Notebook Computer
N870HK1
Service Manual
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January 2017

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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 N870HK1 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.

   ![Do not expose the computer to any shock or vibration.](image1)
   ![Do not place it on an unstable surface.](image2)
   ![Do not place anything heavy on the computer.](image3)

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.

   ![Do not expose it to excessive heat or direct sunlight.](image4)
   ![Do not leave it in a place where foreign matter or moisture may affect the system.](image5)
   ![Don’t use or store the computer in a humid environment.](image6)
   ![Do not place the computer on any surface which will block the vents.](image7)

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.

   ![Do not turn off the power until you properly shut down all programs.](image8)
   ![Do not turn off any peripheral devices when the computer is on.](image9)
   ![Do not disassemble the computer by yourself.](image10)
   ![Perform routine maintenance on your computer.](image11)
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.**

![Image: Use only approved brands of peripherals.](image1.png)

![Image: Unplug the power cord before attaching peripheral devices.](image2.png)

---

**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.

![Image: Do not plug in the power cord if you are wet.](image3.png)

![Image: Do not use the power cord if it is broken.](image4.png)

![Image: Do not place heavy objects on the power cord.](image5.png)
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.
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 on the left 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 130 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”.

**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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### Updating the FLASH ROM BIOS

Download the BIOS
Unzip the downloaded files to a bootable CD/DVD or USB Flash drive
Set the computer to boot from the external drive
Use the flash tools to update the BIOS
Restart the computer (booting from the HDD)
Chapter 1: Introduction

Overview
This manual covers the information you need to service or upgrade the N870HK1 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 10, 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 N870HK1 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 “<span id="warning"></span>” symbol.

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

### Processor Options

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<th>Cache</th>
<th>Technology</th>
<th>Memory</th>
<th>TDP</th>
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<tr>
<td>Intel® Core™ i7 Processor</td>
<td>i7-7700HQ (2.80GHz)</td>
<td>8MB</td>
<td>Smart Cache, 14nm, DDR4-2400MHz, TDP 45W</td>
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<td></td>
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<tr>
<td>Intel® Core™ i5 Processor</td>
<td>i5-7300HQ (2.50GHz)</td>
<td>6MB</td>
<td>Smart Cache, 14nm, DDR4-2400MHz, TDP 45W</td>
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<tr>
<td>Intel® Core™ i3 Processor</td>
<td>i3-7100H (3.00GHz)</td>
<td>3MB</td>
<td>Smart Cache, 14nm, DDR4-2400MHz, TDP 35W</td>
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### Core Logic

<table>
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<td>Intel® HM175 Chipset</td>
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### BIOS

<table>
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<th>BIOS</th>
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<td>64Mb SPI Flash ROM</td>
<td>AMI BIOS</td>
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### Memory

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<th>Memory</th>
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<td>Two 260 Pin SO-DIMM Sockets Supporting DDR4 2400MHz Memory</td>
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<tr>
<td>Memory Expandable up to 32GB</td>
<td></td>
</tr>
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### LCD Options

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<th>LCD Options</th>
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<td>17.3&quot; (43.94cm), 16:9, UHD (3840x2160)/FHD (1920x1080)</td>
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### Video Adapter

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### Intel Integrated GPU

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<td>Dynamic Frequency</td>
<td>Intel Dynamic Video Memory Technology</td>
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<td>Microsoft DirectX® 12 Compatible</td>
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### NVIDIA® Discrete GPU

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<th>NVIDIA® GeForce GTC 1050G Ti</th>
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<td>4GB GDDR5 Video RAM on board</td>
<td>Microsoft DirectX® 12 Compatible</td>
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### Storage

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<td>One Changeable 2.5&quot; 7.0mm (h) SATA3 HDD/SSD</td>
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### Audio

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<td>2 * Built-In Speakers</td>
<td>Built-In Array Microphone</td>
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<td>Built-In Array Microphone</td>
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### Factory Option

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<th>Factory Option</th>
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<td>Intel PTT v 2.0</td>
<td>Fingerprint Reader Module</td>
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<td>Fingerprint Reader Module</td>
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**Introduction**

**Specifications 1 - 3**

1. **Introduction**

2. **Keyboard**
   - Full-size **White-LED Illuminated** Keyboard (with numeric keypad)
   - Or
   - **(Factory Option) Full Color Illuminated** Full-size Keyboard (with numeric keypad)

3. **Pointing Device**
   - Built-in Touchpad

4. **Interface**
   - One USB 2.0 Port
   - One USB 3.0 (USB 3.1 Gen 1) Type A Port
   - One USB 3.0 (USB 3.1 Gen 1) Type A Port and one USB 3.0 (USB 3.1 Gen 1) Type C Port
   - Or
   - **(Factory Option)** One USB 3.1 Gen 2 Type A Port and one USB 3.1 Gen 2 Type C Port
   - One HDMI-Out Port
   - Two Mini DisplayPort 1.2
   - One Headphone-Out Jack
   - One Microphone-In Jack
   - One RJ-45 LAN Jack
   - One DC-in Jack

5. **Card Reader**
   - Embedded Multi-in-1 Card Reader
     - MMC (MultiMedia Card) / RS MMC
     - SD (Secure Digital) / Mini SD / SDHC/ SDXC

6. **M.2 Slots**
   - Slot 1 for **Combo WLAN and Bluetooth** Module
   - Slot 2 for **SATA or PCIe Gen3 x4 SSD**

7. **Communication**
   - Built-In Gigabit Ethernet LAN
   - 1.0M HD PC Camera Module
   - **(Factory Option)** 2.0M FHD PC Camera Module
   - **WLAN/ Bluetooth M.2 Modules:**
     - **(Factory Option)** Intel® Wireless-AC 8265 Wireless LAN (802.11ac) + Bluetooth 4.1
     - **(Factory Option)** Intel® Wireless-AC 3168 Wireless LAN (802.11ac) + Bluetooth 4.0

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

9. **Power**
   - Full Range AC/DC Adapter
     - AC Input: 100 - 240V, 50 - 60Hz
     - DC Output: 19.5V, 6.15A (**120W**)  
   - **(Factory Option)** Built-in 6 Cell Battery Pack, 62WH
   - **(Factory Option)** Built-in 6 Cell Battery Pack, 47WH

10. **Dimensions & Weight**
    - 418.5mm (w) * 288.7mm (d) * 27.4mm (h)
    - 2.9kg (Barebone with 47WH Battery)
Introduction

1. PC Camera
2. *PC Camera LED
   *When the PC camera is in use, the LED will be illuminated.
3. Built-In Array Microphone
4. LCD
5. Speakers
6. Power Button
7. Keyboard
8. Touchpad & Buttons
9. Fingerprint Reader (Optional)
External Locator - Front & Right Side Views

1. **Front View**
   - 1. LED Indicator

2. **Right Side View**
   - 1. Headphone-Out Jack
   - 2. Microphone-In Jack
   - 3. USB 2.0 Port
   - 4. USB 3.0 Port
   - 5. Vent
1. Security Lock Slot
2. DC-In Jack
3. RJ-45 LAN Jack
4. Mini Display Port
5. HDMI-Out Port
6. USB 3.0 (USB 3.1 Gen 1) Type C Port Or (Factory Option) USB 3.1 Gen 2 Type C Port
7. USB 3.0 (USB 3.1 Gen 1) Type A Port Or (Factory Option) USB 3.1 Gen 2 Type A Port
8. Multi-in-1 Card Reader

1. Vent
Introduction

Overheating
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

External Locator - Bottom View

1. Battery
2. Vent
3. Speakers

Figure 6
Bottom View
Mainboard Overview - Top (Key Parts)

1. KBC-ITE IT8587
Mainboard Overview - Bottom (Key Parts)

1. GPU
2. CPU
3. Memory Slots DDR4 SO-DIMM
4. Mini-Card Connector (WLAN Module)
5. PCH
6. CMOS Battery
7. M.2-Card Connector (SSD Module)
Mainboard Overview - Top (Connectors)

1. DC-In Jack
2. RJ-45 LAN Jack
3. Mini Display Port
4. HDMI-Out Port
5. USB Port 3.0/3.1 (Type C) Connector
6. USB Port 3.0/3.1 (Type A) Connector
7. Multi-in-1 Card Reader
8. KB LED Connector
9. Keyboard Cable Connector
Mainboard Overview - Bottom (Connectors)

1. CCD Connector
2. Fan Connector
3. HDD Connector
4. Speaker Connector
5. LCD Connector
Introduction
Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the N870HK1 series notebook’s parts and subsystems. 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 pencil 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 pencil will also provide any possible helpful information. A box with a bell 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 <strong>Battery:</strong></th>
<th><strong>To remove the CCD Module:</strong></th>
</tr>
</thead>
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<td>1. Remove the battery</td>
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<tr>
<td>To remove the <strong>Keyboard:</strong></td>
<td>2. Remove the HDD</td>
</tr>
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<td>1. Remove the keyboard</td>
<td>page 2 - 6</td>
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<tr>
<td>To remove the <strong>HDD:</strong></td>
<td>3. Remove the CCD module</td>
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<tr>
<td>1. Remove the battery</td>
<td>page 2 - 7</td>
</tr>
<tr>
<td>2. Remove the HDD</td>
<td>page 2 - 13</td>
</tr>
<tr>
<td>To remove the <strong>System Memory:</strong></td>
<td></td>
</tr>
</tbody>
</table>
Removing the Battery

1. Turn the computer off, and turn it over.
2. Slide the latch 1 in the direction of the arrow (Figure 1a).
3. Slide the latch 2 in the direction of the arrow.
4. While holding the latch 2, lift the battery 3 (Figure 1b) out of the compartment (Figure 1c).

**Figure 1**

Battery Removal

a. Slide the latch 1 in the direction of the arrow.
b. Lift the battery.
c. Remove the battery.
Removing the Keyboard

1. Turn off the computer, turn it over.
2. Remove screws 1 - 2 from the bottom of the computer.
3. Open it up with the LCD on a flat surface before pressing at point 3 to release the keyboard module (use the special eject stick 4 to do this) while releasing the keyboard in the direction of the arrow 5 as shown (Figure 1a).
4. Carefully lift the keyboard 6 up, being careful not to bend the keyboard ribbon cable 7. Disconnect the keyboard ribbon cable 7 from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins 8 away from the base (Figure 1b).
5. Carefully lift the keyboard 6 off the computer (Figure 1c).

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.

4. Eject Stick
6. Keyboard
- 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 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, and remove the battery (page 2 - 5).
2. Remove the SD card cover (1) and screws (2 - 17) (Figure 2a).
3. Carefully push to release the bottom case from point 18 and then lift it up from point 20 to release the bottom case and ports as indicated by the arrows (Figure 2b).
4. The HDD will be visible at point 21 on the mainboard (Figure 2c).
Disassembly

5. Remove screws 22 from the HDD assembly (Figure 3b).
6. Slightly lift and pull the hard disk assembly in the direction of arrow 23 (Figure 3c).
7. Lift the hard disk assembly 24 out of the bay 25 (Figure 3d).
8. Remove screws 26 - 27 and bracket 28 from the hard disk 29 (Figure 3e).
9. Reverse the process to install a new hard disk (do not forget to replace the screws).

d. Remove the screws.
e. Slightly lift and pull the HDD in the direction of the arrow.
f. Lift the HDD assembly out of the bay.
g. Remove the screws and bracket from the HDD.

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.
Removing the System Memory (RAM)

The computer has two memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 2400 MHz. The main memory can be expanded up to 16GB. 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, turn it over, remove the battery (page 2 - 5).
2. The RAM-2 modules will be visible at point 1 on the mainboard (Figure 4a).
3. Gently pull the two release latches (2 & 3) on the sides of the memory socket in the direction indicated by the arrows (Figure 4b). The RAM module 4 will pop-up (Figure 4c), 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.

Contact Warning
Be careful not to touch the metal pins on the module’s connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module’s performance.
Disassembly

Removing and Installing the M.2 SSD Module

M.2 SSD Module Removal Procedure

1. Turn off the computer, turn it over, remove the battery (page 2 - 5).
2. The M.2 SSD module will be visible at point 1 on the mainboard (Figure 5a).
3. Remove the screw 2 (Figure 5b)
4. The M.2 SSD module 3 (Figure 5c) will pop-up, and you can remove it from the computer.

- 1 Screw

3.M2 SSD Module

a. Locate the M.2 SSD.
b. Remove the screw.
c. The M.2 SSD module will pop up.
Removing the Wireless LAN Module

1. Turn off the computer, turn it over, remove the battery (page 2 - 5).
2. The Wireless LAN module will be visible at point 1 on the mainboard (Figure 6a).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (Figure 6b).
4. The Wireless LAN module 5 (Figure 6c) 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 6b).
## Wireless LAN, Combo Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo 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>
<tr>
<td>WLAN/WLAN &amp; Bluetooth Combo</td>
<td>WM 1</td>
<td>Black</td>
<td>Transparent</td>
</tr>
<tr>
<td></td>
<td>WM 2</td>
<td>Gray</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WM 3</td>
<td>White</td>
<td></td>
</tr>
</tbody>
</table>

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

1. Turn off the computer, turn it over to remove the battery (page 2 - 5).
2. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Carefully remove the rubber covers 1 - 2 and screws 3 - 4.
3. Run your fingers around the inner frame of the LCD panel to lift at the upper point 5 as indicated by the arrows, and slightly push and lift up the inner frame at the middle points 6 - 7 as indicated by the arrows and then run your fingers around the inner frame at the lower point 8 as indicated by the arrows (Figure 7a).
4. Remove the LCD front cover 5 (Figure 7b).

Figure 7
CCD Removal

a. Remove rubber and screws and then carefully release the inner frame of the LCD panel at the points indicated by the arrows.
b. Remove the LCD front cover.

9. LCD Front Cover
   - 2 Screws
Disassembly

Figure 8
CCD Removal (cont’d)

c. Disconnect the cable.
d. Remove the CCD module.

5. Disconnect the cable 10 (Figure 8c).
6. Remove the CCD module 11 (Figure 8d).
7. Reverse the process to install a new CCD module.