboard keys are working properly.
Keyboard responds and prints the right character.

Check the keyboard controller chip.
If the problem is not in the keyboard controller chip or keys, send the keyboard to the service center.

Error beeps

Check if the DRAMs in the motherboard are properly inserted.
Refer to the error beep count table (see below).
Contact your dealer.

Beep Count	Meaning
1	DRAM refresh failure
2	Conventional and extended test failure
3	Base 64 KB RAM failure
4	System timer failure
5	Processor failure
6	Keyboard controller - Gate A20 error
7	Virtual mode exception error
8	Display vertical and horizontal retrace test failured
9	ROM-BIOS checksum failure

COM1, COM2, or printer port fails

Check the connecting cables of your peripheral devices and be sure that the correct ports are used.

Check the software program you're using. If there and no problems in the software, contact your dealer.

B. Error Messages

There are two error types.

A: The following errors are considered fatal:

Channel 2 of timer not functional.

Stray interrupt sensed in controller or
interrupt controller not functional.

CMOS Inoperational indicates CMOS register set failure.

Gate-A20 Error indicates protected mode entry error.

DMA Error indicates DMA page register set failure.

DMA #1/#2 Error indicates failure in DMA unit #1 or #2.

B: The following errors are considered non-fatal:

Keyboard or interface error.

CMOS system options not set, or CMOS time and date not set.

CMOS battery low, CMOS checksum failure,
CMOS memory size mismatch.

CMOS display configuration mismatch, or incorrect display setting.

Floppy disk controller failure.

Hard disk unit # error, or hard disk unit # not defined in CMOS.

>> Specifications <<

A. General Specifications

Item	Specification
CPU	80386SX-20
System Speed	10 MHz (low); 20 MHz (turbo)
Coprocessor	Socket available; optional Intel 80387SX-20 math coprocessor or equivalent
Onboard ROM	128 KB AMI BIOS; no parity check
Onboard RAM	1 MB no parity check
Total System	Expandable to 2 MB with a 1-MB RAM card; To 5 MB with a 4-MB RAM card; No parity check
Video Board	Built-in VGA board Cirrus Logic VGA with 256KB RAM
Video ROM	64KB (for VGA BIOS)
I/O Ports	Two 9-pin male D-type serial; one 25-pin female D-type parallel; one 6-pin female DIN keyboard; one external FDD interface; one 15-pin D-type external CRT
Diskette Drive	Internal 3.5-inch, 1.44 MB x1; External 5.25-inch, 1.2 MB x1 (optional)
Hard Disk Drive	2.5-inch, 21.4 MB, 25ms
Power Input	10.8V - 16.5V DC
Keyboard	83-key embedded keyboard, 101/102-key external keyboard
Weight	7.05 lbs or 3.2 kg (with hard disk & battery pack)
Dimension	210mm x 297mm x 47mm, or 8.2" x 11.7" x 1.8"
Temperature	10°C to 40°C (operating), -20°C to 55°C (storage)
Humidity	5% to 85% (operating), 5% to 85% (storage) (all values non-condensing)
Others	Speaker, battery back-up RTC

B. Display Characteristics

Item	Specification
Technology	Non-glare, F-STN type, CFL backlit LCD display
Resolution	640 x 480 dots structure, 197 x 149 dots active area, 25 x 80 (text), VGA-compatible, 16 gray-scales, White dots on dark blue background
View angle	40° typical; 135° adjustable tilt
Others	0.27mm x 0.27mm dot size; 0.3mm x 0.3mm dot pitch

Display Modes:

Display	Modes	Graphics	Text
External CRT	CGA	640 x 200	80 x 25
	MGA	720 x 348	80 x 25
	EGA	640 x 350	80 x 25
	VGA	640 x 480	80 x 25
Embedded LCD	CGA	640 x 400	80 x 25
	MGA	640 x 350	80 x 25
	EGA	640 x 350	80 x 25
	VGA	640 x 480	80 x 25

C. Power Requirements

AC adapter:

input power	100V - 240 V AC (normal voltage) 50 / 60Hz, single phase
DC output power	16.5V DC, 1.8 amperes

DC/DC converter:

Item	Voltage	Current		
Input	10.8V - 16.5V DC	1.8 A		
Output		max. load	typ. load	min. load
	+5V DC	2.5 A	2 A	0.8 A
	+12V DC	0.5 A	0.3 A	0 A
	-23V DC	50 mA	20 mA	0 A

Battery Pack:

Item	Specification
Model No.	Matsushita P-18S/L33G1 or equivalent
Battery type	NiCad, 1800 mAH
Input voltage	10.8V-16.5V DC
Output voltage	10.8V DC (nominal); 1.8 A
Recharge	600 mA x 4 hours (normal charge, system power on); 1200 mA x 2 hours (fast charge, system power off)

D. Storage Devices

Hard Disk:

For detailed informations see HDD manual

Item	Specification
Description	2.5-inch, 25ms, 21.4 MB
Track Density	1700 tpi
Cylinder	653
Track to track	5 ms

Floppy Disk:

Epson SMD-1000 Floppy Disk Drive

Item	Specification
Description	3.5-inch, 1.44 MB
Track Density	135 tpi
Transfer rate	500 KB/sec
Track to track	3 ms
Settling time	15 ms
Start time	500 ms
Rotation	300 rpm

>> Using the Fn key <<

A. Using the Fn Key and Help Functions

The Fn key located at the lower left corner of your notebook keyboard provides software control of system's speed and external peripherals. The utility diskette shipped with your system contains a help menu showing all the Fn function keys. To invoke the help menu, insert the utility diskette into drive A and type the following command to copy the contents of the diskette to the hard disk:

A>LTNVGA

The system will display the folling message:

```
THIS PROGRAM WILL COPY NOTEBOOK LTNVGA UTILITY TO C:\
Ctrl + Break' to abort or
Press any key to continue...
```

Press any key to continue the operation. The Eagle utility described in Chapter 5 will be copied at the same time. After the copy operation is complete, the system will display the message:

```
UTILITY FILE COPY OK!
remove utility diskette
Press 'Ctrl + Alt + Del' to reboot
```

Remove the diskette from drive A and reboot the system.

To call up the Fn key function help menu, type:

C>FNEHELP /U

The Fn function help menu will appear as follow:

*** THIS PROGRAM CONTROLS THE Fn KEY SUPPORTED FUNCTIONS FOR NOTEBOOK ***

Press Fn and the following keys simultaneously:			
1! bis 9)	= Enable 1 to 9 Minute Sleeping Control		
0=}	= Disable Sleeping Control		
↑	= Keypad +	↓	= Keypad -
F1	= F11	F2	= F12
Scroll	= NumLock ON/OFF	M	= Move to original display
>:	= Shifts screen to Left	<:	= Shifts screen to Right
PgUp	= Changes Speed to Fast	PgDn	= Changes Speed to Slow
A	= Automap ON/OFF	F	= Frame color choices
B	= Bold ON/OFF	R	= Reverse Video ON/OFF
C	= Centering choices	S	= Screen Power ON/OFF
E	= Expand mode ON/OFF	W	= Width Fixup choices

When Fn is pressed together with the other keys, it provide functions that are helpful when using your LCD screen.

The table shows the functions of the Fn key when used togther with other keys.

Keys	Function
Fn + PgUp	Changes CPU speed to high (20 MHz)
Fn + PgDn	Changes CPU speed to low (10 MHz)
Fn + Home	Select the LCD screen
Fn + End	Select the external monitor
Fn + R	Toggle background LCD screen from normal to inverse and vice versa
Fn + >	Shifts LCD screen to the left
Fn + <	Shifts LCD screen to the right
Fn + M	Returns LCD screen to centered position

Note:

The Fn help menu program in your hard disk is updated with all the enhanced functions to fully maximize your LCD screen.

B. Using Soft Switches

For non-English users, the FNHELP.COM program enables the soft switches. This program should be installed in your hard disk.
Copy the FNHELP.COM program in the utility diskette to hard disk. For example, to install a German (GR) keyboard using soft switches, enter the following at the system C prompt:

KEYB GR
FNHELP

*** EINSTELLEN DER CCFT LCD VGA, INTEL 80386SX UND NOTEBOOK FUNKTIONEN ***

Halten Sie die Taste Fn niedergedrückt und drücken gleichzeitig:			
1! bis 9)	= Ruheschaltung (Sleeping Mode) nach 1 bis 9 Minuten		
0=}	= Keine Ruheschaltung		
↑	= Numerisches +	↓	= Numerisches -
F1	= F11	F2	= F12
Scroll	= NUM-LOCK EIN/AUS	M	= Bild in Grundposition
.:	= Bild nach links rücken	,;	= Bild nach rechts rücken
Bild↑	= Geschwindigkeit hoch	Bild↓	= Geschwindigkeit niedrig
Pos1	= Internes Display EIN	Ende	= External Monitor EIN
A	= Automap EIN/AUS	F	= Rahmen-Grauwert ändern
B	= Fettschrift EIN/AUS	R	= Text-Invers EIN/AUS
C	= Bild zentriert	S	= Displaybeleichtung AUS
E	= Zoom EIN/AUS	W	= Ändert Bildbreite
Pos1	= Internes Display EIN	Ende	= External Monitor EIN

Each time a KEYB.COM program is executed, soft switches are disabled. Soft switches are again enabled when the FNHELP program is executed. Add the above commands in your AUTOEXEC.BAT batch program for ease of use.

Note:
Run the KEYB program first before the FNHELP program,

or else the system halts.

Table 3-2 lists the other soft switches for other keyboards.

US	Australia	NL	Netherlands
BE	Belgium	NO	Norway
US	Canada (English)	PO	Portugal
CF	Canada (French)	SP	Spain
DK	Denmark	SV	Sweden
SU	Finland	SF	Switzerland (French)
FR	France	SG	Switzerland
GR	Germany	UK	United Kingdom
IT	Italy	US	United States of America
LA	Latin America		

Each time a KEYB.COM program is executed, soft switches are disabled. Soft switches are again enabled when the FNHELP program is executed. Add the above commands in your AUTOEXEC.BAT batch program for ease of use.