



## ***Need for Speed™ Carbon***

### **Service & Repair Manual for Dedicated Cabinets (Standard & Deluxe)**

040-0182-01 Rev. A

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



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## Preface

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### 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. 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.

### Warnings



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

If the 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!

## Chapter 1 — General Information

### Current Requirements (Approximate)

| Voltage        | Deluxe Cabinet |           | Standard Cabinet |           |
|----------------|----------------|-----------|------------------|-----------|
|                | Inrush         | Operating | Inrush           | Operating |
| <b>115 VAC</b> | 8 Amps         | 5 Amps    | 6.5 Amps         | 4 Amps    |
| <b>230 VAC</b> | 4 Amps         | 3 Amps    | 3.5 Amps         | 2 Amps    |

### Maintenance Restart Feature

To keep the software running optimally, the cabinet will restart itself every 24 hours. The automatic restart will not occur if the operator turns the cabinet off every day. The maintenance restart occurs 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 (not played) for at least 15 minutes, **then** the following screen 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 3 minutes.

3. After the cabinet completes the Restart, the next 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.

**Hint:** To force the restart to happen at a certain time (such as after closing time), power cycle the cabinet at that time. The next restart will be scheduled for 24 hours later.

To see how much time is left before the next maintenance restart, check the **Machine Settings: Info** screen in the Operator Menu (see your Operation Manual for detailed information on using the Operator Menus). This screen also tells you how much time has passed since the last power cycle and the last maintenance restart.

## 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.

For a Game Dongle to be recognized correctly, it should be connected before the cabinet is powered ON. If the software does not recognize the Game Dongle, the **Dongle Missing or Invalid** screen will appear. Make sure the Dongle is connected properly, and then power cycle the cabinet.

**Note:** The dongle supplied with the cabinet is specific to the game software version. Future software upgrades may require a new dongle. If the dongle does not match the software, the **Dongle Missing or Invalid** screen will appear.

**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 1. USB Game Dongle

## Using the Diagnostics Screens in the Operator Menu

For detailed information about using the Operator Menu, please see your Operation Manual.

Press the Operator **TEST/BACK** button to open the Operator Menu. Use the **VIEW** and **⌂** buttons to select **Diagnostics** from the main menu, and then to select a specific diagnostics screen from the submenu. These screens help you test and adjust the cabinet hardware. The Play Control Test Menu is described in detail below.

### The Diagnostics: Play Control Test Menu

Select **Controls** from the Operator Diagnostics Menu to open the Play Control Test menu.

The Play Control Test menu, shown in Figure 2, lets you test driving controls, operator buttons, and coin mechs. If you see a **⊗** symbol displayed over a pedal or the wheel, it was not detected by the software and may be disconnected. Try turning the wheel full left and right, or pressing the pedal full down and releasing. If the device is still not detected, refer to *Control Troubleshooting* on page 47.

To exit from the Play Control Test menu, press the **START** and **VIEW** buttons together.



Figure 2. Play Control Test Menu

- **Buttons:** When you press a control panel or Operator button, its picture should highlight on the screen. The dot next to each button should be yellow until the button is pressed, and stay green after it is pressed. A red dot means the button is stuck in the ON position.
- **Steering Wheel:** When you turn the steering wheel, the graphic should rotate, and the number next to the graphic should change to indicate the steering wheel position. Full left position should be about -127 and full right position should be about 127. As you turn the wheel, the changing numbers should be smooth and linear. A sudden jump in the number, or a different range of numbers, can indicate a bad pot or a loose steering column set screw. The dot under the number should change from yellow to green when you turn the wheel.
- **Gas & Brake Pedal:** The numbers displayed next to the pedals show the pot value when the pedal is full up, full down, and the current value. When you step on the pedals, the number shown for the current position should change. The difference between the full up and full down values should be about 80 ( $\pm 5$ ). As you press and release the pedals, the changing numbers should be smooth and linear. A sudden jump in the numbers can indicate a bad pot or a loose set screw on the pedal assembly. The dot above the pedal should change from yellow to green when you press the pedal.
- **Calibrating the Steering and Pedals:** To calibrate the steering wheel and pedals, press the **START** and **MUSIC** buttons together to reset the pots to 0. A **⊗** symbol will appear over the pictures of the pedals and wheel. Turn the steering wheel all the way to the left and the right to set the pot limits. Press each pedal all the way down to set the pot limits.
- **Shifter:** When you shift through the gears, the shifter in the graphic should move to the correct position. The dot above each shifter position should change from yellow to green when you move the shifter into that position, and then remain green.
- **Coin Mechs:** When you activate a coin mech, its name (Coin 1 or Coin 2) should turn from white to green, and the number should increment to indicate the number of credits inserted. If the name of the mech stays green, this indicates the coin switch is stuck in the ON position. (**Note:** Typically, Coin 1 is both coin mechs, and Coin 2 is the optional bill validator.)
- **START Button and Leader Light:** The **START** button (and Leader Light on Standard Cabinets) should blink while the **Play Control Test** menu is open. If either one fails to blink, check the bulb and wiring.



## Chapter 2 — Linking Cabinets

### Linking Cabinets

You can link up to four cabinets for head-to-head competition. Once the cabinets are linked in hardware and software, the Attract Movies will synchronize, and players can choose to play individually or race against other players. Motion and Non-Motion Cabinets can be linked together if desired.

All Need for Speed™ cabinets ship with a CAT-5 (8-wire) Ethernet cable and cross-over coupler. The cross-over coupler is used to link two cabinets. To link three or four cabinets, connect the Ethernet cable from each cabinet to a 10/100/1000 Mbps Ethernet hub or switch (not included).

**Important:** Some older Need for Speed™ systems shipped with couplers that were not CAT-5 compliant. Be sure to use the coupler that came with your dedicated cabinet.



Figure 3. Linking Cabinets

Follow the steps below to link your cabinets:

1. **Before connecting the Ethernet cables** open the Operator Menu **Machine Settings: Settings** menu on each cabinet and set the Link ID number. Cabinets should be numbered in sequence from left to right, and each cabinet must have a unique number: 1, 2, 3, or 4. Exit from the Operator Menu to reset the number in the software.

**Important:** All linked cabinets must run the same **Software Comm Version**, displayed in the Operator Menu **Machine Info** screen.

2. **To link two cabinets:** Connect an Ethernet cable to the Ethernet port on the power plate of each cabinet. Connect the two cables together with a CAT-5 crossover coupler.
3. **To link three or four cabinets:** Connect an Ethernet cable from the Ethernet port on the power plate of each cabinet to an Ethernet hub or switch (not included) that supports 10/100/1000 Mbps connection speed. Connect the Hub or Switch to AC power.  
**DO NOT use a crossover coupler with a hub or switch.**



## Linking Errors

Each cabinet must have a unique Cabinet Link ID number. If the software detects a duplicate Link ID number, the *Select A Link ID* screen, shown below, will automatically appear and prompt you to change the number. Numbers shown in a gray cabinet image are available. Turn the wheel to select a number and then press the **START** button.



## Cabinet Mismatch Errors

Make sure the Game Settings and Coin Settings are the same for all linked cabinets. You will have unhappy customers if a setting such as *Winner Gets Free Game* is enabled on some cabinets and disabled on others. If the settings listed below are mismatched on linked cabinets, a Blue Dot will appear in the Attract Mode, and you will see an explanation of the problem in the **Machine Settings: Errors** screen.

- Software Comm Version
- Winner gets Free Game
- Free Game Min Players
- Disabled Tracks

## Chapter 3 — Software Restoration

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**Carbon Dedicated Cabinets** are shipped with a DVD-ROM drive installed in the system computer. The software consists of a System Recovery Disk (SRD) on a CD, and a Game Install Disk on a DVD.

**Note:** Upgrade cabinets have a CD-ROM drive and require a set of five Game Install Disks on CD. The CDs can also be used on dedicated cabinets if the DVD is not available. Motion Cabinets require running the Motion Driver Install Disk after the System Recovery Disk.

**Important:** When you run the System Recovery Disk, you will erase all game settings and audits. Open the Operator Menu and write down anything that you want to remember.

**Total software installation time is typically about 20 minutes with a Game Install DVD.** (If using the five Game Install CDs, the installation time is 30-45 minutes. See the document *Need for Speed™ Carbon Software Restore Guide With Game Install Disks on CD-ROMs*, part number: 040-0186-01.)

**Important:** **DO NOT RUN Software Version 1.0 on Dedicated Cabinets, and DO NOT RUN Software Version 1.1 on Upgrade Cabinets.**

### Run the System Recovery CD

1. Insert the System Recovery Disk in the DVD-ROM drive and power the cabinet OFF and then ON. When the computer reboots, the CD should run automatically (wait about 30 seconds). You will see messages onscreen as files are copied to the hard drive.

**Important:** The computer will eject the disk before it finishes the process. **Do not reboot** until the "System recovery successfully completed" screen appears.

2. After about 4—5 minutes, you will be prompted to remove the CD and reboot the computer. Do not insert the Game Install Disk yet! Wait for about 5 minutes while the software finishes the installation. (You may see a static screen with the GLOBAL VR logo for up to 90 seconds.) When the Operating System installation is complete, you will be prompted to insert Game Disk 1. Proceed to Run the Game Install DVD.

## Run the Game Install DVD

**Important:** All linked cabinets must run the same software Comm version displayed in the Machine Info screen of the Operator Menu. (For best results, install the same software version on all linked cabinets.)

1. With the cabinet powered ON, insert the DVD labeled **Game Install Disk 1 of 1**. The DVD will automatically run (wait about 30 seconds). You will see a series of onscreen messages as the software copies components and files to the hard drive. After the software is configured the game will automatically reboot.
2. After about 11 minutes you will be prompted to remove the DVD and press **START**. Keep the disks in a safe place in case you need them in the future.
3. As the game loads, you will be prompted to calibrate the accelerator and brake. Press each pedal firmly to the floor to set the calibration limits. Next, the steering will self-calibrate; Do not touch the wheel while it is calibrating.
4. If the software detects another cabinet with the same Link ID Number, the Select a Link ID screen will appear and prompt you to change the ID. (**Note:** If you install software on linked cabinets simultaneously, the first one finished will automatically be assigned Link ID #1, so you may need to change it in the Operator Menu.)
5. Once the attract movie begins, play one game to finalize hardware calibration and verify proper operation.
6. Press the Operator button and set the sound volume levels, cabinet Link ID Numbers, and any other desired cabinet settings from the Operator Menus.

## Chapter 4 — Service and Repair Procedures

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**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.

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

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**Note:** Procedures in this chapter are the same for Standard and Deluxe cabinets unless noted.

### Access Panels on Cabinet Rear



Use the three access panels on the rear of the cabinet to service internal components. Access Panels are similar on Standard and Deluxe Cabinets.

**Monitor Access Door:** Open to access LCD monitor, monitor power supply, and cooling fan.

**Electronics Access Panel:** Remove four (4) Torx<sup>®</sup> screws to open the panel and access the Audio Amp PCB, GVRI/O Mini PCB, Force-Feedback Steering PCB, and associated DC power supplies.

**Rear Door:** Open to access Computer and AC Power Distribution components.

**Note:** Figure 4 shows a Deluxe Cabinet. Access Panels are in the same places on a Standard Cabinet.

*Figure 4. Cabinet Access Panels*

## Removing the Control Panel

Do the following to remove the control panel from the front of the cabinet to replace the NOS buttons or control panel lighting, or service the steering assembly.

**Note:** You do **not** need to remove any of the screws that go through the plastic dash housing to remove the control panel assembly from the cabinet.

1. Disconnect the cabinet from AC power.
2. To protect the steering pot, remove the Electronics Access Panel and reach through to disconnect the steering pot harness. This removes the risk of breaking the pot if the pot harness is pulled.
3. Remove the three (3) screws above and three (3) screws below the control panel that secure the metal control panel mounting bracket to the cabinet wood.
4. Grip the Steering Wheel and use it to carefully pull the control panel assembly straight out from the cabinet. Be careful not to pull the wires. The wire harnesses should be long enough for you to place the assembly in your lap as you sit in the driver's seat.
5. Disconnect the harness connectors from the steering motor and button harness.
6. Reverse these steps to re-install the control panel assembly.

## Disassembling the Control Panel

To replace the NOS buttons or CCFL tubes, you will need to disassemble the control panel. See page 57 for an exploded-view of the steering wheel assembly.

1. Remove the control panel from the cabinet as described in the previous section.
2. Remove the six (6) T-15 Torx bolts from the center of the steering wheel and remove the cap.
3. Remove the three (3) Socket-head screws from the center of the steering wheel.
4. Remove the 3/4" nut from the center shaft of the steering wheel and remove the wheel
5. Remove the screws that secure the plastic dash housing in place. Carefully remove the housing being careful not to pull the NOS button wires.
6. Reverse these steps to reassemble the control panel. Be sure to securely tighten the nut and socket head screws in the steering wheel.

## Force-Feedback Steering System Service

The major components of the force-feedback steering system are listed below. Figure 5 shows the harness connections. See Figure 26 on page 57 for an exploded-view drawing of the steering wheel and motor assembly, showing the parts in detail.

- Steering Wheel
- Steering Motor
- Force-Feedback PCB (part #: 990-0040-01)
- +24 VDC Power Supply
- 5 K $\Omega$  Steering Pot (Potentiometer)

The Force-Feedback PCB manages communications between the 5 K $\Omega$  steering pot and the computer (via a USB connection). The steering pot sends the computer the steering wheel

position as the player drives, and the computer sends back instructions for controlling the steering motor by regulating the power. The force-feedback steering motor is powered by the +24 VDC power supply via the Force-Feedback PCB.

**Note:** The dual-PCB Force-Feedback system used on older Need for Speed cabinets may be used as a replacement part. For more information, see Service Bulletin SB-023, available at <http://service.globalvr.com>.



**CAUTION:** Do not connect the power supply directly to the steering motor. Doing this will damage the motor and the power supply.

A faulty cable or steering-system component can cause steering problems. Refer to *Control Troubleshooting* on page 47 for help with diagnosing steering problems.

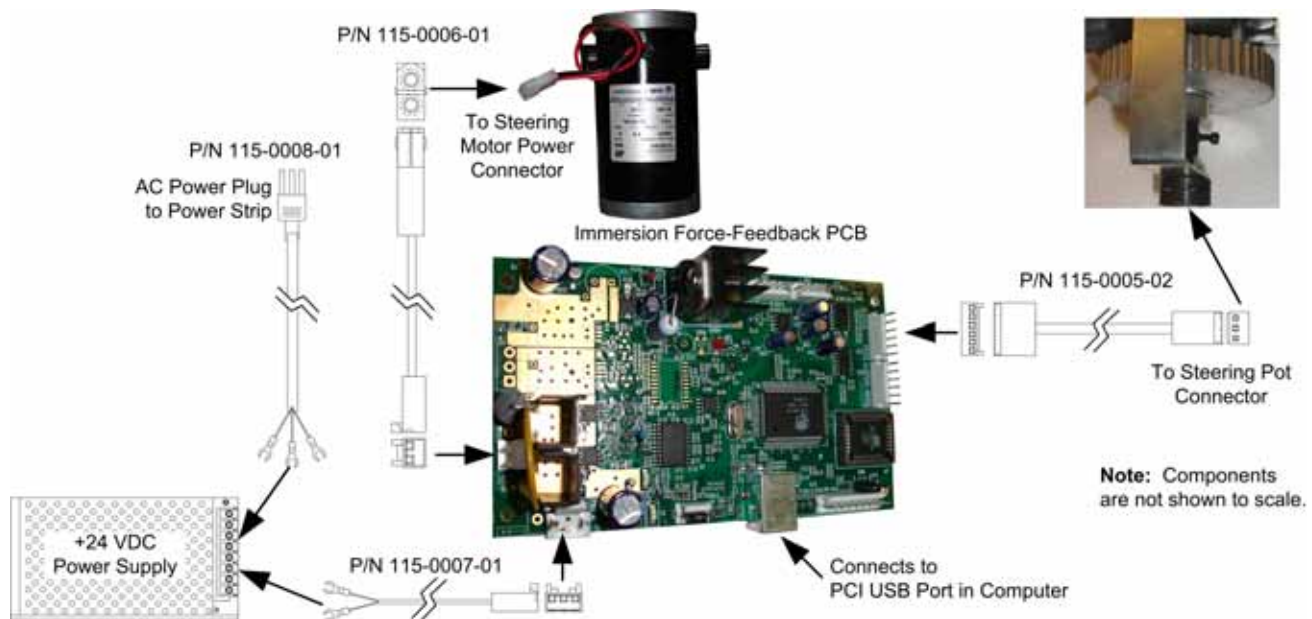


Figure 5. Force-Feedback Steering System Harnessing Diagram

## 5 K $\Omega$ Steering Pot (Potentiometer) Replacement

To test a pot, use the **Diagnostics: Play Control Test** screen in the Operator Menu (see page 6). While turning the wheel, the change in the numbers displayed onscreen above the steering wheel picture should be smooth and linear, with no jumps. You can also power off the game and test resistance at the pot. While turning the wheel, you should see a steady linear increase or decrease in resistance, with no jumps. Jumps could indicate a bad pot or a loose steering column set screw. Use Loctite<sup>®</sup> on the set screw to ensure it is secure.

To replace a pot, refer to Figure 6 and perform the following steps:

1. Remove the control panel assembly as described on page 13 and take it to a workbench.
2. Using a 7/64 Allan wrench, loosen the set screw from the steering column and remove the bracket with the 5 K $\Omega$  steering pot attached.
3. Using a 1/2-inch wrench, remove the nut and lock washer from the bracket and remove the pot.
4. Reverse these steps to install the new pot. Install the pot with the plastic pin through the small hole in the bracket, as shown in Figure 6. Use Loctite to ensure the set screw is secure.

5. Calibrate the steering from the Play Control Test in the Operator Menu after replacing the pot (see page 16).

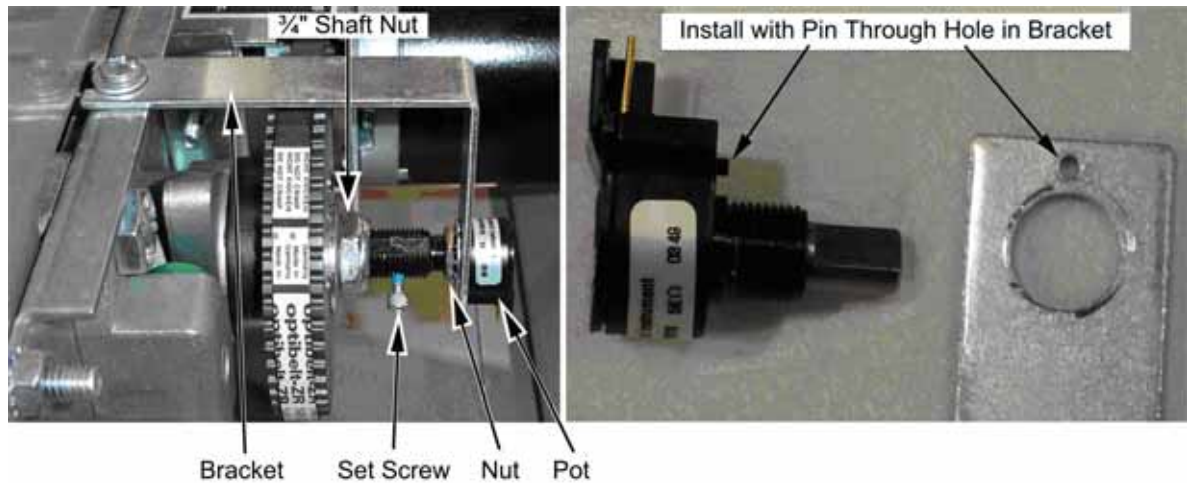


Figure 6. Replacing the 5 K $\Omega$  Steering Pot

### Force-Feedback Belt or Steering Motor Replacement

It is a good practice to inspect the steering belt and gears periodically. Always replace a belt that looks stretched, cracked, or worn. Replace a gear that looks worn.

Refer to Figure 6 above, and Figure 7, and perform the following steps to remove the force-feedback belt for repair.

1. Remove the control panel assembly as described on page 13 and take it to a workbench.
2. Using a 7/64 Allan wrench, loosen the set screw from the steering column and remove the bracket with the pot attached (see Figure 6).
3. Loosen the four (4) 3/8" motor mount Kep nuts that secure the steering motor to the frame (see Figure 7).
4. Using a 10mm socket wrench, loosen the belt tension adjustment bolt several turns until you can slip the belt off of the motor and steering gears (see Figure 7).
5. Inspect the motor gear (the small gear) for wear. A worn gear can quickly wear out a belt. Make sure the two gears are aligned to prevent stress on the belt. Use Loctite on the set screws to ensure they are secure.
6. To replace the motor, remove the four (4) 3/8" Kep nuts that you loosened in step 2, and remove the motor.
7. Reverse these steps to re-install the motor and belt. Adjust the belt tension as described below.

### Force-Feedback Belt Tension Adjustment

The belt tension should be adjusted on a new cabinet after one month of initial operation. After that it should be adjusted every 60—90 days for optimal performance. Inspect the gears for wear at the same time. A worn motor gear can wear out a belt.

1. Tighten the tension adjustment bolt on the motor assembly, shown in Figure 7, until the belt is fully stretched, and then loosen the bolt by 1/2 turn.
2. Calibrate the steering from the Operator Menu after servicing the belt or motor (see page 16).



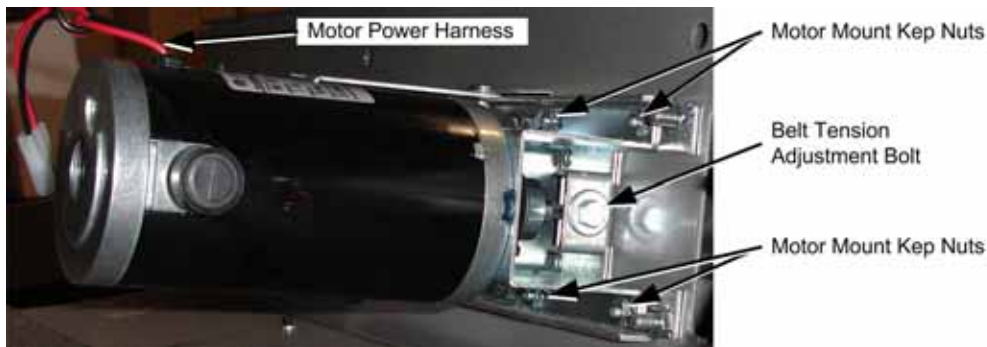


Figure 7. Servicing the Steering Motor

## Force-Feedback PCB Replacement



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

If the steering pulls to one side, this could indicate a bad force-feedback PCB or reversed wires between the steering pot and the PCB. Use the following steps to replace the PCB.

1. Disconnect the cabinet from AC power.
2. Remove the electronics access panel (see page 12).
3. Disconnect all cables from the PCB.
4. Remove the four screws that secure the PCB to the mounting feet.
5. Reverse these steps to install the new PCB. Make sure there is some clearance between the PCB components and the cabinet wall to allow air to circulate around the components.
6. Calibrate the steering as described below.

## Calibrating the Steering and Pedals

Do the following to calibrate the steering wheel and pedals:

1. Open the **Play Control Test** screen in the Operator Menu.
2. Press the **START** and **J** buttons together to reset the pots to 0. A **⊗** symbol will appear over the pictures of the pedals and wheel.
3. Turn the steering wheel all the way to the left and the right to set the pot limits.
4. Press each pedal all the way down to set the pot limits.

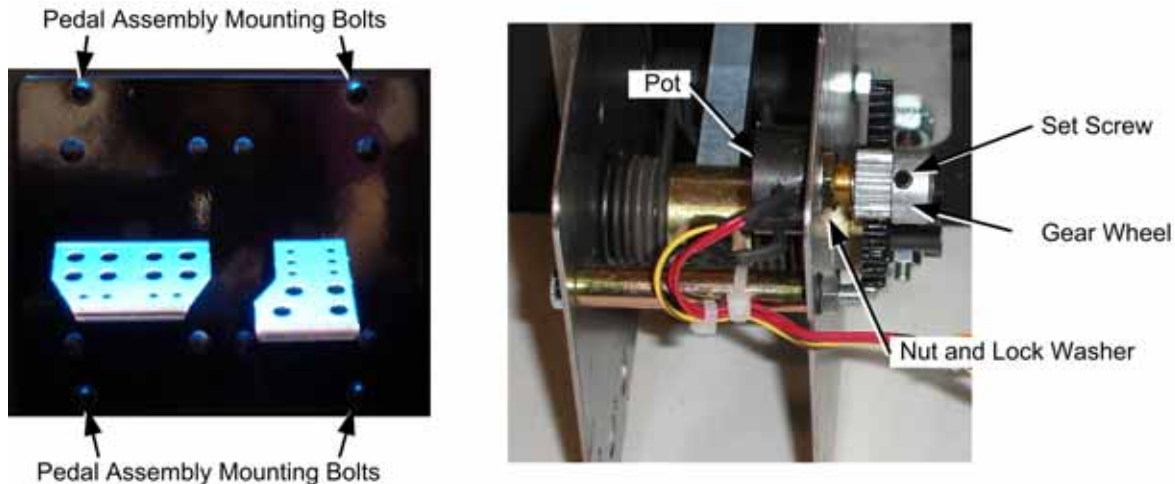
## Pedal Assembly Service

Perform the following steps to remove the pedal assembly. It is removed and installed as one unit. See Figure 26 on page 57 for an exploded view of the assembly with parts list.

1. Disconnect the cabinet AC power cord and remove the rear door from the cabinet.
2. Remove the four (4) 1/4-20 Security Torx bolts that secure the pedal assembly to the cabinet, as shown by the arrows in the first part of Figure 8.
3. Carefully pull the pedal assembly straight out of the cabinet, being careful not to pull the wires, enough to disconnect the wires.

4. Disconnect the pedal harness from the main harness.
5. Disconnect the ground wire from the pedal assembly frame.
6. Reverse these steps to reinstall the pedal assembly.
7. After servicing, calibrate the pedals from **Diagnostics: Play Control Test** in the Operator Menu (see page 16).

**Important:** Be sure to replace the ground wire. It is needed to ensure proper pedal function.



*Figure 8. Pedal Assembly Details*

## 5 K $\Omega$ Gas and Brake Pot (Potentiometer) Replacement

To test a pot, use the **Diagnostics: Play Control Test** screen in the Operator Menu. When you press and release the pedals, you should see a steady increase or decrease in the numbers displayed onscreen near the pedals, with no jumps.

You can also power off the game and test resistance at the pot. When you press and release the pedals, you should see a steady linear increase or decrease in resistance, with no jumps.

To replace a pot, refer to Figure 8 and perform the following steps:

1. Remove the pedals from the cabinet as described in the previous section.
2. Using a 7/64 Allen wrench, loosen the set screw from the gear wheel and remove the gear wheel, as shown in Figure 8.
3. Using a 1/2" wrench, remove the nut and lock washer that secure the pot to the frame.
4. Install the new pot with the same orientation. Make sure that the plastic keys on the pot match with the metal.
5. Re-install the lock washer and nut, being careful not to over-tighten.
6. Re-install the gear wheel and tighten the set screw. Use Loctite to ensure the set screw is secure.
7. Calibrate the pedals from **Diagnostics: Play Control Test** in the Operator Menu after replacing the pot (see page 16).

## Floor NOS Pedal Service

Refer to Figure 9 and perform the following steps to disassemble the NOS pedal and replace the micro switch:

**Note:** Figure 9 shows the NOS Pedal Assembly without wires to better show components.

1. Remove the three (3) Torx screws that secure the NOS Pedal mounting bracket to the floor.
2. Disconnect the harness connector and remove the assembly to a workbench.
3. Remove the two (2) Phillips screws and one (1) Hex screw that secure the pedal to the mounting bracket.
4. Remove the two (2) pivot screws from the sides of the pedal and lift the top off. (See ① below.)
5. Push the plastic tab as indicated by the arrow on the switch plate, and pop the switch plate out of the assembly. (See ② below.) ③ ④
6. Disconnect the wires from the micro switch and connect them to the same connectors on the replacement switch (micro switch connections are the same as shown in Figure 10).
7. Place the micro switch on the pins on the switch plate. Align it with the pins in the base and snap the plate into place. (See ③ & ④ below.)
8. Make sure the switch actuator and spring are positioned properly and replace the top. Reverse the removal steps to secure the pivot screws and re-install the pedal in the cabinet.

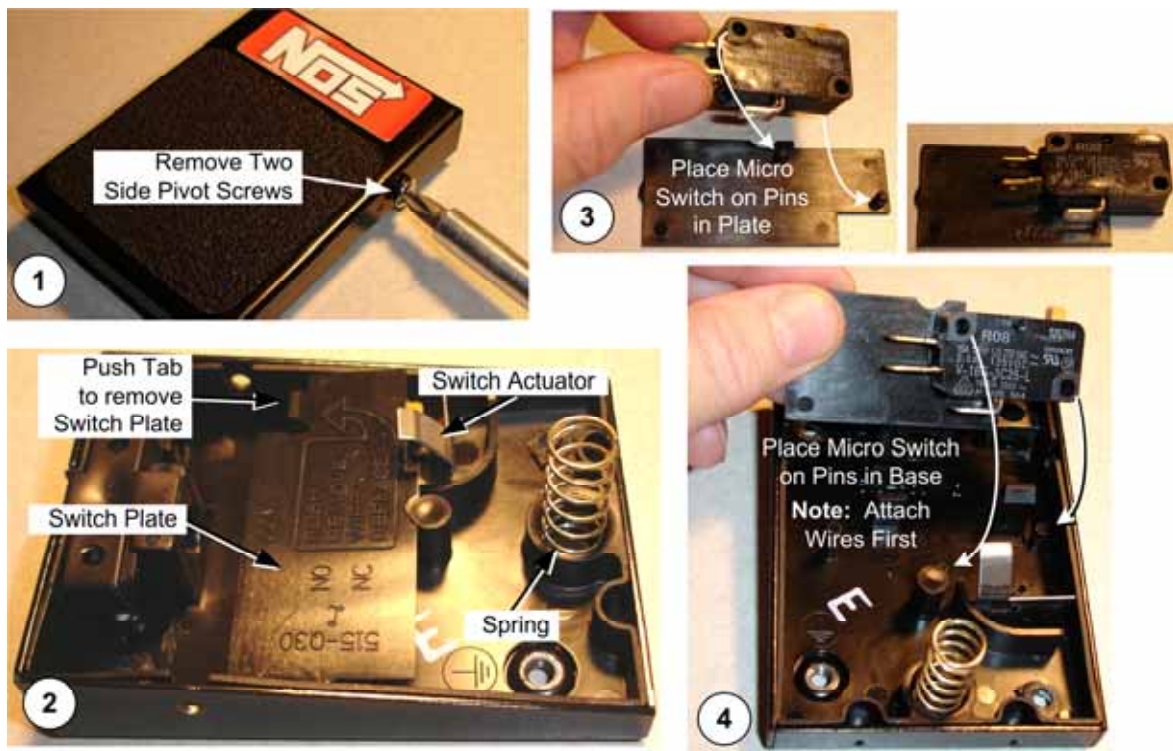


Figure 9. NOS Pedal Service

## Driving Control Panel Button Service

Refer to Figure 10 and perform the following steps to replace a button, bulb, or micro switch:

1. Disconnect the cabinet from AC power.
2. For all except the NOS buttons, remove the four (4) screws that secure the button mounting plate to the cabinet. Remove the plate with the buttons attached, being careful not to pull the wires.
3. For the NOS buttons, remove and disassemble the control panel as described on page 13 to access the buttons.
4. Refer to the figure below to replace button components. When connecting the wires to the micro switch and bulb, refer to the labels on the wires and make sure the connections are correct. See Figure 10 for more information.



**CAUTION:** Do not connect the 5-volt lamp power wire to the micro switch. This can damage the GVRI/O Mini PCB.



Figure 10. Replacing Button Components

## Six-Speed Shifter Service

Perform the following steps to remove the shifter from the seat for replacement or repair.

1. Remove the four (4) T-10H Security Torx screws from the top of the shifter assembly and carefully pull the shifter up out of the housing.
2. Disconnect the Molex connector from the shifter.
3. Reverse these steps to re-install the shifter.

**Important:** Make sure no wires are pinched in the shifter housing. Pinched wires can cause incorrect gear readings.

## Shifter Micro Switch Replacement

The shifter uses four miniature micro switches to relay the shifter position to the computer. Figure 11 shows micro switch placement, and which micro switches are actuated for each gear. By using the chart, you can determine which switch may be faulty. For example, if gears 1 and 2 stop working, the problem is probably with the Left micro switch.

The Controls screen in the Operator Menu also displays which micro switches are actuated as you shift through the pattern.



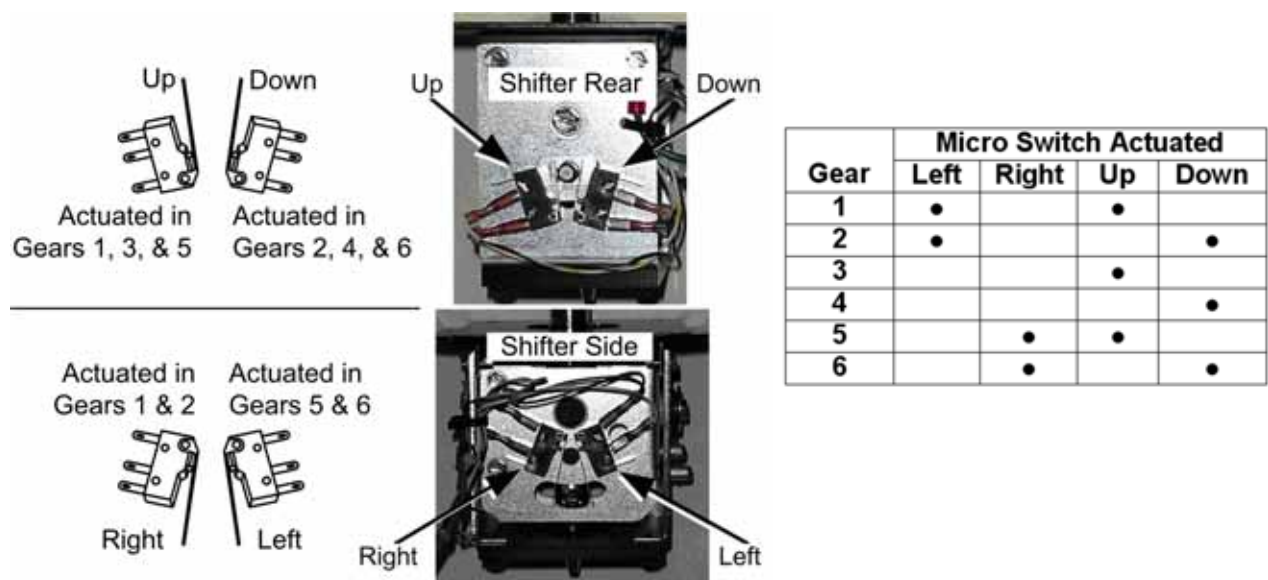


Figure 11. Shifter Micro Switch Actuation

Perform the following steps to replace a micro switch:

1. Remove the shifter assembly from the housing as described on page 19.
2. Disconnect the two wires from the micro switch.
3. Remove the two screws that secure the micro switch to the shifter and remove the switch.
4. Reverse these steps to install the new micro switch.

**Shifter Spring Replacement**

If the shifter does not stay in gear, the spring has probably broken and should be replaced:

1. Remove the shifter assembly from the housing as described on page 19.
2. Make a note of how the components are assembled, and then remove the E-Ring and Screw shown in Figure 12, and remove the spring and flat washers.
3. Reverse the disassembly steps to re-assemble the shifter.

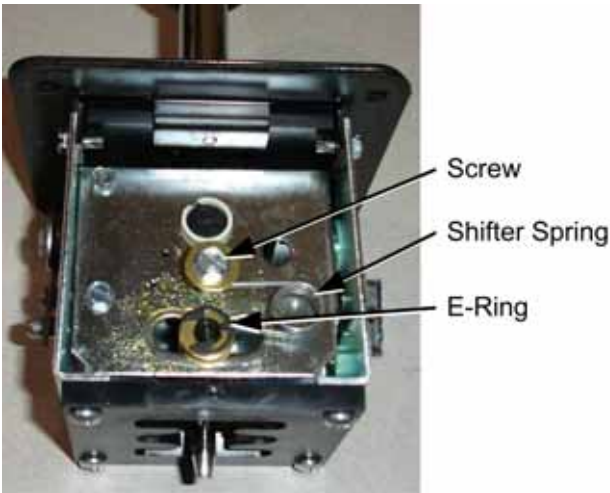


Figure 12. Shifter Spring Replacement

## E-Brake Button Service

1. Remove the four (4) T-10H Security Torx screws from the top of the shifter assembly and carefully pull the shifter up out of the housing to access the E-Brake Button.
2. To replace the button or change the bulb, refer to Figure 10 on page 19. The E-Brake button is assembled the same way as the control panel buttons.

## GVRI/O Mini PCB Service

**Note:** Upgrade cabinets use the Nytric USBI/O PCB instead of the GVRI/O Mini PCB.

Need for Speed™ Carbon requires one of the following GVRI/O Mini PCB firmware versions:

- 037x or higher (current version is 0372)
- 047x or higher (current version is 0470)

To check the firmware version, open the **Machine Settings: Info** screen in the Operator Menu and check the last four digits displayed for **IO Board**. For example, if the screen says "IO Board: GvrIOmini 0x7021 ver 0x0372," the version is 0372.

The GVRI/O MINI PCB relays signals between the system computer and all hardware except for the steering. Each connector on the GVRI/O MINI PCB is keyed to fit only to the correct harness connector. Refer to Figure 13 to locate the connectors on the PCB. See Figure 34 on page 65 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 required on the PCB. Jumpers will be ignored if installed.



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

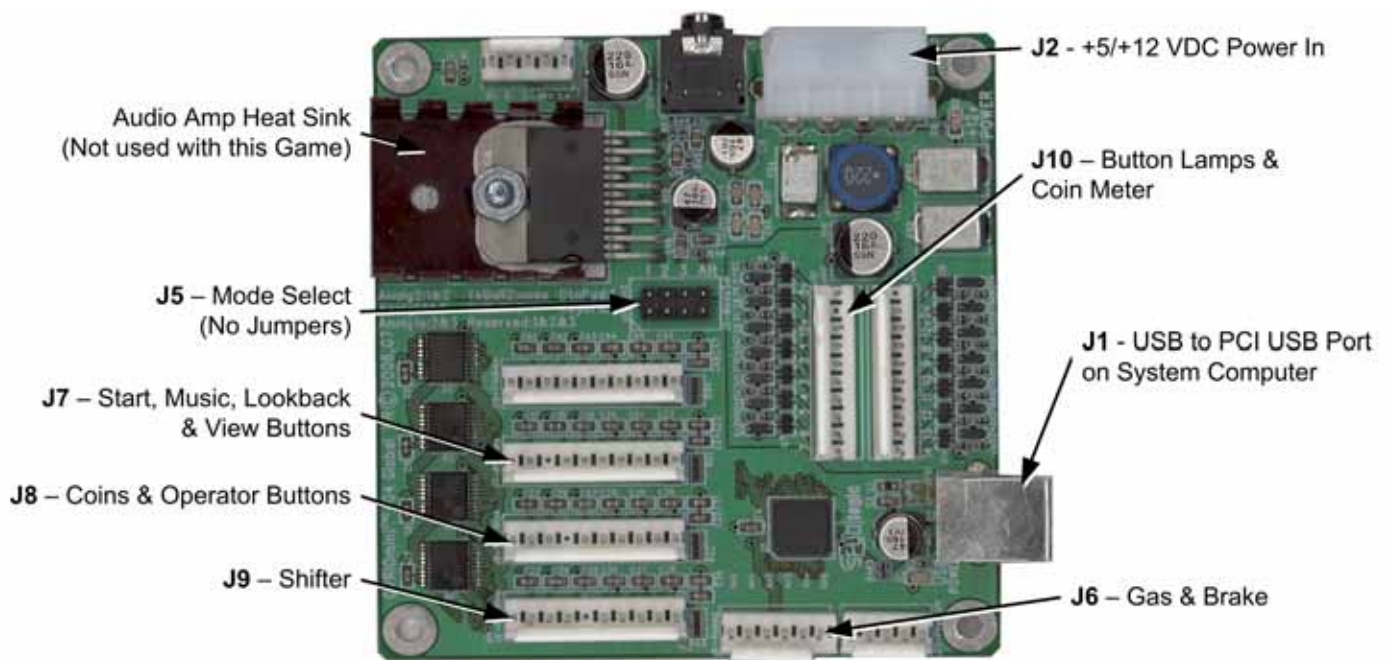


Figure 13. GVRI/O Mini PCB (Version 4)

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

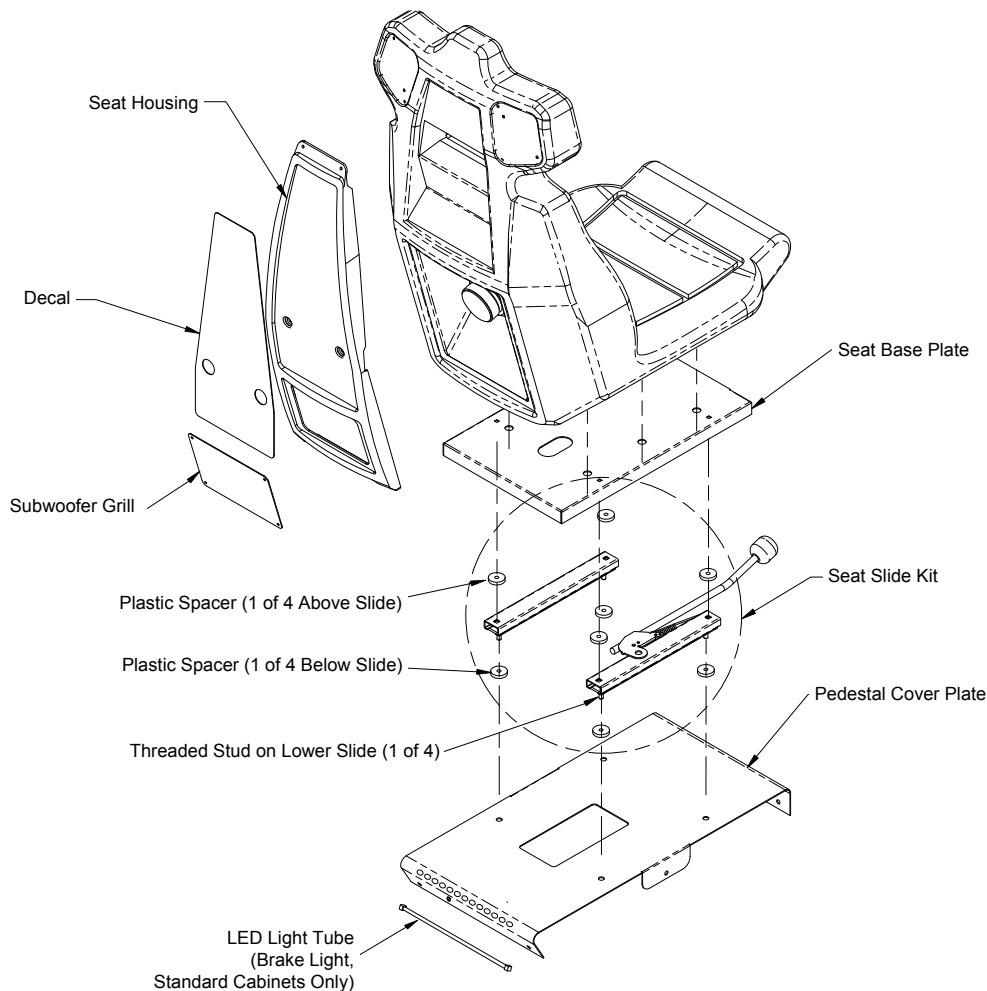


**CAUTION:** To prevent electrostatic discharge (ESD) damage, handle PCBs by the edges only and use a grounding wrist strap or similar precaution.

1. Disconnect the cabinet AC Power Cord.
2. Remove the electronics access panel (see page 12).
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.

## Seat Slide Assembly Replacement

To replace the slide assembly, refer to the figure below and perform the steps that follow.



*Figure 14. Seat Slide Assembly Replacement*

1. Remove the six (6) Torx bolts that secure the pedestal cover plate to the wooden pedestal.
2. Carefully lift the seat assembly and place it on its side. Be careful not to pull the speaker wires that run from the pedestal into the seat. You may need to reach inside the pedestal and snip wire ties to create slack in the wires.



3. Remove the four (4) nuts and flat washers from the bottom of the pedestal cover plate and remove the cover plate, and the four (4) plastic spacers from the seat assembly. Note the placement of each component.
4. Remove the four (4) nuts and flat washers that secure the slide assembly to the seat base plate. Move the lower slides to each side to access all four nuts.

**Note:** When reassembling, be careful to install the four (4) plastic spacers above and below the slide assembly. A missing spacer will cause the seat to wobble and may cause damage. If necessary, flat washers stacked to equal the thickness of the spacer can be used to replace a lost spacer.

5. Reverse these steps to re-assemble the seat. Use the following specs when tightening the nuts to prevent the seat from gradually becoming loose due to motion during gameplay:
  - Seat Base Plate to Slide Assembly: Either replace the 1/4-20 flange nuts with 1/4 Nylock nuts, **or** apply Loctite 242® Threadlocker Blue (or a comparable product) to the threads. Tighten the nuts to 4–6 ft lbs (48–72 in lbs).
  - Pedestal Cover Plate to Slide Assembly: Either replace the 5/16-18 flange nuts with 5/16 Nylock nuts, **or** apply Loctite 242 Threadlocker Blue (or a comparable product) to the threads. Tighten the nuts to 9–12 ft lbs (108–144 in lbs).

**Important:** Loctite can damage plastics. Be careful not to get the Loctite on the plastic seat, and **do not** use Loctite with Nylock nuts.

## Audio Amp and Speakers Service

The Audio Amp supports 6-channel 5.1 Surround Sound. The Audio Amp is powered by the +5/+12 volt DC power supply through a standard PC power connector.

The volume level for each channel on the Audio Amp can be manually adjusted using a small screwdriver to turn the pots, shown in Figure 15. For the subwoofer channel, turn the pot clockwise all the way for maximum volume. For the other channels, turn the pot counterclockwise to turn the volume levels all the way down, and then turn the pot 1/5 of a turn clockwise to bring the volume levels up. Fine-tune the sound levels for your location from this point.

Use the **Diagnostics: Sound Test** screen in the Operator Menu to test the speakers.

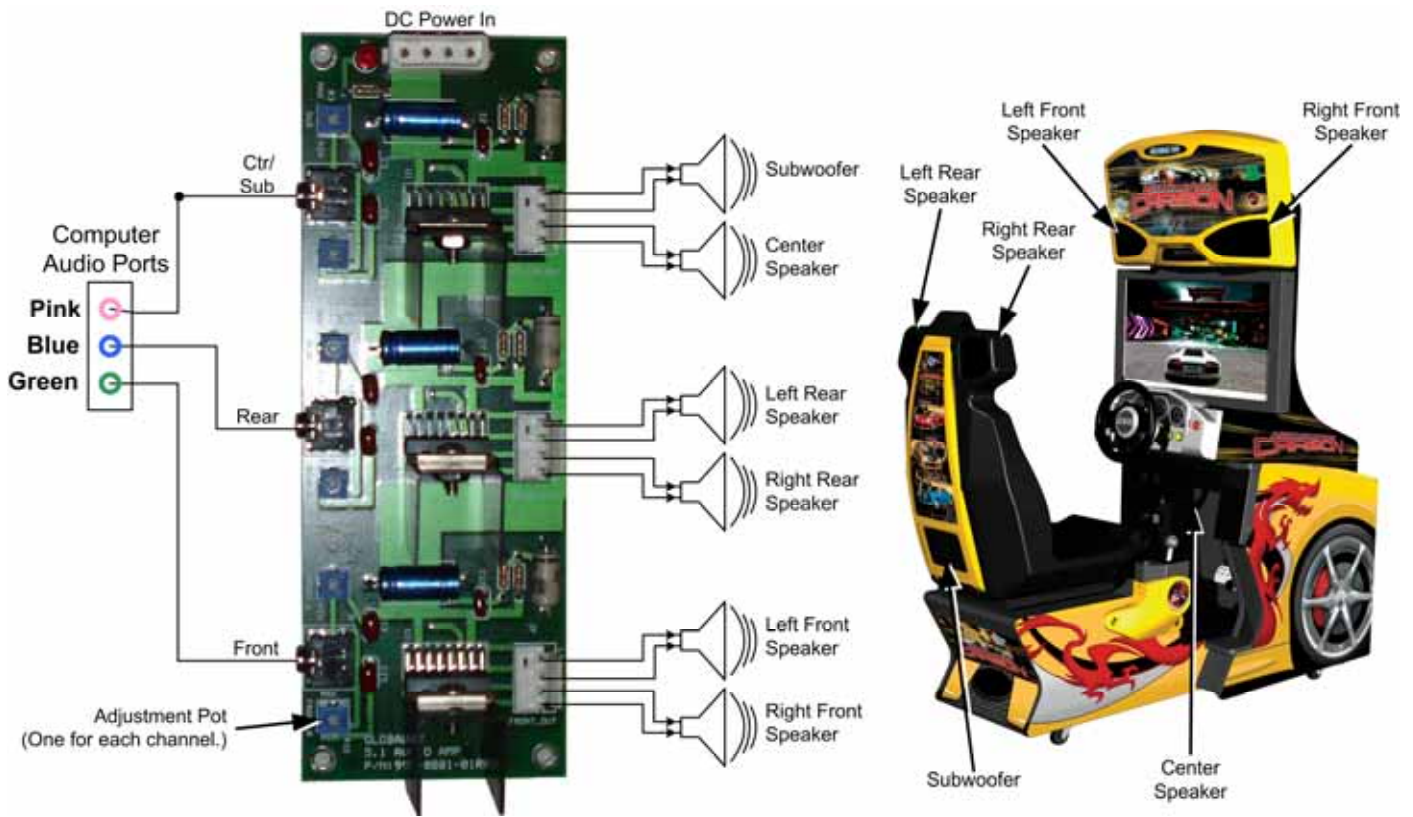


Figure 15. Audio Amp and Speakers

Three 3.5 mm stereo audio cables connect the computer audio ports to the audio amp. Each audio port on the computer is color coded to help identify the channel. See Figure 34 on page 65 for a diagram of the computer audio ports.

- The **green** audio port is for front speakers, left and right.
- The **blue** audio port is for rear speakers, left and right.
- The **pink** audio port is for center channel and bass speaker (subwoofer).

Each speaker is connected to the corresponding speaker output on the audio amp. Figure 15 shows the location of each speaker.

### Audio Amp PCB Replacement



**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 cabinet AC Power Cord.
2. Remove the electronics access panel (see page 12).
3. Disconnect the power harness, speaker wires, and 3.5mm audio cables from the audio amp PCB. Make sure all connectors are labeled to make it easy to reconnect them properly.
4. Use a small Phillips screwdriver to remove the four (4) screws holding the PCB to the mounting feet.

**Note:** Always keep the audio amp PCB inside an ESD anti-static bag when not installed in the cabinet to prevent electrostatic damage.

- Reverse these steps to re-install the audio amp PCB.

### **Front (Marquee) Speaker Replacement (Standard)**

The front speakers are located behind the grills on each side of the marquee. You can remove the grills to inspect the speakers but may need to remove the marquee housing to replace a speaker.

- Remove the eight (8) Torx screws that secure the marquee artwork and clear plastic in place and remove the artwork and plastic.
- Inside the marquee, remove the six (6) screws around the florescent fixture that secure the plastic marquee housing in place, and remove the marquee housing.
- Remove the four (4) screws that secure the speaker to the cabinet.
- Disconnect the wires from the speaker and install them to the same connectors on the new speaker.
- Reverse these steps to install the new speaker.

### **Front (Marquee) Speaker Replacement (Deluxe)**

- You may be able to access the front speakers enough to remove them by removing the speaker grills. Otherwise, remove the plastic marquee housing as described in the next subsection.
- Remove the four (4) screws that secure the speaker to the cabinet.
- Disconnect the wires from the speaker and install them to the same connectors on the new speaker.
- Reverse these steps to install the new speaker.

### **Removing the Marquee Housing (Deluxe)**

- Open the Monitor Access Door on the back of the cabinet and reach through to disconnect the two (2) harnesses to the marquee.
- From the back of the cabinet, remove the four (4) bolts, with washers, that secure the marquee assembly in place.
- Carefully move the marquee assembly (two-person lifting is advised) and take it to a workbench.
- Remove the 15 Torx screws that secure the yellow plastic housing in place, and carefully lift the housing enough to reach inside and disconnect the harnesses from the left and right marker lights. Remove the housing.
- Reverse these steps to re-assemble and re-install the marquee.

### **Center Speaker Replacement**

The center speaker is located near the pedals on the right side wall. Do the following to replace the center speaker:

- Remove the four (4) Torx security screws that secure the speaker grill in place.
- Remove the four (4) Phillips screws that secure the speaker in place.
- Disconnect the wires from the speaker and install them to the same terminals of the new speaker.
- Reverse these steps to install the new speaker.

## Rear (Seat) Speaker or Subwoofer Replacement

The rear speakers are located behind the two small grills at the top rear of the seat. The subwoofer is located behind the molded plastic housing on the back of the seat.

1. **To replace the Subwoofer**, remove the six (6) Torx screws that secure the molded plastic housing on the back of the seat, and remove the housing. Skip to step 3.
2. **To replace the left or right rear speaker**, remove the four (4) 1/4-20H Torx security screws that secure the speaker grill to the back of the seat.
3. Remove the four (4) screws that secure the speaker or subwoofer to the seat.
4. Disconnect the wires from the speaker or subwoofer and install them to the same terminals on the new speaker or subwoofer.
5. Reverse these steps to install the new speaker or subwoofer.

## Computer Replacement



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

---

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

1. Disconnect the cabinet from AC power and remove the rear door from the cabinet.
2. Disconnect all of the cables from the computer.
3. Remove the Game Dongle and keep it with your cabinet. **Do not** ship the Game Dongle with the computer. It contains information that needs to stay with the cabinet.
4. Unbuckle the strap that secures the computer in place and remove the computer.
5. Reverse these steps to install the new computer. Make sure that the computer air vents are not blocked. There is an air vent under the bottom front panel of the computer that is easily blocked by padding or debris. Be sure to reconnect your Game Dongle.
6. After replacing a computer, you must calibrate the pedals (see page 16).
7. Set up your cabinet from the Operator Menu, and play a game to verify proper operation.



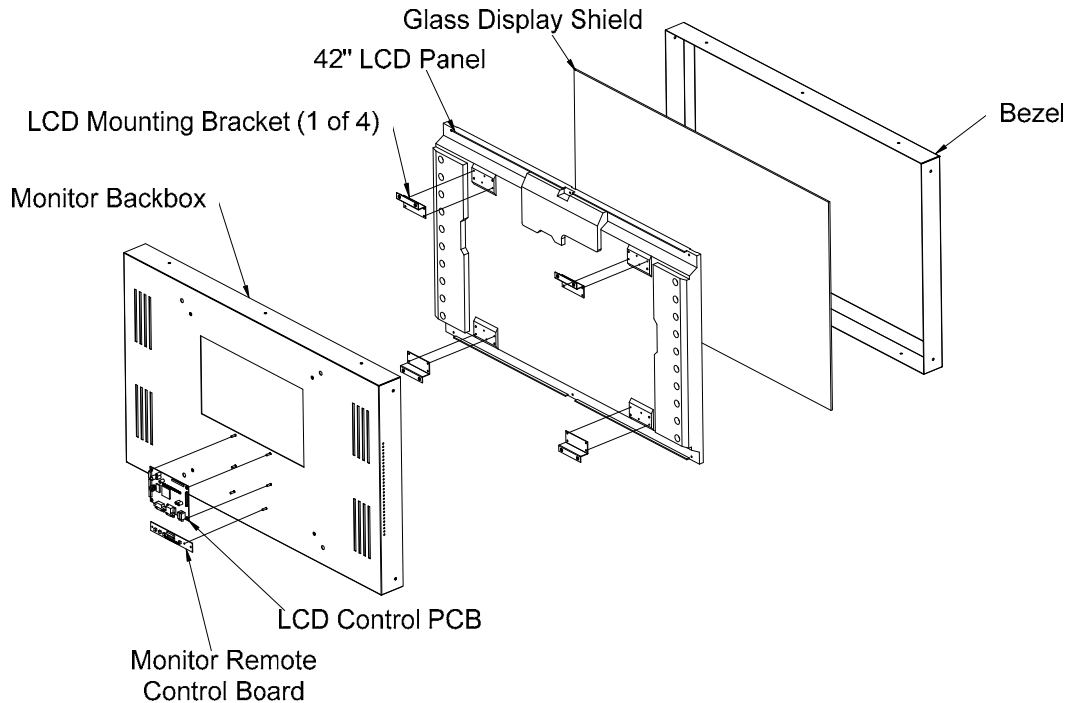
**CAUTION: When shipping the computer, always use plenty of padding and protection. GLOBAL VR recommends shipping the computer in a box with three inches of foam padding on all sides. Shipping the computer without enough padding can VOID THE WARRANTY if the computer is visibly damaged from shipping.**

---

## LCD Monitor Service (Deluxe)

The 42" LCD Monitor is connected to an LCD Control PCB that provides the signal, power, and data to the monitor. The monitor is encased in a metal bezel and backbox assembly with a glass display shield to protect the LCD panel. The Control PCB is mounted to the backbox inside the cabinet. Power is provided by a dedicated 24 VDC power supply that connects to the Control PCB and the AC power strip. The sections that follow provide replacement procedures for LCD Monitor Assembly components. Figure 16 shows an exploded view of monitor assembly.

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



*Figure 16. Monitor Assembly Exploded View (Deluxe)*

## Glass Display Shield Replacement (Deluxe)

Perform the following steps if you need to remove the glass display shield for cleaning or replacement:

1. Remove the five (5) screws, shown by the arrows in the picture below, from the LCD front cover bracket below the front of the monitor and remove the bracket.



*Figure 17. LCD Front Cover Bracket (Deluxe)*

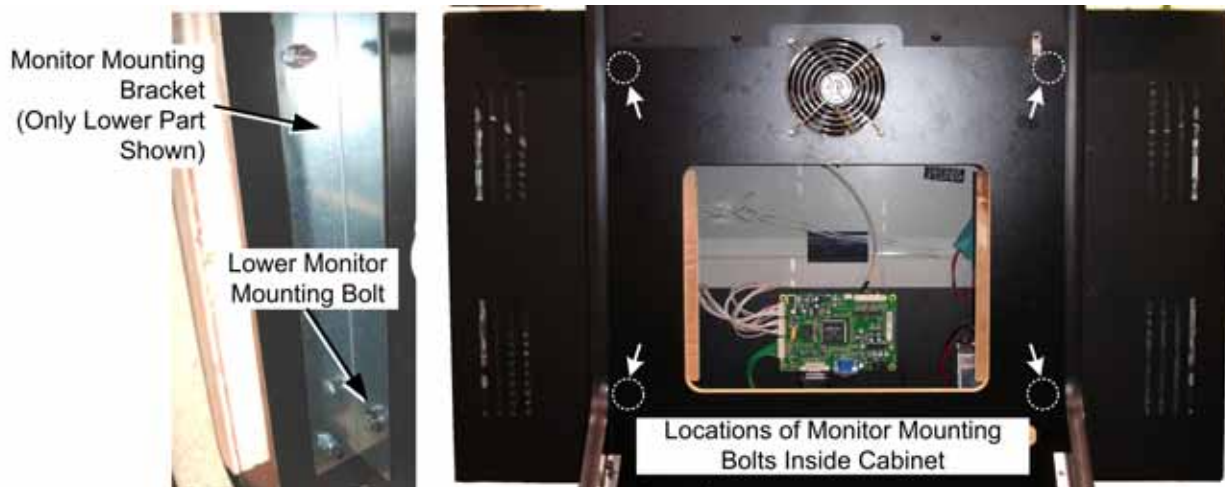
2. Remove the seven (7) screws that secure the bezel in place around the front of the monitor.
3. Carefully lift the bezel and glass away from the monitor.
4. Reverse these steps to replace the bezel and glass.

### LCD Monitor Replacement (Deluxe)



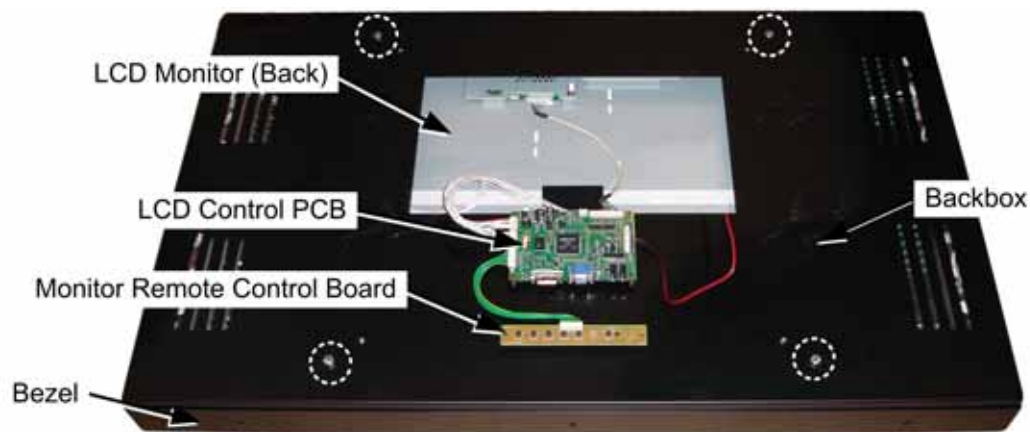
**SHOCK HAZARD. Disconnect the AC power cord before performing the following procedure.**

1. Disconnect the cabinet AC power cord.
2. Refer to Figure 17 and remove the five (5) screws from the LCD front cover bracket below the front of the monitor. Remove the bracket.
3. Remove the Monitor Access Door behind the monitor.
4. Disconnect the video cable from the back of the LCD Control PCB.
5. Disconnect the monitor DC power wires from the monitor power supply terminals (you *do not* need to disconnect the AC wires from the power strip).
6. Remove the two (2) Phillips screws that secure the DC power supply in place so you can move it out of the way to reach the monitor mounting bolts.
7. Remove the four (4) bolts that secure the monitor backbox to the mounting brackets inside the cabinet. Figure 18 shows the locations of the bolts inside the cabinet



*Figure 18. Monitor Mounting Bolts (Deluxe)*

8. Carefully lift the monitor, bezel, and glass out of the cabinet as one unit. This is easiest to do with a person on each side of the assembly.
9. Place the LCD monitor assembly face down on a safe working surface.
10. Refer to Figure 19 for monitor assembly components. Carefully disconnect the three (3) wire harnesses that connect the LCD panel to the LCD Control PCB on the back of the assembly.
11. Remove the seven (7) screws that secure the bezel in place around the front of the monitor.



*Figure 19. Monitor and Backbox Components (Deluxe)*

12. Remove the four (4) bolts from the back of the backbox (shown by the circles in Figure 19) and lift off the backbox with the attached LCD Control PCB and Monitor Remote Control Board.
13. Lift the LCD panel out of the bezel.
14. Reverse these steps to install the new LCD monitor. Read the caution below and refer to Figure 20 to avoid breaking the LCD Control PCB connector.



**CAUTION:** It is very **EASY TO BREAK** the plastic housing around the connector on the LCD Control PCB. Align the connector carefully, and gently push straight in with your thumbs on both sides. **DO NOT FORCE.** Pressing too hard can break the plastic. See Figure 20 for the correct way to connect the harness.

### Monitor Control PCB Replacement (Deluxe)



**SHOCK HAZARD.** Disconnect the AC power cord before performing the following procedure.



**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 cabinet from AC power.
2. Remove the Monitor Access Door behind the monitor.
3. Refer to Figure 19 to identify monitor assembly components. Carefully disconnect all of the cables and wire harnesses from the Control PCB. (Depending on the PCB model, you may need to remove the PCB from the backbox before you can disconnect the power harness.)
4. Remove the four (4) screws that secure the PCB to the monitor backbox and remove the PCB.
5. Reverse these steps to install the new PCB. Read the caution below and refer to Figure 20 to avoid breaking the LCD Control PCB connector.



**CAUTION:** It is very **EASY TO BREAK** the plastic housing around the connector on the LCD Control PCB. Align the connector carefully, and gently push straight in with your thumbs on both sides. **DO NOT FORCE.** Pressing too hard can break the plastic. See Figure 20 for the correct way to connect the harness.



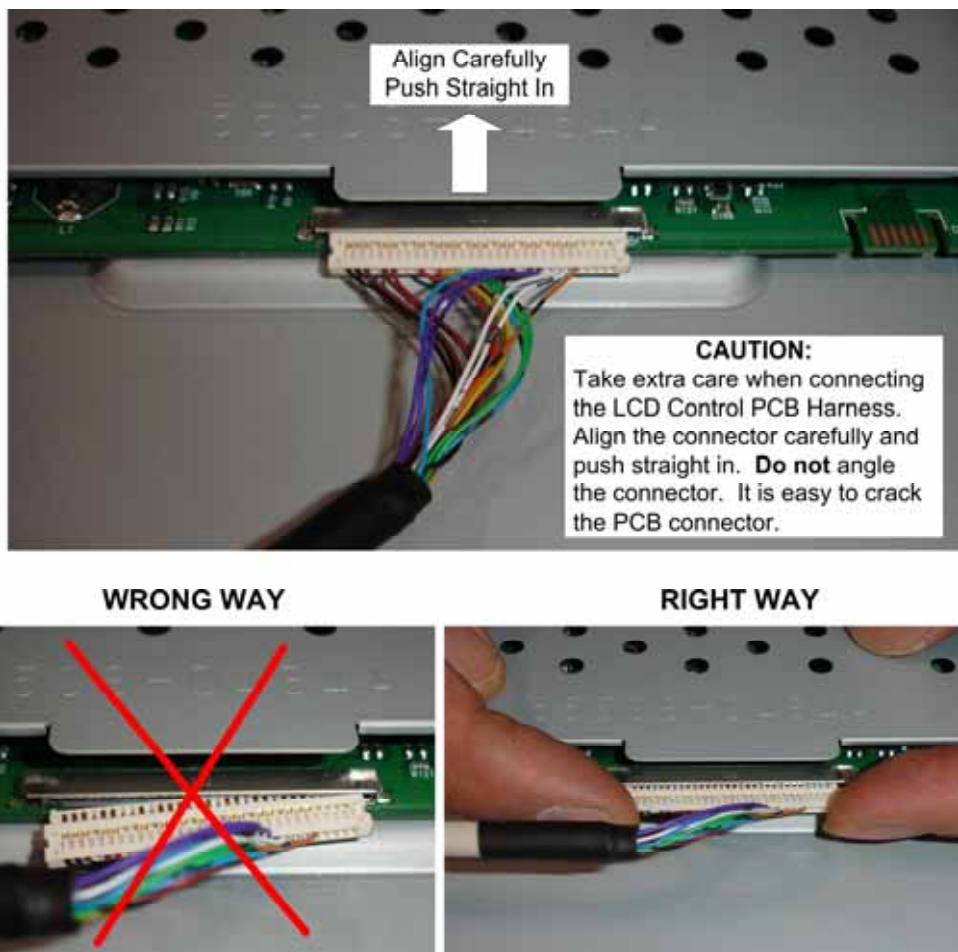


Figure 20. Connecting the LCD Control PCB Harness

### Monitor Power Supply Replacement (Deluxe)



**SHOCK HAZARD.** Disconnect the AC power cord before performing the following procedure.

1. Disconnect the cabinet from AC power.
2. Remove the Monitor Access Door behind the monitor.
3. Make sure all wires connected to the power supply are properly labeled for easy reconnection, and then disconnect them from the terminals.
4. Remove the two (2) screws that secure the power supply mounting bracket to the cabinet and remove the power supply from the cabinet.
5. Remove the mounting bracket from the power supply and install it on the new power supply.
6. Reverse the removal steps to install the new power supply.

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

## LCD Monitor Service (Standard)

The 32" LCD Monitor is connected to an LCD Control PCB that provides the signal, power, and data to the monitor. The monitor is encased in a metal frame with a glass display shield to protect the LCD panel. The LCD Control PCB and Monitor Power Supply are mounted to the back of the LCD assembly. The Monitor Power Supply connects to the AC Power Strip. The sections that follow provide replacement procedures for components of the LCD Monitor Assembly.

**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.

**Note:** Some configurations may vary.

## Glass Display Shield Replacement (Standard)

1. Disconnect the cabinet from AC power.
2. Remove the screws from the sides of the monitor frame.
3. Carefully remove the frame and glass. Be aware that the glass is **not** secured to the frame.
4. Reverse these steps to install the new glass display shield.

## LCD Monitor Replacement (Standard)



**SHOCK HAZARD.** Disconnect the AC power cord before performing the following procedure.



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

1. Remove the Display Shield and Frame as described in the previous section.
2. Remove the Monitor Access Door behind the monitor.
3. Disconnect the video cable from the back of the LCD Control PCB.
4. Check the power cord that connects to the power supply on the back of the monitor. Make sure it has enough slack so you can move the monitor out to disconnect the wires from the terminals. If necessary, snip some cable ties to create enough slack in the power cord.
5. Remove the four (4) bolts that secure the monitor L-brackets to the cabinet and carefully lay the monitor down above the control panel so you can access the power supply terminals.
6. Disconnect the wires from the power supply terminals, making sure they are labeled for proper reconnection.
7. Place the LCD panel on a work surface and carefully disconnect the wire harnesses from the LCD Control PCB and Power Supply.



**CAUTION:** It is very **EASY TO BREAK** the plastic housing around the connector on the LCD Control PCB. Align the connector carefully, and gently push straight in with your thumbs on both sides. **DO NOT FORCE.** Pressing too hard can break the plastic. See Figure 20 for the correct way to connect the harness.

8. Remove the L-Brackets, LCD Control PCB, and Power Supply, and install them on the new monitor.

9. Carefully reconnect the harnesses between the LCD panel and the LCD Control PCB and Power Supply.
10. Reverse the removal steps to install the new monitor in the cabinet.

### Monitor Control PCB Replacement (Standard)

Perform the steps under *Monitor Replacement (Standard)*, above, but remove and replace only the LCD Control PCB from the monitor assembly in step 8. Be sure to see Figure 20 on page 30 for the correct way to connect the Control PCB Harness to avoid breaking the connector.

### Monitor Power Supply Replacement (Standard)

Perform the steps under *Monitor Replacement (Standard)*, above, but remove and replace only the Monitor Power Supply from the monitor assembly in step 8.

### Coin Mech Replacement

Perform the following steps to remove a coin mech. You can replace a 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.

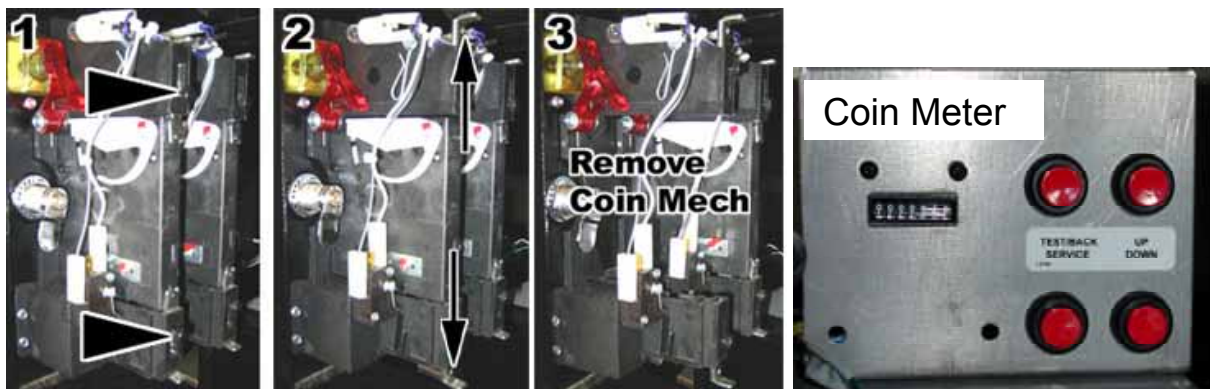


Figure 21. Servicing the Coin Mech and Coin Meter

### Coin Meter Replacement

The coin meter is mounted to the operator button panel. 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 operator button panel 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.

## Players' Card Reader Replacement

1. Disconnect the Card Reader USB cable from the system computer. Snip any tie wraps that secure the cable to the cabinet.
2. From the front of the cabinet, remove the four (4) Torx security screws that secure the Card Reader bezel in place. Carefully remove the Card Reader assembly from the cabinet, routing the cable out through the hole.
3. Remove the four (4) small screws that secure the Card Reader to the bezel.
4. Reverse these steps to install the new Card Reader. Be sure to install strain relief, such as a cable tie with adhesive mount, in case the USB cable gets pulled.
5. Test the Card Reader from **Diagnostics: Card Reader** in the Operator Menu.

## Power Distribution Service

### AC Power Plate

The AC power plate on the back of the cabinet provides the external AC power connection. An AC EMI Filter in the power plate removes electrical noise that can cause interference with the hardware inside the cabinet. The power plate has an ON/OFF switch and a 6 Amp Slo Blo fuse.

AC power from the power plate is routed through a power transformer to an AC power strip/surge suppressor that provides power to all cabinet components.



**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 22. Components must not be grounded to the power plate mounting bolts.

The **Ethernet** port on the power plate is connected to the Ethernet port on the system computer. It is used for linking cabinets.

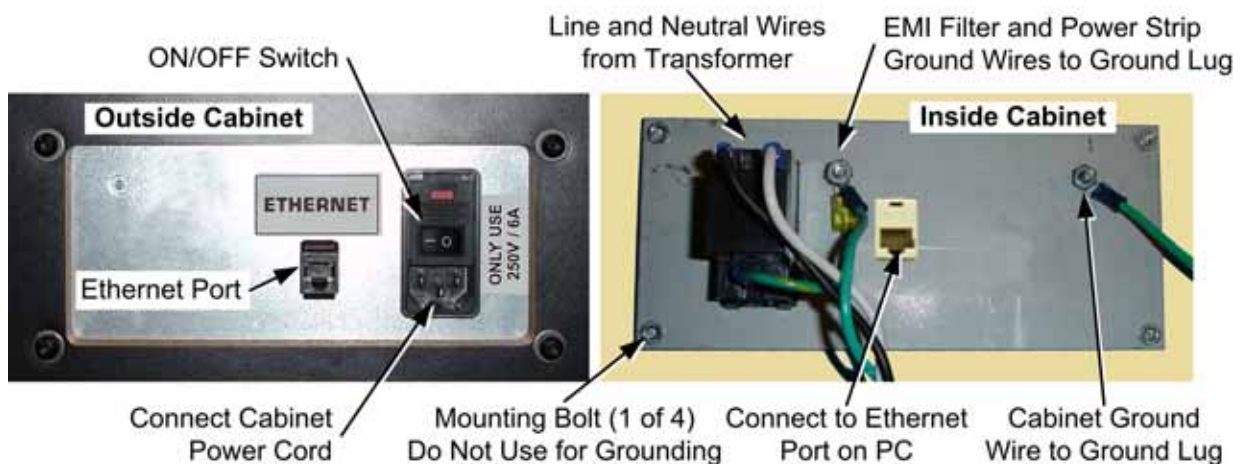


Figure 22. AC Power Plate

## AC Power Strip Replacement

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**SHOCK HAZARD. Disconnect the AC power cord before performing the following procedure.**

---

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. Remove the rear door from the cabinet.
3. Disconnect all components from the power strip.
4. Disconnect the power strip Neutral and Line wires from the power transformer.
5. Disconnect the power strip Ground wire from the AC Power Plate ground lug.
6. Remove the power strip; it is held in place with Velcro®.
7. Replace the power strip with an appropriate unit from GLOBAL VR®. Do not use a different power strip. Be sure to connect each wire to the correct terminal. (See Figure 29 on page 60.)



**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.**

---

## DC Power Supplies (+24 and +5/+12 VDC)

The cabinet has three DC power supplies (*NOT* including the power supply inside the computer).

- +24 VDC supply powers the Force-Feedback Steering System.  
**Important:** Connect **only** the steering components to this +24 VDC Power Supply. **Do not use** the +12 VDC Terminals on the Steering Power Supply.
- +5/+12 VDC supply powers the Audio Amp, GVRI/O Mini PCB, and lighting components.
- +24 VDC supply powers LCD monitor. (For replacement procedures, see Monitor Power Supply Replacement (Deluxe) on page 30, or Monitor Power Supply Replacement (Standard) on page 32.)

Perform the following steps to replace a DC power supply (except for the monitor power supply):



**SHOCK HAZARD. Disconnect the AC power cord before performing the following procedure.**

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

---

1. Turn the cabinet OFF and disconnect the AC power cord.
2. Remove the electronics access panel (see page 12).
3. Disconnect the wires from the DC power supply terminals.
4. Remove the two (2) Phillips screws holding the power supply to the cabinet. Be careful not to remove the screw that secures the terminal plate to the DC power supply.

5. Reverse the removal steps to install the new power supply. Check the labels on each wire and be sure to connect them to the correct terminals. See Figure 29 on page 60 for connection details.
6. Before connecting the DC output wires, connect a volt meter and adjust the output voltage from the pot on the front of the power supply as follows:
  - **+5/+12 VDC power supply:** Set the +5VDC output between +5.05 and +5.1 VDC.
  - **+24 VDC power supply:** Set the +24 VDC output to +24 VDC.

## Cabinet Lighting Service

### Marquee Florescent Light Service

The Marquee is lit by one florescent fixture.

1. To gain access to the fixture, remove the Torx screws that secure the marquee artwork and clear plastic in place (eight (8) screws for Standard or six (6) screws for Deluxe Cabinets).
2. Replace the florescent tube with another 18" florescent tube.
3. To remove the fixture, disconnect the Molex connector on the fixture power cord, and then 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 and replace the artwork and clear plastic. Replace the florescent fixture only with a comparable unit from GLOBAL VR.

### Cold-Cathode Florescent Light Service

Cold-Cathode Florescent Lights (CCFLs) are used to add dramatic lighting effects to the cabinet. See Figure 23 for CCFL assembly details. Each CCFL set is made up of two light tubes and a power inverter. The power inverter is connected to +12 VDC power. If both of the lights in a set fail, the problem is most likely a faulty power inverter or loose power connection. Make sure the power connector is firmly attached to the power inverter. Swap the power inverter with a known good inverter as a test before changing the light tubes.

Some CCFL light sets have power switches. 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 vent holes (the circle of small holes on the case) are not covered.

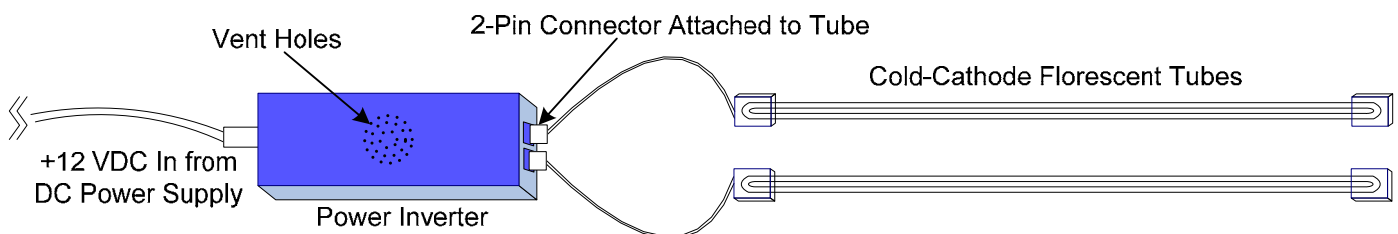


Figure 23. Cold-Cathode Light Detail

### Control Panel CCFLs

The control panel is lit by a set of 12" white CCFLs. To access the power inverter, remove the Electronics Access Panel. If you need to replace the CCFLs, you will need to remove and disassemble the control panel assembly as described on page 13.

## Floor CCFLs Under Seat Pedestal

**Note:** The power inverter for these lights is located inside the seat pedestal. If the lights are not working, the problem is most likely to be with the inverter.

**For Standard Cabinets:** Remove the four (4) bolts that secure the seat assembly to the cabinet and slide the seat assembly away from the cabinet. Turn the seat assembly on its side to access the lights and the power inverter.



**WARNING:** When lifting the back of the Deluxe Cabinet, make sure it is securely braced to prevent injury or damage.

---

**For Deluxe Cabinets:** To access the power inverter, remove the seat as described on page 22. To replace the tubes you will need to carefully lift the back of the cabinet. Make sure leg levelers are down. Place the back of the cabinet on a secure block and make sure it will not fall.

## CCFLs Below Control Panel

1. Remove the Electronics Access Panel and disconnect the two light tubes from the inverter.
2. Remove the two (2) Torx screws that secure the clear plastic housing in place under the control panel and remove the housing with the light tubes.
3. Reverse these steps to re-install the housing and light tubes.

## Leader Light Replacement (Standard)

1. Remove the four (4) Torx screws that secure the Leader Light grill in place and remove the grill.
2. Snip the cable ties that secure the LED light tube to the cabinet.
3. Disconnect the power connector and remove the light from the cabinet.
4. Reverse these steps to install the new Leader Light.

## Marquee Left/Right Marker Light Replacement (Deluxe)

1. Remove the two (2) Torx screws that secure the light in place.
2. Disconnect the harness connector.
3. Reverse these steps to install the new light. Replace with Part Number: 115-0213-01 only.

## LED Brake Light Replacement (Deluxe)

The brake light is located under the Spoiler on Deluxe Cabinets.

1. Remove the six (6) acorn nuts that secure the brake light housing under the spoiler. Carefully remove the housing and disconnect the power connector.
2. Remove the two screws that secure the mounting bracket that holds the LED light tube in place.
3. Center the LED light tube and tighten the mounting bracket with the two screws.
4. Connect the power harness and secure the assembly in place with the six acorn nuts.



## LED Brake Light Replacement (Standard)

The brake light is on the back of the seat pedestal on Standard Cabinets.

1. Remove the six (6) Torx bolts that secure the seat pedestal cover plate to the wooden pedestal (see Figure 14 on page 22).
2. Carefully lift the seat assembly and place it on its side. Be careful not to pull the speaker wires that run from the pedestal into the seat. You may need to reach inside the pedestal and snip wire ties to create slack in the wires.
3. Disconnect the power connector from the LED light tube and snip the cable ties that secure the light tube to the seat pedestal.
4. Reverse these steps to install the new LED light tube. Make sure the LEDs in the light tube line up with the holes in the pedestal cover.

## Exhaust Light Replacement (Tunnel Light)

1. Remove the two screws that secure the tunnel light to the back of the seat pedestal.
2. Disconnect the harness connector.
3. Reverse these steps to install the new light.

## Headlight Replacement (Deluxe)


If a headlight does not work, the problem is most likely a loose connection or faulty PCB. Do the following to replace the PCB that controls the headlight:

1. Remove the two screws that secure the headlight PCB mounting plate to the back of the marquee. Carefully remove the plate enough to disconnect the wire harness from the PCB.
2. Replace the PCB with GLOBAL VR Part #: 990-LEDX6-UCT-02.

## Setting the Date and Time

The date and time do not affect game play and are not displayed in the game, but the time does determine when the daily leaderboards transition to the next day. The date and time are displayed only on the Operator Menu screens, and referenced on the Collections screens.

Perform the following steps to set the date and time:

1. Remove the rear door from the cabinet and connect a USB keyboard to an available USB port on the back of the system computer. (Or you can connect a PS/2 keyboard to the purple PS/2 port on the back of the computer and then reboot the game.)
2. With the game running in Attract mode, press the Windows flag key  on the keyboard (between the Ctrl and Alt keys). This will launch the Windows Start Menu.
3. Use the arrow keys (↑↓) to select **gvrShutdown** from the Start Menu and press **Enter**. This will shut down the game shell and allow you to access Windows features.
4. Use the up arrow key (↑) to select **Run** from the Start Menu and then press **Enter**.
5. In the Run dialog box, type **cmd** and press **Enter**. A command window will appear.

6. Do the following to set the date:
  - a. In the command window, type **date** and press **Enter**.
  - b. A prompt will display the current date in the format: *weekday mm/dd/yyyy*, and will prompt you to enter the date in the format: *mm-dd-yyyy*. Enter the date, with the dashes, and then press **Enter**, or press **Back Space** to make a correction.
7. Do the following to set the time:
  - a. In the command window, type **time** and press **Enter**.
  - b. A prompt will display the current time in the format: *hh:mm:ss.tt* (where *tt* means tenths of a second), and will prompt you to enter the time in the same format.

Use the 24-hour clock, and enter the hour and minutes, with seconds being optional. (For example, 14:23:40 for 2:23:40 PM.) Press **Enter** to set the time entered or **Back Space** to make a correction.
8. Type **exit** and press **Enter** to close the command window.
9. Disconnect the keyboard and reboot the game.

## Setting the Computer BIOS (CMOS)

The computers for Carbon dedicated cabinets are being built with both Asus and Gigabyte motherboards. The BIOS settings are different for the two systems. To determine which motherboard is in your computer, check the audio ports on the computer rear panel. The Asus has four audio ports, and the Gigabyte has six audio ports. You can also start the CMOS Setup Utility and see whether your screens look like the Gigabyte screens in the next section, or the Asus screens in the section starting on page 42.

If your system has a different motherboard, check <http://service.globalvr.com> for updated information.

### BIOS Setup for Gigabyte GA-G31MX-S2 Motherboard

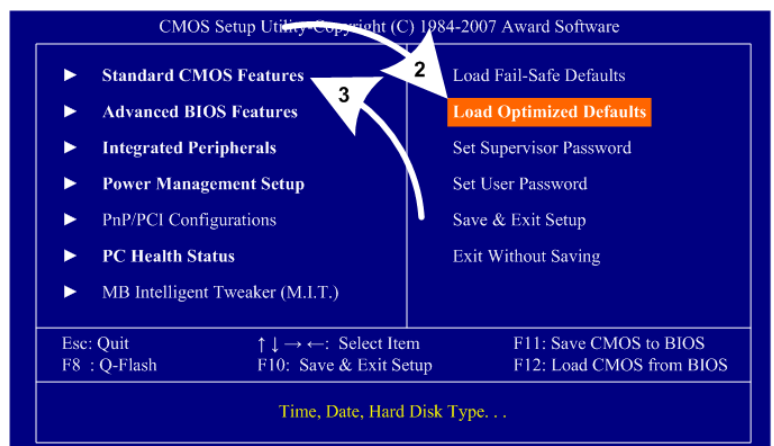
If you are comfortable using the CMOS Setup Utility, connect a keyboard to the computer and press the **DEL** key during boot to run the Utility, select **Load Optimized Defaults** from the Main Menu, and then change the settings shown in the table below. For more help, refer to the detailed instructions that follow.

| Menu                   | Item                  | Setting   |
|------------------------|-----------------------|-----------|
| Standard CMOS Features | Drive A               | None      |
|                        | Halt On               | No Errors |
| Advanced BIOS Features | First Boot Device     | CDROM     |
|                        | Second Boot Device    | Hard Disk |
|                        | Third Boot Device     | Disabled  |
| Integrated Peripherals | USB Keyboard Support  | Enabled   |
|                        | USB Mouse Support     | Enabled   |
| Power Management Setup | AC Back Function      | Full On   |
| PC Health Status       | CPU Smart FAN Control | Disabled  |

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

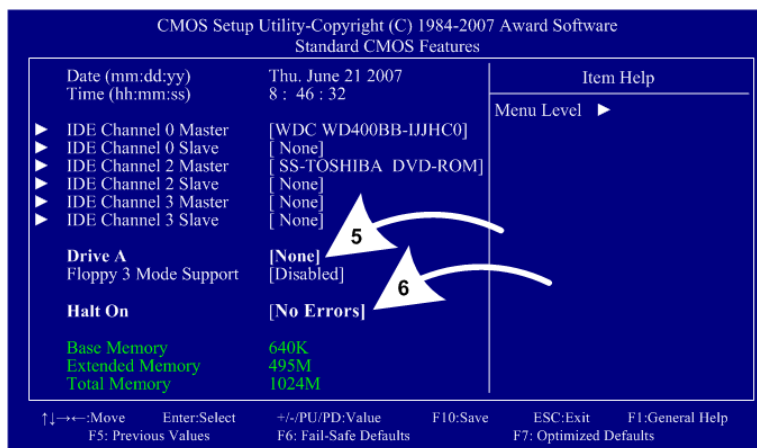
**Do not change any settings that are not specifically described in this document.**

1. Power off the computer and connect a keyboard to the computer. Power on and press the **DEL** key during boot. The CMOS Setup Utility Main Menu will appear:
2. Use the Arrow keys (**↑↓→←**) to select **Load Optimized Defaults**, and press **Enter**.  
Press **Y** and **Enter** when prompted to confirm the change.
3. Use the Arrow keys to highlight **Standard CMOS Features**, and then press **Enter**.



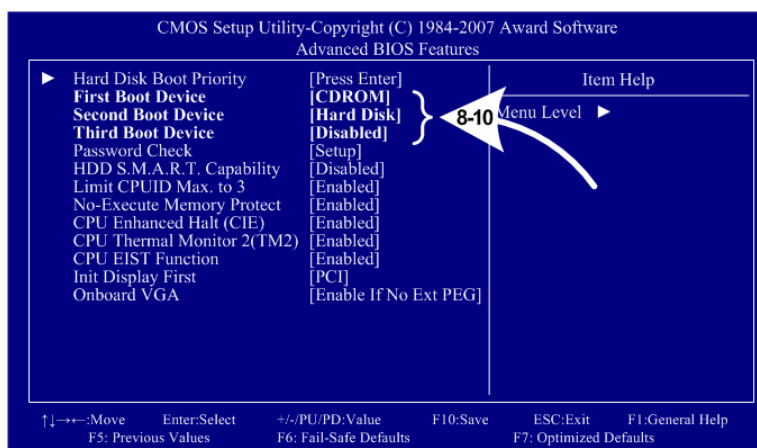
4. A screen similar to the following will appear:
5. Use the Arrow keys to highlight the setting for **Drive A** and press **Enter**. Use the **Page Up** and **Page Down** keys to change the setting to **None**.
6. Change the setting for **Halt On** to **No Errors** the same way.

Press **ESC** to go back to the Main Menu.



7. Now use the Arrow keys to highlight **Advanced BIOS Features** and press **Enter**. A screen similar to the following will appear:
8. Use the Arrow keys to highlight the setting for **First Boot Device** and press **Enter**. Use the **Page Up** and **Page Down** keys to change the setting to **DVDROM**.
9. Change the setting for **Second Boot Device** to **Hard Disk** the same way.
10. Change the setting for **Third Boot Device** to **Disabled** the same way.

Press **ESC** to go back to the Main Menu.

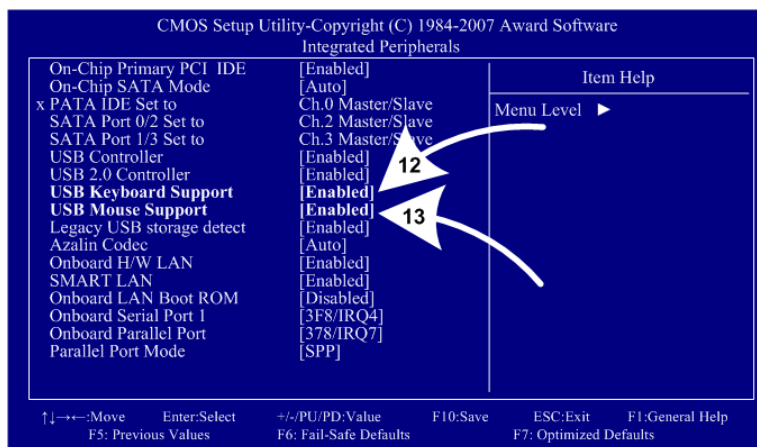


11. Now use the Arrow keys to highlight **Integrated Peripherals** and press **Enter**.

A screen similar to the following will appear:

12. Use the Arrow keys to highlight the setting for **USB Keyboard Support** and press **Enter**. Use the **Page Up** and **Page Down** keys to change the setting to **Enabled**.
13. Use the Arrow keys to highlight the setting for **USB Mouse Support** and press **Enter**. Use the **Page Up** and **Page Down** keys to change the setting to **Enabled**.

Press **ESC** to go back to the Main Menu.

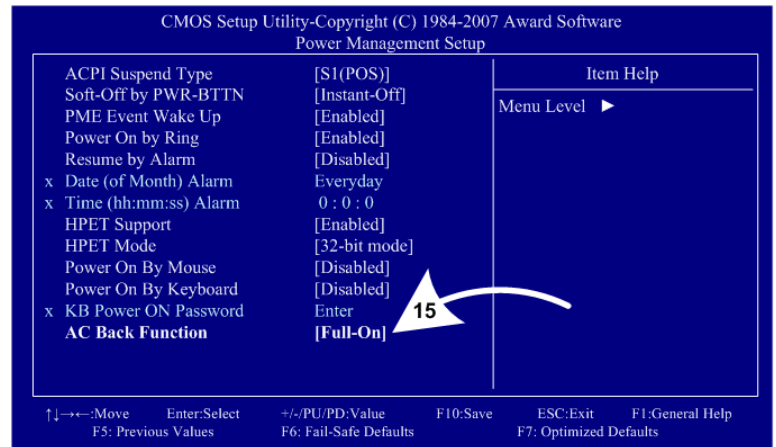


14. Now use the Arrow keys to highlight **Power Management Setup** and press **Enter**.

A screen similar to the following will appear:

15. Use the Arrow keys to highlight the setting for **AC Back Function** and press **Enter**.  
Use the **Page Up** and **Page Down** keys to change the setting to **Full-On**.

Press **ESC** to go back to the Main Menu.

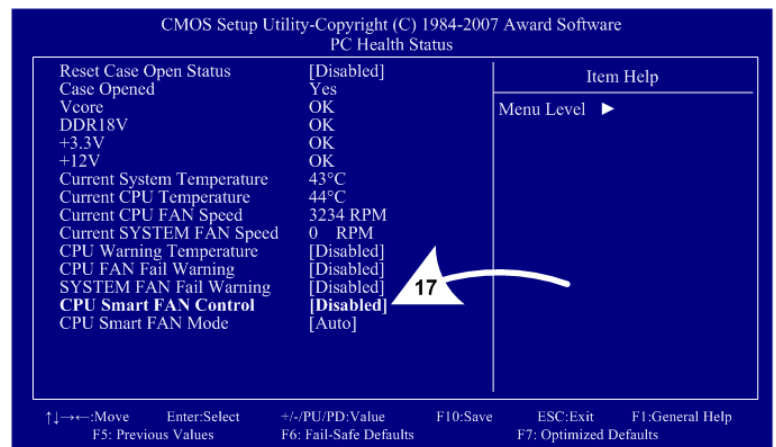


16. Now use the Arrow keys to highlight **PC Health Status** and press **Enter**.

A screen similar to the following will appear:

17. Use the Arrow keys to highlight the setting for **CPU Smart FAN Control** and press **Enter**.  
Use the **Page Up** and **Page Down** keys to change the setting to **Disabled**.

Press **ESC** to go back to the Main Menu.



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

Save to CMOS and EXIT (Y/N) Y

19. Make sure "Y" shows at the end of the prompt (use the arrow keys to select, if necessary), and press **Enter** to save the settings and exit.

## BIOS Setup for Asus P5N-MX Motherboard

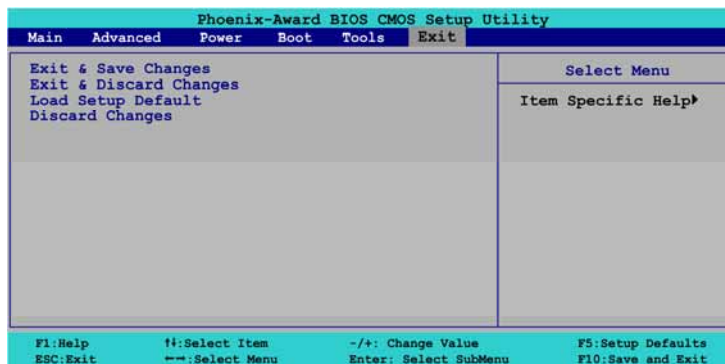
If you are comfortable using the CMOS Setup Utility, connect a keyboard to the computer and press the **DEL** key during boot to run the Utility. Select **Load Setup Default** from the **Exit** Menu first, and then check all of the settings shown in the table below. For more help, refer to the detailed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

| Menu  | Submenu (if applicable)     | Item                     | Setting                 |
|-------|-----------------------------|--------------------------|-------------------------|
| Exit  |                             | Load Setup Default       | <i>(Not applicable)</i> |
| Main  |                             | Legacy Diskette A:       | Disabled                |
|       |                             | Primary IDE Master       | WDC WD400BB             |
|       |                             | Primary IDE Slave        | Sony DVD-ROM            |
| Boot  | Boot Device Priority        | 1st Boot Device          | CDROM                   |
|       |                             | 2nd Boot Device          | Hard Disk               |
|       |                             | 3rd Boot Device          | Disabled                |
|       |                             | 4th Boot Device          | Disabled                |
|       | Boot Settings Configuration | Halt On                  | No Errors               |
| Power | APM Configuration           | Restore on AC Power Loss | Power On                |
|       | Hardware Monitor            | Q-FAN Function           | Disabled                |

**Important:** Your screens may not look exactly like the screens shown in this document, and some settings shown on the screens 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 CMOS 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 Default**, 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 **Legacy Diskette A:** and then use the + and – keys to change the setting to **Disabled**.
7. Verify **Primary IDE Master** is the hard disk (WDC WD400BB) and **Primary IDE Slave** is the DVD-ROM.
8. Use the Arrow keys (← →) to highlight **Power** from the top of the screen, and the **Power** menu will appear.
9. Use the Arrow keys to highlight **APM Configuration** and press **Enter**.

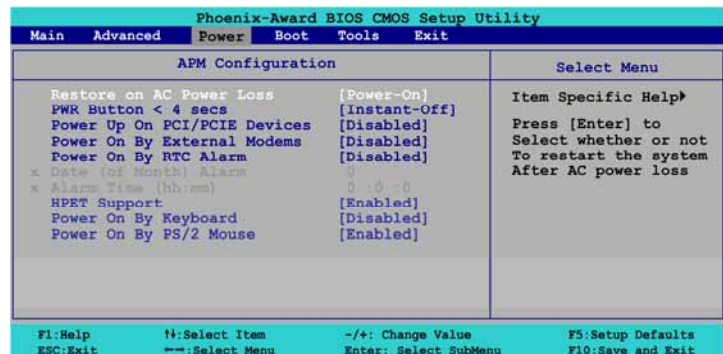
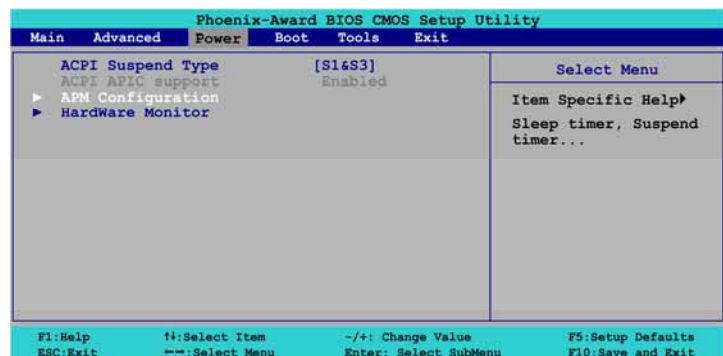
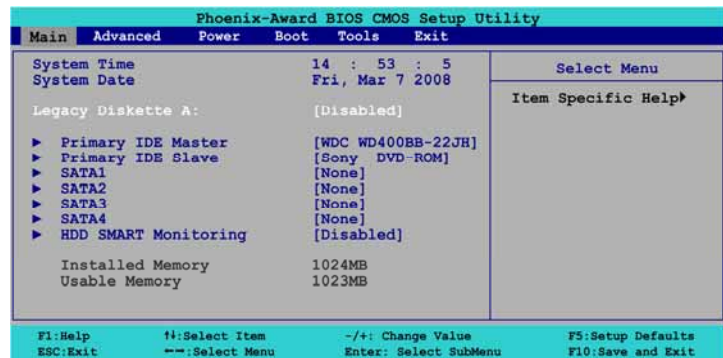
The **APM Configuration** menu will appear.

10. Use the Arrow keys (↑↓) to highlight **Restore on AC Power Loss** and then use the + and – keys to change the setting to **Power-On**.
11. Press **Esc** to return to the **Power** menu.

12. Use the Arrow keys to highlight **Hardware Monitor** and press **Enter**.

The **APM Configuration** menu will appear.

13. Use the Arrow keys (↑↓) to highlight **Q-Fan Function** and then use the + and – keys to change the setting to **Disabled**.



- 14. Use the Arrow keys (← →) to highlight **Boot** from the top of the screen, and the **Boot** menu will appear.
- 15. Use the Arrow keys (↑↓) to highlight **Boot Device Priority** and press **Enter**.

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

- 16. Use the Arrow keys (↑↓) to highlight **1<sup>st</sup> Boot Device**, and then use the + and – keys to change the setting to **CDROM**.
- 17. Do the same step to change **2<sup>nd</sup> Boot Device** to **Hard Disk**, and **3<sup>rd</sup>** and **4<sup>th</sup> Boot Device** to Disabled, as necessary.
- 18. Press **Esc** to return to the **Boot** menu.

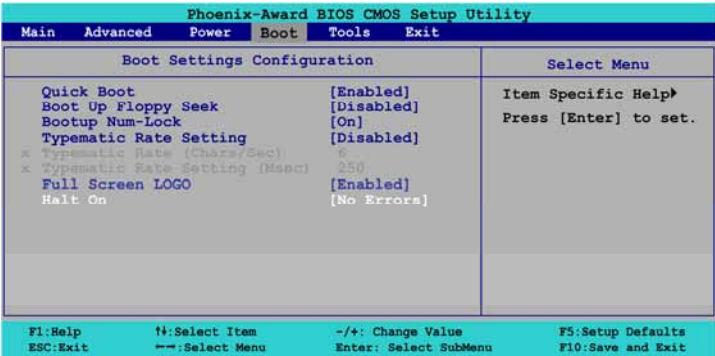
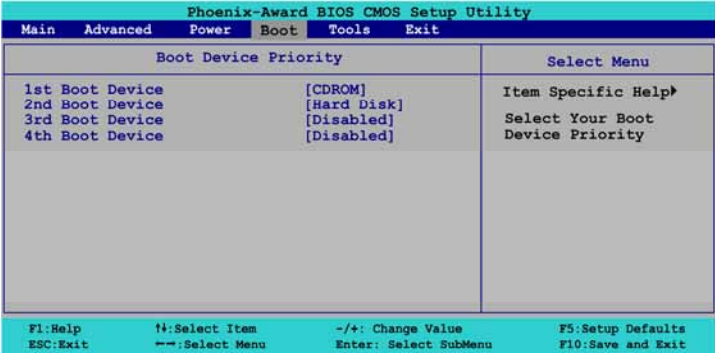
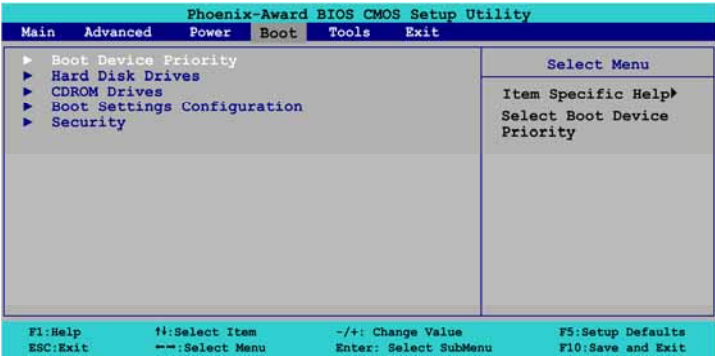
- 19. Use the Arrow keys (↑↓) to highlight **Boot Settings Configuration** and press **Enter**.

The **Boot Settings Configuration** menu will appear

- 20. Use the Arrow keys (↑↓) to highlight **Halt On** and then use the + and – keys to change the setting to **No Errors**.
- 21. Press **Esc** to return to the **Boot** menu.
- 22. Now that all settings are correct, press F10. The following prompt will appear:

Save configuration changes and exit now?  
[ YES ] NO

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



## Chapter 5 — Troubleshooting

### Video Troubleshooting

| Problem  | Cause   | Possible Solution  |
|--|---|--|
| No picture<br>or<br>Corrupted picture on monitor<br><br>You hear the audio                     | Power problem   | Check the Power On LED on the monitor power supply. Make sure the power cord is connected to the power strip and the power strip is on.  |
|  | Loose or faulty DVI 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.   |
|  | 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 DVI video cable and power connection.<br>Make sure the LCD Control PCB connector is properly connected and not cracked or broken (see Figure 20).<br>If you hear Alert beeps from the System PC, contact Technical Support for assistance.  |
|  | 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.<br>If instructed by Technical Support, open the computer and check the following: <ul style="list-style-type: none"> <li>• Make sure the video card is seated properly in the motherboard. Reseat the video card.</li> <li>• Check the power connector to the video card inside the computer. Make sure it is connected properly and is not connected backwards.</li> <li>• Power on the computer and make sure the fan on the video card is spinning fast.</li> </ul> |
| No video and no audio<br><br><b>Note:</b> It takes about 3 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 <b>On (I)</b> position.   |
|  | BIOS setting has changed                                      | Check the BIOS settings (see page 39). For Asus motherboards, 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> . For Gigabyte motherboards, under <i>Power Management Setup</i> , make sure <i>AC Back Function</i> is set to <i>Full-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.<br><br>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 10). If you continue to have problems, you may have a faulty hard drive. Contact Technical Support.   |
| Picture is dim or faded                  | Gamma and/or Vibrance needs adjustment  | Adjust the monitor Gamma and/or Vibrance setting from the Operator Menu <b>Diagnostics</b> screens (see your Operation Manual for more information). If this does not give adequate results, increase brightness using the monitor remote control board mounted to the back of the monitor.  |
| 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 <b>VOL UP</b> button on the Operator Button Panel to raise the volume. Check audio settings in the Operator Menu <b>Machine Settings: Settings</b> menu, and verify that the Master Volume is set high enough. Verify the volume pots are not turned all the way down on the Audio Amp PCB (see Figure 15 on page 24). |
|           | Faulty wiring        | Turn off the game. Verify that all the wires are firmly connected to the speakers and Audio Amp PCB. Verify that each wire is connected to the correct port. Verify that no wires are frayed or improperly shorting to ground. (See <i>Audio Amp and Speakers Service</i> on page 23.)   |
|           | Blown speakers       | Remove the grills and inspect each speaker for visible damage. Run <b>Diagnostics: Sound Test</b> from the Operator Menu to verify each speaker is working.  |
|           | Faulty audio amp PCB | To verify audio is working at the computer, connect stereo headphones to each computer audio port. Test the Audio Amp 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. Run <b>Diagnostics: Sound Test</b> 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. (See <i>Audio Amp and Speakers Service</i> on page 23.)   |
|                                      | Faulty audio amp PCB | To verify audio is working at the computer, connect stereo headphones to each computer audio port. Test the Audio Amp PCB in another working cabinet.  |
|                                      | Faulty wiring        | Turn off the game. Verify that all the wires are firmly connected to the speakers and Audio Amp PCB. Verify that each wire is connected to the correct port. Verify that no wires are frayed or improperly shorting to ground. (See <i>Audio Amp and Speakers Service</i> on page 23.) |

### Control Troubleshooting

| Problem                    | Cause                                  | Possible Solution   |
|----------------------------|--|---|
| Buttons do not work        | Faulty micro switch                    | Replace the micro switch on the button and re-test.   |
|                            | Faulty wiring                          | Disconnect the cabinet from AC power. Verify that all wires are firmly connected to each button and the GVRI/O Mini PCB. Verify that the wires are connected to the correct spades on the button micro switch (see Figure 10 on page 19). Verify that no wires are frayed or improperly shorting to ground. Check for broken wires at cable-tie points. |
|                            | Faulty GVRI/O Mini PCB                 | Make sure that all connections to the PCB are firm. Replace PCB if faulty (see page 21).  |
| Steering pulls to one side | Faulty Force-Feedback PCB              | Verify that the force-feedback PCB is getting +24 VDC power. Test the PCB in a working cabinet.   |
|                            | Faulty motor                           | Test the steering motor in a working cabinet.   |
|                            | Faulty 24 VDC power supply             | Use a volt meter to verify that the force-feedback power supply is putting out +24 VDC.   |
|                            | Pot wires reversed                     | Check the wires between the steering pot and Force Feedback PCB.  |
| Sloppy or poor steering    | Poor calibration                       | Calibrate the steering from <b>Diagnostics: Play Control Test</b> in the Operator Menu (see page 16).   |
|                            | Faulty 5 K $\Omega$ steering pot       | Test calibration from <b>Diagnostics: Play Control Test</b> in the Operator Menu. Replace pot if faulty (see page 14).  |
|                            | Loose set screw                        | Check the set screws in the steering assembly.  |
|                            | Loose shaft nut                        | Tighten the 3/4" shaft nut shown in Figure 6.   |
|                            | Loose or worn drive belt or motor gear | Turn off the cabinet. Open the driving control panel and inspect the belt and gears on the steering motor (see page 15).  |

| Problem                               | Cause  | Possible Solution  |
|---------------------------------------|--|--|
| Sloppy or poor steering (continued)   | Faulty Force-Feedback PCB                      | Verify that the PCB is getting +24 VDC power. Test the PCB in a working cabinet. Calibrate the steering from <b>Diagnostics: Play Control Test</b> in the Operator Menu.   |
| Steering does not auto-calibrate      | Faulty USB cable or PCI USB card               | Test by connecting to a motherboard USB port. You may need to reboot twice for Windows to find the device. Also try a new USB cable. After testing, re-connect to a PCI USB port to minimize the risk of intermittent steering loss due to static shock (again, reboot twice). |
|                                       | Faulty Force-Feedback PCB                      | Verify that the PCB is getting +24 VDC power. Test the PCB in a working cabinet.   |
| Steering wheel shakes                 | Faulty 5 K $\Omega$ steering pot               | Test pot for smooth resistance. If you replace the pot, be sure to calibrate it from <b>Diagnostics: Play Control Test</b> in the Operator Menu (see page 16).   |
| Steering stops working (Intermittent) | Force-Feedback PCB connected to wrong USB port | To minimize the risk static shock, the force-feedback PCB should be connected to a PCI USB port, <b>not</b> to a motherboard USB port. Static shock can cause intermittent steering feedback failure. See Figure 34 on page 65 for a diagram of the computer ports.            |
| No force-feedback in the steering     | Belt is broken                                 | Replace belt (see page 15).  |
|                                       | Motor gear is worn                             | Inspect the motor gear and replace if worn.  |
|                                       | Faulty motor                                   | Test the steering motor in a working cabinet.  |
|                                       | Faulty 24 VDC power supply                     | Use a voltmeter to verify that the power supply is putting out +24 VDC.  |
|                                       | Steering motor not properly grounded           | Make sure the steering motor frame is properly grounded to help minimize the risk of static shock.   |
|                                       | Faulty Force-Feedback PCB                      | Verify that the PCB is getting +24 VDC power. Test the PCB in a working cabinet.   |
|                                       | Force-Feedback PCB connected to wrong USB port | To minimize the risk static shock, the force-feedback PCB should be connected to a PCI USB port, <b>not</b> to a motherboard USB port. Static shock can cause intermittent steering feedback failure. See Figure 34 on page 65 for a diagram of the computer ports.            |
| Shifter does not work in one gear     | Faulty micro switch                            | Replace the faulty micro switch. See Figure 11 on page 20.   |
|                                       | Pinched wire                                   | Make sure wires are not pinched by the shifter housing.  |
| Shifter goes into wrong gear          | Wires are switched or pinched                  | Make sure all wires are connected to correct micro switches and are not pinched by the shifter housing.  |
| Shifter does not work                 | Faulty GVRI/O Mini PCB                         | Check wiring between the shifter and GVRI/O Mini PCB. Replace PCB if faulty.   |



| Problem                               | Cause                      | Possible Solution  |
|---------------------------------------|----------------------------|--|
| Gas or brake does not work properly   | Pot is out of calibration  | Calibrate the pedals from <b>Diagnostics: Play Control Test</b> in the Operator Menu (see page 16). If you replace a pot or the computer, always recalibrate the pedals. (Pedals <b>do not</b> auto-calibrate when you reboot the game.) |
|                                       | Faulty 5 K $\Omega$ pot    | Test the pot for smooth resistance. If you replace the pot, be sure to calibrate the pedals from <b>Diagnostics: Play Control Test</b> in the Operator Menu (see page 16).   |
|                                       | Loose set screw            | A loose set screw can cause the pedal to work only on a partial range of its motion. Tighten the set screw.  |
| Feels like brake stays on during game | Dead spot in the brake pot | Test the brake pot and replace if bad. See page 16.  |

### Cabinet Linking Troubleshooting

| Problem                | Cause  | Possible Solution   |
|------------------------|--|---|
| Cabinets will not link | Faulty wiring                                  | Verify that a CAT-5 or better Ethernet cable is connected between the Ethernet port on the AC Power Plate and the computer. (CAT-5 cables have 8 wires.) While the cabinet is powered on and connected to another cabinet, verify the green LED on the Ethernet card is lit. If you are using an Ethernet hub or switch, verify green LEDs on the hub or switch light for each Ethernet port that is connected. |
|                        | Cross-over coupler not used or used improperly | To connect two cabinets, use one cross-over coupler. <b>Do not</b> run an Ethernet cable directly between two cabinets without a coupler. <b>Do not</b> use a crossover coupler with a hub or switch.   |
|                        | Cross-over coupler is not CAT-5                | Use the CAT-5 (8-wire) coupler that came with your dedicated cabinet.   |
|                        | Faulty Ethernet hub or switch                  | Verify the LEDs on the Ethernet hub or switch are lit for each port used. If possible, verify the hub or switch is working by connecting it to a known working computer network or set of linked cabinets.  |
|                        | Hub or switch is not 10/100/1000 Mbps          | Use a 10/100/1000 Mbps (Gigabit) hub or switch to link three or four cabinets.  |
|                        | Duplicate Link ID numbers                      | A cabinet with a duplicate Link ID number will display the <i>Select A Link ID</i> menu. You can also check or change the Link ID from the Operator menu <b>Machine Settings: Settings</b> screen. Each cabinet in a linked group must have a unique Link ID number.  |
|                        | Mixed Software Comm Versions                   | Verify that all cabinets are running the same Comm Version, shown in <b>Machine Settings: Info</b> screen.  |

## Miscellaneous Troubleshooting

| Problem   | Cause                                    | Possible Solution  |
|---|--|--|
| No power  | 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.   |
| 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.   |
| Cabinet gets very warm  | Faulty ventilation fan                   | Verify that the ventilation fan is working. It is located above the monitor access door on the back of the cabinet. Replace the fan if it is worn or spinning slowly.  |
|   | Cabinet ventilation holes are blocked    | Make sure you have proper clearance between the cabinet rear and the wall. Make sure the vent 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.  |
| Deluxe Only: Left Headlight and Marker Light do not work properly | Incompatible GVR I/O Mini PCB Installed  | Check the I/O Board version in <b>Machine Settings: Info</b> in the Operator Menu. If you have version 0470, please contact GLOBAL VR Support for a replacement (this version does not have outputs for those lights).                   |
| Wrong Date or Time in Menus                                       | Date or time needs to be set             | Refer to <i>Setting the Date and Time</i> on page 37.  |
| 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.   |
|   | 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 ( <b>not</b> Short Pulse or Vending).   |
| Very long wait before System Recovery Disk runs                   | Drive A is enabled in the BIOS Settings  | Check the BIOS settings (see page 39). For Asus motherboards, under <i>Main</i> , set <i>Legacy Diskette A</i> to <i>Disabled</i> . For Gigabyte motherboards, under <i>Standard CMOS Features</i> , set <i>Drive A</i> to <i>None</i> . |

## Error Message Screens

The messages below may appear at boot if the software detects a hardware problem. (Upgrade cabinets may also display card dispenser error messages.)

| Boot Error Message  | Explanation and Solution   |
|---|--|
| Dongle Missing or Invalid   | Make sure the USB Game Dongle is firmly connected.   |
| Invalid Dongle: Incorrect Game Version  | Dongle does not match game version. If you upgrade the software, be sure you connect the corresponding Game Dongle.  |
| There is a CD in the Drive  | Eject the CD from the drive. Press the <b>START</b> button to continue to boot the game.   |
| Error Detected with GVRIO Board   | The GVRIO Mini PCB is either disconnected or malfunctioning, or the USB port or cable is faulty. Check all connections to the PCB. Test in a different USB port and with a different USB cable. Replace the PCB if faulty.   |
| Incorrect GVRIO Board   | The screen will display the revision numbers of the GVRIO Mini PCB installed, and the one required. Contact your distributor to order the correct GVRIO Mini PCB.  |
| Select a Link ID<br>(Screen appears if a duplicate Link ID is detected)                           | The cabinet has the same Link ID as another cabinet. Turn the wheel to select a different Link ID from the screen and press <b>START</b> . Number the cabinets in sequence from left to right.   |
| Steering Auto Calibration failed.<br>Please turn the wheel all the way left and all the way right | The software detected a problem with steering. Once you turn the wheel, the software will determine whether the problem is with the steering pot or the force-feedback. If the problem is with the force feedback, you will be given the option to start the system without force feedback. If the steering pot is not working, the game cannot be started. See page 13 for steering service.  |
| Card Reader Missing   | Message will appear at boot if the card reader is not detected.  |
| Attract Mode Error Messages   | Explanation and Solution   |
| A <b>Red Dot</b> appears in the lower right corner of the Attract Screen                          | Indicates hardware error, usually with a button, gas or brake pot, or steering. Explanation is displayed on <b>Machine Settings: Info</b> screen in Operator Menu.   |
| A <b>Blue Dot</b> appears in the lower right corner of the Attract Screen                         | Indicates Cabinet Mismatch error in linked cabinets. Explanation is displayed on <b>Machine Settings: Info</b> screen. The following conditions will cause a Blue Dot error message: <ul style="list-style-type: none"> <li>• <b>Winner Gets Free Game</b> not set the same on all cabinets</li> <li>• <b>Free Game Min Players</b> not set the same on all cabinets</li> <li>• <b>Race Length</b> not set the same on all cabinets</li> <li>• Duplicate Cabinet Link ID</li> <li>• Different Software Comm Version on one or more cabinets</li> <li>• Different Tracks Disabled</li> <li>• Different Region (Set by Game Dongle)</li> </ul> |

## Chapter 6 — Replacement Parts

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

For help with parts identification, refer to the Cabinet Assembly Drawings on the Service Website, <http://service.globalvr.com>.

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

Parts are for both Standard and Deluxe cabinets except as noted.

**Qty** column refers to quantity used per cabinet, with quantities for Deluxe (Dlx) and Standard (Std) shown as applicable.

### Documents and Software

| Item Number  | Qty | Description                                    |
|--------------|-----|--|
| 040-0178-01  | 1   | Operation Manual                               |
| 040-0179-01  | 1   | Software Restore Guide                         |
| 040-0182-01  | 1   | Service & Repair Manual for Dedicated Cabinets |
| 050-0152-01  | 1   | System Recovery Disk (1 CD)                    |
| 050-0155-DVD | 1   | Game Install Disk (1 DVD)                      |

### Cables

| Item Number       | Qty | Description  |
|-------------------|-----|--|
| 115-0005-02       | 1   | Steering to Immersion PCB, Rev. D                          |
| 115-0006-01       | 1   | Motor to Motor Amp Rev B                                   |
| 115-0007-01       | 1   | +24VDC to Motor Amp Rev C                                  |
| 115-0008-01       | 3   | 110VAC to +24VDC Supply Rev C                              |
| 115-0025-01       | 1   | 110 VAC Fan, Grill & Cord Assembly Rev A                   |
| 115-0049-01       | 1   | Power Plate Ground Cable 3.5" Long Rev A                   |
| 115-0145-01       | 1   | Audio Amp to Seat Harness                                  |
| 115-0146-01       | 1   | GVRI/O, Power, USB Main Harness                            |
| 115-0152-01       | 1   | Coin Door & Service Buttons                                |
| 115-0153-01       | 1   | Floor Light Power Harness                                  |
| 115-0157-01       | 1   | Marquee Florescent Light Assembly                          |
| 115-0161-01       | 1   | AC Power, Marquee Lights                                   |
| 115-0167-01       | 1   | Ground, Brake Pedal  |
| 115-0168-01       | 1   | Transformer, Complete Harness Assembly                     |
| 115-0201-01       | 1   | Marquee, Audio & Leader Light (Standard Only)              |
| 115-0202-01       | 1   | AC Power, Marquee Light Extension                          |
| 115-0203-01       | 1   | Coin Meter, Start Lamp, Brake Light                        |
| 115-0204-01       | 1   | Brake & Exhaust Light                                      |
| 115-0205-01       | 1   | To Brake & Exhaust Lights                                  |
| 115-0206-01       | 1   | Main Harness to Speaker, Headlights, Exhaust (Deluxe Only) |
| 115-0207-01       | 1   | To Speakers, Headlights, Marker Lights (Deluxe Only)       |
| 115-0208-01       | 1   | Control Panel Harness                                      |
| 115-0209-01       | 1   | NOS Pedal Interconnect                                     |
| 115-0210-01       | 1   | Shifter & E-Brake  |
| 115-0211-01       | 1   | Shifter & E-Brake, Extension (Standard Only)               |
| 115-0212-01       | 1   | To NOS Pedal   |
| 115-0213-01       | 2   | Turn Signal Sub Assembly (Deluxe Only)                     |
| 115-0214-01       | 1   | Exhaust Sub Assembly                                       |
| 115-0215-01       | 1   | Marquee, Front Speaker, Leader Light (Standard Only)       |
| 115-0216-01       | 1   | Output Exhaust (Standard Only)                             |
| 115-9635-01 REV A | 1   | Ethernet, CAT 5, 10 Ft Long                                |
| 115-DVINPUT-CBL   | 1   | Digital Video Input (DVI) to LCD Monitor                   |

| Item Number | Qty            | Description                           |
|-------------|----------------|---------------------------------------|
| 80-0213-00  | 1              | Power Cord 6', SJT UL Recognized      |
| 96-0539-00  | 3              | Audio Cable, Stereo 3.5 mm 6'         |
| TRD855BL-5  | 1              | RJ-45 CAT 5e Patch Cable, 5 Feet Long |
| USB-AB06MM  | 1-Std<br>2-Dlx | USB Cable 6ft,USB2-Abo6               |

## Cabinet Hardware

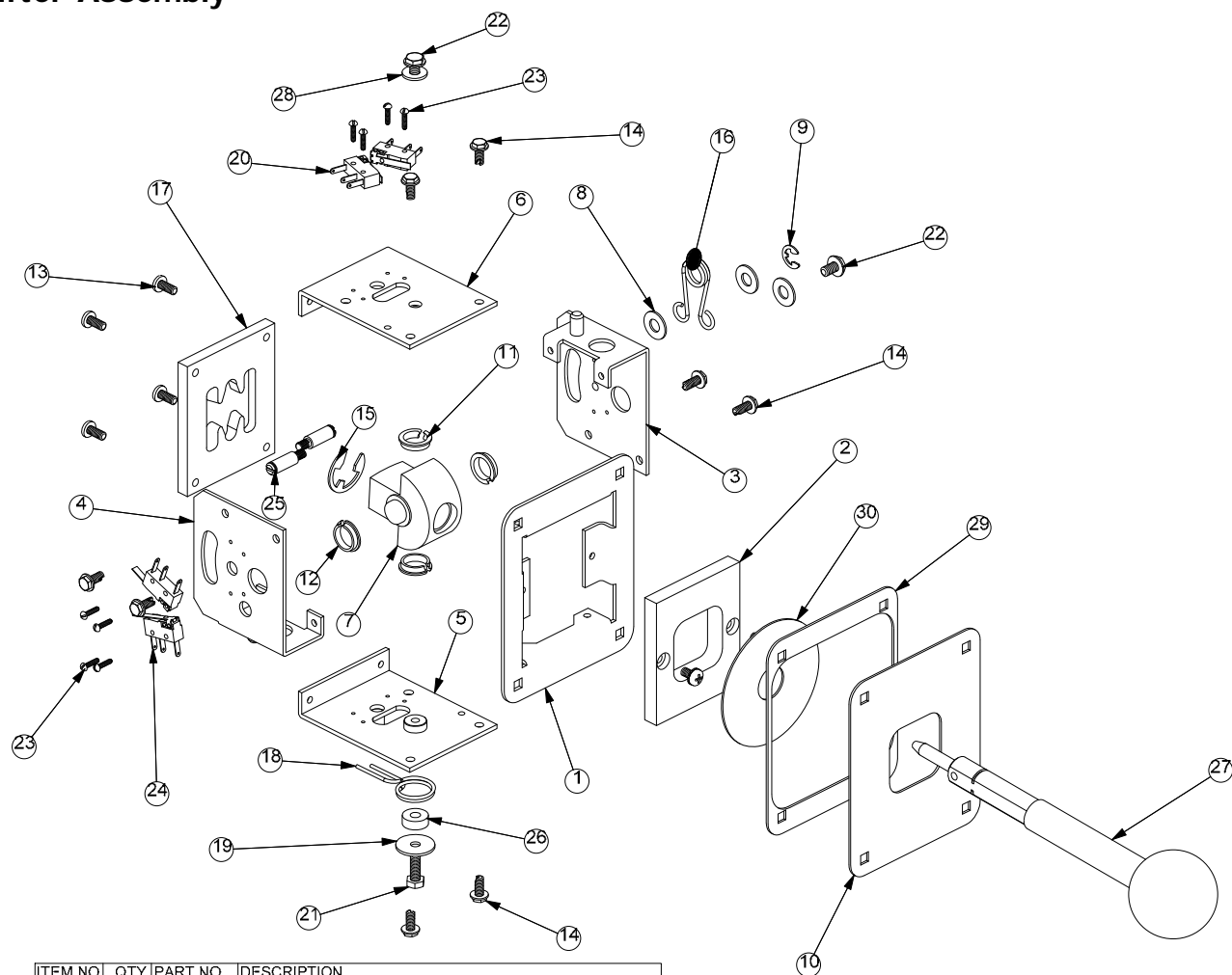
| Part Number                          | Qty | Description  |
|--------------------------------------|-----|--|
| <b>Electronics (Including Power)</b> |     |  |
| (Purchase Locally)                   | 1   | Power Plate Fuse, 6A, Slo Blo, 5mm X 20mm                  |
| 990-0014-CBN                         | 1   | GVRIO Mini – Carbon Version                                |
| 990-LEDX6-UCT-02                     | 2   | PCBA-6 LED-Headlight PCB (Deluxe Only)                     |
| 44-0600                              | 1   | Power Supply 24 VAC  |
| 44-1100-01                           | 1   | Power Supply, 5/12VAC 115 W                                |
| 45077-00                             | 1   | PC Assembly  |
| 49-0963-40                           | 1   | 7 Outlet Surge Protected Power Strip                       |
| 137657                               | 1   | Power Supply, 24VDC - 10 Amps (MW Part# - S-240-24)        |
| 2-30-2434                            | 1   | Transformer, 115-230V, 500W                                |
| CCM1600-ND                           | 1   | Power Entry Module, EMI Filter, PNL MNT, Un-Shield         |
| SCR28I-S033U                         | 1   | Smart Card & Magnetic Stripe Reader                        |
| USB-KQRTG                            | 1   | Game Dongle & Code (Carbon)                                |
| 37201-00                             | 1   | Power Plate, I/O   |
| <b>LCD Monitor Assembly</b>          |     |  |
| FCB-AOD-AWX5-SS32                    | 1   | Flora Digital for Samsung 32" LCD, Estecom (Standard Only) |
| FCB-AOD-AWX7-LG10                    | 1   | 42" LCD Driver Board (Deluxe Only)                         |
| LC420WX7-SLA1                        | 1   | 42" LCD DISPLAY  |
| LTA320WT-L06                         | 1   | LCD, 32", Panel Only                                       |
| 26126-00                             | 1   | Shield, Glass, 42" LCD (Deluxe Only)                       |
| 26138-00                             | 1   | GLASS SHIELD, 32" LCD                                      |
| 37121-00                             | 1   | Bezel, Front LCD, 32" (Standard Only)                      |
| 37126-00                             | 2   | Bracket, 32" LCD Mount (Standard Only)                     |
| 37153-00                             | 1   | Housing, LCD 42 Inch (Deluxe Only)                         |
| 37154-00                             | 1   | Bezel, Front, LCD 42 Inch (Deluxe Only)                    |
| 37169-00                             | 1   | Housing, Rear 32" LCD (Standard Only)                      |
| 37191-00                             | 1   | Cover, LCD Base (Deluxe Only)                              |
| 37192-00                             | 2   | Bracket, 42" LCD Cabinet Mount (Deluxe Only)               |
| 37202-00                             | 1   | Cover-Emissions, 42" LCD                                   |
| 37216-00                             | 4   | Mount, 42" LCD (Deluxe Only)                               |
| <b>Driving Controls</b>              |     |  |
| 50-0413-00                           | 1   | Assembly Dual Pedal W/Chrome Perforated Pedals             |
| 50-0414-31                           | 1   | 6-Speed Shifter  |
| 54-0006-200H1985                     | 1   | "E Brake" Button W/Red Cap                                 |
| 59-6004-800H1628                     | 1   | START Button Assembly                                      |
| 59-6004-822H1998                     | 2   | NOS Button Assembly  |
| 59-6004-855H1625                     | 1   | View Button Assembly                                       |
| 59-6004-855H1626                     | 1   | Music Button Assembly                                      |
| 59-6004-855H1648                     | 1   | Look Back Button Assembly                                  |
| 990-0040-01                          | 1   | Single PCB Steering Board, Immersion                       |
| T-91-S                               | 1   | Assembly, "NOS" Foot Pedal Switch                          |
| 50-0102-14                           | 1   | Steering Mechanism Assembly W/Motor-Wheel-Cover            |
| <b>Lighting</b>                      |     |  |
| 49-1001-00                           | 1   | Fluorescent Light 18"                                      |
| CCFL2R                               | 2   | Assembly Red CCFL Kit                                      |
| CCFL2W                               | 1   | Cold Cathode Fluorescent Light Kit Dual 12", White         |
| M179A                                | 1   | Amber LED Tunnel Light (Exhaust Light)                     |

| Part Number          | Qty | Description  |
|----------------------|-----|--|
| M383C                | 2   | Clear Oval Utility Light (Headlight) (Deluxe Only) |
| METL14R              | 1   | Red LED Light Tube, 14", 12VDC                     |
| METL6R               | 1   | LED Light Tube, Red, 6.13", 12VDC                  |
| 26146-00             | 1   | Housing-Molded-CCFL-Light-Cover (Standard Only)    |
| 26170-00             | 2   | Cover-Headlight, Marquee (Deluxe Only)             |
| 60075-00             | 1   | Reflector-Leader Light (Deluxe Only)               |
| B474A                | 2   | Reflector 2" Amber                                 |
| <b>Audio</b>         |     |  |
| 50-9005-00           | 31  | Speaker, 5 In, 12 Watt, 8 Ohm, Shielded, Happ      |
| 525-VASTECH          | 2   | 5.25" Speaker, 4 Ohm, 150w (Deluxe Only)           |
| 990-0001-01          | 1   | 5.1 Audio Amp Board Populated Rev C                |
| 01-0045-LBH          | 1   | Grill-4" Speaker                                   |
| 37214-00             | 1   | Grill, Standard, Leader Light                      |
| 37189-00             | 1   | Grill, Woofer                                      |
| <b>Miscellaneous</b> |     |  |
| 555-052-1            | 1   | RJ45, Plug-In Connector                            |
| 2569K24              | 1   | Convoluted Sleeving, 18" Long, 3/8" ID             |
| 26001-YEL            | 1   | Marquee Housing - Yellow (Standard Only)           |
| 26005-00             | 1   | Housing, Shifter Cover (Standard Only)             |
| 26015-00             | 1   | Marquee Clear Plastic (Standard Only)              |
| 26074-00             | 1   | Smart Card Reader ESD Bracket                      |
| 26131-00-CBN         | 2   | Housing,-Wheel Panel (Deluxe Only)                 |
| 26132-00-YEL         | 1   | Quarter Panel, Left, Yellow (Deluxe Only)          |
| 26133-00-YEL         | 1   | Quarter Panel, Right, Yellow (Deluxe Only)         |
| 26134-00-YEL         | 1   | Rear Seat Housing, Yellow                          |
| 26161-00             | 1   | Dash Board, Silver                                 |
| 26162-00             | 1   | Floor Mat, Black (Standard Only)                   |
| 26167-00             | 1   | Marquee Housing (Deluxe Only)                      |
| 26169-00             | 1   | Clear Plastic, Pedestal Base (Standard Only)       |
| 26171-00             | 1   | Marquee Clear Plastic(Deluxe Only)                 |
| 26172-00             | 1   | Floor Mat (Deluxe Only)                            |
| 28A2024-0A0          | 3   | Ferrite Bead, Snap On                              |
| 37021-00             | 1   | Seat Panel Base                                    |
| 37032-00             | 2   | Marquee Grill (Standard Only)                      |
| 37040-00             | 2   | Beam Pedestal Support (Standard Only)              |
| 37174-00             | 1   | Shifter Housing (Deluxe Only)                      |
| 37177-00             | 1   | Bracket, Seat Mount (Deluxe Only)                  |
| 37187-00             | 1   | Weldment, Right Quarter Panel (Deluxe Only)        |
| 37194-00             | 4   | Bracket, Quarter Panel                             |
| 37197-00             | 1   | Bracket, Power Supply (Deluxe Only)                |
| 37200-00             | 2   | Bracket, Rear Wheel Support (Deluxe Only)          |
| 37249-00             | 1   | Bracket, Coin Door, Midwidth                       |
| 37250-00             | 1   | Trim-Floor Mat (Deluxe Only)                       |
| 37252-00             | 1   | Bracket, Seat Wrap (Standard Only)                 |
| 37253-00             | 1   | Sheet Metal, Trim Floor Mat (Standard Only)        |
| 37254-00             | 1   | Plate, Profile Wheel Surround (Deluxe Only)        |
| 37255-00             | 1   | Bracket, Card Reader (Standard Only)               |
| 37257-00             | 2   | Bracket, Angle Quarter Panel                       |
| 37258-00             | 1   | Sheet Metal, Shifter Housing (Standard Only)       |
| 37259-00             | 1   | Bracket, NOS                                       |
| 37260-00             | 1   | Sheet Metal, Marquee Hinge (Standard Only)         |
| 37262-00             | 1   | Bracket, Marquee Base (Standard Only)              |
| 37263-00             | 1   | Sheet Metal, Marquee Mount (Standard Only)         |
| 37264-00             | 1   | Sheet Metal, Control Panel                         |
| 37265-00             | 1   | Bracket, Light                                     |



| <b>Part Number</b> | <b>Qty</b> | <b>Description</b>                                       |
|--------------------|------------|--|
| 37266-00           | 1          | Bracket, Switch Plate                                    |
| 37267-00           | 2          | Bracket, Switch Mount                                    |
| 37270-00           | 1          | Sheet Metal, Transformer Plate                           |
| 37271-00           | 0          | Bracket, Multi Cabinet Connector, (2 Per Unit)           |
| 37276-00           | 2          | Grill-Marquee  |
| 37277-00           | 1          | Panel-Marquee-Mount (Deluxe Only)                        |
| 37278-00           | 2          | Plate-Headlight-Mount (Deluxe Only)                      |
| 37279-00           | 1          | Rollbar-Right (Deluxe Only)                              |
| 37280-00           | 1          | Rollbar-Left (Deluxe Only)                               |
| 37281-00           | 1          | Bracket-Spoiler-Mount (Deluxe Only)                      |
| 37282-00           | 1          | Spoiler-Panel (Deluxe Only)                              |
| 37283-00           | 1          | Bracket, Rollbar-Brace (Deluxe Only)                     |
| 37284-00           | 1          | Bracket, Lightbar (Deluxe Only)                          |
| 40-0740-6V         | 1          | Coin Door Assembly, 6V Lamps w/Meter & 4 Service Buttons |
| 49-1019-00         | 3          | PCB Mounting Feet Set Of 4                               |
| 50-0244-NDNC       | 1          | Assembly, Seat, Black, No Decals, No Cover, w/Speakers   |
| 50-0400-00         | 1          | Assembly, Seat Slide Kit                                 |
| 60039-00           | 1          | Computer Mounting Strap                                  |
| 60041-00           | 1          | Foam Base for PC   |

## Shifter Assembly



| ITEM NO. | QTY. | PART NO.   | DESCRIPTION                                       |
|----------|------|------------|---|
| 1        | 1    | 96-0094-00 | BASE PLATE 4 SPD SHFT BLK                         |
| 2        | 1    | 95-2535-00 | GATE BLOCK UPPER MOLDED F/6-SPD SHIFTER           |
| 3        | 1    | 95-2537-00 | PIVOT PLATE F/SHIFTER W/FRONT STANDOFF & SIDE PIN |
| 4        | 1    | 95-2537-10 | PIVOT PLATE F/SHIFTER W/SIDE PIN ONLY             |
| 5        | 1    | 95-2538-00 | SIDE PLATE W/HOLDING PIN                          |
| 6        | 1    | 95-2538-10 | SIDE PLATE NO HOLDING PIN                         |
| 7        | 1    | 50-8346-00 | TRUNNION, FOR I.L. TURBO SHIFTER                  |
| 8        | 3    | 43-0133-00 | #14S BRS FLAT WSH .26X.56X.04                     |
| 9        | 1    | 43-0118-00 | E-RING, 1/4" SHAFT DIA                            |
| 10       | 1    | 50-0416-00 | TOP PLATE, PAINTED, 6-SPD SHFT                    |
| 11       | 2    | 50-8406-00 | BUSHING, NYLINER, F/.078 THK MAT.                 |
| 12       | 2    | 50-8491-00 | BUSHING NYLINER F/.072/.135 THK MAT.              |
| 13       | 4    | 43-1319-00 | SCREW 8-32 X 3/8 PPHMS ZINC                       |
| 14       | 8    | 43-0252-00 | SCREW #8-32 x 3/8 HEX HEAD                        |
| 15       | 1    | 50-8118-00 | E-RING FOR GEAR SHIFTER M15                       |
| 16       | 1    | 50-8294-00 | SPRING, HAIRPIN, HLR SHFTR, SHORT                 |
| 17       | 1    | 95-2536-00 | GATE BLOCK LOWER MOLDED F/6-SPD                   |
| 18       | 1    | 95-1392-10 | TORSION SPRING                                    |
| 19       | 1    | 43-0997-00 | FENDER WASHER .75x.19x.05 ZINC                    |
| 20       | 2    | 95-4194-00 | SWITCH, W/SHORT ACTUATOR                          |
| 21       | 1    | 43-0062-00 | 10-32 X 1/2 HEX HD CAP SCREW                      |
| 22       | 2    | 43-1152-00 | SCREW 10-32 X 5/16 HWHCS ZINC PLATED              |
| 23       | 8    | 43-0013-00 | 2-56 X 3/8 SCR SLOTTED ROUND HEAD MS ZINC         |
| 24       | 2    | 95-4369-00 | SWITCH ASSY DA3 95-4118-00 & 95-4130-07           |
| 25       | 2    | 50-8299-10 | ANCHOR PIN, HANDLE BLK OXD.                       |
| 26       | 1    | 43-0559-00 | WASHER NYLON 1/2 OD X .20 ID X .185 THK           |
| 27       | 1    | 96-0090-10 | KNOB & SHAFT ASSY 1-3/4 BLK BALL KNOB             |
| 28       | 1    | 43-0995-00 | #10 FLAT WASHER                                   |
| 29       | 1    | 95-2674-00 | BASE PLATE 4 SPD SHFT BLK                         |
| 30       | 1    | 95-2557-00 | GUIDE WASHER FOR 6-SPEED SHIFTER                  |

Drawing © Happ Controls

Figure 24. Shifter Assembly Exploded View and Parts

## Pedal Assembly

| ITEM NO | QTY | PART NO.   | DESCRIPTION  |
|---------|-----|------------|--|
| 1       | 1   | 95-2534-00 | PEDAL & BEAM ASSY PERFORATED BREAK CHROME          |
| 2       | 1   | 95-2520-00 | PEDAL & BEAM ASSY PERFORATED GAS CHROME            |
| 3       | 1   | 50-8372-90 | PEDAL FRONT PLATE DUAL SMOOTH BLACK                |
| 4       | 1   | 50-2588-00 | SIDE PLATE RIGHT & LEFT                            |
| 5       | 4   | 50-8171-00 | BUMPER   |
| 6       | 8   | 50-8170-00 | SPACER, TUBE                                       |
| 7       | 1   | 50-8042-00 | SPRING F/PEDAL, RH HELIX                           |
| 8       | 2   | 50-8049-00 | SPRING F/PEDAL, LH HELIX                           |
| 9       | 2   | 50-2979-00 | PIVOT SHAFT, PAINTLOC                              |
| 10      | 2   | 50-8089-02 | GEAR, 1MOD, 12T, .25 BORE                          |
| 11      | 2   | 96-4916-00 | LONG LIFE POT W/NUIT & WSHR 5K                     |
| 12      | 2   | 95-0925-00 | GEAR SEG 1MOD 80T                                  |
| 13      | 8   | 43-0726-00 | CARRIAGE BOLT, 1/4-20 X .50 BLK OXD.               |
| 14      | 9   | 43-0075-00 | SCREW, M5 X 60MM HHCS                              |
| 15      | 2   | 43-0269-00 | SCREW, M6 X 30MM HHCS                              |
| 16      | 9   | 43-0068-00 | LOCKWASHER, M5 RIBBED                              |
| 17      | 8   | 90-1209 00 | 1/4-20 HEX NUT W/KEPS                              |
| 18      | 2   | 43-0983-00 | LOCKWASHER M6 RIBBED                               |
| 19      | 2   | 43-0050-00 | HEX NUT M4   |
| 20      | 2   | 43-0051-00 | SCREW, M4 X 16 MM HHCS                             |
| 21      | 4   | 43-0198-00 | WASHER, M4 FLAT WSH DIN 125A                       |
| 22      | 2   | 43-0277-00 | SET SCREW, M4X8MM CUP POINT                        |
| 23      | 9   | 43-0125-00 | NUT M5   |
| 24      | 4   | 50-2587-00 | BUSHING .35 DIA 5/16 O.D.                          |
| 25      | 2   | 50-0097-00 | WASHER GUIDE 4.38 X 1.75 W/44 SQ HL BLK PLST       |
| 26      | 1   | 50-0008-00 | COMPRESSION SPRING .94 OD X 2.00 LG X .125 DIA WV. |
| 27      | 1   | 50-0011-00 | CYLINDER & TUBE ASSY., I.T. PEDAL                  |

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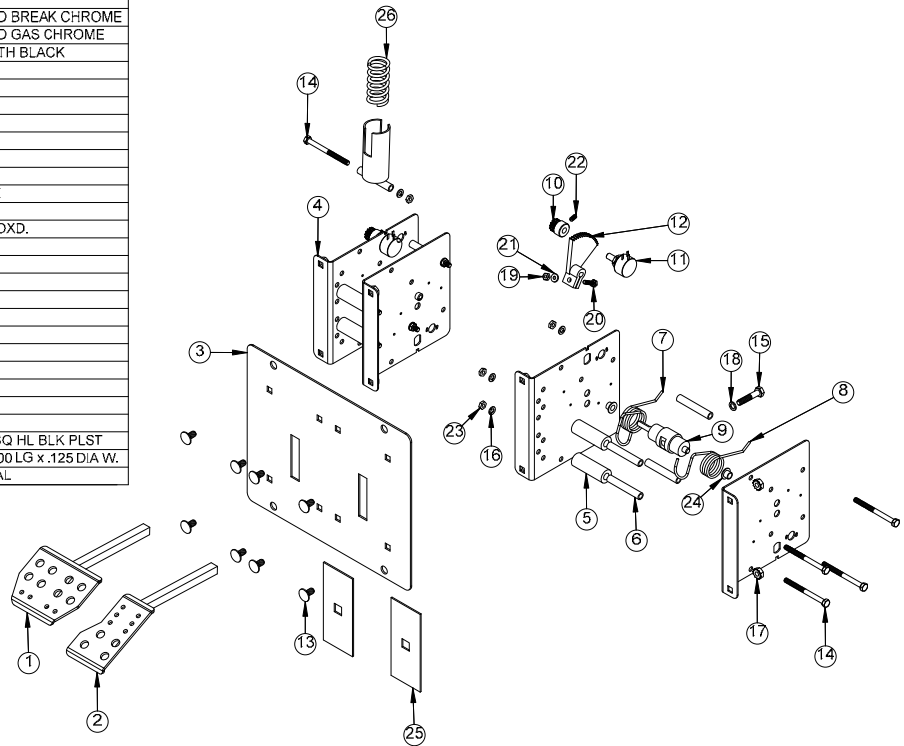


Figure 25. Pedal Assembly Exploded View and Parts

## Steering Assembly

| ITEM NO. | QTY. | PART NO.    | DESCRIPTION                             |
|----------|------|-------------|---|
| 1        | 1    | 143-0341-00 | SCREW, 1/4-28 X 1 SHCS                  |
| 2        | 150  | 4014-00     | SHAFT, 270 DEG. ACTIVE WHEEL            |
| 3        | 1    | 143-0305-00 | KEY, 3/16 SQ. X .74                     |
| 4        | 243  | 0232-00     | NUT, HEX NYLOCK 1/2-20                  |
| 5        | 143  | 0340-00     | LOCKWASHER, EXT. M12                    |
| 6        | 150  | 2092-00     | KEY, SHAFT 4MM x 4MM x 25MM             |
| 7        | 143  | 1170-00     | SCREW, #6-32 x 3/8" SHCS                |
| 8        | 150  | 4043-00     | MOTOR & CONNECTOR ASY.                  |
| 9        | 150  | 4016-00     | WHEEL MTG. BRACKET                      |
| 10       | 150  | 8129-00     | BEARING HOUSING                         |
| 11       | 250  | 8130-00     | BEARING, .59 ID X 1.259 OD              |
| 12       | 150  | 8455-00     | MOTOR MTG. BRACKET                      |
| 13       | 150  | 2659-00     | BEARING SPACER                          |
| 14       | 150  | 4040-PL     | PULLEY, 1BT 1 1/5 PITCH, PLASTIC        |
| 15       | 443  | 0188-00     | SCREW, #8-32 x 3/8" HEX WASHER HD       |
| 16       | 443  | 0576-00     | SCREW, M6 x 60MM HHCS                   |
| 17       | 190  | 1209-00     | FLAT WASHER, 1/4 I.D.                   |
| 18       | 150  | 2545-00     | BRACKET, BELT TENSIONER                 |
| 19       | 442  | 0993-00     | NUT 10-32 HEX WSEMS, ZINC PLTD          |
| 20       | 243  | 0117-00     | HEX HD CAP SCREW M10x30 GR.8.8          |
| 21       | 443  | 0978-00     | SCREW, M10 x .40MM HHCS                 |
| 22       | 150  | 8145-00     | DIE CAST WHEEL STOP, W/BUMPERS          |
| 23       | 443  | 0034-00     | LOCKWASHER M10 RIBBED                   |
| 24       | 443  | 0035-00     | NUT HEX M10                             |
| 25       | 150  | 4045-PL     | STOPPER PIE CAM & PLASTIC PULLEY        |
| 26       | 150  | 4041-00     | TIMING BELT, BLACK 3/8" WIDE            |
| 27       | 150  | 2670-00     | 5K POT, NEI "SENSORCUBE"                |
| 28       | 143  | 0118-00     | LOCKWASHER, INT. 3/8" x 9/16"           |
| 29       | 143  | 0014-00     | HEX NUT 3/8"-24 X 3/32 THK              |
| 30       | 150  | 4018-00     | POT. MTG. BRACKET                       |
| 31       | 150  | 4032-00     | SPACER, POT MTG. BRACKET                |
| 32       | 143  | 0184-00     | SCREW, #10-32 x 3/8" PHFPHD             |
| 33       | 143  | 0995-00     | #10 FLAT WASHER                         |
| 34       | 143  | 0735-00     | SCREW, M4 X 12 SHCS                     |
| 35       | 150  | 2511-00     | ATARI GAMES PATENT DECAL                |
| 36       | 150  | 2525-00     | SPLIT HUB FOR 5/8" SHAFT & 1/4-20 TAP   |
| 37       | 150  | 1035-00HD   | SOFT SUEY TUBER TYPE 60 DUROM           |
| 39       | 150  | 2715-00     | CAP WITH CHECKERED FLAPS LOGO           |
| 40       | 343  | 0328-00     | SCREW, 1/4-20 X .75" SOCKET HD CAP B.O. |
| 41       | 643  | 0284-00     | SCREW, 8-32 X 1/2 TORX TP B.H.          |
| 42       | 143  | 1554-00     | STAR WASHER M14 EXTERNAL TOOTH          |

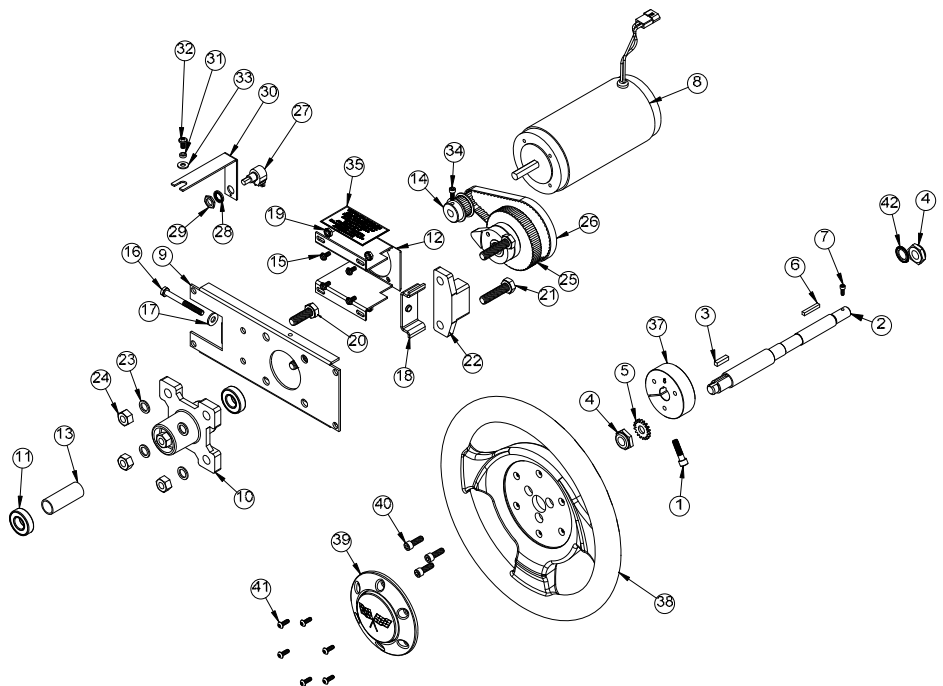


Figure 26. Steering Assembly Exploded View and Parts

## Artwork and Exterior Plastic Parts (Deluxe)



### Additional Decals Not Shown Above (Not to Scale)



Figure 27. Deluxe Cabinet Artwork

## Artwork and Exterior Plastic Parts (Standard)



CBN-AW-14  
NOS Bottle Decal

### Additional Decals Not Shown Above (Not to Scale)



GVR-AW-03  
Card Reader Decal



GVR-AW-02  
GLOBAL VR Logo



CBN-AW-15  
NOS Pedal Decal



CBN-AW-13  
Shifter Plate Decal



Figure 28. Standard Cabinet Artwork

## Chapter 7 — Diagrams and Schematics

**Note:** Cabinet Assembly Drawings can be found on the Service Website, <http://service.globalvr.com>.

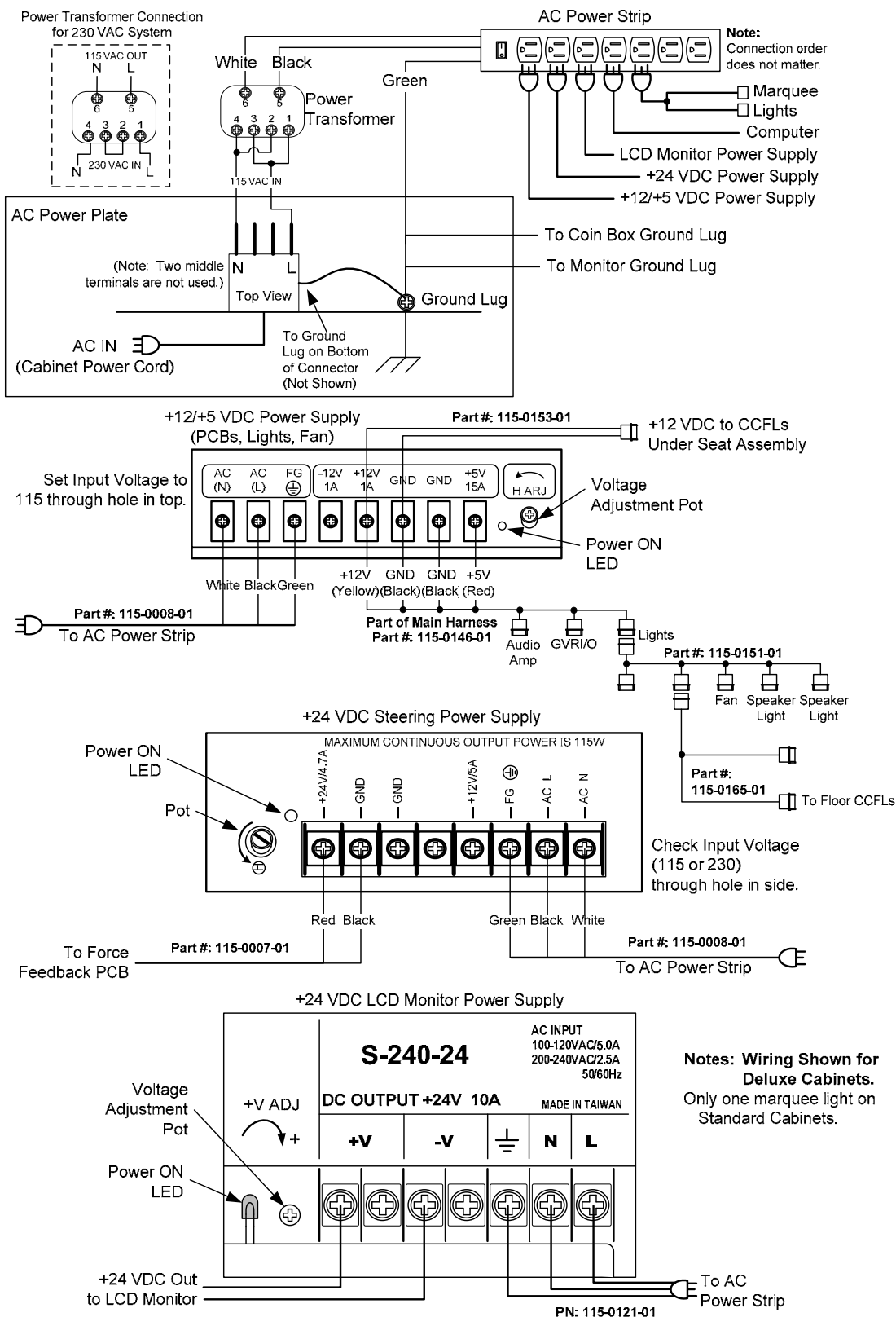


Figure 29. Power Distribution Diagram



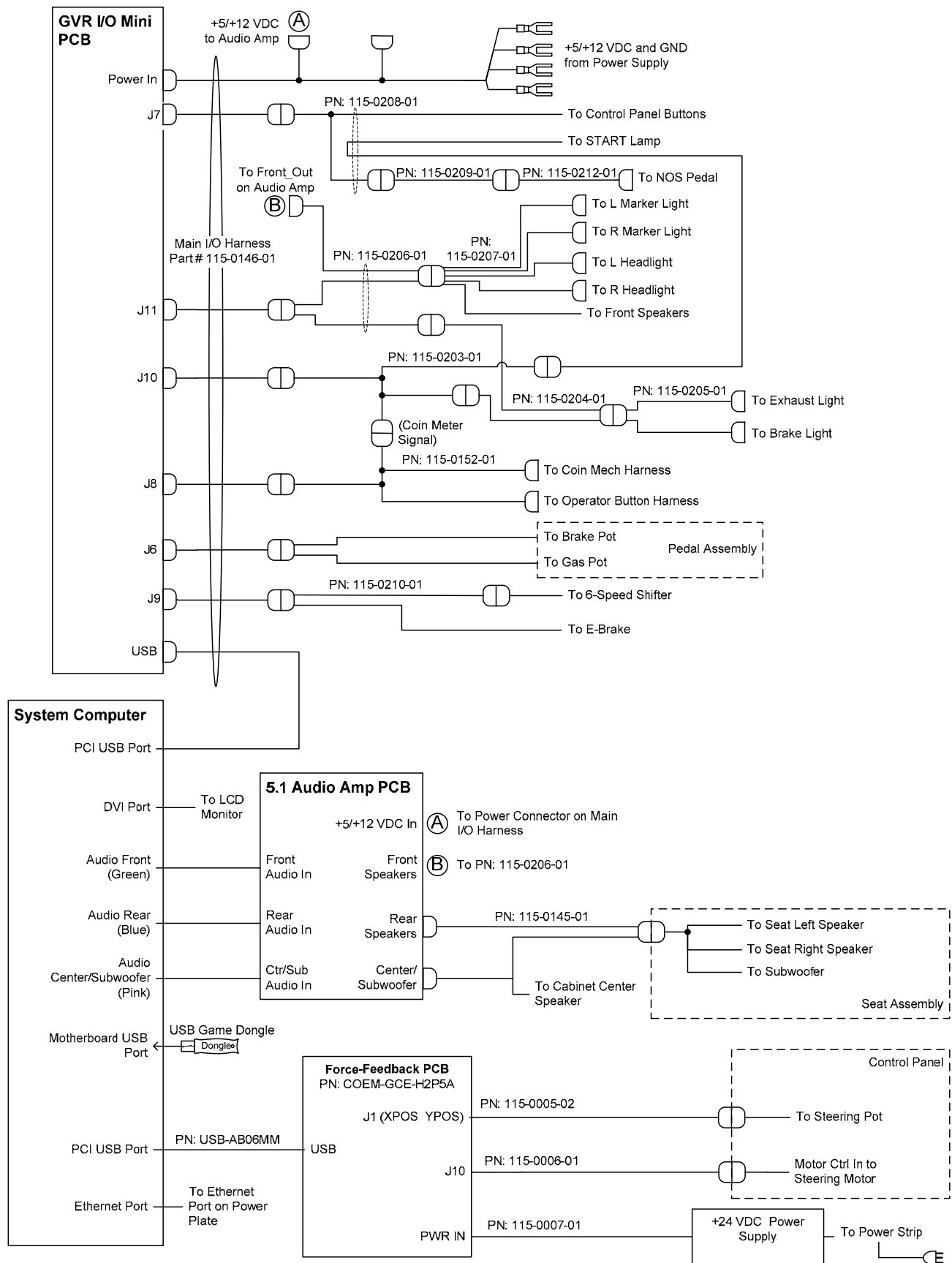
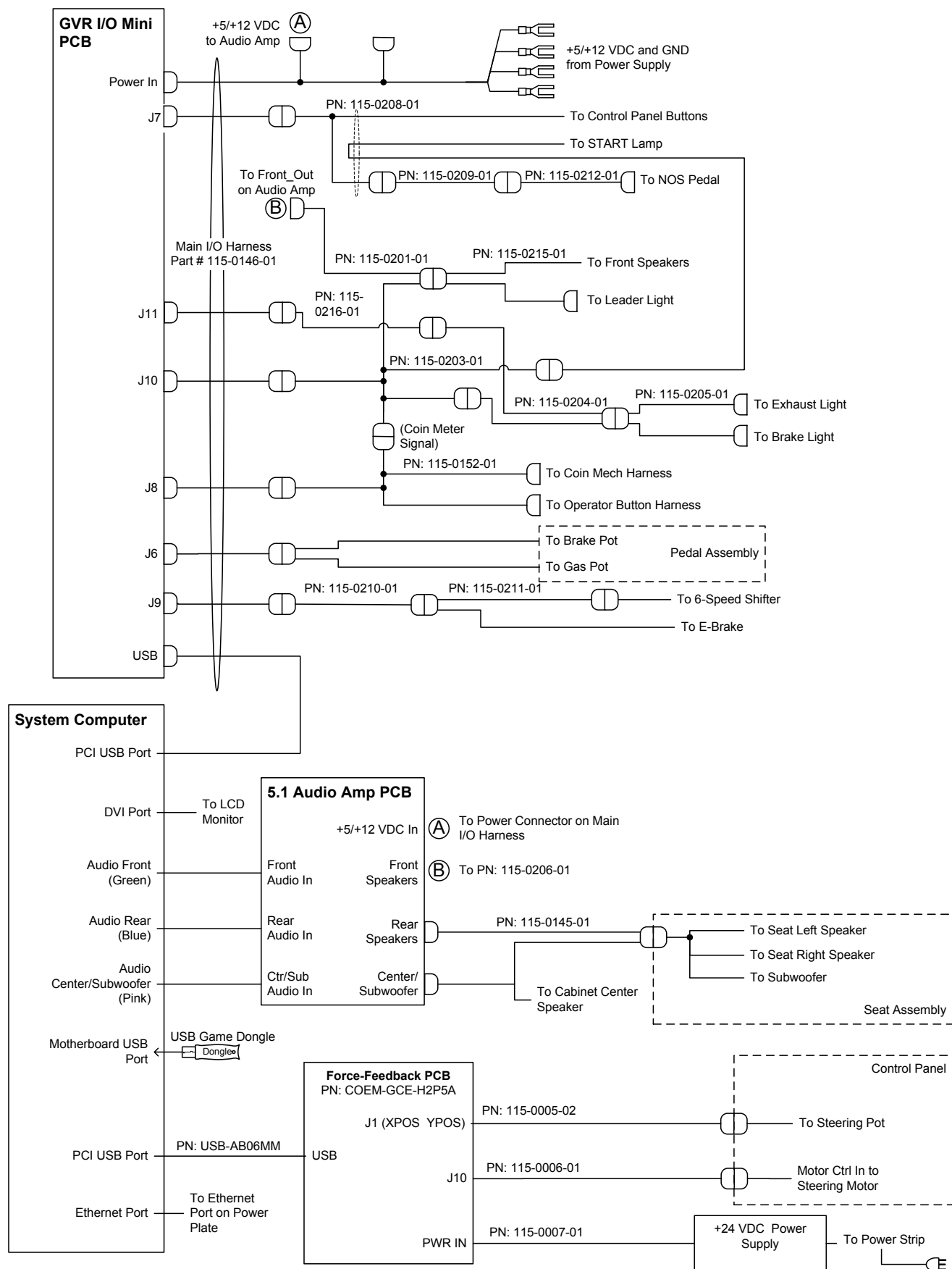


Figure 30. Simplified Wiring Diagram—Deluxe Cabinet



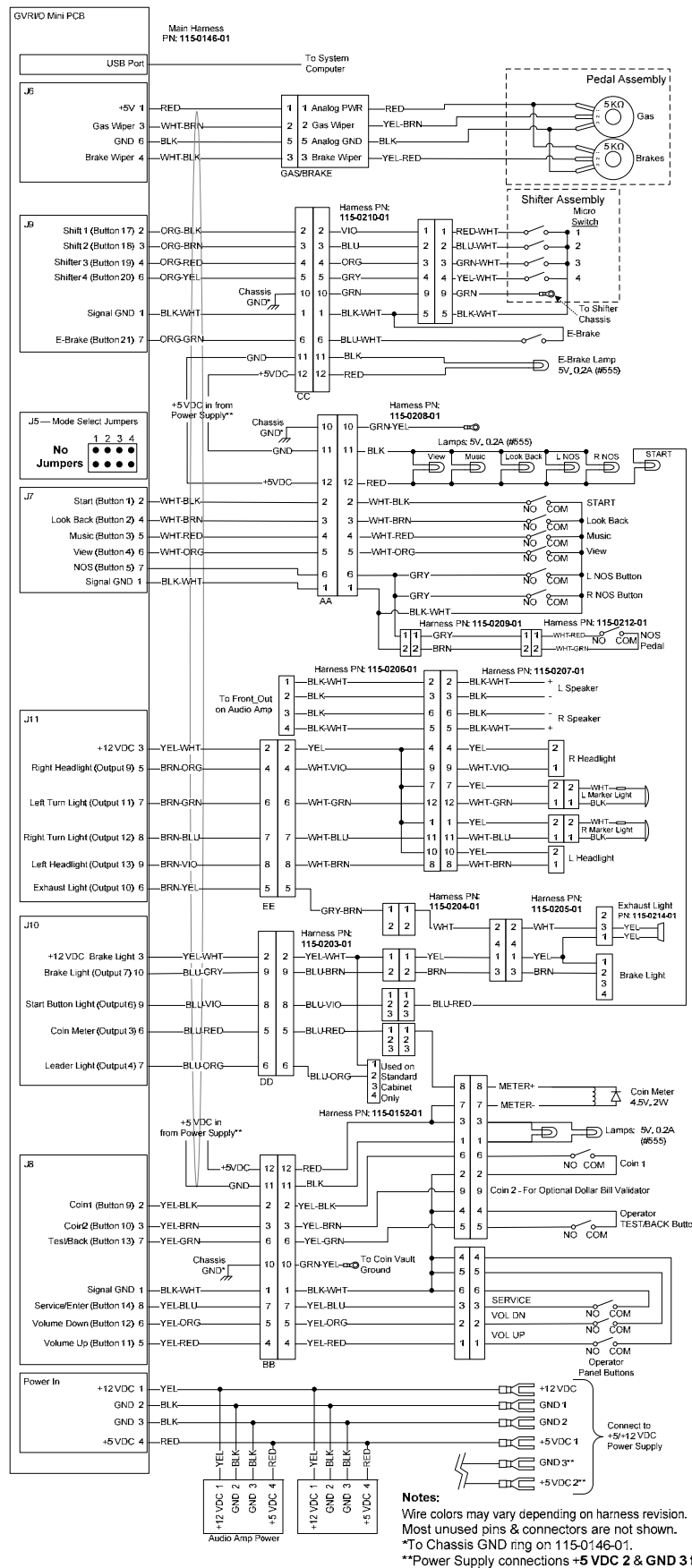


Figure 32. Detailed Wiring Diagram—Deluxe Cabinet

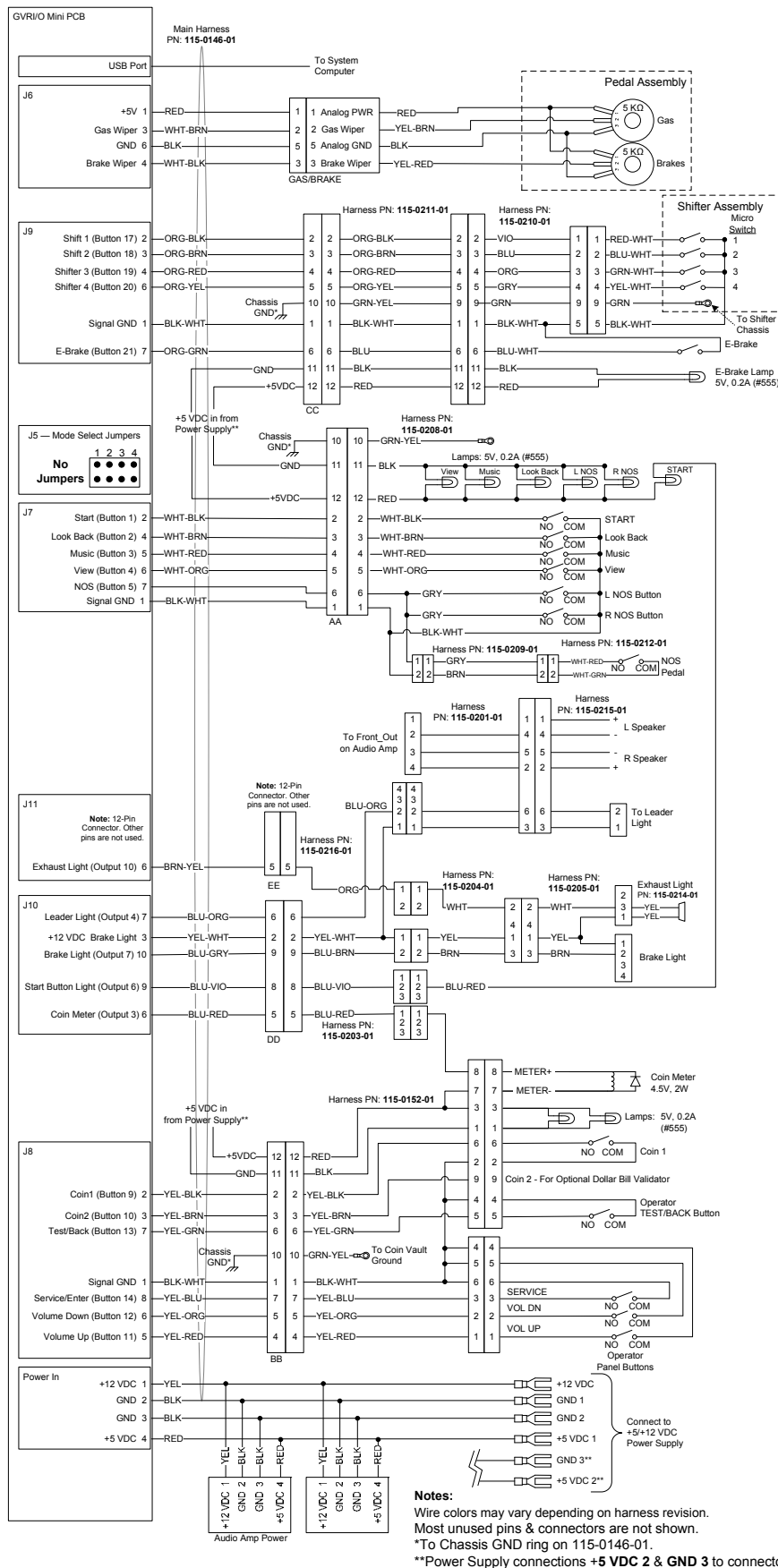


Figure 33. Detailed Wiring Diagram—Standard Cabinet

### Computer Rear with Gigabyte GA-G31MX-S2 Motherboard

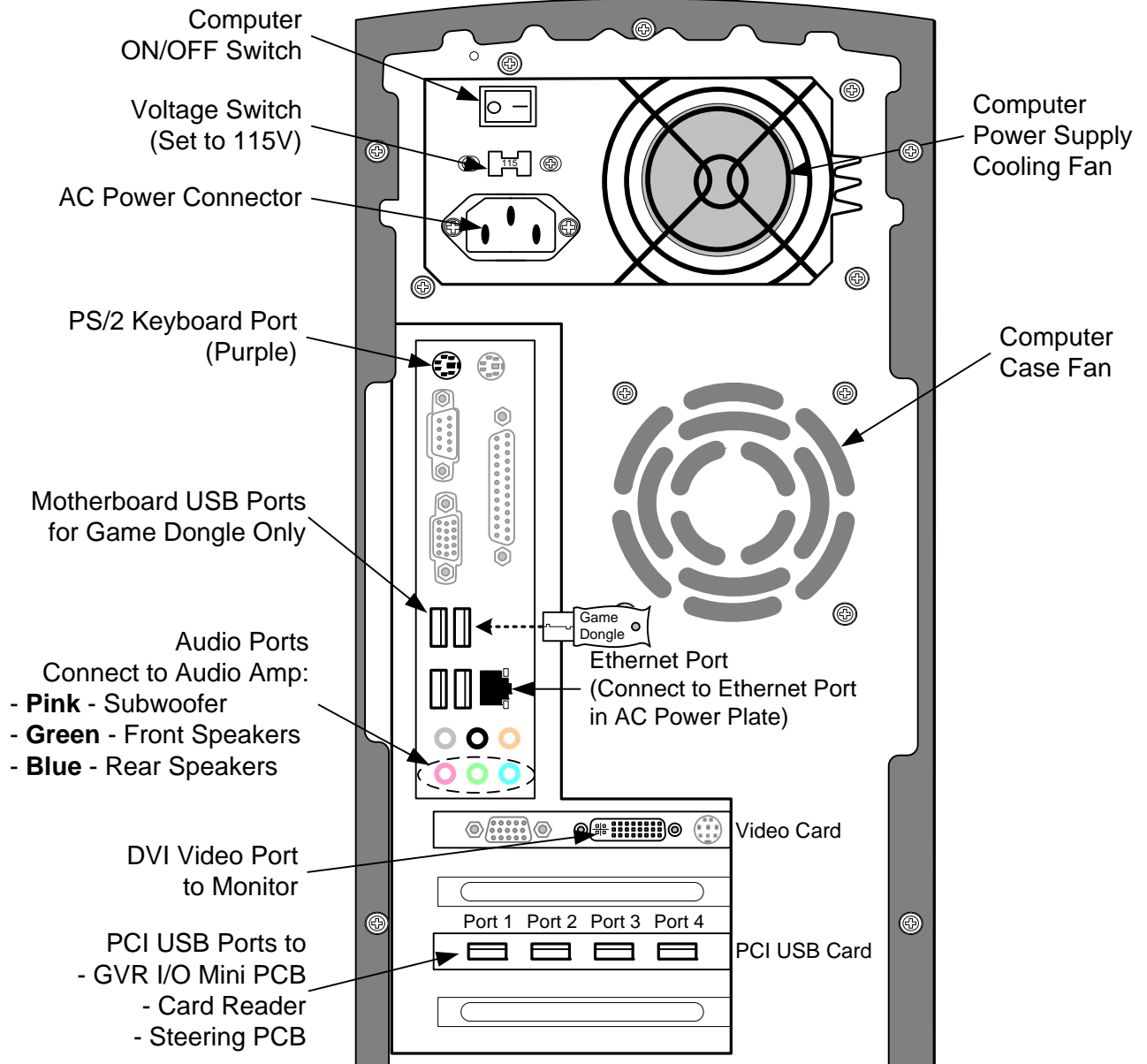


Figure 34. Computer Rear Panel with Gigabyte Motherboard

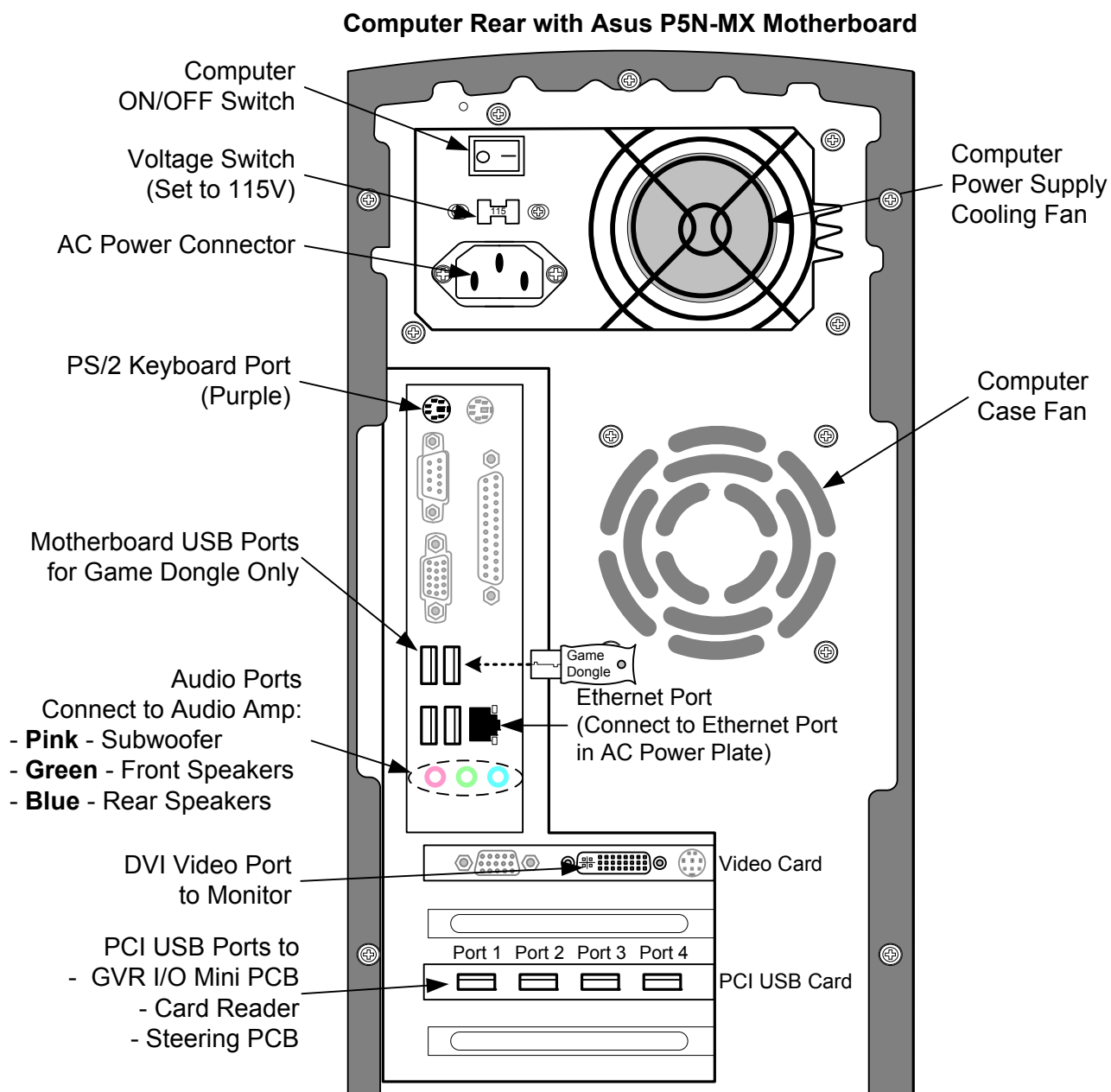


Figure 35. Computer Rear Panel with Asus Motherboard

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- All claims for warranty service are made within the warranty period;
- Products are returned adequately packed and freight prepaid to GLOBAL VR<sup>®</sup>'s designated service center;
- GLOBAL VR<sup>®</sup>'s inspection or test of the Product verifies to GLOBAL VR<sup>®</sup>'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.

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

**Phone:** 408.597.3435

**Fax:** 408.597.3437

**E-mail:** [techsupport@globalvr.com](mailto: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: \_\_\_\_\_
- Game Version (from Operator Menu): \_\_\_\_\_
- OS Version (from Operator Menu): \_\_\_\_\_
- Dongle Version (from Operator Menu): \_\_\_\_\_
- IO 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 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](mailto:techpubs@globalvr.com)