# Troubleshooting

Use the following procedure as a guide for computer problems.

**NOTE:** The diagnostic tests are intended to test this model. Non-Acer products, prototype cards, or modified options can give false errors and invalid system responses.

- 1. Duplicate symptom and obtain the failing symptoms in as much detail as possible.
- 2. Distinguish symptom. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.
- 3. Disassemble and assemble the unit without any power sources.
- 4. If any problem occurs, you can perform visual inspection before you fellow this chapter's instructions. You can check the following:
  - power cords are properly connected and secured;
  - there are no obvious shorts or opens;
  - there are no obviously burned or heated components;
  - all components appear normal.
- 5. Use the following table with the verified symptom to determine which page to go to.

Symptoms (Verified)	Go То
Power failure. (The power indicator does not go on or stay on.)	"Power System Check" on page 65.
POST does not complete. No beep or error codes are indicated.	"Power-On Self-Test (POST) Error Message" on page 67
	"Undetermined Problems" on page 79
POST detects an error and displayed messages on screen.	"Error Message List" on page 68
Other symptoms (i.e. LCD display problems or others).	"Power-On Self-Test (POST) Error Message" on page 67
Symptoms cannot be re-created (intermittent problems).	Use the customer-reported symptoms and go to "Power-On Self-Test (POST) Error Message" on page 67
	"Intermittent Problems" on page 78
	"Undetermined Problems" on page 79

## **System Check Procedures**

#### **External Diskette Drive Check**

If an error occurs with the internal diskette drive, reconnect the diskette connector on the system board.

If the error still remains:

- Reconnect the external diskette drive/DVD-ROM module.
- 2. Replace the external diskette drive/CD-ROM module.
- 3. Replace the main board.

#### External CD-ROM Drive Check

Do the following to isolate the problem to a controller, drive, or CD-ROM. Make sure that the CD-ROM does not have any label attached to it. The label can cause damage to the drive or can cause the drive to fail.

Do the following to select the test device:

- 1. Boot from the diagnostics diskette and start the diagnostics program.
- 2. See if CD-ROM Test is passed when the program runs to CD-ROM Test.
- 3. Follow the instructions in the message window.

If an error occurs, reconnect the connector on the System board. If the error still remains:

- 1. Reconnect the external diskette drive/CD-ROM module.
- 2. Replace the external diskette drive/CD-ROM module.
- 3. Replace the main board.

#### **Keyboard or Auxiliary Input Device Check**

Remove the external keyboard if the internal keyboard is to be tested.

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated in the connector on the system board.

If the keyboard cable connection is correct, run the Keyboard Test.

If the tests detect a keyboard problem, do the following one at a time to correct the problem. Do not replace a non-defective FRU:

- 1. Reconnect the keyboard cables.
- 2. Replace the keyboard.
- 3. Replace the main board.

The following auxiliary input devices are supported by this computer:

- Numeric keypad
- External keyboard

If any of these devices do not work, reconnect the cable connector and repeat the failing operation.

#### Memory check

Memory errors might stop system operations, show error messages on the screen, or hang the system.

- 1. Boot from the diagnostics diskette and start the doagmpstotics program (please refer to main board.
- **2.** Go to the diagnostic memory in the test items.
- 3. Press F2 in the test items.
- Follow the instructions in the message window.

**NOTE:** Make sure that the DIMM is fully installed into the connector. A loose connection can cause an error.

# **Power System Check**

To verify the symptom of the problem, power on the computer using each of the following power sources:

- 1. Remove the battery pack.
- 2. Connect the power adapter and check that power is supplied.
- **3.** Disconnect the power adapter and install the charged battery pack; then check that power is supplied by the battery pack.

If you suspect a power problem, see the appropriate power supply check in the following list:

"Check the Battery Pack" on page 66

#### **Check the Battery Pack**

To check the battery pack, do the following:

#### From Software:

- Check out the Power Management in control Panel
- In Power Meter, confirm that if the parameters shown in the screen for Current Power Source and Total Battery Power Remaining are correct.
- 3. Repeat the steps 1 and 2, for both battery and adapter.
- 4. This helps you identify first the problem is on recharging or discharging.

#### From Hardware:

- 1. Power off the computer.
- Remove the battery pack and measure the voltage between battery terminals 1(+) and 6(ground). See the following figure
- 3. If the voltage is still less than 7.5 Vdc after recharging, replace the battery.

To check the battery charge operation, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

If the battery status indicator does not light up, remove the battery pack and let it return to room temperature. Re-install the battery pack.

If the charge indicator still does not light up, replace the battery pack. If the charge indicator still does not light up, replace the DC/DC charger board.

#### Touchpad check

If the touchpad doesn't work, do the following actions one at a time to correct the problem. Do not replace a non-defective FRU:

- After rebooting, run Tracking Pad PS2 Mode Driver. For example, run Syn touch driver.
- 2. Run utility with the PS/2 mouse function and check if the mouse is working.
- 3. If the the PS/2 mouse does not work, then check if the main board to switch board FPC is connected O.K.
- **4.** If the main board to switch board FPC is connected well, then check if the FCC on touch pad PCB connects properly.
- 5. If the FFC on touch pad PCB connects properly, then check if LS851 JP1 Pin6=5V are pulese. If yes, then replace switch board. If no, then go to next step.
- 6. Replace touch pad PCB.
- 7. If the touch pad still does not work, then replace FPC on Track Pad PCB.

After you use the touchpad, the pointer drifts on the screen for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the touchpad pointer. This symptom is not a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

## Power-On Self-Test (POST) Error Message

The POST error message index lists the error message and their possible causes. The most likely cause is listed first.

**NOTE:** Perform the FRU replacement or actions in the sequence shown in FRU/Action column, if the FRU replacement does not solve the problem, put the original part back in the computer. Do not replace a non-defective FRU.

This index can also help you determine the next possible FRU to be replaced when servicing a computer.

If the symptom is not listed, see "Undetermined Problems" on page 79.

The following lists the error messages that the BIOS displays on the screen and the error symptoms classified by function.

**NOTE:** Most of the error messages occur during POST. Some of them display information about a hardware device, e.g., the amount of memory installed. Others may indicate a problem with a device, such as the way it has been configured.

**NOTE:** If the system fails after you make changes in the BIOS Setup Utility menus, reset the computer, enter Setup and install Setup defaults or correct the error.

# **Index of Error Messages**

## **Error Message List**

Error Messages	FRU/Action in Sequence
Struck Key	See "Keyboard or Auxiliary Input Device Check" on page 64
System CMOS checksum bad - Default configuration used	RTC battery Run BIOS Setup Utility to reconfigure system, then reboot system.
Real time clock error	RTC battery Run BIOS Setup Utility to reconfigure system time, then reboot system. Main board
Previous boot incomplete - Default configuration used	"Load Default Settings" in BIOS Setup Utility. RTC battery Main baord
Invalid System Configuration Data	"Load Default Settings" in BIOS Setup Utility. Main board
Operating system not found	Enter Setup and see if fixed disk and drive A are properly identified.  Dikette drive  Hard disk drive  Main board

### **Error Message List**

No beep Error Messages	FRU/Action in Sequence
Power-on indicator turns off and LCD is blank.	Power source (battery pack and power adapter.) See "Power System Check" on page 65
	Ensure every connector is connected tightly and correctly.
	Reconnect the DIMM.
	Main board.
Power-on indicator turns on and LCD is blank.	Power source (battery pack and power adapter.) See "Power System Check" on page 65
	Reconnect the LCD connector
	Hard disk drive
	LCD cable
	LCD inverter
	LCD
	Main board
Power-on indicator turns on and LCD is blank.	Reconnect the LCD connectors.
But you can see POST on an external CRT.	LCD cable
	LCD inverter
	LCD
	Main board
Power-on indicator turns on and a blinking cursor	Ensure every connector is connected tightly and correctly.
shown on LCD during POST.	Main board

# **Phoenix BIOS Beep Codes**

Code	Beeps	POST Routine Description
02h		Verify Real Mode
03h		Disable Non-Maskable Interrupt (NMI)
04h		Get CPU type
06h		Initialize system hardware
08h		Initialize chipset with initial POST values
09h		Set IN POST flag
0Ah		Initialize CPU registers
0Bh		Enable CPU cache
0Ch		Initialize caches to initial POST values
0Eh		Initialize I/O component
0Fh		Initialize the local bus IDE
10h		Initialize Power Management
11h		Load alternate registers with initial POST values
12h		Restore CPU control word during warm boot
13h		Initialize PCI Bus Mastering devices
14h		Initialize keyboard controller
16h	1-2-2-3	BIOS ROM checksum
17h		Initialize cache before memory autosize
18h		8254 timer initialization
1Ah		8237 DMA controller initialization
1Ch		Reset Programmable Interrupt Controller
20h	1-3-1-1	Test DRAM refresh
22h	1-3-1-3	Test 8742 Keyboard Controller
24h		Set ES segment register to 4 GB
26h		Enable A20 line
28h		Autosize DRAM
29h		Initialize POST Memory Manager
2Ah		Clear 215 KB base RAM
2Ch	1-3-4-1	RAM failure on address line xxxx
2Eh	1-3-4-3	RAM failure on data bits xxxx of low byte of memory bus
2Fh		Enable cache before system BIOS shadow
30h	1-4-1-1	RAM failure on data bits xxxx of high byte of memory bus
32h		Test CPU bus-clock frequency
33h		Initialize Phoenix Dispatch Manager
36h		Warm start shut down
38h		Shadow system BIOS ROM
3Ah		Autosize cache
3Ch		Advanced configuration of chipset registers
3Dh		Load alternate registers with CMOS values
42h		Initialize interrupt vectors
45h		POST device initialization
46h	2-1-2-3	Check ROM copyright notice

48h         Check video configuration against CMOS           49h         Initialize PCI bus and devices           4Ah         Initialize PCI bus and devices           4Ah         Initialize all video adapters in system           4Bh         QuidBoot start (optional)           4Ch         Shadow video BIOS ROM           4Eh         Display BIOS copyright notice           50h         Display BIOS copyright notice           50h         Display CPU type and speed           51h         Initialize EISA board           52h         Test keyboard           54h         Set key click if enabled           58h         2-2-3-1           58h         2-2-3-1           64h         Set key click if enabled           58h         2-2-3-1           58h         2-2-3-1           64h         Display prompt "Press F2 to enter SETUP"           58h         1 Display service           6Ah         Display prompt "Press F2 to enter SETUP"           58h         2-2-3-1           58h         1 Display service           6Ch         1 Test standed memory address lines           6Ch         1 Test standed memory address lines           6Ch         2 Test extended memory address lines	Code	Beeps	POST Routine Description
Alph	48h	-	Check video configuration against CMOS
ABh	49h		Initialize PCI bus and devices
4Ch         Shadow video BIOS ROM           4Eh         Display BIOS copyright notice           50h         Display CPU type and speed           51h         Initialize EISA board           52h         Test keyboard           54h         Set key click if enabled           58h         2-2-3-1           59h         Initialize POST display service           59h         Display prompt "Press F2 to enter SETUP"           58h         Display EVENDAL CALL           60h         Test extended memory           62ch         Test extended memory           62h         Test extended memory           62h         Test extended memory           62h         Test extended memory           62h         Jump to User Patch1           68h         Configure advanced cache registers           67h         Initialize Extended Board	4Ah		Initialize all video adapters in system
Display BIOS copyright notice 50h Display CPU type and speed 51h Initialize EISA board 52h Fest keyboard 54h Set key click if enabled 58h 2-2-3-1 Fest for unexpected interrupts 58h Display prompt "Press F2 to enter SETUP" 58h Display external f2 and 640 KB 69h Display external processor APIC 68h Configure advanced cache registers 67h Initialize Multi Processor APIC 68h Setup System Management Mode (SMM) area 68h Setup System Management Mode (SMM) area 68h Display external L2 cache size 68h Display possible high address for UMB recovery 70h Display phadow-area message Display prompt processor If present Display error messages Check for configuration errors 70h Display error messages Display	4Bh		QuietBoot start (optional)
50h         Display CPU type and speed           51h         Initialize EISA board           52h         Test keyboard           54h         Set key click if enabled           58h         2-2-3-1           59h         Initialize POST display service           5Ah         Display prompt "Press F2 to enter SETUP"           5Bh         Display CPU cache           6Ch         Test extended memory           62h         Test extended memory address lines           64h         Jump to User Patch1           66h         Configure advanced cache registers           67h         Initialize Multi Processor APIC           68h         Enable external and CPU caches           69h         Setup System Management Mode (SMM) area           68h         Enable external and CPU caches           69h         Setup System Management Mode (SMM) area           6Bh         Load custom defaults (optional)           6Ch	4Ch		Shadow video BIOS ROM
5th Initialize EISA board  5th Test keyboard  5th Set key click if enabled  5th Set key click if enabled  5th Set key click if enabled  5th Set for unexpected interrupts  5th Initialize POST display service  5th Display prompt "Press F2 to enter SETUP"  5th Disable CPU cache  5th Disable CPU cache  1	4Eh		Display BIOS copyright notice
52h       Test keyboard         54h       Set key click if enabled         58h       2-2-3-1       Test for unexpected interrupts         59h       Initialize POST display service         5Ah       Display prompt 'Press F2 to enter SETUP'         5Bh       Disable CPU cache         5Ch       Test RAM between 512 and 640 KB         60h       Test extended memory address lines         62h       Test extended memory address lines         64h       Jump to User Patch1         66h       Configure advanced cache registers         67h       Initialize Multi Processor APIC         68h       Enable external and CPU caches         69h       Setup System Management Mode (SMM) area         68h       Display external L2 cache size         68h       Load custom defaults (optional)         6Ch       Display possible high address for UMB recovery         70h       Display possible high address for UMB recovery         70h       Display possible high address for UMB recovery         70h       Check for configuration errors         76h       Check for keyboard e	50h		Display CPU type and speed
Set key click if enabled  58h 2-2-3-1 Test for unexpected interrupts  59h Initialize POST display service  5Ah Display prompt "Press F2 to enter SETUP"  5Bh Display Prompt "Press F2 to enter SETUP"  6Bh Test extended memory address lines  64h Jump to User Patch1  6Bh Configure advanced cache registers  67h Initialize Multi Processor APIC  68h Enable external and CPU caches  69h Setup System Management Mode (SMM) area  6Ah Display external L2 cache size  6Bh Display external L2 cache size  6Bh Display shadow-area message  6Eh Display possible high address for UMB recovery  70h Display error messages  6Eh Display error messages  72h Check for configuration errors  76h Check for configuration errors  76h Check for keyboard errors  76h Check for keyboard errors  8et up hardware interrupt vectors  11tialize coprocessor if present  80h Display ender on-MCD IDE controllers  84h Detect and install external parallel ports  87h Configure non-MCD IDE controllers  88h Initialize PC-compatible PnP ISA devices  88h Re-initialize and Configurable Devices (optional)  88h Initialize Extended BIOS Data Area  88h Initialize Extended BIOS Data Area	51h		Initialize EISA board
58h     2-2-3-1     Test for unexpected interrupts       59h     Initialize POST display service       5Ah     Display prompt "Press F2 to enter SETUP"       5Bh     Disable CPU cache       5Ch     Test RAM between 512 and 640 KB       60h     Test extended memory       62h     Test extended memory address lines       64h     Jump to User Patch1       66h     Configure advanced cache registers       67h     Initialize Multi Processor APIC       68h     Enable external and CPU caches       69h     Setup System Management Mode (SMM) area       6Ah     Display external L2 cache size       6Bh     Load custom defaults (optional)       6Ch     Display shadow-area message       6Eh     Display possible high address for UMB recovery       70h     Display prorr messages       72h     Check for configuration errors       76h     Check for keyboard errors       7Ch     Set up hardware interrupt vectors       7Eh     Initialize coprocessor if present       80h     Disable onboard Super I/O ports and IRQs       81h     Late POST device initialization       82h     Detect and install external parallel ports       84h     Detect and install external parallel ports       85h     Initialize PC-compatible PnP ISA devices	52h		Test keyboard
Initialize POST display service	54h		Set key click if enabled
Display prompt "Press F2 to enter SETUP"	58h	2-2-3-1	Test for unexpected interrupts
Disable CPU cache Test RAM between 512 and 640 KB Test extended memory Test extended memory Test extended memory address lines Jump to User Patch1 Configure advanced cache registers Initialize Multi Processor APIC Enable external and CPU caches Setup System Management Mode (SMM) area Display external L2 cache size Load custom defaults (optional) Check for configuration errors Display error messages The Check for configuration errors Check for keyboard errors Check for keyboard errors Teh Disable onboard Super I/O ports and IRQs Initialize Coprocessor if present Detect and install external PSE32 ports The Detect and install external parallel ports Initialize onboard I/O ports The Configure Motherboard Configurable Devices (optional) Initialize Extended BIOS Data Area BBh Initialize Extended BIOS Data Area	59h		Initialize POST display service
Test RAM between 512 and 640 KB  Total extended memory  Test extended memory  Test extended memory  Test extended memory address lines  Jump to User Patch1  Configure advanced cache registers  Initialize Multi Processor APIC  Bah  Enable external and CPU caches  Setup System Management Mode (SMM) area  Display external L2 cache size  Bah  Display external L2 cache size  Bah  Load custom defaults (optional)  Chan  Display possible high address for UMB recovery  Toh  Display possible high address for UMB recovery  Toh  Display error messages  Check for configuration errors  Check for keyboard errors  Check for keyboard errors  Set up hardware interrupt vectors  Initialize coprocessor if present  Disable onboard Super I/O ports and IRQs  Bah  Detect and install external parallel ports  Set up hardware install external parallel ports  Initialize PC-compatible PnP ISA devices  Re-initialize onboard I/O ports  The Configure Motherboard Configurable Devices (optional)  Reh  Initialize Extended BIOS Data Area  Bah  Initialize Extended BIOS Data Area	5Ah		Display prompt "Press F2 to enter SETUP"
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G4h Jump to User Patch1  G6h Configure advanced cache registers  G7h Initialize Multi Processor APIC  B6h Enable external and CPU caches  G9h Setup System Management Mode (SMM) area  GAh Display external L2 cache size  GBh Load custom defaults (optional)  GCh Display possible high address for UMB recovery  TOh Display error messages  T2h Check for configuration errors  T6h Check for keyboard errors  T6h Check for keyboard errors  T6h Initialize coprocessor if present  B0h Disable onboard Super I/O ports and IRQs  B1h Late POST device initialization  B2h Detect and install external RS232 ports  B3h Configure non-MCD IDE controllers  B4h Detect and install external parallel ports  Initialize PC-compatible PnP ISA devices  B6h Re-initialize noboard I/O ports  T6h Configure Motherboard Configurable Devices (optional)  B8h Initialize Extended BIOS Data Area  B8h Test and initialize Extended BIOS Data Area	60h		Test extended memory
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Enable external and CPU caches  69h Setup System Management Mode (SMM) area  6Ah Display external L2 cache size  6Bh Load custom defaults (optional)  6Ch Display possible high address for UMB recovery  70h Display error message  72h Check for configuration errors  76h Check for keyboard errors  7Ch Set up hardware interrupt vectors  7Eh Initialize coprocessor if present  80h Disable onboard Super I/O ports and IRQs  81h Late POST device initialization  82h Detect and install external parallel ports  84h Detect and install external parallel ports  85h Re-initialize PC-compatible PnP ISA devices  86h Re-initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  84h Initialize Extended BIOS Data Area  88h Test and initialize PS/2 mouse	66h		Configure advanced cache registers
Setup System Management Mode (SMM) area  6Ah  Display external L2 cache size  Load custom defaults (optional)  6Ch  Display shadow-area message  6Eh  Display possible high address for UMB recovery  70h  Display error messages  72h  Check for configuration errors  76h  Check for keyboard errors  76h  Set up hardware interrupt vectors  77h  Initialize coprocessor if present  80h  Disable onboard Super I/O ports and IRQs  81h  Late POST device initialization  82h  Detect and install external RS232 ports  83h  Configure non-MCD IDE controllers  84h  Detect and install external parallel ports  85h  Initialize PC-compatible PnP ISA devices  86h  Re-initialize onboard I/O ports  87h  Configure Motherboard Configurable Devices (optional)  88h  Initialize BIOS Area  89h  Enable Non-Maskable Interrupts (NMIs)  Ahh  Initialize Extended BIOS Data Area  88h  Test and initialize PS/2 mouse	67h		, ,
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BAh Display external L2 cache size BBh Load custom defaults (optional) BCh Display shadow-area message BEh Display possible high address for UMB recovery Display possible high address for UMB recovery TOh Display error messages T2h Check for configuration errors Check for keyboard errors TCh Set up hardware interrupt vectors TEH Initialize coprocessor if present BOH Disable onboard Super I/O ports and IRQs B1h Late POST device initialization B2h Detect and install external RS232 ports Configure non-MCD IDE controllers B4h Detect and install external parallel ports B5h Initialize PC-compatible PnP ISA devices B6h Re-initialize onboard I/O ports B7h Configure Motherboard Configurable Devices (optional) B8h Initialize Extended BIOS Data Area B8h Test and initialize PS/2 mouse	69h		Setup System Management Mode (SMM) area
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Set up hardware interrupt vectors  7Eh Initialize coprocessor if present  80h Disable onboard Super I/O ports and IRQs  81h Late POST device initialization  82h Detect and install external RS232 ports  83h Configure non-MCD IDE controllers  84h Detect and install external parallel ports  85h Initialize PC-compatible PnP ISA devices  86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area	72h		Check for configuration errors
TEh Initialize coprocessor if present  80h Disable onboard Super I/O ports and IRQs  81h Late POST device initialization  82h Detect and install external RS232 ports  83h Configure non-MCD IDE controllers  84h Detect and install external parallel ports  85h Initialize PC-compatible PnP ISA devices  86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	76h		Check for keyboard errors
B0h Disable onboard Super I/O ports and IRQs  81h Late POST device initialization  82h Detect and install external RS232 ports  83h Configure non-MCD IDE controllers  84h Detect and install external parallel ports  85h Initialize PC-compatible PnP ISA devices  86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	7Ch		Set up hardware interrupt vectors
B1h Late POST device initialization  B2h Detect and install external RS232 ports  B3h Configure non-MCD IDE controllers  B4h Detect and install external parallel ports  B5h Initialize PC-compatible PnP ISA devices  B6h Re-initialize onboard I/O ports  B7h Configure Motherboard Configurable Devices (optional)  B8h Initialize BIOS Area  B9h Enable Non-Maskable Interrupts (NMIs)  BAh Initialize Extended BIOS Data Area  BBh Test and initialize PS/2 mouse	7Eh		Initialize coprocessor if present
B2h Detect and install external RS232 ports  83h Configure non-MCD IDE controllers  84h Detect and install external parallel ports  85h Initialize PC-compatible PnP ISA devices  86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	80h		Disable onboard Super I/O ports and IRQs
Configure non-MCD IDE controllers  84h Detect and install external parallel ports  85h Initialize PC-compatible PnP ISA devices  86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	81h		Late POST device initialization
84h Detect and install external parallel ports  85h Initialize PC-compatible PnP ISA devices  86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	82h		Detect and install external RS232 ports
85h Initialize PC-compatible PnP ISA devices  86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	83h		Configure non-MCD IDE controllers
86h Re-initialize onboard I/O ports  87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	84h		Detect and install external parallel ports
87h Configure Motherboard Configurable Devices (optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	85h		Initialize PC-compatible PnP ISA devices
(optional)  88h Initialize BIOS Area  89h Enable Non-Maskable Interrupts (NMIs)  8Ah Initialize Extended BIOS Data Area  8Bh Test and initialize PS/2 mouse	86h		Re-initialize onboard I/O ports
89h Enable Non-Maskable Interrupts (NMIs) 8Ah Initialize Extended BIOS Data Area 8Bh Test and initialize PS/2 mouse	87h		
8Ah Initialize Extended BIOS Data Area 8Bh Test and initialize PS/2 mouse	88h		Initialize BIOS Area
8Bh Test and initialize PS/2 mouse	89h		Enable Non-Maskable Interrupts (NMIs)
	8Ah		Initialize Extended BIOS Data Area
8Ch Initialize floppy controller	8Bh		Test and initialize PS/2 mouse
	8Ch		Initialize floppy controller

8Fh         Determine number of ATA drives (optional)           90h         Initialize hard-disk controllers           91h         Initialize local-bus hard-disk controllers           92h         Jump to UserPatch2           93h         Build MPTABLE for multi-processor boards           95h         Install CD ROM for boot           96h         Clear huge ES segment register           97h         Fixup Multi Processor table           98h         Clear huge ES segment register           97h         Fixup Multi Processor table           98h         Check for SMART drive (optional)           98h         Check for SMART drive (optional)           98h         Check for SMART drive (optional)           98h         Satur power Management           90h         Initialize security engine (optional)           98h         Enable hardware interrupts           90h         Initialize security engine (optional)           98h         Enable hardware interrupts           99h         Determine number of ATA and SCSI drives           90h         Lender bardware interrupts           97h         Determine number of ATA and SCSI drives           98h         Lender bardware interrupts           9Fh         Determine number of ATA and SCSI drives <th>Code</th> <th>Beeps</th> <th>POST Routine Description</th>	Code	Beeps	POST Routine Description
91h         Initialize local-bus hard-disk controllers           92h         Jump to UserPatch2           93h         Build MPTABLE for multi-processor boards           95h         Install CD ROM for boot           96h         Clear huge ES segment register           97h         Fixup Multi Processor table           98h         Search for option ROMs. One long, two short beeps on checksum failure.           99h         Check for SMART drive (optional)           9Ah         Shadow option ROMs           9Ch         Set up Power Management           9Dh         Initialize security engine (optional)           9Eh         Enable hardware interrupts           9Eh         Enable hardware interrupts           9Fh         Determine number of ATA and SCSI drives           A0h         Set time of day           A2h         Check key lock           A4h         Initialize Typermatic rate           A8h         Erase F2 prompt           AAh         Scan for F2 key stroke           ACh         Enter SETUP           AEh         Check for errors           B0h         Check for errors           B2h         POST done- prepare to boot operating system           B4h         1         One short beep befor	8Fh	-	Determine number of ATA drives (optional)
92h         Jump to UserPatch2           93h         Build MPTABLE for multi-processor boards           95h         Install CD ROM for boot           96h         Clear huge ES segment register           97h         Fixup Multi Processor table           98h         1-2         Search for option ROMs. One long, two short beeps on checksum failure.           99h         Check for SMART drive (optional)           9Ah         Shadow option ROMs           9Ch         Set up Power Management           9Dh         Initialize security engine (optional)           9Eh         Enable hardware interrupts           9Fh         Determine number of ATA and SCSI drives           9Fh         Determine number of ATA and S	90h		Initialize hard-disk controllers
93h         Build MPTABLE for multi-processor boards           95h         Install CD ROM for boot           96h         Clear huge ES segment register           97h         Fixup Multi Processor table           98h         1-2         Search for option ROMs. One long, two short beeps on checksum failure.           99h         Check for SMART drive (optional)           9Ah         Shadow option ROMs           9Ch         Set up Power Management           9Dh         Initialize security engine (optional)           9Eh         Enable hardware interrupts           9Fh         Determine number of ATA and SCSI drives           9Fh         Determine number of day           A2h         Determine number of day           A2h         Check key lock           A4h         Initialize Typematic rate           A8h         Erase F2 prompt           A4h         Initialize Typematic rate           A2h         Check key lock           A2h         Check key Stoke           A2h         Check key Stoke           A2h         Erase F2 prompt           A3h         Erase F3 prompt           A4h         Initialize Typematic rate           B4h         Check set SET           B5h	91h		Initialize local-bus hard-disk controllers
95h         Install CD ROM for boot           96h         Clear huge ES segment register           97h         Fixup Multi Processor table           98h         1-2         Search for option ROMs. One long, two short beeps on checksum failure.           99h         Check for SMART drive (optional)           9Ah         Shadow option ROMs           9Ch         Set up Power Management           9Dh         Initialize security engine (optional)           9Eh         Enable hardware interrupts           9Fh         Determine number of ATA and SCSI drives           A0h         Set time of day           A2h         Check key lock           A4h         Initialize Typematic rate           A8h         Erase F2 prompt           AAh         Scan for F2 key stroke           ACh         Enter SETUP           AEh         Clear Boot flag           B0h         Check for errors           B2h         POST done- prepare to boot operating system           B4h         1         One short beep before boot           B5h         Terminate QuietBoot (optional)           B6h         Check password (optional)           B6h         Check password (optional)           B7h         Initialize DMI parame	92h		Jump to UserPatch2
95h         Install CD ROM for boot           96h         Clear huge ES segment register           97h         Fixup Multi Processor table           98h         1-2         Search for option ROMs. One long, two short beeps on checksum failure.           99h         Check for SMART drive (optional)           9Ah         Shadow option ROMs           9Ch         Set up Power Management           9Dh         Initialize security engine (optional)           9Eh         Enable hardware interrupts           9Fh         Determine number of ATA and SCSI drives           A0h         Set time of day           A2h         Check key lock           A4h         Initialize Typematic rate           A8h         Erase F2 prompt           AAh         Scan for F2 key stroke           ACh         Enter SETUP           AEh         Clear Boot flag           B0h         Check for errors           B2h         POST done- prepare to boot operating system           B4h         1         One short beep before boot           B5h         Terminate QuietBoot (optional)           B6h         Check password (optional)           B6h         Check password (optional)           B7h         Initialize DMI parame	93h		Build MPTABLE for multi-processor boards
Fixup Multi Processor table 98h 1-2 Search for option ROMs. One long, two short beeps on checksum failure. 99h Check for SMART drive (optional) 9Ah Shadow option ROMs 9Ch Set up Power Management 9Dh Initialize security engine (optional) 9Eh Enable hardware interrupts 9Fh Determine number of ATA and SCSI drives ADh AZh Check key look A4h Initialize Typematic rate ABh Erase F2 prompt AAh Scan for F2 key stroke Enter SETUP AEh Clear Boot flag BDh BCh BCh BCh BCh BCh BCh BCh BCh BCh BC	95h		
98h 1-2 Search for option ROMs. One long, two short beeps on checksum failure. 99h Check for SMART drive (optional) 9Ah Shadow option ROMs 9Ch Set up Power Management 9Dh Initialize security engine (optional) 9Eh Enable hardware interrupts 9Fh Determine number of ATA and SCSI drives A0h Set time of day A2h Check key look A4h Initialize Typematic rate A8h Erase F2 prompt AAh Scan for F2 key stroke ACh Enter SETUP AEh Clear Boot flag B0h Check for errors B2h POST done- prepare to boot operating system B4h 1 One short beep before boot B5h Terminate QuietBoot (optional) B6h Check password (optional) B6h Initialize DMI parameters B8h Initialize DMI parameters B8h Initialize DMI parameters B8h Clear parity checkers B0h Check rore rore B6h Clear parity checkers B7h Clear post flag B6h Check virus and backup reminders B6h	96h		Clear huge ES segment register
beeps on checksum failure.  99h Check for SMART drive (optional) 9Ah Shadow option ROMs 9Ch Set up Power Management 9Dh Initialize security engine (optional) 9Eh Enable hardware interrupts 9Fh Determine number of ATA and SCSI drives A0h Set time of day A2h Check key lock A4h Initialize Typematic rate A8h Erase F2 prompt AAh Scan for F2 key stroke ACh Enter SETUP AEH B0h Check for errors B2h DORS done- prepare to boot operating system B4h 1 One short beep before boot B5h Terminate QuietBoot (optional) B9h Prepare Boot BAH Initialize PNP Option ROMs BCH	97h		Fixup Multi Processor table
9Ah Shadow option ROMs 9Ch Set up Power Management 9Dh Initialize security engine (optional) 9Eh Enable hardware interrupts 9Fh Determine number of ATA and SCSI drives A0h Set time of day A2h Check key lock A4h Initialize Typematic rate A8h Erase F2 prompt AAh Scan for F2 key stroke ACh Enter SETUP AEh Clear Boot flag B0h Check for errors B2h POST done- prepare to boot operating system B4h 1 One short beep before boot B5h Terminate QuietBoot (optional) B6h Check password (optional) B7h Initialize DMI parameters B8h Initialize DMI parameters B8h Display MultiBoot menu BEH Clear screen (optional) B7h Check virus and backup reminders C0h Try to boot with INT 19 B7h Check virus and backup reminders C1h Initialize POST Error Manager (PEM) C1h Initialize prov Initialize	98h	1-2	
9Ch   Set up Power Management   9Dh   Initialize security engine (optional)   9Eh   Enable hardware interrupts   9Fh   Determine number of ATA and SCSI drives   A0h   Set time of day   A2h   Check key lock   A4h   Initialize Typematic rate   A8h   Erase F2 prompt   AAh   Scan for F2 key stroke   ACh   Enter SETUP   AEh   Clear Boot flag   B0h   POST done- prepare to boot operating system   B4h   1   One short beep before boot   B5h   Terminate QuietBoot (optional)   B6h   Check password (optional)   B7h   Initialize PNP Option ROMs   B8h   Initialize PNP Option ROMs   B8h   Clear sparity checkers   B9h   Clear sparity checkers   B9h   Clear sparity checkers   B9h   Clear sparity checkers   B9h   Display MultiBoot menu   B6h   Clear sparity checkers   B9h   Initialize PNP Option ROMs   CCheck virus and backup reminders   COh   Try to boot with INT 19   C1h   Initialize post Error Manager (PEM)   C2h   Initialize post Error Manager (PEM)   C3h   Initialize post Error Manager (PEM)   C6h   Initialize post Goothood ocking late   C6h   Initialize notebook docking (optional)   C7h   Initialize notebook docking late   C6h   Error Check (optional)   Extended checksum (optional)	99h		Check for SMART drive (optional)
9Dh   Initialize security engine (optional) 9Eh   Enable hardware interrupts 9Fh   Determine number of ATA and SCSI drives A0h   Set time of day A2h   Check key lock A4th   Initialize Typematic rate A8h   Erase F2 prompt AAh   Scan for F2 key stroke ACh   Enter SETUP AEh   Clear Boot flag B0h   Check for errors B2h   POST done- prepare to boot operating system B4h   1 One short beep before boot B5h   Terminate QuietBoot (optional) B6h   Check password (optional) B9h   Prepare Boot BAh   Initialize DMI parameters BBh   Initialize DMI parameters BDh   Display MultiBoot menu BEH   Clear screen (optional) BFh   Clear screen (optional) BFh   Check virus and backup reminders COh   Try to boot with INT 19 C1h   Initialize Error display function C4h   Initialize system error handler C5h   PnPnd dual CMOS (optional) Initialize notebook docking (optional) C7h   Initialize notebook docking (optional) C6h   PnPnd dual CMOS (optional) C6h   Initialize notebook docking (optional) C6h   Extended checksum (optional)	9Ah		Shadow option ROMs
9Eh       Enable hardware interrupts         9Fh       Determine number of ATA and SCSI drives         A0h       Set time of day         A2h       Check key lock         A4h       Initialize Typematic rate         A8h       Erase F2 prompt         AAh       Scan for F2 key stroke         ACh       Enter SETUP         AEh       Clear Boot flag         B0h       Check for errors         B2h       POST done- prepare to boot operating system         B4h       1       One short beep before boot         B5h       Terminate QuietBoot (optional)         B6h       Check password (optional)         B7h       Prepare Boot         BAh       Initialize DMI parameters         BBh       Initialize PnP Option ROMs         BCh       Clear parity checkers         BDh       Display MultiBoot menu         BEh       Clear screen (optional)         BFh       Check virus and backup reminders         C0h       Try to boot with INT 19         C1h       Initialize POST Error Manager (PEM)         C2h       Initialize error logging         C3h       Initialize system error handler         C5h       PnPnd dual CMOS (optional)	9Ch		Set up Power Management
9Fh       Determine number of ATA and SCSI drives         A0h       Set time of day         A2h       Check key lock         A4h       Initialize Typematic rate         A8h       Erase F2 prompt         AAh       Scan for F2 key stroke         ACh       Enter SETUP         AEh       Clear Boot flag         B0h       Check for errors         B2h       POST done- prepare to boot operating system         B4h       1       One short beep before boot         B5h       Terminate QuietBoot (optional)         B6h       Check password (optional)         B9h       Prepare Boot         BAh       Initialize DMI parameters         BBh       Initialize PnP Option ROMs         BCh       Clear parity checkers         BDh       Display MultiBoot menu         BEh       Clear screen (optional)         BFh       Check virus and backup reminders         C0h       Try to boot with INT 19         B1h       Initialize POST Error Manager (PEM)         C2h       Initialize error logging         C3h       Initialize error logging         C3h       Initialize error land CMOS (optional)         C4h       Initialize posteok docking (o	9Dh		Initialize security engine (optional)
A0h Check key lock A2h Check key lock A4h Initialize Typematic rate A8h Erase F2 prompt AAh Scan for F2 key stroke ACh Enter SETUP AEh Clear Boot flag B0h Check for errors B2h POST done- prepare to boot operating system B4h 1 One short beep before boot B5h Terminate QuietBoot (optional) B6h Check password (optional) B7h Prepare Boot B8h Initialize DMI parameters B8h Initialize PNP Option ROMs B6h Clear parity checkers BDh Display MultiBoot menu BEH Clear screen (optional) BFH Check virus and backup reminders COh Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) Check Initialize error logging C3h Initialize error laglaty function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C7h Initialize notebook docking (optional) C7h Initialize notebook docking (optional) C7h Initialize notebook docking (optional) C8h Force check (optional) Extended checksum (optional)	9Eh		Enable hardware interrupts
A2h Check key lock  A4h Initialize Typematic rate  A8h Erase F2 prompt  AAh Scan for F2 key stroke  ACh Enter SETUP  AEh Clear Boot flag  B0h Check for errors  B2h POST done- prepare to boot operating system  B4h 1 One short beep before boot  B5h Terminate QuietBoot (optional)  B6h Check password (optional)  B7 P6 P7 P7 P7 P7 P7 P8 P8 P8 P8 P8 P8 P8 P8 P9	9Fh		Determine number of ATA and SCSI drives
A4th Initialize Typematic rate  A8th Erase F2 prompt  AAh Scan for F2 key stroke  ACh Enter SETUP  AEh Clear Boot flag  B0h Check for errors  B2h POST done- prepare to boot operating system  B4h 1 One short beep before boot  B5h Terminate QuietBoot (optional)  B6h Check password (optional)  B7h Prepare Boot  B8h Initialize DMI parameters  B8h Initialize PnP Option ROMs  BCh Clear parity checkers  BDh Display MultiBoot menu  BEH Clear screen (optional)  BFH Check virus and backup reminders  Coh Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C6h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  Extended checksum (optional)	A0h		Set time of day
A8h	A2h		Check key lock
AAh Scan for F2 key stroke ACh Enter SETUP AEh Clear Boot flag B0h Check for errors B2h POST done- prepare to boot operating system B4h 1 One short beep before boot B5h Terminate QuietBoot (optional) B6h Check password (optional) B7h Prepare Boot B8h Initialize DNI parameters B8h Initialize PnP Option ROMs B7h Clear parity checkers B8h Display MultiBoot menu B8h Clear screen (optional) B7h Check virus and backup reminders C0h Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C1h Initialize pror Iogging C3h Initialize pror display function C4h Initialize pror display function C4h Initialize pror display function C6h Initialize notebook docking (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) Extended checksum (optional)	A4h		Initialize Typematic rate
ACh Enter SETUP  AEh Clear Boot flag  Boh Check for errors  B2h POST done- prepare to boot operating system  B4h 1 One short beep before boot  B5h Terminate QuietBoot (optional)  B6h Check password (optional)  B9h Prepare Boot  BAh Initialize DMI parameters  BBh Initialize PnP Option ROMs  BCh Clear parity checkers  BDh Display MultiBoot menu  BEH Clear screen (optional)  BFH Check virus and backup reminders  COh Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C7h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  Extended checksum (optional)	A8h		Erase F2 prompt
AEh Clear Boot flag  B0h Check for errors  B2h POST done- prepare to boot operating system  B4h 1 One short beep before boot  B5h Terminate QuietBoot (optional)  B6h Check password (optional)  B9h Prepare Boot  BAh Initialize DMI parameters  BBh Initialize PnP Option ROMs  BCh Clear parity checkers  BDh Display MultiBoot menu  BEH Clear screen (optional)  BFH Check virus and backup reminders  COh Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error logging  C3h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C7h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  Extended checksum (optional)	AAh		Scan for F2 key stroke
Boh Check for errors  B2h POST done- prepare to boot operating system  B4h 1 One short beep before boot  B5h Terminate QuietBoot (optional)  B6h Check password (optional)  B9h Prepare Boot  BAh Initialize DMI parameters  BBh Initialize PP Option ROMs  BCh Clear parity checkers  BDh Display MultiBoot menu  BEh Clear screen (optional)  BFh Check virus and backup reminders  Coh Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error logging  C3h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C6h Initialize notebook docking (optional)  C7h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  Extended checksum (optional)	ACh		Enter SETUP
POST done- prepare to boot operating system B4h 1 One short beep before boot B5h Terminate QuietBoot (optional) B6h Check password (optional) B9h Prepare Boot BAh Initialize DMI parameters BBh Initialize PnP Option ROMs BCh Clear parity checkers BDh Display MultiBoot menu BEH Clear screen (optional) BFH Check virus and backup reminders COh Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) Extended checksum (optional)	AEh		Clear Boot flag
B4h 1 One short beep before boot B5h Terminate QuietBoot (optional) B6h Check password (optional) B9h Prepare Boot BAh Initialize DMI parameters BBh Initialize PnP Option ROMs BCh Clear parity checkers BDh Display MultiBoot menu BEh Clear screen (optional) BFh Check virus and backup reminders Coh Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	B0h		Check for errors
B5h Terminate QuietBoot (optional) B6h Check password (optional) B9h Prepare Boot BAh Initialize DMI parameters BBh Initialize PnP Option ROMs BCh Clear parity checkers BDh Display MultiBoot menu BEh Clear screen (optional) BFh Check virus and backup reminders COh Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	B2h		POST done- prepare to boot operating system
B6h Check password (optional) B9h Prepare Boot BAh Initialize DMI parameters BBh Initialize PnP Option ROMs BCh Clear parity checkers BDh Display MultiBoot menu BEh Clear screen (optional) BFh Check virus and backup reminders Coh Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	B4h	1	One short beep before boot
B9h Prepare Boot  BAh Initialize DMI parameters  BBh Initialize PnP Option ROMs  BCh Clear parity checkers  BDh Display MultiBoot menu  BEh Clear screen (optional)  BFh Check virus and backup reminders  C0h Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error logging  C3h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C6h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  C9h Extended checksum (optional)	B5h		Terminate QuietBoot (optional)
BAh Initialize DMI parameters BBh Initialize PnP Option ROMs BCh Clear parity checkers BDh Display MultiBoot menu BEh Clear screen (optional) BFh Check virus and backup reminders C0h Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	B6h		Check password (optional)
BBh Initialize PnP Option ROMs BCh Clear parity checkers BDh Display MultiBoot menu BEh Clear screen (optional) BFh Check virus and backup reminders C0h Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	B9h		Prepare Boot
BCh Clear parity checkers BDh Display MultiBoot menu BEh Clear screen (optional) BFh Check virus and backup reminders C0h Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	BAh		Initialize DMI parameters
BDh Display MultiBoot menu  BEh Clear screen (optional)  BFh Check virus and backup reminders  C0h Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error logging  C3h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C6h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  C9h Extended checksum (optional)	BBh		Initialize PnP Option ROMs
BEh Clear screen (optional)  BFh Check virus and backup reminders  C0h Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error logging  C3h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C6h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  C9h Extended checksum (optional)	BCh		Clear parity checkers
BFh Check virus and backup reminders  C0h Try to boot with INT 19  C1h Initialize POST Error Manager (PEM)  C2h Initialize error logging  C3h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C6h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  C9h Extended checksum (optional)	BDh		Display MultiBoot menu
C0h Try to boot with INT 19 C1h Initialize POST Error Manager (PEM) C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	BEh		Clear screen (optional)
C1h Initialize POST Error Manager (PEM)  C2h Initialize error logging  C3h Initialize error display function  C4h Initialize system error handler  C5h PnPnd dual CMOS (optional)  C6h Initialize notebook docking (optional)  C7h Initialize notebook docking late  C8h Force check (optional)  C9h Extended checksum (optional)	BFh		Check virus and backup reminders
C2h Initialize error logging C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	C0h		Try to boot with INT 19
C3h Initialize error display function C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	C1h		Initialize POST Error Manager (PEM)
C4h Initialize system error handler C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	C2h		Initialize error logging
C5h PnPnd dual CMOS (optional) C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	C3h		Initialize error display function
C6h Initialize notebook docking (optional) C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	C4h		Initialize system error handler
C7h Initialize notebook docking late C8h Force check (optional) C9h Extended checksum (optional)	C5h		PnPnd dual CMOS (optional)
C8h Force check (optional) C9h Extended checksum (optional)	C6h		Initialize notebook docking (optional)
C9h Extended checksum (optional)	C7h		Initialize notebook docking late
	C8h		Force check (optional)
D2h Unknown interrupt	C9h		Extended checksum (optional)
	D2h		Unknown interrupt

Code	Beeps	POST Routine Description
E0h		Initialize the chipset
E1h		Initialize the bridge
E2h		Initialize the CPU
E3h		Initialize the system timer
E4h		Initialize system I/O
E5h		Check force recovery boot
E6h		Checksum BIOS ROM
E7h		Go to BIOS
E8h		Set Huge Segment
E9h		Initialize Multi Processor
EAh		Initialize OEM special code
EBh		Initialize PIC and DMA
ECh		Initialize Memory type
EDh		Initialize Memory size
EEh		Shadow Boot Block
EFh		System memory test
F0h		Initialize interrupt vectors
F1h		Initialize Run Time Clock
F2h		Initialize video
F3h		Initialize System Management Mode
F4h	1	Output one beep before boot
F5h		Boot to Mini DOS
F6h		Clear Huge Segment
F7h		Boot to Full DOS

# Index of Symptom-to-FRU Error Message

## LCD-Related Symptoms

Symptom / Error	Action in Sequence
LCD backlight doesn't work	First, plug a monitor to CRT port. Next, enter BIOS utility to running "Load Default Settings" then reboot the system.
	Reconnect the LCD connectors.
	Keyboard (if the brightness function key doesn't work).
	LCD cable
	LCD inverter
	LCD
	Main board
LCD is too dark	Enter BIOS Utility to execute "Load Setup Default Settings", then
LCD brightness cannot be adjusted	reboot system.
	Reconnect the LCD connectors.
	Keyboard (if the brightness function key doesn't work).
	LCD cable
	LCD inverter
	LCD
	Main board
Unreadable LCD screen	Reconnect the LCD cable
Missing pels in characters	LCD cable
Abnormal screen	LCD
Wrong color displayed	Main board
LCD has extra horizontal or vertical lines displayed.	

### **Indicator-Related Symptoms**

Symptom / Error	Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly	Main board
HDD/CD-ROM active indicators cannot work	HDD/CD-ROM drive
	Device driver
	Main board

### **Power-Related Symptoms**

Symptom / Error	Action in Sequence
Power shuts down during operation	Power source (battery pack and power adapter). See "Power System Check" on page 65.
	Battery pack
	AC adapter
	See if the thermal module is overheat (Heat sink or fan).
	Main board
The system cannot power-on.	Power source (battery pack and power adapter). See "Power System Check" on page 65.
	Battery pack
	Power adapter
	CPU
	Main board
The system cannot power-off.	In Windows XP operating system, hold and press the power switch for more than 4 seconds. If the system can power off, then the main board is OK. Verify OS in the HDD.  Main board

### **Power-Related Symptoms**

Symptom / Error	Action in Sequence
Battery can't be charged or discharged	See "Check the Battery Pack" on page 66.
	Battery pack
	Main board
System hang during POST	ODD/HDD/FDD/RAM module
	Main board

## **PCMCIA-Related Symptoms**

Symptom / Error	Action in Sequence
System cannot detect the PC Card (PCMCIA)	PCMCIA slot assembly
	Main board
PCMCIA slot pin is damaged.	PCMCIA slot assembly
PC Card cannot be inserted or ejected	Check if the PCMCIA slot is blocked
	Main board

### **Memory-Related Symptoms**

Symptom / Error	Action in Sequence
Memory count (size) appears different from actual size.	Enter BIOS Setup Utility to execute "Load Default Settings" then reboot system.
	RAM module
	Main board
	Check BIOS revision
System can power on, but you hear two long beeps: "B, B" and the LCD is blank.	Reinsert DIMM
	DIMM
	Main board

### **Speaker-Related Symptoms**

Symptom / Error	Action in Sequence
In Windows, multimedia programs, no sound comes from the computer.	OS volume control
	Audio driver
	Speaker
	Main board
Internal speakers make noise or emit no sound.	Speaker
	Main board
Microphone cannot work	Audio driver
	Volume control in Windows XP
	Main board

### **Power Management-Related Symptoms**

Symptom / Error	Action in Sequence
The system will not enter hibernation mode	Power option in Windows XP
	Hard disk drive
	Main board
The system doesn't enter standby mode after closing the lid of the portable computer.	Driver of Power Option Properties
	Lid close switch in upper case
	Main board

# **Power Management-Related Symptoms**

Symptom / Error	Action in Sequence
The system doesn't resume from hibernation/	Connect AC adapter then check if the system resumes from
standby mode.	Standby/Hibernation mode.
	Check if the battery is low.
	Hard disk drive
	Main board
The system doesn't resume from standby mode after opening the lid of the portable computer.	LCD cover switch
	Main board
Battery fuel gauge in Windows doesn't go higher than 90%.	Refresh battery (continue use battery until power off, then charge
	battery).
	Battery pack
	Main board
System hangs intermittently.	Reconnect hard disk/CD-ROM drives.
	Main board

# Peripheral-Related Symptoms

Symptom / Error	Action in Sequence
System configuration does not match the installed devices.	Enter BIOS Setup Utility to execute "Load Setup defaults", then reboot system.
	Reconnect hard disk/CD-ROM drives/FDD or other peripherals.
	Main board
External display does not work correctly.	Press Fn+F5, LCD/CRT/Both display switching
	Keyboard
	Main board
USB does not work correctly	Main board
Print problems.	Enter BIOS Setup Utility to execute "Load Default Settings" then reboot the system.
	Run printer self-test.
	Printer driver
	Printer cable
	Printer
	Main board
Parallel port device problems	Enter BIOS Setup Utility to execute "Load Default Settings" then reboot the system.
	Device driver
	Device cable
	Device
	Main board

## **Keyboard/Touchpad-Related Symptoms**

Symptom / Error	Action in Sequence
Keyboard (one or more keys) does not work.	Reconnect the keyboard cable.
	Keyboard
	Main board
Touchpad does not work.	Reconnect touchpad cable.
	Touchpad board
	Main board

### Modem/LAN-Related Symptoms

Symptom / Error	Action in Sequence
Internal modem does not work correctly.	Phone cable Driver Reconnect the Internal modem cable to the main board tightly. Main board
Internal LAN does not work correctly	Lan cable Driver Main board

**NOTE:** If you cannot find a symptom or an error in this list and the problem remains, see "Undetermined Problems" on page 79.

### **Intermittent Problems**

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

When analyzing an intermittent problem, do the following:

- 1. Run the diagnostic test for the system board in loop mode at least 10 times.
- 2. If no error is detected, do not replace any FRU.
- 3. If any error is detected, replace the FRU. Rerun the test to verify that there are no more errors.

#### **Undetermined Problems**

The diagnostic problems does not identify which adapter or device failed, which installed devices are incorrect, whether a short circuit is suspected, or whether the system is inoperative.

Follow these procedures to isolate the failing FRU (do not isolate non-defective FRU).

NOTE: Verify that all attached devices are supported by the computer.

**NOTE:** Verify that the power supply being used at the time of the failure is operating correctly. (See "Power System Check" on page 65):

- 1. Power-off the computer.
- 2. Visually check them for damage. If any problems are found, replace the FRU.
- 3. Remove or disconnect all of the following devices:

Non-Acer devices
Printer, mouse, and other external devices
Battery pack
Hard disk drive
DIMM
PC Cards

- 4. Power-on the computer.
- 5. Determine if the problem has changed.
- 6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
- 7. If the problem remains, replace the following FRU one at a time. Do not replace a non-defective FRU:

System boardLCD assembly

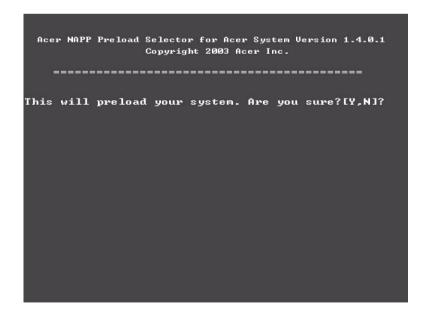
#### Use NAPP CD to Build Master Hard Disc Drive

#### **CD to Disk Recovery**

- 1. Prepare NAPP CD, Recovery CD and System CD.
- 2. Put NAPP CD into the optical drive. Then boot up the system.
- 3. The system will ask you if you want to build NAPP Master HDD. Please press any key to continue.



4. NAPP CD will start to preload the system, please click [Y].



5. Select CD to Disk Revocery.

6. Put the Recovery CD to the optical drive. This step is to create image files to the system, you do not have to put the Recovery CD to the optical drive in order. Place one Recovery CD to the drive at one time till you finish all Recovery CDs.

```
Please Insert Any Recovery CD

Please Press Any Key to Continue.

Press any key to continue...

-
```

After you place the Recovery CD to the optical drive, you will see the display below.

```
Please Wait for COPYING ......
X:\images \70E40I01.HDD
```

7. Then insert the System CD to the optical drive.

```
Please Insert the System CD

Please Press Any Key to Continue.

Press any key to continue...

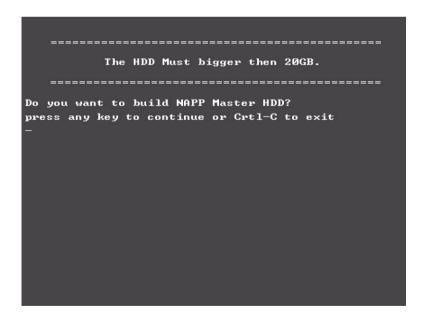
-
```

8. You will see the screen displaying "PASS" when the system has buit NAPP Master hard disc drive.

```
888888888
                                       sssssssss
                                       22
                          22
       PP
PP
       PP
                                       SS
                          22
РРРРРРРРР
                          222222222
                                       sssssssss
PP
                                 SS
          ававававава
                                               SS
                          222222222
                                       222222222
            PLEASE REMOVE YOUR CD !!!!!
            key to exit!!
```

## **Disk to Disk Recovery**

- 1. Prepare NAPP CD, Recovery CD and System CD.
- 2. Put NAPP CD into the optical drive. Then boot up the system.
- 3. The system will ask you if you want to build NAPP Master HDD. Please press any key to continue.



4. NAPP CD will start to preload the system, please click [Y].

**5.** Select Disk to Disk Recovery. Then choose Single Language or Multi-Languages Recovery. **NOTE:** For Multi-Languages Recovery, not more than five languages could be loaded to the system.

6. Put the Recovery CD to the optical drive. This step is to create image files to the system, you do not have to put the Recovery CD to the optical drive in order. Place one Recovery CD to the drive at one time till you finish all Recovery CDs.

```
Please Insert Any Recovery CD

Please Press Any Key to Continue.

Press any key to continue...

-
```

After you place the Recovery CD to the optical drive, you will see the display below.

```
Please Wait for COPYING ......
X:\images \70E40I01.HDD
```

7. Then insert the System CD to the optical drive.

```
Please Insert the System CD

Please Press Any Key to Continue.

Press any key to continue...

-
```

8. You will see the screen displaying "PASS" when the system has buit NAPP Master hard disc drive.

```
PPPPPPPPPP
                        222222222
                                     sssssssss
PPPPPPPPPP
          AA
                        222222222
                                     222222222
                 AA
          AA
         аааааааааааа
                    AA
                                            SS
                        888888888
                                     222222222
     *** PLEASE REMOUE YOUR CD!!!!! ****
press any key to exit!!
```