Installation & Service Manual for Dedicated Cabinets

040-0264-01 Rev. A

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

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Preface

Safety

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

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

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

- Some non-115 VAC games contain a power transformer to convert local voltage to 115 VAC. Otherwise, electronic components in the game cabinet run on the local voltage, and the voltage switches on the computer, monitor, and DC power supplies must be set to the local voltage. Please confirm that your local voltage matches the voltage sticker on the cabinet before connecting to AC power.

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

Precautions for Game Operation

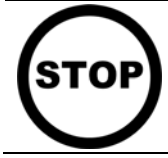
GLOBAL VR® assumes no liability for injuries incurred while playing our games.

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

Warnings

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

If 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!

Environmental Conditions

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

FCC Notices (United States)

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

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

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

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

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

Operation is subject to the following conditions:

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

Chapter 1 — Introduction

Cabinet Specifications

Cabinet Dimensions & Weight

With the full marquee installed, the cabinet dimensions are Width: 60” (153 cm), Depth: 68” (173 cm), Height: 84” (214 cm). Weight is approximately 470 lbs (214 kg).

Current Requirements (Approximate)

Voltage	Inrush	Operating
115 VAC	7 Amps	5 Amps
230 VAC	3.5 Amps	3 Amps

Hardware Features

- Dual-core computer
- Nvidia® GeForce® graphics
- 42" or Larger HD monitor
- Supports dollar bill validator
- Easy Installation
- Surround Sound Audio
- Force-Feedback Steering
- Link up to 4 Cabinets
- Stylized Marquee with Special-Effects Lighting for Yellow-Label Operation

Cabinet Installation

Unpack and Inspect the Cabinet

1. Carefully remove the cabinet, monitor, and marquee assembly from the shipping container, giving yourself plenty of space. Inspect for any obvious damage.
2. Remove the keys from the coin return slot. Open the coin door to locate the second set of keys.

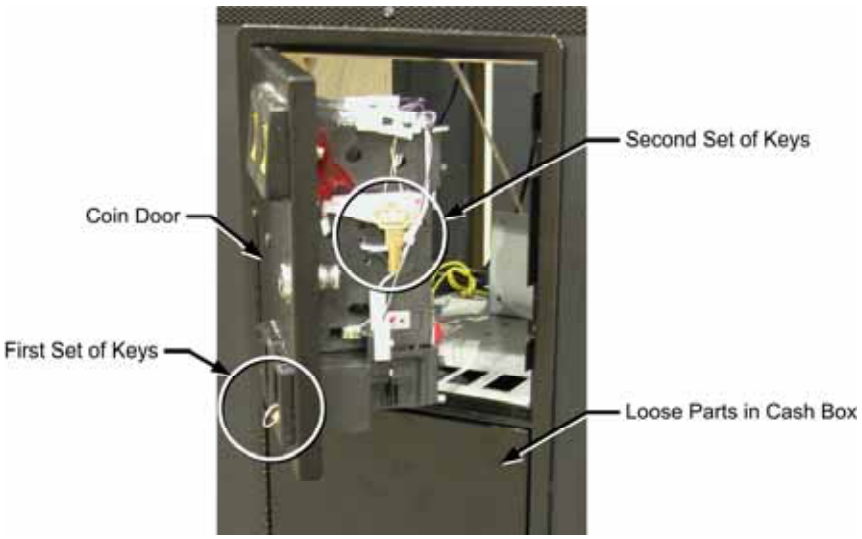


Figure 1. Coin Door with Key Location

3. Locate the loose parts inside the cash box and in separate packaging. You should find the following items (may vary with cabinet style):

   - CAT-5 Network Cable
   - AC Power Cord
   - Hardware for Securing Display Cabinet and Seat Cabinet together
   - System Recovery Disk
   - Game Install Disk
   - Operation Manual
   - Installation & Service Manual (This Document)
   - Software Restore Guide
   - Setting the Computer BIOS (CMOS) Instructions

4. It is advisable to check inside the cabinet in case any components have shifted or come loose during shipping. Remove the doors from the back of the cabinet and verify that all components are securely mounted, and all cables and wires are securely connected. See pages 39 & 40 for wiring diagrams.

Monitor & Marquee Installation

Important: Installing the Monitor and Sintra Marquee is a two-person job.

Install the Monitor and Connect Leader Light & Marquee Light

1. Connect the Power and HDMI Cables to the monitor.
2. Secure the monitor to the cabinet with the four mounting bolts. Place a lock washer, then flat washer on each bolt before inserting it from inside the cabinet.
3. Two LED Strip Lights are installed on the upper rear of the monitor. Connect them as follows:
   a. The shorter strip is the Leader Light. Connect it to the PC power connector with the Blue and Yellow wires hanging from the hole in the top of the cabinet.
   b. The longer strip will illuminate the marquee. Connect it to the PC power connector with the Black and Yellow wires hanging from the hole in the top of the cabinet. Drop the power connectors into the cabinet.

Install the Marquee

The Sintra Marquee assembly is made up of three pieces, the Marquee/Bezel, the Logo, and the Guns (for yellow-label operation only). The Guns have LED Special-Effects Lighting installed. The marquee is pre-assembled at the factory.

To install the Marquee Assembly, refer to Figure 2 and note the seven (7) mounting screw locations. Do the following steps:

1. Position the Marquee Assembly over the back of the cabinet, with the logo facing the front above the monitor.
2. If using the Marquee Guns with Special-Effects Lighting, drop the Power/Control Cable with PCB through the hole in the top of the cabinet. Remove the Electronics Access Panel on the back of the cabinet and fish the connector and PCB through to the area where the other PCBs are mounted. Connect it to a power connector inside the cabinet and use the screw-mounted cable tie to secure the assembly to the cabinet near the other PCBs.
3. While a second person supports the Marquee Assembly, secure it to the cabinet with the seven (7) ¼-20 x ¾" screws with flat washers provided. The screws mate with T-nuts in the cabinet.

4. If you wish, you can power on and test the cabinet now, as described on page 9. Turn the cabinet OFF and disconnect the power cord before continuing with installation.

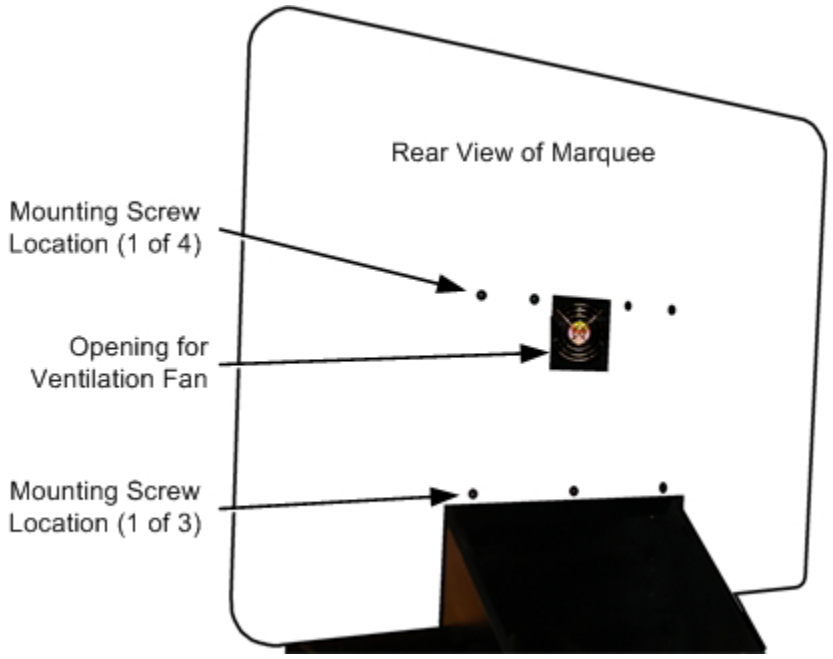


Figure 2. Rear View of Sintra Marquee

Seat Assembly Installation

1. Insert the seat runners so that they extend out from the cabinet, as shown below. Secure each runner with four (4) 1/4-20 x 1-1/4" hex-head bolts with lock washers and flat washers.

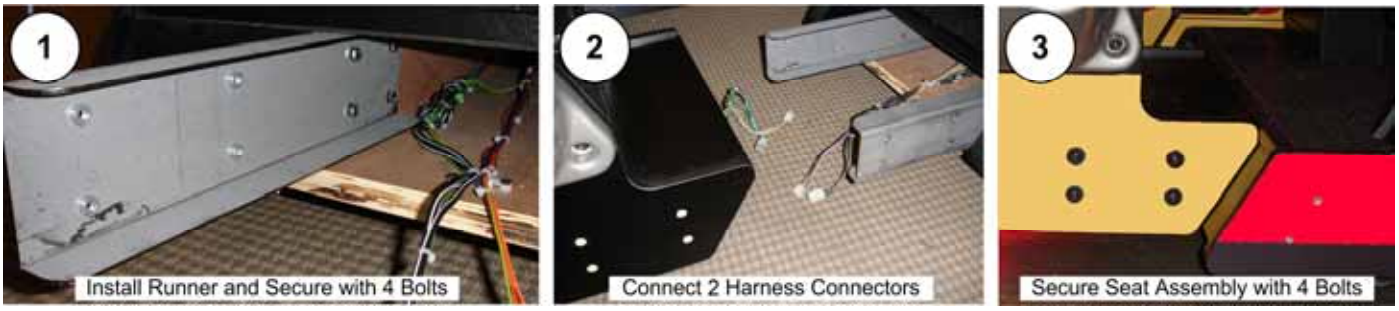


Figure 3. Installing the Seat Runners

2. Slide the seat assembly onto the seat runners, leaving enough space to connect the harnesses.
3. Connect the two (2) harness connectors between the Display Cabinet and seat assembly. One is audio to the speakers, the other is power to the LED lights.
4. Slide the seat assembly towards the cabinet while guiding the wire harnesses inside. Attach the seat assembly to the seat runners using four (4) 2-1/4" T-27 Torx security screws with 1/4" lock washers and fender washers.

Power On and Test

1. Connect the AC power cord from the cabinet to a grounded (3-terminal) AC outlet and turn ON the ON/OFF switch on the lower rear of the cabinet. If a Found New Hardware Wizard appears onscreen, power cycle the game.
2. Verify that the game boots properly and the Attract Movie starts. If the Cabinet Linking Error screen appears, see page 10 for troubleshooting information. If any other error messages appear, please refer to the troubleshooting tables in your *Redline Rampage Operation Manual* (Part # 040-0267-01).
3. Play a game to verify proper operation.
4. Press the **Test** button inside the coin door to open the Operator Menu, and select **Diagnostics** to test controls and audio.
5. Use the Operator Menus to set up audio volume, pricing, and other Operator Settings. See your *Redline Rampage Operation Manual* for details on using the Operator Menus.

Green-Label Operation

To Operate in Green-Label mode, with no guns on the cars, select **Green-Label** as the Label Color under **Game Settings** in the Operator Menu.

Remove the Guns from the Marquee Assembly if necessary, and apply the Green-Label sticker.

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.

Two cabinets can be linked directly; you do not need a cross-over coupler. If you use a coupler to link two cabinets, it must be Gigabit compliant. To link three or four cabinets, connect the Ethernet cable from each cabinet to a Gigabit-compliant Ethernet hub or switch (not included).

Figure 4. Linking Cabinets

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. For best results run the same software version on all linked games.

- **To link two cabinets:** Connect one Ethernet cable to the Ethernet port on the power plate of both cabinets.
- **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). The hub or switch must support 10/100/1000 Mbps (Gigabit) connection speed. Connect the Hub or Switch to AC power.

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
- Free Game Min Players
- Winner Gets Free Game
- Disabled Tracks

Cabinet Linking Troubleshooting

The issues below can prevent cabinets from linking properly.

Cause	Possible Solution
Faulty wiring	Verify that a CAT-5 (8-wire) Ethernet cable is connected between the Ethernet port on the AC Power Plate and the computer. 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 link two cabinets, connect an Ethernet cable to the Ethernet port on the power plate of each cabinet. If you use a cross-over coupler make sure it is Gigabit compliant. **Do not** use a cross-over coupler with a hub or switch.
Cross-over coupler is not Gigabit compliant	All components used to link cabinets must be Gigabit (10/100/1000 Mbps) compliant. Couplers shipped with older cabinets are not Gigabit compliant.
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	A 10/100/1000 Mbps (Gigabit) hub or switch is required to link three or four cabinets.
Duplicate Link ID numbers	A cabinet with a duplicate Link ID number will display the *Select A Link ID* menu. You can also check or change the Link ID from the Operator menu **Machine Settings: Settings** 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 **Machine Settings: Info** screen. If Comm Versions are different, re-install software as needed (see page 13) so that all games are running the same software version.

Setting the Date and Time

The date and time are not seen on any gameplay screens, but are displayed in the Operator menus, including the collections screens.

You can change the date and time in the Computer BIOS (CMOS) Setup Utility. Refer to the separate document titled *Setting the Computer BIOS (CMOS)* for the motherboard in your system computer. This document is included with your game and is also available from the Hardware Reference Page at **http://service.globalvr.com/reference**.

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: If you replace your computer, **remove the dongle and keep it with the cabinet**.

Figure 5. USB Game Dongle

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 *Redline Rampage 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.

Chapter 2 — Software Restoration

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.

For best results, open the DVD-ROM Drive and inspect the tray. If it is dirty, gently wipe it with a clean, soft cloth or use a CD/DVD Laser Lens Cleaner, available at electronics and music stores, and even drugstores, to clean the lens in the drive to help ensure it reads the software disks properly. If you have continued problems with a drive, you can replace it with a plug-and-play compliant SATA DVD-ROM drive.

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.)

Software Restoration takes about 20 minutes.

Run the System Recovery Disk

1. Insert the System Recovery Disk in the DVD-ROM drive and power the cabinet OFF and then ON. When the computer reboots, the disk should run automatically (wait about a minute). You will see messages onscreen as files are copied to the hard drive.
2. After about 8 minutes, the computer will eject the disk and prompt you to remove the Disk and reboot the computer. Do not insert the Game Install Disk yet! The software will setup the drivers and then reboot after about 3 minutes. After another 3 minutes, you will be prompted to "Please insert Game Disk number 1." Proceed to Run the Game Install Disk.

Run the Game Install Disk

1. With the cabinet powered ON, insert the DVD labeled **Game Install Disk 1 of 1**. The DVD will automatically run. You will see a series of onscreen messages as the software copies

components and files to the hard drive. After about 10 minutes the game will automatically reboot and then finalize thesoftware installation.

2. About 11 minutes after you inserted the Game Install Disk a screen will appear saying "There is a Disk in the drive." Remove the DVD and press the **START** button. Keep the disks in a safe place in case you need them in the future.

Test and Set Up

1. After you remove the disk and press the **START** button, 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.
2. 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. Turn the wheel to select an available Link ID and press the **START** button.

   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.
3. Once the attract movie begins, play one game to finalize hardware calibration and verify proper operation.
4. Press the Operator button and set the sound volume levels and any other desired cabinet settings from the Operator Menus.

Chapter 3 — Service and Repair Procedures

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.

DANGER

Always turn the cabinet OFF and disconnect the AC Power Cord before performing any repair work.

Access Panels on Cabinet Rear

Figure 6. Cabinet Rear Access Panels (Shown with Marquee Removed)

Use the access panels on the rear of the cabinet to service internal components.

Upper Opening: This opening is normally covered by the marquee bezel. Remove the Marquee Assembly as described on page 30 to access the monitor mounting bolts or ventilation fan.

Electronics Access Panel: Remove four (4) Torx® screws to open the panel and access the Audio Amp PCB, GVRI/O Mini PCB, Steering Board, and Marquee Special-Effects Lighting Control PCB.

Rear Door: Open to access Computer, DC Power Supplies, and other Power Distribution components.

Removing the Control Panel Assembly

Do the following to remove the entire control panel assembly, with the steering motor, from the front of the cabinet.

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. Remove the Electronics Access Panel and reach through to disconnect the following five (5) connectors:
   - Steering pot harness (**Note:** Tugging or pulling these wires can damage the steering pot.)
   - Steering Motor Power Harness
   - Fire Buttons 2-pin Molex connector (If Used)
   - 12-pin Molex connector from the control panel buttons.
   - Start button lamp harness
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. Make sure all wires are free of the cabinet; avoid tugging or pulling any wires.
5. Reverse these steps to re-install the control panel assembly.

Disassembling the Control Panel

To replace the buttons that are mounted in the plastic housing or the LED light strip, you will need to disassemble the control panel. See page 36 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 BOOST 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. See Figure 22 on page 36 for an exploded-view drawing of the steering wheel and motor assembly, showing the parts in detail.

- Steering Wheel
- Steering Motor
- Global VR Steering Board
- +24 VDC Power Supply
- 5 KΩ Steering Pot (Potentiometer)
- Fire Buttons (for Yellow-Label Operation Only)

The Steering Board manages communications between the 5 KΩ 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 Steering Board.

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. See the Troubleshooting chapter in your *Redline Rampage Operation Manual* for help with diagnosing steering problems.

5 KΩ Steering Pot (Potentiometer) Replacement

To test a pot, use the **Diagnostics: Play Control Test** screen in the Operator Menu. 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® Blue on the set screw to ensure it is secure.

To replace a pot, refer to Figure 7 and perform the following steps:

1. Remove the control panel assembly as described on page 16 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 KΩ 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 7. Use Loctite Blue 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 20).

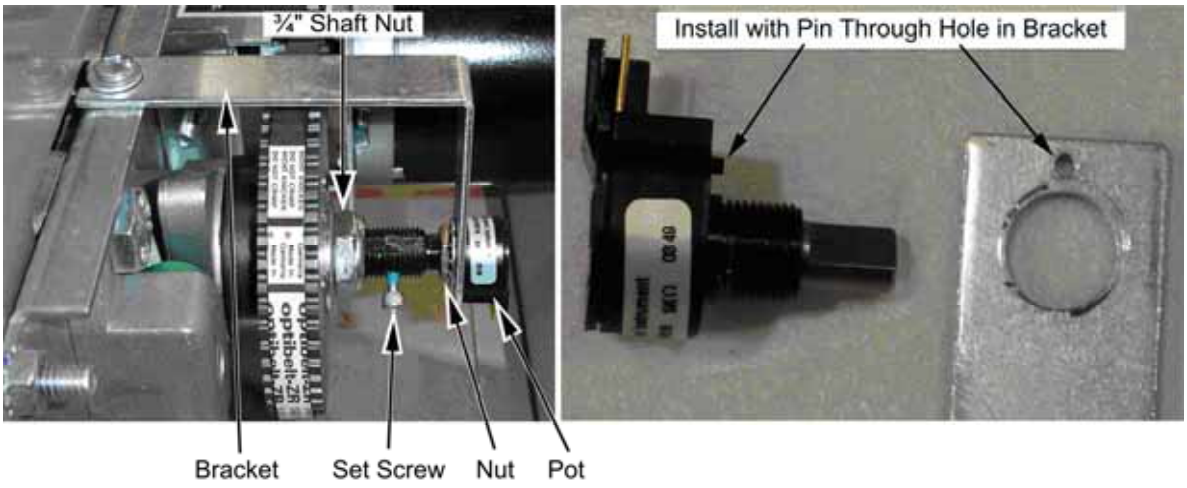


Figure 7. Replacing the 5 KΩ Steering Pot

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 7 above, and Figure 8, and perform the following steps to remove the force-feedback belt for repair.

1. Remove the control panel assembly as described on page 16 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 8).
3. Loosen the four (4) 3/8" motor mount Kep nuts that secure the steering motor to the frame (see Figure 8).
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 8).
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 Blue 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 8, until the belt is fully stretched, and then loosen the bolt by ½ turn.
2. Calibrate the steering from the Operator Menu after servicing the belt or motor (see page 20).

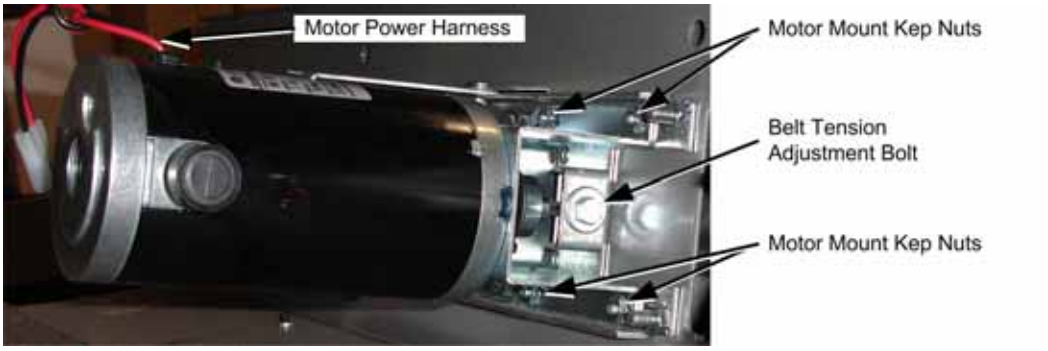


Figure 8. Servicing the Steering Motor

Steering Board Replacement

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

Important: There are two versions of the Global VR Steering Board:

- **Part number 990-GVRFF-02 for Redline Rampage**
- Part number 990-GVRFF-01 for older driving games

The boards look identical but are programmed with different firmware. Check the label on the board to make sure that you are using the correct board. If you use the wrong board the steering will not function properly. Redline Rampage is also compatible with the Immersion Force-Feedback PCBs that were installed on earlier games.

If the steering pulls to one side, this could indicate a bad Steering Board or reversed wires between the steering pot and the steering board. Do the following to replace the steering board:

1. Disconnect the cabinet from AC power.
2. Remove the electronics access panel (see page 15).
3. Disconnect all cables from the steering board.
4. Remove the four screws that secure the steering board mounting feet to the cabinet.
5. Reverse these steps to install the new steering board. Make sure there is some clearance between the steering board components and the cabinet wall to allow air to circulate around the components.
6. Calibrate the steering as described in the next section.

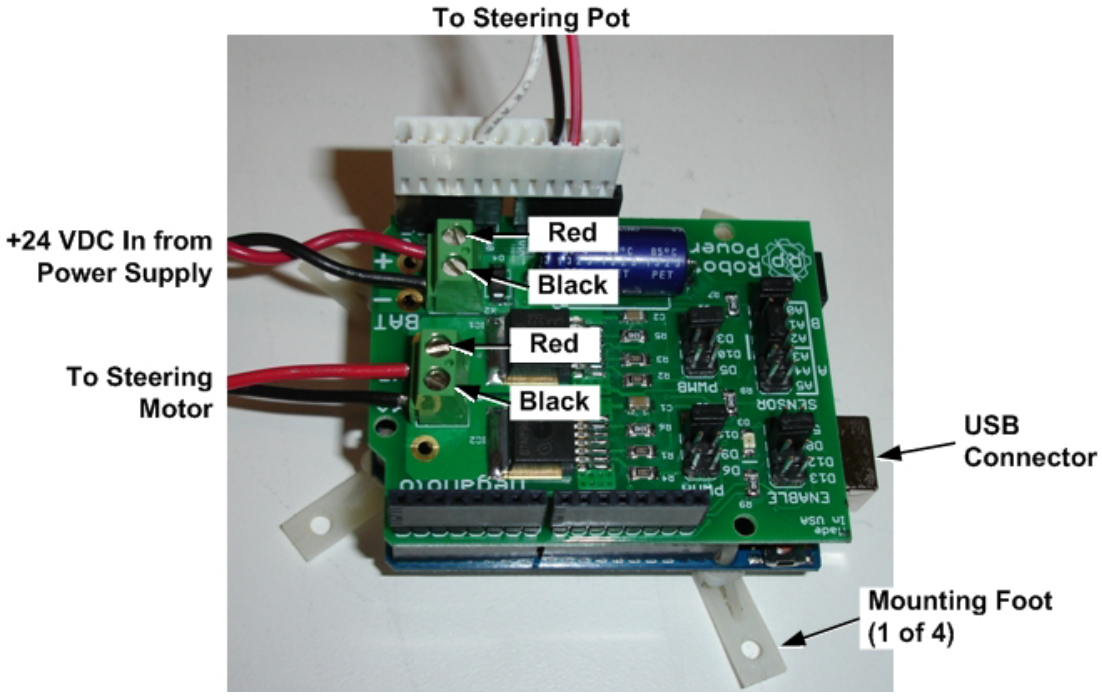
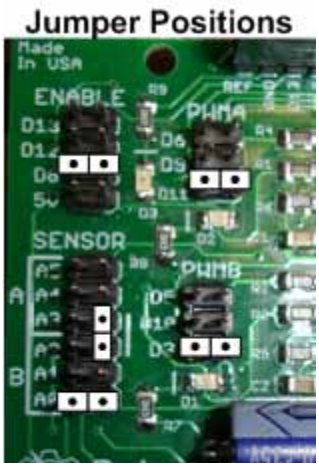


Figure 9. GLOBAL VR Steering Board Connections



The GLOBAL VR Steering Board requires five (5) jumpers. The jumpers are pre-installed on the PCB. If they are removed the Steering Board will not work properly.

This picture shows the positions of the jumpers for reference.

Figure 10. Steering Board Jumper Positions

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 **DROP HAZARDS** 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.

Fire Buttons on Steering Wheel

Fire Buttons are mounted on the Steering Wheel and used for Yellow-Label operation only. The Fire Button wires are routed through the wheel into the cabinet. The Fire signal connects to **Pin 2** of **J9** on the GVRI/O Mini PCB, and the ground connects to **Pin 1** of **J9** on the GVRI/O Mini PCB. (It does not matter which wire is connected to power and which to ground.)

The Fire Buttons cannot be replaced in the field. If the buttons need to be replaced, order a new steering wheel assembly, Part # 50-1035-RR.

Do the following to replace the steering wheel:

1. Open the Electronics Access Panel (see Figure 6) and disconnect the 2-pin Molex connector between the steering wheel Fire Buttons and the main harness.
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. The rubber boot between the steering wheel and cabinet will be loose; be sure to keep it in place when you replace the steering wheel.
6. Reverse these steps to reassemble the steering wheel. Be sure to securely tighten the nut and socket-head screws.

Pedal Assembly Service

Perform the following steps to remove the pedal assembly. It is removed and installed as one unit. See Figure 21 on page 36 for an exploded view of the assembly with parts list.

1. Disconnect the cabinet from AC power 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 11.
3. Carefully pull the pedal assembly straight out of the cabinet far enough to disconnect the wires, being careful not to pull 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 20).

Important: Be sure to re-connect the ground wire to the pedal assembly frame. The pedals will not function properly if it is not connected.

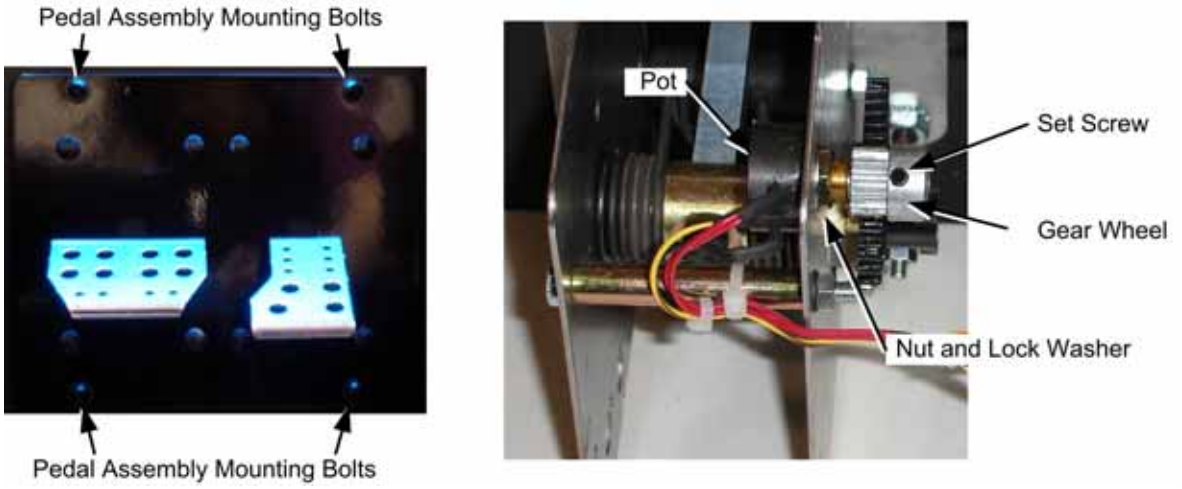


Figure 11. Pedal Assembly Details

5 KΩ 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. The low value should be greater than 0, and the high value should be less than 255.

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 11 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 11.
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. De-solder each wire from the old pot. Slide shrink tubing over the wire, solder it to the same terminal on the new pot, and shrink the tubing around the connection.
6. Re-install the lock washer and nut, being careful not to over-tighten.
7. Re-install the gear wheel and tighten the set screw. Use Loctite Blue to ensure the set screw is secure.
8. Calibrate the pedals from **Diagnostics: Play Control Test** in the Operator Menu after replacing the pot (see page 20).

Driving Control Panel Button Service

Refer to Figure 12 and perform the following steps to replace a button, bulb, or micro switch:

1. Disconnect the cabinet from AC power.
2. For buttons mounted in the metal mounting plates, remove the screws that secure the mounting plate to the cabinet and remove the plate with the buttons attached, being careful not to pull the wires.
3. For buttons mounted in the plastic dash housing, remove and disassemble the control panel as described on page 16 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 12 for more information.

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

Figure 12. Replacing Button Components

GVRI/O Mini PCB Service

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 26 on page 40 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.

The GVRI/O MINI PCB with Part Number 990-0014-CBN is used in dedicated games. PCBs from NASCAR Racing games (Part #: 990-0014-NS) can be used as replacement parts; be sure to leave the two jumpers in place if using a NASCAR Racing PCB.

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

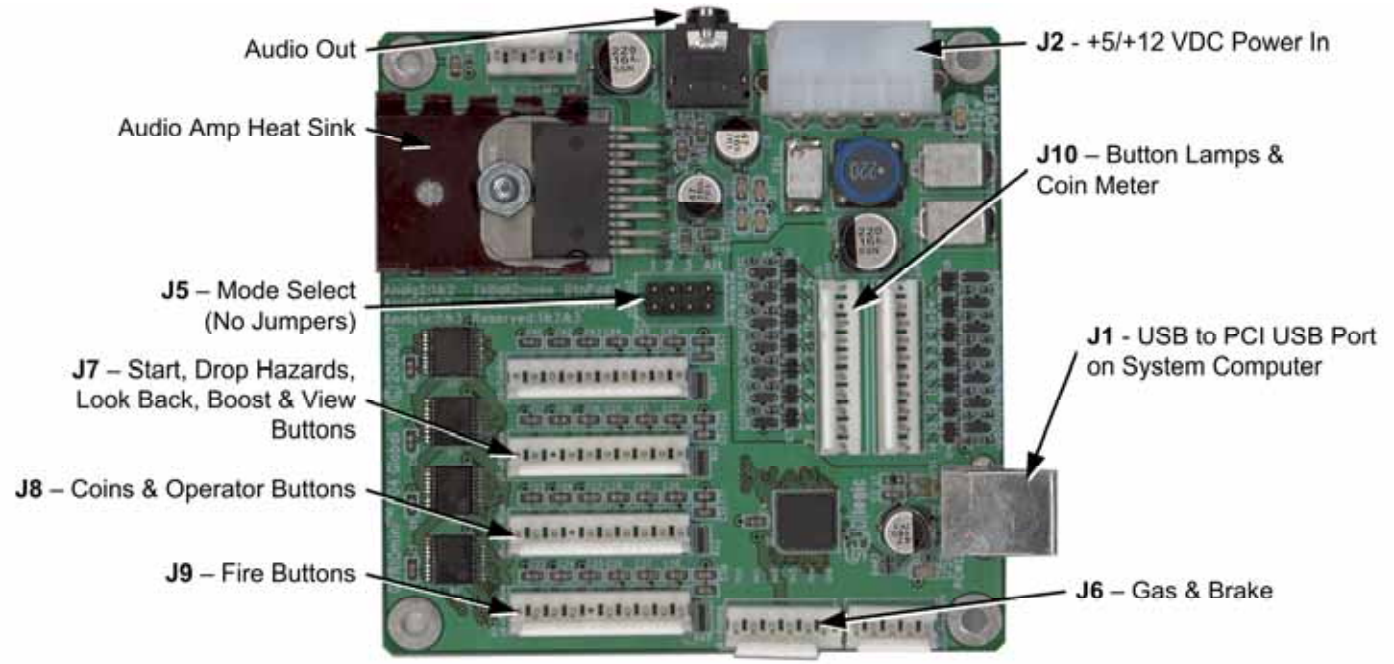


Figure 13. GVRI/O Mini PCB (Version 4)

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 from AC Power.
2. Remove the electronics access panel (see page 15).
3. Make sure that all wire harnesses are labeled for ease of reconnection, and then disconnect them from the PCB. (Connectors are keyed to prevent connecting them to the wrong ports.)
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.

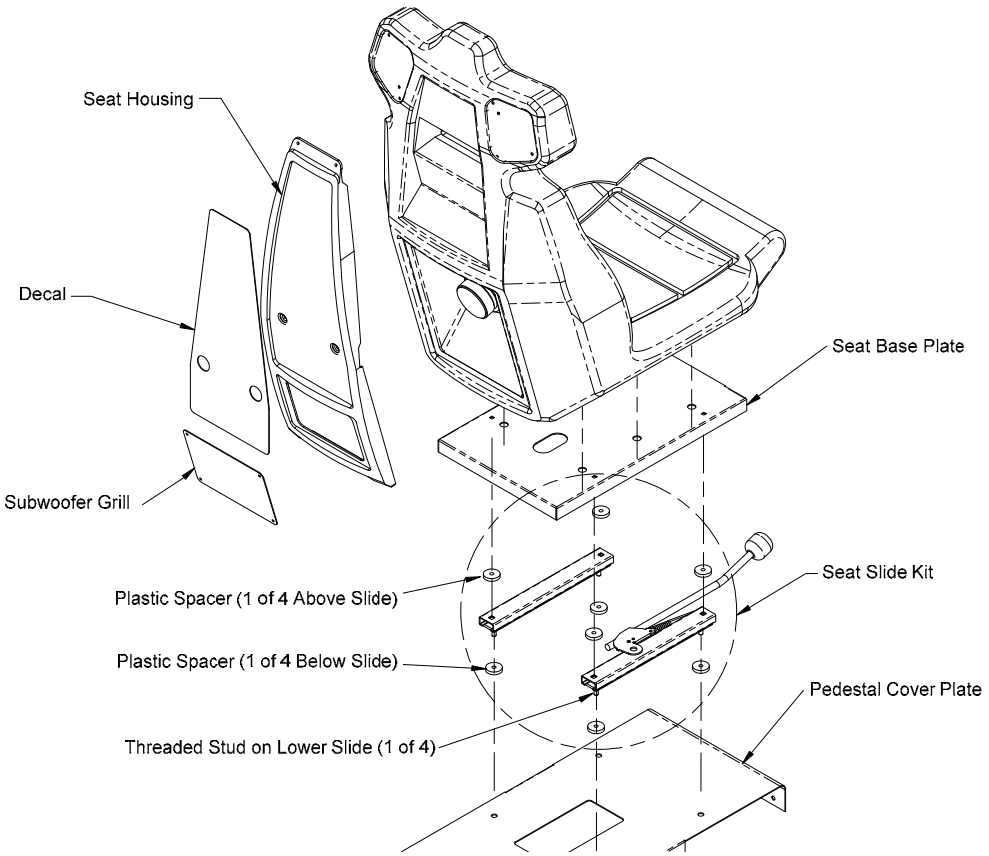


Figure 14. Seat Slide Assembly Replacement

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 ¼-20 flange nuts with ¼ Nylock nuts, **or** apply Loctite 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 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 Service

The left and right front speakers are mounted to the sides of the cabinet. The front speakers are driven by the audio amp on the GVRI/O Mini PCB. The rear (seat) speakers are driven by a separate audio amp installed in the cabinet. The subwoofer in the seat is also driven by the rear audio channel. Standard 3.5 mm stereo audio cables connect the computer to the audio amps. If you need to replace an audio amp, you can use a standard game or kiosk amp.

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

Front Speaker Replacement

The front speakers are mounted with a bolt from inside the cabinet. They are also secured to the cabinet with double-sided tape for added stability. Be sure to score the decal around the speaker to avoid damaging the decal when you remove the speaker.

1. Using a sharp Exacto knife, score the cabinet side panel decal around the speaker.
2. Remove the Electronics Access Panel from the back of the cabinet and remove the bolt that secures the speaker in place.
3. Use a thin tool such as a putty knife to loosen the speaker from the double-sided tape. The part of the side-panel decal under the speaker will be pulled away with the tape; be careful to make sure the decal does not tear where it will be visible.
4. Disconnect the wires from the speaker terminals and connect them to the same terminals on the new speaker.
5. Install the new speaker by reversing the removal steps.

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.

   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.

2. Remove the four (4) screws that secure the speaker or subwoofer to the seat.

3. Disconnect the wires from the speaker or subwoofer and install them to the same terminals on the new speaker or subwoofer.
4. 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 from the computer and keep it with your 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 20).
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.

HD Monitor Replacement

The HD Monitor is a stand-alone TV with an internal power supply. If problems occur with the HD Monitor it must be replaced or returned for service. The monitor has no user-serviceable internal parts. If your game is under warranty, contact your distributor to get an RMA.

To replace the monitor, do the following steps:

1. Turn off the cabinet and disconnect the AC power cord.
2. Remove the Sintra Marquee Assembly from the cabinet as described on page 30. You can now access the monitor mounting bolts through the opening in the back of the cabinet behind the marquee.
3. Disconnect the AC power and HDMI cables from the monitor.
4. Disconnect the power connectors from the LED Strip Lights mounted to the top of the monitor. (One is the Leader Light, the other illuminates the marquee.)
5. With a second person supporting the monitor, remove the four (4) monitor mounting bolts and remove the monitor.
6. Reverse the removal steps to install the new monitor.

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.

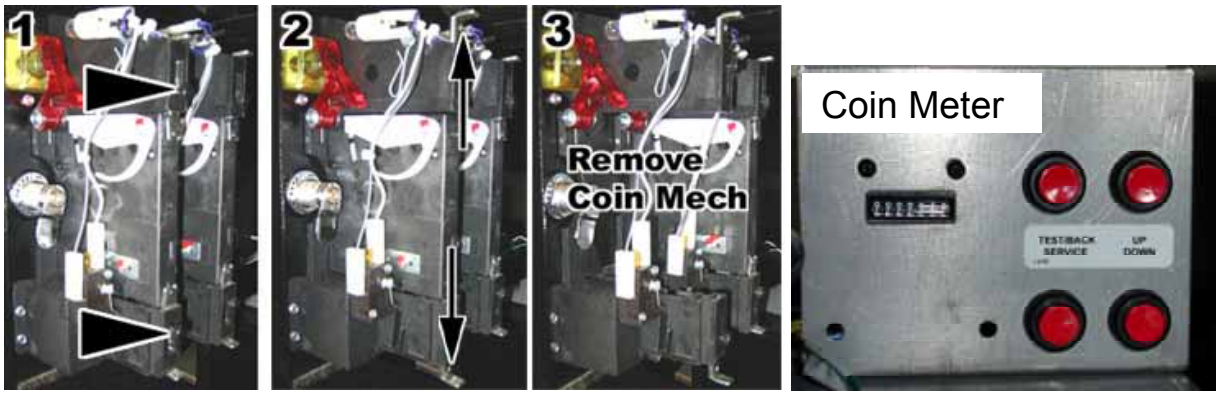


Figure 15. Servicing the Coin Mech and Coin Meter

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 or preferred splicing method to connect the wires to the new coin meter.
5. Use the two screws to install the new coin meter.

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 removes electrical noise that can cause interference with the hardware inside the cabinet, and a fuse protects the components. The incoming power is connected an AC power strip/surge suppressor that provides power to all 115 VAC cabinet components.

For countries that use 230 VAC, internal components may be set to run on local voltage, **or** incoming AC power may be routed through a power transformer to convert the power to 115 VAC.

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 16. **Do NOT** ground components 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.

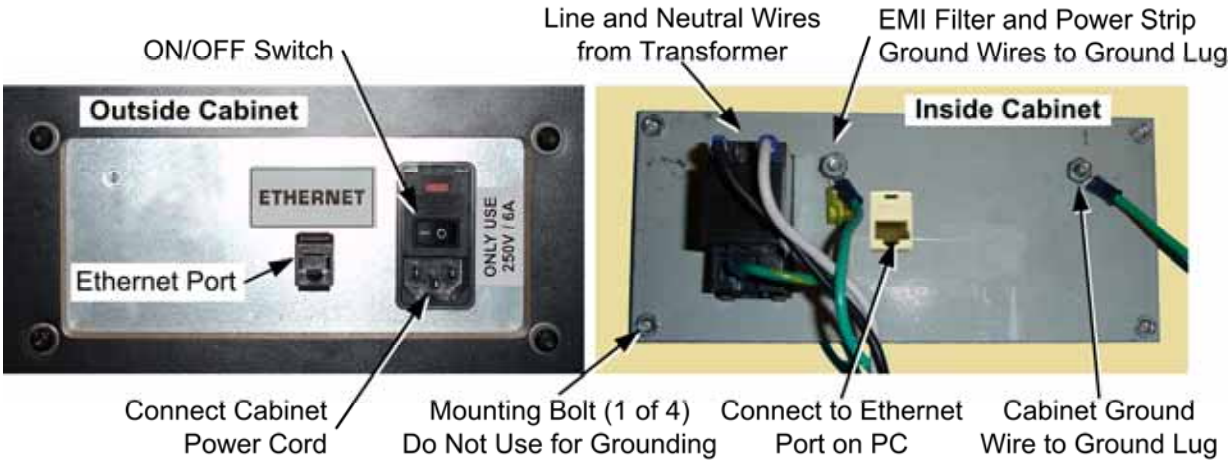


Figure 16. AC Power Plate

AC Power Strip Replacement

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 from AC power.
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 25 on page 39.)

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.

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

The cabinet has two DC power supplies mounted on the cabinet floor inside the rear door.

- +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/-12 VDC supply powers the Audio Amp, GVRI/O Mini PCB, and lighting components.

Perform the following steps to replace a DC 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 rear door (see page 15).
3. Make sure all wires are labeled for easy reconnection and then 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 25 on page 39 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.

Sintra Marquee Replacement

Important: Replacing the Sintra Marquee is a two-person job.

The marquee is made up of three pieces, the Bezel, the Logo, and the Guns with special-effects lighting. Operators running the game in Green-Label Mode may wish to remove the guns.

Refer to Figure 17 and note the seven (7) mounting screw locations shown by circles. Do the following steps:

1. If you wish to replace the Logo only, remove the three (3) ¼-20 x 2” screws with two fender washers and two plastic spacers that secure the logo to the marquee. Remove the Logo and use the hardware to install the new Logo.
2. If you wish to remove or replace the Guns, locate the Arduino Nano PCB at the end of the power/control cable; it should be mounted in the cabinet near the other PCBs . Disconnect the four-pin power connector and free the screw-down cable tie and then carefully pull the cable out of the top of the cabinet. Remove the hardware securing the gun assembly in place.

3. To replace the entire marquee assembly, have a second person support the assembly while you remove the seven (7) ¼-20 x ¾" mounting screws with flat washers shown by the circles in Figure 17.
4. Re-install the marquee or marquee components by reversing the removal steps.

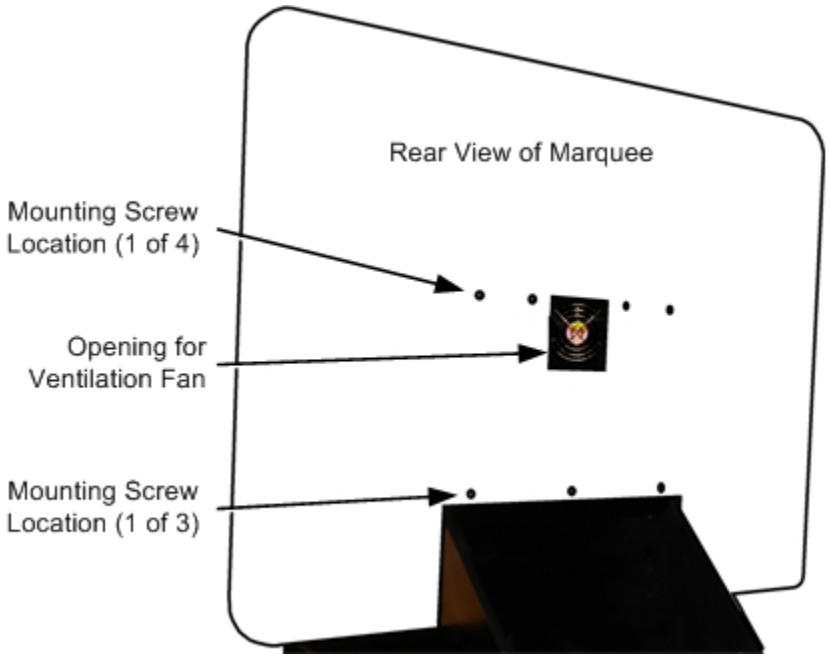


Figure 17. Rear View of Sintra Marquee

Marquee Special-Effects Lighting

The LEDs in the Marquee Guns artwork are controlled by an Arduino Nano PCB, which should be mounted inside the Electronics Access Panel near the other PCBs. Each LED in the assembly is also hard-wired to a small PCB that controls the function of that individual LED. The LEDs are connected in series, so if a wire becomes disconnected the LEDs located after the break will not function.

If the lighting is not functioning correctly, check all connections to the Arduino Nano PCB. If some of the LEDs are not functioning, disassemble the marquee and check connections between the LED controller PCBs.

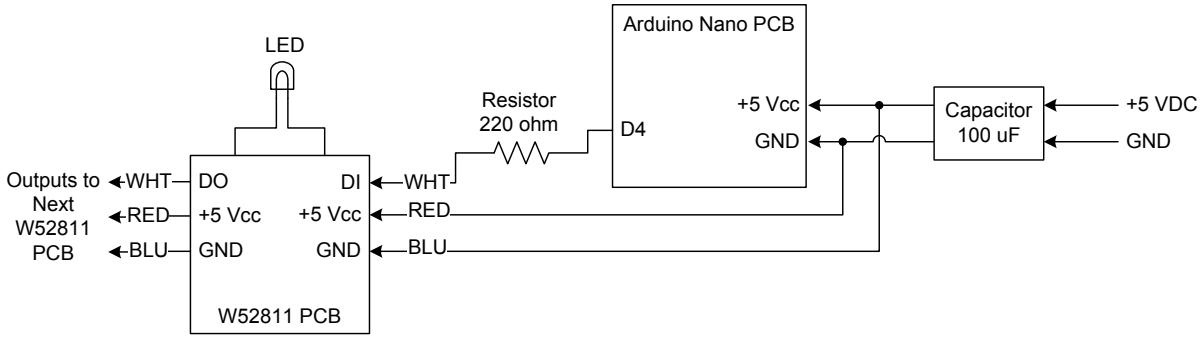


Figure 18. Marquee LED Wiring

Cabinet Lighting Service

Except for the Marquee special-effects lights and the button and coin lamps, cabinet lighting consists of LED Light strips.

LED Light Strips

LED Light strips connect to 12 Volt DC Power and Ground. You can use either Single-Color or Multi-Color Light Strips in your cabinet.

Single-Color LED Light Strip, shown in Figure 19, emits only one color. It has one terminal for 12 VDC power and one for ground.

Multi-Color LED Light Strip, shown in Figure 20, can be red, blue, green, or a mix, depending on which terminal is connected to ground (R, G, or B). For white light, ground all three color terminals.

LED light strips can be cut to the length needed, but **cut only on the white cut line** between the terminals, as shown in Figure 19. Each segment contains two or three LEDs, depending on the light strip type.

Power and ground leads can be soldered to either end of the LED light strip.

Secure the LED light strip in place with the double-stick tape pre-installed on the back of the strip.

Figure 19. Single-Color LED light strip Light

Figure 20. Multi-Color LED light strip Light

LED Light Strip Replacement Steps

To avoid electrical shock, unplug the cabinet before servicing lighting components.

The following are general steps for replacing the LED light strips.

1. Turn off the cabinet and disconnect the AC power cord.
2. If the light is under a cover or speaker grill, remove the screws securing the cover or grill.

3. If the light has a 4-pin PC power connector, disconnect it from the power harness.
4. If there is no connector, snip the wires and splice them to the wire leads from the new light.
5. Carefully pull the light strip off of the cabinet; it is secured with adhesive.
6. Remove the protective backing from the adhesive on the new LED light strip and install it by reversing the removal steps.

Accessing Specific LED Light Strips

- **Control Panel Lights:** Remove and disassemble the control panel assembly as described on page 16 to replace the light strips.
- **Lights Under Seat Pedestal (that Shine on the Floor):** 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 lighting components.
- **Lights on Back of Seat Pedestal:** Remove the six (6) Torx bolts that secure the seat pedestal cover plate to the wooden pedestal and then remove the seat assembly to access the light strip.
- **Lights behind Woofer Grill on Seat Back:** Remove the four (4) screws that secure the grill in place.
- **Exhaust Lights:** Remove the six (6) Torx bolts that secure the seat pedestal cover plate to the wooden pedestal and then remove the seat assembly. Inside the seat, remove the screws that secure the exhaust pipe in place. The exhaust lights are connected to a controller that controls the lighting effects. The controller is connected to +12 VDC.
- **Lights Below Control Panel (that shine on the Pedals):** Remove the two (2) Torx screws that secure the clear plastic housing in place under the control panel and remove the housing to access the light strip.
- **Lights Below Marquee or Leader Light:** Remove the adhesive LED strip from the top of the monitor.

Setting the Computer BIOS (CMOS)

Refer to the separate document titled *Setting the Computer BIOS (CMOS)* for the motherboard in your system computer. This document is included with your game and is also available from the Hardware Reference Page at **http://service.globalvr.com/reference**

Troubleshooting

Please refer to the troubleshooting tables in your *Redline Rampage Operation Manual* (Part # 040-0267-01).

You can find documents and other useful information on our Service Website: http://service.globalvr.com

Chapter 4 — Replacement Parts

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

Selected parts can be purchased online at **http://parts.globalvr.com**.

Notes: Part numbers may change due to hardware or software revisions.
Qty column shows quantity used per cabinet.

Documents and Software

Item Number	Qty	Description
040-0267-01	1	Operation Manual
040-0254-01	1	Installation and Service Manual (This Document)
040-0265-01	1	Software Restore Guide
040-BIOS-xx*	1	BIOS Setup Instructions
050-0233-01*	1	System Recovery Disk
050-0237-01*	1	Game Install Disk

*Part Numbers may change due to hardware and software revisions.

Cables

Item Number	Qty	Description
115-0008-01	2	110VAC to DC Power Supply
115-0049-01	1	Power Plate Ground Cable 3.5"
115-0167-01	1	Brake Pedal Ground Cable
115-0239-01	1	Cable, Steering Pot to GVR Steering Board
115-0240-01	1	Cable, Motor Control to GVR Steering Board
115-0241-01	1	Cable, 24 VDC Power to GVR Steering Board
64-0064-00	2	RJ-45 CAT 5E Patch Cable, 5'
80-0213-00	1	Power Cord 6'
96-0539-00	1	Stereo Cable, 3.5 mm 6'
USB-AB06MM	1	USB Cable 6', USB2-ABO6

General Hardware

Part Number	Qty	Description
Electronics (Including Power)		
(Purchase Locally)	1	Power Plate Fuse, 6A, Slo Blo, 5mm X 20mm
990-0014-CBN	1	GVRIO Mini PCB
44-0600		Power Supply, 24 Volt
44-1100-01	1	Power Supply, 5V/12V 115 W
45087-00	1	PC Assembly
49-0963-40	1	Surge-Protected Power Strip
2-30-2434	1	Transformer, 115-230V, 500W (Optional for 220 VAC Games Only)
CCM1600-ND	1	Power Entry Module, EMI Filter, PNL MNT, Un-Shield
USB-KQRTG-HL-RR	1	Game Dongle & Code
37201-00	1	AC Power Plate
555-052-1	1	RJ45 Plug-In Connector (Cabinet Linking)
115-0025-01	2	110 VAC Fan, Grill & Cord Assembly
Driving Controls		
50-2978-30	1	Dual Pedal Assembly
59-6004-800H1628	1	START Button Assembly
59-6004-855H1625	1	VIEW Button Assembly
59-6004-855H1648	1	LOOKBACK Button Assembly
75-0006-822H2774	2	BOOST Button Assembly
990-GVRFF-02	1	GLOBAL VR Steering Board with Harness

Part Number	Qty	Description
50-0102-14-RR	1	Steering Assembly W/Motor & Wheel, WITH FIRE BUTTONS
50-0102-14	1	Steering Assembly W/Motor & Wheel, WITHOUT FIRE BUTTONS
Miscellaneous		
2569K24	1	Convoluted Sleeving, 18" Long, 3/8" ID
37189-00	1	Woofer Grill, Seat Back
26197-00	1	Plastic Dash Housing
26162-00	1	Floor Mat, Black
26169-00	1	Clear Plastic Light Cover, Pedestal Base
37021-00	1	Seat Panel Base
37040-00	2	Beam Pedestal Support
37194-00	4	Bracket, Quarter Panel
37249-00	1	Bracket, Coin Door, Midwidth
37252-00	1	Bracket, Seat Wrap
37253-00	1	Sheet Metal, Trim Floor Mat
37264-00	1	Sheet Metal, Control Panel Bracket
37265-00	1	Bracket, Light
37371-00	1	Bracket, Switch Plate
37267-00	2	Bracket, Switch Mount
37270-00	1	Sheet Metal, Transformer Plate (Optional for 220 VAC Games Only)
37324-00	1	Cover Plate, Wood Pedestal
40-0740-6V	1	Coin Door Assembly, Mid-Width, with Meter & 4 Service Switches
45083-00	1	Seat & Wood Pedestal Assembly
49-1019-00	2	PCB Mounting Feet, Set Of 4
50-0244-ND	1	Seat Assembly
50-0400-00	1	Seat Slide Kit Assembly
60039-00	1	Computer Mounting Strap

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	4	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	50-8069-02	GEAR, 1MOD, 12T, .25 BORE
11	2	96-4916-00	LONG LIFE POT W/NUT & 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 W.
27	1	50-0011-00	CYLINDER & TUBE ASSY., I.T. PEDAL

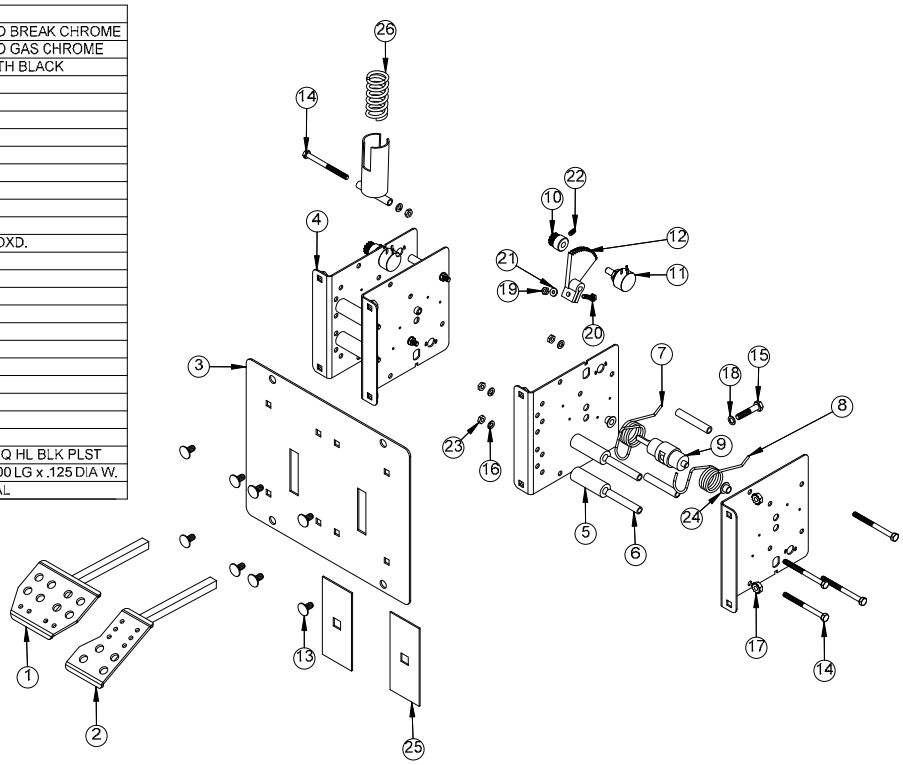


Figure 21. Pedal Assembly Exploded View and Parts

Steering Assembly

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	43-0341-00	SCREW, 1/4-28 X 1 SHCS
2	1	50-4014-00	SHAFT, 270 DEG. ACTIVE WHEEL
3	1	43-0305-00	KEY, 3/16 SQ. X .74
4	2	43-0232-00	NUT, HEX NYLOCK 1/2-20
5	1	43-0340-00	LOCKWASHER, EXT. M12
6	1	50-2092-00	KEY, SHAFT 4MM x 4MM x 25MM
7	1	43-1170-00	SCREW, #6-32 x 3/8" SHCS
8	1	50-4043-00	MOTOR & CONNECTOR ASY.
9	1	50-4016-00	WHEEL MTG. BRACKET
10	1	50-8129-00	BEARING HOUSING
11	2	50-8130-00	BEARING, .59 ID X 1.259 OD
12	1	50-8455-00	MOTOR MTG. BRACKET
13	1	50-2659-00	BEARING SPACER
14	1	50-4040-PL	PULLEY, 16T 1/5 PITCH, PLASTIC
15	4	43-0188-00	SCREW, #8-32 x 3/8" HEX WASHER HD
16	1	43-0576-00	SCREW, M6 x 60MM HHCS
17	1	90-1208-00	FLAT WASHER, 1/4 I.D.
18	1	50-2545-00	BRACKET, BELT TENSIONER
19	4	42-0093-00	NUT 10-32 HEX W/SEMS, ZINC PLTD
20	2	43-0117-00	HEX HD CAP SCREW M10x30,GR 8.8
21	2	43-0978-00	SCREW, M10 x 40MM HHCS
22	1	50-8145-00	DIE CAST WHEEL STOP, W/BUMPERS
23	4	43-0034-00	LOCKWASHER M10 RIBBED
24	4	43-0035-00	NUT HEX M10
25	1	50-4045-PL	STOPPER PIE CAM & PLASTIC PULLEY
26	1	50-4041-00	TIMING BELT, BLACK 3/8" WIDE
27	1	50-2670-00	5K POT, NEI "SENSORCUBE"
28	1	43-0018-00	LOCKWASHER, INT. 3/8" x 9/16"
29	1	43-0014-00	HEX NUT 3/8"-24 X 3/32 THK
30	1	50-4018-00	POT. MTG. BRACKET
31	1	50-4032-00	SPACER, POT MTG. BRACKET
32	1	43-0184-00	SCREW, #10-32 x 3/8" PHPNHD
33	1	43-0995-00	#10 FLAT WASHER
34	1	43-0735-00	SCREW, M4 X 12 SHCS
35	1	50-2511-00	ATARI GAMES PATENT DECAL
37	1	50-2525-00	SPLIT HUB FOR 5/8" SHAFT & 1/4-20 TAP
38	1	50-1035-00HD	HOOP, SOFT RUBBER TYPE 60 DUROM
39	1	50-2715-00	CAP WITH CHECKERED FLAGS LOGO
40	3	43-0328-00	SCREW, 1/4-20 X .75" SOCKET HD CAP B.O.
41	6	43-0284-00	SCREW, 8-32 X 1/2 TORX TP B.H.
42	1	43-1554-00	STAR WASHER M14 EXTERNAL TOOTH

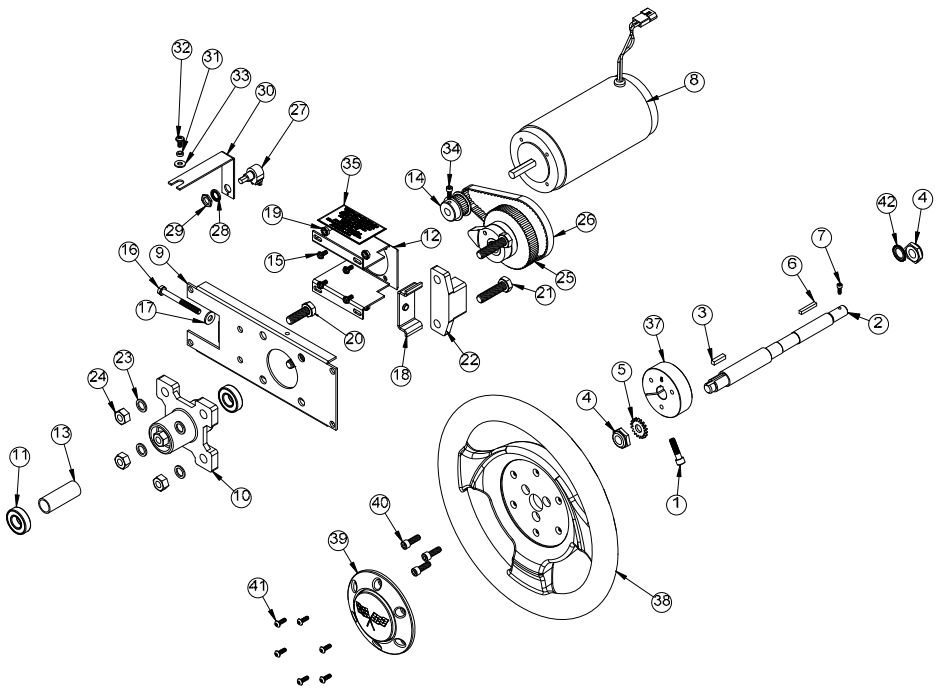


Figure 22. Steering Assembly Exploded View and Parts (Fire Buttons not shown)

Artwork Identification

Figure 23. Dedicated Cabinet Artwork

Chapter 5 — Diagrams and Schematics

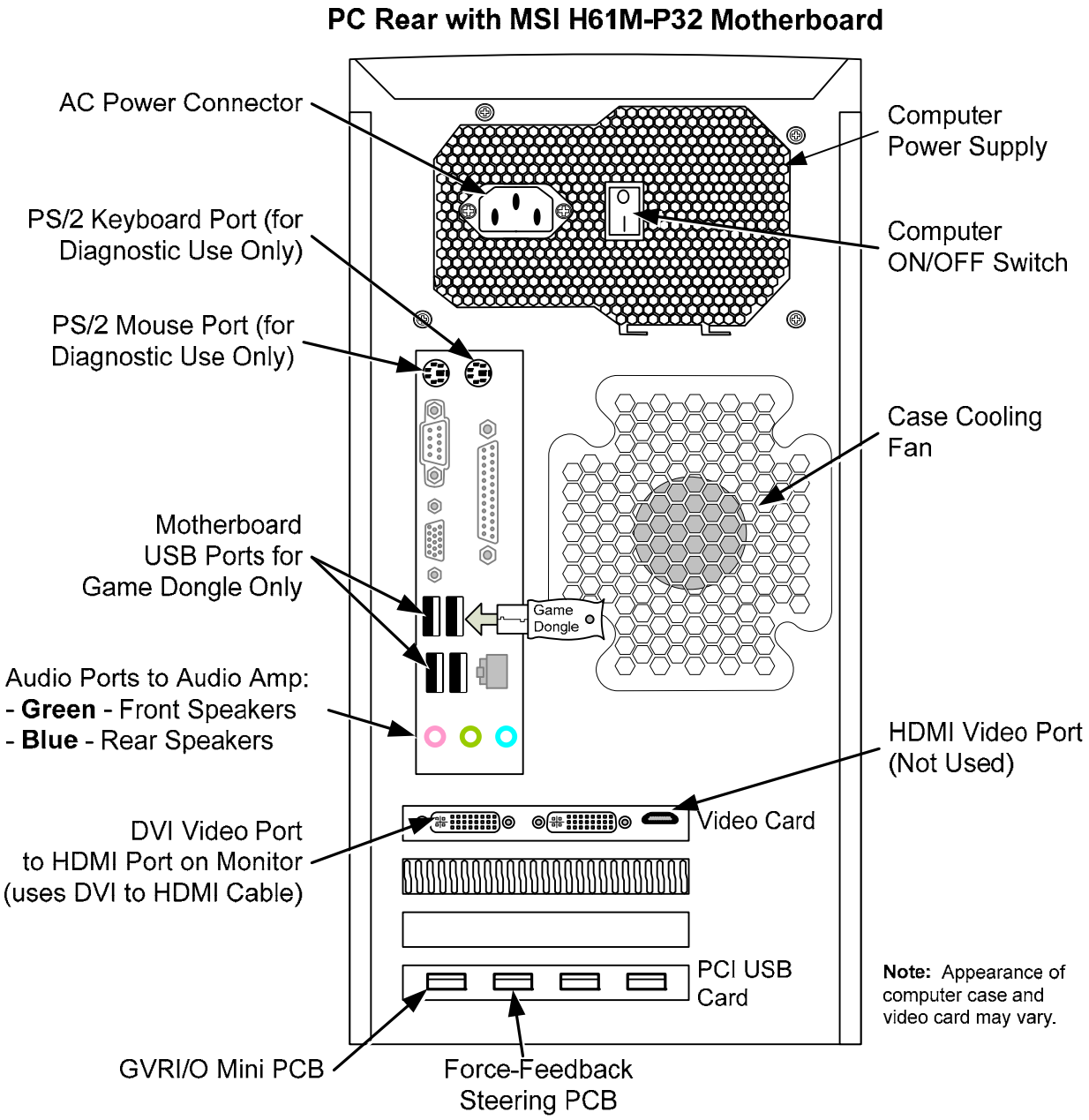


Figure 24. Computer Rear Panel

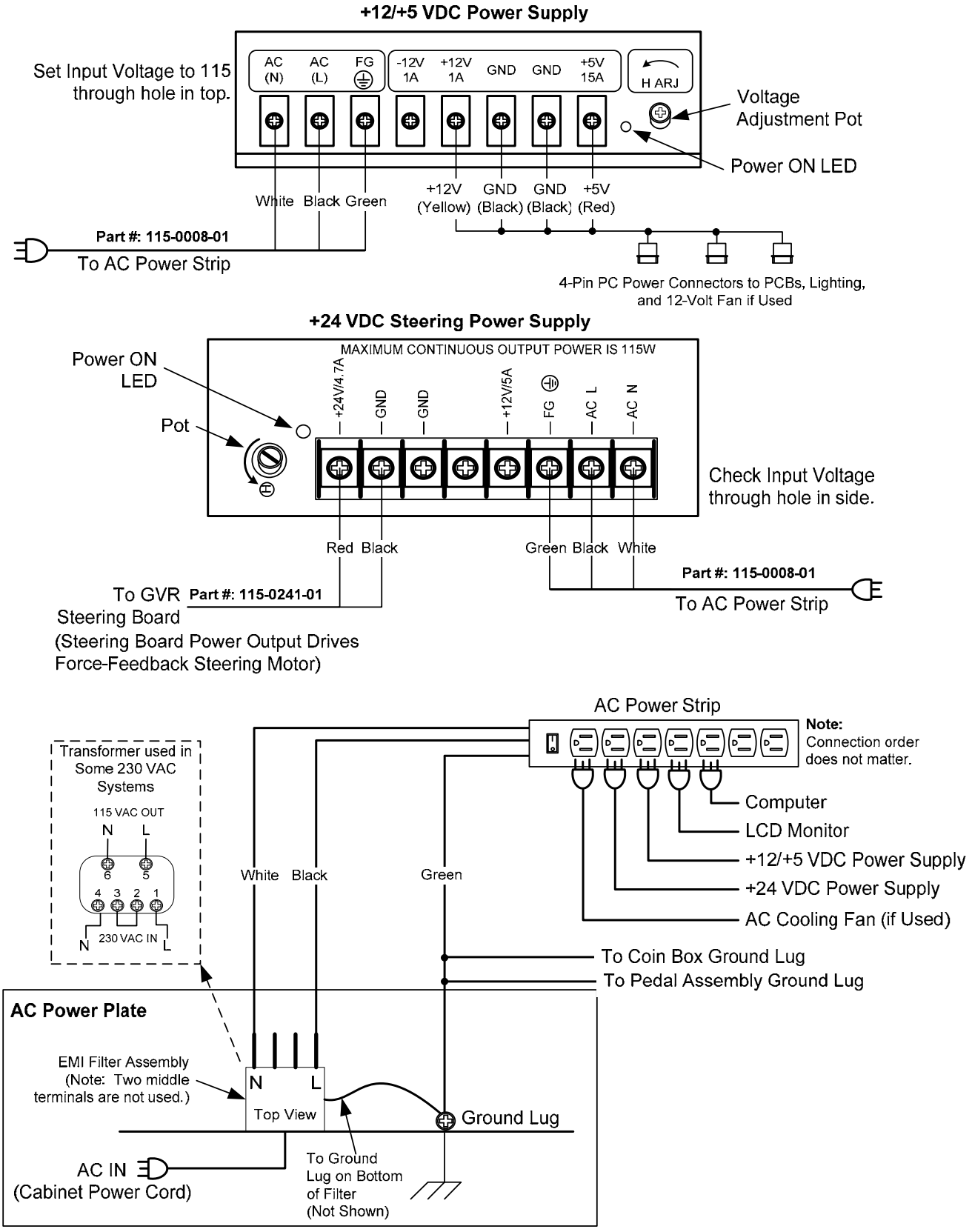


Figure 25. Power Distribution Diagram

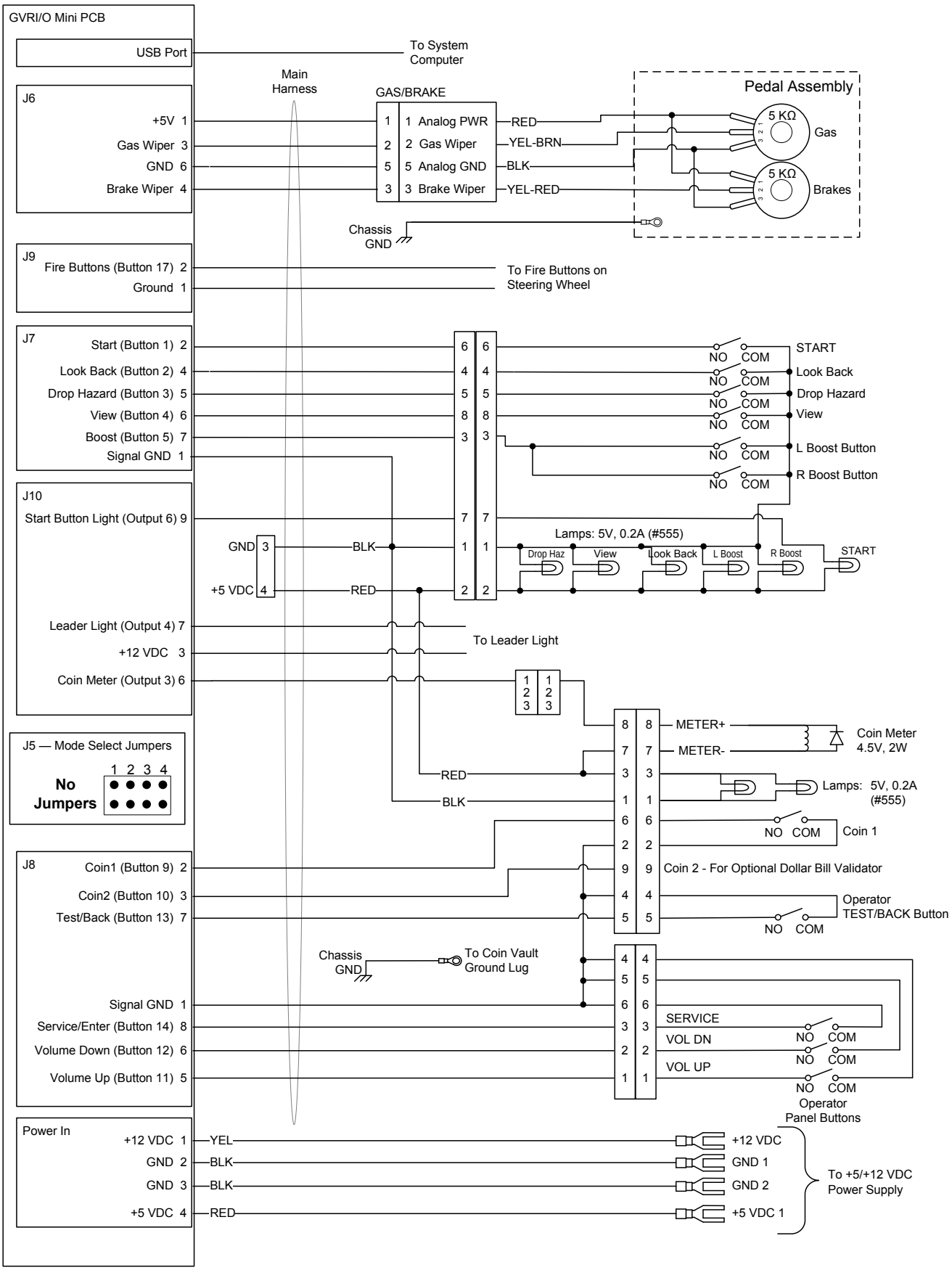


Figure 26. Detailed Wiring Diagram

Technical Support

Service & Parts

Hours: 7:00AM–5:00PM Pacific Time, Monday–Friday
Phone: 408.597.3435
Fax: 408.597.3437
E-mail: techsupport@globalvr.com
Parts E-mail: servicesupport@globalvr.com
Website: http://service.globalvr.com

Purchase selected parts online at http://parts.globalvr.com.

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