User Manual

Version 1.00

Part Number:

Contents

Dear Valued Customer,

At Kontron Mobile Computing, we strive to be the worldwide leader in customer-specific computing solutions for demanding environments. Our mission is to provide you with a total system solution for your field automation needs.

The ReVolution convertible laptop/tablet is a computing platform designed for off-site and in-vehicle users requiring remote, high-powered computing capabilities. The ReVolution expands to integrate multiple technologies into one powerful solution specific to your application needs.

Kontron Mobile Computing has built its reputation around the endurance of its products in demanding environments. The ReVolution meets strict standards for computing equipment in shock, vibration, temperature, humidity and altitude testing. It withstands the toughest conditions and proves itself again and again in mission-critical field applications.

When we deliver your new ReVolution, our job at Kontron Mobile Computing will have just begun. We will do what it takes to ensure your complete satisfaction with our services and your ReVolution. We want this to be the beginning of a long and outstanding experience for you, our valued customer.

Kontron Mobile Computing
7631 Anagram Drive
Eden Prairie, MN 55344-7310

Technical Alteration Disclaimer

The information contained in this manual may be subject to technical alteration, as a result of the continual upgrading of our products. The attached documentation does not guarantee the technical processes or product characteristics described in the manual.

Kontron Mobile Computing does not accept any liability for printing errors or other inaccuracies in this manual. This manual only contains a general description of technical processes and instructions that may not be applicable in every case. If in doubt, please contact your nearest Kontron Mobile Computing representative or office listed in the "Technical Support" section of this manual.

Copyright Notice

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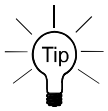
Eden Prairie, MN 55344-7310

Symbols used in this Manual

Symbol	Meaning
	This symbol indicates the danger of injury to the user or the risk of damage to the product if the corresponding warning notices are not observed. It may also cause interference with radio-sensitive equipment.
	This symbol indicates that the product or parts that may be damaged if the corresponding warning notices are not observed.
	This symbol indicates general information about the product and the user manual.
	This symbol precedes helpful hints and tips for daily use.
SYSM	Program names are printed in *italics*.
format a:	Commands are printed in Courier.

Introduction to User Manual

The *ReVolution User Manual* provides information to assist in using your ReVolution computer in the most productive manner for your organization. It includes safety instructions, care and maintenance advice, and photographs of the ReVolution, specific components and accessories.

The manual also includes a “Getting Started” section for first-time operations, or as a refresher on starting up the system. The “Modifying the System” section describes how to use and adjust the components and devices. Refer to the “Technical Data” section for component specifications, and the “Technical Appendices” section for programming information. The “Customer Service” section offers technical support contact information.

To obtain additional copies of this user manual, or to view it online:

1. Insert the ReVolution Utilities CD that came with the original shipment of your ReVolution computer. This contains an electronic copy of the manual.
   .
2. Go to www.kontronmobile.com. Select the following path: Technical Support →Technical Search→Manual

3. Call or write the Kontron Technical Support department to order additional hard copies. Contact information is located on the Technical Support page.

Safety Instructions

Please read this section carefully and observe the following instructions – and those on the computer - for your own safety and correct use of the ReVolution.

Kontron Mobile Computing built and tested the ReVolution computer in accordance with EN60950. In order to maintain this condition and ensure safe operation, you must observe the instructions and warnings contained here and elsewhere in this manual.

Do not operate the ReVolution in areas sensitive to radio interference, such as airplanes and hospitals. There is no means to shut off the Bluetooth and WLAN radios installed in the system.

- ❑ Operate the ReVolution in accordance with the instructions for use.
- ❑ Make sure electrical receptacles match the regulations in your area.
- ❑ Place cables, especially the power cable, out of traffic areas where people could trip over them.
- ❑ Do not put an AC power connection in sockets shared by a number of other power users.
- ❑ Do not use an extension cable.
- ❑ Plug the power cable into a nearby socket to prevent an accidental disconnection.
- ❑ Use only the cables supplied by Kontron.
- ❑ Do not place the ReVolution in the proximity of heat sources or in a damp location. Make sure it has adequate ventilation.
- ❑ Connect to ReVolution interfaces: only devices and components that meet the requirements of a SELV circuit (security low voltage output) in accordance with EN60950.
- ❑ Lock or screw down all plugs on the connection cables to the housing.
- ❑ You may not safely operate the ReVolution if:
  –it has visible damage or
  –it no longer functions.
  Shut down the computer and secure it against unintentional operation.
- ❑ Any extensions to the computer must meet legal stipulations and the device specifications.
- ❑ Only authorized Kontron technical repair personnel may perform assembly, extensions, new settings, alterations or repairs while under warranty.
- ❑ Only use original accessories approved by Kontron.

Operation of Laser Source Devices

Class 1 laser products typically contain a label similar to the following. Use caution when dealing with such devices.

The CD-ROM, CD-RW, DVD, DVD/CD-RW Combo modules and others contain a light-emitting diode (classified in accordance with IEC 825-1:1993: LASER CLASS 1) and must not be opened. When the cover is opened, invisible laser radiation is emitted. Do not expose yourself to this radiation.

Safety Instructions for the CMOS Lithium Battery

The CPU board is equipped with an internal, rechargeable CMOS lithium battery. Please refer to the “Technical Data” section for information about battery type.

- ❑ This battery is not user-replaceable.
- ❑ Kontron shall not assume any warranty obligation if any attempt is made to replace the battery by individuals other than those at Kontron repair facilities.
- ❑ Please observe local regulations for the disposal of the battery and the disposal information of the battery-manufacturers.

Safety Instructions for the Removable Lithium Battery Modules

The ReVolution is equipped with a removable lithium battery. Please observe following instructions:

- ❑ Refer to the “Getting Started” and “Technical Data” sections for information about the battery type.
- ❑ Only use batteries supplied by Kontron.
- ❑ Kontron shall not assume any warranty obligation if a different battery, a different battery type or a different power source is used.
- ❑ Please observe local regulations for the disposal of the battery and the disposal information of the battery-manufacturers.

FCC Statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection. This equipment generates, uses and can radiated radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase these separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation. Proposed RF exposure safety information to include in User’s Manual.

Canadian Notice

This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

European Union Notice

Warning: This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures to mitigate such interference.

CAUTION

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

ACHTUNG

Explosionsgefahr bei falsch eingesetzter Batterie. Batteriewechsel nur mit gleichen oder ähnlichen, vom Hersteller empfohlenen, Batterien.

WARNING

Only authorized service personnel should attempt to repair this equipment. Improper repairs can create a safety hazard.

WARNUNG

Lebensgefahr Achtung, nur autorisiertes Kundendienst Fachpersonal darf dieses Gerät reparieren. Falsche Reparaturen können lebensgefährlich sein.

Care and Maintenance

Display

Use a soft cloth to clean the display. You can use a slightly dampened cloth if display is soiled but DO NOT use any abrasive substances or materials on the display surface.

Other Areas

Clean all other areas of the ReVolution with a damp, soft cloth. You may dampen the cloth with a mild household cleaner or simply water. If a mild household cleaner is used, wipe again with a damp cloth only and then with a dry cloth.

- ***Do not use strong solvents, such as benzene, thinner or rubbing alcohol that could discolor paint or plastic.***
- ***Do not use commercial household cleaners or cosmetics, as they may harm the surface.***
- ***Do not spray water, as liquid damages the computer or causes it to work improperly.***
- ***TOUCH PAD: Avoid using sharp objects such as pen or pencil tips because they can permanently damage the touch pad's surface. Use the stylus provided.***
- ***TOUCHSCREEN Avoid using sharp objects such as pen or pencil tips because they can permanently damage the touch pad's surface. Use the stylus provided.***

Base Unit and Optional Parts

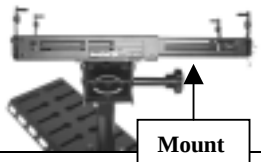
This section displays the base unit and optional parts of the ReVolution laptop and tablet computer. Get in touch with your Kontron sales representative for order information.

Base Units

	Description
	Convertible Laptop and Tablet Standard Components: • Resistive Matrix Touchscreen • Master Hard Drive • CD-ROM Drive • Battery Pack • AC/DC Adapter • Power Cord • Stylus • Shoulder Strap

Optional Parts

	Description
	Master Removable Hard Drive Module – 40GB std; upgradeable to 60GB
	CD-ROM Drive Module
	CD-RW Drive Module
	DVD Drive Module
	DVD/CD-RW Combo Module
	Floppy Disk Drive Module
	Slave Removable Hard Drive Module – 40GB or 60GB
	Backlit, Sealed Keyboard

	Description
	Battery Pack
	External Battery Charger
	I/O Extension Stick (Port Replicator)
	Hard Case
	Soft Case
	Shoulder Strap
	In-Vehicle Mount with or without Docking Station
	AC Power Adapter
	DC to DC Converter, 11-32 VDC
	DC Power Cord with cigarette lighter plug, 12 ft.

The ReVolution Convertible Laptop and Tablet

Before using your ReVolution convertible laptop/tablet computer, please take a few minutes to learn about its features. This section displays “at a glance” the components and options.

The ReVolution converts from a laptop to a tablet – and back! Switch-It™ is the unique hinge that turns the display 180 clockwise. The ReVolution consists of the following additional features:

- QuickSilver™ CPU module with 1.06 GHz (or higher) Intel Mobile Pentium III-M processor
- Rugged, lightweight, magnesium alloy construction tested to specific U.S. Military and NEMA standards for resistance to shock, vibration, water, temperature and dust
- 40GB master removable hard drive (60GB upgrade)
- 128 MB SDRAM (upgradeable to 640 MB)
- CD-ROM drive module
- Windows XP Professional, 2000 Professional and Windows 98SE operating system support
- Bluetooth technology for wireless PAN connectivity
- 2 PCMCIA slots
- Spread Spectrum wireless LAN connectivity
- 56Kb Modem (V.90)
- Video RAM, 8-48MB (shared)
- Wide range of optional components

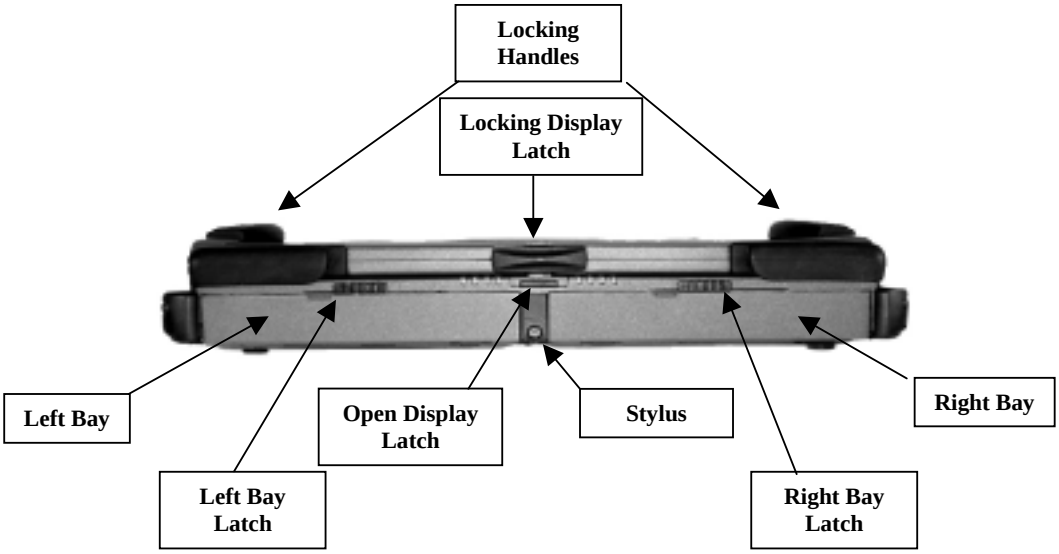
Drive Options:

- CD-ROM module
- CD-RW module
- 40 GB or 60 GB slave removable hard drive
- DVD module
- DVD/CD-RW combo
- Floppy Disk Drive module

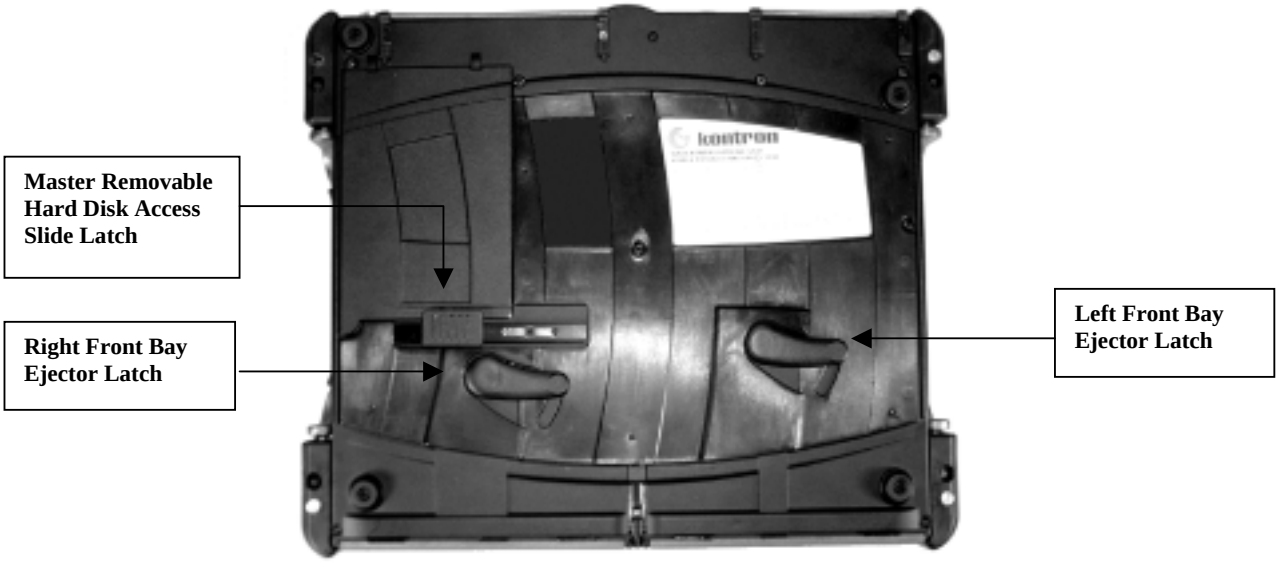
You can configure the ReVolution for almost any application, through the user-friendly Phoenix BIOS setup, outlined in the “Technical Appendices” section.

ReVolution at a Glance

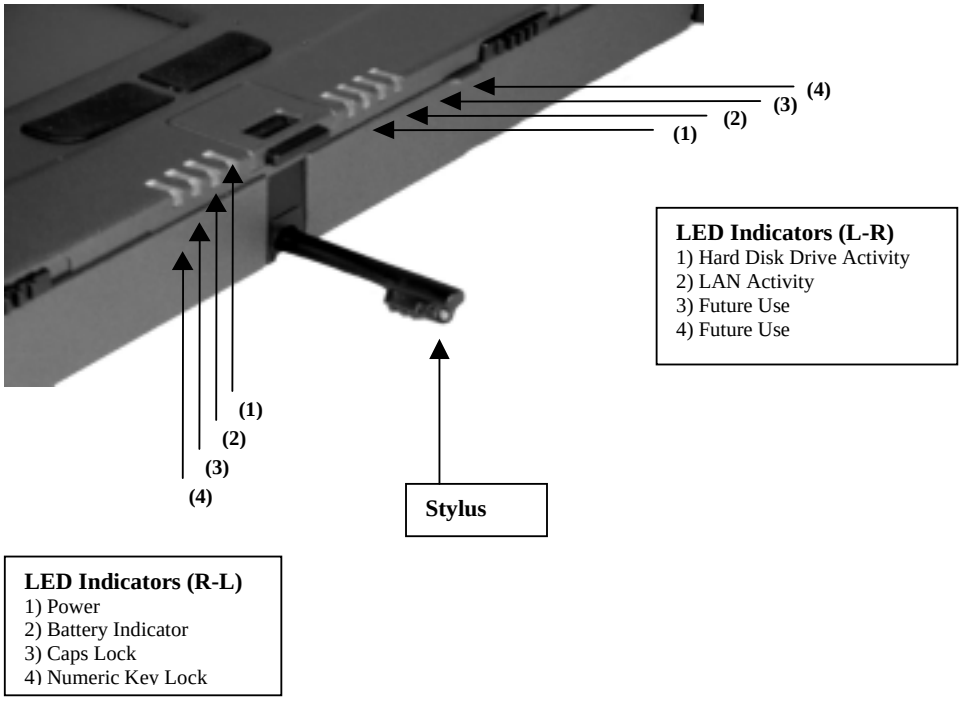
Front Panel



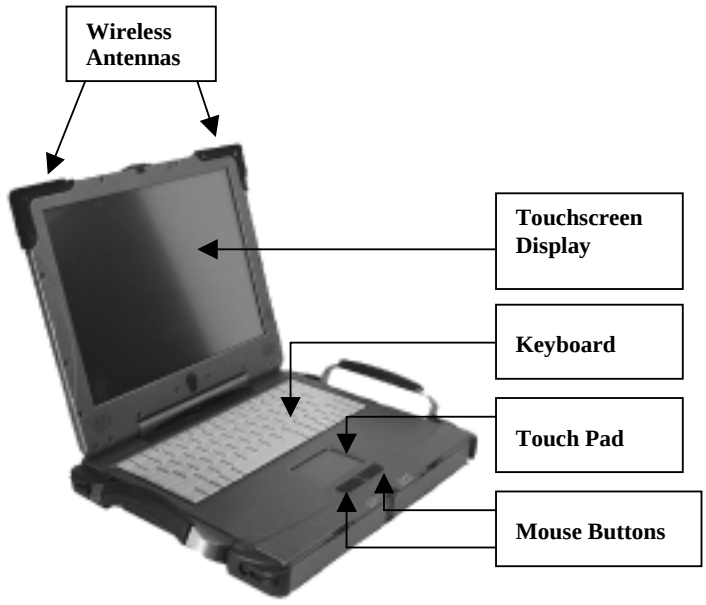
Bottom Panel



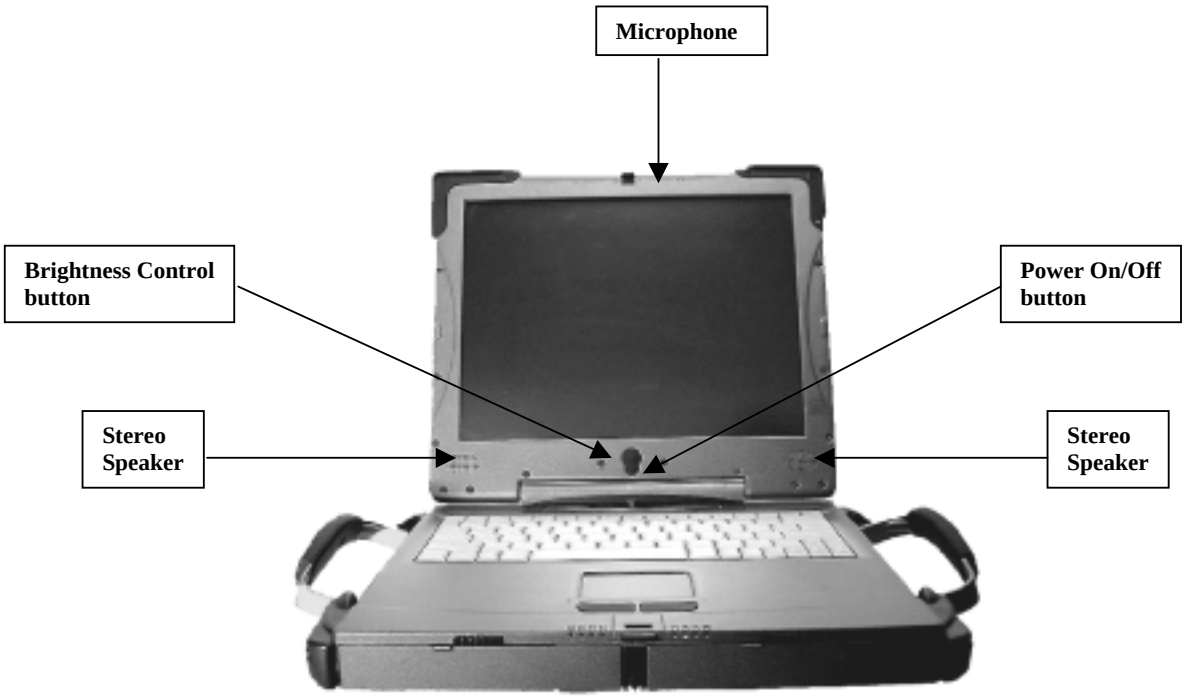
Front Panel – LEDs



Front Laptop View



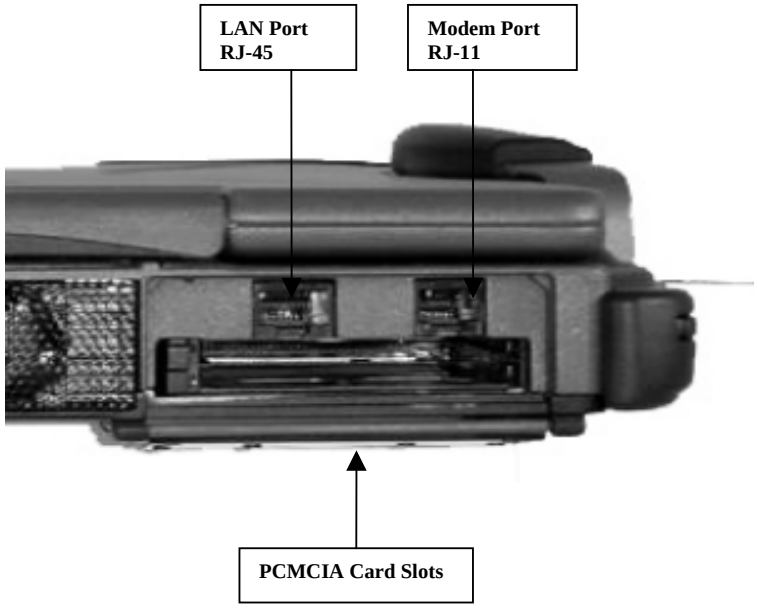
Front Laptop View (continued)



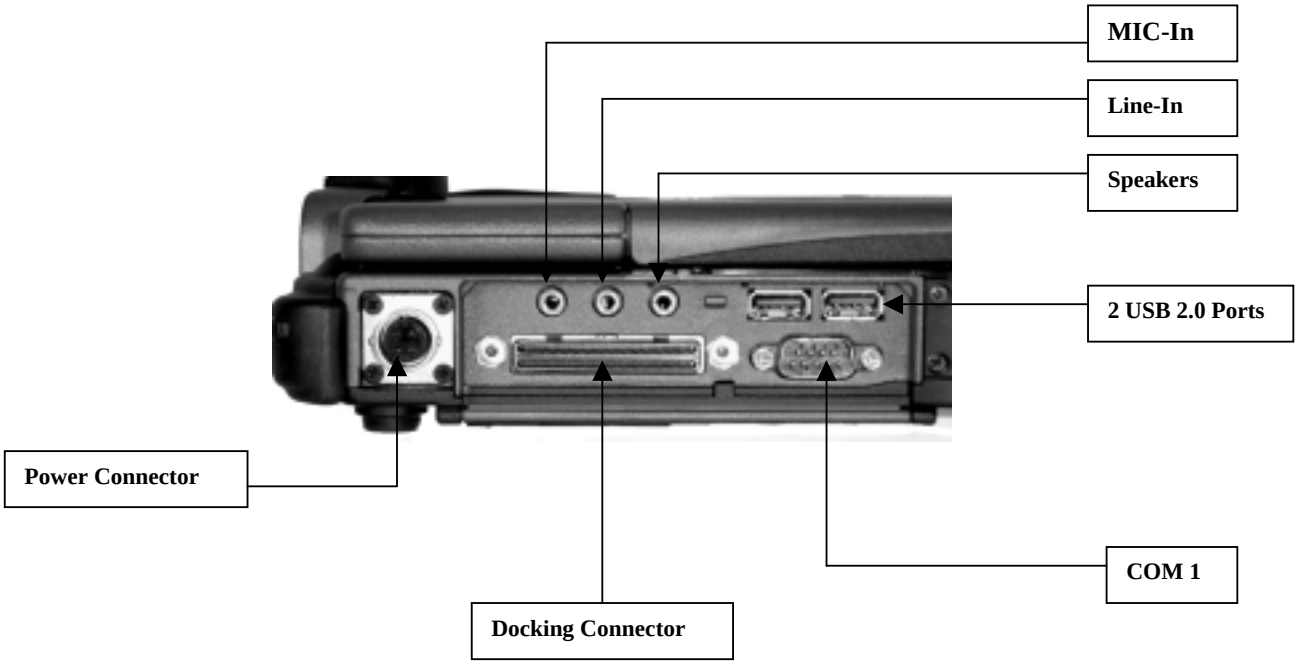
Interface Panel

The Interface Panel along the back spine of the ReVolution provides access to the ports and operating controls described on the following page.

Interface Panel – Right Side



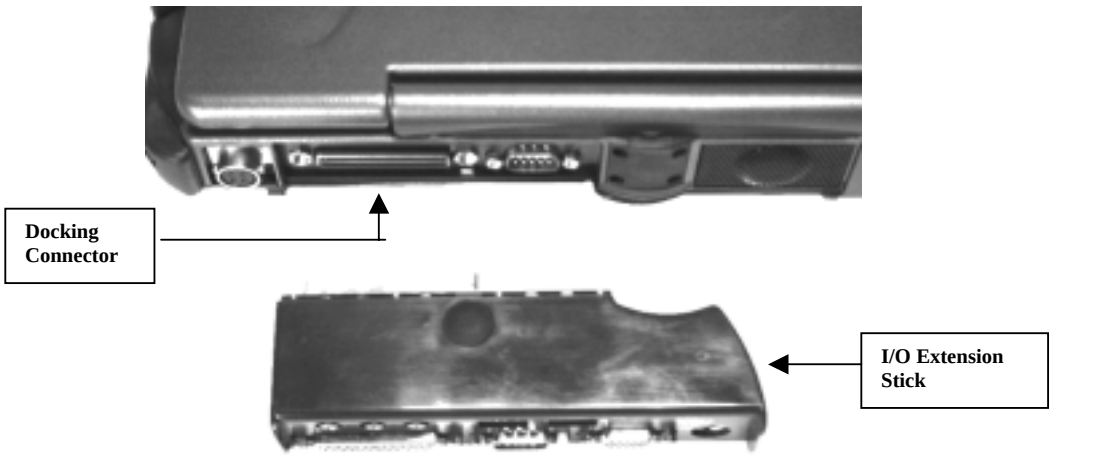
Interface Panel - Left Side

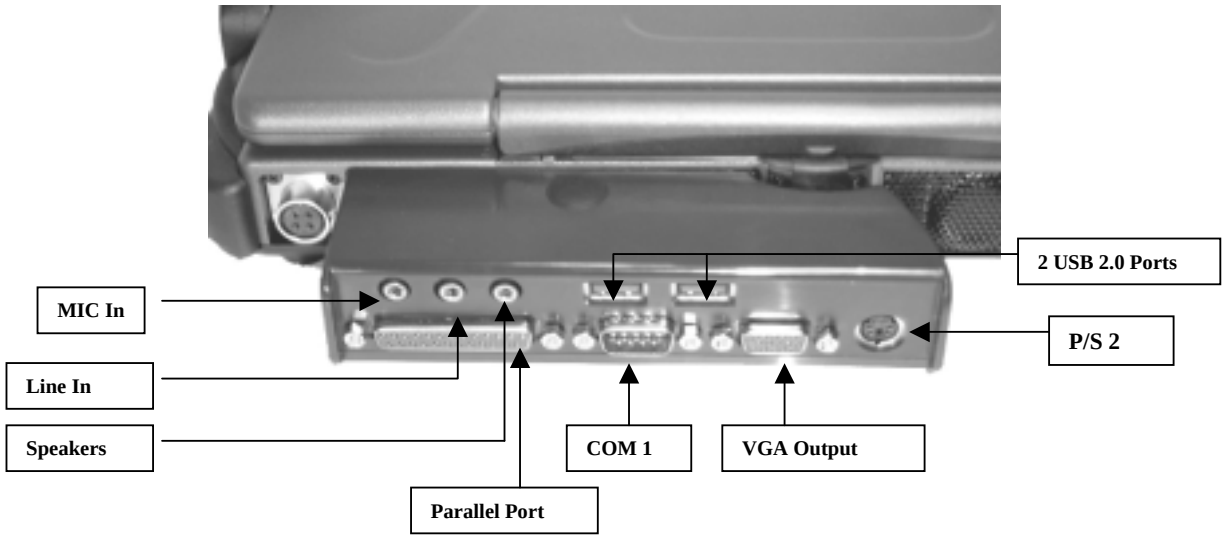


I/O Extension Stick (Port Replicator)

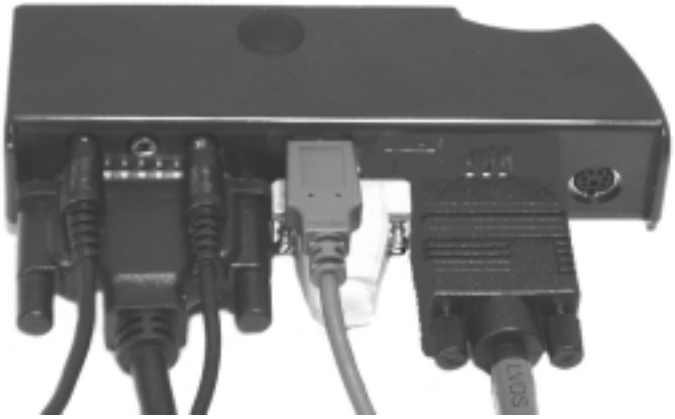
The I/O Extension Stick fits into the docking connector on the back interface panel, and provides additional I/O ports not standard on the back interface panel.

- ***If PS2 or USB devices are attached to the I/O Extension Stick, and the I/O Stick is "hotplugged" (the system is running), these devices may fail to run. The system must be rebooted. If these devices are plugged into the I/O Stick after it is plugged into the system, they will operate normally.***

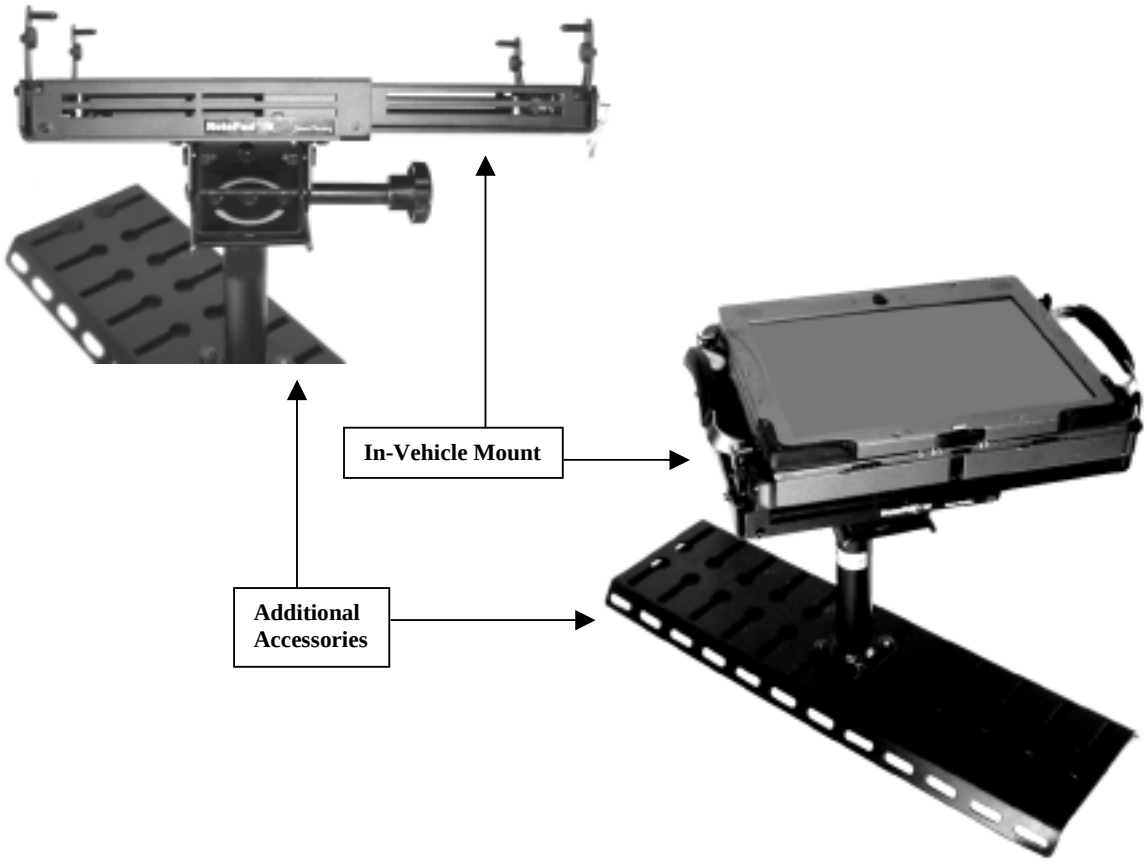




Cabled I/O Extension



In-Vehicle Mount



Other mounting solutions are also available. Contact your Kontron Mobile Computing sales representative for more information.

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Getting Started

This section describes first-time or typical start-up operations of the ReVolution system:

- ❑ Connecting to Power
- ❑ Power On and Power Off
- ❑ Battery Power
- ❑ Converting from Laptop to Tablet and Back
- ❑ Windows End-User Experience
- ❑ Accessing this *ReVolution User Manual*

Connecting to Power

The ReVolution is shipped in the "off" condition. Depending on your required range of use, you can connect the ReVolution to AC (via an AC/DC adapter) or DC power supply.

This section will detail the proper cabling requirements for your ReVolution system.

- ***Before using your system, become familiar with the components and check that everything is connected properly.***
- ***Following a proper cabling procedure will prevent a false "power on" condition, which could result in unit operational failure.***
- ***Attach the power cable last!***

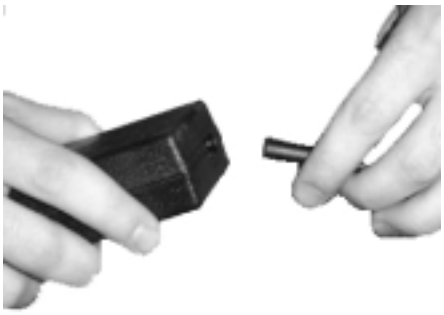
- ***The plug on the AC power cable supplied corresponds to the requirements of the country in which you purchased your ReVolution system.***
- ***To avoid accidentally disconnecting your computer, plug the AC power cable into a nearby outlet.***
- ***Allow at least 200 mm (approximately 8") between the ReVolution and the AC/DC adapter.***
- ***The AC/DC adapter must be uncovered and stand freely with at least 100 mm (approximately 4") free space around it and the ReVolution.***
- ***Do not place the AC/DC adapter on a heat-sensitive surface.***

Connecting the AC/DC Adapter

When AC is available, connect the ReVolution to the AC power supply with an AC/DC adapter, as described below.

Connect the locking DC power cord to the DC voltage socket of the ReVolution. The other end of the DC power cord connects into available DC power connector i.e. cigarette lighter.

The AC voltage socket is on the left side of the Interface panel.



Connect the female end of the AC power cord into the AC power adapter.

Plug the male end of the AC power adapter into an available wall socket.

Power On/Off Button

When pressed for ~1/2 second continuously, the system will:

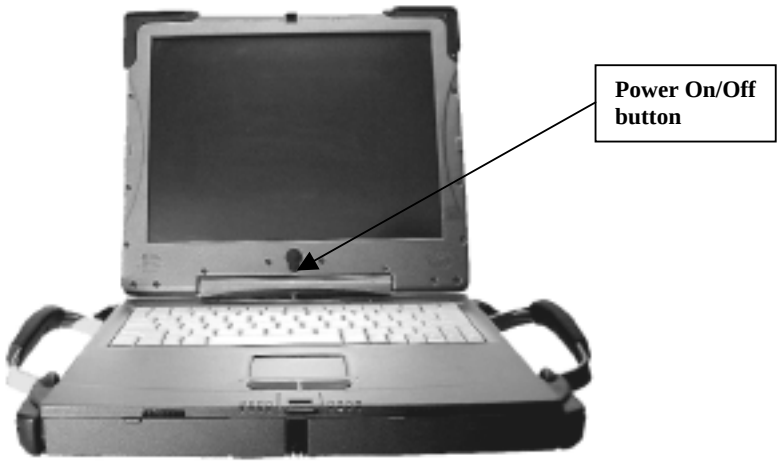
- From Off: Check for valid temperature and then turn on.
- From Suspend: Check for valid temperature and then turn on.
- From On: Initiate power off sequence.

When pressed for > 4 seconds continuously, the system: begins an override function according to the ACPI specification.

The Override Function is useful if the system becomes unresponsive. It will perform a “hard” shut down.

Power On and Power Off

The **Power On/Off** button is the lower of the two buttons located in the bottom-center of the display panel.



Turning on the System

Do not operate the ReVolution in areas sensitive to radio interference, such as airplanes and hospitals.

There is no means to shut off the Bluetooth and WLAN radios installed in the system.

Press the **Power On/Off** button for approximately 1/2 second. The computer will check for valid temperature, then turn on.

As the computer powers up, the LEDs will blink and the screen will indicate that the computer is installing BIOS and checking memory. This is the Power-On Self Test (POST). When finished with POST, a System Configuration screen shows briefly how the system BIOS is configured. To examine the configuration at length, press the **Pause/Break** key as soon as the System Configuration comes up on the display. Press **Enter** to continue. The system then loads the operating system.

The **Power Indicator LED** is the fourth light left of center. It is visible when the display is open or closed. The following table lists the various power states as indicated by the combination of flashes of the Power and Battery Indicator LEDs:

Power State	Power LED	Battery Indicator LED
OFF	OFF	OFF
On, Charging	ON	Slow Blink
Low Battery	OFF	Fast Blink
Running on battery	OFF	ON
Running on AC not charging	ON	OFF
Battery Malfunction	Fast Blink	Fast Blink
Sleep mode battery	Slow Blink	OFF
Sleep mode AC	OFF	Slow Blink

To awaken the ReVolution from sleep mode, press the Power button.

Slow blink is defined as - 0.5 Hz, 50% duty cycle, i.e. ON for one second, OFF for one second
Fast blink is defined as - 1 Hz, 50 % duty cycle, i.e. On for 500 ms, OFF for 500 ms

Never operate this computer in AC mode while standing in water. You can operate it in DC or battery mode.

If you should encounter a problem in powering up:

1. Verify all connectors are properly connected.
2. Verify your boot drive.
3. Boot your system with only the power cord connected to the computer. This is the minimum required to see if the system is working.
4. If your system still does not start after steps 1-3, contact your nearest Technical Support department for assistance. See the "Technical Support" section of this manual for contact information.

Turning off the System

Kontron recommends that you close all applications before shutting down or powering off the ReVolution.

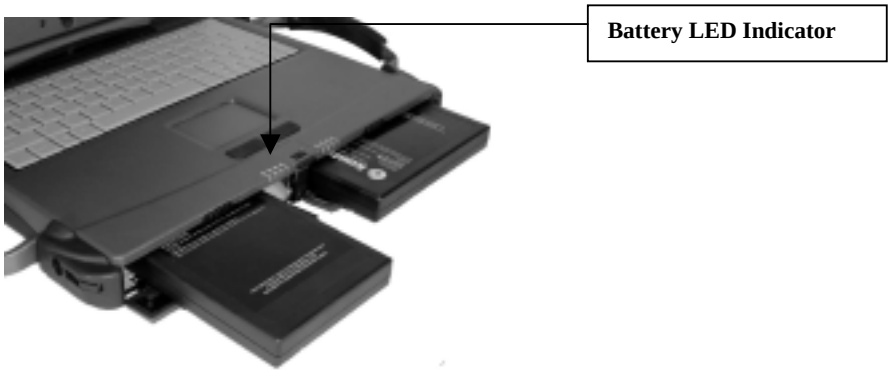
1. Follow the shut down procedures specified in the operating system manual provided with your unit.

OR

2. Press the **Power On/Off** button and hold it down for approximately 1/2 second.

Battery Power

If an AC/DC power source is not available, you can operate your ReVolution from one or two battery packs. The LED indicator for battery power is the third LED left of center.



A lithium ion battery pack is the only component that can be installed in the right front bay. It will provide approximately 3.5 hours operating time under power management.

You can insert an additional lithium ion battery pack into the left front bay to extend your computer's operating time. Together, the two batteries will provide approximately 7 hours under power management. Refer to the "Modifying the System" section for instructions on removing and inserting a battery pack, and power management information.

The **Battery Indicator LED** is the second light from the right, as displayed above. It is visible when the display is open or closed. The following table lists the various power states as indicated by the combination of flashes of the Battery and Power Indicator LEDs:

Power State	Power LED	Battery Indicator LED
OFF	OFF	OFF
On, Charging	ON	Slow Blink
Low Battery	OFF	Fast Blink
Running on battery	OFF	ON
Running on AC not charging	ON	OFF
Battery Malfunction	Fast Blink	Fast Blink
Sleep mode battery	Slow Blink	OFF
Sleep mode AC	OFF	Slow Blink

Slow blink is defined as - 0.5 Hz, 50% duty cycle, i.e. ON for one second, OFF for one second
Fast blink is defined as - 1 Hz, 50 % duty cycle, i.e. On for 500 ms, OFF for 500 ms

Converting from Laptop to Tablet and Back

Open to Laptop Position

1. Pivot both **locking handles** out and down, to free the display.
2. Press the **open display latch** while lifting the display.
3. Lift the display to vertical position for laptop mode.

Convert from Laptop to Tablet

1. Open the display to a vertical position as described above.
2. ☞ Rotate the display in **CLOCKWISE** direction 180 until the display stop-peg clicks into the receiver on the base chassis.
3. Close the display, making sure it rests between the alignment guides on the nylon corner mounts.
4. Press the **locking display latch** until it engages the latch catch.
5. Pivot the **locking handles** up and in until they engage the locking tab on the display.

Convert from Tablet to Laptop

1. Pivot both **locking handles** out and down, to free the display.
2. Press the **open display latch** while lifting the display.
3. Open the display to a vertical position.
4. Rotate the display in counter-clockwise direction 180 until the display stop-clicks into the receiver on the base chassis.
5. Adjust screen to desired viewing angle.

Close from Laptop Position

1. Pull display down toward the keyboard.
2. Hold in position.
3. Press **locking display latch**.
4. Release pressure on display.
5. Pivot both **locking handles** up and inward until they engage the locking tab on the display.

Windows Set-up

The first time you power on your ReVolution, a series of screens will inform you of operating system setup options and prompt you for personal preferences. Simply follow the onscreen instructions to finish the setup of your operating environment.

Accessing the User Manual

To view or obtain additional copies of this *ReVolution User Manual*, you may:

1. Insert the ReVolution Utility CD that came with the original shipment of your ReVolution computer. This CD contains an electronic copy of the manual.
2. Go to www.kontronmobile.com. Select the following path: Technical Support →Technical Search→Manual.
3. Call or write the Kontron Technical Support department to order additional hard copies. Contact information is located on the Technical Support page.

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Modifying the System

This section describes how to use and adjust the components and devices of the ReVolution. You will find instructions for removing and inserting the following components:

- Alternative Display
- Battery Pack
- Hard Disk Drive-Master
- Left Bay Modules (CD-ROM, Floppy Disk Drive, etc.)
- PCMCIA Cards
- Shoulder Straps

You will find information about the following devices in this section:

- Audio
- Chipset
- LAN
- Modem
- Touchscreen
- Touch Pad
- USB 2.0
- Video
- Wireless 802.11b
- Wireless Bluetooth
- CD-ROM
- DVD
- Power Management Modes
- Volume Level

You can find device drivers for operating systems such as Microsoft Windows on the ReVolution Utilities CD shipped with the unit. Occasionally there will be special instructions on how to properly install a device driver. These instructions are stored in the directory of the device driver in a text file for your reference.

Drivers on the ReVolution Utilities CD include:

- Audio
- Chipset
- LAN
- Modem
- Touchscreen
- Touch Pad
- USB 2.0
- Video
- Speed Step
- Wireless 802.11b
- Wireless Bluetooth

Alternative Display

For some applications, you may want to use an additional SVGA monitor. To connect an SVGA display to your ReVolution, you must use an optional I/O extension stick (port replicator).

Battery Packs

The right front bay only accepts a lithium ion battery pack that will provide approximately 3.5 hours of operating time. This bay contains the main or primary battery source. This section describes how to remove a battery pack from, and insert one into, the right front bay. Refer to the **"Left Bay Modules"** section for information on removing and inserting an additional or secondary battery pack into the left bay. Refer to the **"Power Management Modes"** section for more information on battery operations.

- ***The photograph above shows the angles at which you insert a battery into the right bay and left bay.***
- ***Insert a battery into the right bay sideways, with battery label facing up and a set of the battery contact points facing away from you and positioned in the front LEFT portion of the battery pack.***
- ***Insert a battery into the left bay length-wise, with battery label up and a set of battery contact point facing away from you and positioned in the front RIGHT portion of the battery pack .***
- ***If two batteries are inserted and both are charged, the computer can be on when you remove or insert one or the other of the batteries.***
- ***If two batteries are used during operation, the system is designed to deplete the "secondary" or Left Bay battery first.***

Removing Battery from Right Bay

•Open door of right front bay.
•Turn unit over.

•Push ejector latch forward.
•The battery pack ejects.

Inserting Battery into Right Bay

To insert a battery into the right front bay:

- Open the right bay door.
- Insert a battery into the right bay sideways, with battery label facing up. A set of the battery contact points facing away from you and positioned in the front LEFT portion of the battery pack.
- Align the latch post at the bottom of the battery with the receiving slot on the bottom of the bay.
- Carefully slide the battery into the bay until it locks into place.
- Close and lock the door.

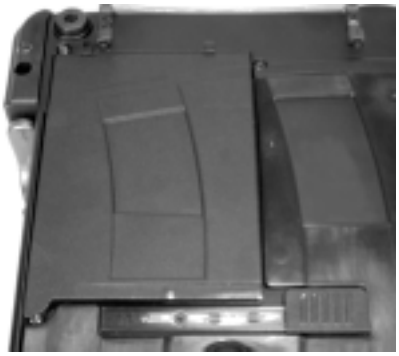
- ***The system will notify you when the main power source has been lost, and the unit is running on battery power. When the system is running on battery power, the computer will sustain approximately 3.5 hours of operating time.***
- ***The system will monitor the presence of external input voltage and the battery pack voltage. It will begin to charge whenever it detects a low battery voltage condition and stop charging when one or both batteries are fully charged.***
- ***The system charges one battery at a time, charging the left battery fully, then the right battery.***
- ***Charge time with system power off takes up to 3.5 hours per battery. With system power on, charge time takes up to 7 hours per battery.***
- ***For faster battery charging, Kontron recommends the optional external battery charger listed in the "Base Unit and Optional Parts" section of this manual.***

Hard Disk Drive - Master

The ReVolution comes standard with a master removable hard disk drive, located inside the bottom panel. An upgrade to 60GB is available. The following two series of photographs demonstrate how to remove and insert a hard disk drive module.

☞ • ***Turn off the computer before removing or inserting the hard disk drive module.***

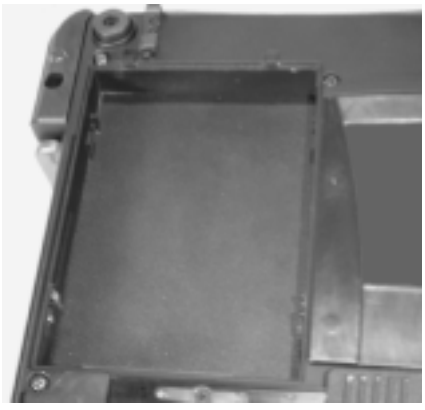
Removing a Hard Disk Drive (HDD)



• Make sure all module doors are closed.
• Lay unit on its top.
• Push slide latch to right
• Remove door.

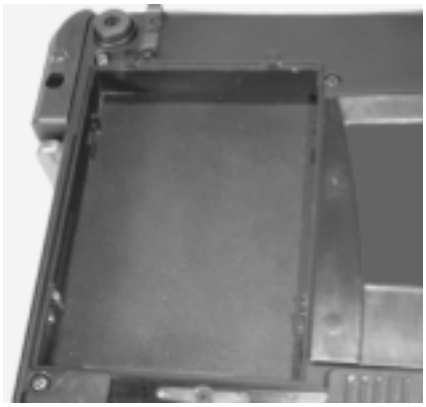
• Lift handle on HDD module to 90° angle.

• Slide module back until it disengages from connector.
• Lift module straight up.



• Remove module from bay.

Inserting a Hard Disk Drive (HDD)



- **Close top display so only metal is exposed.**
- **Lay unit on its top.**
- **Push slide latch to right.**
- **Remove HDD door.**

- **Lift handle on HDD module up to 90° angle.**
- **Align posts on sides of module with receiving slots in HDD bay.**

- **Push module down until it reaches bottom of the bay.**
- **Pull forward until it fully engages HDD connector.**
- **Press handle back down. The module must be fully engaged with the connector for the handle to fit down.**

- **Replace HDD module door.**

- **Move slide latch left until it reaches stop point.**

Left Bay Modules

The left front bay of the ReVolution accepts the following modules:

- CD-ROM
- CD-RW (read-write)
- Floppy Disk Drive
- DVD
- DVD/CD-RW Combo
- Slave Hard Disk Drive
- Battery Pack

All these modules can be inserted and removed from the left bay in the same manner, as demonstrated below. The computer can be on when performing these functions. However, if the modules are not in the bay when the system is started, the system will not recognize them if added or swapped while the system is running. You will have to reboot for the system to detect the module.

CD-ROM, CD-RW, DVD and DVD/CD-RW Modules

☞

- ***Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.***

☞

- ***The laser beam used in any laser equipped drive unit can be harmful to the eyes. Never look directly at the laser read head while changing discs.***

☞

- ***Use discs that bear the COMPACT DISC logo.***
- ***Handle discs by their edges.***
- ***Store discs in their cases to minimize dust, contamination, scratches, bending or other damage.***
- ***Periodically wipe each disc with a soft, dry cloth, gently rubbing outward from the center.***

☞

DO NOT:

- ***Expose computer to a sudden impact or excessive vibration.***
- ***Touch the bottom surface of the disc.***
- ***Bend a disc.***
- ***Write on a disc with a hard object, such as a ballpoint pen or pencil.***
- ***Affix any label directly on a disc.***
- ***Expose discs to direct sunlight.***
- ***Store discs in areas subject to high temperatures or humidity.***
- ***Use fluids such as Benzene, record cleaning fluid, or anti-static fluid, that can damage the drive mechanism or lens.***

Removing any Left Bay Module

- **Push ejector latch forward.**
- **The module ejects.**
- **Remove module carefully and place it in a safe, clean location.**

Inserting any Left Bay Module

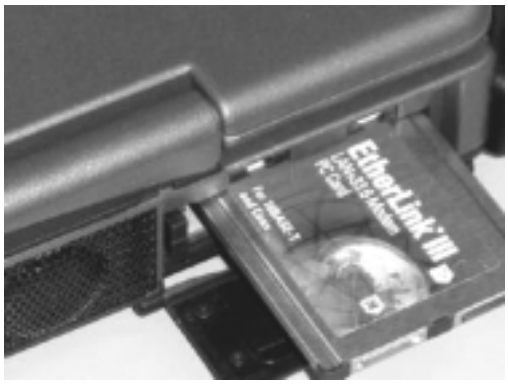
To insert any of the modules listed above:

- Place the computer right-side up.
- Open the door of the left front bay.
- Align the latch post at the bottom of the module with the receiving slot on the bottom of the bay.
- Carefully slide the module into the bay until it locks into place.

☞ • ***Align the groove on the battery bottom with the guide in the bay to insert properly.***

PCMCIA Cards

Two PCMCIA slots on the back interface panel accept two Type II PC Cards or one Type III PC Card. You can insert and remove the cards while the computer is on.



To insert a PC card, carefully slide the card right-side up into one of the card slots until the card clicks.

To remove a card from the top card slot, press the top card ejector button.
To remove a card from the bottom card slot, press the bottom card ejector.

- ***The peak power consumption of each of the PCMCIA slots may not exceed 3.3 Watts Peak (600 mA at +5 V).***
- ***Follow the card manufacturer's instructions in the PC Card documentation.***
- ***Do not force a PC Card into or out of the slot.***
- ***Prevent external debris from entering the slot.***
- ***Make sure that the PC cards all have the legally prescribed approvals (e.g. IEC/EN 60950).***
- ***The ReVolution has an extended temperature range. This might be not the case with your PC Card. Please note that the operating temperature range could be decreased for the whole system depending on the manufacturer's recommended temperature range for the PC card that you want to use.***

Shoulder Straps

All four corners of the ReVolution have a catch on which to attach a shoulder strap. Choose the two corners most comfortable for you. The following photographs display how to attach the two ends of the strap to the computer.

• **Extract the recessed catch from the corner.**

• **Attach the hook end of the shoulder strap to the catch.**
• **Repeat steps one and two with another corner.**

The shoulder strap attaches to any two of the four corners.

Audio

The audio system is made up of an AD1881A, which meets the Audio Codec '97 2.0 and 2.1 Extensions. The main architectural features of the AD1881A are the high-quality analog mixer section, two channels of ΣΔ ADC conversion, two channels of ΣΔ DAC conversion with Data Direct Scrambling (D^2S) rate generators.

The audio system has three 3.5 mm diameter jacks: a microphone input, speaker output and line in.

- The **Microphone Jack** allows you to receive monophonic input from an external microphone.
- The **Speaker Output Jack** allows you to directly drive external speakers at 1W.
- The **Line-In Jack** allows you to receive stereo line-level audio input from an external source.

This audio system enables you to enjoy various multimedia audio features. This audio chip provides the following features and more:

- Recording and playing back of PCM and WAV files in 8-bit or 16-bit format.
- Sampling of various rates from 8 KHz to 48 KHz for the WAV file.
- Playback of MIDI files through an FM synthesizer.
- Recording from various sound sources, such as an integrated microphone, an external microphone, or an audio device attached to the line-in jack.

Volume Level

The ReVolution will adjust the speaker output level when you change the **volume slider** on the Windows task bar or press the **volume up/down** function keys.

CD-ROM, CD-RW, DVD and DVD/CD-RW Combo Module Drives

- ***All these modules can be inserted and removed from the left bay in the same manner. The computer can be on when performing these functions. However, if the modules are not in the bay when the system is started, the system will not recognize them if added or swapped while the system is running. You will have to reboot for the system to detect the module.***

Software Installation- CD writer

With the CD-RW drive module installed in the ReVolution, you can record using CD-R(CD-Recordable) or CD-RW (CD-ReWritable) discs. Types of files you can record are backup files, pictures and movies, or your own creation of audio files. Easy to use CD recording software is included with the CD-RW drive.

For more information, refer to the CD-RW software provided with the drive package.

Software Installation - DVD player

With the DVD drive installed in the ReVolution, you can play DVD movies. Easy to use DVD software is included with the DVD drive.

For more information, refer to the DVD software provided with the drive package.

Chipset

The ReVolution uses the Intel 830M and ICH3 chipset. This chipset incorporates the Video, IDE, USB, and AC97 sub-systems. Specialized operating system drivers are located on the utilities CD shipped with your ReVolution and must be installed to maximize the performance of this chipset. If you ordered your ReVolution with an operating system pre-installed you will not need to install these drivers, these drivers are installed for you at the factory.

Driver Installation: Chipset

The Intel chipset driver is installed at the factory for your ReVolution. If special instructions are available for driver installation for the chipset, you will find these instructions in the directory that contains the driver.

Driver Installation: Application Accelerator

The Intel Application Accelerator software is designed to improve hard drive interface performance. Review the documents in the application accelerator directory on the CD or on Intel's web site to learn more about the details of this software.

LAN - Embedded

The built-in network feature allows you to connect your computer to an Ethernet-based (10/100) Mbps) network via the RJ-45 jack. To use the network feature, connect an Ethernet cable from the network jack on the rear of the computer to a network jack or hub on your network.

Modem

Via the RJ-11 on the back interface panel, you have access to a PCI V.90/K56flex modem. This modem design is based on Lucent Technologies L56xMF (Mars II) PCI bus host-based modem controller chip set. This chip set has a high level of integration with the advantage of letting the DSP perform MIPS-intensive operations, such as V.90 and K56flex, while consuming the host with less MIPS-intensive functions, such as V.42bis.

This modem includes data, fax and TAM (telephone answering machine) functions. It complies fully with Microsoft's PC98 and PC99 requirements, and supports both APM and ACPCI power management.

The DAA of this modem is designed to comply with the regulations of the following countries:

- -America: US, Canada
- -Asia: Japan, Malaysia, Singapore, Hong Kong, Australia, New Zealand
- -Europe: CTR21 - 18 European Countries:

  Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland, Netherlands and UK.

You can use the built-in modem only on a public-switched telephone network (PSTN). You cannot use a private branch exchange (PBX) or some other type of digital telephone extension line. If you connect the built-in modem to a line other than PSTN, an error message appears, preventing you from using the line. If you are not sure which kind of phone line you are using, contact your telephone company.

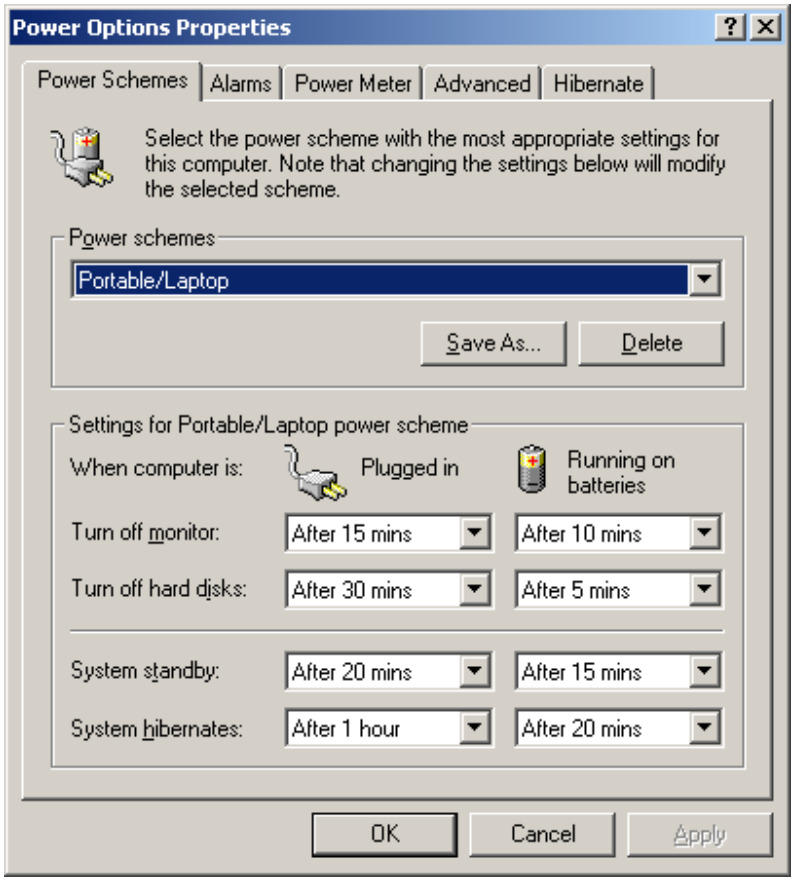
Power Management Modes

Windows

Your ReVolution will manage power consumption while running the Windows operating system, based on the settings in Windows Control Panel power options. To maximize battery run-time, be aware of the settings affecting power consumption. In addition to Control Panel power options, the following items can influence battery run time:

- LCD backlight level
- Intel Speed Step mode
- Wireless network settings

Set the power management properties for your application in Windows Power Options.



If you are running an operating system that does not fully support power management (APM or ACPI), such as Legacy, you can set basic power management features in BIOS setup. Refer to the **"Phoenix BIOS Setup"** section in this document for these settings.

Battery Operations

The right bay battery is the primary battery source and is identified as battery number 1. The left bay battery is the secondary battery source identified as battery number 2. Using two or more batteries will allow you to swap charged batteries into the module bays for extended portable operation.

Single battery operation

The ReVolution running on a single battery will deplete battery charge until an alarm level is met then trigger the action set for that alarm. Set the alarm level and action in Power Options in Windows Control Panel.

Stand-by battery operation

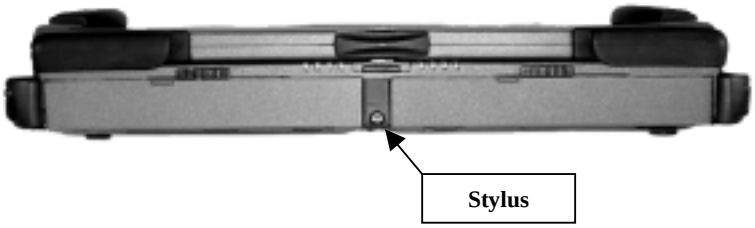
When running the ReVolution with two charged batteries, the secondary battery will be depleted first. The primary battery will power the ReVolution when the secondary battery is empty, keeping the ReVolution running as a stand-by battery. Replace the depleted secondary battery with a charged battery to resume powering the ReVolution on the secondary battery.

Alternate battery operation

Place a battery in either bay and run the ReVolution until a low battery message is displayed. Place a charged battery in the remaining open bay to continue operation and remove the discharged battery.

Touchscreen

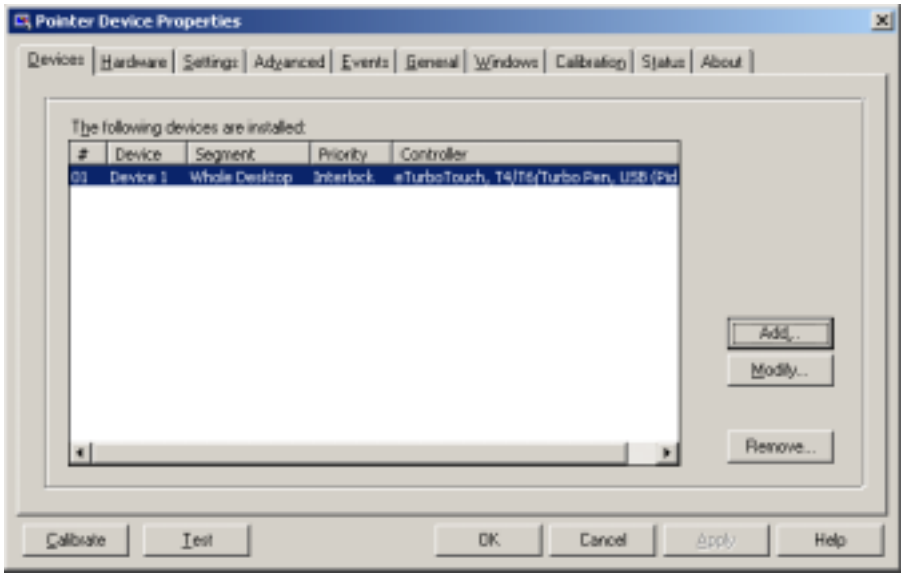
Your ReVolution is designed with a resistive touch screen that acts as a mouse pointer. Use the provided stylus for best results.



User Settings

Multiple behavior settings are available for the touchscreen. Your preferences may differ from the default settings for interacting with screen objects. You can change these settings by:

- Running the touchscreen property sheet from the **Start-Programs-UPDD-Settings** menu,
- Clicking on “Pointer Device Settings” in the system tray, or
- Running “Pointer Devices” in Windows Control Panel. The following screen will appear.



- Navigate the **Settings** and **Advanced** tabs to adjust click responsiveness.
- Select the **Events** tab to program the mouse event that executes when touching the screen.
- The **Windows** tab provides double-click settings and a test area to try your new settings.
- Click the **Help** button if you need more information.

Driver Installation

The driver for your touchscreen is loaded at the factory when you order a Microsoft Windows operating system. If you need to reload the driver, use the ReVolution Utilities CD included with your unit.

Calibrate

The ReVolution touchscreen is calibrated at the factory. Run the calibration routine when an alignment problem exists between the mouse pointer and the stylus contact location on the screen. You can adjust the calibration of the touchscreen by running the program at **Start-Programs-UPDD-Calibrate**. Carefully touch the location of the markers with your stylus to recalibrate the touch screen.

After calibrating the ReVolution touchscreen you can test the alignment by pressing the **Test** button to view the tracking accuracy.

Touch Pad

The built-in touch pad is a PS/2-compatible pointing device that senses movement on its surface; the cursor responds as you move your finger on the surface of the touch pad. The central location on the palm rest provides optimal comfort and support.

Touch Pad Basics:

1. Move your finger across the touch pad to move the cursor.

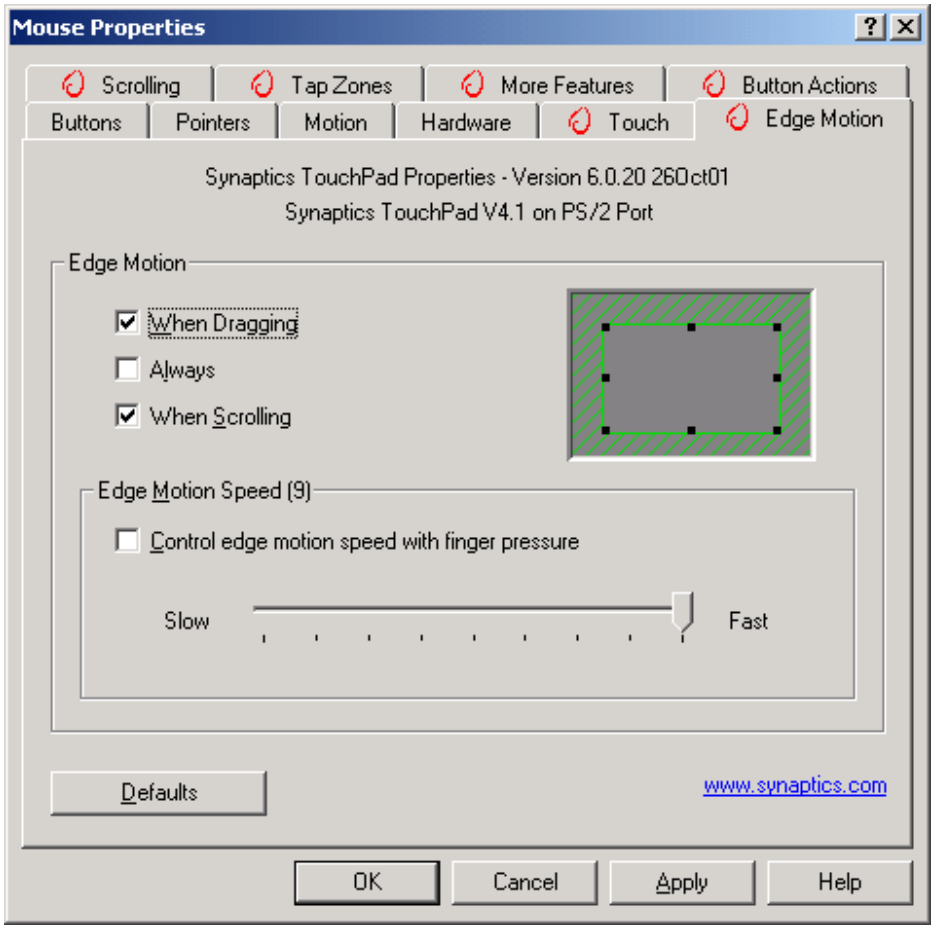
2. Press the left and right buttons located on the bottom edge of the touch pad to select and execute. These two buttons are similar to the left and right buttons on a mouse. Tapping on the touch pad produces similar results.

Function	Left Button	Right Button	Tap
Execute	Click twice quickly		Tap twice (at same speed as double-clicking a mouse button)
Select	Click once		Tap once
Drag	Click and hold, then use finger to drag the cursor on the touch pad		Tap twice (at same speed as double-clicking a mouse button), then hold finger to the touch pad on the second tap and drag the cursor.
Access Content Menu		Click once	
Scroll			

Note: Keep your fingers clean and dry when using the touch pad. Also keep the touch pad dry and clean. The touch pad is sensitive to finger movements. Hence, the lighter the touch, the better the response. Tapping harder will not increase the touch pad's responsiveness.

Change the behavior of the touch pad by adjusting the Mouse Properties in the Microsoft Windows Control Panel, displayed on the following page. For additional touch pad control, load the touch pad driver found on the ReVolution Utilities CD included with your unit.

Special touch pad features allow greater control of touch pad usage. Familiarize yourself with these features on this screen.



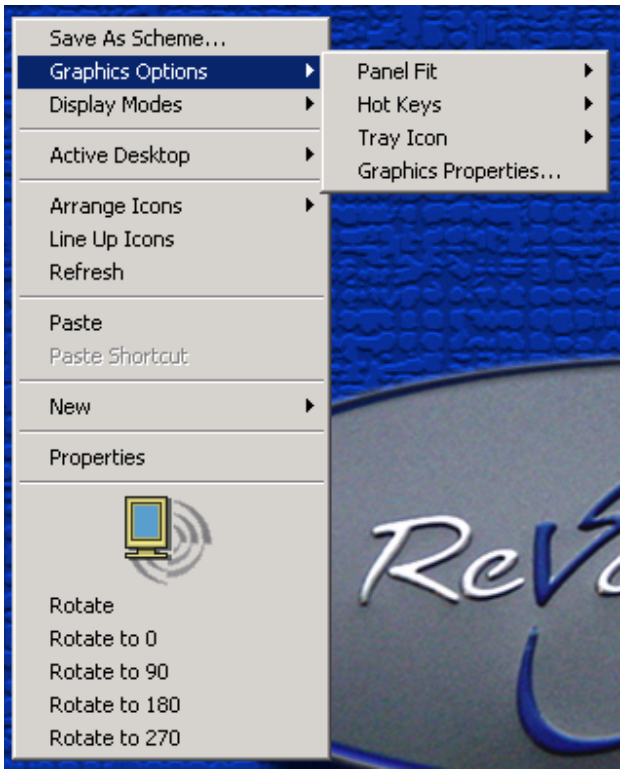
USB Ports

Driver Installation

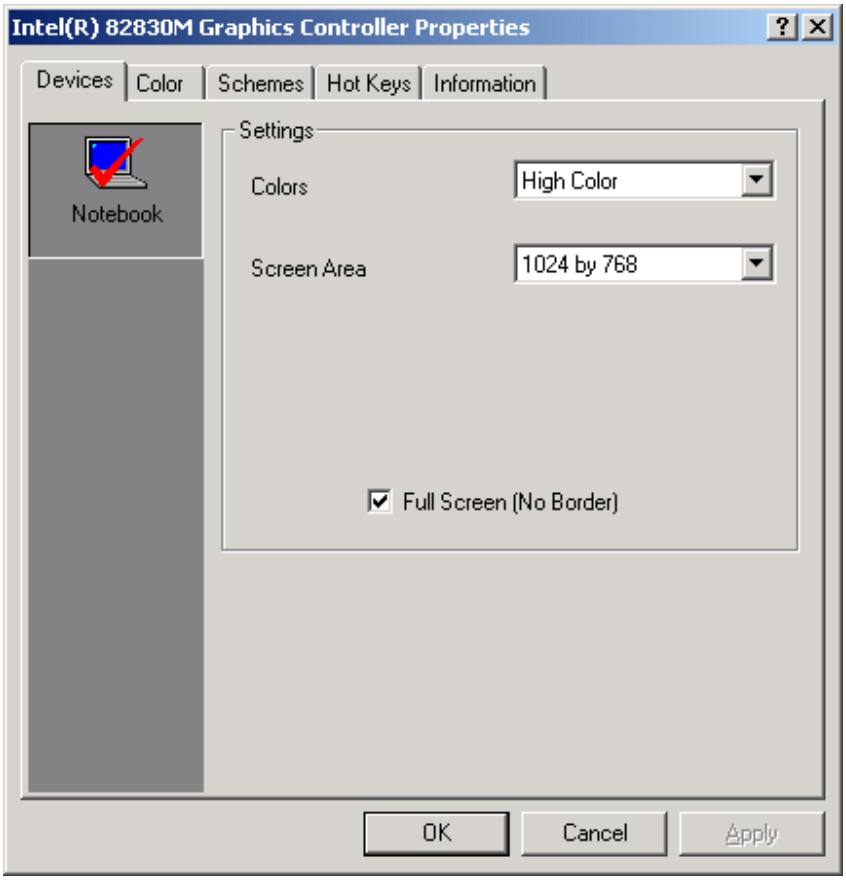
The ReVolution is designed with a USB 2.0 compliant controller that requires an operating system driver to exploit its capabilities. The driver is preinstalled at the factory and a backup of the driver is on the ReVolution Utilities CD delivered with your system.

Video

The ReVolution is designed with the Intel i830M grapics and memory ccontroler (GMCH). You can control the video system through the Microsoft Windows Control Panel. You can also gain quick access to video options by clicking the Intel Graphics Technology icon in the system  tray or by right clicking on the desktop, as follows.



The Graphics Controller property sheet through the Windows Control Panel allows you view and change device color depth, resolution, color correction, display schemes, and hot keys.



Driver Installation

Browse the ReVolution Utilities CD to locate the video driver installation. Intel frequently updates the graphics drivers for i830M. Download this driver from www.intel.com.

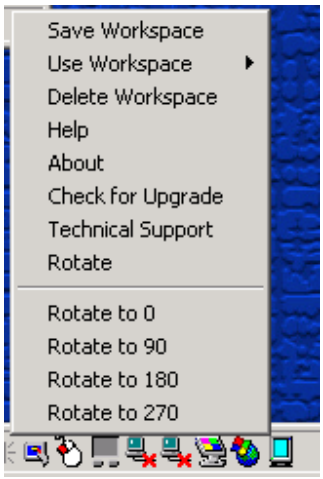
Video Rotation

The ReVolution can change the orientation of the display image in four degrees of rotation. Rotating the screen can be useful when running the ReVolution in tablet mode, to suit your workspace. The normal orientation when in laptop mode is zero degrees. You may want to switch to 90 or 270 for a “Portarit” display or simply flip the screen by setting 180 rotation. There is three ways to change screen rotation. Use the system tray icon, right click on the desktop, or use the hot keys.

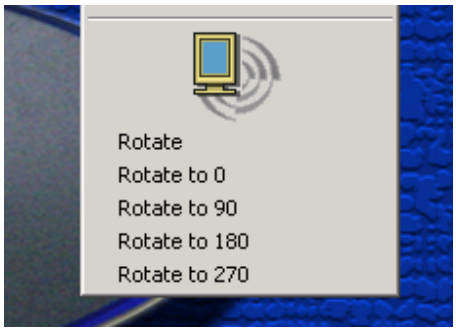
Hot Key Rotation:

To rotate your screen's image press <Control> + <Shift> and hit the <R> key.
Rotate to 0 press <Control> + <Shift> and hit the <0> key.
Rotate to 90 press <Control> + <Shift> and hit the <9> key.
Rotate to 180 press <Control> + <Shift> and hit the <8> key.
Rotate to 270 press <Control> + <Shift> and hit the <7> key.

Task Bar Rotation



Desktop Rotation:



Wireless - 802.11b (WLAN)

Do not operate the ReVolution in areas sensitive to radio interference, such as airplanes and hospitals.

There is no means to shut off the Bluetooth and WLAN radios installed in the system.

The integrated Wireless LAN (WLAN) device in the ReVolution is an 802.11b wireless network card that is attached to the computer via a mini-PCI slot.

The main characteristics include:

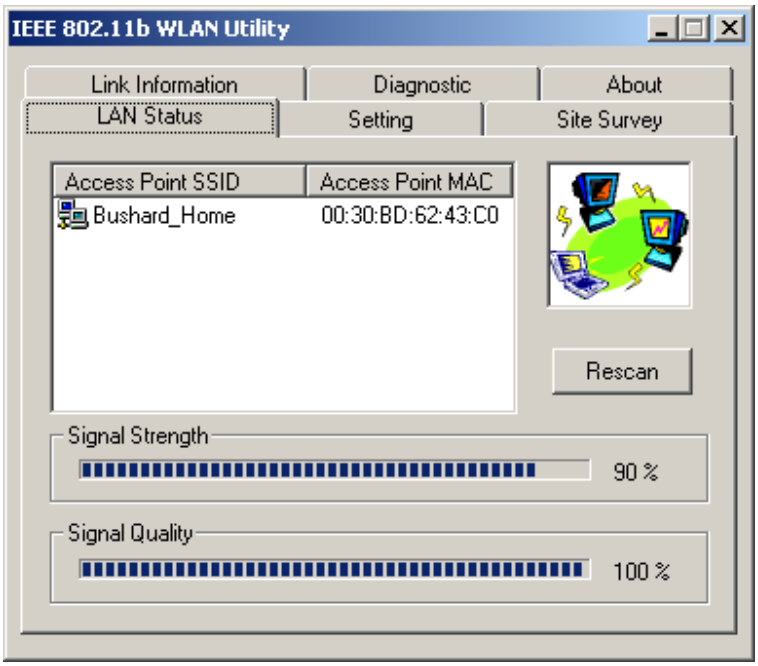
- Operating frequency in the 2.4 GHz band.
- Compliance with WECA Wireless Fidelity (Wi-Fi) testing standard and ability to communicate up the maximum transfer rate of 11 Mbps.
- Maximum range of about 105 Meters.

This device provides a plug-and-play seamless connectivity to all network resources, and Internet access at up to 11 Mbps. No cables are necessary to run, just an access point. It provides a high-speed connectivity at up to 11 Mbps over an extended operating range. It automatically falls back to 5.5, 2, and 1 Mbps. It is compliant with IEEE 802.11b standards which also assures compatibility with other 802.11b compliant devices and networks.

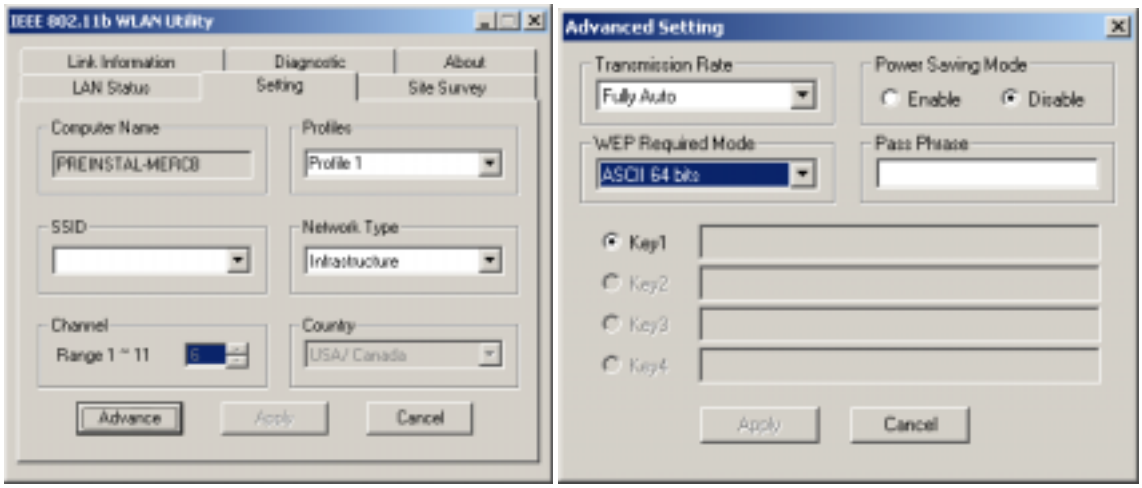
Frequency Range:	2.4 GHz to 2.4835 GHz
Typical outdoor operating range	30 M @ 11 Mbps 50 M @ 5.5 Mbps 100 M @ 2 Mbps 105 M @ 1 Mbps
Modulation Technique:	DSSS(Direct Sequence Spread Spectrum) with BPSK (1Mbps), QPSK (2Mbps), and CKK(5.5 and 11 Mbps)
Channel Support	US/Canada: 11 (1 ~ 11) Major European Country: 13(1 ~ 13) France: 4(10~13) Japan: 14(1 ~ 13 or 14th)

Driver

The software for the WLAN allows you to view and set the connection to other 802.11b devices. Run this utility by navigating to Start-Programs-IEEE 802.11b MiniPCI Utility in Windows 2000 or Windows 98. The following screen will appear. When running Windows XP go to Device Manager.



To secure transmissions with an 802.11b device that has WEP enabled, set a pass phrase or key on the Advanced Setting window.



Wireless - Bluetooth

Do not operate the ReVolution in areas sensitive to radio interference, such as airplanes and hospitals. There is no means to shut off the Bluetooth and WLAN radios installed in the system.

For PAN environments, Bluetooth provides freedom from wired connections. By using this radio-based link, computers, mobile phones, PDA and other portable handheld devices are able to transmit data to each other or connect to Internet without a single cable.

While the possibilities are nearly endless for the applications of the technology, some of the current capabilities include:

- Eliminating the need for wired connections between electronic products and accessories such as a keyboard, mouse, headsets, printers, other computers;
- Exchanging files, business cards, calendar appointments, etc. with groups of Bluetooth users;
- Transferring and synchronizing files between devices;
- Connecting to localized content services in public areas;
- Functioning as remote controls, keys, tickets and e-cash wallets.

The Bluetooth wireless technology and Wireless LAN (802.11b) are complementary technologies. The Bluetooth wireless technology is designed to replace cables between cell phones, laptops, and other computing and communication devices within a 10-meter range. Wireless LAN is wireless Ethernet; it provides an extension or replacement of wired networks for dozens of computing devices.

Issues do arise with the coexistence of both Bluetooth and Wireless LAN. Any time devices are operated in the same frequency band, there is the potential for interference which results in a lower bandwidth

This device has a maximum range of about 10 meters, depending on the environment. The maximum data transfer rate is 1.0Mbps. This is a Class 2 device with a typical Tx power of 0 dBm. The operating frequency range is 2.402 GHz to 2.480 GHz with a channel spacing of 1 MHz.

Technical Data

ReVolution

Main Specification

Processor	Intel Mobile Pentium® III-M 1.06 GHz or higher
Main Battery	Lithium Ion battery - 57 Watt, 3.5 hour life (approximate)
BIOS:	PhoenixBIOS 4.0, Release 6
RAM:	128 MB SDRAM standard
L2-Cache	512KB
Keyboard:	Full-size QWERTY keyboard with 84 keys (USA Standard)
Interfaces:	1x Power Connector with 10-28 VDC, 4.6 Amps 1x Serial Port (COM 1) 2x USB 2.0 Ports Docking connector 1x RJ11 56K V.90 Modem 1x RJ45 10/100Mbs Ethernet/LAN Audio phonejacks: 1x MIC-In 1x Line-In 1x Speaker-Out Integrated: 802.11b WLAN, Bluetooth PAN
Hard Disk Drives:	40GB primary removable hard drive standard – upgradeable to 60GB 40GB secondary, optional removable hard drive – upgradeable to 60MB Call Technical Support or your Sales Representative for other available options.
PCMCIA:	Card BUS connector provides two open PC Card slots that accommodate two Type II, or one Type III PCMCIA device.
Graphics Controller:	Integrated Direct AGP Graphics Core frequency up to 166 MHz 350 MHz RAM DAC Video-RAM: 8 to 48 MB of Dynamic Video Memory (shared) Up to 32 MB with 128 MB RAM; 48 MB with 256 MB RAM
Pointing Device:	Touch Pad on the keyboard, Touchscreen on the display
Power specification	10-24 VDC
AC adapter:	Input: 90-264 VAC, 50-60 Hz; Output: 12V, 55W
RTC/CMOS Battery	Rechargeable LIon real-time clock/CMOS battery on main board. Not user-serviceable.

Mechanical Specification

Dimensions:	
Width	12.8" (326 mm)
Depth	10.25" (261 mm)
Height	2.125" (54 mm)
Weight:	8 lbs. with one battery module installed.
Chassis:	Rigid, lightweight magnesium design

Environmental Specifications

Operating temperature	–15 C to +50°C (5 F to 140 °F) NOTE: Excludes all CD-ROM, DVD and floppy devices. See device specifications later in this section.
Storage temperature	–20 C to +70 °C (–4 F to 158 °F) NOTE: Excludes all CD-ROM, DVD and floppy devices. See device specifications later in this section.
Operating humidity	10–88 % relative humidity, non-condensing
Storage humidity	5–95 % relative humidity, non condensing
Shock	Mil-Std 810F: Method: 516.5 Procedures: I = 40G IV = 26 drops @ 36” V = 75G NOTE: Excludes all CD-ROM, DVD and floppy devices. See device specifications later in this section.
Vibration	Mil-Std 810F: Method: 514.5 Procedure I Category 20 & 24
Blowing Rain	IP54/NEMA 3
Sand and Dust	NEMA 3
Altitude Operating	Up to 15,000 ft. (4,500 m)
Altitude Non-Operating	Up to 35,000 ft. (10,668 m)
EMI & Safety	FCC Part 15 Class B (ETSI 300 328/1997) CE Directive Class B (ETSI 301489-17/2002) UL, EN 60950

CE-Directives and Standards

CE –Directives	
Low Voltage directive (Electrical Safety)	EN 60950
EMC Directive	EN 55022

Electrical Safety	**Standards**
U.S.A.	UL 60950/2002
Canada	CSA 22.2 No. 60950-00

EMC	**Standards**
U.S.A.	FCC Part 15.247/2002

CD-ROM Module

Interface	IDE
Temperature range	in operation: 5°C to +50°C in storage: -30°C to +65°C
Humidity	5% - 90% (relative, non-condensing)
Features	Read Data 24X CAV max. Audio Play 8X CAV max.

CD-RW Module

Interface	IDE
Temperature range	in operation: 5°C to +50°C in storage: -20°C to +60°C
Humidity	10% - 80% (relative, non-condensing)
Features	Write 8X max. Read 24X max.

DVD Module

Interface	IDE
Temperature range	in operation: 5°C to +50°C in storage: -30°C to +65°C
Humidity	5% - 90% (relative, non-condensing)
Features	DVD-ROM 24X CAV max. CD 8X CAV max.

DVD/CD-RW Module

Interface	IDE
Temperature range	in operation: 5°C to +50°C in storage: -20°C to +60°C
Humidity	10% - 80% (relative, non-condensing)
Features	**Read:** DVD-ROM 8X CAV max. CD-ROM 24X CAV max. **Write:** CD-R 8X CLV CD-RW 4X CLV High Speed CD-RW 8X CLV

Floppy Disk Drive Module

Interface	TTL
Temperature range	in operation: 5°C to +50°C in storage: -40°C to +60°C
Humidity	20% - 80% (relative, non-condensing)
FDD:	3.5" 1.44Mb Formatted

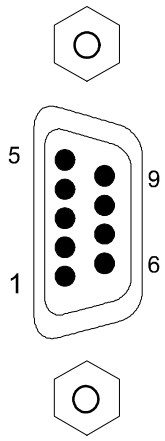
Lithium Ion Battery Pack

Interface	SMBUS VI.0
Temperature range	Operating: 0° to +45°C charging -20° to +60°C discharging
Service Life	300 Cycles typ.
Typical Capacity	8000mAH@.2C
Nominal Voltage	7.40V
Remaining Capacity LEDs:	
Green (Three)	76-100% remaining
Green (Two)	51-75% remaining
Green (One)	26-50% remaining
Red	0-25%

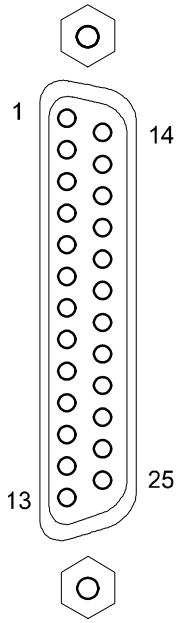
Technical Appendices

The following tables show the connector pin-out assignments for the external connections of the ReVolution computer. Active low signals are indicated by a minus sign. Refer to the “ReVolution at a Glance” section for locations.

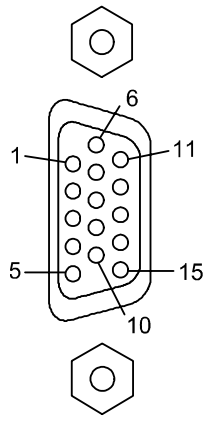
RS232 Serial Port (COM A)

Pin	Signal name	9-pin SUB D-plug
1	DCD (Data Carrier Detect)	
2	RXD (Receive Data)	
3	TXD (Transmit Data)	
4	DTR (Data Terminal Ready)	
5	GND (Signal Ground)	
6	DSR (Data Set Ready)	
7	RTS (Request to Send)	
8	CTS (Clear to Send)	
9	RI (Ring Indicator)	

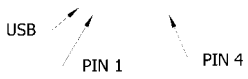
Parallel Port (I/O Stick Option Only)

Pin	Signal name	25-pin SUB D-socket
1	–STROBE	
2	DATA0	
3	DATA1	
4	DATA2	
5	DATA3	
6	DATA4	
7	DATA5	
8	DATA6	
9	DATA7	
10	–ACKN	
11	BUSY	
12	PE	
13	SELECT	
14	–AUTOFD	
15	–ERROR	
16	–INIT	
17	–SLCTIN	
18–25	GND	

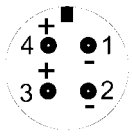
Analog Monitor (VGA-Output, I/O Stick Option Only)

Pin	Signal name	15-pin SUB D-socket
1	red	
2	green	
3	blue	
4, 5	4 is NC, 5 is GND	
6–8	GND	
9	not connected	
10–12	10-GND, 11-NC, 12-DDC Data	
13	HSYNC	
14	VSYNC	
15	DDC Clock	

USB 2.0 Ports

Pin	Signal name	USB
1	+5 Volts	
2	P-	
3	P+	
4	GND	

Power Supply Connector

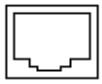
Pin	Signal name	4-pin Female socket (Looking into socket on back interface panel))
1	Ground	
2	Ground	
3	DC Input(+10 to +28 Volts DC)	
4	DC Input(+10 to +28 Volts DC)	

PS/2 Keyboard/Mouse Connector (I/O Stick Option Only)

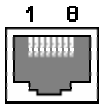
Pin	Name	Dir.	Description	
1	DATA	↔	Mouse Data	
2	DATA	↔	Keyboard Data	
3	GND	—	Ground	
4	VCC	→	Power , +5 VDC	
5	CLK	→	Mouse Clock	
6	CLK	→	Keyboard Clock	

This illustrates the pin-out of the external PS/2 Keyboard/Mouse connector. This connection is “hot pluggable” and interchangeable between the external keyboard and the external mouse. Hot pluggable means you may connect either the external keyboard or external mouse while the computer power is on.

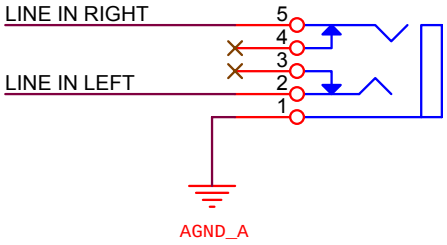
RJ-11 Modem Port

Pin	Name	
1	Not Connected	
2	TIP	
3	RING	
4	Not Connected	

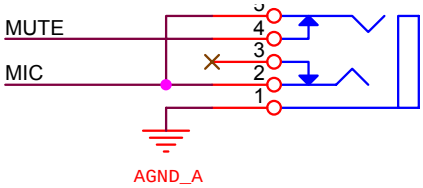
RJ-45 LAN Port

Pin	Name	Description	RJ-45 LAN Port
1	TX+	Transmit Data+	
2	TX-	Transmit Data-	
3	RX+	Receive Data+	
4	Not Connected	Pin 4 is shorted to Pin 5 then AC coupled to ground through a 75 Ohm resistor	
5	Not Connected	See Above	
6	RX-	Receive Data-	
7	Not Connected	Pin 7 is shorted to Pin 8 then AC coupled to ground through a 75 Ohm resistor	
8	Not Connected	See Above	

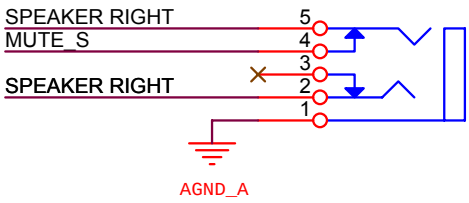
Line-In



MIC-In



Speakers



System Hardware Assignments

The ReVolution, like all computers based on standard IBM-compatible personal computer architecture, contains a set of user hardware- and software-configurable resources. The system uses some of these resources for various standard and optional features. The user can modify others.

This section describes the standard system resources, their use and assignment status.

The following table of **I**nterrupt **R**e**Q**uests (IRQs) are assigned by the BIOS. Plug-and-play operating systems (Windows 98/2000/XP) may change the IRQ assignments.

Table of IRQ Assignment by BIOS

IRQ Number	Use	Type	Status
0	Timer	ISA	Permanent Assignment
1	Keyboard	ISA	Permanent Assignment
2	Programmable Interrupt Controller	ISA	Permanent Assignment
3	COM Port B (2)	ISA	BIOS enable/disable
4	COM Port A (1)	ISA	BIOS enable/disable
5		PNP/PCI	
6	Floppy Disk	ISA	Permanent Assignment, if installed
7	LPT1		BIOS Adjustable
8	Real Time Clock	ISA	Permanent Assignment
9	ACPI EC	ISA	PNP/PCI Assignment
10		PNP/PCI	
11		PNP/PCI	
12	Mouse	ISA	BIOS enable/disable
13	Math Coprocessor	ISA	Permanent Assignment
14	IDE Controller	ISA	PCI/PNP assignment
15			

DMA Channel Table

DMA Channel	Use	Status
0	Unused	Available To User
1	Unused	Available To User
2	Floppy Disk	Permanent Assignment
3	ECP Parallel Port	BIOS adjustable
4	DMA Controller	Permanent Assignment
5	Unused	Available To User
6	Unused	Available To User
7	Unused	Available To User

Embedded Controller

The Embedded Controller (EC) in the ReVolution supervises its “power state” by monitoring incoming power levels and temperature, making decisions for safe operation. The EC also interacts with the system BIOS and informs the APM manager with power-related messages. When a fault condition occurs, the EC will change the power state and indicate the fault by flashing a series of codes on the power LED:

Embedded Controller LEDs

Refer to the “ReVolution at a Glance” section for LED locations.

Symbol	Name	Purpose
	NumLock	Indicates NumLock state. LED is on when NumLock is active.
	Caps Lock	Indicates capital letter state. LED is on when Caps Lock is active.
	Battery Indicator	Indicates battery status
	Power	Indicates AC power attached
	Hard Disk Drive Activity	Indicates when hard drive is accessed.
	LAN Activity	Indicates embedded LAN activity.
	Wireless Activity	Future Use
	Mail	Future Use

You must clear the active fault before the EC will continue operation. The EC is continuously on when power is applied to the ReVolution. It is field-upgradeable.

The EC will perform a power-down override, which forces the ReVolution to turn off, when a user presses the **power on/off button** continually for 4 seconds.

Note: The Embedded Controller is active whenever there is a DC power source (external or battery) present, even with ReVolution power off. If the ReVolution is stored with one battery installed, the EC will discharge a fully charged battery in approximately 27 days. Kontron recommends that the ReVolution be stored for extended periods with no battery installed.

Power and Battery Indicators

Power State	Power LED	Battery Indicator LED
OFF	OFF	OFF
On, Charging	ON	Slow Blink
Low Battery	OFF	Fast Blink
Running on battery	OFF	ON
Running on AC not charging	ON	OFF
Battery Malfunction	Fast Blink	Fast Blink
Sleep mode battery	Slow Blink	OFF
Sleep mode AC	OFF	Slow Blink

Slow blink is defined as - 0.5 Hz, 50% duty cycle, i.e. ON for one second, OFF for one second
Fast blink is defined as - 1 Hz, 50 % duty cycle, i.e. On for 500 ms, OFF for 500 ms

Phoenix BIOS Setup

Use the Phoenix BIOS Setup program for:

- Setting system time and date.
- Installing new drives for hard disks and floppy disks.
- Enhancing system performance by controlling advanced features such as shadow memory and cache memory.

To start the Phoenix BIOS Setup utility:

1. Turn on or reboot your system.
2. Press the **ESC** key when ReVolution splash screen appears.
3. PhoenixBIOS displays this message: Press <F2> to enter SETUP
4. Pressing <F2> displays the Main Menu.

Incorrect settings can cause your system to malfunction.

Navigating the Setup Menus

The Menu Bar at the top of the window lists these selections:

Main	Use this menu for basic system configuration.
Advanced	Use this menu to set the Advanced Features available on your system's chipset.
Security	Use this menu to set User and Supervisor Passwords and the Backup and Virus-Check reminders.
Power	Use this menu to configure Power-Management features.
Exit	Exits the current menu.

Use the left/right ← → arrow keys to make a selection.

Legend Bar

Use the keys listed in the legend bar on the bottom of the screen to make your selections or exit the current menu. The chart on the following page describes the legend keys and their alternates:

Key Function	
<F1> or <Alt-H>	General Help window (See below).
<Esc>	Exit this menu.
↔ **Left or right arrow keys**	Select a different menu.
↕ **Up or down arrow keys**	Move cursor up and down.
<Tab> or <Shift-Tab>	Cycle cursor up and down.
<Home> or <End>	Move cursor to top or bottom of window.
<PgUp> or <PgDn>	Move cursor to next or previous page.
<F5> or <->	Select the Previous Value for the field.
<F6> or <+> or <Space>	Select the Next Value for the field.
<F9>	Load the Default Configuration values for this menu.
<F10>	Load the Previous Configuration values for this menu.
<Enter>	Execute Command or Select P Submenu.
<Alt-R>	Refresh screen.

To select an item:

- Use the arrow keys to move the cursor to the field you want.
- Use the plus-and-minus value keys to select a value for that field. The Save Values commands in the Exit Menu save the values currently displayed in all the menus.

To display a sub menu:

- Use the arrow keys to move the cursor to the sub menu you want.
- Press **<Enter>**. A pointer (_) marks all sub menus.

Field Help Window

The **Help** window on the right side of each menu displays the help text for the currently selected field. It updates as you move the cursor to each field.

General Help Window

Advanced Hard Disk Features

If Advanced Hard Disk Features are installed, select one of the Master or Slave sub-menus on the Main Menu.

Use the **legend keys** listed on the bottom to make your selections and exit to the Main Menu.

Use the chart on the following page to configure the hard disk drive with Advanced Hard Disk Features:

Advanced Hard Disk Features

Feature	Options	Description
Type	None User Auto (Default) IDE Removable CD-ROM ATAPI Removable	**None** = Autotyping is not able to supply the drive type, or end user has selected None, disabling any drive that may be installed. **User** = You supply the hard-disk drive information in the following fields. **Auto** = Autotyping, the drive itself supplies the information. **IDE Removable** = Removable disk drive **CD-ROM** = CD-ROM drive. **ATAPI Removable** = Removable disk drive.
Cylinders	1 to 65,536	Number of cylinders.
Heads	1 to 16	Number of read/write heads.
Sectors		
Multi-Sector Transfers	Disabled Standard 2 sectors 4 sectors 8 sectors 16 sectors	Any selection except Disabled determines the number of sectors transferred per block. Standard is 1 sector per block.
LBA Mode Control	Enabled Disabled	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads, & Sectors.
32-Bit I/O	Enabled Disabled (Default)	This setting enables or disables 32-bit IDE data transfers.
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 OR Standard Fast DMA A Fast DMA B Fast DMA F	Selects the method for transferring the data between the hard disk and system memory. The Setup menu only lists those options supported by the drive and platform.
Ultra DMA Mode	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Selects the Ultra DMA mode used for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.

Memory Cache

Enabling **cache** saves time for the CPU by holding data most recently accessed in regular memory (dynamic RAM or DRAM) in a special storage area of static RAM (SRAM), which is faster. Before accessing regular memory, the CPU first accesses the cache. If it does not find the data it is looking for there, it accesses regular memory.

Selecting **Memory Cache** from the Main Menu displays a menu like the one shown here. The actual features displayed depend on your system's hardware.

Feature	*Options*	*Description*
Memory Cache	Enabled (Default) Disabled	Sets the state of the memory cache.
Cache System BIOS area	Uncached Write Protect (Default)	Controls caching of BIOS system.
Cache Video BIOS area	Uncached Write Protect (Default)	Controls caching of video BIOS area.
Cache Base 0-512K:	Uncached Write Through Write Protect Write Back (Default)	Controls caching of 512k base memory
Cache Base 512k-640k:	Uncached Write Through Write Protect Write Back (Default)	Controls caching of 512k – 640k base memory
Cache Extended Memory Area:	Uncached Write Through Write Protect Write Back (Default)	Controls caching of system memory above one megabyte
Cache segments, e.g., E800-EFFF	Enabled Disabled (Default) Write Through Write Protect Write Back	Controls caching of individual segments of memory usually reserved for shadowing system or option ROMs

WARNING: Incorrect settings can cause your system to malfunction.

Boot Features Menu

Select **Boot** from the menu bar on the Main Menu.

Use the **legend keys** to make your selections and exit to the Main Menu.

Use the following chart to select your boot options.

Feature	*Options*	*Description*
Boot-time Diagnostic Screen:	Enabled Disabled (Default)	Display the diagnostic screen during boot.
Quickboot Mode:	Enabled (Default) Disabled	Allows the system to skip certain tests while booting. This will decrease the time to boot the system.

The BIOS attempts to load the operating system from the disk drives in the sequence selected here. The topmost item is the first boot device that BIOS will attempt to boot an operating system. If the device is not bootable the BIOS will move to the next device until a bootable device is found. If no devices are found to be bootable then the BIOS will post an error message.

Advanced Menu

Select **Advanced** from the menu bar on the Main Menu.

Use the **legend keys** to make your selections and exit to the Main Menu.

Use the following chart to configure the keyboard features:

Feature	*Options*	*Description*
Installed O/S	Other Win95 Win98 (Default) WinME Win2000	Select the operating system installed on your system that you will use most often. NOTE: An incorrect setting can cause some operating systems to display unexpected behavior.
Reset Configuration Data:	No (Default) Yes	Select "Yes" if you want to clear the Extended System Configuration Data (ESCD) area.
Large Disk Access Mode:	Other DOS (Default)	UNIX, Novell Netware, or other operating systems, select 'Other'. If you are installing new software and the drive fails, change this selection and try again. Different operating systems require different representations of drive geometries.
Local Bus IDE adapter:	Disabled (Default) Primary (Default)	Enable the integrated local bus IDE adapter
OEM Platform Advanced Menu		The items in this menu will allow the user to: 1) Test Mobile features of the Almador-m Chipset 2) Alter the Reference board environment.
Advanced Chipset Control		
I/O Device Configuration		
Keyboard Features		
Legacy USB Support	Enabled (Default) Disabled	Enable support for Legacy Universal Serial Bus.

OEM Platform Advanced Memory Menu

Feature	*Options*	*Description*
Platform Power Management Sub-Menu		These items will control the various CPU and Chipset Power Management Features of this platform
ACPI Table/Features Control Sub Menu		These items will control: 1) Which ACPI Tables will be include in the RSDT Entry Table Field. 2) The values stored in specific ACPI Table Fields. 3) The Enabling of Specific ACPI Features.
Integrated Devise Control Sub-Menu		These items determine whether the integrated PCI Devices will be enabled in PCI Config. Space
ATA 66/ATA 100 Support	Enabled Disabled	This item allows IDE drives to be set above ATA 33 if the drive supports that speed.

Integrated Device Control Sub-Menu

Feature	*Options*	*Description*
USB – Device 29	Disabled Enabled (Default)	Enable or Disable all ICH3 USB 1.1 Devices by setting item to the desired value.
USB – Device 29, Function 1	Disabled Enabled (Default)	Enable or Disable all ICH3 USB 1.1 Devices by setting item to the desired value.
USB – Device 29, Function 2	Disabled Enabled (Default)	Enable or Disable all ICH3 USB 1.1 Devices by setting item to the desired value.
AC97 – Device 31, Function 5	Disabled Enabled (Default)	Enable or Disable the AC97 Audio Device if present. This Setup Item will have no effect if an AC97 Audio MDC is not present.

Advanced Chipset Control Menu

Feature	*Options*	*Description*
IGD Boot Type	VBIOS Default (Default) CRT LCD CRT_LCD	Select the Video Display that the Internal Graphics Device will make active during the POST: 1) VBIOS Default 2) CRT 3) LCD 4) CRT_LCD Selecting "VBIOS Default" will allow the VBIOS to choose the Video Display to enable.
IGD – LCD Panel Type	800x600 LVDS 1024x768 LVDS (Default)	Select the LCD Panel used by the Internal Graphics Device by selecting the appropriate setup item. The first item is Panel 1, the last item is Panel 16. Some Panels are not numbered due to size constraints. NOTE: SVGA screen requires change to 800x600 LVDS.
Default Primary Video	AGP (Default) PCI	Select PCI to use a PCI video card for the boot display device. Select AGP to use an AGP video card for the boot display device.
Graphics Aperture	32MB 64MB (Default) 128MB 256MB	Select the size of the Graphics Aperture for the AGP video device.
Enable Memory Gap	Disable (Default) Extended	Free RAM Address space for use with an option card starting at 15MB.

I/O Device Configuration Menu

The CPU communicates with external devices such as printers through devices called **Input/Output (I/O) ports** such as serial and parallel ports. These I/O devices require the use of system resources such as I/O addresses and interrupt lines. If these devices are Plug and Play, either the BIOS can allocate the devices during POST, or the operating system can do it.

If the I/O devices are not Plug and Play, they may require manually setting them in Setup. On some systems, the **chipset** manages the communication devices. Other systems have, instead, a separate **I/O chip** on the motherboard for configuring and managing these devices.

Many systems allow you to control the configuration settings for the I/O ports.

Select **I/O Device Configuration** on the Advanced Menu to display this menu and specify how you want to configure these I/O Devices:

Use the **legend keys** to make your selections and exit to the Main Menu.

Use the following chart to configure the Input/Output settings:

Feature	*Options*	*Description*
Serial port A: Serial port B:	Disabled Enabled (Default) Auto OS Controlled	Disabled turns off the port. Enabled requires you to enter the base Input/Output address and the Interrupt number on the next line. Auto makes the BIOS configure the port automatically during POST. OS Controlled lets the PnP Operating System (such as Windows 95) configure the port after POST.
Parallel Port:	Disabled Enabled (Default) Auto OS Controlled	Disabled turns off the port. Enabled requires you to enter the base Input/Output address and the Interrupt number below. Auto makes the BIOS auto configure the port during POST. OS Controlled lets the PnP Operating System (such as Windows 95) configure the port after POST.
Mode	Output only Bi-directional ECP (Default) EPP & ECP	Output only is standard one-way protocol for a parallel device. Bi-directional uses two-way protocol of an Extended Capabilities Port (ECP).
Floppy Disk Controller	Disabled Enabled Auto (Default)	Enables the on-board legacy diskette controller. Disabled turns off all legacy diskette drives. Auto select per BIOS or OS

Use this menu to specify how the I/O (Input and Output) ports are configured:

- Manually by you.
- Automatically by the BIOS during POST
- Automatically by a PnP Operating System such as Windows 95 after the Operating System boots.

Warning: If you choose the same I/O address or Interrupt for more than one port, the menu displays an asterisk (*) at the conflicting settings. It also displays this message at the bottom of the menu:
`* Indicates a DMA, Interrupt, I/O, or memory resource conflict with another device.`
Resolve the conflict by selecting another settings for the devices.

Keyboard Features

Select **Keyboard** from the menu bar on the Main Menu.

Use the **legend keys** to make your selections and exit to the Main Menu.

Use the following chart to configure the keyboard features:

Feature	*Options*	*Description*
Numlock	Auto On Off (Default)	On or Off turns NumLock on or off at bootup. Auto turns NumLock on if it finds a numeric key pad.
Key Click	Enabled Disabled (Default)	Enables key click.
Keyboard auto-repeat rate	2/sec 6/sec 10/sec 13.3/sec 21.8/sec 26.7/sec 30/sec (Default)	Sets the number of times per second to repeat a keystroke when you hold the key down.
Keyboard auto-lag delay	¼ sec ½ sec (Default) ¾ sec 1 sec	Sets the delay time after the key is held down before it begins to repeat the keystroke.

Security Menu

Select **Security** from the menu bar on the Main Menu.

Use the **legend keys** to make your selections and exit to the Main Menu.

Enabling "Supervisor Password" requires a password for entering Setup. The passwords are not case sensitive.

Pressing **<Enter>** at either Set Supervisor Password or Set User Password displays a dialog box like this:

Set Password
Enter password: [ ]
Confirm password: [ ]
Enter: Accept

Type the password and press **<Enter>**. Repeat.

Note: In some systems, the User and Supervisor passwords are related; you cannot have a User password without first creating a Supervisor password. In other systems, you can create and use them independently.

Use the following chart to configure the system-security and anti-virus options.

Feature	*Options*	*Description*
Set Supervisor Password	Up to seven alphanumeric characters	Pressing <Enter> displays dialog box for entering the supervisor password. In related systems, this password gives full access to Setup menus.
Set User Password	Up to seven alphanumeric characters	Pressing <Enter> displays the dialog box for entering the user password. In related systems, this password gives restricted access to SETUP menus.
Password on Boot	Enabled Disabled	Enabled requires a password on boot. Requires prior setting of the Supervisor password. If supervisor password is set and this option disabled, BIOS assumes user is booting.
Diskette Access	Enabled Disabled	Enabled requires a password to boot from or access the floppy disk.

Boot Menu

Select **Boot** from the menu bar on the Main Menu.

Use this menu to arrange to specify the priority of the devices from which the BIOS will attempt to boot the Operating System. The BIOS will attempt first to boot from the CD-ROM drive (the only Removable Device listed). Failing that, it will attempt to boot from the Primary Master hard disk, and so on down the list.

Removable Devices, **Hard Drive**, and **Network Boot** are the generic types of devices on your system from which you can boot an operating system. You may have more than one device of each type. If so, the generic type is marked with a plus or minus sign. Use the **<Enter>** key to expand or collapse the devices marked with <+> or <->. Press **<Ctrl+Enter>** to expand all such devices.

Note: Floppy drives are not managed on this menu as part of Removable Devices. To change a device's priority on the list, first select it with the up-or-down arrows, and move it up or down using the <+> and <-> keys. Pressing **<n>** moves a device between the Removable Devices and Hard Drive. Pressing **<Shift+1>** enables or disables a device.

Feature	*Options*	*Description*
Removable Devices	Legacy Floppy Drives	Keys used to view or configure devices
Hard Drive	Toshiba MK6412MAT-(PM) Bootable Add - Cards	
CD-ROM Drive		

Exit Menu

Select **Exit** from the menu bar on the Main Menu.

The following sections describe each of the options on this menu. Note that **<Esc>** does not exit this menu. You must select one of the items from the menu or menu bar to exit.

Exit Saving Values

After making your selections on the Setup menus, always select either "Exit Saving Value" or "Save Changes." Both procedures store the selections displayed in the menus in **CMOS** (short for "battery-backed CMOS RAM") a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS.
After you save your selections, the program displays this message: `Values have been saved to CMOS! Press <space> to continue`

If you attempt to exit without saving, the program asks if you want to save before exiting.
During bootup, *Phoenix*BIOS attempts to load the values saved in CMOS. If those values cause the system boot to fail, reboot and press **<F2>** to enter Setup. In Setup, you can get the Default Values (as described below) or try to change the selections that caused the boot to fail.

Exit Discarding Changes

Use this option to exit Setup without storing in CMOS any new selections you may have made. The selections previously in effect remain in effect.

Load Setup Defaults

To display the default values for all the Setup menus, select "Load Setup Defaults" from the Main Menu. The program displays this message:

```
ROM Default values have been loaded!
Press <space> to continue
```

If, during bootup, the BIOS program detects a problem in the integrity of values stored in CMOS, it displays these messages:

```
System CMOS checksum bad - run SETUP
Press <F1> to resume, <F2> to Setup
```

The CMOS values have been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. Press **<F1>** to resume the boot or **<F2>** to run Setup with the ROM default values already loaded into the menus. You can make other changes before saving the values to CMOS.

Discard Changes

If, during a Setup Session, you change your mind about changes you have made and have not yet saved the values to CMOS, you can restore the values you previously saved to CMOS. Selecting “Discard Changes” on the Exit menu updates all the selections and displays this message:

```
CMOS values have been loaded!
Press <space> to continue
```

Save Changes

Selecting “Save Changes” saves all the selections without exiting Setup. You can return to the other menus if you want to review and change your selections.

BIOS Messages

The following is a list of the messages that the BIOS can display. Most of them occur during POST. Some of them display information about a hardware device, e.g., the amount of memory installed. Others may indicate a problem with a device, such as the way it has been configured.

Following the list are explanations of the messages and remedies for reported problems. *****If your system displays one of the messages marked below with an asterisk (*****), write down the message and contact Kontron Technical Support.

If your system fails after you make changes in the Setup menus, reset the computer, enter Setup and install Setup defaults or correct the error.

0200 Failure Fixed Disk
Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

0210 Stuck key
Stuck key on keyboard.

0211 Keyboard error
Keyboard not working.

***0212 Keyboard Controller Failed**
Keyboard controller failed test. May require replacing keyboard controller.

0213 Keyboard locked - Unlock key switch
Unlock the system to proceed.

0220 Monitor type does not match CMOS - Run SETUP
Monitor type not correctly identified in Setup

***0230 Shadow Ram Failed at offset: nnnn**
Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

***0231 System RAM Failed at offset: nnnn**
System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

***0232 Extended RAM Failed at offset: nnnn** Extended memory not working or not configured properly at offset **nnnn.**

0250 System battery is dead - Replace and run SETUP
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system. **Note:** ReVolution's CMOS battery is rechargeable and should never need replacement.

0251 System CMOS checksum bad - Default configuration used
System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact KMC.

***0260 System timer error**
The timer test failed. Requires repair of system board.

***0270 Real time clock error**
Real-Time Clock fails BIOS hardware test. May require board repair.

0271 Check date and time settings
BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991- 2099).

0280 Previous boot incomplete - Default configuration used

Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

0281 Memory Size found by POST differed from CMOS
Memory size found by POST differed from CMOS.

02B0 Diskette drive A error
02B1 Diskette drive B error
Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

02B2 Incorrect Drive A type - run SETUP
Type of floppy drive A: not correctly identified in Setup.

02B3 Incorrect Drive B type - run SETUP
Type of floppy drive B: not correctly identified in Setup.

02D0 System cache error - Cache disabled
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

02F0: CPU ID:
CPU socket number for Multi-Processor error.

***02F4: EISA CMOS not writeable**
ServerBIOS2 test error: Cannot write to EISA CMOS.

***02F5: DMA Test Failed**
ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

***02F6: Software NMI Failed**
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

***02F7: Fail-Safe Timer NMI Failed**
ServerBIOS2 test error: Fail-Safe Timer takes too long.

device Address Conflict
Address conflict for specified **device.**

Allocation Error for: device
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive
CD ROM Drive identified.

Entering SETUP ...
Starting Setup program

***Failing Bits: nnnn**
The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n
Fixed disk **n** (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict

I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu
There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

***Parity Check 1 nnnn**
Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.** Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

***Parity Check 2 nnnn**
Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

Press <F1> to resume, <F2> to Setup, <F3> for previous
Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup
Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:
PS/2 mouse identified.

Run the I2O Configuration Utility
One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed
System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*
Displays the address ***nnnn*** of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed
Video BIOS successfully copied to shadow RAM.

Test Points and Beep Codes

At the beginning of each POST routine, the BIOS outputs the test point error code to I/O address 80h. Use this code during trouble shooting to establish at what point the system failed and what routine was being performed. The following is a list of the checkpoint codes written at the start of each test and the beep codes issued for terminal errors. Unless otherwise noted, these codes are valid for PhoenixBIOS 4.0 Release 6.x.

Code	Beeps	Description
02h		Verify Real Mode
03h		Disable Non-Maskable Interrupt (NMI)
04h		Get CPU type
06h		Initialize system hardware
07h		Disable shadow and execute code from the ROM.
08h		Initialize chipset with initial POST values
09h		Set IN POST flag
0Ah		Initialize CPU registers
0Bh		Enable CPU cache
0Ch		Initialize caches to initial POST values
0Eh		Initialize I/O component
0Fh		Initialize the local bus IDE
10h		Initialize Power Management
11h		Load alternate registers with initial POST values
12h		Restore CPU control word during warm boot
13h		Initialize PCI Bus Mastering devices
14h		Initialize keyboard controller
16h	1-2-2-3	BIOS ROM checksum
17h		Initialize cache before memory Auto size
18h		8254 timer initialization
1Ah		8237 DMA controller initialization
1Ch		Reset Programmable Interrupt Controller
20h	1-3-1-1	Test DRAM refresh
22h	1-3-1-3	Test 8742 Keyboard Controller
24h		Set ES segment register to 4 GB
28h		Auto size DRAM
29h		Initialize POST Memory Manager
2Ah		Clear 512 kB base RAM
2Ch	1-3-4-1	RAM failure on address line ***xxxx****
2Eh	1-3-4-3	RAM failure on data bits ***xxxx**** of low byte of memory bus
2Fh		Enable cache before system BIOS shadow
32h		Test CPU bus-clock frequency
33h		Initialize Phoenix Dispatch Manager
36h		Warm start shut down
38h		Shadow system BIOS ROM
3Ah		Auto size cache
3Ch		Advanced configuration of chipset registers
3Dh		Load alternate registers with CMOS values
41h		Initialize extended memory for RomPilot
42h		Initialize interrupt vectors
45h		POST device initialization
46h	2-1-2-3	Check ROM copyright notice
47h		Initialize I20 support
48h		Check video configuration against CMOS
49h		Initialize PCI bus and devices
4Ah		Initialize all video adapters in system
4Bh		QuietBoot start (optional)
4Ch		Shadow video BIOS ROM
4Eh		Display BIOS copyright notice
4Fh		Initialize MultiBoot

50h		Display CPU type and speed
51h		Initialize EISA board
52h		Test keyboard
54h		Set key click if enabled
55h		Enable USB devices
58h	2-2-3-1	Test for unexpected interrupts
59h		Initialize POST display service
5Ah		Display prompt "Press F2 to enter SETUP"
5Bh		Disable CPU cache
5Ch		Test RAM between 512 and 640 kB
60h		Test extended memory
62h		Test extended memory address lines
64h		Jump to UserPatch1
66h		Configure advanced cache registers
67h		Initialize Multi Processor APIC
68h		Enable external and CPU caches
69h		Setup System Management Mode (SMM) area
6Ah		Display external L2 cache size
6Bh		Load custom defaults (optional)
6Ch		Display shadow-area message
6Eh		Display possible high address for UMB recovery
70h		Display error messages
72h		Check for configuration errors
76h		Check for keyboard errors
7Ch		Set up hardware interrupt vectors
7Dh		Initialize Intelligent System Monitoring
7Eh		Initialize coprocessor if present
80h		Disable onboard Super I/O ports and IRQs
81h		Late POST device initialization
82h		Detect and install external RS232 ports
83h		Configure non-MCD IDE controllers
84h		Detect and install external parallel ports
85h		Initialize PC-compatible PnP ISA devices
86h		Re-initialize onboard I/O ports.
87h		Configure Motherboard Configurable Devices (optional)
88h		Initialize BIOS Data Area
89h		Enable Non-Maskable Interrupts (NMIs)
8Ah		Initialize Extended BIOS Data Area
8Bh		Test and initialize PS/2 mouse
8Ch		Initialize floppy controller
8Fh		Determine number of ATA drives (optional)
90h		Initialize hard-disk controllers
91h		Initialize local-bus hard-disk controllers
92h		Jump to UserPatch2
93h		Build MPTABLE for multi-processor boards
95h		Install CD ROM for boot
96h		Clear huge ES segment register
97h		Fix up Multi Processor table
98h	1-2	Search for option ROMs. One long, two short beeps on checksum failure
99h		Check for SMART Drive (optional)
9Ah		Shadow option ROMs
9Ch		Set up Power Management
9Dh		Initialize security engine (optional)
9Eh		Enable hardware interrupts
9Fh		Determine number of ATA and SCSI drives
A0h		Set time of day
A2h		Check key lock
A4h		Initialize typematic rate

A8h		Erase F2 prompt
AAh		Scan for F2 key stroke
ACh		Enter SETUP
AEh		Clear Boot flag
B0h		Check for errors
B1h		Inform RomPilot about the end of POST.
B2h		POST done - prepare to boot operating system
B4h	1	One short beep before boot
B5h		Terminate QuietBoot (optional)
B6h		Check password (optional)
B7h		Initialize ACPI BIOS
B9h		Prepare Boot
BAh		Initialize SMBIOS
BBh		Initialize PnP Option ROMs
BCh		Clear parity checkers
BDh		Display MultiBoot menu
BEh		Clear screen (optional)
BFh		Check virus and backup reminders
C0h		Try to boot with INT 19
C1h		Initialize POST Error Manager (PEM)
C2h		Initialize error logging
C3h		Initialize error display function
C4h		Initialize system error handler
C5h		PnPnd dual CMOS (optional)
C6h		Initialize note dock (optional)
C7h		Initialize note dock late
C8h		Force check (optional)
C9h		Extended checksum (optional)
CAh		Redirect Int 15h to enable remote keyboard
CBh		Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk
CCh		Redirect Int 10h to enable remote serial video
CDh		Re-map I/O and memory for PCMCIA
CEh		Initialize digitizer and display message
D2h		Unknown interrupt
		The following are for boot block in Flash ROM
E0h		Initialize the chipset
E1h		Initialize the bridge
E2h		Initialize the CPU
E3h		Initialize system timer
E4h		Initialize system I/O
E5h		Check force recovery boot
E6h		Checksum BIOS ROM
E7h		Go to BIOS
E8h		Set Huge Segment
E9h		Initialize Multi Processor
EAh		Initialize OEM special code
EBh		Initialize PIC and DMA
ECh		Initialize Memory type
EDh		Initialize Memory size
EEh		Shadow Boot Block
EFh		System memory test
F0h		Initialize interrupt vectors
F1h		Initialize Run Time Clock
F2h		Initialize video
F3h		Initialize System Management Manager
F4h		Output one beep
F5h		Clear Huge Segment

F6h		Boot to Mini DOS
F7h		Boot to Full DOS

Customer Service

This section provides contact information should you need technical support for your system, or need to return merchandise.

Technical Support

If you should encounter difficulties with your application or with this product, or need guidance on setting up your system, we are ready to assist you. Please contact our Technical Support department at the following locations:

USA:
Technical Support hours are: 7:00AM to 6:00PM – Monday – Friday
TEL: (888) 343-5396 (Toll free in US and Canada)
(952) 974-7200
FAX: (952) 949-2791
E-mail: support@kontronmobile.com

Europe, Middle East, Africa:
TEL: (+49) 8165-77 112
FAX: (+49) 8165-77 110
E-mail: techsup@kontron.com

Kontron Asia (except China):
TEL: 011-886-2-2910-3532
FAX: 011-886-2-2910-3482

Sales Contact:
E-mail: sales@kontron-asia.com

Technical Support Contact:
E-mail: support@kontron-asia.com

Kontron China:
TEL: +86 21 5426 1660
FAX: +86 21 5426 1650
E-mail: FAE@kontron.com.cn

Technical Support Contact:
E-mail: FAE@kontron.com.cn

When you call, make sure to have the following information on hand:

- unit part number (P/No #),
- serial number (S/No #) of the defective unit (found on the back of the unit).

Then, explain the nature of your problem to the service technician.

If you have any questions about Kontron Mobile Computing, or our products and services, you may reach us at the aforementioned telephone numbers, by e-mail, or by writing to:

Kontron Mobile Computing Inc.
7631 Anagram Drive
Eden Prairie, MN 55344 USA

Returning Defective Merchandise

Before returning any merchandise, please follow these instructions:

1. In the **USA / North America**, contact:

   KMC Technical Support
   Technical Support hours are: 7:00AM to 6:00PM – Monday – Friday
   TEL: (888) 343-5396 (Toll free in US and Canada)
   (952) 974-7200
   FAX: (952) 949-2791
   E-mail: support@kontronmobile.com

In **Europe**:
Contact our Service Department and request an
RMA # (Return Material Authorization) by:
Fax: (+49) 8165-77 331
E-mail: service@kontron.com

In **Asia**:
Contact your sales representative and request an
RMA # (Return Material Authorization) by:
FAX: 011-886-2-2910-3482
E-mail: sales@kontron-asia.com

In **China**:
Contact your sales representative and request an
RMA # (Return Material Authorization) by:
FAX: +86 21 5426 1650
E-mail: FAE@kontron.com.cn

2. Make sure that you receive a RMA # from Kontron-Service before returning any merchandise. Clearly write or mark this number on the outside of the package you are returning.
3. Include the name and telephone number of a person whom we can contact for further explanations if necessary when returning goods. Where applicable, always include all duty papers and invoice(s) associated with the item(s) in question.
4. Ensure that the unit is packed in its original box, if available, or packed to avoid shipping damage.
5. Include a copy of the RMA form and problem description.

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