SERVICE MANUAL

EUROCOM
SHARK 4
Notebook Computer
N150SC / N150SD
Service Manual
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About this Manual
This manual is intended for service personnel who have completed sufficient training to undertake the maintenance and inspection of personal computers.

It is organized to allow you to look up basic information for servicing and/or upgrading components of the N150SC / N150SD series notebook PC.

The following information is included:

Chapter 1, Introduction, provides general information about the location of system elements and their specifications.
Chapter 2, Disassembly, provides step-by-step instructions for disassembling parts and subsystems and how to upgrade elements of the system.

Appendix A, Part Lists
Appendix B, Schematic Diagrams
Appendix C, Updating the FLASH ROM BIOS
IMPORTANT SAFETY INSTRUCTIONS

Follow basic safety precautions, including those listed below, to reduce the risk of fire, electric shock and injury to persons when using any electrical equipment:

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:
   • AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 6.15A (120 Watts) minimum AC/DC Adapter.

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
This device may not cause harmful interference.
This device must accept any interference received, including interference that may cause undesired operation.
Instructions for Care and Operation

The notebook computer is quite rugged, but it can be damaged. To prevent this, follow these suggestions:

1. **Don’t drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

   ![Image 1] Do not expose the computer to any shock or vibration.

   ![Image 2] Do not place it on an unstable surface.

   ![Image 3] Do not place anything heavy on the computer.

2. **Keep it dry, and don’t overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

   ![Image 4] Do not expose it to excessive heat or direct sunlight.

   ![Image 5] Do not leave it in a place where foreign matter or moisture may affect the system.

   ![Image 6] Don’t use or store the computer in a humid environment.

   ![Image 7] Do not place the computer on any surface which will block the vents.

3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don’t forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.

   ![Image 8] Do not turn off the power until you properly shut down all programs.

   ![Image 9] Do not turn off any peripheral devices when the computer is on.

   ![Image 10] Do not disassemble the computer by yourself.

   ![Image 11] Perform routine maintenance on your computer.
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.

5. **Take care when using peripheral devices.**

   ![Peripherals Diagram](image)

   **Use only approved brands of peripherals.**
   **Unplug the power cord before attaching peripheral devices.**

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**Power Safety**

The computer has specific power requirements:

- Only use a power adapter approved for use with this computer.
- Your AC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your service representative or local power company.
- The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
- When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
- Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the computer, make sure it is disconnected from any external power supplies.

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**Power Safety Warning**

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). It is advisable to also remove your battery in order to prevent accidentally turning the machine on.

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![Power Cord Diagram](image)

**Do not plug in the power cord if you are wet.**
**Do not use the power cord if it is broken.**
**Do not place heavy objects on the power cord.**
Battery Precautions

- Only use batteries designed for this computer. The wrong battery type may explode, leak or damage the computer.
- Do not continue to use a battery that has been dropped, or that appears damaged (e.g. bent or twisted) in any way. Even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire.
- Recharge the batteries using the notebook’s system. Incorrect recharging may make the battery explode.
- Do not try to repair a battery pack. Refer any battery pack repair or replacement to your service representative or qualified service personnel.
- Keep children away from, and promptly dispose of a damaged battery. Always dispose of batteries carefully. Batteries may explode or leak if exposed to fire, or improperly handled or discarded.
- Keep the battery away from metal appliances.
- Affix tape to the battery contacts before disposing of the battery.
- Do not touch the battery contacts with your hands or metal objects.

Battery Guidelines

The following can also apply to any backup batteries you may have.

- If you do not use the battery for an extended period, then remove the battery from the computer for storage.
- Before removing the battery for storage charge it to 60% - 70%.
- Check stored batteries at least every 3 months and charge them to 60% - 70%.

Battery Disposal

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Caution

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

Battery Level

Click the battery icon in the taskbar to see the current battery level and charge status. A battery that drops below a level of 10% will not allow the computer to boot up. Make sure that any battery that drops below 10% is recharged within one week.
Preface

Related Documents
You may also need to consult the following manual for additional information:

User’s Manual on CD/DVD
This describes the notebook PC’s features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup
1. Remove all packing materials.
2. Place the computer on a stable surface.
3. Insert the battery and make sure it is locked in position.
4. Securely attach any peripherals you want to use with the computer (e.g., keyboard and mouse) to their ports.
5. Attach the AC/DC adapter to the DC-In jack at the rear of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 135 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (Note: Never lift the computer by the lid/LCD).
7. Press the power button to turn the computer “on”.

Figure 1
Opening the Lid/LCD/Computer with AC/DC Adapter Plugged-In

Shut Down
Note that you should always shut your computer down by choosing the Shut down command in Windows (see below). This will help prevent hard disk or system problems.

Click the icon in the Start Screen and choose Shut down from the menu.

Or

Right-click the Start button at the bottom of the Start Screen or the Desktop and choose Shut down or sign out > Shut down from the context menu.
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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the N150SC / N150SD series notebook computer. Information about operating the computer (e.g. getting started, and the Setup utility) is in the User’s Manual. Information about drivers (e.g. VGA & audio) is also found in the User’s Manual. The manual is shipped with the computer.

Operating systems (e.g. Windows 8.1, etc.) have their own manuals as do application softwares (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The N150SC / N150SD series notebook is designed to be upgradeable. See Disassembly on page 2 - 1 for a detailed description of the upgrade procedures for each specific component. Please take note of the warning and safety information indicated by the “” symbol.

The balance of this chapter reviews the computer’s technical specifications and features.
Introduction

Specifications

Latest Specification Information
The specifications listed here are correct at the time of sending them to the press. Certain items (particularly processor types/speeds) may be changed, delayed or updated due to the manufacturer’s release schedule. Check with your service center for more details.

CPU
The CPU is not a user serviceable part. Accessing the CPU in any way may violate your warranty.

Processor Options

| Design I: |
| Intel® Core™ i7 Processor |
| i7-4720HQ (2.60GHz) |
| 6MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W |
| Intel® Core™ i5 Processor |
| i5-4210H (2.90GHz) |
| 3MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W |

| Design II: |
| Intel® Core™ i7 Processor |
| i7-4870HQ (2.50GHz), i7-4720HQ (2.60GHz) |
| 6MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W |
| Intel® Core™ i5 Processor |
| i5-4210H (2.90GHz) |
| 3MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W |

Core Logic
Intel® HM87 Chipset

BIOS
48Mb SPI Flash ROM
AMI BIOS

Memory
Two 204 Pin SO-DIMM Sockets Supporting DDR3L 1600MHz Memory
Memory Expandable up to 16GB
(The real memory operating frequency depends on the FSB of the processor.)

Storage
(Factory Option) One 9.5mm(h) Optical Device Type Drive (Super Multi Drive)
(Factory Option) 2.5” 9.5mm 2nd HDD/SSD caddy
One Changeable 2.5” 9.5mm/7.0mm (h) SATA HDD/SSD

LCD Options
15.6” (39.62cm) FHD

Video Adapter
Intel® Integrated GPU and NVIDIA® Discrete GPU
Supports Microsoft Hybrid Graphics

| Design I: |
| Intel Integrated GPU |
| Intel® HD Graphics 4600 |
| Dynamic Frequency (Intel Dynamic Video Memory Technology for up to 1.7GB) |
| Microsoft DirectX®11.1 Compatible |
| NVIDIA® Discrete GPU |
| NVIDIA® GeForce GTX 950M |
| 2GB GDDR5 Video RAM on board |
| Microsoft DirectX® 12 Compatible |

| Design II: |
| Intel Integrated GPU |
| Intel® HD Graphics 5200 (Core i7-4870HQ) |
| Dynamic Frequency (Intel Dynamic Video Memory Technology for up to 1.7GB) |
| Microsoft DirectX®11.1 Compatible |
| Intel® HD Graphics 4600 (Core i7-4720HQ/ i5-4210H) |
| Dynamic Frequency (Intel Dynamic Video Memory Technology for up to 1.7GB) |
| Microsoft DirectX®11.1 Compatible |
1. Introduction

NVIDIA® Discrete GPU
NVIDIA® GeForce GTX 960M
2GB GDDR5 Video RAM on board
Microsoft DirectX® 12 Compatible

Audio
High Definition Audio Compliant Interface
2 * Built-In Speakers
Built-In Microphone
Sound Blaster™ Cinema 2

Security
Security (Kensington® Type) Lock Slot
BIOS Password
(Factory Option) Fingerprint Reader
(Factory Option) TPM v 2.0

Keyboard
Illuminated Full-size “WinKey” keyboard (with numeric keypad)

Pointing Device
Built-in Touchpad

Interface
Four USB 3.0 Ports
One Mini DisplayPort
One HDMI-Out Port
One External Monitor Port
One Headphone-Out Jack
One Microphone-In Jack
One S/PDIF Out Jack
One RJ-45 LAN Jack
One DC-in Jack

M.2 Slots
Slot 1 for M.2 2230 WLAN Combo Module Card with PCIe & USB Interfaces
Slot 2 for M.2 2280 SSD Card with SATA/ PCIe x2/ x4 Interface
Or
(Factory Option) Slot 2 for LTE/HSPA+ M.2 3042 3G or 4G Module Card with USB Interface

Communication
Built-In Gigabit Ethernet LAN
(Factory Option) 2.0M FHD PC Camera Module
(Factory Option - Models A & B Only) M.2 3G/4G Module

WLAN/ Bluetooth M.2 Modules:
(Factory Option) Intel® Wireless-AC 7265 Wireless LAN (802.11ac) + Bluetooth 4.0
(Factory Option) Intel® Wireless-N 7265 Wireless LAN (802.11b/g/n) + Bluetooth 4.0
(Factory Option) Intel® Wireless-AC 3160 Wireless LAN (802.11ac) + Bluetooth 4.0
(Factory Option) Third-Party Wireless LAN 802.11b/g/n + Bluetooth 4.0

Card Reader
Embedded Multi-In-1 Card Reader
MMC (MultiMedia Card) / RS MMC
SD (Secure Digital) / Mini SD / SDHC/ SDXC

Power
Full Range AC/DC Adapter
AC Input: 100 - 240V, 50 - 60Hz
DC Output: 19.5V, 6.15A (120W)
Built-In 6 Cell Smart Lithium-Ion Battery Pack, 62WH

Dimensions & Weight
385mm (w) * 268mm (d) * 28.5mm (h)
2.5kg (Barebone with 62WH Battery)

Environmental Spec
Temperature
Operating: 5°C - 35°C
Non-Operating: -20°C - 60°C
Relative Humidity
Operating: 20% - 80%
Non-Operating: 10% - 90%

Note: Specifications may vary depending on the model and configuration.
Introduction

External Locator - Top View with LCD Panel Open

1. PC Camera
2. *PC Camera LED
   *When the PC camera is in use, the LED will be illuminated.
3. Microphone
4. LCD
5. Speakers
6. Power Button
7. Keyboard
8. Touchpad & Buttons
9. Fingerprint Reader (Optional)
Introduction

External Locator - Front & Right Side Views

**Front View**
1. LED Indicators

**Right Side View**
1. USIM Card Reader (for 3G/4G USIM Cards)
2. Multi-in-1 Card Reader
3. USB 3.0 Port
4. External Monitor Port
5. RJ-45 LAN Jack
Introduction

Figure 4
Left Side View
1. Security Lock Slot
2. USB 3.0 Ports
3. S/PDIF-Out Jack
4. Microphone-In Jack
5. Headphone-Out Jack
6. Optical Device Drive Bay
7. Emergency Eject Hole

Figure 5
Rear View
1. Vent
2. USB 3.0 Port
3. HDMI-Out Port
4. Mini Display Port
5. DC-In Jack
1. Vent
2. Battery

To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.
Mainboard Overview - Top (Key Parts)

1. KBC-ITE IT8587
1. CMOS Battery
2. Mini-Card Connector (M.2 PCIe/SATA SSD Module)
3. Mini-Card Connector (M.2 3G/SATA Module)
4. Mini-Card Connector (WLAN Module)
5. GPU-GTX960M
6. CPU
7. Memory Slots DDR3L SO-DIMM
Mainboard Overview - Top (Connectors)

1. DC-In Jack
2. Mini Display Port
3. HDMI-Out Port
4. USB Port 3.0 Connector
5. Audio Board Connector
6. Finger Print Connector
7. TP Connector
8. LED Board Connector
9. HDD Connector
10. Keyboard Cable Connector
11. USIM Card Reader
12. Multi-in-1 Card Reader
13. USB Port 3.0 Connector
14. External Monitor Port
15. RJ-45 LAN Jack
16. Power Switch Board Connector
17. Speaker Connector
Mainboard Overview - Bottom (Connectors)

1. CCD Connector
2. Battery Connector
3. Fan Connector
Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the N150SC / N150SD series notebook’s parts and sub-systems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

We suggest you completely review any procedure before you take the computer apart.

Procedures such as upgrading/replacing the RAM, optical device and hard disk are included in the User’s Manual but are repeated here for your convenience.

To make the disassembly process easier each section may have a box in the page margin. Information contained under the figure # will give a synopsis of the sequence of procedures involved in the disassembly procedure. A box with a  lists the relevant parts you will have after the disassembly process is complete. Note: The parts listed will be for the disassembly procedure listed ONLY, and not any previous disassembly step(s) required. Refer to the part list for the previous disassembly procedure. The amount of screws you should be left with will be listed here also.

A box with a  will also provide any possible helpful information. A box with a  contains warnings.

An example of these types of boxes are shown in the sidebar.
Disassembly

**NOTE:** All disassembly procedures assume that the system is turned **OFF**, and disconnected from any power supply (the battery is removed too).

**Maintenance Tools**
The following tools are recommended when working on the notebook PC:

- M3 Philips-head screwdriver
- M2.5 Philips-head screwdriver (magnetized)
- M2 Philips-head screwdriver
- Small flat-head screwdriver
- Pair of needle-nose pliers
- Anti-static wrist-strap

**Connections**
Connections within the computer are one of four types:

- **Locking collar sockets for ribbon connectors**
  To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

- **Pressure sockets for multi-wire connectors**
  To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.

- **Pressure sockets for ribbon connectors**
  To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

- **Board-to-board or multi-pin sockets**
  To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.
Maintenance Precautions

The following precautions are a reminder. To avoid personal injury or damage to the computer while performing a removal and/or replacement job, take the following precautions:

1. **Don't drop it.** Perform your repairs and/or upgrades on a stable surface. If the computer falls, the case and other components could be damaged.

2. **Don't overheat it.** Note the proximity of any heating elements. Keep the computer out of direct sunlight.

3. **Avoid interference.** Note the proximity of any high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage components and/or data. You should also monitor the position of magnetized tools (i.e. screwdrivers).

4. **Keep it dry.** This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

5. **Be careful with power.** Avoid accidental shocks, discharges or explosions.
   - Before removing or servicing any part from the computer, turn the computer off and detach any power supplies.
   - When you want to unplug the power cord or any cable/wire, be sure to disconnect it by the plug head. Do not pull on the wire.

6. **Peripherals** – Turn off and detach any peripherals.

7. **Beware of static discharge.** ICs, such as the CPU and main support chips, are vulnerable to static electricity.
   - Before handling any part in the computer, discharge any static electricity inside the computer. When handling a printed circuit board, do not use gloves or other materials which allow static electricity buildup. We suggest that you use an anti-static wrist strap instead.

8. **Beware of corrosion.** As you perform your job, avoid touching any connector leads. Even the cleanest hands produce oils which can attract corrosive elements.

9. **Keep your work environment clean.** Tobacco smoke, dust or other air-born particulate matter is often attracted to charged surfaces, reducing performance.

10. **Keep track of the components.** When removing or replacing any part, be careful not to leave small parts, such as screws, loose inside the computer.

Cleaning

Do not apply cleaner directly to the computer, use a soft clean cloth.

Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.
Disassembly Steps

The following table lists the disassembly steps, and on which page to find the related information. **PLEASE PERFORM THE DISASSEMBLY STEPS IN THE ORDER INDICATED.**

<table>
<thead>
<tr>
<th>To remove the Battery:</th>
<th>To remove the 3G Module:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Remove the battery</td>
<td>1. Remove the battery</td>
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<tr>
<td></td>
<td>page 2 - 5</td>
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<td>To remove the HDD:</td>
<td>2. Remove the 3G</td>
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<tr>
<td>1. Remove the battery</td>
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</tr>
<tr>
<td>2. Remove the HDD</td>
<td>page 2 - 16</td>
</tr>
<tr>
<td>To remove the Optical Device:</td>
<td></td>
</tr>
<tr>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td>2. Remove the Optical device</td>
<td>page 2 - 10</td>
</tr>
<tr>
<td>To remove the Keyboard:</td>
<td></td>
</tr>
<tr>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td>2. Remove the keyboard</td>
<td>page 2 - 11</td>
</tr>
<tr>
<td>To remove the System Memory:</td>
<td></td>
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<tr>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td>2. Remove the system memory</td>
<td>page 2 - 12</td>
</tr>
<tr>
<td>To remove the M.2 SSD:</td>
<td></td>
</tr>
<tr>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td>2. Remove the SSD</td>
<td>page 2 - 13</td>
</tr>
<tr>
<td>To remove the Wireless LAN Module:</td>
<td></td>
</tr>
<tr>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td>2. Remove the WLAN</td>
<td>page 2 - 14</td>
</tr>
</tbody>
</table>
Removing the Battery

1. Turn the computer off, and turn it over.
2. Locate the battery and remove screws 1 - 2 (Figure 1a).
3. Carefully lift the battery 3 up in the direction of the arrow 4 (Figure 1b).
4. Remove the battery off the computer (Figure 1c).

Figure 1
Battery Removal

a. Remove the screws.
b. Lift the battery.
c. Remove the battery.

Battery • 2 Screws
Removing the Hard Disk Drive

The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 9.5mm or 7mm (h). Follow your operating system’s installation instructions, and install all necessary drivers and utilities (as outlined in Chapter 4 of the User’s Manual) when setting up a new hard disk.

Hard Disk Disassembly Process

1. Turn off the computer, remove the battery (page 2 - 5) and keyboard (page 2 - 11).
2. Remove the SD card cover and screws (Figure 2a).
3. Carefully lift the bottom case up at point and slide in the direction of the arrow to remove it (Figure 1b).
4. The HDD will be visible at point on the mainboard (Figure 2a).
5. Remove screws 20 - 21 from the HDD assembly (Figure 3c).
6. Lift the hard disk at a 45 degrees angle and slide it out in the direction of arrow 22 (Figure 4d).
7. Remove the hard disk assembly 23 out of the bay 20 (Figure 4e).

HDD System Warning

New HDD’s are blank. Before you begin make sure:

You have backed up any data you want to keep from your old HDD.

You have all the CD-ROMs and FDDs required to install your operating system and programs.

If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.
Disassembly

8. Remove screws 25 - 29 from the hard disk assembly (*Figure 4f*).
9. Separate the hard disk 30 from the bracket 31 and mylar cover 32 (*Figure 4g*).
10. Reverse the process to install a new hard disk (do not forget to insert the mylar cover between the bracket and hard disk as shown before replacing the screws).

*Figure 4*

HDD Assembly Removal (cont’d.)

f. Remove the screws from the HDD assembly.
g. Separate the HDD, mylar cover and bracket.

---

4. Remove the screws from the HDD assembly.
5. Separate the HDD, mylar cover and bracket.

---

*Installing 9.5mm or 7mm HDD*

Note that the hard disks pictured on the following pages are all 9.5mm(h) hard disk drive.

In some cases, a 7.0mm(h) hard disk drive will be installed. Do pay attention on the alignment of the hard disk and bracket when tightening the screws.

For more information, contact your distributor/supplier, and bear in mind your warranty terms.
Disassembly

Hard Disk Size Note (Foam Rubber Insert)
Note that the hard disks pictured on the following pages are all 9.5mm(H) hard disk drives. In some cases 7mm(H) hard disk drives will be installed. Also pay attention on the alignment of the hard disk and bracket when tightening the screws.

For more information contact your distributor/supplier, and bear in mind your warranty terms.

- If you are replacing a 9.5mm(H) HDD with a 7mm(H) HDD then insert the foam rubber insert (as shown above).

- If you are replacing a 7mm(H) HDD with a 9.5mm(H) HDD then remove the foam rubber insert.
Removing the Optical (CD/DVD) Device

1. Turn off the computer, remove the battery (page 2 - 5), and bottom case (page 2 - 6).
2. Carefully push out the optical device 1 out of the bay in the direction of the arrow 2 (Figure 6a).
3. Carefully pry the bezel 4 off the optical device at point 3 (Figure 6b).
4. Separate the bezel 4 and the optical device (Figure 6d).
5. Reverse the process to attach the front bezel 4 with the new optical device at point 3 (Figure 6d).
6. Insert the new device and carefully slide it into the computer (the device only fits one way. DO NOT FORCE IT; The screw holes should line up). Replace the bottom cover and tighten the screws.
7. Restart the computer to allow it to automatically detect the new device.

Figure 6
Optical Device Removal

a. Push the optical device out of the computer.
b. Pry the bezel off the optical device.
c. Separate the bezel and optical device.
d. Install the front bezel.

1. Optical Device
2. Bezel Cover

---

2 - 10 Removing the Optical (CD/DVD) Device
Removing the Keyboard

1. Turn off the computer, remove the battery (page 2 - 5), and bottom case (page 2 - 6).
2. Open it up with the LCD on a flat surface before pressing at point 1 & 2 to release the keyboard module (use the special eject stick to do this) while releasing the keyboard in the direction of the arrow 3 as shown (Figure 7a).
3. Carefully lift the keyboard 4 up, being careful not to bend the keyboard ribbon cable 5. Disconnect the keyboard ribbon cable 5 from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins 6 away from the base (Figure 7b).
4. Carefully lift the keyboard 4 off the computer (Figure 7c).

Figure 7

Keyboard Removal

a. Eject the keyboard using a special eject stick to push the keyboard out while releasing the keyboard as shown.
b. Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
c. Remove the keyboard.

Re-inserting the Keyboard

When re-inserting the keyboard firstly, align the keyboard tabs at the bottom of the keyboard with the slots in the case.
Removing the System Memory (RAM)

The computer has two memory sockets for 204 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR3L up to 1600 MHz. The main memory can be expanded up to 32GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

Memory Upgrade Process

1. Turn off the computer, remove the battery (page 2 - 5), and bottom case (page 2 - 6).
2. The RAM modules will be visible at point 1 on the mainboard (Figure 8a).
3. Gently pull the two release latches (2 & 3) on the sides of the memory socket in the direction indicated by the arrows (Figure 8b). The RAM module 4 will pop-up (Figure 8c), and you can then remove it.
4. Pull the latches to release the second module if necessary.
5. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
6. The module will only fit one way as defined by its pin alignment. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE IT; it should fit without much pressure.
7. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
8. Replace the bottom cover and the screws (see page 2 - 5).
9. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.
Removing the M.2 SSD Module

1. Turn off the computer, remove the battery (page 2 - 5), and bottom case (page 2 - 6).
2. The M.2 SSD module will be visible at point 1 on the mainboard (Figure 9a).
3. Remove the screw 2 (Figure 9b).
4. The M.2 SSD module 3 (Figure 9c) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new SSD (make sure that the hexagonal screw is in the correct location). Note that a flat-head screw driver can be used to tighten or remove the hexagonal screw as shown (Figure 9d).

Figure 9
M.2 SSD Module Removal

- Locate the M.2 SSD.
- Remove the screw.
- The M.2 SSD module will pop up.

3. M2 SSD Module
- 1 Screw
Disassembly

Removing the Wireless LAN Module

1. Turn off the computer, remove the battery (page 2 - 5), keyboard (page 2 - 11) and bottom case (page 2 - 6).
2. The Wireless LAN module will be visible at point 1 on the mainboard (Figure 10a).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (Figure 10b).
4. The Wireless LAN module 5 (Figure 10c) will pop-up, and you can remove it from the computer.

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket (Figure 10b).

Figure 10
Wireless LAN Module Removal

a. Locate the WLAN.
b. Disconnect the cables and remove the screw.
c. The WLAN module will pop up.

Wireless LAN Module

• 1 Screw
Wireless LAN, Combo, 3G & LTE Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo, 3G and LTE modules are not labelled. The cables/covers (each cable will have either a black or transparent cable cover) are color coded for identification as outlined in the table below.

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Antenna Type</th>
<th>Cable Color</th>
<th>Cable Cover Type</th>
</tr>
</thead>
<tbody>
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<td>Black</td>
<td>Transparent</td>
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<td></td>
<td>WM 2</td>
<td>Gray</td>
<td>White</td>
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<tr>
<td>LTE Broadband</td>
<td>LTE 1</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td>LTE 2</td>
<td>Gray</td>
<td>Black</td>
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<tr>
<td>3G Broadband</td>
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<tr>
<td></td>
<td>3G 2</td>
<td>Gray</td>
<td>Black</td>
</tr>
</tbody>
</table>

Cable 1 is usually connected to antenna 1 (Main) on the module, and cable 2 to antenna 2 (Aux).
Disassembly

Removing the 3G Module

3G Module Removal Procedure

1. Turn off the computer, remove the battery (page 2 - 5), and bottom case (page 2 - 6).
2. Locate the module, it is visible at point 1 (Figure 11a).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 from the module (Figure 11b).
4. The module 3 will pop-up (Figure 11c).
5. Lift the module up and off the computer (Figure 11d).

5. 3G Module
   • 1 Screw
Appendix A: Part Lists

This appendix breaks down the *N150SC / N150SD* series notebook’s construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

**Note:** This section indicates the *manufacturer’s* part numbers. Your organization may use a different system, so be sure to cross-check any relevant documentation.

**Note:** Some assemblies may have parts in common (especially screws). However, the part lists DO NOT indicate the total number of duplicated parts used.

**Note:** Be sure to check any update notices. The parts shown in these illustrations are appropriate for the system at the time of publication. Over the product life, some parts may be improved or re-configured, resulting in *new* part numbers.
## Part List Illustration Location

The following table indicates where to find the appropriate part list illustration.

<table>
<thead>
<tr>
<th>Part</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Top</td>
<td>page A - 3</td>
</tr>
<tr>
<td>Bottom</td>
<td>page A - 4</td>
</tr>
<tr>
<td>Main Board</td>
<td>page A - 5</td>
</tr>
<tr>
<td>HDD</td>
<td>page A - 6</td>
</tr>
<tr>
<td>2nd HDD</td>
<td>page A - 7</td>
</tr>
<tr>
<td>LCD</td>
<td>page A - 8</td>
</tr>
<tr>
<td>DVD</td>
<td>page A - 9</td>
</tr>
<tr>
<td>Combo</td>
<td>page A - 10</td>
</tr>
<tr>
<td>Dummy ODD</td>
<td>page A - 11</td>
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</table>
Main Board
Figure A - 4
HDD

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</table>
2nd HDD

Figure A - 5
2nd HDD

<table>
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</table>
Figure A - 6

LCD

A Part Lists

<table>
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A - 8 LCD
Figure A - 7

DVD

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Figure A - 8
Combo

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Figure A - 9

Dummy ODD

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Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the N150SC/N150SD notebook’s PCB’s. The following table indicates where to find the appropriate schematic diagram.

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<th>Diagram - Page</th>
<th>Diagram - Page</th>
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</thead>
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<td>Lynx 3/9 - Page B - 25</td>
<td>Click / Finger Con Board - Page B - 51</td>
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<tr>
<td>Processor 1/7 - Page B - 3</td>
<td>Lynx 4/9 - Page B - 26</td>
<td>LED, PWR SW Board - Page B - 52</td>
</tr>
<tr>
<td>Processor 2/7 - Page B - 4</td>
<td>Lynx 5/9 - Page B - 27</td>
<td>Finger Print Board - Page B - 53</td>
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<tr>
<td>Processor 3/7 - Page B - 5</td>
<td>Lynx 6/9 - Page B - 28</td>
<td>LED / PWR SW Board - Page B - 54</td>
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<tr>
<td>Processor 4/7 - Page B - 6</td>
<td>Lynx 7/9 - Page B - 29</td>
<td>ODD Ext. Board - Page B - 55</td>
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<td>Processor 5/7 - Page B - 7</td>
<td>Lynx 8/9 - Page B - 30</td>
<td>Power Sequence - Page B - 56</td>
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<td>Lynx 9/9 - Page B - 31</td>
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<td>Processor 7/7 - Page B - 9</td>
<td>WLAN, 3G, Fan, Audio Con - Page B - 32</td>
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<td>CCD, M-Key, Click Conn - Page B - 33</td>
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<td>DDR3 SO-DIMM B_0 - Page B - 11</td>
<td>Audio Codec ALC269 - Page B - 37</td>
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<td>RTD2136 - Page B - 12</td>
<td>HDD, TPM, KB LED, PWR Con, T/P - Page B - 38</td>
<td></td>
</tr>
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</table>
Processor 1/7

Haswell BGA Processor 1/7 (DMI, PEG, FDI)

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Processor 1/7
Haswell Processor 2/7 (CLK, MISC, JTAG)

Schematic Diagrams

Processor 2/7

Sheet 3 of 55

Processor 2/7

Haswell Processor 2/7 (CLK, MISC, JTAG)
Haswell Processor 7/7 ( RESERVED )

1. DEFAULT: 00 - Device 1 function 1 & 2 disabled
   01: AB, AC - Device 1 function 1 enabled; function 2 disabled
   10: AB, AC, AD - Device 1 functions 1 & 2 enabled
   11: (Default) 00 - Device 1 functions 1 & 2 disabled

DISPLAY PORT PRESENCE STRAP

0: ENABLED; TO EMBEDDED DISPLAY PORT
1: DISABLED; TO EMBEDDED DISPLAY PORT

PCI EXPRESS STATIC LANE REVERSAL FOR ALL PEG PORTS

CFG7

0: PEG Wait for BIOS for training
1: (Default) PEG Train immediately following xxRESETB de assertion

PCIE PORT BIFURCATION STRAPS

CPU STRAP FOR PROCESSOR

- CONFIGURATION: DEF
- LANE DEFINITION MATCHES

DEFENSIVE PULL DOWN SITE

RSVD TPBE4

RSVD TPG21

RSVD TPBD3

RSVD TP G10

RSVD TP G12

RSVD TP A6

RSVD TP A5

RSVD TP E1

RSVD TP F1

RSVD_A35

RSVD_F6

RSVD_BD3

RSVD_BE4

RSVDE5

RSVDL50

CFG15R52

CFG14R53

CFG13V54

CFG12U53

CFG11W53

CFG10Y53

CFG9Y54

CFG8Y49

CFG7W51

CFG6V51

CFG4Y50

CFG3AE49

CFG1AD49

CFG0AG49

TESTLO_F20F20

RSVD_TPF25

RSVD_TPF24

RSVD_TPL51

RSVD_TPL53

RSVD_TPL52

VCCF22

VSSF52

VSSF51

VSSG19

TESTLO_F21F21

RSVD_TPG24

RSVD_TPG6

RSVD_TPF6

RSVD_TPBD3

RSVD_TP A6

RSVD_TP A5

RSVD_TP E1

RSVD_TP F1

CFG19 V52

CFG17 Y51

CFG18 V53

CFG16 Y52

RSVD_H50

RSVD_G53

RSVD_F16

RSVD_F8

RSVD_AL6

RSVD_BC4

RSVD AU26

RSVD AU27

RSVD AH49

RSVD B50

VSS H52

VSS H51

VSS H53

VSS H54

R382 49.9_1%_04

R30 49.9_1%_04

RSVD_G12

RSVD_A6

RSVD_A5

RSVD_E1

RSVD_F1

CFG_RCOMP

B.Schematic Diagrams

Sheet 8 of 55

Processor 7/7

Schematic Diagrams
SO-DIMM B_0

Layout Note:
SO-DIMM_A0 is placed farther from the CPU than SO-DIMM_B0
RTD2136

**Schematic Diagrams**

**Power**

- 1. Entire trace of Panel VCC should be wider than 80-mil.

**Mode Configure Table (Power On Latch)**

<table>
<thead>
<tr>
<th>MODECFG (PIN48)</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>EP MODE</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>EEPROM MODE</td>
</tr>
</tbody>
</table>

- RTD2136 Supports three operation modes for system design:
  - Reserved 4.7K resistor pull up/down for mode selection.
  - ROM ONLY Mode: PIN47 4.7K pull low, PIN48 4.7K pull high
  - EP Mode: PIN47 4.7K pull high, PIN48 4.7K pull low
  - EEPROM Mode: PIN47 4.7K pull high, PIN48 4.7K pull high

**Dual Mode Regulator Configuration**

- 4.7u_25V_X5R_08
- 1K_04
- 4.7K_04
- 12K_1%
- 100K_04
- 20140929
- 20141211 BCN
VGA Frame Buffer Interface
VGA Frame Buffer A
VGA Frame Buffer B
Lynx Point -M (PCIe, USB)
WLAN, 3G, Fan, Audio Con

B - 32  WLAN, 3G, Fan, Audio Con
CCD, M-Key, Click Conn

Schematic Diagrams

NGFF_M (M2) SSD (PCIE 4X)

Sheet 32 of 55
CCD, M-Key, Click Conn

Schematic Diagrams
Schematic Diagrams

USB 3.0, USB Charge

USB POWER SWITCH

USB2.0 PORT(PORT2)
USB3.0 PORT(PORT3)

USB2.0 PORT(PORT1)
USB3.0 PORT(PORT2)
USB2.0 Charge Function

USB Charger PORT

Co-lay with charger
W/O USB CHARGER

SLG55583VTR : 6-02-55583-3D0

6-21-B4A20-009

6-20-B4A00-009
**HDMI, RJ45**

**HDMI Connector (W/ HDMI Repeater)**

**HDMI Repeater**

---

Sheet 35 of 55

HDMI, RJ45
Speaker wire length less than 8000mils, it don't need LC Filter.

5VS
Speaker 4 ohm------> 40mils
SPKOUTR+, R-, L+, L- Trace width

C518 0.1u_16V_Y5V_04
C519 0.1u_16V_Y5V_04
R284 *20mil_short_04
KBC_BEEP[38]
20141008 D02
HDA_SPKR[22]

MIC_DATA[32]
D26
HDA_BITCLK[22]
HDA_SDOUT[22]
HDA_SDIN0[22]
HDA_RST#[22,36]
HDA_SYNC[22]

KBC_MUTE#[38]
HDA_RST#[22,36]

C538 22p_50V_NPO_04
47p_50V_NPO_04
C529 0.1u_16V_Y5V_04
C531 0.1u_16V_Y5V_04
C532 22p_50V_NPO_04
C527 10u_6.3V_X5R_06
10u_6.3V_X5R_06
C545 10u_6.3V_X5R_06
C546 10u_6.3V_X5R_06

C541 2.2u_6.3V_X5R_06
C542 0.1u_16V_Y5V_04
C543 0.1u_16V_Y5V_04

R300 *20mil_short_04
R302 33_04
4.7K_04
R295

Thermal Pad place 9 Via Hole.

MIC1-VREFO-R
MIC1-VREFO-L
MIC1_L
MIC1_R

R303 2.2K_04
R301 2.2K_04
R275 1K_04
R278 1K_04

HCB1005KF-121T20
ER2 0_04
ER1 0_04

PVSS142
PVSS243
DVSS27
DVDD-IO 9
PVDD1 39
PVDD2 46

DVDD1 1
AVDD1 25
AVDD2 38

MIC2-VREFO 29
MONO-OUT 20
HP-OUT-R 33
HP-OUT-L 32

LDO_CAP 28
MIC1-R 22
MIC1-L 21
MIC2-L 16
JDREF 19

AUDG
20141020
MIC1-L [31]
MIC1-R [31]

C556 10u_6.3V_X5R_06
C548

20140929
20140929
20141211 BCN

CODEC (ALC269 VC2)

CODEC_ALC269 VC2

EMI Require

Audio Codec ALC269

Sheet 36 of 55
Audio Codec
ALC269

B.Schematic Diagrams
KBC-ITE IT8587
DRAM Power, 1.5VS

1.35V/0.75VS

VDDQ_VTT

1.5VS

EMI
V-Core

Sheet 42 of 55
V-Core
Battery Mode VDD3 can't be turned off at system off

POWER ON:
USB_CHARGE_EN = DDON = HI

POWEROFF CHARGE:
USB_CHARGE_EN = HI
DDON = LO

Vout = 2*(1+R1/R2) = 2*(1+13K/20K) = 3.3V

Vout = 2*(1+R1/R2) = 2*(1+30K/18.7K) = 5.208V
LED / PWR SW Board
Click / Finger Con Board
Schematic Diagrams

LED, PWR SW Board

K/B LED

PWR LED

POWER BOTTOM

6-52-57301-023
6-52-57301-022
6-53-31500-060

N155 LED, PWR SW Board

B - 52 LED, PWR SW Board
Finger Print Board

* * GU1 旁邊不可加點以免上件後短路

NOTE: MODE = HIGH (NC), USB MODE = LOW, SPI MODE

Sheet 52 of 55
Finger Print Board
ODD Ext. Board

Schematic Diagrams

ODD TRANSFER BOARD
M/B

S1  S2  S3  S4  S5  S6  S7
Q_ODD1
Q_GND
P1  P2  P3  P4  P5
Q_ODD_DETECT
Q_5VS
Q_GND

S1  S2  S3  S4  S5  S6  S7
Q_ODD2
Q_GND

PIN
Q_GND

C18609-11305-L
S1
S2
S3
S4
S5
S6
S7
P1
P2
P3
P4
P5

C185J9-11308-L
S1
S2
S3
S4
S5
S6

Sheet 54 of 55
N170 ODD Ext. Board

20141211 D02A

QH1
MTH6_0D2_3
QH2
MTH6_0D2_3

GND

1QR *0_04
2QR *0_04
3QR *0_04
4QR *0_04
5QR *0_04
6QR *0_04
Appendix C: Updating the FLASH ROM BIOS

To update the FLASH ROM BIOS, you must:

• Download the BIOS update from the web site.
• Unzip the files onto a bootable CD/DVD/USB Flash Drive.
• Reboot your computer from an external CD/DVD/USB Flash Drive.
• Use the flash tools to update the flash BIOS using the commands indicated below.
• Restart the computer booting from the HDD and press F2 at startup to enter the BIOS.
• Load setup defaults from the BIOS and save the default settings and exit the BIOS to restart the computer.
• After rebooting the computer you may restart the computer again and make any required changes to the default BIOS settings.

Download the BIOS
1. Go to www.clevo.com.tw and point to E-Services and click E-Channel.
2. Use your user ID and password to access the appropriate download area (BIOS), and download the latest BIOS files (the BIOS file will be contained in a batch file that may be run directly once unzipped) for your computer model (see sidebar for important information on BIOS versions).

Unzip the downloaded files to a bootable CD/DVD or USB Flash drive
1. Insert a bootable CD/DVD/USB flash drive into the CD/DVD drive/USB port of the computer containing the downloaded files.
2. Use a tool such as Winzip or Winrar to unzip all the BIOS files and refresh tools to your bootable CD/DVD/USB flash drive (you may need to create a bootable CD/DVD with the files using a 3rd party software).

Set the computer to boot from the external drive
1. With the bootable CD/DVD/USB flash drive containing the BIOS files in your CD/DVD drive/USB port, restart the computer and press F2 (in most cases) to enter the BIOS.
2. Use the arrow keys to highlight the Boot menu.
3. Use the “+” and “-” keys to move boot devices up and down the priority order.
4. Make sure that the CD/DVD drive/USB flash drive is set first in the boot priority of the BIOS.
5. Press F4 to save any changes you have made and exit the BIOS to restart the computer.
BIOS Update

Use the flash tools to update the BIOS

1. Make sure you are not loading any memory management programs such as HIMEM by holding the F8 key as you see the message “EFI Shell”. You will then be prompted to give “Y” or “N” responses to the programs being loaded by EFI Shell. Choose “N” for any memory management programs.

2. You should now see DISK fsX:\> (X is the designated drive number for the CD/DVD drive/USB flash drive).

3. Type the following command:
   
   fsX:\> Flash.nsh

4. The utility will then proceed to flash the BIOS.

5. You should then be prompted to press any key to restart the system or turn the power off, and then on again but make sure you remove the CD/DVD/USB flash drive from the CD/DVD drive/USB port before the computer restarts.

Restart the computer (booting from the HDD)

1. With the CD/DVD/USB flash drive removed from the CD/DVD drive/USB port the computer should restart from the HDD.

2. Press F2 as the computer restarts to enter the BIOS.

3. Use the arrow keys to highlight the Exit menu.

4. Select Load Setup Defaults (or press F3) and select “Yes” to confirm the selection.

5. Press F4 to save any changes you have made and exit the BIOS to restart the computer.

Your computer is now running normally with the updated BIOS

You may now enter the BIOS and make any changes you require to the default settings.