

JUSTICE LEAGUE **HEROES UNITED**

Operation & Service Manual **040-0207-01 Rev. A**

- **Read this manual before use.**
- **Keep this manual with the machine at all times.**



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Table of Contents

Preface	4	Audio Speakers Service (26" Standard)	27
Safety.....	4	LCD Monitor Service (42" Deluxe)	27
Precautions for Game Operation.....	4	LCD Monitor Replacement (42" Deluxe)	28
Warnings	4	Glass Display Shield Replacement	
Environmental Conditions	4	(42" Deluxe).....	28
FCC Notices (United States).....	5	Monitor Power Supply Replacement	
Chapter 1 — Introduction.....	6	(42" Deluxe).....	28
Game Features	6	LCD Monitor Service (26" Standard).....	29
Current Requirements (Approximate)	7	Glass Display Shield Replacement	
Hardware Features	7	(26" Standard)	29
Chapter 2 — Installing a New Cabinet.....	8	LCD Monitor Replacement (26" Standard)..	29
Checking the Game Dongle	9	Computer Replacement	30
Maintenance Restart Feature.....	9	Coin Mech Replacement	31
Chapter 3 — Playing a Game.....	10	Coin Meter Replacement	31
Chapter 4 — Operator Menu and Game		Ventilation Fan Service.....	31
Setup	12	Power Distribution Service.....	32
Navigating the Operator Menu.....	12	AC Power Plate	32
Machine Settings Menu.....	14	AC Power Strip Replacement.....	32
Machine Information Menu	15	+5/+12 VDC Power Supply Replacement.....	33
Game Settings Menu	16	Marquee Florescent Light Service	
Coin Settings Menu.....	17	(42" Deluxe).....	33
Statistics Screens	18	Marquee Florescent Light Service	
Diagnostics Menus	20	(26" Standard)	34
Controller Diagnostics Menu.....	21	Florescent Light Fixture Replacement	
Chapter 5 — Software Restoration.....	22	(Either Cabinet).....	34
Run the System Recovery Disk	22	Cold-Cathode Florescent Light Service	
Run the Game Install Disk.....	22	(42" Deluxe).....	35
Chapter 6 — Service and Repair	23	Setting the Computer BIOS (CMOS)	36
Opening the Control Panel (42" Deluxe)	23	Chapter 7 — Troubleshooting.....	39
Opening the Control Panel (26" Standard).....	23	Video Troubleshooting	39
Control Panel Button Service.....	24	Audio Troubleshooting	40
Joystick Service.....	24	Control Troubleshooting.....	41
Joystick Handle Replacement	24	Miscellaneous Troubleshooting.....	42
Joystick Carriage, PCB, and Grommet		Chapter 8 — Replacement Parts	43
Replacement	25	Chapter 9 — Diagrams and Schematics	47
GVRI/O Mini PCB Service.....	26	Warranty Service	51
Audio Speakers Service (42" Deluxe).....	27	LIMITED WARRANTY	51
Subwoofer Replacement (42" Deluxe).....	27	Technical Support	52

List of Figures

Figure 1. Cabinet Dimensions and Weights	6	Figure 12. AC Power Plate	32
Figure 2. Coin Door with Key Location	8	Figure 13. Marquee Assembly (42" Deluxe).....	34
Figure 3. USB Game Dongle	9	Figure 14. 42" Deluxe Cabinet Artwork Part	
Figure 4. 2-Player Game Screen	11	Numbers	45
Figure 5. Operator Menu Flowchart	13	Figure 15. 26" Standard Cabinet Artwork Part	
Figure 6. Player Button and Micro Switch	24	Numbers	46
Figure 7. Joystick Exploded View	25	Figure 16. Power Distribution Diagram	47
Figure 8. GVRI/O Mini PCB (Version 4)	26	Figure 17. Simplified Wiring Diagram.....	48
Figure 9. 26" Monitor Top Retaining Bracket ...	29	Figure 18. Detailed Wiring Diagram	49
Figure 10. 26" Monitor Mounting Bracket	30	Figure 19. Computer Rear Panel Diagram	50
Figure 11. Servicing the Coin Mech and Coin			
Meter.....	31		

Preface

Safety

Please read this page before preparing your arcade cabinet for game play.

The following safety instructions apply to all game operators and service personnel. Specific warnings and cautions will be included throughout this manual.

Use the following safety guidelines to help protect the system from potential damage and to ensure your personal safety:

- Electronic components in the game cabinet run on 115 VAC. 230 VAC systems have a transformer to convert power to 115 VAC inside the cabinet. The voltage switch on the back of the computer must be set to 115. If you power up the computer outside of the cabinet, set the switch to match the local AC voltage:
 - 115 volts / 60Hz in most of North and South America and some Far Eastern countries such as Japan, South Korea and Taiwan
 - 230 volts / 50Hz in most of Europe, the Middle East and the Far East
- To help prevent electric shock, plug the system into a properly grounded power source. These cables are equipped with 3-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a 3-wire cable with properly grounded plugs.
- To help protect your system from sudden increases and decreases in electrical power, use a surge suppressor, line conditioner or Uninterruptible Power Supply (UPS).
- Be sure nothing rests on the system's cables and that the cables are not located where they can be stepped on or tripped over.
- Keep your system far away from radiators and other heat sources.
- Do not block cooling vents.
- Do not place the game in an area where a water jet would be used or use a water jet to clean the game.

Precautions for Game Operation

GLOBAL VR® assumes no liability for injuries incurred while playing our games.

Operators should be aware that certain health and physical conditions may make people susceptible to injury when playing video games, particularly when the game moves or creates a sense of motion.

Warnings



To avoid electrical shock, unplug the cabinet before performing installation or service procedures.

If a power cord is damaged, it must be replaced by the equivalent power cord available from GLOBAL VR or your distributor.



GLOBAL VR assumes no liability for any damages or injuries incurred while setting up or servicing the cabinet. Only qualified service personnel should perform installation or service procedures!

Environmental Conditions

Cabinet is intended for indoor use only. Be sure to keep the cabinet dry and maintain operating temperatures of 59°—86°F (15°—30°C).

FCC Notices (United States)

Electromagnetic Interference (EMI) is any signal or emission radiated in free space or conducted along power or signal leads, that endangers the functioning of radio navigation or other safety service, or that seriously degrades, obstructs, or repeatedly interrupts a licensed radio communications service. Radio communications services include, but are not limited to, AM/FM commercial broadcast, television, cellular services, radar, air-traffic control, pager, and Personal Communication Services (PCS). These licensed services, along with unintentional radiators such as digital devices (including computer systems) contribute to the electromagnetic environment.

Electromagnetic Compatibility (EMC) is the ability of items of electronic equipment to function properly together in the electronic environment. While this computer system has been designed and determined to be compliant with regulatory agency limits for EMI, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference with radio communications services, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna.
- Relocate the cabinet relative to the receiver.
- Plug the game into a different outlet so that the computer and the receiver are on different branch circuits.

If necessary, consult a Regulatory EMC representative of GLOBAL VR or an experienced radio/television technician for additional suggestions. You may find the [FCC Interference Handbook](#), to be helpful. It is available from the U.S. Government Print Office, Washington, DC 20402.

This device has been tested and complies with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Chapter 1 — Introduction

GLOBAL VR and DC Comics™ deliver a brand new comic book adventure designed exclusively for the coin-op market. Players select and control their favorite hero from DC's JUSTICE LEAGUE to help stamp out the forces of evil that conspire against mankind.

Conversion kits are available to convert old cabinets to JUSTICE LEAGUE™: Heroes United.

Game Features

- 2-player cooperative play
- Competitive play for points
- Signature Powers Moves
- 3 worlds each with 3 levels
- Staged difficulty level makes it easy for beginning and challenging for experienced players.

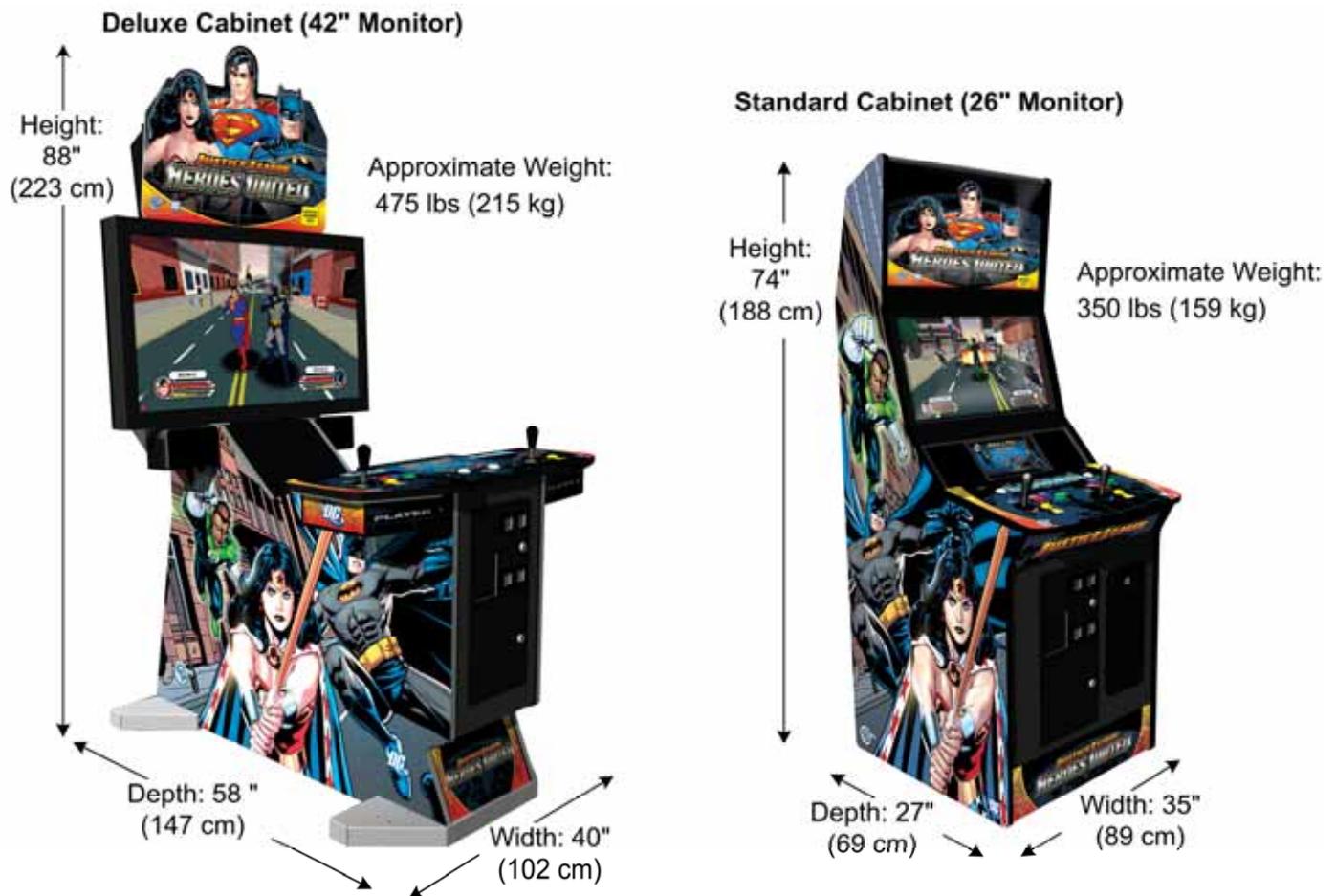


Figure 1. Cabinet Dimensions and Weights

Current Requirements (Approximate)

Voltage	42" Deluxe Cabinet		26" Standard Cabinet	
	Inrush	Operating	Inrush	Operating
115 VAC	8 Amps	5 Amps	4.5 Amps	3 Amps
230 VAC	4 Amps	3 Amps	2.5 Amps	1.5 Amps

Hardware Features

- Dual-Core Processor
- NVIDIA® GeForce Graphics
- 1 Gigabyte RAM
- 49-Way Digital Joysticks
- 26" Standard or 42" Deluxe LCD Monitor
- Dramatic Lighting on Deluxe Cabinet
- Supports Dollar Bill Validator

Chapter 2 — Installing a New Cabinet

Use the following procedure to set up your game:

1. Carefully remove the cabinet from the packaging, giving yourself plenty of space. Inspect the exterior for any damage.
2. Remove the keys from the coin return slot. Open the coin door to locate the second set of keys.

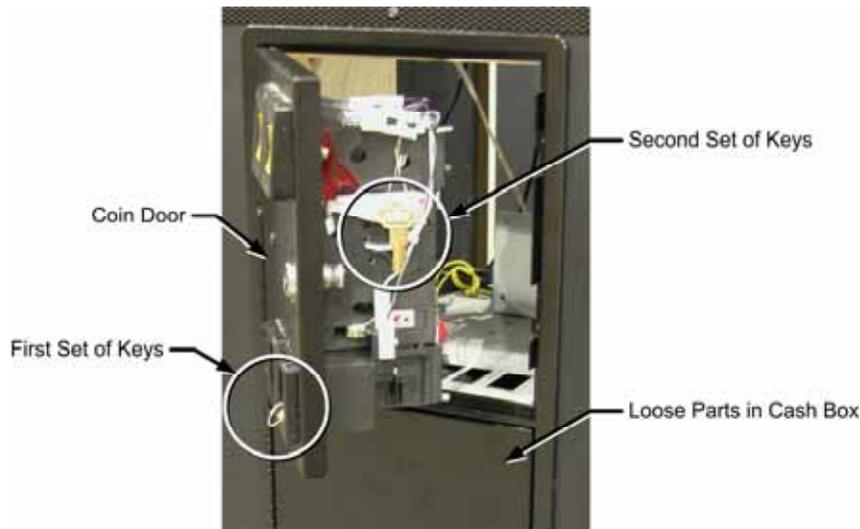


Figure 2. Coin Door with Key Location

3. Locate the items listed below; they are usually in the coin vault:
 - System Recovery Disk
 - Operation & Service Manual (This Document)
 - Game Install Disk
 - AC Power Cord
4. Your game cabinet should arrive ready to play, but it is advisable to check inside in case any components have shifted or come loose during shipping. Remove the door from the back of the cabinet and verify that all components are securely mounted, and all cables and wires are securely connected. See *Chapter 9 — Diagrams and Schematics*, beginning on page 47, for wiring and connection diagrams.
5. **42" Deluxe Cabinets Only:** If the Marquee Artwork and clear plastic were packed separately from the cabinet, please see Figure 13 on page 33 for a diagram of the marquee assembly. The marquee artwork is sandwiched between the large sheet of clear plastic and the small plastic wings at each side. It is attached to the marquee housing by 7 (seven) screws that screw into metal standoffs that screw into nuts behind the marquee housing.
6. Connect the AC power cord from the cabinet to a grounded (3-terminal) AC wall outlet.
7. Power ON the cabinet using the ON/OFF switch located on the lower rear of the cabinet. Verify that the game boots properly.
8. Once the Attract movie starts, play a game with both sets of controls to verify that everything works properly.
9. Enter the Operator Menu to set up pricing and other settings. See Chapter 4 for detailed information on using the Operator Menus to set up your game.

Checking the Game Dongle

The cabinet uses a Game Dongle to activate the game software. If the dongle is missing, the game will not run. When a USB Game Dongle is installed and working properly, a **red** LED will illuminate inside the dongle. If the software does not recognize the Game Dongle, make sure the Dongle is connected properly, and then power cycle the cabinet.

If the dongle comes out while the game is running, a NO DONGLE screen will appear the next time a **START** button is pressed. Re-install the dongle; there is no need to reboot the game.

Note: The dongle supplied with the cabinet is specific to the game and software version. Future software upgrades may require a new dongle.

Important: Some of your cabinet information is stored in the dongle, so if you replace your computer, **remove the dongle and keep it with the cabinet.**



Figure 3. USB Game Dongle

Maintenance Restart Feature

To keep the software running optimally, the game must be restarted every 24 hours. For locations that turn their games off every day, no additional restarts are needed. For locations that leave their games turned on continuously, the software will automatically reboot the game once every 24 hours according to the following conditions:

1. If the game has been running continuously for at least 24 hours, **and** the game has been in Attract Mode for at least 15 minutes, **then** a screen like the following will be displayed:



2. The screen will count down for 30 seconds.

If a user presses the **START** button, the screen will not appear again until the next time the Attract Mode has been running for 15 minutes.

If nobody presses the **START** button, the game will shut down and restart, which will take about 2 minutes.

3. After the cabinet completes the Restart, the next Maintenance Restart will be scheduled for 24 hours later. If the initial Restart happens to be scheduled during a busy time for your location, the action of players pressing **START** to postpone will move the restart to a time that is not busy.

Chapter 3 — Playing a Game

This section describes the basics of starting and playing a game.

1. Coin up and press the **START** button. The **Select Character** screen will appear. Use the joystick to highlight the character you want to play and then press any button.



2. The **Select Level** screen will appear next. Use the joystick to highlight the level you want to play and then press any button.



3. Once the game starts, use the joystick to control your character's direction.
4. Press the **QUICK** (red) button to punch and **STRONG** (blue) to kick. Press **DEFEND** (green) to evade or shield your hero from attacks.
5. If you start a 1-Player Game, an onscreen prompt will be displayed during the game, inviting a second player to join, as shown in the picture to the right.
6. Watch the Health Meter! Once it runs out your character is vulnerable. Some enemies drop Health power-ups when defeated.
7. Press the **Yellow+Red** or **Yellow+Blue** buttons together to use **Power Moves**. (Each character has unique power moves.)



1-Player Game Screen

You gain power each time you kick or punch an enemy. You can also pick up Power-Up Coins when you destroy explosive barrels or other objects, or defeat enemies carrying coins. More power in your Power Meter means your hero will inflict more damage on the enemies.

8. As you play, your character's score, health, and power stats are displayed onscreen, as shown below. Each character's picture is displayed next to their stats. In the picture below, Superman has lots of power, but is low on health. Green Lantern is out of power but has more health than Superman.



Figure 4. 2-Player Game Screen

Chapter 4 — Operator Menu and Game Setup

This chapter describes how to use the Game Operator menu to set up the game, diagnose problems, and view gameplay and earnings statistics.

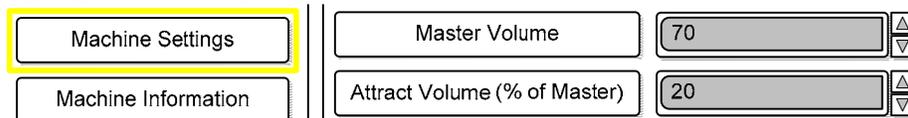
Navigating the Operator Menu

Use the Operator buttons to navigate the Operator Menu as follows:

- Use the **Test/Back** button to open the Operator menu. Once in the menu, use it to de-select an item or exit from a submenu.
- Use the **Up & Down** buttons to move through a list and highlight items (a yellow box around an item indicates it is highlighted). Also use the **Up & Down** buttons to change the setting for a selected item.
- Use the **Service/Select** button to select a highlighted item (a red box appears around a selected item) and to highlight and select the settings box for a highlighted item.

For example, the following steps explain how to change the Attract Volume from the menus.

1. Press the Operator **Test/Back** button to open the Operator Menu. Machine Settings will be highlighted with a yellow box.



2. Press the **Service/Select** button to select the highlighted Machine Settings menu.
3. Press the **Down** button to highlight (yellow box) Attract Volume.
4. Press the **Service/Select** button twice. The first press highlights (yellow box) the settings box for Attract Volume; the second press selects (red box) the settings box.



5. With the settings box selected, press the **Up** and **Down** buttons to set the desired volume level.



6. Press **Test/Back** repeatedly until only Machine Settings, in the left menu, is highlighted.
7. Press the **Up** and **Down** buttons until Play Game is highlighted.
8. Press the **Service/Select** button to return to the game.

Notes: To exit from some sub-menu screens, press the **Down** button to highlight Back to Main Menu, and then press **Service/Select**.

Pressing the **Service/Select** button during Attract Mode adds a Service Credit that you can use for testing game play. You can disable or enable this feature from the Machine Settings menu.

Pressing the **Up** or **Down** Operator buttons during Game or Attract Mode adjusts the Master Volume level.

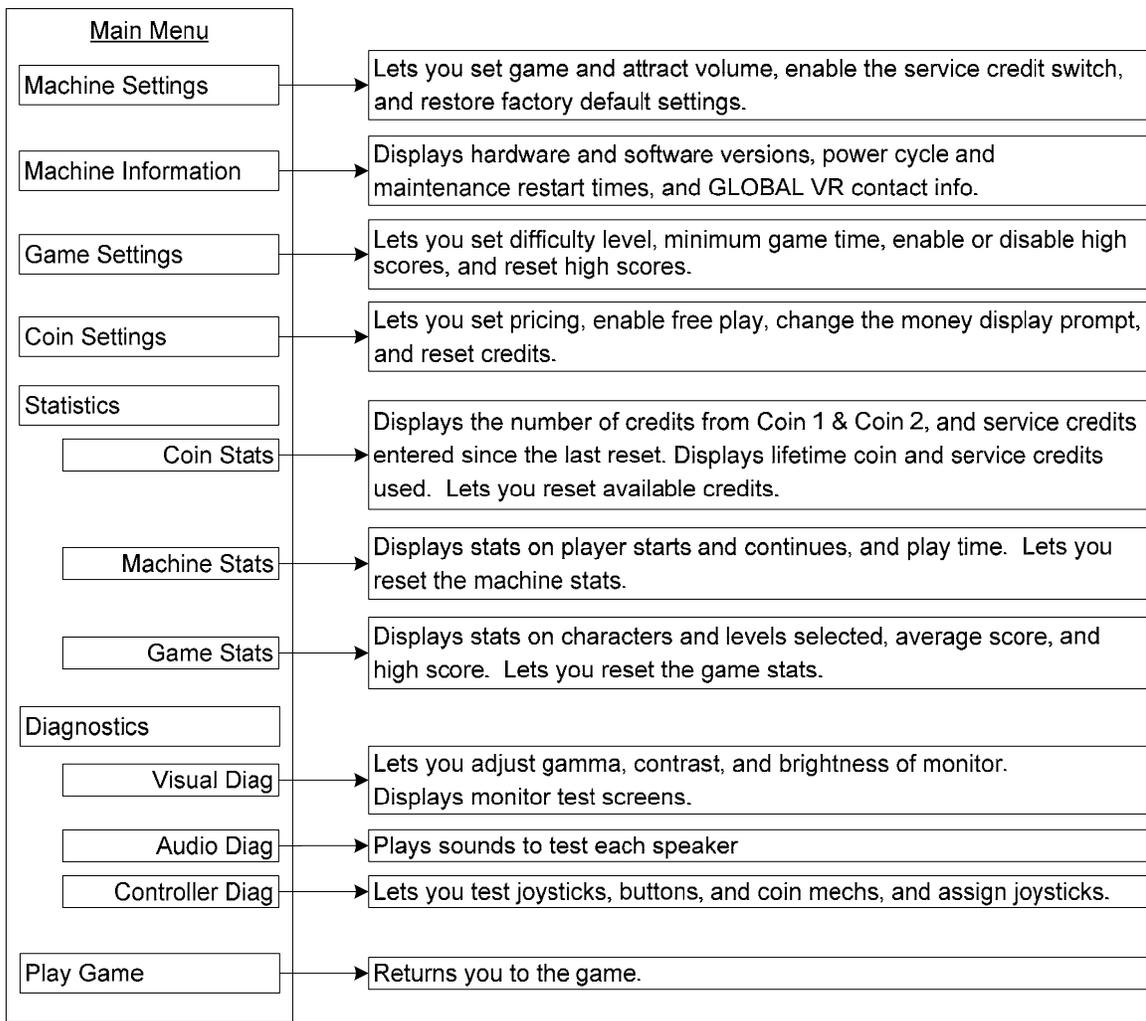


Figure 5. Operator Menu Flowchart

Machine Settings Menu

This menu lets you set audio volume levels, enable or disable the Service Credit Switch, and restore factory default settings.

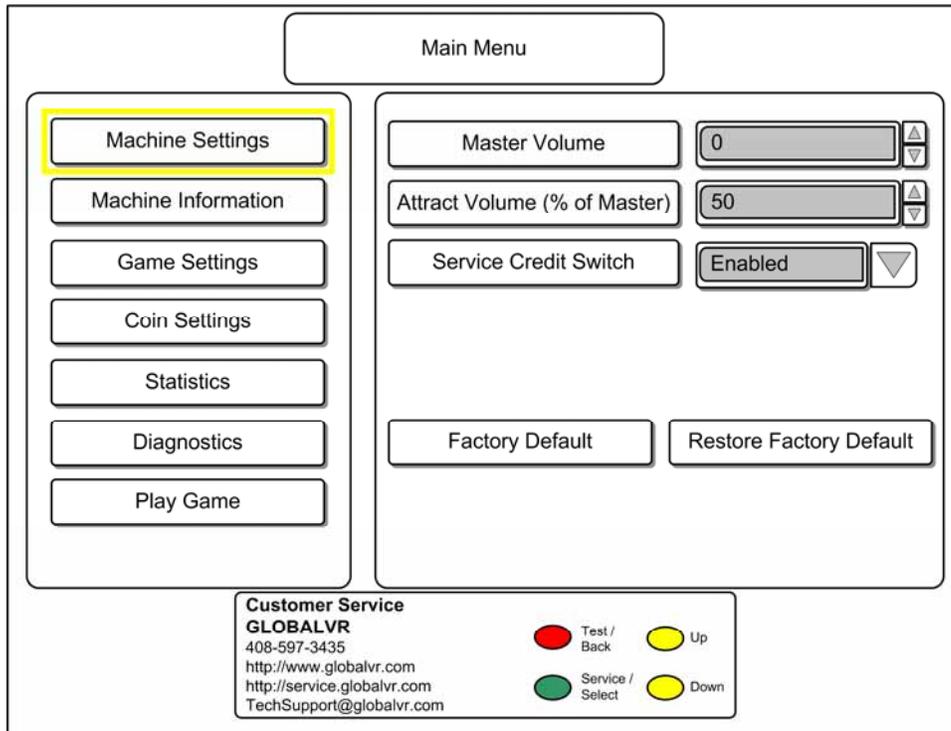


Figure 1. Machine Settings Menu

Menu Item	Description
Master Volume	Sets the Master Volume level from 0 to 100. (Same as using the UP/DOWN buttons on the Operator button panel during Game or Attract Mode.)
Attract Volume	Sets Attract Mode volume level as a percentage of Master volume.
Service Credit Switch	Sets Service Credit Switch to Enabled or Disabled . If Enabled, the Service/Select button on the Operator button panel can be used to add Service Credits for testing gameplay.
Factory Default	Selecting Restore Factory Default restores all Game Settings to factory defaults. A popup window will appear describing exactly what will be reset, and giving you the option to press Service/Select to proceed or Test/Back to cancel.

Machine Information Menu

This screen displays information about the hardware and software, and the maintenance restart.

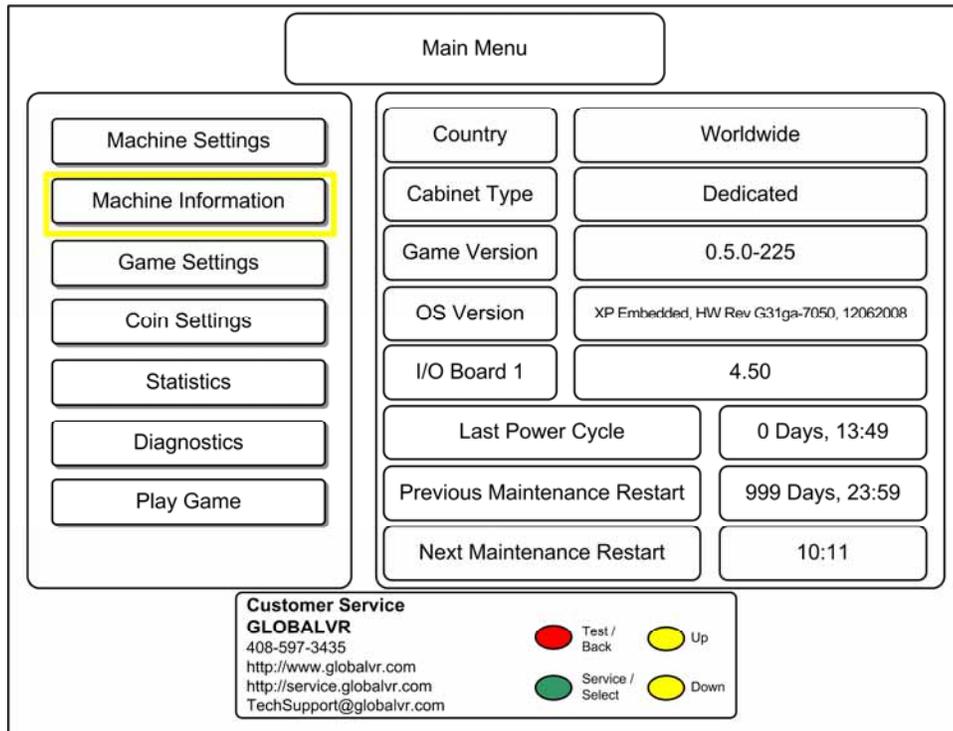


Figure 2. Machine Information Menu

Menu Item	Description
Country	Displays the country of operation as set by the game dongle.
Cabinet Type	Displays the type of cabinet, as set by the game dongle.
Game Version	Displays the Game Software version.
OS Version	Displays the Operating System version.
I/O Board 1	Displays the version of the I/O PCB in the cabinet.
Last Power Cycle	Displays the time, in days, hours and minutes, since the cabinet was last powered on.
Previous Maintenance Restart	Displays the time, in days, hours and minutes, since the last maintenance restart. (A maintenance restart will only occur if the cabinet is not powered off for 24 hours. See page 9 for more information.) Note: If the screen displays <i>999 Days</i> , this indicates that no maintenance restart has occurred because the cabinet has been powered off every day.
Next Maintenance Restart	Displays the time, in hours and minutes, until the next maintenance restart. If the cabinet is powered off, this time resets to 24 hours.

Game Settings Menu

This screen lets you set game difficulty and minimum time, and set whether to save and display high scores.

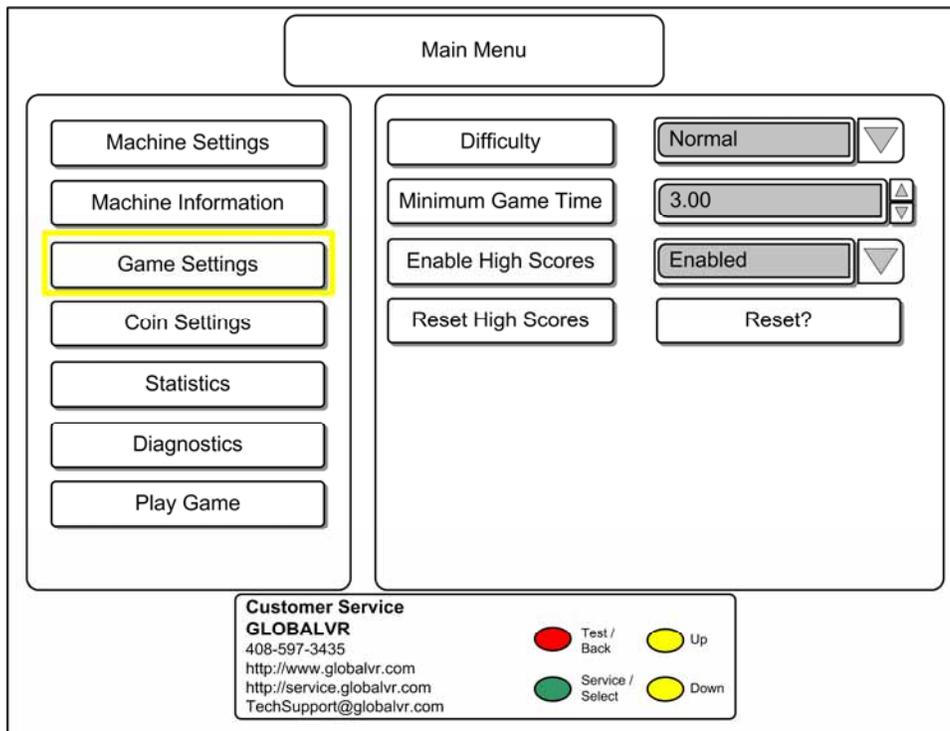


Figure 3. Game Settings Menu

Menu Item	Description
Difficulty	Sets the overall game difficulty. Options are Easy, Normal, and Hard.
Minimum Game Time	Sets the amount of gameplay time that a player is guaranteed per start. (Range is 2—5 minutes.)
Enable High Scores	If Enabled, players can enter their names when they get a high score, and the high scores are displayed during Attract Mode. If Disabled, no High Scores are displayed and players are not prompted to enter a name when they get a high score.
Reset High Scores	Select the Reset? button, and then press Service/Select again when prompted to confirm, to reset the high scores displayed in Attract Mode to default values.

Coin Settings Menu

This screen lets you set up pricing and displays available paid and service credits.

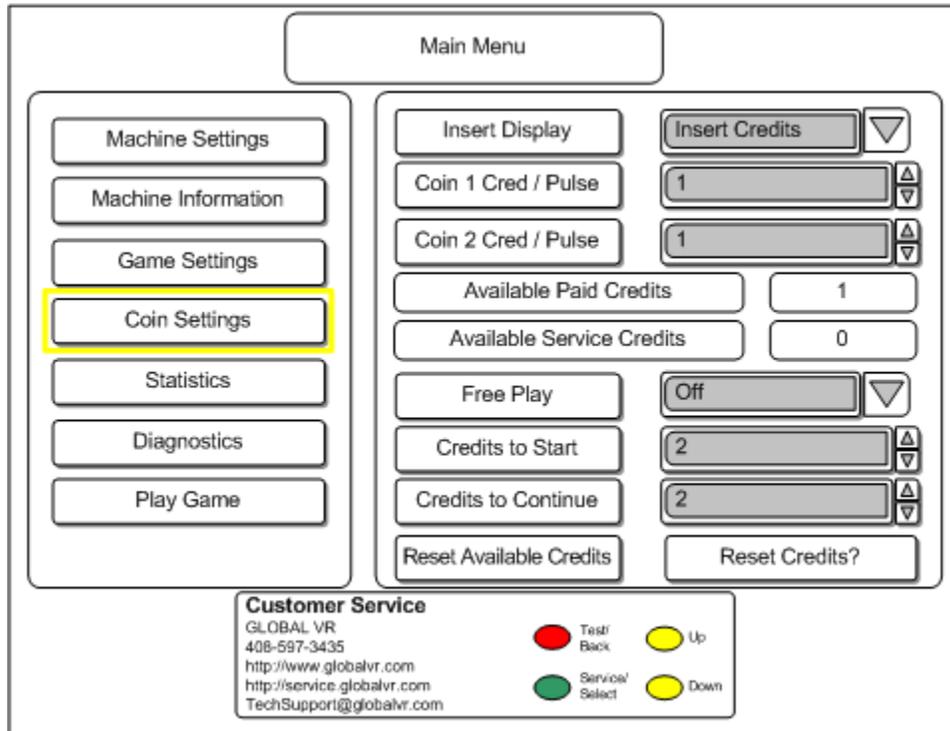
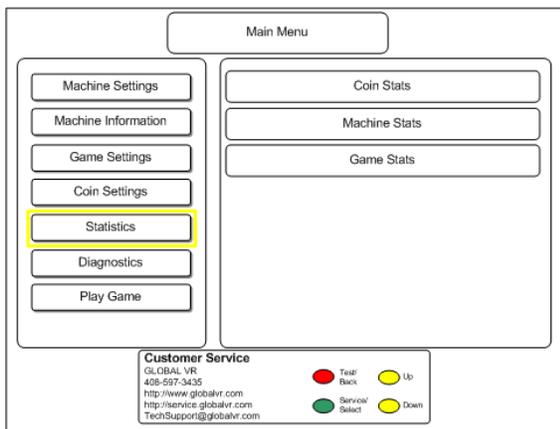


Figure 4. Coin Settings Menu

Menu Item	Description
Insert Display	Selects the money display prompt text displayed onscreen. Options are <i>Insert Credits</i> or <i>Swipe Card</i> .
Coin 1 Cred / Pulse	Sets the number of credits per pulse for Coin Mech 1 (coins)
Coin 2 Cred / Pulse	Sets the number of credits per pulse for Coin Mech 2 (bills)
Available Paid Credits	Displays the number of available paid credits.
Available Service Credits	Displays the number of available service credits (added using the Service button on the Operator Button panel).
Free Play	Turns Free Play On or Off.
Credits to Start	Sets the number of credits to start a new game.
Credits to Continue	Sets the number of credits to continue a game.
Reset Available Credits	Select Reset Credits? , and then press Service/Select again when prompted to confirm, to clear all available credits.

Statistics Screens

The Statistics screens allow the operator to view the statistics collected by the cabinet. To reset the statistics for any screen, highlight the **Reset** button onscreen and press **Service/Select**. A popup window will appear describing exactly what will be reset, and giving you the option to press **Service/Select** to proceed or **Test/Back** to cancel.

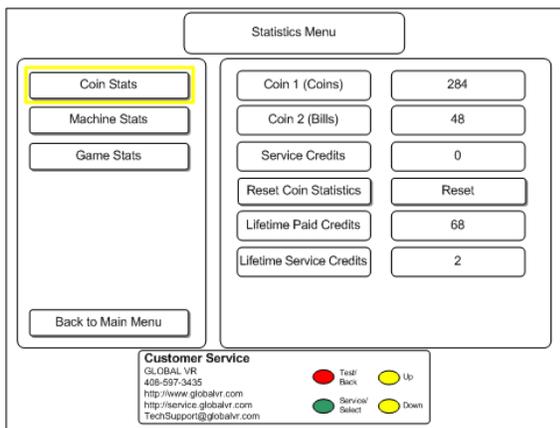


Statistics Main Menu allows you to select from the following:

Coin Stats to view or reset earnings data

Machine Stats, to view or reset gameplay data

Game Stats to view or reset game level, character play, and score data



Coin Stats displays the collection data for the cabinet.

Coin 1 (Coins): Credits earned from Coin Mechs

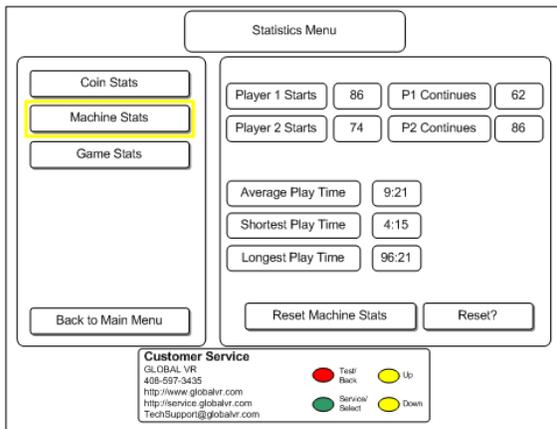
Coin 2 (Bills): Credits earned from Bill Validator

Service Credits: Service Credits used

Reset Coin Statistics: Select **Reset?** to clear current coin statistics. Lifetime totals are never reset unless the operating system is restored using the System Recovery Disk.

Lifetime Paid Credits: Total Paid Credits earned for the lifetime of the cabinet

Lifetime Service Credits: Total Service Credits used for the lifetime of the cabinet



Machine Stats displays player starts and length of play statistics.

Player 1 Starts: Number of Player 1 starts

P1 Continues: Number of times Player 1 has continued a game

Player 2 Starts: Number of Player 2 starts

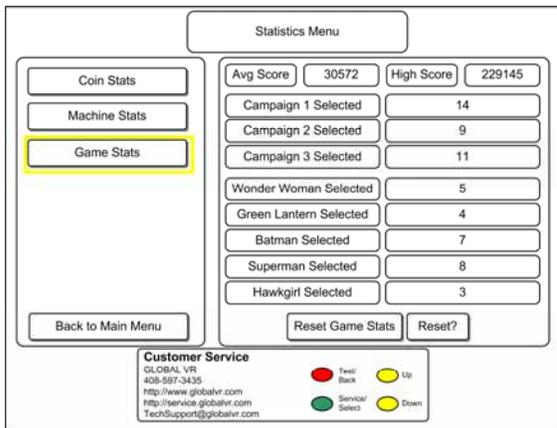
P2 Continues: Number of times Player 2 has continued a game

Average Play Time: Average time a game lasts

Shortest Play Time: Shortest play time recorded

Longest Play Time: Longest play time recorded

Reset Machine Stats: Select **Reset?** to clear all statistics displayed on this screen



Game Stats displays detailed statistics about the game levels played, plus average and high scores.

Avg Score: Average of all scores

High Score: Highest score recorded

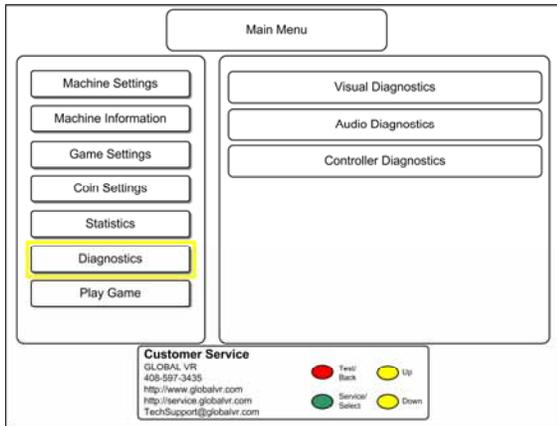
Campaign x Selected: Displays the number of times each campaign has been selected for play

Character Selected: Displays the number of times each character has been selected for play

Reset Game Stats: Select **Reset?** to clear all statistics displayed on this screen

Diagnostics Menus

The Diagnostics menus allow the operator to adjust video appearance, and test audio, game controls, and coin inputs.

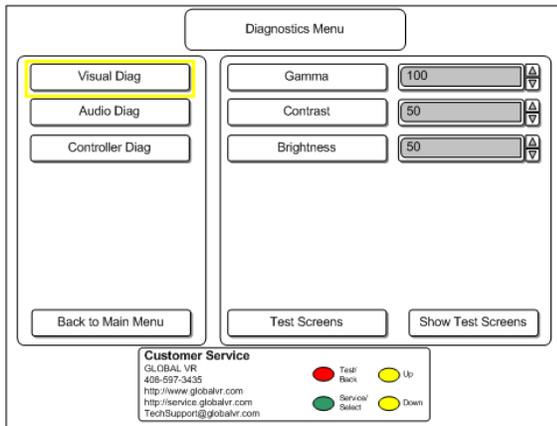


Diagnostics Main Menu allows you to select from the following:

Visual Diagnostics to adjust monitor brightness, contrast or gamma, and display monitor test screens

Audio Diagnostics to test left and right audio output

Controller Diagnostics to test game controls and coin inputs



Visual Diagnostics allows you to adjust the image quality on the monitor.

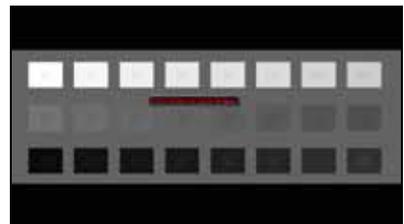
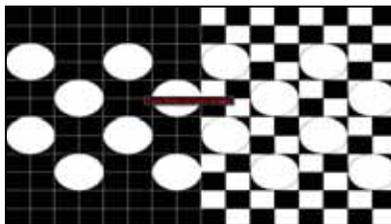
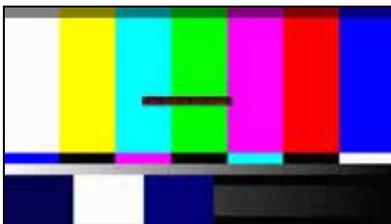
Gamma: Adjusts the overall brightness of the image in a different way than the Brightness setting. If your image is not bright enough, you can experiment with Gamma and Brightness settings to see which has the best effect.

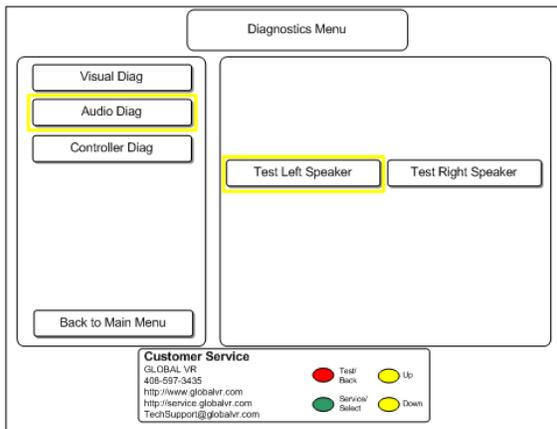
Contrast: Adjusts the monitor contrast levels

Brightness: Adjusts the monitor brightness levels

Test Screens: Select **Show Test Screens** to open a series of monitor test screens (see examples below) designed to help you adjust the image using the Monitor Remote Control. Press the **Service/Select** button repeatedly to cycle through the screens.

Examples of Monitor Test Screens:





Audio Diagnostics allows you to test the left and right speakers individually.

Highlight **Test Left Speaker** and press **Service/Select** to hear a test sound from the left speaker only.

Highlight **Test Right Speaker** and press **Service/Select** to hear a test sound from the right speaker only.

To repeat the test sound, press **Service/Select** again. Press **Up** or **Down** to select the other speaker.

Controller Diagnostics Menu

This menu displays an image of the Player 1 and Player 2 controls to allow you to test the joysticks and buttons. You can also assign which joystick is used for each player in case they get swapped. You can also test the coin and bill inputs.

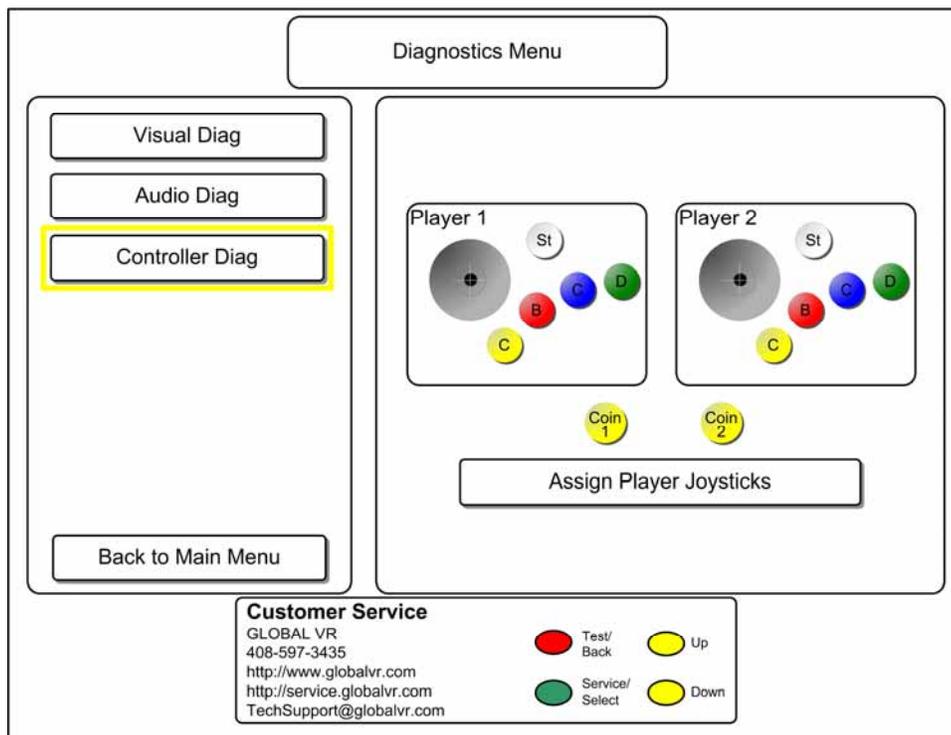


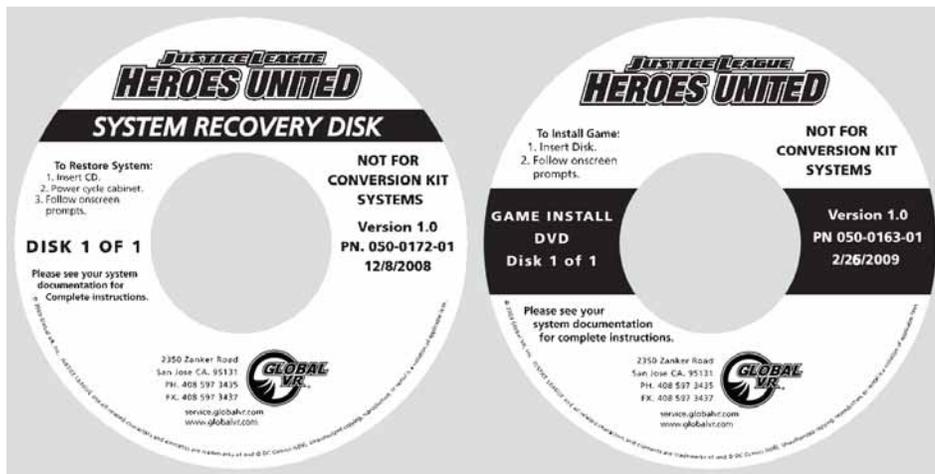
Figure 5. Controller Diagnostics Menu

When you move a joystick, the joystick center-point in the picture will move in the direction of joystick movement if the joystick is working properly.

When you press a button or activate a coin mech (Coin 1) or the bill validator (Coin 2) the corresponding item will be highlighted onscreen.

Select **Assign Player Joysticks**, and press **Service/Select** if the joysticks should happen to get swapped. When prompted, press the **START** button for Player 1, and then for Player 2 to reassign each joystick to the correct control set.

Chapter 5 — Software Restoration



Follow the instructions below if you need to re-install software on your cabinet.

Total installation time is about 20 minutes.

Note: On **26" Standard Cabinets** the easiest way to reach the DVD-ROM drive is probably to open the control panel as described on page 23. You may also be able to reach the drive through the coin door.

Important: When you use the System Recovery Disk, you will erase all game settings and coin and game statistics. It is advisable to contact Technical Support before using the System Recovery Disk to resolve a problem.

Run the System Recovery Disk

1. With the cabinet powered ON, open the DVD-ROM drive and insert the CD labeled **System Recovery Disk**. Power the cabinet OFF and then ON. The computer will boot from the CD, and you will see a series of screens as the computer copies files to the hard drive.
2. After about 4-5 minutes, when you are prompted, remove the CD and turn the cabinet OFF and then ON. (**Do not** insert the Game Install Disk yet!)
3. When the computer reboots, you will see a series of processing screens. After about 5 minutes the computer will automatically reboot. After another minute you will see a message saying "Please insert Justice League Game Disk number 1." Proceed to run the Game Install Disk as described below.

Run the Game Install Disk

1. Open the DVD-ROM drive and insert the DVD labeled **Game Install Disk 1 of 1**. The computer will read the DVD automatically (do not reboot). You will see the Installer screen as the software copies files, and after about 7 minutes the computer will reboot.
2. After about 2 minutes more, the Attract Mode will start. Remove the disk from the drive. Keep the disks in a safe place in case you need them in the future.
3. Use the Operator Menus to set pricing and change any desired settings.
4. Play a game and use both sets of controls to verify proper operation. (If the Service Credit Switch is enabled, press the **Service/Select** button in Attract Mode to insert Service Credits for testing the game.)

Chapter 6 — Service and Repair



CAUTION: GLOBAL VR assumes no liability for any damage or injuries incurred while servicing the cabinet. Only qualified service personnel should perform service and installation of cabinet hardware.

To prevent electrostatic discharge (ESD) damage, handle PCBs by the edges only and use a grounding wrist strap or similar precaution.

Please read the service instructions before working on the cabinet.



Always turn the cabinet OFF and disconnect the AC power cord before performing any repair work.

Opening the Control Panel (42" Deluxe)

Open the control panel to service the joysticks, buttons, and control panel CCFLs.

Each side of the control panel has a base cover held in place by four nuts and bolts. Reach through the coin door to remove the four nuts and remove the cover. The figure below shows the locations of the nuts and bolts.

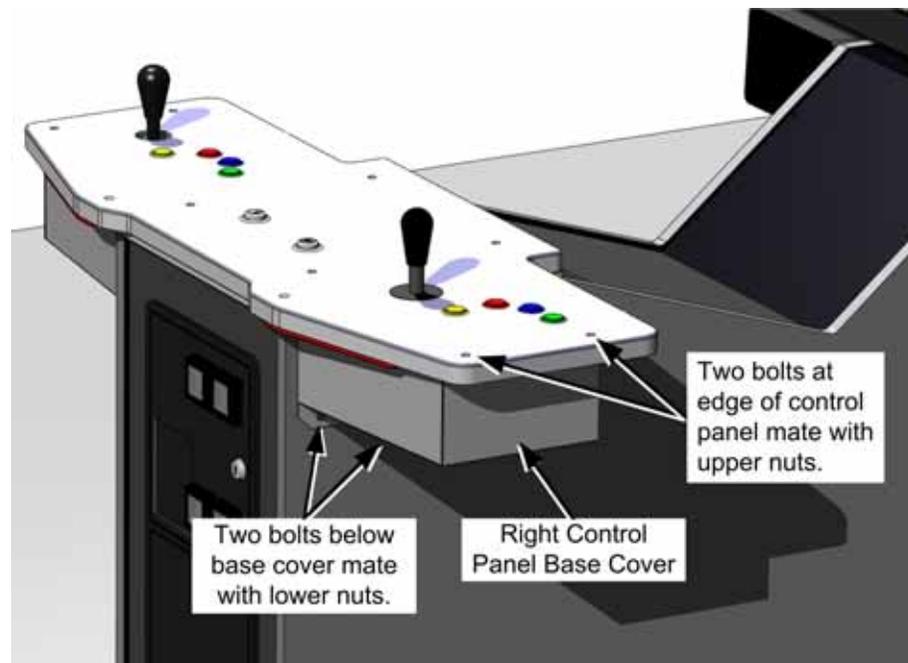


Figure 6. Opening Control Panel (42" Deluxe)

Opening the Control Panel (26" Standard)

Open the control panel to service the joysticks and buttons, and to access the GVRI/O Mini PCB.

To open the control panel, remove the five (5) Torx security screws from the control panel surface. Being careful not to pull any wires, tilt the control panel back and lean it against the cabinet. The control panel is **not** on a hinge.

Control Panel Button Service

Figure 6 shows a control panel button and micro switch, and which micro switch spade connects to each wire. Perform the following steps to replace the micro switches or the buttons:

1. Open the control panel as described in the previous sections.
2. Gently press the plastic micro switch to the side to release it from the button housing.
3. Disconnect the two wires from the micro switch and connect them to the new micro switch. Be sure to connect the ground wire to the COM connector and the signal wire to the NO connector, as shown in Figure 6.
4. To remove the button, unscrew the retaining ring.
5. Reverse these steps to install the replacement button and micro switch.

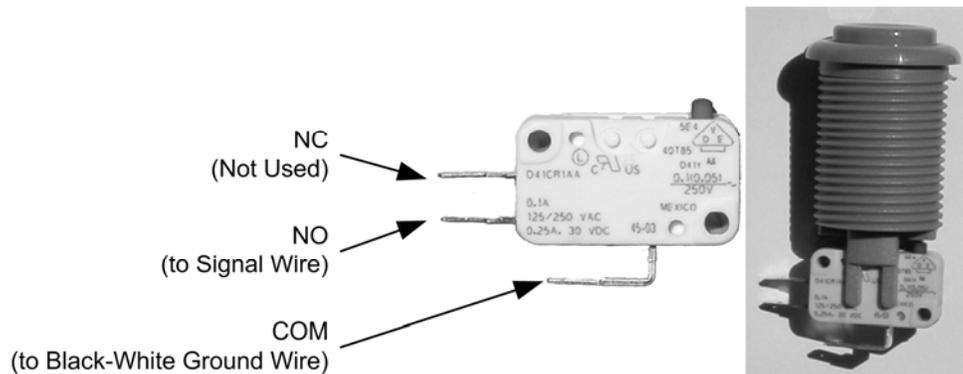


Figure 6. Player Button and Micro Switch

Joystick Service

Joystick Handle Replacement

Refer to Figure 7 on page 25 for an exploded-view drawing of joystick components.

1. Open the Control Panel as described on page 23.
2. Remove the E-clip from the bottom of the joystick assembly and pull the joystick handle out through the top of the control console. The lower shaft spacer will be loose under the joystick assembly, and the small upper spacer will remain on the joystick handle.
3. Place the small upper spacer on the new joystick handle and insert the handle into the control panel and through the lower shaft spacer.
4. Re-install the E-clip on the bottom of the joystick assembly.
5. After servicing a joystick, select **Diagnostics: Controller Diag** from the Operator Menu to verify proper operation (see page 21).

Joystick Carriage, PCB, and Grommet Replacement

Refer to Figure 7 for an exploded-view drawing of joystick components.



CAUTION: To prevent electrostatic discharge (ESD) damage, handle PCBs by the edges only and use a grounding wrist strap or similar precaution.

1. Disconnect the game from AC power and open the Control Panel as described on page 23.
2. Disconnect the cable from the joystick.
3. Remove the four Phillips screws from the joystick carriage.

Note: Do **not** loosen the four hex nuts that secure the hub to the control panel.
4. Remove the joystick carriage, PCB, and L-stop. Note the orientation of the PCB so you can re-install it the same way.
5. To remove the grommet, first remove the joystick handle as described in the previous section, and then remove the four Phillips screws that secure the grommet to the hub.

Note: If you need to replace the hub, you will have to remove all buttons and screws from the top of the control panel, and then remove the plastic overlay to access the screws that secure the hub to the console.
6. Reverse these steps to re-install the joystick components.
7. After servicing a joystick, select **Diagnostics: Controller Diag** from the Operator Menu to verify proper operation (see page 21).

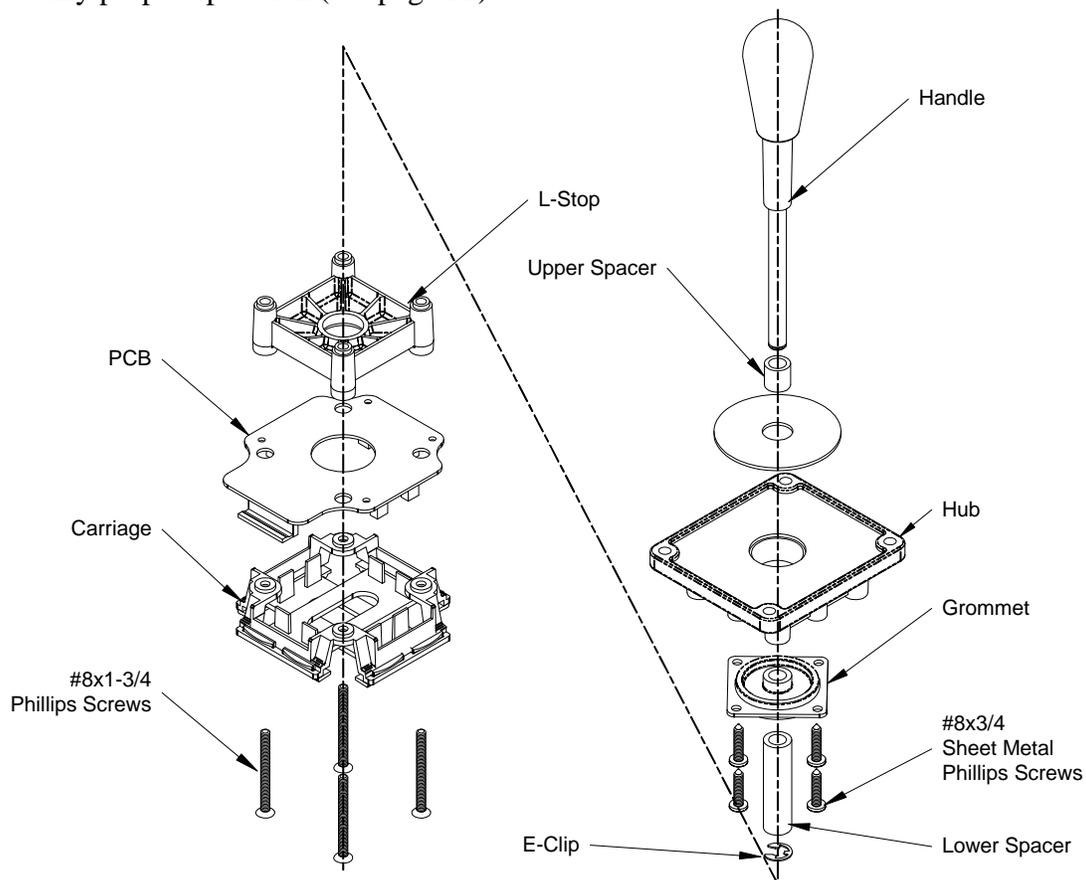


Figure 7. Joystick Exploded View

GVRI/O Mini PCB Service

Important: This game requires game-specific GVRI/O Mini PCB firmware version 4.32 or later. If you replace the PCB with the wrong firmware version the game will not work properly. To verify the firmware version, open the **Machine Information** screen in the Operator Menu and check the number displayed for **IO Board 1**. (The initial release displays 4.50 in the Operator Menu.)

The GVRI/O MINI PCB relays signals between the system computer and the hardware. Each connector on the GVRI/O MINI PCB is keyed to fit only to the correct harness connector. Refer to Figure 8 to locate the connectors on the PCB. See Figure 18 for detailed wiring information.

The GVRI/O MINI PCB should always be connected to a PCI USB port, **not** a motherboard USB port, to minimize the possibility of static shock. No jumpers are used with this game.

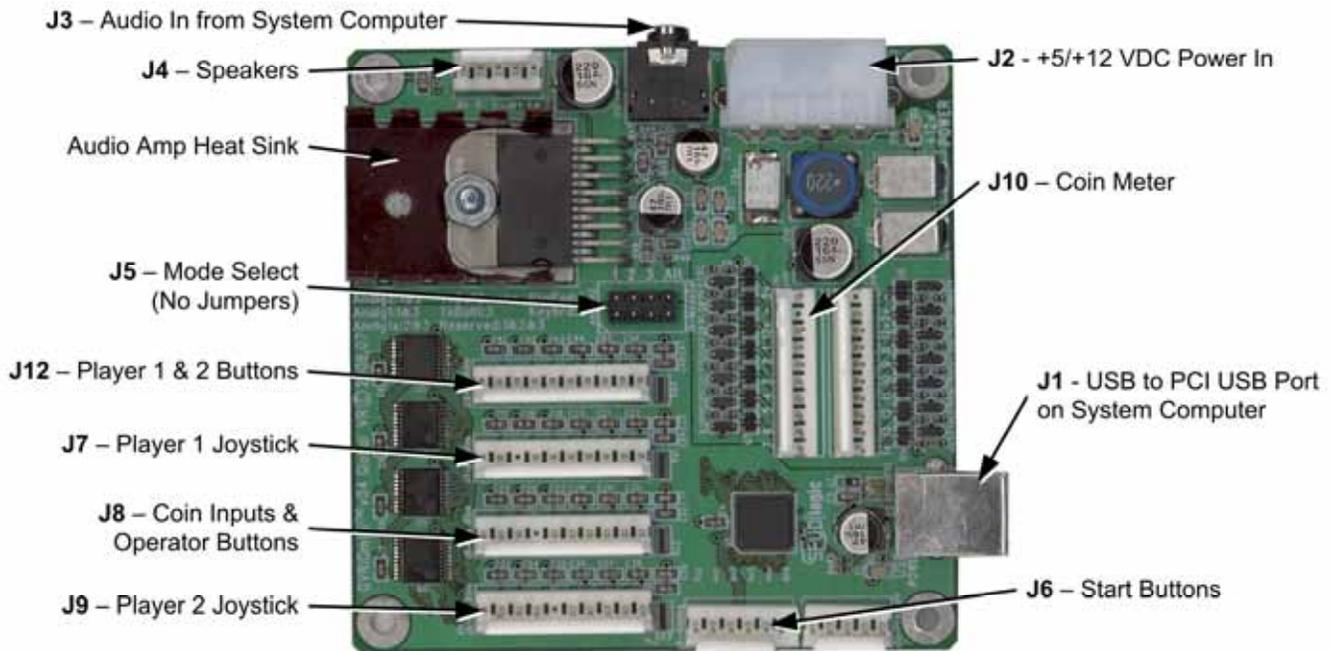


Figure 8. GVRI/O Mini PCB (Version 4)

Perform the following steps to replace the GVRI/O Mini PCB:



CAUTION

Disconnect the cabinet from AC power before changing any connections to the GVRI/O MINI PCB.

To prevent electrostatic discharge (ESD) damage, handle PCBs by the edges only and use a grounding wrist strap or similar precaution.

1. Disconnect the cabinet AC Power Cord.
2. **42" Deluxe Cabinets:** Open the coin door. The PCB is mounted to an interior cabinet wall.
26" Standard Cabinets: The PCB is located on a shelf below the control panel. You can reach it by opening the control panel as described on page 23 or removing the rear door from the cabinet.
3. Make sure that all wire harnesses are labeled for ease of reconnection, and then disconnect them from the PCB.
4. Remove the four screws that secure the PCB to the mounting feet.
5. Reverse the removal steps to install the new PCB.

Audio Speakers Service (42" Deluxe)

If you need to replace the left or right speaker, do the following:

1. Remove the cabinet rear door.
2. Inside the cabinet, disconnect the Molex[®] connector that secures the speaker harness to the main audio harness.
3. Inside the cabinet, remove the two (2) nuts and washers that secure the speaker in place.
4. Outside the cabinet, remove the two wood screws that secure the speaker under the monitor housing.
5. Remove the speaker with the mounting bracket.
6. Remove the two (2) screws that secure the speaker to the mounting bracket and install the bracket on the new speaker.
7. Reverse these steps to install the new speaker.
8. Select **Diagnostics: Audio Diag** from the Operator Menu to verify proper operation.

Subwoofer Replacement (42" Deluxe)

The subwoofer is located behind the grill below the monitor. It plays a combination of the left and right audio channels to enhance the overall richness of the audio.

1. Remove the four (4) Torx security screws that secure the grill to the cabinet.
2. Remove the four (4) screws that secure the subwoofer to the cabinet and lift it enough to disconnect the wires.
3. Connect the wires to the same terminals on the replacement subwoofer.
4. Reverse these steps to install the new subwoofer and replace the grill.

Audio Speakers Service (26" Standard)

The speakers are located behind two grills below the monitor. Perform the following steps to replace a speaker:

1. Remove the four (4) Torx security screws that secure the speaker grill to the cabinet.
2. Remove the four (4) screws that secure the speaker to the cabinet and lift it enough to disconnect the wires.
3. Connect the wires to the same terminals on the replacement speaker.
4. Reverse the removal steps to install the new speaker and replace the grill.
5. Select **Diagnostics: Audio Diag** from the Operator Menu to verify proper operation.

LCD Monitor Service (42" Deluxe)

The 42" LCD Panel is connected to an LCD Control PCB that provides the signal, power, and data to the panel. The LCD Control PCB and Monitor Power Supply are mounted to the back of the monitor assembly. The Monitor Power Supply provides 24 VDC and connects to the AC Power Strip. The monitor is encased in a metal bezel with a glass display shield to protect the LCD panel. The sections that follow provide replacement procedures for components of the 42" LCD Monitor Assembly.

A Monitor Remote Control PCB is connected to the monitor and can be used to adjust the monitor image. You can access Monitor Test Screens from the Operator Menu (see page 20) to help adjust the monitor.

Note: If the monitor does not work, make sure the harnesses between the control PCB and LCD panel are connected properly. Also check the DVI video cable and power connection.

LCD Monitor Replacement (42" Deluxe)

1. Disconnect the cabinet from AC power.
2. Remove the four (4) screws that secure the rear cover plate to the back of the cabinet behind the LCD monitor.
3. Disconnect the power and video cables from the back of the monitor.
4. Remove the four (4) screws that secure the monitor to the cabinet.
5. Remove the seven (7) screws that secure the bezel in place around the front of the monitor.
6. Carefully lift the bezel away from the cabinet, with the glass inside the bezel frame. Be very careful as the glass is not secured in the frame.
7. Carefully lift the monitor out through the front of the cabinet.
8. Reverse these steps to install the new monitor.

Glass Display Shield Replacement (42" Deluxe)

1. Disconnect the cabinet from AC power.
2. Remove the seven (7) screws that secure the bezel in place around the front of the monitor.
3. Carefully lift the bezel away from the cabinet, with the glass inside the bezel frame. Be very careful as the glass is not secured in the frame.
4. Replace the glass in the bezel.
5. Reverse these steps to re-install the bezel with the new glass.

Monitor Power Supply Replacement (42" Deluxe)

The 24 VDC monitor power supply is located in the lower part of the cabinet. Do the following if you need to replace the power supply:

1. Disconnect the cabinet from AC power.
2. Remove the four (4) screws that secure the rear cover plate to the back of the cabinet behind the LCD monitor.
3. Make sure all wires connecting to the power supply are properly labeled for reconnection, and then disconnect them from the terminals.
4. Remove the two (2) screws that secure the power supply mounting bracket in place.
5. Reverse the removal steps to install the new power supply.

Note: If the monitor does not function properly, verify the power supply is putting out +24 VDC.

LCD Monitor Service (26" Standard)

The 26" monitor is a self-contained assembly containing the LCD, power supply, and electronics. A separate Remote Control can be used to adjust the monitor image. You can access Monitor Test Screens from the Operator Menu (see page 20) to help adjust the monitor.

Glass Display Shield Replacement (26" Standard)

1. Remove the three screws from the marquee top retaining bar and remove the retaining bar, marquee artwork, and clear plastic.
2. Remove the nuts and carriage bolts that secure the monitor top retaining bracket at the top of the glass display shield.
3. Remove the glass display shield.
4. Reverse these steps to install the new glass display shield.

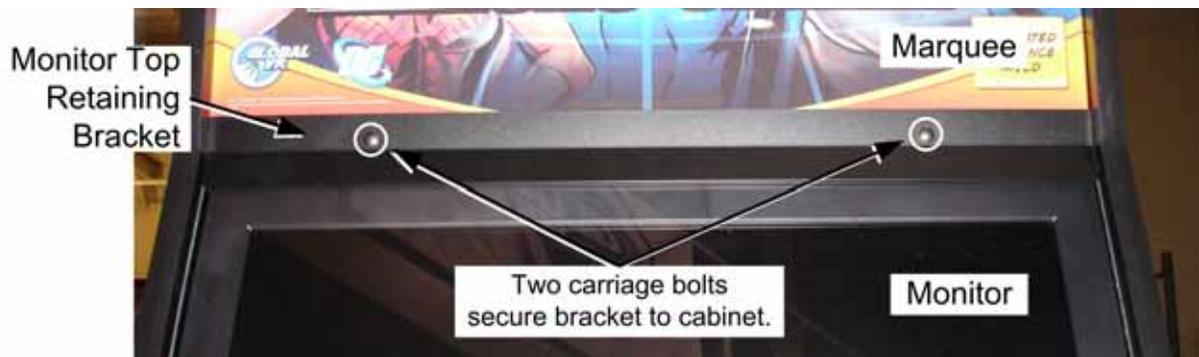


Figure 9. 26" Monitor Top Retaining Bracket

LCD Monitor Replacement (26" Standard)

The 26" monitor is held in place by a top retaining bracket and a mounting bracket inside the cabinet. Refer to Figure 9 & Figure 10, and perform the following steps to replace the monitor:



SHOCK HAZARD. Do not open the monitor housing. The monitor must be replaced as a unit. It has no components that can be repaired in the field.

1. Disconnect the cabinet AC Power Cord and remove the rear door from the cabinet.
2. Disconnect the power and video cables from the back of the monitor assembly.
3. Remove the two bolts that secure the monitor mounting bracket to the cabinet.
4. Remove the glass display shield as described in the previous section.
5. Remove the monitor assembly through the front of the cabinet.

Note: The steps below are based on the monitor that was used in initial cabinet production. As products change frequently, some steps may be different for your replacement monitor.
6. Remove the three screws that secure the monitor mounting bracket to the metal piece on the bottom of the monitor, and install the bracket on the new monitor the same way.
7. Remove the small metal bracket that presses against the ON/OFF switch to keep the monitor ON. Secure it to the new monitor with heavy-duty double-stick tape.

8. Remove the JUSTICE LEAGUE™ artwork from the front of the monitor and apply it to the new monitor.
9. If the new monitor has a logo that sticks out from the front, break it off.
10. Install the new monitor by reversing the removal steps.
11. Select **Diagnostics: Visual Diagnostics** in the Operator Menu if you need to adjust the new monitor (see page 20).

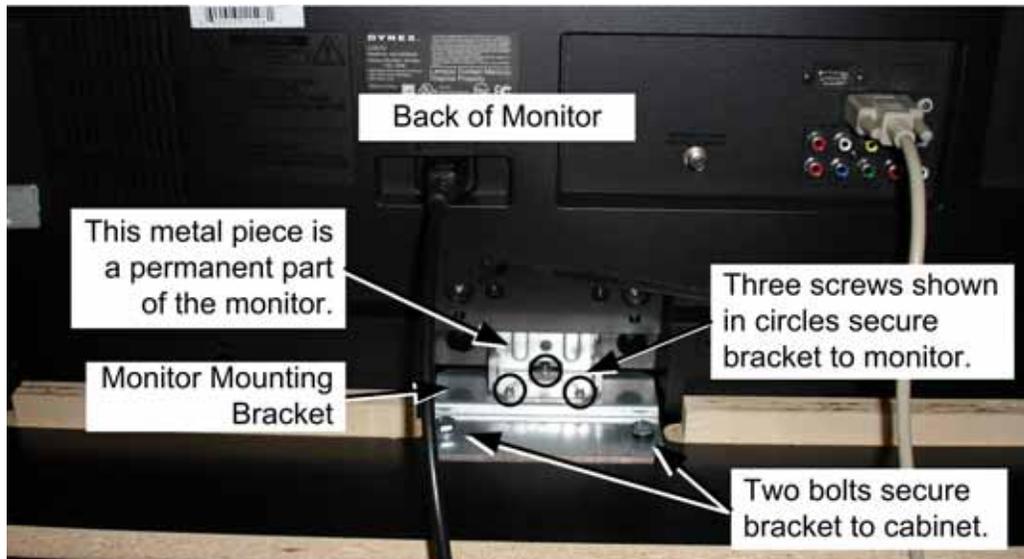


Figure 10. 26" Monitor Mounting Bracket

Computer Replacement



CAUTION: The computer is serviced as one unit. **YOU WILL VOID YOUR WARRANTY** if you open the computer without direct authorization from the GLOBAL VR Technical Support staff.

Perform the following steps to remove the computer from the cabinet:

1. Disconnect all of the cables from the computer.
2. Remove the Game Dongle and keep it with your cabinet. **Do not ship the game dongle with the computer.**
3. Unbuckle the strap that secures the computer in place and carefully remove the computer.
4. Reverse these steps to replace the computer. See Figure 19 on page 50 for computer connections. Make sure all computer air vents are clear of anything that could block air flow.

When shipping the computer, always use plenty of padding and protection. **GLOBAL VR recommends shipping the computer in a box with three inches of foam padding on all sides.**



CAUTION: Shipping the computer without enough padding can **VOID THE WARRANTY** if the computer is visibly damaged from shipping.

Coin Mech Replacement

Perform the following steps to remove the coin mech. You can replace the coin mech with any standard arcade coin mech.

1. Unscrew the thumbscrews on the latches as shown by the arrows in step 1 of the figure below.
2. Slide the latches apart from each other and remove the Coin Mech as shown in steps 2 and 3.
3. Reverse these steps to re-install a coin mech. It is important to verify the operation of the newly installed coin mech with both good and bad coins.

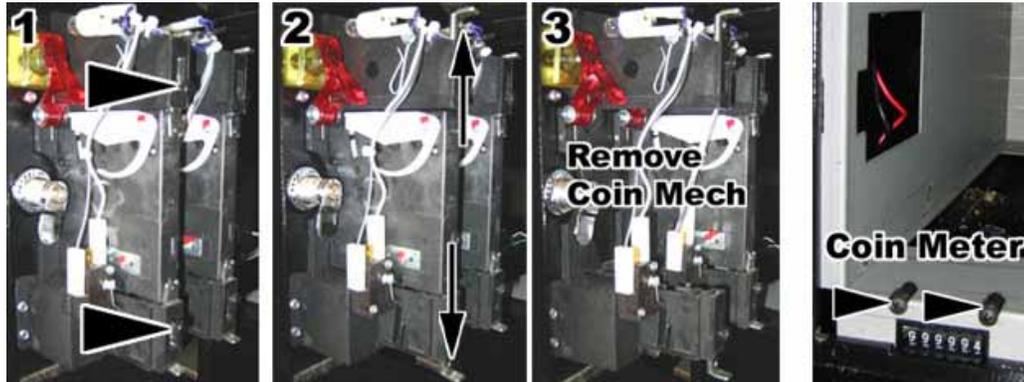


Figure 11. Servicing the Coin Mech and Coin Meter

Coin Meter Replacement

The coin meter is located in the bottom left-hand corner of the cash box. Perform the following steps to remove the coin meter:

1. Turn the cabinet OFF and disconnect the AC power cord.
2. Remove the two Phillips screws holding the coin meter to the cabinet and remove the coin meter.
3. Cut the two wires from the coin meter and strip the ends of the wires to attach the new meter.
4. Use two butt splices to connect the wires to the new coin meter.
5. Use the two screws to install the new coin meter.

Ventilation Fan Service

The ventilation fan is very important for moving hot air out of the cabinet. The computer and other electronics will not work properly if they are overheated. The fan is powered by +12 VDC from the DC Power Supply. Always make sure that all vent holes in the cabinet are free of debris so air can flow freely. Do the following to replace the fan:

1. Turn the cabinet OFF, disconnect the AC power cord, and remove the cabinet back door.
2. Disconnect the Molex fan power connector from the power harness.
3. Remove the four (4) screws that secure the fan to the cabinet.
4. Reverse these steps to install the new fan. Make sure the fan is blowing air OUT of the cabinet.

Power Distribution Service

AC Power Plate

The AC power plate provides the external AC power to the cabinet.

An AC EMI Filter in the Power Entry Module removes the electrical noise that can cause interference with the hardware inside the cabinet. A fuse in the Power Entry Module protects the module. AC power is routed to a 7-outlet AC power strip/surge suppressor that provides power to all components in the cabinet.

Caution: The cabinet must be connected to a secure ground to function properly.

Ground wires from system components must be securely connected to the ground lug on the power plate, as shown in Figure 12. Components must **not** be grounded to the power plate mounting bolts.

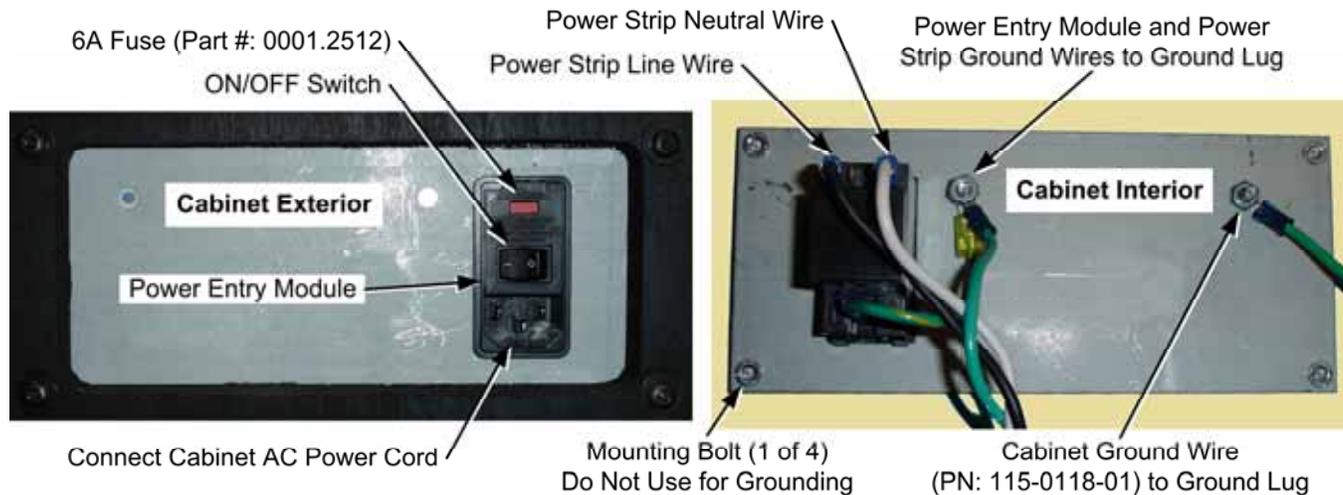


Figure 12. AC Power Plate

AC Power Strip Replacement

The AC power strip provides power to all of the components in the cabinet. Perform the following steps to replace the power strip:

1. Turn the cabinet OFF and disconnect the AC power cord.
2. Disconnect all components from the power strip.
3. Disconnect the power strip from the AC power plate terminals (see Figure 12).
4. Remove the power strip; it is held in place with Velcro®.
5. Replace the power strip with an appropriate unit from GLOBAL VR (part # 49-0963-40). Do not attempt to use a different power strip. Be sure to connect each wire to the correct terminal (See Figure 16. Power Distribution Diagram on page 47.)



CAUTION: Be sure to connect each wire to the correct terminal. The ground wire must be securely connected to the ground lug on the power plate or the game will not function properly.

+5/+12 VDC Power Supply Replacement

The DC power supply provides +5 and +12 VDC to power the GVRI/O PCB, coin lamps, coin meter, and the CCFL lighting on the 42" deluxe cabinet. Remove the rear door from the cabinet to access the DC power supply, and perform the following steps to replace it:

Note: 42" Deluxe cabinets also have a 24 VDC power supply to power the LCD monitor. To replace this power supply, see page 28.

1. Turn the cabinet OFF, disconnect the AC power cord, and remove the rear door.
2. Make sure that all wires connected to the DC power supply are properly labeled for easy re-assembly, and then disconnect the wires from the terminals on the DC power supply.
3. Remove the four (4) screws that secure the power supply to the cabinet.
4. Remove the mounting brackets from the power supply and install them the same way on the new power supply.
5. Reverse the removal steps to install the new power supply. Adjust the +5V output to 5.4V **before** connecting the power supply to the output harnesses (use 5.2V if the power supply is connected). If the voltage is too high it will damage electronic components. If it is too low, the game will not work properly.
6. Be sure to connect the wires to the correct terminals. See Figure 16 on page 47 for a diagram.

Marquee Florescent Light Service (42" Deluxe)

The marquee is lit by a florescent fixture that uses a standard 18" florescent tube. To access the fixture you need to remove the marquee artwork and clear plastic.

Refer to Figure 13 for a diagram of the marquee assembly. The marquee artwork is sandwiched between the large sheet of clear plastic and the small plastic wings at each side. It is attached to the marquee housing by metal standoffs. Do the following to remove the marquee artwork and clear plastic:

1. Remove the seven (7) Torx screws from the front of the marquee. These screw into the metal standoffs that screw into nuts behind the marquee housing.
2. Remove the clear plastic sheet with the artwork and clear plastic wings.
3. Replace the florescent tube with another 18" florescent tube.
4. Reverse the removal steps to re-install the artwork and clear plastic.

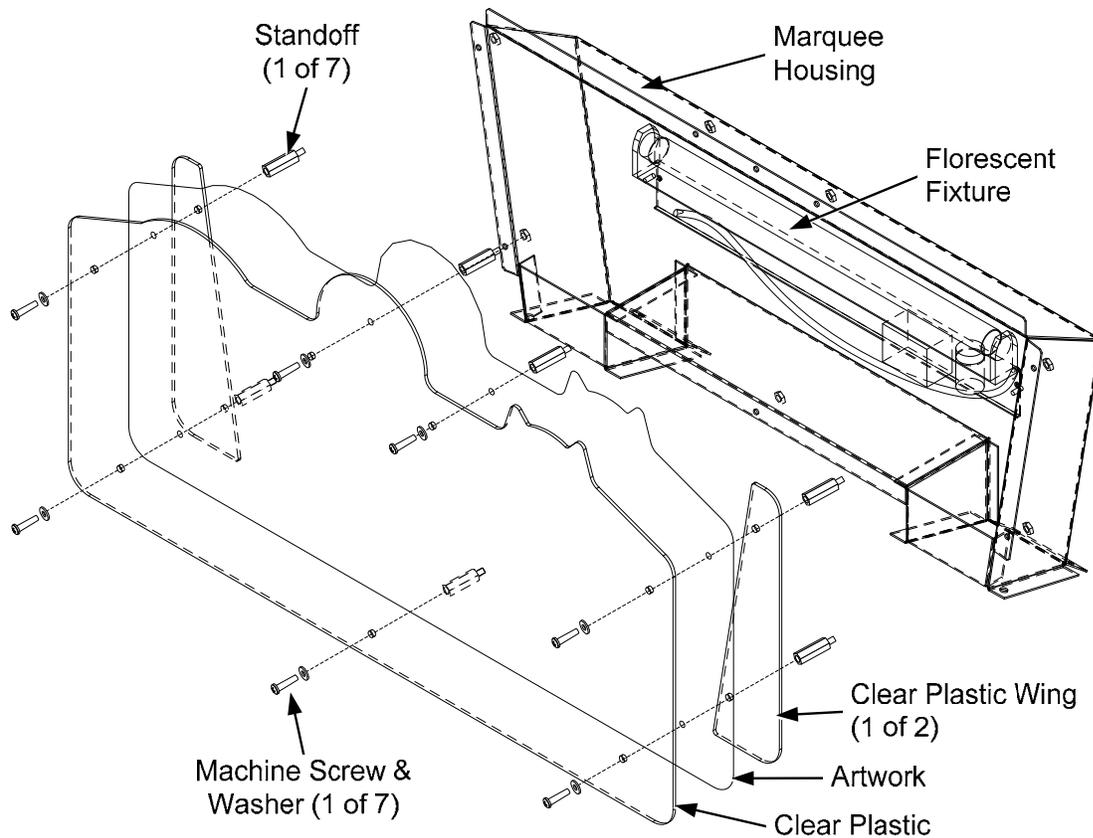


Figure 13. Marquee Assembly (42" Deluxe)

Marquee Florescent Light Service (26" Standard)

The marquee is lit by a florescent fixture that uses a standard 18" florescent tube.

To gain access to the marquee fixture, remove the screws that secure the top retaining bracket above the marquee. Remove the bracket, marquee artwork, and clear plastic. Replace the florescent tube with another 18" florescent tube.

Florescent Light Fixture Replacement (Either Cabinet)

1. Disconnect the cabinet AC Power Cord and open the marquee as described under *Marquee Florescent Light Service*, above.
2. Snip the AC power wires just below where they are spliced to the fixture power wires.
3. Remove the two Phillips screws that secure the fixture to the cabinet and remove the fixture.
4. Reverse these steps to install the new fixture. Use GLOBAL VR part #: 49-1001-00 only.

Cold-Cathode Florescent Light Service (42" Deluxe)

Cold-cathode florescent lights (CCFLs) add dramatic lighting effects to the cabinet. See Figure 7 for CCFL detail.

Note: If both lights in a set fail, make sure the power connector is firmly attached to the power inverter. Connect the lights to another power inverter to test them. Replace the power inverter if faulty; it is held in place with Velcro and/or cable ties.

Refer to the table below if you need to replace a cold-cathode tube or inverter.

If you replace an inverter, and the replacement set has a power switch, make sure it is switched ON. Install the inverter so that the vents (the circle of small holes) on the case are not covered.

Light Location	Size & Qty	Changing Tube(s)	Inverter Location
Kick Panel	One 12" White Tube	Remove the four (4) screws that secure the clear plastic plate above the kick panel.	Cabinet Floor
Control Panel	One 6" White Tube on Each Side	Remove the Control Panel Base Cover (see page 23).	Inside Control Panel Base Cover
Subwoofer	One 12" Red Tube	Remove the four (4) Torx screws that secure the subwoofer grill to access the tubes. Remove the back door to access the inverter.	Inside Cabinet on Side Wall

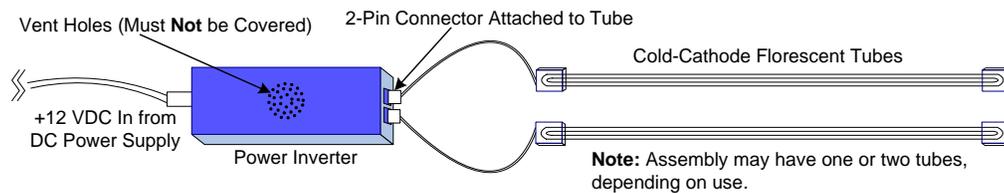


Figure 7. Cold-Cathode Light Detail

Setting the Computer BIOS (CMOS)

This procedure applies to the Asus **P5KPL-CM** Motherboard. If your system has a different motherboard, check <http://service.globalvr.com> for updated information.

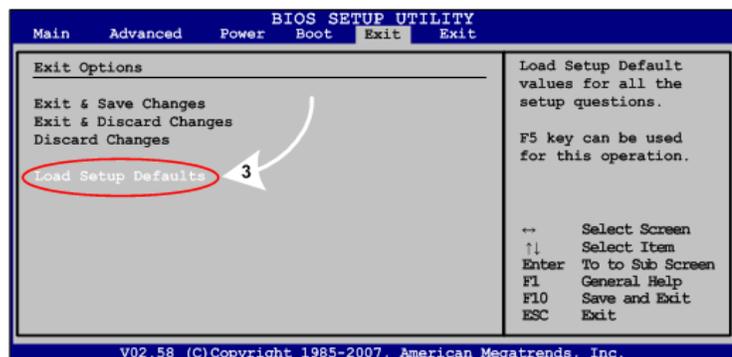
If you are comfortable using the BIOS Setup Utility, connect a keyboard to the computer and press the **DEL** key during boot to run the Utility. Select **Load Setup Default** from the **Exit** Menu first, and then check all of the settings shown in the table below. For more help, refer to the detailed instructions that follow.

Menu	Submenu (if applicable)	Item	Setting
Exit		Load Setup Default	<i>(Not applicable)</i>
Main		System Time	<i>(Set to local time)</i>
		System Date	<i>(Set to current date)</i>
		Legacy Diskette A:	Disabled
		Primary IDE Master	WDC WD400BB
		Primary IDE Slave	Sony DVD-ROM
Advanced	CPU Configuration	Intel(R) SpeedStep(tm) Tech	Disabled
Boot	Boot Device Priority	1st Boot Device	DVD ROM
		2nd Boot Device	HDD
		3rd Boot Device	Disabled
	Boot Settings Configuration	Wait for F1 if Error	Disabled
Power	APM Configuration	Restore on AC Power Loss	Power On
	Hardware Monitor	CPU Q-Fan Control	Disabled <i>(default setting)</i>

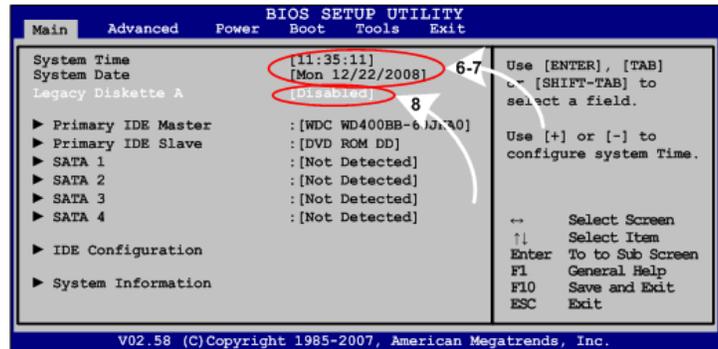
Important: Your screens may not look exactly like the screens shown in this document, and some settings shown in the pictures may be different from your system.

Do not change any settings that are not specifically described in this document.

1. Power off the game and connect a keyboard to the computer. Power on and press the **DEL** key during boot. The BIOS Setup Utility will start:
2. Use the Arrow keys (**← →**) to highlight **Exit** from the top of the screen, and the **Exit** menu will appear.
3. Use the Arrow keys (**↑↓**) to select **Load Setup Defaults**, and press **Enter**.
4. A prompt will appear saying **Load Setup Defaults (Y/N)?** Make sure **YES** is highlighted and press **Enter** to confirm the change.

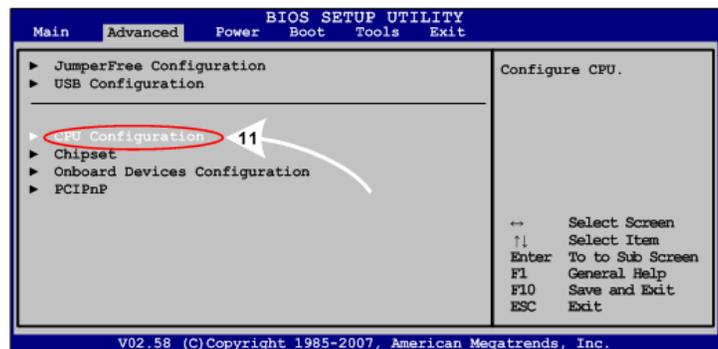


5. Use the Arrow keys (← →) to highlight **Main** from the top of the screen, and the **Main** Menu will appear.
6. Use the Arrow keys (↑↓) to highlight **System Time**. The hour will be highlighted. Use the + and – keys to set the hour to local time. Press **Tab** to move to the minutes, and set them the same way.
7. Use the Arrow keys (↑↓) to highlight **System Date** and set it the same way you set the time.
8. Use the Arrow keys (↑↓) to highlight **Legacy Diskette A:** and then use the + and – keys to change the setting to **Disabled**.
9. Verify **Primary IDE Master** is the hard disk (WDC WD400BB) and **Primary IDE Slave** is the Sony DVD-ROM.

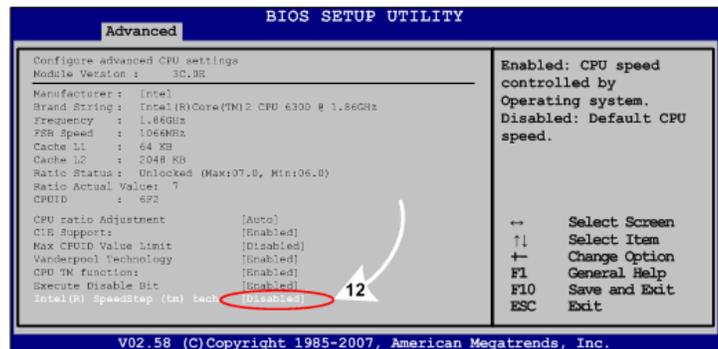


10. Use the Arrow keys (← →) to highlight **Advanced** from the top of the screen, and the **Advanced** menu will appear.
11. Use the Arrow keys to highlight **CPU Configuration** and press **Enter**.

The **Configure Advanced CPU Settings** menu will appear.

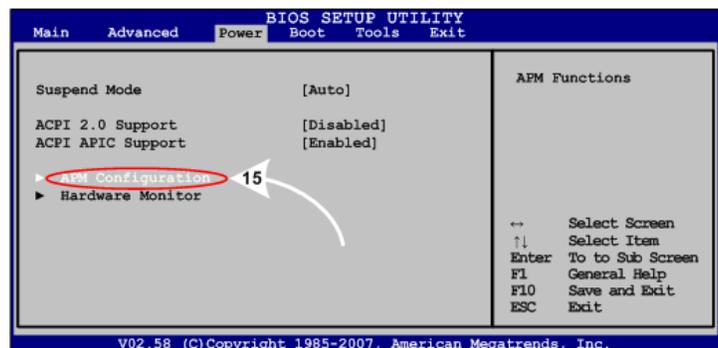


12. Use the Arrow keys (↑↓) to highlight **Intel(R) SpeedStep (tm) tech.** and then use the + and – keys to change the setting to **Disabled**.
13. Press **Esc** to return to the **Advanced** menu.

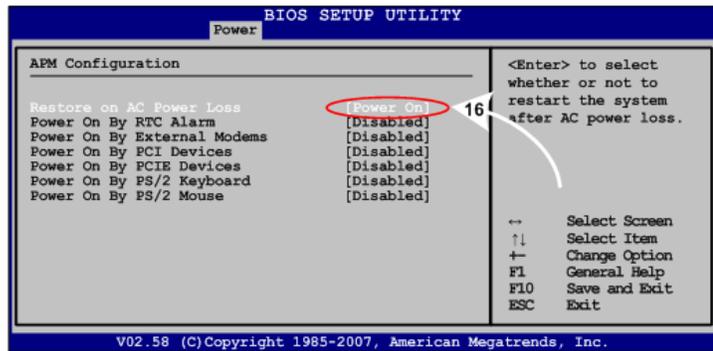


14. Use the Arrow keys (← →) to highlight **Power** from the top of the screen, and the **Power** menu will appear.
15. Use the Arrow keys to highlight **APM Configuration** and press **Enter**.

The **APM Configuration** menu will appear.



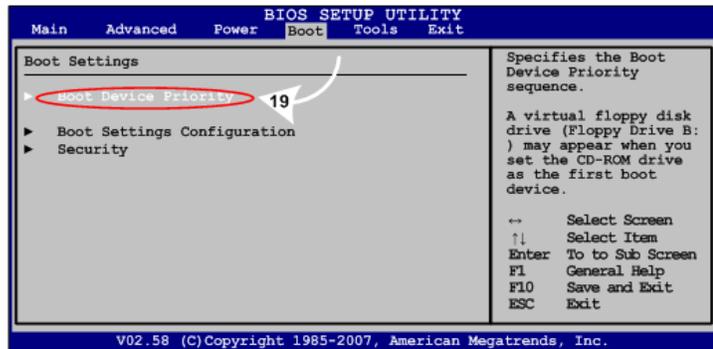
16. Use the Arrow keys (↑↓) to highlight **Restore on AC Power Loss** and then use the + and – keys to change the setting to **Power-On**.



17. Press **Esc** to return to the **Power** menu.

Note: It is also recommended to select **Hardware Monitor** from the Power menu and verify **CPU Q-Fan Control** is set to **Disabled**.

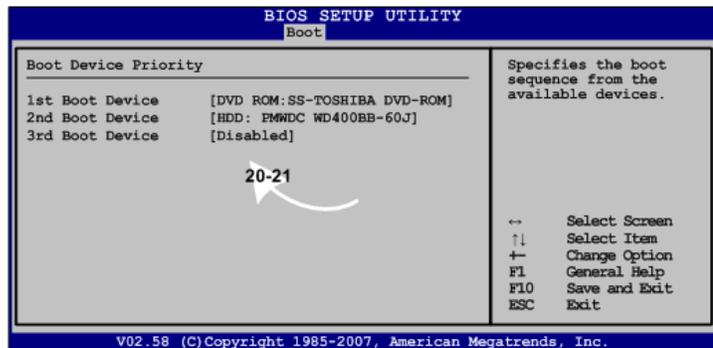
18. Use the Arrow keys (← →) to highlight **Boot** from the top of the screen, and the **Boot** menu will appear.



19. Use the Arrow keys (↑↓) to highlight **Boot Device Priority** and press **Enter**.

The **Boot Device Priority** menu will appear.

20. Use the Arrow keys (↑↓) to highlight **1st Boot Device**, and then use the + and – keys to change the setting to **DVD ROM**.



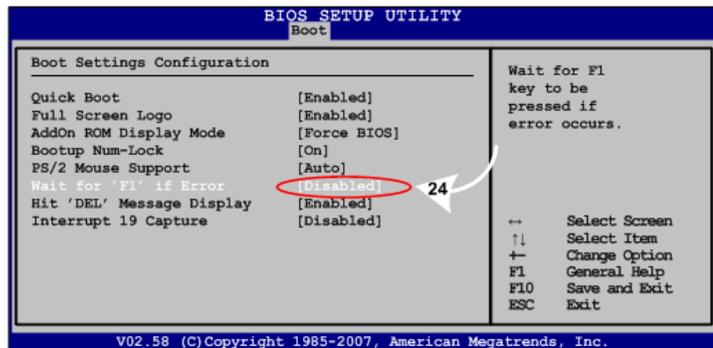
21. Do the same step to change **2nd Boot Device** to **HDD**, and **3rd Boot Device** to **Disabled**, as necessary.

22. Press **Esc** to return to the **Boot** menu.

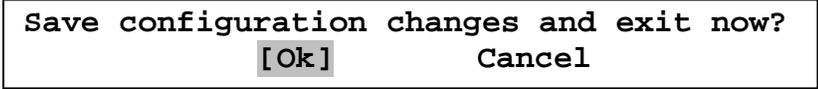
23. Use the Arrow keys (↑↓) to highlight **Boot Settings Configuration** and press **Enter**.

The **Boot Settings Configuration** menu will appear

24. Use the Arrow keys (↑↓) to highlight **Wait for F1 if Error** and then use the + and – keys to change the setting to **Disabled**.



25. Now that all settings are correct, press F10. The following prompt will appear:



26. Make sure **Ok** is highlighted (use the arrow keys ← → to select, if necessary), and press **Enter** to save the settings and reboot the computer.

Chapter 7 — Troubleshooting

Video Troubleshooting

Problem	Cause	Possible Solution
No picture or Corrupted picture on monitor You hear the audio	Power problem	Check the Power ON LED on the 26" monitor or the 42" monitor power supply. Make sure the power cord is connected to the power strip and the power strip is on.
	Loose or faulty video cable	Verify that the video cable is firmly connected from the monitor to the video card in the computer. While the monitor is powered ON, disconnect the video cable. You should briefly see a message on-screen saying <i>No Input Signal</i> if the monitor is working. Check the video cable and make sure it is not pinched or frayed. Connect the cable to a different monitor to verify video output.
	42" Deluxe: Loose or faulty connections between LCD Panel and Control PCB	Make sure that all harnesses between the control PCB and LCD panel are connected properly. Check the video cable and power connection. Make sure the LCD Control PCB connector is properly connected to the monitor. If you hear Alert beeps from the System PC, contact Technical Support for assistance.
	42" Deluxe: Faulty DVI connector on monitor control PCB	Try using the VGA connector on the monitor control PCB. Either use a DVI to VGA adapter, or connect a VGA cable from the VGA port on the video card. If the video quality is not acceptable with VGA, order a replacement monitor control PCB.
	Loose or faulty video card	When the computer boots up, it performs a PC self-diagnostic test. If you hear 3 beeps from the computer, this indicates a problem with the video card. If the video card is faulty, contact Technical Support. If instructed by Technical Support, open the computer and check the following: <ul style="list-style-type: none"> • Make sure the video card is seated properly in the motherboard. Reseat the video card if loose. • Check the power connector to the video card inside the computer. Make sure it is connected properly and is not connected backwards. • Power on the computer and make sure the fan on the video card is spinning fast.
No video and no audio Note: It takes about 1 ½ minutes to boot and start the game.	PC power switch is off	If the computer does not power on, make sure the On/Off switch on the back of the computer is in the On (I) position.
	BIOS setting has changed	Check the BIOS settings (see page 36). Under <i>Power</i> , select <i>APM Configuration</i> , and make sure <i>Restore on AC Power Loss</i> is set to <i>Power On</i> .

Problem	Cause	Possible Solution
No video and no audio (Continued)	No power to computer	Verify the computer is ON by the LED on the front of the computer. Verify the line voltage switch on the back of the computer is set to 115V. Make sure the AC power cord is firmly connected to the computer and the power strip, and the power strip LED is on. Turn off the power strip, wait 20 seconds, and then turn it back on to reboot the computer. If you have checked all power connections, and the fan in the computer power supply does not come on, the computer power supply may be bad.
	Corrupted software or Faulty hard drive	Restore the software (see page 22). If you continue to have problems, you may have a faulty hard drive. Contact Technical Support.
Picture is dim or faded	Gamma and/or Brightness needs adjustment	Adjust the monitor Gamma and/or Brightness setting from Diagnostics: Visual Diag in the Operator Menu (see page 20). If this does not give adequate results, increase brightness using the monitor remote control for 26" standard cabinets, or the remote control PCB mounted to the back of the monitor for 42" deluxe cabinets.
Red or green horizontal lines on monitor	Faulty LCD control PCB	Contact Technical Support for assistance.

Audio Troubleshooting

Problem	Cause	Possible Solution
No audio	Volume set too low	Use the VOL UP button on the Operator Button Panel to raise the volume. Check Machine Settings in the Operator Menu and verify Master Volume is set high enough.
	Faulty wiring	Turn off the game. Verify that all the wires are firmly connected to the speakers and GVRI/O PCB. Verify that the audio cable is connected to the green port in the computer. Verify that no wires are frayed or improperly shorting to ground. (See Figure 17 & Figure 18.) To verify audio is working at the computer, connect stereo headphones to the computer audio port.
	Blown speakers	Remove the grills and inspect each speaker for visible damage. Select Diagnostics: Audio Diag from the Operator Menu to verify each speaker is working.
	Faulty Audio Amp on GVRI/O PCB	To verify audio is working at the computer, connect stereo headphones to the computer audio port. Test the GVRI/O PCB in another cabinet.
Audio hum	Fault in AC Wiring	A constant low hum in the speakers can be caused by a ground loop, or reversed AC line and neutral wires to a component such as a power supply.

Problem	Cause	Possible Solution
Poor sound from one or more speakers	Blown speakers	Remove the grills and inspect each speaker for visible damage. Select Diagnostics: Audio Diag from the Operator Menu to verify each speaker is working.
	Reversed wires	A weak or low muffled sound is a sign of reversed speaker wires. Check for reversed wires on each speaker.
	Faulty audio amp on GVRI/O PCB	To verify audio is working at the computer, connect stereo headphones to the computer audio port. Test the PCB in another working cabinet.
	Faulty wiring	Turn off the game. Verify that all the wires are firmly connected to the speakers and GVRI/O PCB. Verify that each wire is connected to the correct port. Verify that no wires are frayed or improperly shorting to ground. (See Figure 17 & Figure 18.)

Control Troubleshooting

Problem	Cause	Possible Solution
A button does not work	Faulty micro switch	Replace the button micro switch and re-test. Verify that the wires are connected to the correct spades on the micro switch.
Buttons do not work	Faulty wiring	Disconnect the cabinet from AC power. Verify wires are firmly connected to each button and the GVRI/O Mini PCB. Verify the GVRI/O Mini PCB is connected to a PCI USB port in the computer. Verify that no wires are frayed or improperly shorting to ground.
	Faulty GVRI/O Mini PCB	Make sure that all connections to the PCB are firm. Test PCB in another cabinet. Replace PCB if faulty.
Joystick does not work	Faulty joystick PCB	Replace joystick PCB. (See page 25.)
	Faulty wiring	Disconnect the cabinet from AC power. Verify that all the wires are firmly connected to the joystick and the GVRI/O Mini PCB. Verify GVRI/O Mini PCB is connected to a PCI USB port in the computer. Verify no wires are frayed or improperly shorting to ground.
	Faulty GVRI/O Mini PCB	Make sure that all connections to the PCB are firm. Test PCB in another cabinet. Replace PCB if faulty.
No joystick or button functions	No power to the GVRI/O Mini PCB	The LED on the GVRI/O Mini PCB will light when either DC power or USB is connected. To check the power connection, disconnect the USB connector. If the LED remains lit, the PCB is receiving DC power. If it does not, check the power connection and troubleshoot the DC power supply.
	Faulty wiring	Verify that all connectors are firmly connected to the GVRI/O Mini PCB, and the USB cable is firmly connected from the PCB to a PCI USB port on the computer. Verify that no wires are frayed or improperly shorting to ground. Try a different USB cable.
	Faulty GVRI/O Mini PCB	Make sure that all connections to the PCB are firm. Test PCB in another cabinet. Replace PCB if faulty.
Joystick feels loose or doesn't center properly	Bad joystick grommet	Replace the joystick grommet. (See page 25.)

Miscellaneous Troubleshooting

Problem	Cause	Possible Solution
No power (No cabinet lights, video, or audio)	Power strip not plugged in or turned off	Make sure the power strip ON/OFF switch is ON, and the light on the power strip is on. If the light is off, make sure the connections to the AC power plate and power transformer terminals are secure.
	Cabinet not connected or turned off	Make sure the AC power cord is firmly connected to the power plate and an active AC outlet, and the cabinet ON/OFF switch is ON.
	Blown fuse in power entry module	Check the fuse in the power entry module in the power plate (see page 32). If blown, replace with GLOBAL VR Part # 0001.2512.
	Faulty power entry module	Disconnect the cabinet from AC power and check all connections to the power plate. Replace a faulty module with GLOBAL VR Part #CCM1600-ND.
Game Dongle not found by system computer	Game Dongle not connected	Make sure the Game Dongle is securely connected. Power the cabinet off and then on.
	Faulty Game Dongle	Make sure the dongle is connected properly. It will light-up red when recognized by the computer. Contact Tech Support to exchange a faulty dongle.
	Faulty USB port	Test the dongle in a different USB port and reboot.
Cabinet gets very warm	Faulty ventilation fan	Verify that the ventilation fan is working. Replace the fan if it is worn or spinning slowly (see page 31).
	Cabinet ventilation holes are blocked	Make sure you have proper clearance between the cabinet rear and the wall. Make sure all ventilation holes are clear of dust and debris and that air is freely blowing out of the cabinet.
Marquee lamp does not light or is intermittent	Faulty florescent tube	Check the florescent tube for darkened or cracked end. Replace the florescent tube if it looks worn.
	Faulty florescent fixture	Verify the florescent tube pins make a good connection with the lamp fixture. Check the ballast for proper operation. Replace fixture if faulty.
	Faulty wiring	Check the AC power connection to the fixture.
42" Deluxe: CCFL light doesn't work	Faulty tube or inverter	First check power connections, then try a different inverter. If the light still doesn't work, replace the light tube (see page 35).
Game will not accept coins	Faulty coin mech	Verify the coin mech is not jammed and is properly aligned and latched to the coin door (see page 31).
	Faulty ground wire	Check the ground wire to the coin door.
Wrong number of credits shown	Incorrect setting	Adjust settings from the Operator Menu.
	Faulty wiring	Disconnect cabinet power cord. Check all coin mech wiring. Verify no wires are frayed or shorting to ground.
Optional DBA not working	Incorrect dipswitch setting	Set dipswitches for Long Pulse or Gaming (not Short Pulse or Vending).
Very long wait before System Recovery Disk runs	Drive A is enabled in the BIOS	Check the BIOS settings (see page 36). Under <i>Main</i> , set <i>Legacy Diskette A</i> to <i>Disabled</i> . Make sure DVD ROM is set as 1 st Boot Device.

Chapter 8 — Replacement Parts

If you need replacement parts, please reference these part numbers when contacting GLOBAL VR Service or your distributor.

Notes: Part numbers may change due to hardware or software revisions.

Qty column refers to quantity used per cabinet.

Documents and Software

Item Number	Qty	Description	Cabinet
040-0207-01	1	Operation & Service Manual	Both
050-0163-01	1	Game Install Disk (1 DVD)	Both
050-0172-01	1	System Recovery Disk (1 CD)	Both

Cables

Item Number	Qty	Description	Cabinet
115-0008-01	1	Power Cable, AC to DC Power Supply	Both
115-0049-01	1	Power Plate Ground Wire	Both
115-0098-01	1	Power Cable, 12V to CCFLs	42"
115-0099-01	1	Ground Harness	42"
115-0100-01	1	Speaker Harness	26"
115-0119-01	2	Speaker Wires	42"
115-0121-01	1	Power Cable, AC to Monitor Power Supply	42"
115-0182-01	1	Main Button Harness	Both
115-0183-01	1	Start Buttons Harness	Both
115-0184-01	1	Joysticks Harness	Both
115-0185-01	1	Coin Door & Service Buttons Harness	Both
115-0186-01	1	DC Power Cable, +12V/+5V to GVRI/O PCB & Fan	Both
115-0217-01	1	Speaker Harness	42"
115-DVINPUT-CBL	1	DVI Video Cable	42"
80-0213-00	1	AC Power Cord, 6', SJT UL Recognized	Both
96-0539-00	2	Stereo Audio Cable, 3.5 MM, 6'	Both
GLO-PWRCORD	1	Power Cord, Marquee Florescent Light	Both
USB-AB06MM	1	USB Cable, 6', USB2-ABO6	Both
V-0606	1	VGA Video Cable, 6'	26"

Electronics & Functional Components

Item Number	Qty	Description	Cabinet
Primary Functional Components			
12V-FAN-QCA	1	Fan, 12VDC, 120mm, W/ Fan Guard & Connector	Both
40-0740-6V	1	Coin Door Assembly, Mid-Width, 6V Lamp, Meter, & 4 Service Buttons	Both
45078-00	1	System Computer	Both
50-9005-00	2	Speaker, 5", 12 Watt, 8 Ohm, Shielded	26"
50-9986-00	1	Speaker Pair, 3-Way, 50 Watt	42"
5555-15142-00	1	Subwoofer, 4 Ohm, 8"	42"

Item Number	Qty	Description	Cabinet
990-0014-JL	1	GVRI/O Mini PCB, Game-Specific, Ver. 4.32 or later	Both
DX-LCD26-09	1	Dynex-26" LCD-HDTV	26"
EI-420W02-001-AOD	1	42" LCD Monitor Assembly	42"
S-150-24	1	DC Power Supply	Both
USB-KQRTG-HL-JLA	1	Game Dongle & Code (Exchange Only)	Both
Power Components			
0001.2512	1	Power Plate Fuse, 6Amp, 5mm x 20mm	Both
37117-01	1	Power Plate	Both
44-1100-01	1	Power Supply, +5V/+12VDC, 115 W	Both
49-0963-40	1	7-Outlet Power Strip, Surge Protected, 6', 15A,1500 Joules	Both
CCM1600-ND	1	Power Entry Module with EMI Filter & Fuse	Both
Lighting Components			
49-1001-00	1	Florescent Light Fixture, 18"	Both
CCFL2R	1	CCFL, 12", Red	42"
CCFL2W	1	CCFL, 12", White	42"
CCFL62W	2	CCFL, 6", White	42"
Player Control Panel Components			
50-3100-00	2	Joystick, 49 Way Optical	Both
58-9100-LG	2	Button, Red Long Pushbutton with Micro Switch & Nut	Both
58-9111-LG	2	Button, White Long Pushbutton with Micro Switch & Nut	Both
58-9122-LG	2	Button, Blue Long Pushbutton with Micro Switch & Nut	Both
58-9133-LG	2	Button, Green Long Pushbutton with Micro Switch & Nut	Both
58-9155-LG	2	Button, Yellow Long Pushbutton with Micro Switch & Nut	Both

Cabinet Hardware (Metal & Plastic, etc.)

Item Number	Qty	Description	Cabinet
1556A15	3	3" Zinc Plated Corner Brace	42"
26093-00	1	Clear Plastic, Kick Panel	42"
26107-00	1	Bracket, Speaker Light Assembly	42"
26126-00	1	Monitor Display Shield, 42", Glass	42"
26180-00	2	Clear Plastic, Control Base	42"
26185-00	1	Marquee Clear Plastic	26"
26186-00	1	Control Panel Plastic Cover	26"
26187-00	1	Monitor Display Shield, 26",Glass	26"
28A2024-OA0	4	Ferrite Bead, Snap-On	42"
37101-00	2	Weldment, Caster, Cabinet	42"
37103-00	1	Weldment, Marquee	42"
37153-00	1	Housing, LCD Monitor	42"
37154-00	1	Monitor Bezel	42"
37166-00	2	Mount, Speaker Box	42"
37167-00	1	Grill, Woofer	42"
37216-00	4	Mount, 42" LCD	42"
37294-00	2	Cover, Control Panel Base	42"

Item Number	Qty	Description	Cabinet
37295-00	1	Glass Display Shield Retainer	26"
37296-00	1	LCD Monitor Mounting Bracket	26"
49-1002-00	4	Leveler, 3/8-16 X 2.00 LG 200LB W/O NUT	Both
49-1019-00	1	PCB Mounting Feet, Set of 4	Both
60041-00	2	Foam Base, Computer, 1 x 7.25 x 13.50	Both
60039-00	1	Computer Mounting Strap	Both
917-HANDLE	1	Handle, 5 1/2", Zinc	26"
PSQ25115ZN-3H	4	Caster, Swivel, Hard Rubber, 1.75 x 3.00	42"
S109-127-1PA	1	Black Louvered Vent	42"

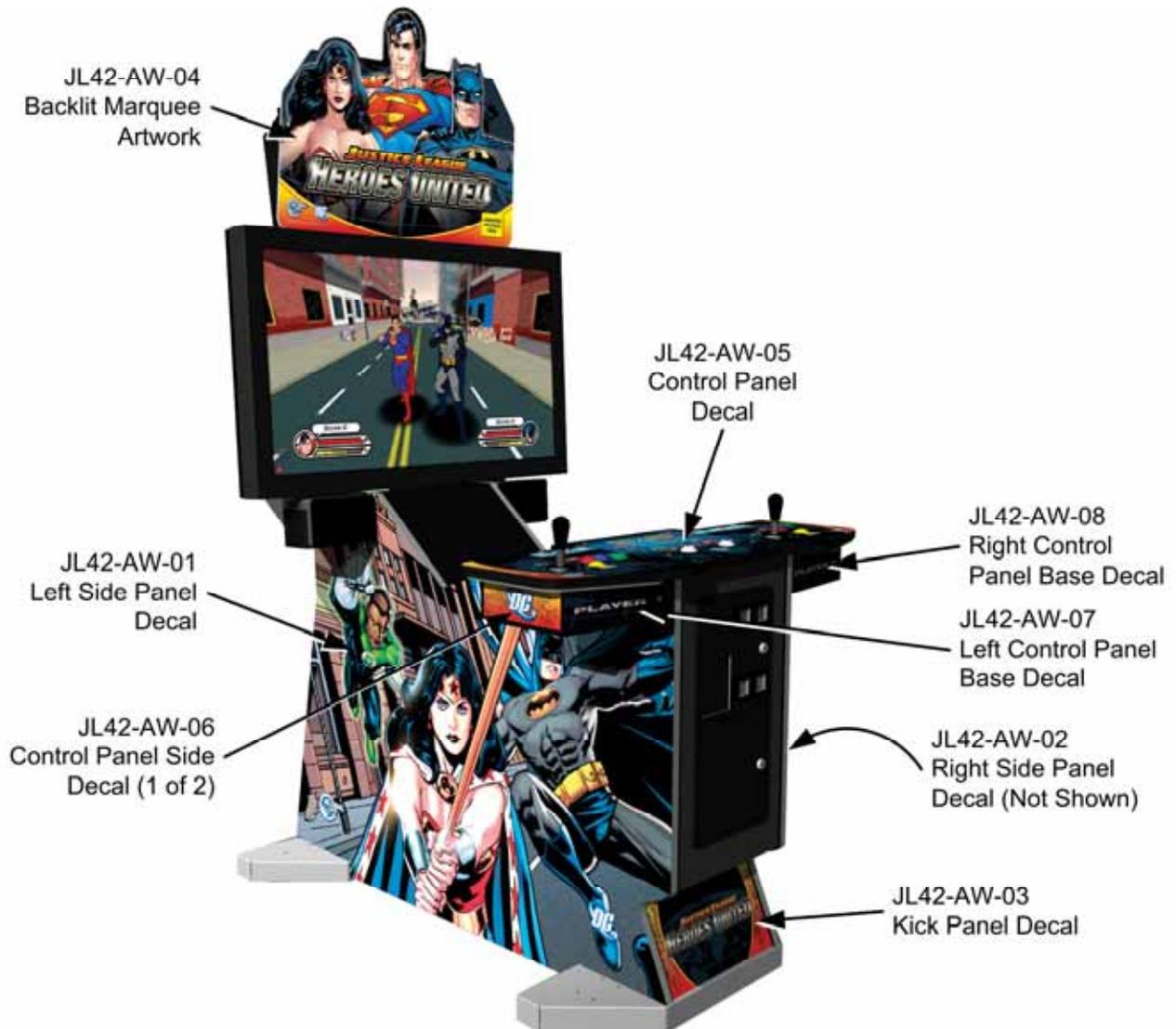


Figure 14. 42" Deluxe Cabinet Artwork Part Numbers

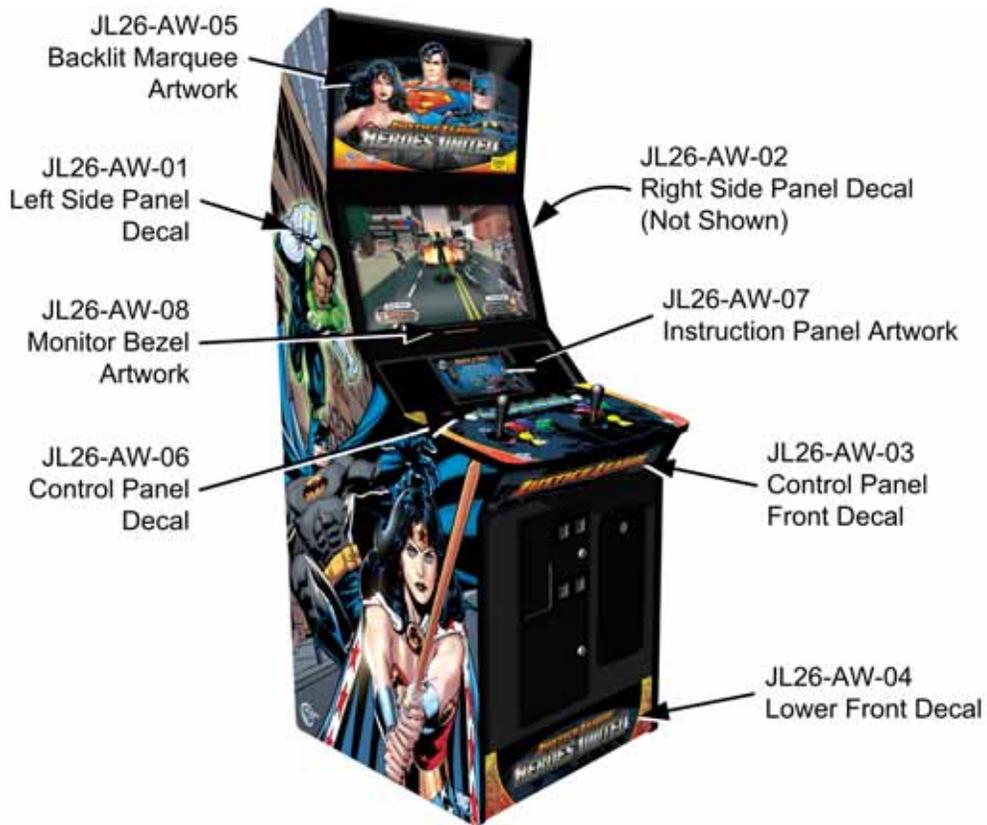


Figure 15. 26" Standard Cabinet Artwork Part Numbers

Chapter 9 — Diagrams and Schematics

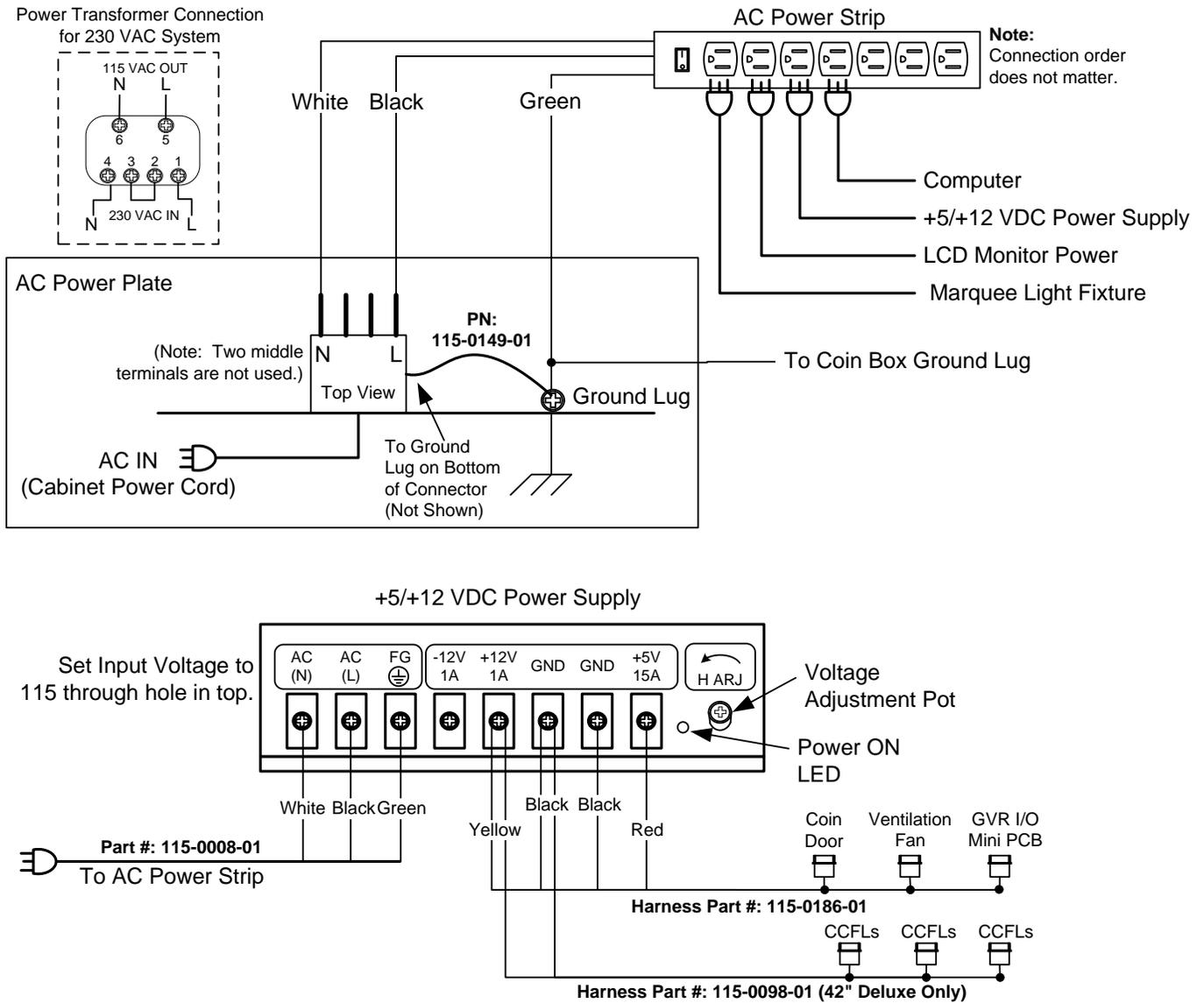


Figure 16. Power Distribution Diagram

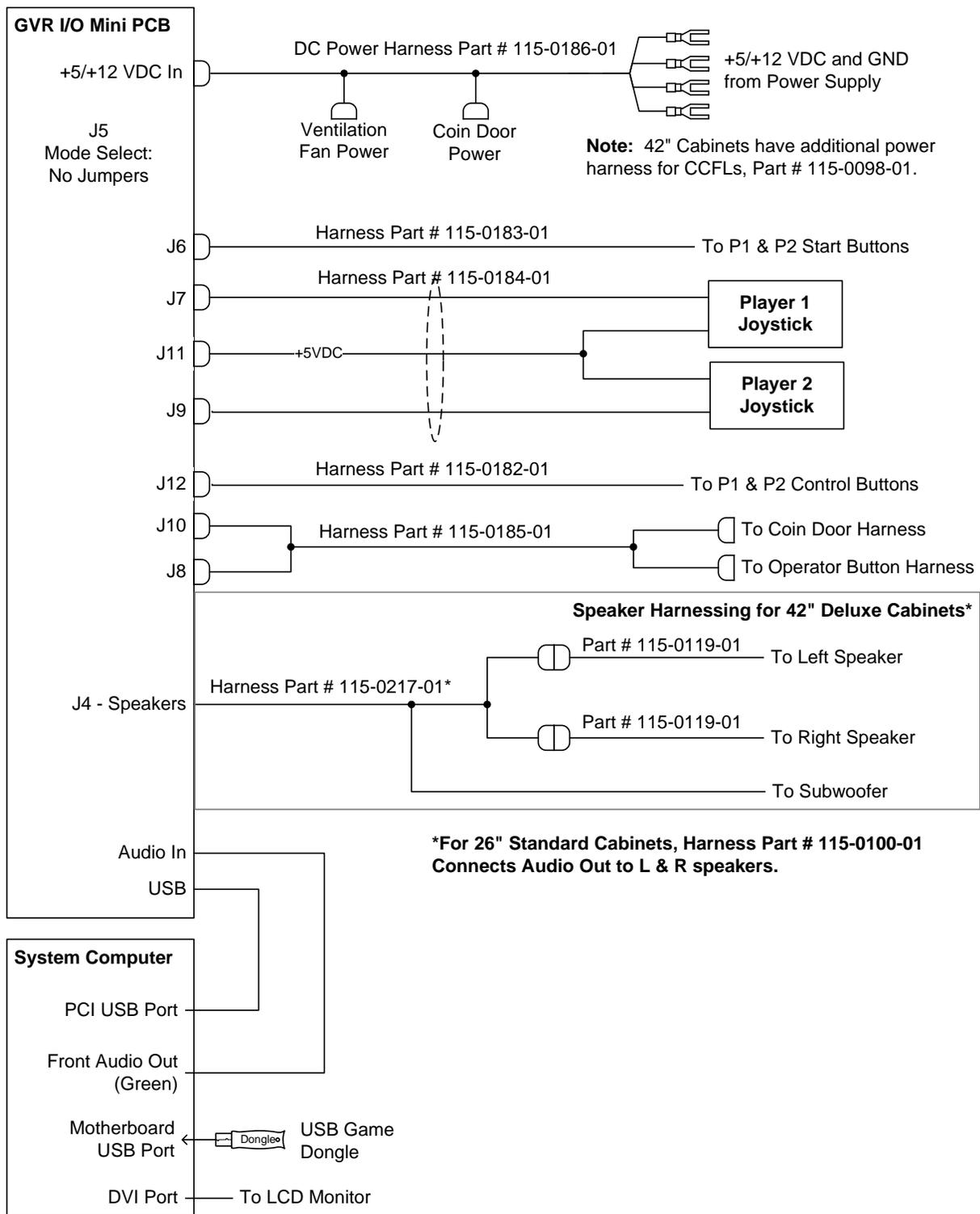


Figure 17. Simplified Wiring Diagram

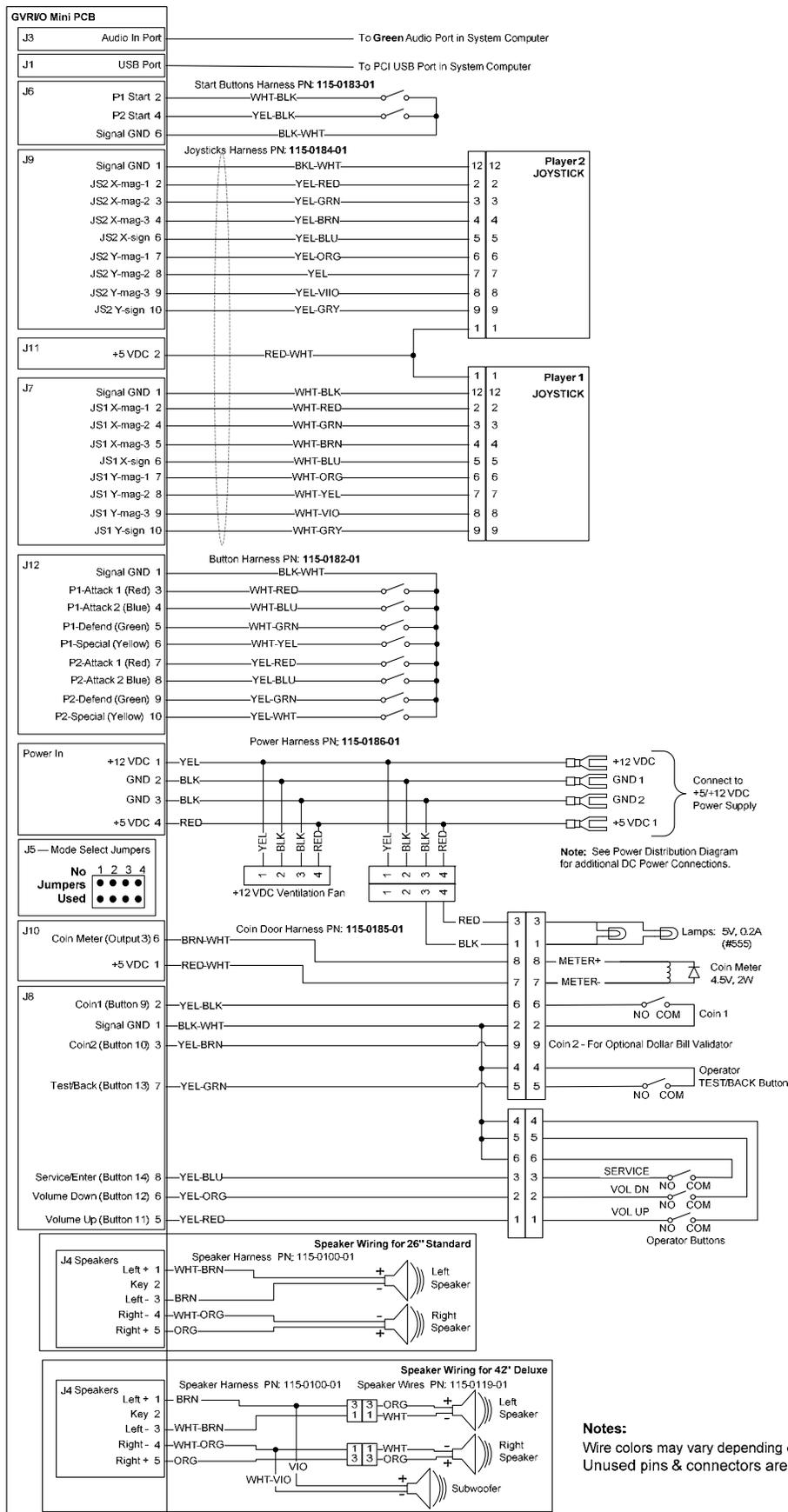


Figure 18. Detailed Wiring Diagram

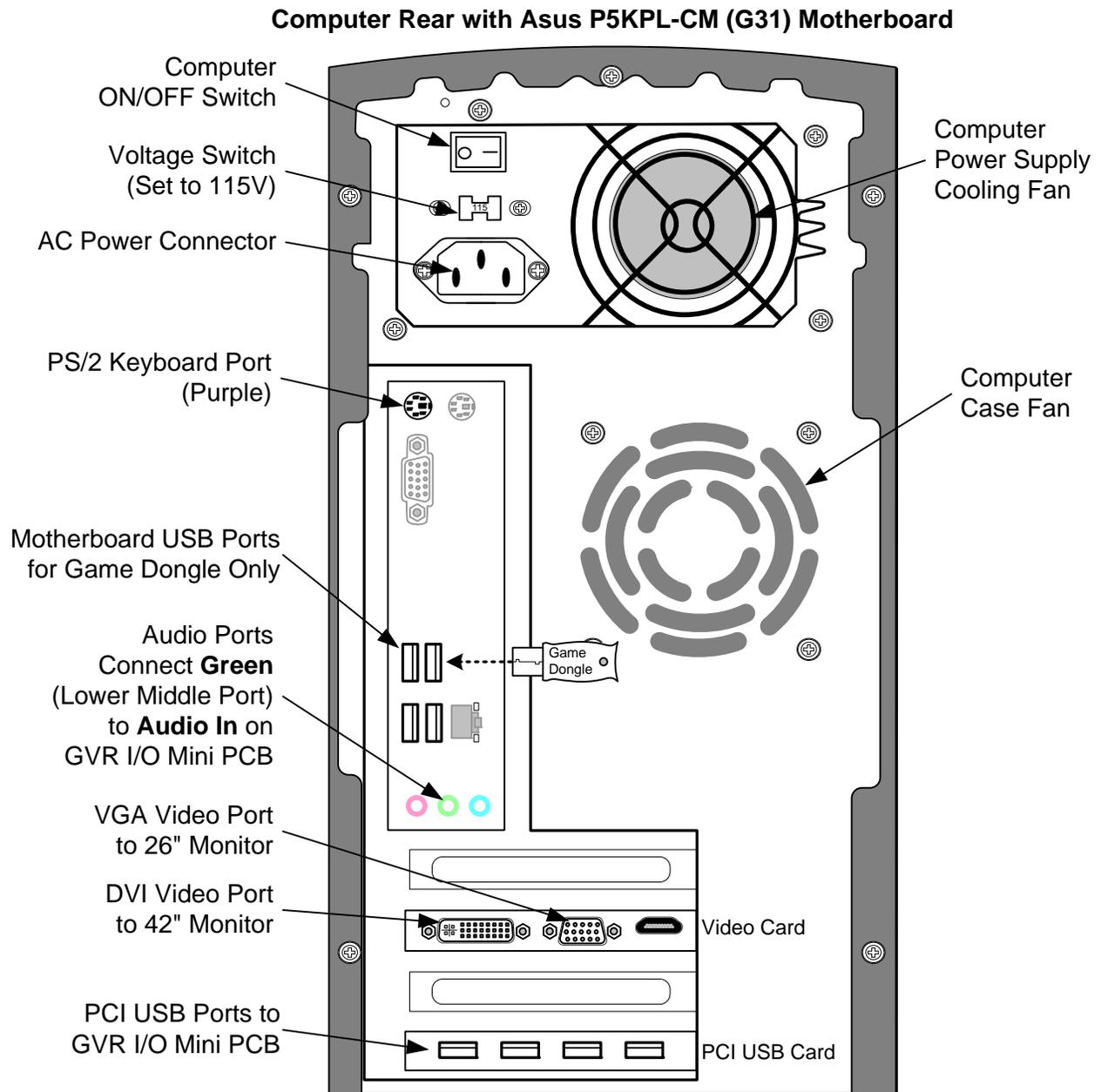


Figure 19. Computer Rear Panel Diagram

Warranty Service

If you should require warranty service, please contact your authorized GLOBAL VR distributor.

LIMITED WARRANTY

LIMITED WARRANTY FOR JUSTICE LEAGUE: HEROES UNITED (North America Only)

All software and accompanying documentation furnished with, or as part of the Product, is supplied "AS IS" with no warranty of any kind except where expressly provided otherwise in any documentation or license agreement furnished with the Product.

During the warranty period, GLOBAL VR® will, at no charge, repair the Product, provided:

- Purchaser believes that the Product is defective in material or workmanship and promptly notifies GLOBAL VR® in writing with an explanation of the claim;
- All claims for warranty service are made within the warranty period;
- Products are returned adequately packed and freight prepaid to GLOBAL VR®'s designated service center;
- GLOBAL VR®'s inspection or test of the Product verifies to GLOBAL VR®'s satisfaction that the alleged defect(s) existed and were not caused by accident, misuse, neglect, unauthorized or attempted repair or testing, unauthorized modification, incorrect installation, vandalism, failure to follow the maintenance schedule or procedures; or operation in out-of-specification environmental conditions.

GLOBAL VR® will return the repaired Product freight prepaid to the Purchaser. All freight costs associated with replacement of warranty parts after expiration of the original warranty period are the responsibility of the Purchaser. GLOBAL VR® is not obligated to provide the Purchaser with a substitute unit or on-site service during the warranty period or at any time. If after investigation GLOBAL VR® determines that the reported problem was not covered by the warranty, Purchaser shall pay GLOBAL VR® for the cost of investigating the problem at its then prevailing per incident billing rate. No repair or replacement of any Product or part therein shall extend the warranty period as to the entire Product. The warranty on the repaired part shall be in effect for the remainder of the original warranty period, but will not exceed the original warranty period.

Purchaser's exclusive remedy and GLOBAL VR®'s sole obligation is to supply or pay for all labor necessary to repair any Product found to be defective within the warranty period and to supply, at no extra charge, new or rebuilt replacements for defective parts. If repair or replacement fails to remedy the defect, then, and only in such event, shall GLOBAL VR® refund to Purchaser the purchase price for said Product. Purchaser's failure to make a claim as provided above or continued use of the Product shall constitute an unqualified acceptance of said Product and a waiver by Purchaser of all claims thereto.

IN NO EVENT SHALL GLOBAL VR® BE LIABLE FOR LOSS OF PROFITS, LOSS OF USE, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM OPERATION OF THE GAME IN ANY CONDITION. GLOBAL VR® SHALL NOT BE RESPONSIBLE FOR THE SUITABILITY, PERFORMANCE, OR SAFETY OF ANY NON- GLOBAL VR® PART OR ANY MODIFICATION PERFORMED BY ANY PRODUCT DISTRIBUTOR UNLESS SUCH WORK IS EXPRESSLY AUTHORIZED IN ADVANCE BY GLOBAL VR®.

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Technical Support

Service & Parts

Hours: 7:00AM–5:00PM Pacific Time, Monday–Friday

Phone: 408.597.3435

Fax: 408.597.3437

E-mail: techsupport@globalvr.com

Website: <http://service.globalvr.com>

Extended Service Hours: Monday–Friday 5pm—Midnight
Saturday & Sunday 7:00am—Midnight Pacific Time

Free telephone, e-mail, and online support are provided for systems during the warranty period. GLOBAL VR Technical Support can help you troubleshoot problems and diagnose defective parts. We can also answer questions about the operation of your game.

When you contact Technical Support, please provide the information listed below to assist the Technical Support representative in solving your problem quickly. For your convenience, space is provided to write important numbers.

- Cabinet Serial Number: _____
- Cabinet Type (from Operator Menu): _____
- Game Version (from Operator Menu): _____
- OS Version (from Operator Menu): _____
- I/O Board Version (from Operator Menu): _____
- Your mailing address and telephone number.
- A summary of the question or a detailed description of the problem with your cabinet.

The additional information listed below, as applicable, may assist Technical Support in solving your problem quickly.

- Specific error message
- Any changes made to the system
- Date of latest software install or upgrade
- For game-play issues, the game mode and number of players

To comment on this manual, please e-mail: techpubs@globalvr.com