MERIT ENTERTAINMENT™

T E C H   2 0 0 8

ION HARDWARE

Motherboard:

ECS	ASUS
CPU: AMD 1.8 GHz	CPU: AMD 1.8 GHz

Memory: 128MB \\ 256MB PC2700 DDR 333MHz (DDR – Double Data Rate)

Note: The motherboard does not emit an audio tone when DDR DIMM is defective or not seated correctly.

Note: No video or sound: Try reseating DDR DIMM and CPU on the motherboard.

I/O board: Titan I/O board:
- 4 LEDs: D1, D2, D3 & D8
- Setup and calibration buttons are located on the I/O board and OSD board.

OSD Board: On Screen Display:

Features:
- Setup & calibrate buttons.
- Program security key.
- LCD video control buttons.

ION SOFTWARE

ION 2006	ION 2006.5
Version: V20.00 – V20.27	Version: V21.51
Security Key: SA3505-XX	Security Key: SA3505-XX

ION 2007	ION 2007.5
Version: V22.00 – V22.10	Version: V23.00
Security Key: SA3522-XX // SA3523-XX	Security Key: SA3522-XX // SA3523-XX

ION 2008	ION 2008.5
Version: V24.05	Version: V25.00
Security Key: SA3547-XX // SA3548-XX	Security Key: SA3547-XX // SA3548-XX

FORCE HARDWARE

Motherboard: ECS
CPU: Intel Celeron 533\566 MHz
Memory: DIMM – Dual inline memory module (PC133)
- **Invalid motherboard configuration:** Proper CMOS configuration needs to be performed. See Force ECS configuration

I/O Board: 3 in 1 I/O & USB I/O Board
3 in 1 I/O board:
- Used EVO, Edge, Wallette & Fusion and is not interchangeable with the USB I/O board.

USB I/O Board: (square I/O board)
- Used in the Radion, Elite, Vibe, Classic, 19" Upright & Mr. VIPs.
- USB I/O jumper settings for the FORCE Series games:
J5B - USB Port setting for Elite & Upright games.
J5A - USB Port setting for Radion & Classic games.

J5B	J5A

JP6 ▫▫ JP5   JP6 ▫▫ JP5

TechTip: If the jumpers are not set correctly, the I/O board will display an "Invalid Key" error.
TechTip: Check I/O board LEDs for voltages: Diodes D1: +3vdc, D2: +5vdc, D4: VSS & D3: USB VCC.
All four LEDs should be lit red. If not, an "Invalid Key" error will appear.
Setup and calibration buttons are located on the I/O board and OSD board.

OSD Board: On Screen Display:
Features:
- Setup & calibrate buttons.
- Program security key.
- LCD video control buttons.
TechTip: OSD board is only used on EVO, Edge, Wallette and Fusion cabinets.
TechTip: Security key socket on the OSD board was not operational on Force Fusion games.

FORCE SOFTWARE

FORCE 2002
Version: V8.00 - V8.06
Security Key: SA3050-XX

FORCE 2002.5
Version: V9.00 - V9.01
Security Key: SA3050-XX

FORCE 2003
Version: V10.00 - V10.09
Security Key: SA3059-XX

FORCE 2003.5
Version: V11.00 - V11.05
Security Key: SA3059-XX

FORCE 2004
Version: V12.00 - V12.10
Security Key: SA3068-XX

FORCE 2004.5
Version: 13.00 - V13.10
Security Key: SA3068-XX

FORCE 2005
Version: V14.00 - V14.22
Security Key: SA3083-XX

FORCE 2005.5
Version: V15.02
Security Key: SA3083-XX

FORCE 2006
Version: V20.00 – V20.27
Security Key: SA3501-XX // SA3504-XX

FORCE 2006.5
Version: V21.05
Security Key: SA3501-XX // SA3504-XX

FORCE 2007
Version: V22.00 - V22.10
Security Keys: SA3526-XX

FORCE 2007.5
V23.00 - V23.02
Security Key: SA3526-XX

FORCE 2008
Version: V24.04
Security Key: SA3542-XX // SA3543-XX

FORCE 2008.5
Version: V25.00
Security Key: SA3542-XX // SA3543-XX

64 Meg of DIMM (64512K) required Force 2002(5), 2003(5), 2004(5) 2005(5), 2006(5), 2007(5) and 2008 (5)

CMOS CONFIGURATIONS

CMOS stores information as the date, time and system settings on the motherboard.
CMOS battery: CR2032

ASUS (ION)
1 - Plug keyboard into PS/2 (purple) port or USB port on the motherboard.
2 - On power up. Press and hold the **DEL** key to enter BIOS setup.
3 - At the **BIOS setup screen**, arrow over to **EXIT**.
4 - Arrow down to **LOAD SETUP DEFAULTS**.
5 - Press **ENTER**. Select **OK**.
6 - Arrow up to **EXIT & SAVE CHANGES**.
7 - Press **ENTER**. Select **OK**.
8 - The game should reboot. Unplug the keyboard.

ECS (ION)
1 - Plug a keyboard into the purple port connector (PS2) or USB port on the motherboard.
2 - Power the game on. Press **DEL** to enter **SETUP**.
3 - Arrow over and down to **Load Optimized Defaults**.
4 - Press **ENTER**. Press **Y** for **"Yes"** Then **ENTER**.
5 - Press **F10**, Press **Y** for Yes. Then **Enter**.
6 - The system should reboot. Unplug the keyboard.

ECS (FORCE)
1 - Plug a keyboard into the **purple port** connector (PS2) or USB port on the motherboard.
2 - Power the game on. Press **DEL** to enter **SETUP**.
3 - Arrow over and down to **Load Fail-Safe Defaults**.
4 - Press **Enter**, select **Y** for Yes.
5 - Arrow over and down to **Load Optimized Defaults**.
6 - Press **ENTER**. Press **Y** for **"Yes"**.
7 - Press **ENTER**. Press **F10** and then press **ENTER**.
8 - The system will reboot. Unplug the keyboard.

TechTip: DIPswitch 8 (DS8) should be tried first before doing a keyboard CMOS.
TechTip: keyboard with a PS2 (purple) or USB port will with the ECS and ASUS motherboards

CMOS ERRORS   ** Corrupted motherboard

<u>Serial port or USB port:</u>
• No Touch controller found.
• Fatal error, cannot access I/O board (2006 & 2007 software)
• Invalid key error: Motherboard not USB port.

<u>Primary IDE port:</u> (Hard drive)
• Disc boot failure or operating system not found.
• Bad Command or File Name: hard drive related issue.

<u>Secondary IDE port:</u> (CD\DVD drive)
• Loading problem: CD\DVD drive cannot be accessed.

<u>Other:</u>
• No modem detected: MegaNet (international) or Tournamaxx. (US & Canada)
• No sound or audio.

I/O BOARD

Problem: **Fatal error cannot access I/O board**. Communication problem between the motherboard and I/O board.
Possible causes:
- Software: Corrupt hard drive: Reload software.
- Motherboard: CMOS corruption: Perform CMOS configuration.
- Motherboard: Defective motherboard.
- I/O board: Defective I/O board: 4 red LEDs need to be active or lit for correct I/O board function.
- Harness problem: Broken wire at pin connector harness.
- Power connection: Check power supply connector

TechTip: Related to 2006, 2007 and 2008 versions of software.

2006:
- Possible touch controller related problem.

Printer error:
- Defective I/O board. Printers are used in games manufactured for Germany.

TechTip: The DIPswitches will not function if the I/O board is not communicating with the motherboard.

COIN JAM ERROR

Problem: Coin jam error message.
Possible causes:
- Coin acceptor.
- Bill acceptor (note acceptor)
- I/O board.
- Opto board (Radion\Select\Slim)
- Jumper settings

Problem: Coin jam error message appears on the screen with audio tone after the game boots up.
Procedure: Once Coin jam error sound stops (about 30-40 seconds), try inserting bills (paper notes) and coins.
If bills (paper notes) and coins are accepted and registered, then the DBA (note acceptor) and coin mech are not in question.
The problem is related to the I/O board. Also possible harness or jumper settings.
TechTip: The I/O boards have 6-8 credit input channels. For example: US domestic uses channels 1 & 2 for coin and bill.
This may indicate that channels 3 through 6-8 maybe shorted. *Refer to the game series for further information.*

Jumper settings:
Ion: Titan I/O board jumper setting:
- With coin mech: JP8 – Open.
- No coin mech: JP8 – Closed. (Shorted)
- JP1, JP7 & JP8 must closed or shorted, if not, coin jam error will occur.

Force: 3 in 1 I/O board (EVO)
- Coin mech: JP7 - Open
- No coin mech: JP7 – Closed. (Shorted)
- JP1 & JP8 must be shorted; if not, coin jam error will occur.

Force: USB I/O board: (square I/O board)
- JP1 must be shorted: if not coin jam will occur.

TechTip: If "Coin jam" appears on the screen after a replacement I/O board was installed. Compare the jumper settings to the I/O board that was removed to the I/O board installed. All I/O boards shipped are loaded and may need to have a jumper changed due to different configurations involving coin mech.

SECURITY KEY

Security key is a copyright protection device. The security key can be programmed for different versions of software depending on laws or requirements for particular state or country.
SA3523-01 is an Ion 2007 security key. The **SA3523** is the base number. The **-01** represents US standard.

Invalid key error:
All Games:
- Check for a defective security key.
- Invalid Key for version: Software does not match key version.
- Corrupted hard drive: Reload software CDs.
- Corrupted CMOS configuration: Reconfigure motherboard CMOS configuration and check time & date.
  Check CMOS configuration section Tech 2008 notes.

Force & Ion 2007 & 2008
- Force Key Detected in ION System for version PG3002-01 V2X.XX
- Ion Key Detected in Force System for version PG3002-01 V2X.XX
- No Security Key detected for version PG3002-01 V2X.XX - No security key present.
- Invalid Key for version PG3002-01 V2X.00 - Software does not match key version.
- Key Range Mismatch: Key and software do not match completely.

TechTip: "Fatal I/O error cannot access I/O board" this indicates no communication between motherboard to the I/O board.

Force & Ion:
- **LEDs:** Check LEDs on the I/O board: All four LEDs must be lit in order for the I/O board to function correctly.
- **USB cable:** Make sure USB cable is seated all the way at the I/O board and motherboard.
- Check for a defective I/O board, or if the I/O board was replaced, check the jumpers.
  Refer to FORCE Series on Tech 2008 notes for I/O board (USB port)
- **DIPswitch DS4 & 7:** Memory clear. Corrupted hard drive. *Check Memory Clear section / DIPswitches.*
- **I/O-OSD boards:** Invalid key error will occur if there is a security key in the OSD board and a security key I/O board.

Tech Tip:
- **ERROR 1: INVALID KEY FOR VERSION…** This error message is directly related to the 2006 version only. Re Refer to the above Force & Ion heading for trouble shooting.

Force:
The game goes to "**Maxx loading**" then invalid key. To test whether the I/O board is being detected by the motherboard, turn the game off and put DIPswitch 6 (DS6) to the ON position. Then turn the game back on.
If "**Maxx loading**" followed by invalid key again, this would indicate that the motherboard is not detecting the I/O board.
- Check for the four red LEDs on the I/O board.
- Check and reseat the USB cable.
- Check power connector on the I/O board.
- Corrupted CMOS configuration on the motherboard.
- Defective I/O board.
- Defective motherboard.

TechTip: If invalid key error occurs when attempting to download newer software, chances are the new security key was installed first and the attempted download failed. This would indicate a loading problem.
Refer to DOWNLOADING page of TECH2008 for possible solution.

HARD DRIVES

Ion \ Force:
- **Disc Boot Failure**: Indicates a defective hard drive.
- **Operating System Not Found**: Check the IDE ribbon cable from hard drive to motherboard.
  May indicate a defective hard drive.
- **Reboot and Select proper Boot device…:** Indicates a defective hard drive. Related to ASUS motherboard.

Corrupted Hard drive:
- **Bad Command or File Name**: This may indicate a corrupted hard drive or motherboard. (Corrupt CMOS)
  Hard drive: Reloading the CDs\DVDs may help correct the "BAD COMMAND or FILE NAME" error.
  Motherboard: Performing a CMOS configuration may also help correct a "BAD COMMAND or FILE NAME" error.

Ion:
- **LiLo-Keytable read/check sum error:** Indicates a corrupted hard drive. Try reloading software.
- **Kernel panic:** System crashTry reseating IDE ribbon cable for the hard drive.

Force:
- **Interrupt 18H Check cable…:** Indicates a defective hard drive.

Ion \ Force \ Maxx:
- **Error 64, 67 & 97:** Indicates a defective hard drive. (Seen during download of new software)
- **Error 94:** May indicate that the hard drive is connected to the Secondary IDE.
  - ❑ **Hard drive** must be connected the Primary IDE connector.
  - ❑ **CD\DVD-ROM drive** must be connected to Secondary IDE port.

Corrupted hard drive error messages:
- **Checking for bad blocks:** Possible corrupted hard drive.
- **Mounting other file system – failed:** Possible corrupted hard drive.
- **Rebooting to perform maintenance:** Possible corrupted hard drive.

TechTip: Reloading the software will reformat the hard drive and restore to factory default level.
TechTip: Ion 2007: DIPswitch 4 & 7 procedure may restore an Ion hard drive.

DOWNLOADING

CD \ DVD:
- Check the CD\DVD for scratches or defects. Try a different set of CDs or DVDs.

DVD Disk:
- **Error Detected #96:** Defective DVD (disk) Problem occurred during download of software.
  This has been seen with DVD2 of the Ion DVD software sets.

CD \ DVD-ROM Drive:
- Jumper setting: CD\DVD-ROM drive must be set to MASTER (MA).
- **Error 13.9**: This error can indicate either defective set CD\DVDs or CD\DVD-ROM drive.
- Rebooting: Game reboots after software is loaded.
  The age and condition of the CD\DVD-ROM drive are factors in downloading problems. Try a newer drive.

CMOS Configuration:
- A problem with CMOS configuration can cause the motherboard to not recognize the CD\DVD-ROM drive.
  See **CMOS Configuration** page.

Connection Problem:
- Make sure that the Centronics cable is connected correctly and pushed all the way down in place.
  Try another Centronics cable.
- IDE ribbon cable: Use IDE ribbon cable connected between the CD\DVD-ROM drive and the motherboard.
   Use the fan power connector to power the CD-ROM drive.
  The IDE ribbon cable going to the motherboard will go to the Secondary IDE connector on the CD\DVD-ROM drive.
- **CD-ROM error:** CD\DVD-ROM must be to Secondary IDE port.
  - ❑ Hard drive IDE ribbon cable must be connected to the Primary IDE Port (top port) on the motherboard.
  - ❑ CD\DVD-ROM drive IDE ribbon cable connects to Secondary IDE port (bottom port) on the motherboard.

Loading problem:
During a download the CD\DVD drive tray opens and the screen indicates to install the next disc.
But there is no next disc to install. This would indicate the disc that was loading is defective.
Example 1: Force 2005 is a 4 CD set. If CD4 is ejected and request CD5, then CD4 is defective.
Example 2: Force 2003 is a 2 CD set. If CD1 is ejected directly after touching the green ACCEPT icon, then CD1 is defective.

LOCKUPS \ REBOOTS

All games

Fans: Make sure fans are clean and clear of dirt. On the CPU chip, power supply (if any) and hood, etc.

Ion: Screen messages:
- Screen displays **"Sub D disconnect"** or "**No Input signal**, **check connector"** message. Try reseating DIMM.
  This message is being generated by the LCD video display or digital monitor (CRT) and not the motherboard.
- Game boot ups to the **"Merit Industries, Inc"** screen on power up:
  A defective hard drive or Centronics IDE cable can cause this problem.
  Disconnect IDE cables and power game up. Disc boot failure should appear on the screen.

Hardware:
- Motherboard: A defective motherboard can be responsible for lockups and reboots.
- Hard drive: Problems with age and physical condition are factors. 24/7 operation.
- Power supply can create problems with lockups and reboots.

TechTip: If the fan in the power supply has failed, it is recommended that the power supply be replaced.

Memory: Physical memory: Ion (DDR) \ Force (DIMMs)
- Defective DIMMs can cause games to lock up or reset and can also create graphics problems.
- Continuous repeating tone or tones may indicate a hardware memory problem with the DIMM.
  Try reseating or replacing the DIMM(s)

Memory corruption: Corrupted software or missing files on the hard drive.
- Corrupted software on a hard drive can also be responsible for games rebooting and locking up.
- Clearing memory or reloading the CDs may help correct the problem. *Refer to memory clear section.*
- Some software versions had problems with lockups and reboots. *Refer to Tech2007 for software revision.*

Voltage: Location / wall outlet / grounding.
- Heavy devices: A refrigeration unit (beer box) or compressors on the same line will cause lockups.
- Poor line voltage: The location may have a problem with poor wall voltage or grounding with electrical system.
- Reversed polarity at the wall outlet will effect game operation.
- Improper wall voltage or low voltage can be a factor.
- Neon Lights: Can produce disruptive line noise.
- Proper grounding is necessary for normal game and touchscreen operation. Proper grounding is also a safety issue.

Monitors & Touchscreens: Games with CRTs.
- Touchscreen cable should not be positioned under or on top of the yoke of the monitor.
- Touchscreen controller cable should not be positioned near the flyback transformer.

MEMORY CLEAR PROCEDURE

DIPswitches – Linux operating system: Ruby, Sapphire, Jade, Crown, 2003, 2004, 2005, 2006, 2007 & 2008.
- DS6: Hardware configuration: Identifies system hardware and reconfigures the device drivers for the motherboard.
- DS4 & 7: Complete memory clear. Resets the game to the factory defaults. Clears ALL memory on hard drive.
  Resets CMOS on the motherboard and resets device drivers for the hardware devices.

DIPswitch 1
- DS1: Four selection icons: DS6, DS8, DS4 & 7, DS5 & 7 for 2006, 2007 and 2008 only.

Reloading software – CDs or DVDs
Reloading the discs will reformat the hard drive and restore the software to an original default level.

TechTip: If the DIPswitch 4 & 7 and the reloading of the software does not resolve a problem,
then the actual hard drive maybe the problem.

Microtouch:
- SMT-4 Controller: Force games only. (black box)
- USB Controller: Ion only (open face)

Function
- Green LED on controller lit is at half brightness and goes to full brightness when the screen is touched.
- Overlay functions on capacitance.

TechTip: Green LED is flashing from 1 to 5 times, Possible defective touchscreen or controller.
TechTip: Green LED is not lit: Check +12 vdc. The touchscreen and/or controller may be defective.

Calibration:
1. Locate and press the **CALIBRATE** button.
2. Touch the first dot or center of 4 arrows that appears on the screen for 2 seconds, and then pull your finger away.
3. Touch the second dot or center of 4 arrows that appears on the screen for 2 seconds, and then pull your finger away.
4. During the touchscreen test, the cursor should follow your finger anywhere you touch the screen.

CALIBRATION \ LOCKUP PROBLEMS:
Touchscreen:
- Problem with the entire screen: Recalibrate the touchscreen. If calibration is still off, replace the touchscreen.
- Problem in one area of screen: check for scratches or nicks on the screen: Replace the touchscreen
- Loses calibration: Check the ground pin on the line cord. Replace AC line cord. Check AC wall outlet.
- Calibration off: DIPswitch 6 will reload the device drivers for Linux operating systems.

USB controller:
USB cable: No green LED lit: Check USB cable going to motherboard. Possibility defective or disconnected.

Grounding:
- Improper grounding will affect the operation of the touchscreen.
- Double-touch problem: Taking two or three cards away as in Tri Towers & 11-UP after only one touch.
  Make sure the A/C plug and wall outlets are properly grounded.

CRT \ Monitor:
- The touchscreen cable should not be positioned under or on top of the yoke of the monitor.
- The touchscreen controller cable should not be positioned near the flyback transformer.

TechTip: If the cable is not properly installed, touchscreen response will be 180 degrees out of sync.
TechTip: Microwave ovens and neon lights can and will interfere with the calibration of the touchscreen
         and should not be within 6 feet or 2 meters of the game.

Removal: Waxed dental floss // Cleaning: Use only a soft cloth with water or denatured alcohol.

Symptom: No green LED or green LED is dim and not responding to touch. (This procedure does not apply to Ion platform)

Warning!!! Do not install another touch controller.
There is a strong possibility of damaging the replacement controller.
Procedure: With game turned off, start by checking the resistance across connector points 4 & 5, it the resistance measures from 0 to 180 ohms (Possibility higher) than the touchscreen (cable) is defective and the controller damaged. At this point, the touchscreen and controller will both need to be replaced. There should about 2 to 3 Meg ohms across connector points 4 & 5. Should the resistance measure good across connector points 4 & 5, than only the touchscreen controller will need to be replaced. Refer to the diagram for the connector points.
TechTip: This will not apply to Ion game platform.

TOUCHSCREEN OVERLAY CONNECTOR