Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for GIGABYTE GA-970A-D3. You'll find the answers to all your questions on the GIGABYTE GA-970A-D3 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual GIGABYTE GA-970A-D3
User guide GIGABYTE GA-970A-D3
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GA-970A-D3

User's Manual
Rev. 1201
12ME-970AD3-1201R

Manual abstract:

Identifying Your Motherboard Revision The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information. Example:

.. 89 5-3-1 5-3-2 5-3-3 -5- Box Contents GA-970A-D3 motherboard Motherboard driver disk User's Manual Quick Installation Guide Two SATA cables I/O Shield The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice. Optional Items 2-port USB 2.0 bracket (Part No. 12CR1-1UB030-5*R) 2-port SATA power cable (Part No. 12CF1-2SERPW-0*R) COM port cable (Part No. 12CF1-1CM001-3*R) -6- GA-970A-D3 Motherboard Layout KB_MS_USB CPU_FAN OPTICAL ATX_12V R_USB2 Socket AM3+ R_USB1 PWR_FAN R_USB30 USB_LAN Etron EJ168 PCIEX1_1 (▢) AMD 970 DDR3_4 DDR3_2 DDR3_3 DDR3_1 ATX AUDIO Realtek/ Atheros GbE LAN CODEC PCIEX16 PCIEX1_2 GA-970A-D3 BAT AMD SB950 0 2 4 SATA3 1 3 5 SYS_FAN1 PCIEX1_3 PCIEX4 iTE Super I/O PCI1 B_BIOS M_BIOS PCI2 CLR_CMOS COMA SPDIF_O TPM SYS_FAN2 F_USB3 F_USB2 F_USB1 F_PANEL F_AUDIO (Note) Due to a hardware limitation, the PCIEX1_1 slot can only accommodate a shorter PCI Express x1 expansion card. For a longer expansion card, use other expansion slots.

-7- GA-970A-D3 Motherboard Block Diagram CPU CLK+/- (200 MHz) 1 PCI Express x16 AM3+/AM3 CPU DDR3 2000 (O.C.)/1866/1600/ 1333/1066 MHz Dual Channel Memory Hyper Transport Bus LAN 3 PCI Express x1 PCIe CLK (100 MHz) RJ45 Realtek/ Atheros GbE LAN 2 USB 3.0/2.0 Etron EJ168 PCI Express Bus x16 x1 x1 x1 AMD 970 x1 x1 PCIe CLK (100 MHz) PCI Express Bus PCI Express Bus 6 SATA 6Gb/s x4 PCIe CLK (100 MHz) AMD SB950 1 PCI Express x4 14 USB 2.0/1.1 Dual BIOS PCI Bus LPC iTE Bus Super I/O CODEC COM PS/2 KB/Mouse 2 PCI PCI CLK (33 MHz) For detailed product information/limitation(s), refer to "1-2 Product Specifications." -8- Surround Speaker Out Center/Subwoofer Speaker Out Side Speaker Out MIC Line Out Line In S/PDIF Out Chapter 1 Hardware Installation 1-1 Installation Precautions The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures: •• Prior to installation, make sure the chassis is suitable for the motherboard. •• Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer.

These stickers are required for warranty validation. •• Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components. •• When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely. •• When handling the motherboard, avoid touching any metal leads or connectors. •• It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory.

If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity. •• Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container. •• Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off. •• Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard. •• Before using the product, please verify that all cables and power connectors of your hardware components are connected.

•• To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components. •• Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing. •• Do not place the computer system on an uneven surface. •• Do not place the computer system in a high-temperature environment. •• Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user. •• If you are uncertain about any io the product specifications and product-related information without prior notice. Hardware Installation - 12 - 1-3 Installing the CPU and CPU Cooler Read the following guidelines before you begin to install the CPU: •• Make sure that the motherboard supports the CPU. (Go to GIGABYTE's website for the latest CPU support list.) •• Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.

•• Locate the pin one of the CPU.

The CPU cannot be inserted if oriented incorrectly. •• Apply an even and thin layer of thermal grease on the surface of the CPU. •• Do not turn on the computer if the CPU cooler is not installed, otherwise overMemory) Due to CPU limitations, read the following guidelines before installing the memory in Dual Channel mode. 1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed. 2. When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored DDR3 sockets for optimum performance. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets. Hardware Installation DDR3_4 DDR3_2 DDR3_3 DDR3_1 - 16 - 1-4-2 Installing a Memory Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. DDR3 and DDR2 DIMMs are not compatible to each other or DDR DIMMs.

Be sure to install DDR3 DIMMs on this motherboard. Notch DDR3 DIMM A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets. Step 1: Note the orientation of the memory module. Spread the retaining clips at both ends of the memory socket.

Place the memory module on the socket. As indicated in the picture on the left, place your fingers on the top edge of the memory, push down on the memory and insert it vertically into the memory socket. Step 2: The clips at both ends of the socket will snap into place when the memory module is securely inserted. - 17 - Hardware Installation 1-5 Installing an Expansion Card Read the following guidelines before you begin to install an expansion card: •• Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.

•• Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage. PCI Express x1 Slot PCI Express x16 Slot PCI Slot Follow the steps below to correctly install your expansion card in the expansion slot. 1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel. 2. Align the card with the slot, and press down on the card until it is fully seated in the slot. 3. Make sure the metal contacts on the card are completely inserted into the slot. 4.

Secure the card's metal bracket to the chassis back panel with a screw. 5. After installing all expansion cards, replace the chassis cover(s). 6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s). 7. Install the driver provided with the expansion card in your operating system. Example: Installing and Removing a PCI Express Graphics Card: • Installing a Graphics Card: Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock.

• Removing the Card: Press the latch at the end of the slot to release the card and then lift the card straight out from the slot. Hardware Installation - 18 - 1-6 Back Panel Connectors USB 2.0/1.1 Port The USB port supports the USB 2.0/1.

1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc. PS/2 Keyboard/Mouse Port Use this port to connect a PS/2 mouse or keyboard. Optical S/PDIF Out Connector This connector provides digital audio out to an external audio system that supports digital optical audio. Before using this feature, ensure that your audio system provides an optical digital audio in connector.

USB 3.0/2.0 Port RJ-45 LAN Port The USB 3.0 port supports the USB 3.0 specification and is compatible to the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc. The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.

Connection/ Speed LED Activity LED Connection/Speed LED: State Orange Green Off Description 1 Gbps data rate 100 Mbps data rate 10 Mbps data rate Activity LED: State Description Blinking Data transmission or receiving is occurring Off No data transmission or receiving is occurring LAN Port •• When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard. •• When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector. - 19 Hardware Installation Center/Subwoofer Speaker Out Jack (Orange) Rear Speaker Out Jack (Black) Side Speaker Out Jack (Gray) Line In Jack (Blue) Use this audio jack to connect center/subwoofer speakers in a 5.1/7.1-channel audio configuration. Use this audio jack to connect rear speakers in a 4/5.1/7.1-channel audio configuration. Use this audio jack to connect side speakers in a 7.

1-channel audio configuration. The default line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc. Line Out Jack (Green) Mic In Jack (Pink) The default line out jack. Use this audio jack for a headphone or 2-channel speaker.

This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration. The default Mic in jack. Microphones must be connected to this jack.

In addition to the default speakers settings, the ~ audio jacks can be reconfigured to perform different functions via the audio software. Only microphones still MUST be connected to the default Mic in jack ( ). Refer to the instructions on setting up a 2/4/5.1/7.1-channel audio configuration in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio." Hardware Installation - 20 - 1-7 Internal Connectors 1 3 5 2 8 7 4 10 11 13 14 4 12 9 6 1) 2) 3) 4) 5) 6) 7) ATX_12V ATX CPU_FAN SYS_FAN1/SYS_FAN2 PWR_FAN CLR_CMOS SATA3 0/1/2/3/4/5 8) 9) 10) 11) 12) 13) 14) BAT F_PANEL F_AUDIO SPDIF_O F_USB1/F_USB2/F_USB3 COMA TPM Read the following guidelines before connecting external devices: •• First make sure your devices are compliant with the connectors you wish to connect. •• Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.

•• After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard. - 21 Hardware Installation 1/2) ATX_12V/ATX (2x4 12V Power Connector and 2x12 Main Power Connector) With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard.

Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation. The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start. To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system. ATX_12V: 8 4 5 ATX_12V 1 Pin No.

1 2 3 4 5 6 7 8 Definition GND (Only for 2x4-pin 12V) GND (Only for 2x4-pin 12V) GND GND +12V (Only for 2x4-pin 12V) +12V (Only for 2x4-pin 12V) +12V +12V ATX: 12 24 1 ATX 13 Pin No. 1 2 3 4 5 6 7 8 9 10 11 12 Definition Pin No. 3.3V 13 3.3V 14 GND 15 +5V 16 GND 17 +5V 18 GND 19 Power Good 20 5VSB (stand by +5V) 21 +12V 22 +12V (Only for 2x12-pin ATX) 23 3.

3V (Only for 2x12-pin ATX) 24 Definition 3.3V -12V GND PS_ON (soft On/Off) GND GND GND -5V +5V +5V +5V (Only for 2x12-pin ATX) GND (Only for 2x12-pin ATX) Hardware Installation - 22 - 3/4/5) CPU_FAN/SYS_FAN1/SYS_FAN2/PWR_FAN (Fan Headers) The motherboard has a 4-pin CPU fan header (CPU_FAN), a 3-pin (SYS_FAN2) and a 4-pin (SYS_ FAN1) system fan headers, and a 3-pin power fan header (PWR_FAN). Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design.

For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis. CPU_FAN: 1 CPU_FAN Pin No. 1 2 3 4 SYS_FAN1: Definition GND +12V /Speed Control Sense Speed Control Definition GND +12V /Speed Control Sense Reserve Definition GND +12V Sense 1 SYS_FAN1 Pin No. 1 2 3 4 Pin No. 1 2 3 SYS_FAN2/PWR_FAN: 1 SYS_FAN2 1 PWR_FAN •• Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang. •• These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers. 6) CLR_CMOS (Clear CMOS Jumper) Use this jumper to clear the CMOS values (e.g.

date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds. Open: Normal Short: Clear CMOS Values •• Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values. •• After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations). - 23 - Hardware Installation 7) SATA3 0/1/2/3/4/5 (SATA 6Gb/s Connectors) The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The AMD SB950 South Bridge supports RAID 0, RAID 1, RAID 5, RAID 10, and JBOD. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array. G.

QBOFM SATA3 G.QBOFM 7 7 0 2 4 1 3 5 1 1 G.QBOFM Pin No. 1 2 3 4 5 6 7 Definition GND TXP TXN GND RXN RXP GND UG T DEBUG PORT •• A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.

•• A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.) •• A RAID 10 configuration requires four hard drives. 8) BAT (Battery) The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.

You may clear the CMOS values by removing the battery: 1. Turn off your computer and unplug the power cord. 2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.) 3. Replace the battery. 4. Plug in the power cord and restart your computer. •• Always turn off your computer and unplug the power cord before replacing the battery.

•• Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model. •• Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model. •• When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up). •• Used batteries must be handled in accordance with local environmental regulations. Hardware Installation - 24 - 9) F_PANEL (Front Panel Header) Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables. Message/Power/ Sleep LED Power Switch Speaker MSG+ MSGPW+ PW- SPEAK+ 2 1 HD+ HDRESRES+ CICI+ PWR+ PWR- SPEAK20 19 Hard Drive Activity LED Reset Switch Power LED Chassis Intrusion Header •• MSG/PWR (Message/Power/Sleep LED, Yellow/Purple): Connects to the power status indicator on the chassis front panel. The LED System Status LED is on when the system is operating. The LED keeps blinking when the sysS0 On S1 Blinking tem is in S1 sleep state.

The LED is off when the system is in S3/S4 sleep S3/S4/S5 Off state or powered off (S5). •• PW (Power Switch, Red): Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management Setup," for more information). •• SPEAK (Speaker, Orange): Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code.

One single short beep will be heard if no problem is detected at system startup. If a problem is detected, the BIOS may issue beeps in different patterns to indicate the problem. Refer to Chapter 5, "Troubleshooting," for information about beep codes. •• HD (Hard Drive Activity LED, Blue) Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

•• RES (Reset Switch, Green): Connects to the reset switch on the chassis front panel.

Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart. •• CI (Chassis Intrusion Header, Gray): Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor. The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly. - 25 Hardware Installation 10) F_AUDIO (Front Panel Audio Header) The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header.

Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it. For HD Front Panel Audio: Pin No. Definition 1 MIC2_L F_PANEL(NH) 2 GND 3 MIC2_R 4 -ACZ_DET 5 LINE2_R 6 GND 7 FAUDIO_JD 8 No Pin 9 LINE2_L 10 GND For AC'97 Front Panel Audio: Pin No. Definition 1 MIC 2 GND 3 MIC Power 4 NC 5 Line Out (R) 6 NC 7 NC 8 No Pin 9 Line Out (L) 10 NC 9 F_AUDIO(H) 10 1 F_PANEL (H61M-D2) 2 • The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functionality via M_SATA the audio software in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio." • Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel Voltage measurement module(X58A-OC) audio module), refer to Chapter 5, "Configuring 2/4/5.1/7.

1-Channel Audio." • Some chassis provide a front panel audio module that has separated connectors on each wire PWM Switch (X58A-OC) instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer. 1 1 DB_PORT BIOS Switcher (X58A-OC) DIP 1 2 3 11) SPDIF_O (S/PDIF Out Header) DIP 1 2 3 This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expanPCIe power connector (SATA)(X58A-OC) sion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time.

For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card. Pin No. 1 2 Definition SPDIFO GND Voltage measurement points(G1.Sniper 3) BIOS Switcher (SW4) 1 Hardware Installation - 26 - 1 2 3 DIP 1 1 ACPI_CPT (GA-IVB) 1 2 3 SMB_CPT (GA-IVB) DIP CLR_CMOS CI DIS_ME GP15_CPT (GA-IVB) XDP_CPU XDP_PCH (GA-IVB) 12) F_USB1/F_USB2/F_USB3 (USB Headers) The headers conform to USB 2.0/1.

1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer. Pin No. 1 2 3 4 5 6 7 8 9 10 Definition Power (5V) Power (5V) USB DXUSB DYUSB DX+ USB DY+ GND GND No Pin NC G 9 10 1 2 When the system is in S4/S5 mode, only the USB ports routed to the F_USB1 header can support the ON/OFF Charge function. •• Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB header. •• Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket. 13) COMA (Serial Port Header) The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer. Pin No.

1 2 3 4 5 6 7 8 9 10 Definition NDCDNSIN NSOUT NDTRGND NDSRNRTSNCTSNRINo Pin 9 10 1 2 - 27 - Hardware Installation DB_PORT BIOS S 1 14) TPM (Trusted Platform Module Header) You may connect a TPM (Trusted Platform Module) to this header. TPM w/housing 19 1 Voltage measurement module(X58A-OC) PWM 20 2 Pin No. 1 2 3 4 5 6 7 8 9 10 Definition LCLK GND LFRAME No Pin LRESET NC LAD3 LAD2 VCC3 LAD1 Pin No. 11 12 13 14 15 16 17 18 19 20 Definition LAD0 GND PCIe power connector (SATA)(X58A-OC) NC ID SB3V SERIRQ GND NC NC SUSCLK BIOS Switcher (SW4) Voltage measurement points(G1.Sniper 3) Hardware Installation - 28 - 1 1 Chapter 2 BIOS Setup BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS. To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on. To see more advanced BIOS Setup menu options, you can press <Ctrl> + <F1> in the main menu of the BIOS Setup program.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility. • Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system. • @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS. For instructions on using the Q-Flash and @BIOS utilities, refer to Chapter 4, "BIOS Update Utilities." •• Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS.

To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction. •• BIOS will emit a beep code during the POST. Refer to Chapter 5, "Troubleshooting," for the beep codes description. •• It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results.

Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.

) - 29 - BIOS Setup 2-1 Startup Screen The following screens may appear when the computer boots. A. The LOGO Screen (Default) Function Keys B. The POST Screen Award Modular BIOS v6.00PG Copyright (C) 1984-2012, Award Software, Inc. GA-970A-D3 F8h . .

. . <DEL>: BIOS Setup <F9>: XpressRecovery2 <F12>: Boot Menu <End>: Qflash 03/13/2012-RD970-SB950-7A66FG03C-00 Motherboard Model BIOS Version Function Keys Function Keys: <TAB>: POST SCREEN Press the <Tab> key to show the BIOS POST screen. To show the BIOS POST screen at system startup, refer to the instructions on the Full Screen LOGO Show item on page 42. <DEL>: BIOS SETUP\Q-FLASH Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup. <F9>: XPRESS RECOVERY2 If you have ever entered Xpress Recovery2 to back up hard drive data using the driver disk, the <F9> key can be used for subsequent access to Xpress Recovery2 during the POST. For more information, refer to Chapter 4, "Xpress Recovery2." <F12>: BOOT MENU Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key <h> or the down arrow key <i> to select the first boot device, then press <Enter> to accept. To exit Boot Menu, press <Esc>. The system will directly boot from the device configured in Boot Menu. Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings. You can access Boot Menu again to change the first boot device setting as needed. <END>: Q-FLASH Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

BIOS Setup - 30 - 2-2 The Main Menu Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter a sub-menu. (Sample BIOS Version: F8h) CMOS Setup Utility-Copyright (C) 1984-2012 Award Software □ □ □ □ □ MB Intelligent Tweaker(M.I.T.

) Standard CMOS Features Advanced BIOS Features Integrated Peripherals Power Management Setup PC Health Status Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving F11: Save CMOS to BIOS F12: Load CMOS from BIOS ESC: Quit F8: Q-Flash □□□□: Select Item F10: Save & Exit Setup Change CPU's Clock & Voltage BIOS Setup Program Function Keys <h><i><f><g> Move the selection bar to select an item <Enter> Execute command or enter the submenu <Esc> Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu <Page Up> Increase the numeric value or make changes <Page Down> Decrease the numeric value or make changes <F1> Show descriptions of the function keys <F2> Move cursor to the Item Help block on the right (submenus only) <F5> Restore the previous BIOS settings for the current submenus <F6> Load the Fail-Safe BIOS default settings for the current submenus <F7> Load the Optimized BIOS default settings for the current submenus <F8> Access the Q-Flash utility <F9> Display system information <F10> Save all the changes and exit the BIOS Setup program <F11> Save CMOS to BIOS <F12> Load CMOS from BIOS Main Menu Help The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu. Submenu Help While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu. •• If you do not find the settings you want in the Main Menu or a submenu, press <Ctrl>+<F1> to access more advanced options. •• When the system is not stable as usual, select the Load Optimized Defaults item to set your system to its defaults. •• The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version. - 31 BIOS Setup □ The Functions of the <F11> and <F12> keys (For the Main Menu Only) □ F11: Save CMOS to BIOS This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles (Profile 1-8) and name each profile. First enter the profile name (to erase the default profile name, use the SPACE key) and then press <Enter> to complete.

□ F12: Load CMOS from BIOS If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load, then press <Enter> to complete. □ MB Intelligent Tweaker(M.I.T.) □ Standard CMOS Features Use this menu to configure the clock, frequency and voltages of your CPU, memory, etc. Use this menu to configure the system time and date, hard drive types, and the type of errors that stop the system boot, etc. Use this menu to configure the device boot order, advanced features available on the CPU, and the primary display adapter. Use this menu to configure all peripheral devices, such as SATA, USB, integrated audio, and integrated LAN, etc. Use this menu to configure all the power-saving functions. □ Advanced BIOS Features □ Integrated Peripherals □ Power Management Setup □ PC Health Status Use this menu to see information about autodetected system/CPU temperature, system voltage and fan speed, etc. Fail-Safe defaults are factory settings for the most stable, minimal-performance system operations. Optimized defaults are factory settings for optimal-performance system operations. Change, set, or disable password. It allows you to restrict access to the system and BIOS Setup. A supervisor password allows you to make changes in BIOS Setup. Change, set, or disable password. It allows you to restrict access to the system and BIOS Setup. A user password only allows you to view the BIOS settings but not to make changes. □ Load Fail-Safe Defaults □ Load Optimized Defaults □ Set Supervisor Password □ Set User Password □ Save & Exit Setup Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.) Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.) □ Exit Without Saving BIOS Setup - 32 - 2-3 MB Intelligent Tweaker(M.I.T.) CMOS Setup Utility-Copyright (C) 1984-2012 Award Software MB Intelligent Tweaker(M.

*) CPU Clock Ratio CPU NorthBridge Freq. Core Performance Boost (Note) CPB Ratio (Note) CPU Host Clock Control x CPU Frequency(MHz) PCIE Clock(MHz) HT Link Width HT Link Frequency DRAM E.O.C.P Set Memory Clock x Memory Clock } DRAM Configuration ******** System Voltage Optimized ******** System Voltage Control x CPU PLL Voltage Control x DRAM Voltage control x DDR VTT Voltage Control x NB Voltage Control Enter: Select □□□□: Move F5: Previous Values [Auto] [Auto] [Enabled] [Auto] [Auto] 200 [Auto] [Auto] [Auto] [Disabled] [Auto] x6.66 [Press Enter] [Auto] Auto Auto Auto Auto ESC: Exit F1: General Help F7: Optimized Defaults 3000Mhz 2000Mhz 3600Mhz Item Help Menu Level □ 2400Mhz 1333Mhz +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults CMOS Setup Utility-Copyright (C) 1984-2012 Award Software MB Intelligent Tweaker(M.I.T.) x x x x HT Link Voltage Control NB/PCIe/PLL Voltage Ctrl CPU NB VID Control CPU Voltage Control Normal CPU Vcore Auto Auto Auto Auto 1.4125V Item Help Menu Level □ Enter: Select □□□□: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.) (Note) This item is present only when you install a CPU that supports this feature.*

- 33 BIOS Setup CPU Clock Ratio Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being used. Allows you to alter the North Bridge controller frequency for the installed CPU. The adjustable range is dependent on the CPU being used. Allows you to determine whether to enable the Core Performance Boost (CPB) technology, a CPU performance-boost technology.
(Default: Enabled) Allows you alter the ratio for the CPB. The adjustable range is dependent on the CPU being installed. (Default: Auto) Enables or disables the control of CPU host clock. Auto (default) allows the BIOS to automatically adjust the CPU host frequency. Manual allows the CPU Frequency (MHz) item below to be configurable. Note: If your system fails to boot after overclocking, please wait for 20 seconds to allow for automated system reboot, or clear the CMOS values to reset the board to default values. Allows you to manually set the CPU host frequency. The adjustable range is from 200 MHz to 500 MHz. This option is configurable only when CPU Host Clock Control is set to Manual. Important It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

Allows you to manually set the PCIe clock frequency. The adjustable range is from 100 MHz to 150 MHz. Auto sets the PCIe clock frequency to standard 100 MHz. (Default: Auto) Allows you to manually set the width for the HT Link between the CPU and chipset. Auto BIOS will automatically adjust the HT Link Width. (Default) 8 bit Sets HT Link Width to 8 bit. 16 bit Sets HT Link Width to 16 bit. Allows you to manually set the frequency for the HT Link between the CPU and chipset. Auto BIOS will automatically adjust the HT Link Frequency. (Default) x1~x13 Sets HT Link Frequency to x1~x13 (200 MHz~2.
6 GHz). CPU NorthBridge Freq. Core Performance Boost (Note) CPB Ratio (Note) CPU Host Clock Control CPU Frequency(MHz) PCIE Clock(MHz) HT Link Width HT Link Frequency DRAM E.O.C.
P Set Memory Clock Memory Clock Allows you to determine whether to use the preset memory overclocking profile to achieve optimum overclocking performance. (Default: Disabled) Determines whether to manually set the memory clock. Auto lets BIOS automatically set the memory clock as required. Manual allows the memory clock control item below to be configurable. (Default: Auto) This option is configurable only when Set Memory Clock is set to Manual.
*The adjustable range is dependent on the CPU being installed. This item is present only when you install a CPU that supports this feature. - 34 - (Note) BIOS Setup DRAM Configuration CMOS Setup Utility-Copyright (C) 1984-2012 Award Software DRAM Configuration x x x x x x x x x x x x x x CPU Host Clock Control CPU Frequency(MHz) Set Memory Clock Memory Clock DCTs Mode DDR3 Timing Items 1T/2T Command Timing CAS# latency RAS to CAS R/W Delay Row Precharge Time Minimum RAS Active Time TwTr Command Delay Trfc0 for DIMM1, DIMM3 Trfc1 for DIMM2, DIMM4 Write Recovery Time Precharge Time Row Cycle Time RAS to RAS Delay **DCTs Drive Strength** [Auto] 200 [Auto] x6.66 1333Mhz [Unganged] [Auto] SPD Auto Auto --Auto 9T 9T Auto 9T 9T Auto 9T 9T Auto 24T 24T Auto 5T 5T Auto 110ns 110ns Auto --Auto 10T 10T Auto 5T 5T Auto 33T 33T Auto 4T 4T DCT0 DCT1 Item Help Menu Level □ Enter: Select □□□□: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults CMOS Setup Utility-Copyright (C) 1984-2012 Award Software DRAM Configuration ProcOdt(ohms) DQS Drive Strength Data Drive Strength MEMCLK Drive Strength Addr/Cmd Drive Strength CS/ODT Drive Strength CKE Drive Strength **DCTs Addr/Cmd Timing** Addr/Cmd Setup Time Addr/Cmd Fine Delay CS/ODT Setup Time CS/ODT Fine Delay CKE Setup Time CKE Fine Delay Channel Interleaving Bank Interleaving DQS Training Control CKE Power Down Mode Memclock tri-stating [Auto] 80 [Auto] 1.0x [Auto] 1.0x [Auto] 1.25x [Auto] 1.5x [Auto] 1.5x [Auto] 1.5x DCT0 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 [Auto] 60 [Auto] 1.*

5x [Auto] 1.5x [Auto] 1.5x [Auto] 2.0x [Auto] 2.0x [Auto] 2.0x DCT1 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 Item Help Menu Level □ [Enabled] [Enabled] [Skip DQS] [Disabled] [Disabled] +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults Enter: Select □□□□: Move F5: Previous Values CPU Host Clock Control, CPU Frequency (MHz), Set Memory Clock, Memory Clock The settings under the four items above are synchronous to those under the same items on the MB In- telligent Tweaker(M.I.T.) main menu. Allows you to set memory control mode.
Ganged Sets memory control mode to single dual-channel. Unganged Sets memory control mode to two single-channel.

(Default) DCTs Mode DDR3 Timing Items Manual allows all DDR3 Timing items below to be configurable. Options are: Auto (default), Manual. - 35 BIOS Setup 1T/2T Command Timing CAS# latency Options are: Auto (default), 1T, 2T.

Options are: Auto (default), 5T~14T. Options are: Auto (default), 2T~19T. Options are: Auto (default), 2T~19T. Options are: Auto (default), 8T~40T. Options are: Auto (default), 4T~9T.

*Options are: Auto (default), 90ns, 110ns, 160ns, 300ns, 350ns. Options are: Auto (default), 90ns, 110ns, 160ns, 300ns, 350ns. Options are: Auto (default), 5T~8T, 10T, 12T, 14T, 16T. Options are: Auto (default), 4T~10T. Options are: Auto (default), 10T~56T. Options are: Auto (default), 1T~9T. RAS to CAS R/W Delay Row Precharge Time Minimum RAS Active Time TwTr Command Delay Trfc1 for DIMM1, DIMM3 Trfc0 for DIMM2, DIMM4 Write Recovery Time Precharge Time Row Cycle Time RAS to RAS Delay **DCTs Drive Strength** ProcOdt(ohms) Options are: Auto (default), 240 ohms, 120 ohms, 80 ohms, 60 ohms. Options are: Auto (default), 0.75x, 1.0x, 1.*

25x, 1.5x. Options are: Auto (default), 0.75x, 1.0x, 1.25x, 1.5x. Options are: Auto (default), 0.75x, 1.0x, 1.

25x, 1.5x. Options are: Auto (default), 1.0x, 1.25x, 1.

5x, 2.0x. Options are: Auto (default), 1.0x, 1.25x, 1.

*5x, 2.0x. Options are: Auto (default), 1.0x, 1.25x, 1.5x, 2.0x. - 36 - DQS Drive Strength Data Drive Strength MEMCLK Drive Strength Addr/Cmd Drive Strength CS/ODT Drive Strength CKE Drive Strength BIOS Setup **DCTs Addr/Cmd Timing** Addr/Cmd Setup Time Addr/Cmd Fine Delay CS/ODT Setup Time CS/ODT Fine Delay CKE Setup Time CKE Fine Delay Options are: Auto (default), 1/2T, 1T. Options are: Auto (default), 0/64~31/64. Options are: Auto (default), 1/2T, 1T.*

*Options are: Auto (default), 0/64~31/64. Options are: Auto (default), 1/2T, 1T. Options are: Auto (default), 0/64~31/64. Channel Interleaving Enables or disables memory channel interleaving. Enabled allows the system to simultaneously access different channels of the memory to increase memory performance and stability. (Default: Enabled) Enables or disables memory bank interleaving. Enabled allows the system to simultaneously access different banks of the memory to increase memory performance and stability. (Default: Enabled) Enables or disables memory DQS training each time the system restarts. (Default: Skip DQS) Bank Interleaving DQS Training Control CKE Power Down Mode Determines whether to set the memory to power down mode when the CKE pin is closed. (Default: Disabled) Determines whether to enable memory clock tri-stating in CPU C3 or Alt VID mode. (Default: Disabled) Memclock tri-stating ******** System Voltage Optimized ******** System Voltage Control Determines whether to manually set the system voltages. Auto lets the BIOS automatically set the system voltages as required. Manual allows all voltage control items below to be configurable. (Default: Auto) Allows you to set the CPU PLL voltage. Normal Supplies the CPU PLL voltage as required. (Default) 2.060V ~ 3.170V The adjustable range is from 2.060V to 3.170V.*

Note: Increasing CPU voltage may result in damage to your CPU or reduce the useful life of the CPU. CPU PLL Voltage Control DRAM Voltage control - 37 - BIOS Setup Allows you to set memory voltage. Normal Supplies the memory voltage as required. (Default) 1.035V ~ 2.145V The adjustable range is from 1.035V to 2.145V. □ Note: Increasing memory voltage may result in damage to the memory or reduce the useful life of the memory. Allows you to set the DDR VTT voltage.

Normal Supplies the South Bridge voltage as required. (Default) 0.515V ~ 1.145V The adjustable range is from 0.515 to 1.145V. □ Note: Increasing memory voltage may result in damage to the memory or reduce the useful life of the memory. DDR VTT Voltage Control NB Voltage Control Allows you to set the North Bridge voltage. Normal Supplies the North Bridge voltage as required. (Default) 0.

870V ~ 1.500V The adjustable range is from 0.870 to 1.500V. Allows you to set the HT Link voltage.

Normal Supplies the North Bridge voltage as required. (Default) 0.735V ~ 1.520V The adjustable range is from 0.735 to 1.

520V. Allows you to set the North Bridge PCIe PLL voltage. Normal Supplies the North Bridge PCIe PLL voltage as required. (Default) 1.335V ~ 2.445V The adjustable range is from 1.335V to 2.445V. HT Link Voltage Control NB/PCIe/PLL Voltage Control CPU NB VID Control Allows you to set the CPU North Bridge VID voltage. Auto sets the CPU North Bridge VID voltage as required.

The adjustable range is dependent on the CPU being installed. (Default: Normal) Note: Increasing CPU voltage may result in damage to your CPU or reduce the useful life of the CPU. Allows you to set the CPU voltage. Auto sets the CPU voltage as required. The adjustable range is dependent on the CPU being installed. (Default: Normal) Note: Increasing CPU voltage may result in damage to your CPU or reduce the useful life of the CPU. Displays the normal operating voltage of your CPU. CPU Voltage Control Normal CPU Vcore BIOS Setup - 38 - 2-4 Standard CMOS Features CMOS Setup Utility-Copyright (C) 1984-2012 Award Software Standard CMOS Features } } } } } } Date (mm:dd:yy) Time (hh:mm:ss) IDE Channel 0 Master IDE Channel 0 Slave IDE Channel 1 Master IDE Channel 1 Slave IDE Channel 2 Master IDE Channel 2 Slave Halt On Thu, Mar 29 2012 22:31:24 [None] [None] [None] [None] [None] [None] [All, But Keyboard] 640K 766M Item Help Menu Level □ Base Memory Extended Memory Enter: Select □□□□: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults Date (mm:dd:yy) Sets the system date. The date format is week (read-only), month, date and year. Select the desired field and use the up arrow or down arrow key to set the date.

Sets the system time. For example, 1 p.m. is 13:0:0. Select the desired field and use the up arrow or down arrow key to set the time.

Time (hh:mm:ss) IDE HDD Auto-Detection Press <Enter> to autodetect the parameters of the SATA device on this channel. IDE Channel 0, 1 Master/Slave Configure your SATA devices by using one of the two methods below: • Auto Lets the BIOS automatically detect SATA devices during the POST. (Default) • None □ If no SATA devices are used, set this item to None so the system will skip the detection of the device during the POST for faster system startup. Access Mode Sets the hard drive access mode. Options are: Auto (default), CHS, LBA, Large.

IDE Auto-Detection Press <Enter> to autodetect the parameters of the SATA device on this channel. Extended IDE Drive Configure your SATA devices by using one of the two methods below: • Auto Lets the BIOS automatically detect SATA devices during the POST.

(Default) • None ❑ If no SATA devices are used, set this item to None so the system will skip the detection of the device during the POST for faster system startup. Access Mode Sets the hard drive access mode. Options are: Auto (default), Large. Capacity Approximate capacity of the currently installed hard drive. IDE Channel 0, 1 Master/Slave IDE Channel 2 Master/Slave - 39 - BIOS Setup Halt On Allows you to determine whether the system will stop for an error during the POST. All Errors Whenever the BIOS detects a non-fatal error the system boot will stop. No Errors The system boot will not stop for any error. All, But Keyboard ❑ The system boot will not stop for a keyboard error but stop for all other errors.

(Default) These fields are read-only and are determined by the BIOS POST. Base Memory ❑ Also called conventional memory. Typically, 640 KB will be reserved for the MS-DOS operating system. Extended Memory The amount of extended memory. Memory BIOS Setup - 40 - 2-5 Advanced BIOS Features CMOS Setup Utility-Copyright (C) 1984-2012 Award Software Advanced BIOS Features x x x x x } Load Line Control AMD C1E Support AMD C6 Support Virtualization AMD K8 Cool&Quiet control AMD APM Master Mode CPU core Control (Note) One Core Per Compute Unit (Note) CPU core 1-2 (Note) CPU core 3-4 (Note) CPU core 5-6 (Note) CPU core 7-8 (Note) Hard Disk Boot Priority EFI CD/DVD Boot Option First Boot Device Second Boot Device Third Boot Device Password Check HDD S.M.A.R.T. Capability [Auto] [Auto] [Enabled] [Disabled] [Auto] [Auto] [Auto] Disabled Enabled Enabled Enabled Enabled [Press Enter] [Auto] [Hard Disk] [CDROM] [USB-FDD] [Setup] [Disabled] Item Help Menu Level ❑ Enter: Select ❑❑❑❑: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults CMOS Setup Utility-Copyright (C) 1984-2012 Award Software Advanced BIOS Features Away Mode Full Screen LOGO Show IOMMU support Init Display First [Disabled] [Enabled] [Disabled] [PCI Slot] Item Help Menu Level ❑ Enter: Select ❑❑❑❑: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults Load Line Control Enables or disables Load Line control.

This item allows you to adjust Vdroop at different levels. Enabling Load Line control may keep the CPU voltage more constant under light and heavy CPU load. Auto lets the BIOS automatically configure this setting. (Default: Auto) Enables or disables the C1E CPU power-saving function in system halt state. When enabled, the power consumption will be reduced during system halt state.

Auto ❑ If a CPU that supports hardware C1E is installed, the BIOS will automatically enable the hardware C1E function. If not, the C1E function will be disabled. (Default) This item is present only when you install a CPU that supports this feature. - 41 BIOS Setup AMD C1E Support (Note) Enabled ❑ If a CPU that supports hardware C1E is installed, the BIOS will automatically enable the hardware C1E function. If not, the BIOS will enable the software C1E function.

Disabled Disables the C1E function. Virtualization Virtualization allows a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Disabled) Auto ❑ Lets the AMD Cool'n'Quiet driver dynamically adjust the CPU clock and VID to reduce heat output from your computer and its power consumption. (Default) Disabled Disables this function. Auto Lets BIOS automatically configure this setting. (Default) Enabled ❑ Dynamically monitors the power consumption of the CPU cores and automatically optimizes the CPU to its best performance level. Disabled Disables this function. AMD K8 Cool&Quiet control AMD APM Master Mode CPU core Control (Note) Allows you to determine whether to manually enable/disable CPU Core. Auto ❑ Lets the BIOS to enable all CPU cores (number of cores available depends on the CPU being used).

(Default) Manual Allows you to individually enable/disable CPU Core. One Core Per Compute Unit (Note) Enables or disables one core of each Compute Unit. If set to Enabled, each Compute Unit will operate with only one core and the CPU core 3-4, 5-6, 7-8 items will become unconfigurable. This item is configurable only when CPU core Control is set to Manual. (Default: Disabled(Default: Disabled) This setting is fixed. CPU Core 1-2 is always enabled. CPU core 1-2 (Note) CPU core 3-4/5-6/7-8 (Note) Allows you to enable/disable each Compute Unit respectively. If set to Disabled, both cores of the CPU Unite will be disabled. This item is configurable only when One Core Per Compute Unit is set to Disabled. (Default: Enabled) Specifies the sequence of loading the operating system from the installed hard drives.

Use the up or down arrow key to select a hard drive, then press the plus key <+> (or <PageUp>) or the minus key <-> (or <PageDown>) to move it up or down on the list. Press <Esc> to exit this menu when finished. Set this item to EFI if you want to install the operating system to a hard drive larger than 2.2 TB. Make sure the operating system to be installed supports booting from a GPT partition, such as Windows 7 64-bit and Windows Server 2003 64-bit. Auto lets the BIOS automatically configure this setting depending on the hard drive you install. (Default: Auto) Specifies the boot order from the available devices. Use the up or down arrow key to select a device and press <Enter> to accept. Options are: LS120, Hard Disk, CDROM, ZIP, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, Legacy LAN, Disabled. Hard Disk Boot Priority EFI CD/DVD Boot Option First/Second/Third Boot Device BIOS Setup - 42 - Password Check Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup.

After configuring this item, set the password(s) under the Set Supervisor/User Password item in the BIOS Main Menu. Setup A password is only required for entering the BIOS Setup program. (Default) System ❑ A password is required for booting the system and for entering the BIOS Setup program. Enables or disables the S.M.A.R.T. (Self Monitoring and Reporting Technology) capability of your hard drive. This feature allows your system to report read/write errors of the hard drive and to issue warnings when a third party hardware monitor utility is installed.

(Default: Disabled) Enables or disables Away Mode in Windows XP Media Center operating system. Away Mode allows the system to silently perform unattended tasks while in a low-power mode that appears off. (Default: Disabled) Allows you to determine whether to display the GIGABYTE Logo at system startup.

Disabled displays normal POST message. (Default: Enabled) Enables or disables AMD IOMMU support. (Default: Disabled) HDD S.M.A.R.T. Capability Away Mode Full Screen LOGO Show IOMMU support Init Display First Specifies the first initiation of the monitor display from the installed PCI graphics card or the PCI Express graphics card. PCI Slot Sets the PCI graphics card as the first display. (Default) PEG Sets the PCI Express graphics card on the PCIEX16 slot as the first display. PEG1 Sets the PCI Express graphics card on the PCIEX4 slot as the first display. - 43 - BIOS Setup 2-6 Integrated Peripherals CMOS Setup Utility-Copyright (C) 1984-2012 Award Software Integrated Peripherals x x x } OnChip SATA Controller OnChip SATA Type OnChip SATA Port4/5 Type OnChip SATA RAID5 Support OnChip SATA3.

0 Support OnChip SATA Port as ESP Onboard LAN Function Onboard LAN Boot ROM SMART LAN Onboard Audio Function USB30 Controller USB Controllers USB Legacy Function USB Storage Function Onboard Serial Port 1 [Enabled] [Native IDE] IDE Enabled [Enabled] Press Enter [Enabled] [Disabled] [Press Enter] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [3F8/IRQ4] Item Help Menu Level ▯ Enter: Select ▯▯▯▯: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults OnChip SATA Controller (AMD SB950 South Bridge, SATA3 0~SATA3 5 connectors) Enables or disables the integrated SATA controller. (Default: Enabled) Configures the operating mode of the integrated SATA2 0~SATA2 3 controller. Native IDE Allows the SATA controller to operate in Native IDE mode. (Default) ▯ Enable Native IDE mode if you wish to install operating systems that support Native mode. RAID Enables RAID for the SATA controller.

AHCI ▯ Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. OnChip SATA Type (AMD SB950 South Bridge, SATA3 0~SATA3 3 connectors) OnChip SATA Port4/5 Type (AMD SB950 South Bridge, SATA3 4/SATA3 5 connectors) This option is configurable only when OnChip SATA Type is set to RAID or AHCI. Configures the operating mode of the integrated SATA3 4/SATA3 5 connectors. IDE ▯ Disables RAID for the SATA controller and configures the SATA controller to PATA mode. (Default) As SATA Type The mode depends on the OnChip SATA Type settings. Enables or disables RAID 5 support for the SATA controller integrated in the AMD SB950 South Bridge. This option is configurable only when OnChip SATA Type is set to RAID. (Default: Enabled) Enables or disables the SATA 6Gb/s function integrated in the South Bridge. When set to Disabled, the SATA controller will operate in SATA 3Gb/s mode.

(Default: Enabled) OnChip SATA RAID5 Support (AMD SB950 South Bridge, SATA3 0~SATA3 5 connectors) OnChip SATA3.0 Support BIOS Setup - 44 - OnChip SATA Port as ESP CMOS Setup Utility-Copyright (C) 1984-2012 Award Software OnChip SATA Port as ESP x x Port0 as ESP Port1 as ESP Port2 as ESP Port3 as ESP Port4 as ESP Port5 as ESP [Disabled] [Disabled] [Disabled] [Disabled] Disabled Disabled Item Help Menu Level ▯▯ Enter: Select ▯▯▯▯: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults Port0 as ESP/Port1 as ESP/Port2 as ESP/Port3 as ESP This option is configurable only when OnChip SATA Type is set to AHCI. Enabled will speed up the hot plug detection of the connected SATA device. (Default: Disabled) Port4 as ESP/Port5 as ESP This option is configurable only when OnChip SATA Type is set to AHCI and OnChip SATA Type Port4/5 is set to As SATA Type. Enabled will speed up the hot plug detection of the connected SATA device. (Default: Disabled) Onboard LAN Function Enables or disables the onboard LAN function. (Default: Enabled) If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to Disabled. Allows you to decide whether to activate the boot ROM integrated with the onboard LAN chip. (Default: Disabled) Onboard LAN Boot ROM SMART LAN (LAN Cable Diagnostic Function) CMOS Setup Utility-Copyright (C) 1984-2012 Award Software SMART LAN Start detecting at Port..

... Part1-2 Status = Open Part3-6 Status = Open Part4-5 Status = Open Part7-8 Status = Open / / / / Length Length Length Length = = = = 0m 0m 0m 0m Item Help Menu Level ▯▯ Enter: Select ▯▯▯▯: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults This motherboard incorporates cable diagnostic feature designed to detect the status of the attached LAN cable. This feature will detect cabling issue and report the approximate distance to the fault or short.

Refer to the following information for diagnosing your LAN cable: When No LAN Cable Is Attached... If no LAN cable is attached to the motherboard, the Status fields of all four pairs of wires will show Open and the Length fields show 0m, as shown in the figure above. - 45 - BIOS Setup When LAN Cable Is Functioning Normally.

.. If no cable problem is detected on the LAN cable connected to a Gigabit hub or a 10/100 Mbps hub, the following message will appear: Start detecting at Port..... @@@@@@When a Cable Problem Occurs...

@@@@@@@@Enables or disables the Etron EJ168 USB controller. @@@@Allows USB keyboard to be used in MS-DOS. @@@@Options are: Auto, 3F8/IRQ4 (default), 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Disabled. Onboard Serial Port 1 BIOS Setup - 46 - 2-7 Power Management Setup CMOS Setup Utility-Copyright (C) 1984-2012 Award Software Power Management Setup x x x ACPI Suspend Type Soft-Off by Power button USB Wake Up from S3 Modem Ring Resume PME Event Wake Up HPET Support (Note) Power On By Mouse Power On By Keyboard KB Power ON Password AC Back Function Power-On by Alarm Date (of Month) Resume Time (hh:mm:ss) ErP Support [S3(STR)] [Instant-off] [Enabled] [Disabled] [Enabled] [Enabled] [Disabled] [Disabled] Enter [Soft-Off] [Disabled] Everyday 0:0:0 [Disabled] Item Help Menu Level ▯ Enter: Select ▯▯▯▯: Move F5: Previous Values +/-/PU/PD: Value F10: Save F6: Fail-Safe Defaults ESC: Exit F1: General Help F7: Optimized Defaults Specifies the ACPI sleep state when the system enters suspend. S1(POS) Enables the system to enterthe ACPI S1 (Power on Suspend) sleep state. ▯ In S1 sleep state, the system appears suspended and stays in a low power mode. The system can be resumed at any time. @@@@@@@@@@@@@@@@@@@@@@Disabled Disables this function. @@Allows the system to be turned on by a PS/2 keyboard wake-up event.