Concise User's Guide
Ausführliches Benutzerhandbuch
Guide Utilisateur Concis
Guía del Usuario Concisa
Guida Rapida per l'Utente
Introduction (English)

About this Concise User Guide

This quick guide is a brief introduction to getting your system started. This is a supplement, and not a substitute for the expanded English language User’s Manual in Adobe Acrobat format on the Device Drivers & Utilities + User’s Manual disc supplied with your computer. This disc also contains the drivers and utilities necessary for the proper operation of the computer (Note: The company reserves the right to revise this publication or to change its contents without notice).

Some or all of the computer’s features may already have been setup. If they aren’t, or you are planning to re-configure (or re-install) portions of the system, refer to the expanded User’s Manual. The Device Drivers & Utilities + User’s Manual disc does not contain an operating system.

Regulatory and Safety Information


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Chapter 1: Operations

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

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

**Power & Battery Safety**

- Only use an AC/DC adapter approved for use with this computer.
- Use only the power cord and batteries indicated in this manual.
- Your AC/DC 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 AC/DC 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.
- Make sure that your computer is completely powered off before putting it into a travel bag (or any such container).
- 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 computer’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 dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
• Do not touch the battery contacts with your hands or metal objects.

Battery Disposal & Caution
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.

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.

Servicing
Attempting to service the computer yourself may violate your warranty and expose you and the computer to electric shock. Refer all servicing to qualified service personnel, particularly under any of the following conditions:

• When the power cord or AC/DC adapter is damaged or frayed.
• If the computer has been exposed to any liquids.
• If the computer does not work normally when you follow the operating instructions.
• If the computer has been dropped or damaged (do not touch the poisonous liquid if the LCD panel breaks).
• If there is an unusual odor, heat or smoke coming from your computer.

Cleaning
• Use a soft clean cloth to clean the computer, but do not apply cleaner directly to the computer.
• Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.
• Before cleaning the computer remove the battery and make sure the computer is disconnected from any external power supplies, peripherals and cables (including telephone lines).
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 to 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”.

System Software

Your computer may already come with system software pre-installed. Where this is not the case, or where you are re-configuring your computer for a different system, you will find this manual refers to Microsoft Windows 10.

HDD RAID Support

Your hard disk(s) can be set up in AHCI mode or RAID mode (for increased performance or protection). Note that setting up your hard disk(s) in RAID mode needs to be done prior to installing the Windows OS (see RAID Setup on page 5).
RAID Setup

You may use your hard disks (if you have included more than one hard disk in your purchase option) in combination with Striping (RAID 0), Mirroring (RAID 1), Parity Across Disks (RAID 5) or Recovery for either fault tolerance or performance.

Prepare the following before setting up your serial ATA hard disks in RAID mode:

- The *Microsoft Windows OS* disc/USB Key.
- A second hard disk installed in the Primary HDD bay for **RAID level 0 or 1 or Recovery**.
  OR
- A second hard disk installed in the Primary HDD bay, and a third hard disk in the Secondary HDD bay for **RAID level 5**.
- The *Device Drivers & Utilities + User’s Manual* disc.

<table>
<thead>
<tr>
<th>RAID Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery</td>
<td>Two Identical drives copying data between a master and a recovery disk. This provides more control over how data is copied between the master and recovery drives, fast volume updates and the ability to view the data in Windows Explorer.</td>
</tr>
<tr>
<td>RAID 0</td>
<td>Identical drives reading and writing data in parallel to increase performance. RAID 0 implements a striped disk array and the data is broken into blocks and each block is written to a separate disk drive. RAID 0 (a striped array) is not fault-tolerant. The failure of one drive will result in the loss of all data in the array.</td>
</tr>
<tr>
<td>RAID 1</td>
<td>Identical drives in a mirrored configuration used to protect data. Should a drive that is part of a mirrored array fail, the mirrored drive (which contains identical data) will handle all the data. When a new replacement drive is installed, data to the new drive is rebuilt from the mirrored drive to restore fault tolerance. RAID 1 (mirrored array) provides full data protection, as data can simply be copied from a healthy disk to a replacement for any failed disk.</td>
</tr>
<tr>
<td>RAID 5</td>
<td>Identical drives (at least three drives must be used) in a parity across disks configuration are used to protect data and increase performance. A RAID 5 array can withstand a single disk failure without losing access to data.</td>
</tr>
</tbody>
</table>

*Table 1 - RAID Description*
RAID Setup Procedure

Part I: BIOS
1. Start-up your computer and press F2 to enter the BIOS.
2. Go to the Advanced menu, select SATA Mode Selection and press Enter.
3. Select RAID.
4. Press Esc and go to the Boot menu.
5. Set the CD/DVD-ROM Drive (make sure the Microsoft Windows OS disc is inserted) as the first device in the boot order from the Boot menu.
6. Select Exit Saving Changes from the Exit menu (or press F10) and press Enter to exit the BIOS and reboot the computer.

Part II: Intel Matrix
1. Press Ctrl + i to enter RAID configuration menu.

Figure 2 - Intel(R) Matrix Storage Manager Option ROM
3. Type the RAID volume name and then press Tab or Enter to advance to the next field.
4. Specify (use the up and down arrow keys) the RAID level (RAID 0 or RAID 1 or RAID 5 or Recovery - see Table 1 on page 5) and then press Tab or Enter to advance to the next field.
5. Press Enter and the system will select the physical disks to use.
6. Press Enter and select (if applicable) the Strip Size (best set to default).
7. Press Enter and select the Capacity size (best set to default).
8. Press Enter to select Create Volume.
9. Press Enter to create the volume, and confirm the selection by pressing Y.
10. This will now return to the main menu.
13. Click Next to continue installing the operating system as normal (see your Windows documentation if you need help on installing the Windows OS).
14. Install the Windows drivers as per Table 5 on page 19.

Make sure the Windows 10 OS USB Stick is in a USB port. and as the computer starts up it will automatically boot from the Windows 10 OS USB stick.
Figure 4
Front View with LCD Panel Open

1. PC Camera (Optional)
2. Built-In Microphone
3. LCD
4. LED Status Indicators
5. Touch Sensor Instant Keys
6. Speakers
7. Power Button
8. Keyboard
9. TouchPad and Buttons
10. Fingerprint Reader Module
11. LCD Panel Color LED

Wireless Device Operation Aboard Aircraft

The use of any portable electronic transmission devices (e.g., WLAN or Bluetooth) aboard aircraft is usually prohibited. Make sure any wireless modules are OFF if you are using the computer aboard aircraft.

Use the appropriate function key combination/touch sensor instant key to toggle power to any wireless modules, and check the indicators to see if any modules are powered on or not (see Table 2 on page 9).
Keyboard & Function Keys

The keyboard includes a numeric keypad (on the right side of the keyboard) for easy numeric data input. Pressing **Fn + NumLk** turns on/off the numeric keypad. It also features function keys to allow you to change operational features instantly. The function keys (**F1 - F12** etc.) will act as hot keys when pressed while the **Fn** key is held down. In addition to the basic function key combinations, visual indicators are available when the hot key driver is installed.

<table>
<thead>
<tr>
<th>Keys</th>
<th>Function/Visual Indicators</th>
<th>Keys</th>
<th>Function/Visual Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn + ~</td>
<td>Play/Pause (in Audio/Video Programs)</td>
<td>Fn + F7</td>
<td>Display Toggle</td>
</tr>
<tr>
<td>Fn + 1</td>
<td>Fan Automatic Control/ Full Power</td>
<td>Fn + F8/F9</td>
<td>Brightness Decrease/ Increase</td>
</tr>
<tr>
<td>Fn + F1</td>
<td>TouchPad Toggle</td>
<td>Fn + F10</td>
<td>PC Camera Power Toggle</td>
</tr>
<tr>
<td>Fn + F2</td>
<td>Turn LCD Backlight Off (Press a key to or use TouchPad to turn on)</td>
<td>Fn + F11</td>
<td>WLAN Module Power Toggle</td>
</tr>
<tr>
<td>Fn + F3</td>
<td>Mute Toggle</td>
<td>Fn + F12</td>
<td>Bluetooth Module Power Toggle</td>
</tr>
<tr>
<td>Fn + F4</td>
<td>Sleep Toggle</td>
<td>Fn + NumLk</td>
<td>Number Lock (Numeric Keypad) Toggle</td>
</tr>
<tr>
<td>Fn + F5/F6</td>
<td>Volume Decrease/ Increase</td>
<td>Fn + Scrlk</td>
<td>Scroll Lock Toggle</td>
</tr>
</tbody>
</table>

*Table 2 - Function Keys & Visual Indicators*
LED Indicators
The LED indicators on the computer display helpful information about the current status of the computer.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Hard Disk Activity" /></td>
<td>Green</td>
<td>Hard Disk Activity</td>
</tr>
<tr>
<td><img src="image" alt="Number Lock" /></td>
<td>Green</td>
<td>Number Lock (Numeric Keypad) Activated</td>
</tr>
<tr>
<td><img src="image" alt="Caps Lock" /></td>
<td>Green</td>
<td>Caps Lock Activated</td>
</tr>
<tr>
<td><img src="image" alt="Scroll Lock" /></td>
<td>Green</td>
<td>Scroll Lock Activated</td>
</tr>
<tr>
<td><img src="image" alt="Computer On" /></td>
<td>Green</td>
<td>The Computer is On</td>
</tr>
<tr>
<td><img src="image" alt="Computer Sleep" /></td>
<td>Blinking Green</td>
<td>The Computer is in Sleep Mode</td>
</tr>
<tr>
<td><img src="image" alt="Battery Charging" /></td>
<td>Orange</td>
<td>The Battery is Charging</td>
</tr>
<tr>
<td><img src="image" alt="Battery Full" /></td>
<td>Green</td>
<td>The Battery is Fully Charged</td>
</tr>
<tr>
<td><img src="image" alt="Battery Low" /></td>
<td>Blinking Orange</td>
<td>The Battery Has Reached Critically Low Power Status</td>
</tr>
</tbody>
</table>

Table 3 - LED Indicators

Touch Sensor Instant Keys
Press the Touch Sensor Instant Keys on the computer to toggle the appropriate function on/off. When a module is powered on, the appropriate icon will be highlighted blue.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Bluetooth" /></td>
<td>Bluetooth Module Power Toggle</td>
</tr>
<tr>
<td><img src="image" alt="WiFi" /></td>
<td>Wireless LAN Module Power Toggle</td>
</tr>
<tr>
<td><img src="image" alt="Camera" /></td>
<td>PC Camera Module Power Toggle</td>
</tr>
<tr>
<td><img src="image" alt="Volume Control" /></td>
<td>Volume Control (Press and hold your finger at either end of the volume control to adjust the system volume)</td>
</tr>
<tr>
<td><img src="image" alt="Mute" /></td>
<td>Mute Toggle</td>
</tr>
</tbody>
</table>

Table 4 - Touch Sensor Instant Keys

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Figure 6
Front, Left & Right Views

1. Speakers
2. Consumer Infrared Transceiver
3. LED Power Indicators
4. DVI-Out Port
5. Cable (CATV) Antenna Jack*
6. RJ-45 LAN Jack
7. HDMI-Out Port
8. USB 3.0 Ports
9. eSATA Port
10. Mini-IEEE 1394 Port
11. HDMI-In Port
12. 8-in-1 Card Reader
13. Optical Device Drive Bay
14. Line-In Jack
15. S/PDIF-Out Jack
16. Microphone-In Jack
17. Headphone-In Jack
18. USB 2.0 Ports
19. Security Lock Slot

USB 3.0 Port

The USB 3.0 port is denoted by its blue color; USB 2.0 ports are colored black. USB 3.0 will transfer data much faster than USB 2.0, and is backwards-compatible with USB 2.0.
**Concise User’s Guide**

**System Map: Rear & Bottom Views**

1. Vent
2. DC-In Jack
3. Component Bay Cover
4. Sub Woofer
5. Battery (Secondary HDD Bay - HDD3)
6. Primary HDD Bay (HDD1 & 2)

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**Battery Information**

Always completely discharge, then fully charge, a new battery before using it. Completely dis-charge and charge the battery at least once every 30 days or after about 20 partial discharges (see the expanded User’s Manual on the Device Drivers & Utilities + User’s Manual disc).

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**Overheating**

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

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The CPU is not a user serviceable part. Accessing the CPU in any way may violate your warranty.
Video Features
You can switch display devices, and configure display options, from the Display control panel in Windows and/or the NVIDIA Control Panel as long as the video driver is installed.

To access Display control panel:
1. Click Start, and click Control Panel (or point to Settings and click Control Panel).
2. Click Display (icon) - in the Appearances and Personalization category.
3. Click Adjust Screen Resolution/Adjust resolution.
4. Alternatively you can right-click the desktop and select Screen resolution.
5. Use the dropbox to select the screen Resolution.
6. Click Advanced settings.

To access the NVIDIA Control Panel:
1. Click Start and click All Programs > NVIDIA Corporation.
2. Click to select NVIDIA Physx Properties.

OR
1. The NVIDIA Control Panel can be accessed by right-clicking the desktop, and then clicking NVIDIA Control Panel (or from the NVIDIA Control Panel in the Windows Control Panel).

Display Devices
Besides the built-in LCD, you can also use an external VGA monitor (CRT)/external Flat Panel Display or TV (connected to the DVI-Out port/HDMI-Out port) as your display device.
SLI Multi GPU Configuration
This computer features an NVIDIA Scalable Link Interface (SLI) that improves graphic quality and performance by combining dual NVIDIA GPUs (two video cards are required) in a single system. To enable/disable SLI Configuration:

1. Go to NVIDIA Control Panel (see Video Features on page 13).
2. Click “+” next to 3D Settings if its sub-items are not shown and then click Set SLI Configuration.
3. Click “Enable SLI technology (recommended)”.
4. Click to “Select the display to view the SLI rendered content on.” (only a single display may be used).
5. Click Apply and Yes to restart the computer.

Note: DO NOT use the Fn + F7 key combination to toggle through display options when SLI is enabled. SLI supports only a Single display, and attempting to configure dual displays may cause an error. Use the NVIDIA Control Panel to select the display to be used.

SLI Multi GPU Configuration & Battery Power
Note that due to the high power and system demands created by enabling SLI Configuration, you should not enable SLI configuration if your computer is powered by battery only. If you attempt to run an SLI configuration when the computer is powered by the battery only, then system problems may occur.

- If the computer is currently powered by battery only do not enable SLI configuration.
- If you have currently enabled SLI configuration, and the computer is powered by the AC/DC adapter, do not switch to battery power only (or go to the NVIDIA Control Panel and disable SLI configuration before switching to battery power only).
Power Options

The Power Options (Hardware and Sound menu) control panel icon in Windows allows you to configure power management features for your computer. You can conserve power by means of power plans and configure the options for the power button, sleep button (Fn + F4), computer lid (when closed), display and sleep mode (the default power saving state) from the left menu. Note that the Power saver plan may have an affect on computer performance.

Click to select one of the existing plans, or click Create a power plan in the left menu and select the options to create a new plan. Click Change Plan Settings and click Change advanced power settings to access further configuration options.

Audio Features

You can configure the audio options on your computer from the Sound control panel in Windows, or from the Realtek HD Audio Manager icon in the taskbar/control panel (right-click the taskbar icon to bring up an audio menu). The volume may also be adjusted by means of the Fn + F5/F6 key combination.

Sound Volume Adjustment

The sound volume level is set using the volume control within Windows (and the volume function keys on the computer). Click the Volume icon in the taskbar to check the setting.
Concise User’s Guide

HDMI Ports

This computer features both HDMI (High-Definition Multimedia Interface) input and output ports. HDMI is a compact audio/video interface for transmitting uncompressed digital data.

- The HDMI-Out port allows you to display and hear video/audio sources from your computer to digital TVs, displays or audio systems that support an HDMI input.
- The HDMI-In port allows you to display external sources such as Blu-ray players, DVDs, set top boxes and games consoles etc. on your computer screen.

GameMate Media Player (HDMI-In)

The GameMate Media Player allows you to play content from digital sources through the HDMI-In port.

1. Connect your digital source to the HDMI-In port using an HDMI cable.
2. Access the GameMate Media Player from the desktop shortcut or from GameMate folder in Program Files.
3. Press Play on any attached digital source player (or use a remote control to navigate the menus of consoles etc.).
4. The picture will appear in the GameMate Media Player.

Figure 11 - GameMate Media Player
Audio Configuration (HDMI-Out)
As HDMI (High-Definition Multimedia Interface) carries both audio and video signals you will need to configure the audio output as per the instructions below.

Audio Setup for LCD Monitors/TVs with HDMI Input
Some LCD monitors/TVs support HDMI input, but DO NOT have built-in digital audio decoders. Where this is the case, when playing DVDs in Windows Media Player/CyberLink Power DVD, a background noise can occur. If this situation does arise then please follow the instructions below.

1. Click Start, and click Control Panel (or point to Settings and click Control Panel).
2. Click Sound (Hardware and Sound).
4. Click Supported Formats (tab).
5. Click to disable (remove the check in the box) DTS Audio and Dolby Digital.
6. Click OK to close the Sound control panel.

HDMI Audio Support
Note that some NVIDIA video card models DO NOT support High Definition Audio through HDMI. When connecting these video cards to an external display (using an HDMI cable), it is recommended that you use a third party video application (e.g. Power DVD) that provides appropriate audio decoding to play DVD’s etc. Alternatively you can output audio through an alternative source to the HDMI connection.

Windows Audio Setup for HDMI
1. Click Start, and click Control Panel (or point to Settings and click Control Panel).
2. Click Sound (Hardware and Sound).
3. Click Playback (tab), and click to select Realtek Digital Output.
4. Click Set Default (button).
5. Click OK to close the Sound control panel.
Setup for 5.1 Surround Sound
To setup your system for 5.1 surround sound you will need to connect the audio cables to the Line-In, Headphone-Out and Microphone-In jacks.

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**) and make sure you are in **Classic View**.
2. Click **Realtek HD Audio Manager** (or right-click the taskbar icon and select **Sound Manager**).
3. Click **Speakers** (tab) and click **Speaker Configuration** (tab).
4. Select **5.1 Speaker** from the **Speaker Configuration** pull-down menu.
5. Plug the front speaker cables into the Headphone-Out Jack.
6. Plug in the cables (you may require an adapter to connect each cable to the appropriate jack e.g a stereo mini to dual RCA adapter) from your speakers as follows:
   - Line-In Jack = Rear Speaker Out
   - Microphone-In Jack = Center/Subwoofer Speaker Out
7. As you plug in each cable a dialog box will pop up.
8. Click to put a tick in the appropriate box according to the speaker plugged-in (e.g. Rear Speaker Out), and then click **OK** to save the setting.
9. Click **OK** to exit **Realtek HD Audio Manager**.

![Figure 13 - Speaker Configuration](image)

![Figure 14 - Connected Device Auto Popup](image)
Driver Installation

The Device Drivers & Utilities + User’s Manual disc contains the drivers and utilities necessary for the proper operation of the computer. Insert the disc and click Install Drivers (button), or Option Drivers (button) to access the Optional driver menu. Install the drivers in the order indicated in Table 5. Click to select the drivers you wish to install (you should note down the drivers as you install them). Note: If you need to reinstall any driver, you should uninstall the driver first.

Manual Driver Installation
Click the Browse CD/DVD button in the Drivers Installer application and browse to the executable file in the appropriate driver folder.

If a Found New Hardware wizard appears during the installation procedure, click Cancel and follow the installation procedure as directed.

Windows Update
After installing all the drivers make sure you enable Windows Update in order to get all the latest security updates etc. (all updates will include the latest hotfixes from Microsoft).

<table>
<thead>
<tr>
<th>Driver (Win 7)</th>
<th>Page#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipset</td>
<td>page 19</td>
</tr>
<tr>
<td>Video</td>
<td>page 19</td>
</tr>
<tr>
<td>LAN</td>
<td>page 20</td>
</tr>
<tr>
<td>CardReader</td>
<td>page 20</td>
</tr>
<tr>
<td>Touchpad</td>
<td>page 20</td>
</tr>
<tr>
<td>USB 3.0</td>
<td>page 20</td>
</tr>
<tr>
<td>Hot Key</td>
<td>page 20</td>
</tr>
<tr>
<td>Audio</td>
<td>page 20</td>
</tr>
<tr>
<td>HDMI-In</td>
<td>page 20</td>
</tr>
<tr>
<td>Wireless LAN Module (Optional)</td>
<td>page 21</td>
</tr>
<tr>
<td>PC Camera (Optional)</td>
<td>page 22</td>
</tr>
<tr>
<td>Consumer Infrared (Optional)</td>
<td>page 24</td>
</tr>
<tr>
<td>Fingerprint Reader (Optional)</td>
<td>page 26</td>
</tr>
<tr>
<td>Bluetooth Module (Optional)</td>
<td></td>
</tr>
<tr>
<td>Note: No driver installation required (see page 25)</td>
<td></td>
</tr>
</tbody>
</table>

Enable Windows Update (see left)

Table 5 - Driver Installation
Concise User’s Guide

Chipset
1. Click Install Drivers (button).
2. Click 1.Install Chipset Driver > Yes.
3. Click Next > Yes > Next > Next.
4. Click Finish to restart the computer.

Video
1. Click Install Drivers.
2. Click 2.Install Video Driver > Yes.
3. Click Next > Yes.
4. Click Finish to restart the computer.

LAN
1. Click 3.Install LAN Driver > Yes.
2. Click Next > Install > Finish.

CardReader
1. Click 4.Install Cardreader Driver > Yes.
2. Click Install > Finish.

Touchpad
1. Click 5.Install Touchpad Driver > Yes.
2. Click Next.
3. Click the button to accept the license and click Next.
4. Click Finish > Restart Now to restart the computer.

USB 3.0
1. Click 6.Install USB 3.0 Driver > Yes.
2. Click Next.
3. Click the button to accept the license and then click Next.
4. Click Next > Install > Finish.

Hot Key
1. Click 7.Install Hotkey Driver > Yes.
2. Click Next > Next.
3. Click Finish > Finish to restart the computer.

Audio
1. Click 8.Install Audio Driver > Yes.
2. Click Next > Finish to restart the computer.

HDMI-In Driver
1. Click Option Drivers (button).
2. Click 5.Install HDMI In Driver > Yes.
3. Click Next.
4. Click Finish (the application will prepare to install).
5. Click Next > Install.
6. Click Finish.

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Wireless LAN Module

Before installing the Wireless LAN driver, use the *Fn + F11* key combination or touch sensor instant key to power ON the WLAN module. When the Wireless LAN module is powered on, the LED will be highlighted and the on-screen visual indicator will briefly be displayed.

Intel WLAN
1. Click **Option Drivers** (button).
2. Click **1.Install WLAN Driver > Yes**.
3. Click **Next > Next**.
4. Click the button to accept the license and click **Next**.
5. Click **Next > Next > Finish**.

802.11b/g/n WLAN (Third-Party)
1. Click **Option Drivers** (button).
2. Click **1.Install Wireless Lan Driver > Yes**.
3. Choose the language you prefer and click **Next**.
4. Click **Next > Install**.
5. Click **Finish** to restart the computer.

Connecting to a Wireless Network

The operating system is the default setting for Wireless LAN control in *Windows*. Make sure the Wireless LAN module is turned on.

1. Click the taskbar wireless icon and then double-click an access point to connect to or click to **Open Network and Sharing Center** if you do not see a network you want to connect to in the taskbar menu (a list of options will appear allowing setting changes, and creating a new network).
2. You may need to enter a security key for any access point to which you are trying to connect.
3. Click to select a network location (e.g. Home, Work or Public).
4. Click “**View or change settings in Network and Sharing Center**” to access further options for the connection.
5. Click the taskbar icon to see any currently connected networks.
6. To disconnect from the wireless network you can click the taskbar wireless icon , click the active connection and then click **Disconnect** (button).
PC Camera

The **PC Camera** module uses the **BisonCap** application to capture video files.

---

**Latest PC Camera Driver Information**

Check the *Device Drivers & Utilities + User’s Manual* disc, and any accompanying insert pages, for the latest updated information on the PC Camera driver, which may override the information provided here.

---

**PC Camera Driver Installation**

1. Turn on the module using **Fn + F10** or touch sensor instant key (the LED will be highlighted and the on-screen visual indicator will briefly be displayed when the module is powered on).
2. Click **Option Drivers** (button).
3. Click **2.Install WebCam Driver > Yes**.
4. Choose the language you prefer and click **Next > Next**.
5. Click **Finish** to restart the computer.
6. Run the **BisonCap** application program from the **BisonCam** shortcut on the desktop, or from the **Bison-Cam** item in the **Start > Programs/All Programs** menu (if the hardware is turned off use the **Fn + F10** key combination or touch sensor instant key ( to turn it on again).

---

**PC Camera Audio Setup**

If you wish to capture video & **audio** with your camera, it is necessary to setup the audio recording options in **Windows**.

1. Click **Start**, and click **Control Panel** (or point to **Settings** and click **Control Panel**).
2. Click **Sound** (Hardware and Sound).
3. Click **Recording** (tab).
4. Right-click **Microphone** (Realtek High Definition Audio) and make sure the item is not disabled.
5. Double-click **Microphone** (or select **Properties** from the right-click menu).
6. Click **Levels** (tab), and adjust the **Microphone** and **Microphone Boost** sliders to the level required.
7. Click **OK** and close the control panels.
8. Run the **BisonCap** program from the **Start > Programs/All Programs > BisonCam** menu.
9. Go to the **Devices** menu heading and select **Microphone** (Realtek....) (it should have a tick alongside it).
10. Go to the **Capture** menu heading and select **Capture Audio** (it should have a tick alongside it).
BisonCap

The BisonCap application is a video viewer useful for general purpose video viewing and testing, and can capture video files to .avi format.

1. Run the BisonCap program from the Start > Programs/All Programs > BisonCam menu (it is recommended that you Set Capture File before the capture process - see “Set Capture File” below).
2. Go to the Capture menu heading (if you wish to capture audio check PC Camera Audio Setup on page 22) and select Start Capture.
3. Click OK (the file location will be displayed in the pop-up box) to start capturing the video, and press Esc to stop the capture (you can view the file using the Windows Media Player).

Set Capture File

Prior to capturing video files you may select the Set Capture File... option in the File menu, and set the file name and location before capture (this will help avoid accidentally overwriting files). Set the name and location then click Open, then set the “Capture file size:” and click OK. You can then start the capture process as above.

Reducing Video File Size

Note that capturing high resolution video files requires a substantial amount of disk space for each file. After recording video, check the video file size (right-click the file and select Properties) and the remaining free space on your hard disk (go to Computer, right-click the hard disk, and select Properties). If necessary you can remove the recorded video file to a removable medium e.g. CD, DVD or USB Flash drive.

Note that the Windows system requires a minimum of 15GB of free space on the C: drive system partition. In order to prevent system problems it is recommended that you save the captured video file to a location other than the C: drive, limit the file size of the captured video or reduce video resolution.

To Reduce Video Resolution Output Size:

1. Run the BisonCap program.
2. Go to Options and scroll down to select Video Capture Pin....
3. Click the Output Size drop box and select a lower resolution size in order to reduce the captured file size.
USB TV Tuner Module

The optional TV Tuner allows you to watch TV, play music CDs, video conference and capture still images and video on your PC.

You will also be supplied with a remote control unit and appropriate antenna and fittings for the USB TV Tuner module.

A driver is provided on the Device Drivers & Utilities + User’s Manual disc for the remote control supplied with the TV Tuner.

The Cable (CATV) antenna jack will only be enabled when the TV Tuner module is installed.

Consumer Infrared Driver Installation

1. Click Option Drivers (button).
2. Click 3. Install CIR Driver > Yes.
3. Choose the language you prefer and click Next > Next.
4. Click Finish to restart the computer.

Windows Media Center

1. Run Windows Media Center directly from the Start menu (Start > Programs > Windows Media Center).
2. Windows Help and Support provides information on the Windows Media Center functions. Click Start and select Help and Support, and then type “Media Center” in the Search Help box and click the magnifying glass icon to bring up the results.

Digital TV Broadcast Signal

The antenna is the most crucial factor in receiving a clear digital terrestrial TV broadcast signal. The passive antenna provided should provide a clear signal when placed beside a window. If the signal is not clear then you can purchase an active antenna (it should also be placed beside a window) to improve the signal. You should also check with any related government website which provides information on digital terrestrial TV coverage for

---

Figure 15 - TV Tuner Ports/Jacks

1. Consumer Infrared Transceiver
2. CATV Antenna Jack

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your area. Note that (unlike standard analog TV) if the digital signal is weak then no picture will appear on the TV at all.

**TV Recording and Power Plans**
If you intend to use the optional TV Tuner to record live TV, then go to the **Power Options** control panel and create a power plan to prevent the power saving options from adjusting the computer’s performance level.

**Intel Turbo Memory Module**

*Intel Turbo Memory Technology* (also known as *Optane® flash memory*) is an Intel technology that reduces the time it takes for a computer to boot up, to load applications, and to write data to the hard drive.

**Intel Turbo Memory & Matrix Storage Setup and Driver Installation**

1. Click **Option Drivers** (button).
2. Click 4.Install TM&iMSM > Yes.
3. Click Next > Yes > Next > Next.
4. Click Finish to restart the computer.

**TV Tuner Module Support**

The TV Tuner module (factory option) in Windows is supported by the *Windows Media Center* software. Note that the *Windows Media Center* software is not included in *Starter* or *Home Basic* versions of Windows 7.

**TV Tuner Remote**

Point the remote at the consumer IR transceiver to change channels etc.
Fingerprint Reader

If you have included the fingerprint reader in your purchase option you will need to install the driver as per the instructions below.

Fingerprint Reader Driver Installation
1. Click **Option Drivers** (button).
2. Click **6.Install FingerPrint Driver > Yes**.
3. Click **Software Installation**.
4. Click **Next > Next > Next**.
5. Click **Finish > Yes** to restart the computer.

User Enrollment
1. Click **Start > Programs/All Programs > Protector Suite QL > User Enrollment**, or double click the taskbar icon 😻.
2. On the first run of the program you will be asked to click the **Accept** button to accept the license.
3. If you have not set a **Windows** password you will be prompted to do so (note: If you have not set a password **Protector Suite QL** cannot secure access to your computer).
4. Click **Submit** when you have entered password.
5. You will then be prompted to enroll your fingerprints (you can click **Tutorial** to get help with fingerprint enrollment at any time).
6. Click the button above any of the fingers to begin the enrollment process for that finger.
7. Swipe the finger until the progress bar reaches 100% to enroll that finger.
8. Repeat the process for all the fingers you wish to enroll.
9. Close the fingerprint status window.
10. You can also run the **Tutorial**, or **Product Tour** (to run the product tour video) to get more information.
11. Right-click the taskbar icon 😻 to **Start Control Center** to allow you to **Edit Fingerprints**, register **Applications**, and access the **Help** menu etc.
12. If you swipe your finger over the reader at any time you can access the **Biomenu**.
Bluetooth Configuration

Setup your Bluetooth Device so the Computer Can Find it

1. Turn your Bluetooth device (e.g. PDA, mobile phone etc.) on.
2. Make the device discoverable (to do this check your device documentation).

To Turn the Bluetooth Module on

1. Press the **Fn + F12** key combination or touch sensor instant key  to power on the Bluetooth module.
2. A Bluetooth icon will appear in the taskbar.
3. You can then do any of the following to access the Bluetooth Devices control panel.
   - **Double-click** the icon to access the Bluetooth Devices control panel.
   - **Click/Right-click** the icon and choose an option from the menu.

Bluetooth Help

Click **Start** and select **Help & Support** and then type **Bluetooth** in the **Search Help** box, and then click the magnifying glass icon to find more information on Bluetooth transfer.

Bluetooth Data Transfer

Note that transferring data between the computer and a Bluetooth enabled device is supported in one direction only (simultaneous data transfer is not supported).
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause - Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <strong>Wireless LAN/Bluetooth</strong> modules cannot be detected.</td>
<td>The modules are off. Check the appropriate touch sensor indicator to see if the modules are on or off (see ). If the LED indicator is not illuminated, then press the appropriate touch sensor instant key/function key combination in order to enable the modules.</td>
</tr>
<tr>
<td>The <strong>Bluetooth</strong> module is off after resuming from Sleep.</td>
<td>The Bluetooth module’s default state will be off after resuming from the Sleep power-saving state. Use the key combination (<code>Fn + F12</code>) or touch sensor instant key  to power on the Bluetooth module after the computer resumes from Sleep.</td>
</tr>
<tr>
<td>The <strong>Wireless LAN indicators</strong> show that the WLAN module is powered on, however the module does not connect.</td>
<td>The WLAN module is turned off in the <em>Windows Mobility Center</em>. The computer’s wireless function keys will not function properly if Wireless is turned OFF in the <em>Windows Mobility Center</em> control panel. Make sure that Wireless is ON in the <em>Windows Mobility Center</em> to ensure proper function key behavior.</td>
</tr>
<tr>
<td>The captured video files from the <strong>PC Camera</strong> are taking up too much disk space.</td>
<td>Note that capturing high resolution video files requires a substantial amount of disk space for each file. See <em>Reducing Video File Size on page 23</em>.</td>
</tr>
<tr>
<td><strong>No sound</strong> can be heard through an <strong>HDMI</strong> connected display device.</td>
<td>You have not configured the HDMI audio output. See <em>HDMI Ports on page 16</em>.</td>
</tr>
</tbody>
</table>
Specifications

Latest Specification Information
The specifications listed in this section are correct at the time of going to 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 details.

Processor Options
Intel® Core™ i9/i7/i5 Processor

- i9-9900K (3.60 GHz, 8 Cores/16 Threads, 16M L3 Cache, 14nm, LGA1151 Package)
- i7-9700K (3.50 GHz, 8 Cores/8 Threads, 12M L3 Cache, 14nm, LGA1151 Package)
- i7-9700 (3.20 GHz, 8 Cores/8 Threads, 12M L3 Cache, 14nm, LGA1151 Package)
- i5-9500 (3.20 GHz, 6 Cores/6 Threads, 9M L3 Cache, 14nm, LGA1151 Package)

Memory
Four 240 Pin SO-DIMM Sockets Supporting DDR4 2666/2400MHz Memory Memory Expandable up to 128GB

Storage
Up to three Changeable 2.5" (6cm) 9.5 mm (h) SATA (Serial) Hard Disk Drives supporting RAID level 0/1/5

raid options
(Factory Option) Up to 2 x M.2 PCIe Type SSD drives

Core Logic
Intel® Z390 Chipset

BIOS
Phoenix BIOS (16Mb SPI Flash-ROM)

Video Adapter
nVIDIA® GeForce RTX 2060M PCIe Video Card (SLI)
6GB GDDR6 Video RAM on board
Microsoft DirectX® 12 Compatible

Security
Security (Kensington® Type) Lock Slot
BIOS Password
(Factory Option) Fingerprint Reader Module

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

Pointing Device
Built-in TouchPad (scrolling key functionality integrated)
## Concise User’s Guide

### Communication
- **Built-In Giga Base-TX Ethernet LAN**
- **(Factory Option) 3.0M Pixel USB PC Camera Module**
- **(Factory Option) Bluetooth 2.1 + EDR (Enhanced Data Rate) Module**
- **Wireless LAN Module Options:**
  - **(Factory Option) Intel® WiFi Link 6200 (802.11a/g/n) Wireless LAN Half Mini-Card Module**
  - **(Factory Option) Intel® WiFi Link 6300 (802.11a/g/n) Wireless LAN Half Mini-Card Module**
  - **(Factory Option) Third-Party 802.11b/g/n Wireless LAN Half Mini-Card Module**

### Card Reader
- **Embedded 8-in-1 Card Reader (MS/ MS Pro/ SD/ Mini SD/ MMC/ RS MMC/ MS Duo)**
  - **Note:** MS Duo/ Mini SD/ RS MMC Cards require a PC adapter

### Mini Card Slots
- **Slot 1 for WLAN Module**
- **(Factory Option) Slot 2 for TV Tuner Module or Turbo Memory Module**

### Interface
- **Three USB 2.0 Ports**
- **Two USB 3.0 Ports**
- **One eSATA Port**
- **One HDMI-Out Port**
- **One HDMI-In Port**
- **One DVI-Out Port**
- **One S/PDIF Out Jack**
- **One Headphone/Speaker-Out Jack**
- **One Microphone-In Jack**
- **One Line-In Jack**
- **One RJ-45 LAN Jack**
- **One DC-In Jack**
- **One Consumer Infrared Port for Optional TV Tuner Remote Control**
- **One CATV Antenna Jack (for Optional TV Tuner)**

### Audio
- **High Definition Audio Compliant Interface**
- **S/PDIF Digital Output**
- **Four Speakers**
- **One Sub Woofer**
- **Built-In Microphone**
- **Dolby Home Theater (5.1 Channel) Certified**

### Environmental Spec

#### Temperature
- **Operating:** 5°C - 35°C
- **Non-Operating:** -20°C - 60°C

#### Relative Humidity
- **Operating:** 20% - 80%
- **Non-Operating:** 10% - 90%

### Power
- **Full Range AC/DC Adapter – AC in 100 - 240V, 50 - 60Hz DC Output 20V, 9A (180 Watts)**
- **Removable Polymer Smart Lithium-Ion Battery Pack, 88.8WH**

### Dimensions & Weight
- **379mm (w) * 246mm (d) * 41.7mm (h)**
- **Around 3.5 kg with Battery**

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1-30 - Specifications

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Chapter 2: Upgrading/Servicing the Notebook

Overview

This chapter provides step-by-step instructions for disassembling and servicing the Ace Mustang W650R 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 \( \square \) 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 \( \square \) will also provide any possible helpful information. A box with a \( \square \) 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 pin 1 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 pin 1 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 airborne 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>Disassembly Step</th>
<th>Steps</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>To remove the Battery</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To remove the Optical Device</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the Optical device</td>
<td>page 2 - 6</td>
</tr>
<tr>
<td>To remove a Processor</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the processor</td>
<td>page 2 - 7</td>
</tr>
<tr>
<td>To remove and install a Video Card</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the video card</td>
<td>page 2 - 9</td>
</tr>
<tr>
<td></td>
<td>3. Install the video card</td>
<td>page 2 - 11</td>
</tr>
<tr>
<td>To remove the Keyboard</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the keyboard</td>
<td>page 2 - 12</td>
</tr>
<tr>
<td>To remove the Wireless LAN Module</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the wireless LAN</td>
<td>page 2 - 16</td>
</tr>
<tr>
<td>To remove the Bluetooth Module</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the Bluetooth</td>
<td>page 2 - 17</td>
</tr>
<tr>
<td>To remove the System Memory</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the system memory</td>
<td>page 2 - 18</td>
</tr>
<tr>
<td>To remove the HDD</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the HDD from the Primary HDD Bay</td>
<td>page 2 - 20</td>
</tr>
<tr>
<td></td>
<td>3. Remove the HDD from the Primary HDD Bay</td>
<td>page 2 - 24</td>
</tr>
<tr>
<td>To remove the Hinges</td>
<td>1. Remove the battery</td>
<td>page 2 - 5</td>
</tr>
<tr>
<td></td>
<td>2. Remove the LCD back cover</td>
<td>page 2 - 26</td>
</tr>
</tbody>
</table>
Removing the Battery

1. Turn the computer off, and turn it over.
2. Loosen screws 1 - 3 (Figure 1a) and carefully lift the battery up (Figure 1b).
3. Remove the battery from the battery bay (Figure 1c).

Figure 1
Battery Removal

a. Loosen screws.
b. Carefully lift the battery up.
c. Remove the battery from the battery bay.
Disassembly

Removing the Optional Optical (CD/DVD) Device

1. Turn off the computer, remove the battery (page 2 - 5).
2. Remove screws 1 & 3 from the hard disk bay cover (Figure 2a).
3. Remove the hard disk bay cover (Figure 2b).
4. Remove the screw at point 4 (Figure 2c), and use a screwdriver to carefully push out the optical device at point 6 (Figure 2d).
5. Reverse the process to install any new optical device.

Figure 2
Optical Device Removal

a. Remove the screws from the hard disk bay cover.
b. Remove the hard disk bay cover.
c. Remove the screw
d. Use a screwdriver to carefully push out the optical device at point 3.

6. Optical Device
   • 3 Screws
Removing the Processor

1. Turn off the computer, remove the battery (page 2 - 5).
2. Remove the screws 1 - 5 from the component bay cover (Figure 3a).
3. Remove the screws 6 - 8 from the CPU fan (Figure 3b).
4. Disconnect the fan cable 9 and remove the CPU fan (Figure 3c).
5. Remove the screws 10 - 18 from the CPU heatsink (Figure 3d).

Heat Sink Screw Removal and Insertion
Remove the screws from the heat sink in the order indicated here: 7-6-5-4-3-2-1. When tightening the screws, make sure that they are tightened in the order: 1-2-3-4-5-6-7.

10. CPU Fan
18. CPU Heatsink
• 15 Screws

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6. Carefully lift up the heat sink off the computer by pulling the plastic strip up (Figure 4e).
7. Press down and hold the latch (with the latch held down you will be able to release it) (Figure 4f).
8. Move the latch upward and bracket downward fully in the direction indicated to unlock the CPU (Figure 4g).
9. Carefully (it may be hot) lift the CPU up out of the socket (Figure 4h).
10. Reverse the process to install a new CPU.
11. When re-inserting the CPU, pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!)

**Caution**
The heat sink, and CPU area in general, contains parts which are subjected to high temperatures. Allow the area time to cool before removing these parts.
Removing and Installing the Video Card

Video Card Removal Procedure
1. Turn off the computer, turn it over and remove the battery (page 2 - 5) and component cover (page 2 - 7).
2. Remove screws 1 - 3 (Figure 5a).
3. Disconnect the fan cables 9 & 10 and remove the fan units 11 & 12 (Figure 5b).
4. Remove screws 43 - 20 from the heat sink unit in the order indicated on the label (i.e. screw 4 first through to screw 1 last) (Figure 5c).
5. Carefully (it may be hot) remove the heat sink units 21 & 22 by pulling the plastic strips 23 & 24 up (Figure 5d).
6. Remove screws 25 - 28 from the video cards 29 & 30 (Figure 5d).

Heat Sink Screw Removal and Insertion
Remove the screws from the heat sink in the order indicated here: 4-3-2-1.
When tightening the screws, make sure that they are tightened in the order: 1-2-3-4.

Caution
The heat sink, and video card area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.

a. Remove the fan screws.
b. Disconnect the fan cables & remove the fan units.
c. Remove the screws in the correct order.
d. Carefully remove the heat sink units by pulling the plastic strips up. Remove the video

Figure 5
Video Card Removal Procedure

a. Remove the fan screws.
b. Disconnect the fan cables & remove the fan units.
c. Remove the screws in the correct order.
d. Carefully remove the heat sink units by pulling the plastic strips up. Remove the video
Disassembly

7. The video cards 29 & 30 will pop up.
8. Disconnect the video card cables 31 & 32 and remove the video cards 29 & 30 (Figure 6f).

Caution

The heat sink, and video card area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.

29 & 30 Video Cards

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Installing a New Video Card

1. Prepare to fit the video cards 29 & 30 into the slot by holding it at about a 30° angle (page 2 - 10).
2. The card needs to be fully into the slot, and the video card and socket have a guide-key and pin which align to allow the card to fit securely (Figure 7h).
3. Fit the connectors firmly into the socket, straight and evenly (Figure 7h).
4. DO NOT attempt to push one end of the card in ahead of the other.
5. The card’s pin alignment will allow it to only fit one way. Make sure the module is seated as far into the socket as it will go (none of the gold colored contact should be showing). DO NOT FORCE the card; it should fit without much pressure.
6. Secure the card with screws 29 - 30 (Figure 5 on page 2 - 9).
7. Attach the video card fan and secure with the screws as indicated in Figure 5 on page 2 - 9.
8. Reinsert the component bay cover, and secure with the screws as indicated in Figure 14 on page 2 - 18.

Figure 7
Installing a New Video Card

g. Insert the video cards at a 30 degree angle.  
h. Fit the connectors straight and even.

Caution
The heat sink, and video card area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.
Disassembly

Removing the Keyboard

1. Turn off the computer and remove the battery (page 2 - 5).
2. Remove screws 1 - 3 from the bottom of the computer (Figure 8a).
3. Turn the computer over, open the Lid/LCD, and carefully (a cable is connected to the underside of the LED cover module) unsnap up the LED cover module from point 4 on the right (Figure 8b).
4. Disconnect cable 5 and remove the LED cover module 6 (Figure 8c).
5. Remove screws 7 - 11 from the keyboard (Figure 9d).
6. Carefully lift the keyboard up, being careful not to bend the keyboard ribbon cable 12. Disconnect the keyboard ribbon cable from the locking collar socket 13 (Figure 9e).
7. Remove the keyboard 14 (Figure 9f).

Re-Inserting the Keyboard
When re-inserting the keyboard, align first the four keyboard tabs (Figure 9f) that are located at the bottom, to the slots in the case.

Keyboard Tabs

Figure 9
Keyboard Removal (cont’d.)

d. Remove screws from the keyboard.
e. Carefully lift the keyboard up, being careful not to bend the keyboard ribbon cable. Disconnect the keyboard ribbon cable from the locking collar socket.
f. Remove the keyboard.
Disassembly

Figure 10
Keyboard Removal (cont’d.)

g. Remove screws from the keyboard shielding plate.
h. Lift the keyboard shielding plate up in the direction of the arrow.
i. Remove the keyboard shielding plate.

8. Remove screws 13 - 16 from the keyboard shielding plate 18 (Figure 10g).
9. Lift the keyboard shielding plate up in the direction of the arrow 19 (Figure 10h).
10. Remove the keyboard shielding plate 18 (Figure 10i).

18. Keyboard Shielding Plate
• 3 Screws
Keyboard Shielding Plate Insertion
1. When re-inserting the keyboard shielding plate make sure you insert it by sliding it into position at an angle as illustrated by arrow below, and press it down into position (Figure 11a).
2. Secure the plate with screws 1 - 5 (Figure 11b).

Figure 11
Keyboard Shielding Plate Insertion

a. When re-inserting the keyboard shielding plate make sure you insert it by sliding it into position at an angle as illustrated by arrow below, and press it down into position.
b. Secure the plate with screws.

- 3 Screws
Disassembly

Figure 12
Wireless LAN Module Removal

a. The Wireless LAN module will be visible at point 1 on the mainboard.
b. Disconnect the cables and remove the screw.
c. The WLAN module will pop up.
d. Lift the WLAN module out.

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

Removing the Wireless LAN Module

1. Turn off the computer, remove the battery (page 2 - 5) and the keyboard (page 2 - 9).
2. The Wireless LAN module will be visible at point 1 (Figure 12a) on the mainboard.
3. Carefully disconnect cables 2 - 3, then remove screw 4 from the module socket (Figure 12b).
4. The Wireless LAN module 5 (Figure 12c) will pop-up.
5. Lift the Wireless LAN module 5 (Figure 12d) up and off the computer.

5. WLAN Module.
   • 1 Screw

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Removing the Bluetooth Module

1. Turn off the computer, remove the battery (page 2 - 5) and the keyboard (page 2 - 9).
2. The Bluetooth module will be visible at point 1 (Figure 13a).
3. Remove screw 2 (Figure 13b).
4. Carefully separate the Bluetooth module from the connector 3 and disconnect the cable 4 (Figure 13b).
5. Lift the Bluetooth module 5 (Figure 13c) up and off the computer.

Figure 13
Bluetooth Module Removal

a. The Bluetooth module will be visible at point 1.
b. Remove the screw, disconnect the cable and the connector.
c. Lift the Bluetooth module up off the socket.
Disassembly

Removing the System Memory (RAM)

The computer has four memory sockets for 240 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 2666/2400MHz. The main memory can be expanded up to 128GB. The SO-DIMM modules supported are 4GB/8GB/16GB/32GB Modules. 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 the keyboard (page 2 - 9).
2. The RAM modules will be visible at points 1 - 3 (Figure 14a).
3. Gently pull the two release latches (1 - 9) on the sides of the memory socket in the direction indicated by the arrows (Figure 14b).
4. The RAM module 10 will pop-up (Figure 14c), and you can then remove it.

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.

Figure 14
RAM Module Removal

a. The RAM modules will be visible at points 1 - 3.
b. Gently pull the two release latches on the sides of the memory socket in the direction indicated by the arrows.
c. The RAM module will pop-up, and you can then remove it.

a.

b.

10. RAM Module

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5. Pull the latches to release the second and third modules if necessary.
6. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
7. The module’s pin alignment will allow it to only fit one way. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE the module; it should fit without much pressure.
8. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
9. Replace the bay cover and screws (make sure you reconnect the fan cable before screwing down the bay cover).
10. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.
Disassembly

Removing the Hard Disk(s) from the Primary HDD Bay

The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 9.5mm (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.

1. Turn off the computer, remove the battery (page 2 - 5) and hard disk bay cover (page 2 - 6).
2. Remove screws 1 - 4 from the hard disk assembly (Figure 15a).
3. Disconnect cable 5 from the hard disk assembly (Figure 15a).
4. Remove the hard disk assembly 6 (Figure 15b).
5. Grip the tab to remove the HDD cable 7 (Figure 15c).

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Figure 15
Removing the Hard Disk(s) from the Primary HDD Bay

a. Remove screws and disconnect cable from the hard disk assembly.
b. Remove the hard disk assembly.
c. Grip the tab to remove the HDD cable.

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6. Hard Disk Assembly
   • 4 Screws

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2 - 20 Removing the Hard Disk(s) from the Primary HDD Bay

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6. Remove screws 8 - 11 (Figure 16d). *The number and sequence of screws to be removed will depend on whether or not you have one or two hard disks installed in the case.

d. Remove the screws.
2. Remove the Hard Disk(s) from the Primary HDD Bay

Disassembly

Inserting the Primary Hard Disk(s)

1. Insert the HDD(s) ① into the HDD case ② as illustrated (Figure 17a). *Make sure the cable connectors are facing towards the gap at the rear of the case.
2. Insert screws ③ - ⑥ to secure the hard disk(s) in the case (Figure 17b).

---

Figure 17
Inserting the Primary Hard Disk(s)

a. Insert the HDD into the case.
b. Insert screws to secure the hard disk(s) in the case.

a. 1. Hard Disk 2. Hard Disk Case
   • 4 Screws

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3. Firmly insert the HDD cable 7 into the hard disk assembly 8 in the direction of the arrow 9 as indicated below (Figure 18c).
4. Insert the HDD assembly into the bay by pushing it straight down (Figure 18d). *Do not insert the assembly at an angle.
5. Firmly connect cable 7 to the mainboard and then secure the assembly with screws 10 - 13 (Figure 18d).

Removing the Hard Disk from the Secondary HDD Bay

Figure 18
Inserting the Primary Hard Disk(s) (cont’d.)

- Firmly insert the HDD cable into the hard disk assembly.
- Insert the HDD assembly into the bay by pushing it straight down. Firmly connect the cable and then secure the assembly with screws.

8. Hard Disk Assembly
9. Hard Disk Cable

- 4 Screws
Disassembly

1. Remove screws 1 - 4 from the hard disk assembly *(Figure 19a).*
2. Grip the tab and slide the hard disk assembly in the direction of the arrow 5 *(Figure 19b).*
3. Lift the hard disk assembly out of the compartment *(Figure 19b).*
4. Remove screws 6 - 8 from the hard disk assembly *(Figure 19c).*
5. Separate the hard disk 10 from the HDD case 11 *(Figure 19d).*
6. Insert the replacement HDD into the case *Make sure the cable connector is facing towards the rear of the case as illustrated below.

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10. Hard Disk  
11. Hard Disk Case  

- 8 Screws
7. Replace screws 1 to 3 (page 2-23).
8. Insert the HDD assembly into the bay by pushing it straight down (do not insert the assembly at an angle) and then slide it in the direction of the arrow 12 to lock in place (Figure 20e).

![Image of HDD assembly being inserted into bay]

*Figure 20*
Removing the Hard Disk(s) from the Secondary HDD Bay (cont’d.)

e. Insert the HDD assembly into the bay by pushing it straight down and then slide it in the direction of the arrow to lock in place.
Removing the Hinges

1. The whole LCD assembly (Figure 21a) is detached from the base of the computer.
2. Re-insert hinges 2 & 3 (Figure 21a) into the top case and raise the LCD to a 90° angle (Figure 21b) to adjust the positioning of the hinges for removal.
3. Remove the whole LCD assembly again from the base of the computer (Figure 21c).
4. Remove screws 4 - 7 at the base of the LCD assembly (Figure 21c).

Note:
- This is the position of the hinges prior to re-inserting them into the top case of the computer.
- This will be the new position of the hinges after re-inserting them into the top case of the computer.

1. LCD Assembly
   • 4 Screws
5. Remove hinges 8 & 9. (Figure 22d).

d. Remove the hinges.
Disassembly