OCIPUG Hardware SIG

September 9, 2008

OCIPUG Hardware SIG

- Agenda – September 9, 2008
  - 7:00 – 7:05 Administration
  - 7:05 – 8:30 Featured Topic: “Building Your Own System: Installing the Balance of Your Components” (alias, “Assembly – Part 2”)
  - 8:30 – 9:00 Hardware News
  - 9:00 – 9:10 Break
  - 9:10 – 9:55 Hardware Submission and Random Access (Q&A)
  - 9:55 – 10:00 Recap, Preview, and Close

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- Administration
  - Welcome! Please Sign In.
  - This SIG is a resource for computer users and potential computer users.
  - Random Access “Log” – sets response sequence
  - Hardware Assistance RELEASE Form
  - This presentation will be posted on the OCIPUG Hardware SIG web site:
    - Click the “Hardware” link at http://www.ocipug.org/

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- Administration (continued)
  - Also posted on that web site:
    - SIG info and meeting schedule
    - Prior presentations (back to “Day One”, April 11, 2000)
    - Hardware links (to press releases and product pages)
    - “Resource” links (to product reviews, product news, “self help”, PC technology and industry/standard organizations, e-tailers, and pricing engines)

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- Building…('08): Set-Up/Assembly, Part 2
  - Givens (from the last meeting) – you have:
    - Set up your motherboard, installed your CPU and RAM, and successfully performed a bench test.

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - The Process
    - Install the motherboard “assembly”
    - Perform an initial system-level test
    - Assemble and review the component docs (balance)
    - Install the “floppy” and hard drives
    - Install other externally-accessible drives
    - Attach data and power cables
    - Install I/O cables/brackets

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - The Process (continued)
    - Install adapter cards
    - Perform a system-level test
    - Set up your BIOS (baseline).

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - NOTE: The assembly instructions which follow assume a very basic chassis, i.e., NO “tool-free” features and the installation of IDE/ATAPI drives. Your chassis and drives may vary. [Recall that there is only one (1) SATA device per SATA data cable.]

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - Install the Motherboard “assembly”
    - Remove the chassis side cover, drive bays, and front bezel to provide access
    - As applicable, insert the chassis I/O shield – you may also need to knock out connector opening cover(s) in the I/O shield
    - Compare the layout of the mounting holes in the motherboard with the standoffs on the chassis “floor” – add, remove, or relocate the standoffs to match the motherboard layout.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install the Motherboard "assembly" (continued)
    - Connect the chassis front panel wires to the motherboard – watch the orientation of the connectors (+/-). Note that there may not be an exact match between available connectors (headers) on the motherboard and the wire set included in the chassis. At minimum you need to connect the power (on/off) switch. If included, also connect the reset switch, power-on LED, and hard drive activity LED cables – others as you desire.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install the Motherboard "assembly" (continued)
    - Position the motherboard – watch the chassis I/O shield area to make sure the EMI "fingers" contact the connector housings without blocking the connector openings; you should see a standoff through each mounting hole in the motherboard – if not, remove the motherboard and re-setup the standoffs; you will need to apply pressure towards the rear of the chassis to align the mounting holes
    - As applicable, secure the motherboard with the provided screws (screws that should have come with the chassis)

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - Perform an Initial System Test
    - Install your power supply (check/set the voltage switch) and connect the main and CPU (processor) power cables (watch the connector keying) – do not connect to external power
    - As applicable, install your video card and connect it to an appropriate monitor; turn on the monitor
    - Attach your keyboard
    - Connect the power supply to a grounded power outlet via a good surge suppressor; turn on the surge suppressor and, as applicable, the power supply

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Perform an Initial System Test (continued)
    - Push the chassis "power-on" button – the system "should" start up. If not, power down, disconnect the power cable, remove the motherboard, check installed-vs.-required standoffs, adjust accordingly, reassemble, and retest until the system starts up.
    - As applicable, hit the "Del" or "F2" key to enter the BIOS

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - Perform an Initial System Test (continued)
    - If you are able to enter the BIOS, your initial system test was successful – motherboard, CPU, RAM, video card, and power supply are functional; basic system assembly is OK
    - Power down system unit and monitor; disconnect power, the keyboard, and the monitor.

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - Assemble and Review the Component Docs (balance)
    - As applicable, check docs for master/slave settings
    - Check docs for power, data, audio, and other I/O connections.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install the"Floppy" and Hard Drives
    - If not already removed, and applicable, remove the floppy and/or hard drive "cage(s)" from the chassis
    - Remove the drive bay "cover" for the floppy drive from the chassis' front bezel – pops out towards the front
    - Eyeball the "to-be" location of the floppy in the chassis and temporarily install the floppy (4 small, fine thread screws) – the eject button should be towards the "bottom" of the chassis when it stands upright
    - Check for "fit" (front-to-rear).

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install the"Floppy" and Hard Drives (continued)
    - If applicable, reposition the floppy and recheck until position is correct; secure with 4 screws
    - If applicable, set the booting hard drive as "master" – or leave at CS (cable select) if pre-set by the manufacturer. [IDE]
    - Install the hard drive (4 short, coarse thread screws) – the power and data cable connectors towards the rear (and typically towards the bottom of the chassis when the chassis is upright)
    - If applicable, install the hard drive cage in the chassis; secure it.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install Other Externally-Accessible Drives
    - Remove the drive bay "cover(s)" for the drive(s) from the chassis' front bezel – pop out towards the front.
    - Since there can be only one master and one slave drive attached to an IDE/ATAPI cable, check the master/slave drive settings; change as required – set the noticeably slower drive as the slave. [IDE]
    - Note that the data cable has a "long" and a "short" end – established by the relative position of the center connector. The drives attach at the short end with the pin-1 stripe "keyed" towards the drive's power socket. [IDE]

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install Other Externally-Accessible Drives (cont.)
    - Note the data cable's pin-1 stripe location in relation to the "to-be" location of the drives in the chassis; adjust the "stack" such that the master drive is at the end of the cable. See next point… [IDE]
    - Sometimes the master drive will be on the bottom and the cable will go up, flop back over after attaching to the slave drive, and then drop down to the motherboard. Sometimes the master drive will be on the top and the cable will just drop down, connect to the slave drive, and then drop down to the motherboard. All cable connector layout dependant. [IDE]

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install Other Externally-Accessible Drives (cont.)
    - Watch the front-to-rear positioning of the drive in the chassis so drives don't recede from or overhang the front bezel.
    - Secure the drive(s) in the chassis – 4 small, fine thread screws for each drive.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Attach Data and Power Cables
    - If present, connect the power supply fan speed monitoring cable to the "pwr fan" socket (header) on the motherboard; note keying. ["Sys fan" is OK if available.]
    - Connect the floppy drive data cable – "non-split" end at the motherboard and the "split" end at the drive; make sure BOTH rows of the floppy header pins are engaged. The "red stripe" on the data cable is typically towards the power connector. Ensure both connectors are fully seated.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Attach Data and Power Cables (continued)
    - Connect the hard drive data cable(s) – long end at the motherboard and the short end at the drive; watch master/slave drive positioning and the connector keying (pin-1 identification at the motherboard and pin-1 stripe on the cable). At the drive end the stripe is on the side nearest the drive's power connector. Ensure both connectors are fully seated. [IDE]
    - If you are using SATA drives, the associated data cables are also keyed ("L" shape), proceed accordingly.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Attach Data and Power Cables (continued)
    - Connect the data cables for the other drives – long end at the motherboard and the short end at the drives; watch master/slave drive positioning and the connector keying (pin-1 identification at the motherboard and pin-1 stripe on the cable). At the drive end the stripe is on the side nearest the drive's power connector. Ensure all connectors are fully seated. [IDE]
    - If you are using SATA drives, the associated data cables are also keyed ("L" shape), proceed accordingly.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Attach Data and Power Cables (continued)
    - Note the keying of the power supply's power connectors and the keying of the motherboard and drive sockets.
    - Connect the main power cable to the motherboard – watch the keying; make sure the connector is fully seated.
    - Connect the CPU (processor) power cable:
      - Most current boards have a 2x2 (4-pin) processor connector
      - Some boards may have a 2x4 (8-pin) processor connector
      - All such connectors are keyed (match cable side clip to motherboard connector ridge)

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Attach Data and Power Cables (continued)
    - Connect the floppy power cable to the floppy drive – note the power connector keying (the connector's two "legs" straddle the flat plastic portion of the drive power header). Ensure the connector is fully seated.
    - Connect power cables to the other drives – note the power connector keying and the drive connector socket keying (beveled edges or "L" orientation). Ensure each connector is fully seated.
    - If applicable, attach chassis fan power cable(s).

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install I/O Cables/Brackets
    - Many current motherboards include cables and brackets to provide additional I/O functionality, e.g., USB 2.0, IEEE-1394 (FireWire), and audio. If present – and desired – connect each cable to the associated motherboard header/socket, route the cable's bracket to a rear "card slot" bracket opening (remove cover, if required), and secure the bracket.
    - If present – and desired – connect front I/O cables from your chassis/module to the motherboard.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install I/O Cables/Brackets (continued)
    - Watch connector keying at the motherboard.
    - Note that you may need to enable the particular feature in the BIOS or by jumper.
    - Note that you may NOT have enough motherboard headers to support all front I/O connections (to front chassis locations) AND all rear I/O bracket ports. If you do not connect all the cables, consider taping over the non-functional ports – at the external locations.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install Adapter Cards
    - As applicable, install your video card – make sure it is full seated and that any included retention mechanism is fully engaged. Secure with 1 large, coarse thread screw.
    - As applicable, install other adapter cards – make sure each is full seated. Secure each with 1 large, coarse thread screw.
    - Follow the motherboard manual's instruction in regards "sequencing" of the adapter cards (matching cards to slots).

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Install Adapter Cards (continued)
    - If you fill all or almost all of the available adapter card slots you MAY have IRQ conflicts. Check the docs that came with the cards to see if there are any applicable "Troubleshooting" instructions – or start swapping card locations – and/or try to reserve PCI slots in the BIOS. Good Luck! [The best plan may be to pull a card at a time (lowest-priority-first sequence) until the problem "goes away". Consider doing without that card.]

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - Perform a System-Level Test
    - Attach your keyboard
    - Connect your system to your monitor and power on the monitor
    - Connect the power supply to a grounded power outlet via a good surge suppressor; turn on the surge suppressor, and, as applicable, turn on the power supply.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Perform a System-Level Test (continued)
    - Push the chassis "power-on" button – the system "should" start up. If not, check to see if the power supply fan is spinning – if not, the power supply is NOW bad, the surge suppressor is NOW not turned on or is NOW defective, you NOW have a bad power cable between the system and the surge suppressor, or you NOW have no power at the wall. [Just in case, check that you didn't dislodge the power on/off switch cable at the motherboard.] Fix and retry.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Perform a System-Level Test (continued)
    - Listen for "Beep Codes" – 1 = AOK; 3 = video; constant bleeping = CPU overheating or a video card which requires its own power connection is NOT connected; other numbers typ = RAM. Remove system power, remove/reseat/connect affected component(s), add power, and retry.
    - If the power supply fan is spinning but the system is not starting (and no beep codes), remove power
    - Remove and reinstall the CPU – including removing and replacing the thermal compound. Reconnect power and try powering on again.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Perform a System-Level Test (continued)
    - If no help (system is still not starting up), then, in the following sequence, disconnect/remove components from the system until the unit starts up. Each time – power down, remove power, remove or disconnect the component, reattach power, and retry powering on the system. Debug from there.
      1. System RAM (depopulate, swap slots, try "known good")
      2. All adapter cards except the video card – if this works, add back one at a time.
      3. The motherboard assembly – try an external set-up like last session's bench test.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Perform a System-Level Test (continued)
    - Once the system starts up, check chassis "power-on" and "hard drive activity" lights – if needed, attach or correctly attach those leads to the motherboard.
    - Check that the floppy drive power-on light comes on and then goes back off. If it doesn't go off, the data cable connection is wrong (power down and fix).
    - As the system starts up, as applicable, hit the "Del" or "F2" key to enter the BIOS.

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- Building…(‘08): Set-Up/Assy, Part 2 (cont)
  - Perform a System-Level Test (continued)
    - If you are able to enter the BIOS your system-level test was at least partially successful – at least the motherboard, CPU, RAM, and video are functional.
    - Exit the BIOS and allow the system to boot further. Watch for device enumeration – hard drive, floppy, and other drives. If there are any error messages, write them down. The system should halt when it finds no OS or no bootable drive.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Set Up Your BIOS
    - Reboot the system and go into the BIOS.
    - IF your booting hard drive is attached to a "secondary" controller (RAID or SATA), select that controller for first boot. If applicable, set to "ATA" or "RAID" elsewhere in the BIOS (screens vary – recheck the motherboard manual).
    - Enable or disable devices that will or will not be used, respectively.
    - Do NOT enable "Turbo", "Top Performance" or similarly named "options".

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - Set Up Your BIOS (continued)
    - If in doubt, do nothing, or, if identifiable, set options to "fail-safe" or "optimized" defaults – see motherboard manual.
    - **RECORD all BIOS changes!**
    - Save your changes and exit the BIOS.
    - Reboot to confirm BIOS changes did not have a negative effect. If OK, stop. If not, back out the BIOS changes one at a time.

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- Building…('08): Set-Up/Assy, Part 2 (cont)
  - You're now ready for next month (the final meeting in this series) – "Building Your Own System: Installing Your OS and Device Drivers and Functional Testing".

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- Hardware News
  - Processors
    - Intel introduced the:
      - Core 2 Quad Q8200 – 2.33GHz, 4MB L2, 1333MHz FSB, 95W TDP, 45nm process technology, MSRP: $224 (1K)
      - Pentium Dual-Core E5200 – 2.5GHz, 2MB L2, 800MHz FSB, 65W TDP, 45nm process technology, MSRP: $84 (1K)
      - Celeron D 450 – 2.2GHz, 512KB L2, 800MHz FSB, 35W TDP, 65nm process technology, MSRP: $53 (1K)
  - Core Logic (Chipsets) – nothing new

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- Hardware News (continued)
  - Motherboards
    - MSI released the “P45-8D Memory Lover” motherboard for Intel system solutions – includes eight (8) memory slots (4 DDR2 and 4 DDR3) to support future upgrades. No product page.
  - System RAM – nothing new

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- Hardware News (continued)
  - Graphics Processors and Cards
    - AMD (ATI) released the Radeon HD 4800 X2 series:
      - 4870 X2 – 2 x 4870 GPUs, 2.4 teraFLOPS of processing power, 750MHz core, 1600 stream processors, 2GB of GDDR5 memory (230GB/sec bandwidth), 285W max power; MSRP (card): $549 [$550-$560, NewEgg]
      - 4850 X2 – 2 x 4850 GPUs, 2.0 teraFLOPS of processing power, 625MHz core, 1600 stream processors, 2GB of GDDR3 memory (128GB/sec bandwidth), 230W max power; MSRP (card): $399 [at retail later in September]
      - 1GB versions to follow
      - 4870X2 cards introduced by ASUS, Diamond, Gigabyte, MSI, PowerColor, Sapphire, and VisionTek.

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- Hardware News (continued)
  - Graphics Processors and Cards (continued)
    - NVIDIA released the “GeForce 9400 GT” GPU – 16 processing cores, 550MHz graphics clock, 400MHz memory clock, 128-bit memory interface, 512MB (standard memory configuration), 12.8GB/sec bandwidth; MSRP: $59. Cards introduced by ASUS, BFG, EVGA, Gigabyte, Leadtek, MSI, and XFX.

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- Hardware News (continued)
  - Hard Drives
    - Western Digital added 750GB and 1TB models to its RE3 enterprise drive series – 32MB cache, 1.2 million hour MTBF, five year warranty; MSRP: $199 (750GB) and $249 (1TB)

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- Hardware News (continued)
  - Hard Drive Controllers
    - HighPoint released the RocketRAID 3500 series of SATA II/300 RAID controllers based on the 800MHz Intel IOP341 I/O processor – all include 256MB of cache and support RAID 0, 10, 0+1, 5, and 6; PCIe x8 interface
      - 3510 – 4 port internal
      - 3520 – 8 port internal
      - 3522 – 8 port external
      - 3540 – 16 port internal
      - The 3522 and 3540 include battery back-up and an Ethernet port (for out-of-band management).

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- Hardware News (continued)
  - Hard Drive Controllers (continued)
    - HighPoint also released the RocketRAID 4320 SATA II/300 RAID controller based on the 1.2GHz Intel IOP348 I/O processor – includes 256MB of cache and support RAID 0, 10, 0+1, 5, and 6; PCIe x8 interface; 8 port internal; battery back-up; and an Ethernet port (for out-of-band management).

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- Hardware News (continued)
  - Optical and Other Drives
    - LiteOn introduced 22X DVD burners with “SmartErase” (supports either “quick” erase where the index is erased and “full” erase where the entire disc is overwritten with random, meaningless characters):
      - iHAP322 – PATA; MSRP: $45
      - iHAP422 – PATA with LightScribe; MSRP: $50
      - iHAS322 – SATA; MSRP: $50
      - iHAS422 – SATA with LightScribe; MSRP: $60

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- Hardware News (continued)
  - Sound Processors and Cards – nothing new
  - Modems and NICs – nothing new
  - Power Supplies
    - OCZ introduced the “ModXStream Pro” series – gamer focused, 400W – 700W, (intelligent) modular cable set (main and CPU power are direct, other cables are modular), dual +12V rails: MSRP not provided.
  - Misc – nothing new

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- Break
  - No more than 10 minutes, please.

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- Hardware Assistance & Random Access (Q&A)
  - Hardware Assistance RELEASE Form
  - Random Access Log

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- Recap, Preview, and Close
  - Recap
  - Preview
    - Featured Topic for October 14, 2008: “Building Your Own System: Installing Your OS and Device Drivers and Functional Testing”
    - Close (please police up the area)