Need For Speed™ GT

System Documentation
040-1201-01 Rev. C

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

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Chapter 1 – Introduction

Safety

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

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

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

- To help avoid damage to the computer, the power supply on the computer automatically detects the voltage to match the AC power available at the location:
  - 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.
- Do not spill food or liquid on the cabinet.
- Do not push any objects into the openings of the system. Doing so can cause fire or electric shock by shorting out interior components.
- Keep your computer far away from radiator and other heat sources.
- Do not block cooling vents.

Warnings

CAUTION	To avoid electrical shock, unplug the cabinet before performing the installation procedures.
	GLOBAL VR assumes no liability for any damages or injuries incurred while setting up the cabinet. Only qualified service personnel should perform this installation!

Environmental Conditions

Cabinet is intended for indoor use only. Be sure to keep the cabinet dry and maintain operating temperatures of 10°-40°C (50°-104°F).

Regulatory Notices

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 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:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer 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, and if not installed and used in accordance with the instruction manual, 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.

Need For Speed™ Description

GLOBAL VR presents full-throttle driving action with *Need For Speed*™.

Get behind the wheel of the world's top high-performance cars, including the 450-horsepower Dodge Viper GTS, the nimble Lotus Elise, the BMW Z8 and the fastest production Corvette ever made, the Z06. With a mix of high-end American muscle and top European exotics, *Need For Speed* has cars that will appeal to all players.

With remarkable car detail and state-of-the art special effects, the graphics of *Need For Speed* are second-to-none. The sky is reflected in the surface of your car. Smoke pours from your tires when you punch it off the line. Leaves blow from trees as you rocket past. Of course, it's hard to notice these details when you're tearing down a mountain road at 160 with a Z8 two inches from your right rear quarter panel.

Need For Speed features a player-selectable difficulty system that provides easier handling for beginning players and more challenging realistic driving physics for experienced drivers. The driving experience is further heightened with 6-speaker surround sound (3-speaker in upright cabinets) and force-feedback steering. *Need For Speed* is linkable, allowing blistering head-to-head competition for up to 4 players.

Need For Speed™ GT Upgrade

The GT Upgrade provides the following new features:

- **4 New Cars.** Porsche 911 Turbo – McLaren F1 – Mercedes CLK GTR – Ford Crown Victoria Police Cruiser.
- **New Shadow Attack Play Mode.** Players challenge the best time on each track in a head-to-head race against the top player's "shadow."
- **Improved Handling.** New handling physics and faster gameplay make *Need For Speed GT* the most exciting driver on the market.
- **New Marquee Artwork.** Players will know that you've installed the latest *Need for Speed* software.
- **New Operator Features.** The software update adds these features to the operator menus:
  - The Machine Menu adds a **Monitor Gamma Setting**. This allows the operator to adjust the relative brightness of the monitor to compensate for age-related dimming. The default value is ***1.0***. The maximum allowed value is ***3.97***.
  - The Options Menu adds a **Clear Each High Score** setting. By default, each high score on the cabinet is erased after 30 days. This option allows the operator to choose to erase high scores ***Never***, in ***7 days***, or in ***30 days*** (default).
  - The Games Stats menu adds the new cars to the available statistics.
  - The Machine and Sound menus now show the cabinet style (sit-down or upright).

Cabinet Models

Need for Speed comes in 3 cabinet models: standard, deluxe, and upright. The models share common hardware, but have slightly different set-up and service procedures. Unless otherwise noted, the procedures in this manual apply to all models.

Figure 1 – Cabinet Styles

Chapter 2 – Installing a New Cabinet

Use the following procedures to setup your game:

- **Standard Cabinet.** Basic Cabinet Setup (page 7) + Standard Cabinet Installation (page 8).
- **Deluxe Cabinet.** Basic Cabinet Setup (page 7) + Deluxe Cabinet Installation (page 10).
- **Upright Cabinet.** Basic Cabinet Setup (page 7) + Upright Cabinet Installation (page 13).

Basic Cabinet Setup (All Models)

Use the following procedure to install a new cabinet:

1. Carefully remove the cabinet from the shipping container. Give yourself plenty of space around the cabinet as you remove it from the shipping container. Inspect the exterior of the cabinet for any damage.
2. Remove the keys from the coin return slot. Open the coin door to locate the second set of keys. See **Figure 2**. On the deluxe model, the coin door and cash box are located on the driving console, not the main cabinet.

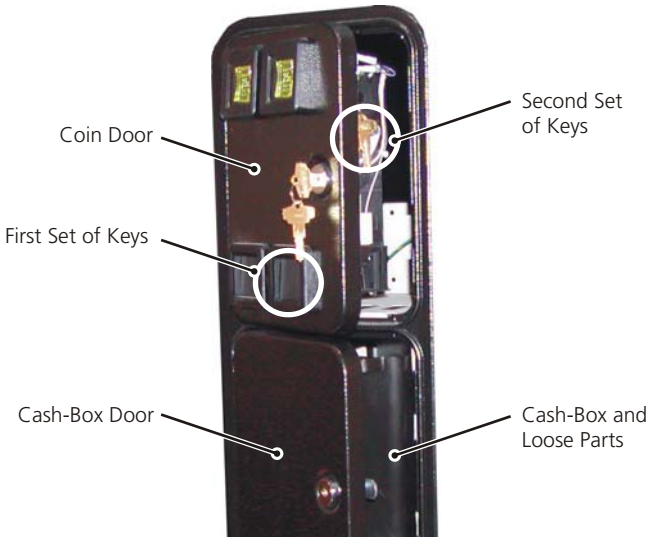


Figure 2 – Coin Door and Cash-Box Door

3. Open the cash-box door and remove the loose parts inside the cash box. You will find the following items (may vary with cabinet style):
   - GLOBAL VR Instruction Manual (this document)
   - 10/100 Base-T Network cable
   - 10/100 Base-T Crossover coupler
   - AC power cord
   - T-25 Torx Security Bit
4. Remove the back door from the cabinet and inspect the computer system. Verify that all cables and wires are securely connected to the computer. See page 52 for a guide to the cable connections.
5. Connect the wall cord to a grounded (3-terminal) AC wall outlet.
6. Power ON the cabinet using the On/Off switch located on the lower rear of the cabinet to verify proper operation.

Standard Cabinet Installation

Standard Cabinet Driving Seat Installation

Locate the hardware used to assemble the driving seat inside the cash box. There are (8x) ¼-20 x 1" hex bolts with lock washers to secure the seat runners to the cabinet, and (8x) ¼-20 x 1" T-25H Torx bolts with lock washers and fender washers to secure the driving seat to the runners.

1. The seat runners are installed backwards for shipping. Remove the (4x) hex bolts holding each seat runner inside the cabinet using a 7/16" socket wrench. See item A in **Figure 3**.
2. Pull the seat runners out, flip them over, and reinsert them. Attach the runners using the (4x) hex bolts with lock washers for each bracket. The angled end of the seat runners should be pointed out and away from the cabinet as shown in item C of **Figure 3**.

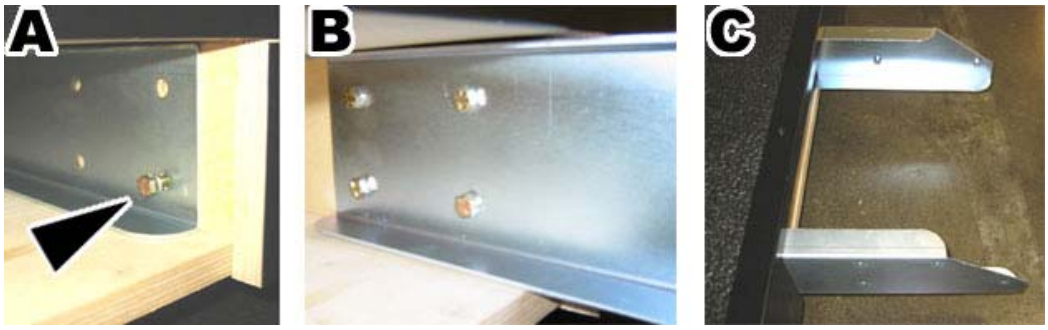


Figure 3 – Installing the Seat Runners

3. Slide the driving seat onto the seat runners. Leave enough space to connect the wire harnesses.
4. Locate the two wire harnesses inside the driving seat and inside the cabinet where the seat runners are installed. Connect each wire harness together as shown in item A of **Figure 4**. The connectors are keyed to prevent incorrect wiring.
5. Slide the driving seat towards the cabinet while guiding the wire harnesses inside. Attach the driving seat to the seat runners using (4x) ¼-20 T-25H Torx screws with lock washers and fender washers. Repeat for each side of the driving seat. See item B of **Figure 4**.

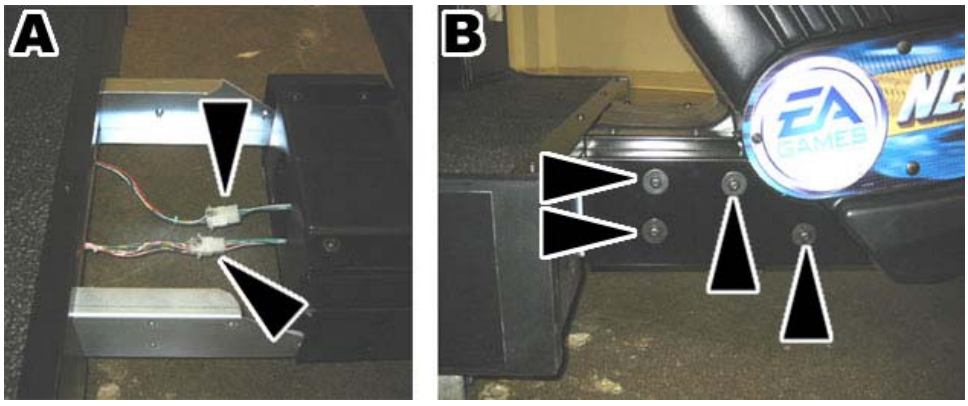


Figure 4 – Attaching the Driving Seat to the Runners

Standard Cabinet Marquee Setup

1. Rotate the marquee forward towards the front of the cabinet as shown in **Figure 5**.

Figure 5 – Installing the Standard Cabinet Marquee

2. Install the marquee support bracket on the backside of the marquee using (6x) ¼-20 x 1" hex bolts. Install the bracket with the sharper angle towards the top of the marquee. See item A in **Figure 6**. Secure the top of the bracket to the marquee first, and then install the bottom bolts. Align the bottom holes in the bracket by bending the marquee backwards slightly.

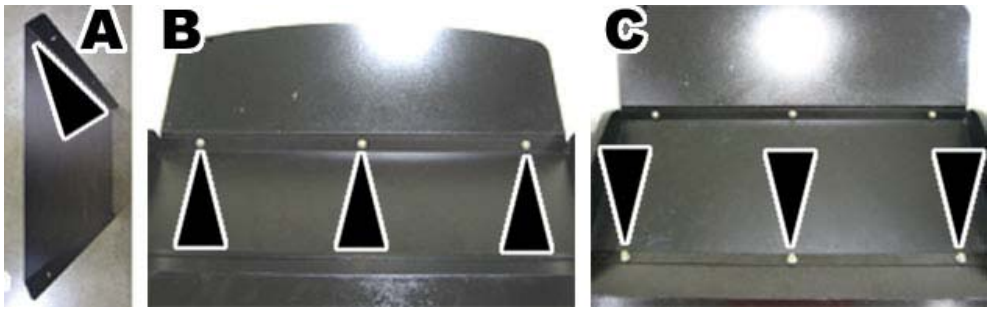


Figure 6 – Installing Marquee Support Bracket

The standard cabinet is now ready for game play.

Deluxe Cabinet Installation

Begin by removing the monitor console, driving console, and driving seat from the packaging. It is suggested that you do the final assembly at the location were the game will be played. This way each separate console and seat will have plenty of clearance to pass through normal size doors in your location.

1. Secure the bottom bracket of the front monitor bezel to the monitor console with (3x) ¼ -20 x 1" hex bolts and washers. See below.

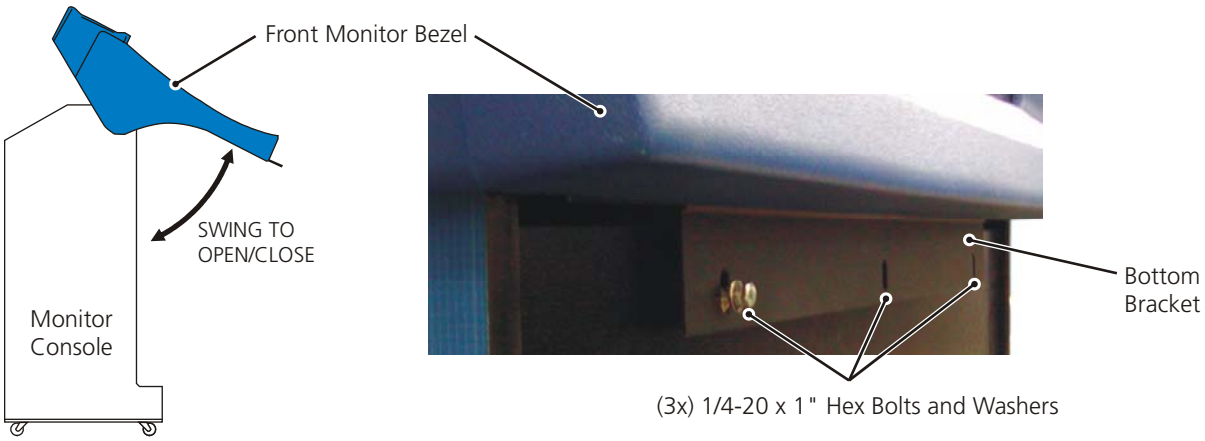


Figure 7 – Securing the Front Monitor Bezel

2. Locate the console rails inside the monitor console. Use (8x) ¼-20 x 2" Torx-security bolts, (8x) ¼ fender washers, and (8x) ¼" lock washers to secure the rails to the monitor console. Do not tighten the bolts all the way down until the last step in these instructions. See the figure below.

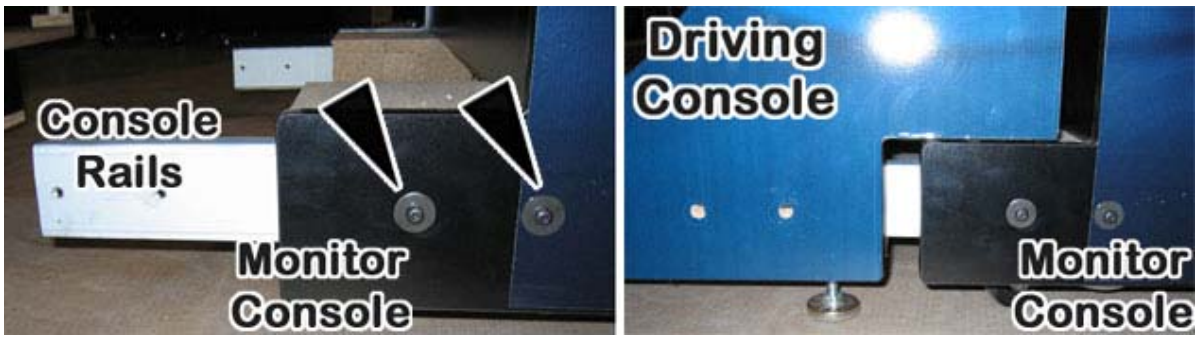


Figure 8 – Attaching the Console Rails, and Mating the Consoles

3. Slide the driving console onto the rails. Leave enough room between the two consoles so that you can get your hand in and connect the wiring harnesses between the 2 consoles. See the figure above.

4. On the monitor console, there are 3 wires hanging out the right-side hole. See the figure below. These connect to separate PCB cards on the back of the driving console.
   - **(1)** is a 6-pin connector that runs to the monitor control panel behind the coin door.
   - **(2)** is a 3-pin connector that connects to the power force feedback card.
   - **(3)** is a USB cable that connects to the force feedback controller card.

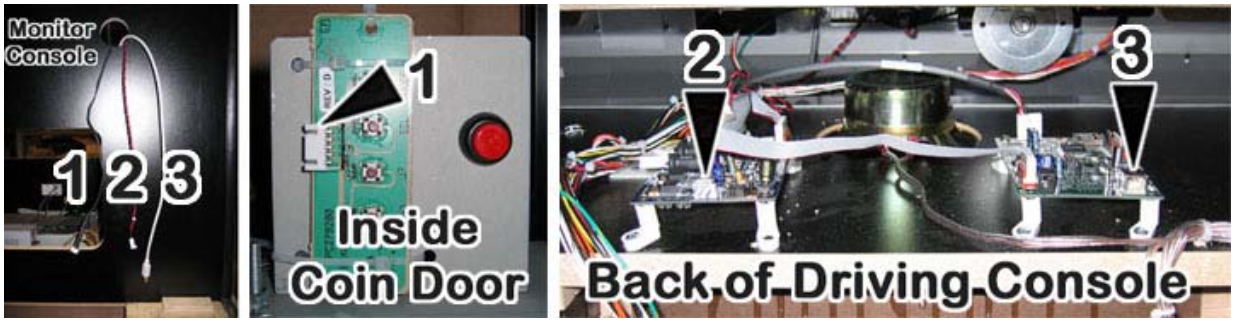


Figure 9 – Connecting Cables from the Monitor Console to the Driving Console

5. On the back of the driving console are 4 main wire harnesses that connect and power the driving controls and buttons. See the figure below. These wire harnesses will connect to points inside the monitor console.
   - **(1)** is a 4-pin power connector that runs to a 4-pin mating connector from the computer power supply mounted on the floor of the monitor console.
   - **(2)** is a 37-pin connector that runs to the 37-pin port on the back of the computer.
   - **(3)** is a 25-pin connector that runs to the 25-pin port on the back of the computer.
   - **(4)** is a 3-pin grounding wire that runs to the 3-pin mating connector from the AC panel in the monitor console. It is very important to connect the grounding wires between the 2 consoles to assure a reliable operating cabinet.

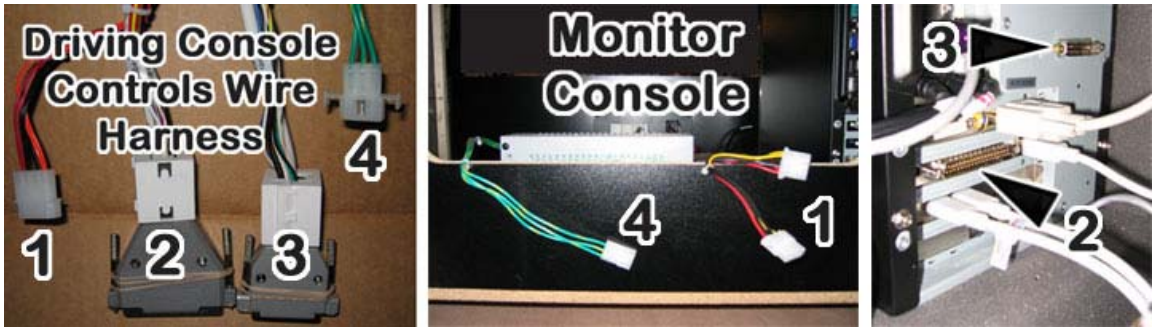


Figure 10 – Connecting Cables from the Driving Console to the Monitor Console

6. On the back of the driving console is a wire harnesses with two 4-pin connectors. This harness connects to the u5.1AMP on the inside of the monitor console, as shown in the figure below. You will need to run the audio wires through the hole just above the u5.1AMP.
   - The **(R)** wire connector connects to the Rear Audio port.
   - The **(C/S)** wire connector connects to the Center/Base audio port.

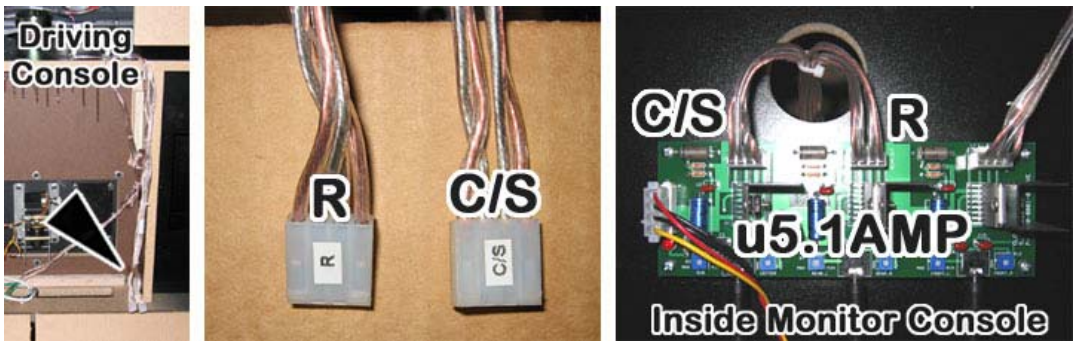


Figure 11 – Connecting the Driving Console Speakers

Deluxe Cabinet Driving Seat Installation

1. Follow the procedure on page 8 to install the driving seat.
2. Once all the wires are connected between the driving seat and the two consoles, power the cabinet ON. Go into the Operator Menu and verify all the driving controls and ensure that sound is coming out from the correct speakers by using the Player Control test and the Sound test.

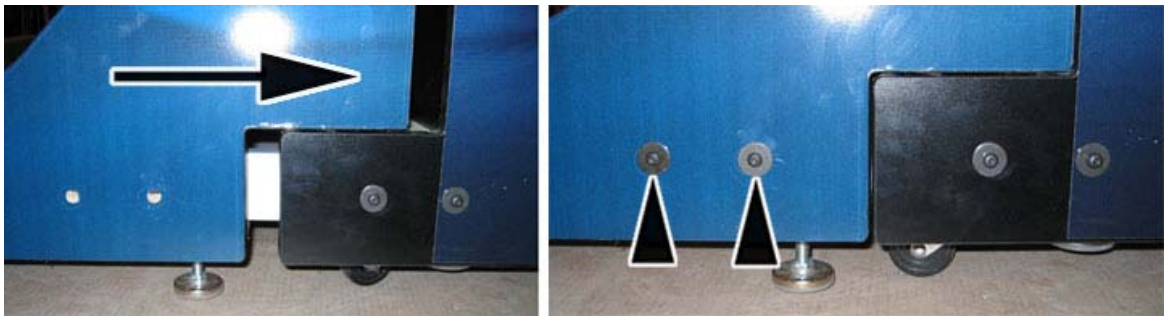


Figure 12 – Bolting the Driving Console to the Monitor Console

3. When testing is complete, push the driving console onto the monitor console as shown above. Make sure the wire harnesses will not be pinched or damaged when you push the two consoles together. Insert the bolts on the driving console first, and make sure they connect with the rails on the inside before tightening. If the holes in the rail do not line up with the holes in the cabinet, insert a small screwdriver in the hole of the cabinet to slide the rails into place so the bolts will connect with the mounting holes.

The deluxe cabinet is now ready for game play.

Upright Cabinet Installation

Standard Upright Installation

When used in the standard configuration, without a driving seat, the upright cabinet requires no additional installation. The driving pedal components are shown in **Figure 13**. These components need to be removed and reconfigured if the optional seat assembly is installed. Refer to the following section for more information.

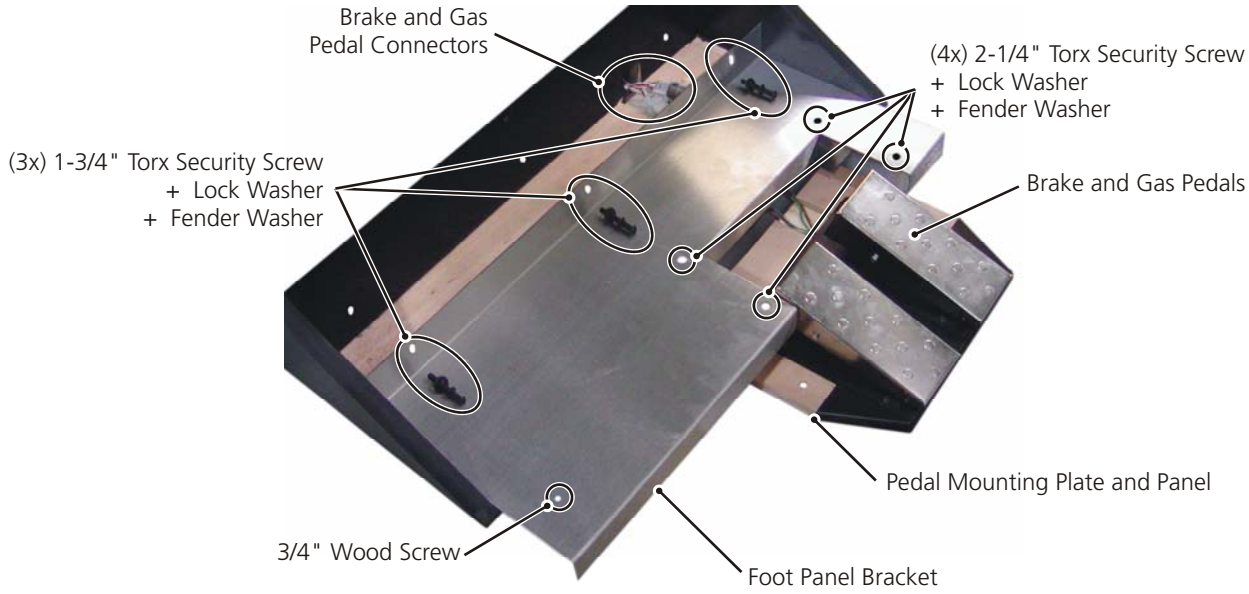


Figure 13 – Standard Upright Configuration Installation/Removal

Upright Installation with Seat Assembly

The optional seat assembly is shipped separately from the upright cabinet. Use the following procedure to remove the standard pedal configuration, mount the pedals on the seat assembly, and connect the seat assembly to the cabinet:

1. Turn cabinet power OFF.
2. See **Figure 13** on page 6. Remove the (3x) 1-3/4" Torx screws holding the back of the foot panel bracket to the cabinet. Remove the 3/4" wood screw on the left side of the foot panel bracket.
3. Slowly pull the foot panel bracket back from the cabinet, exposing the brake and gas pedal connectors. Unplug the pedal connectors.
4. Remove the entire foot panel bracket and pedals from the cabinet.
5. Remove the (4x) 2-1/4" Torx screws holding the pedal mounting plate to the foot panel bracket.
6. Remove the (8x) Torx machine screws holding the pedals to the pedal mounting plate. Pull the pedals and cables free from the pedal mounting plate.
7. Use the (8x) Torx machine screws to mount the pedals to the seat assembly. Thread the cables through the hole and pull them to the front. See **Figure 14** on page 14.

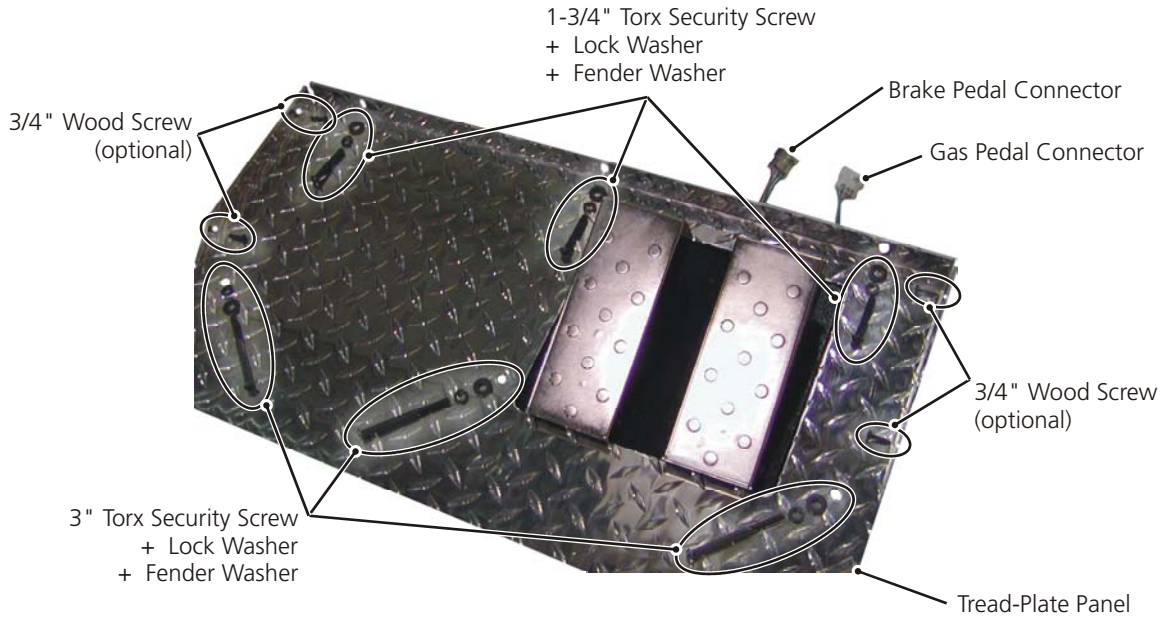


Figure 14 – Optional Seat Assembly Installation/Removal

8. Slide the seat assembly onto the front of the upright cabinet, leaving enough room to connect the cables. Connect the gas and brake pedal to the matching connectors on the cabinet. Use wire ties or rubber bands to secure excess cable length.
9. Slide the seat assembly the rest of the way onto the cabinet. Use the (3x) 3" Torx screws with lock and fender washers (included with the seat assembly) to hold the tread-plate panel down.
10. Use the 1-3/4" Torx screws with lock and fender washers from step 2 to secure the front of the tread-plate panel to the front of the upright cabinet.
11. If desired, secure the sides of the tread-plate panel to the cabinet using (4x) 3/4" wood screws.

The upright cabinet with seat assembly is now ready for game play.

Linking Cabinets

You can link up to 4 cabinets together for head to head competition. The necessary cables and hardware are provided with each game to link 2 cabinets together. A NFS Linking Kit is required to link more than 2 cabinets together. Once the cabinets are linked in hardware and software, players can choose to play individually, or against other players. Follow the instructions below to link your NFS cabinets correctly.

Figure 15 – Installing Network Cables

1. Locate the 10ft Ethernet cable and Ethernet Cross-Over coupler, which should be inside the cash box of each cabinet.
2. Connect an Ethernet cable to the Ethernet connector at the back of each cabinet next to the power switch.
3. If connecting two cabinets, connect the two cables to one cross-over coupler (don't use two couplers).
4. If connecting three or four cabinets, connect the cables to the Ethernet hub. The hub includes an AC power adapter, which must be plugged in and powered ON. Do not use any of the cross-over couplers when using a hub.
5. When the hardware has been connected, go into the Operator Menu on each cabainet, and adjust the Cabinet Link ID number shown by the arrow in the picture below. Each cabinet must have a unique number: 1 , 2 , 3 , or 4. When you change the Cabinet Link ID number, the game software will automatically reboot the computer when you exit the Operator Menu to make the changes take effect.

   If you have a duplicate cabinet number among the linked cabinets, you will get an error message on screen on both of the cabinets that have the duplicate cabinet link ID number. Correct the duplicate Cabinet Link ID numbers in the Operator Menu to make the error message go away.

Figure 16 – Checking Link Status

Installing an External Monitor

Use the following procedure to install an external monitor:

1. Turn the cabinet power OFF. Locate the video card on the rear of the PC. The card provides an S-Video connection.
2. Connect an S-Video cable to the video card. Run the cable out the back of the cabinet, and connect it to the external monitor.
3. Plug the PS/2 keyboard into the purple-colored PS/2 port on the back of the computer. Turn the cabinet power ON, and allow the game software to start.
4. With the cabinet powered ON, and the game running, press the Windows *Start* key on the keyboard (between the *Ctrl* and *Alt* keys). This will launch the Windows Start menu.
5. Use the cursor keys to select **My Computer**, and press *Enter*. This will launch Windows Explorer:

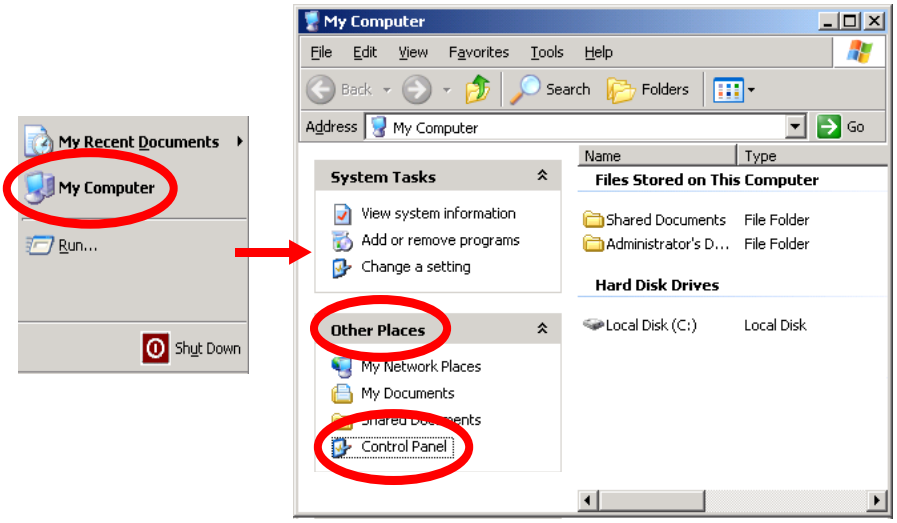


Figure 17 – Using the Start Menu and Windows Explorer to Launch Control Panel

6. Press the *Tab* key to move the highlight down to the box labeled **Other Places**.
7. When **Other Places** is highlighted, use the cursor keys to move the highlight to the item, **Control Panel**. The control panel will be displayed:

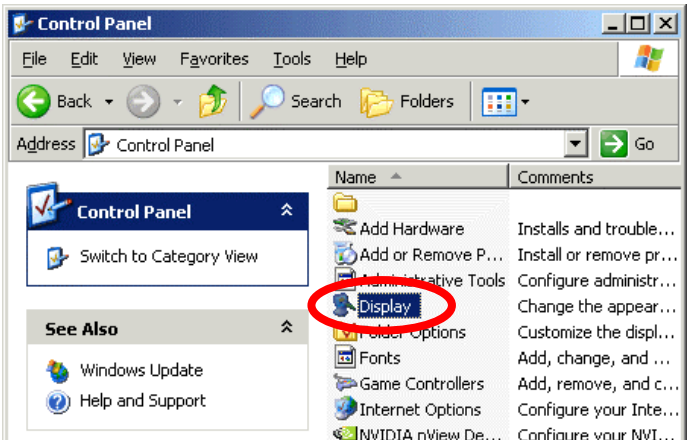


Figure 18 – Selecting the Display Control Panel

8. Move the highlight to the item **Display** and press *Enter*. This will show the Display control panel.
9. Use the *Tab* and cursor keys to highlight the **Themes** tab, and then use the left/right cursor keys to move to the **Settings** tab.

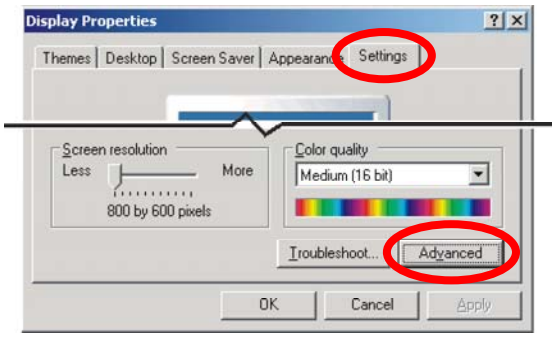


Figure 19 – Selecting the Settings Tab in the Display Control Panel

10. Use the *Tab* key to move down to the **Advanced** button, then press *Enter*. The following window will be displayed:

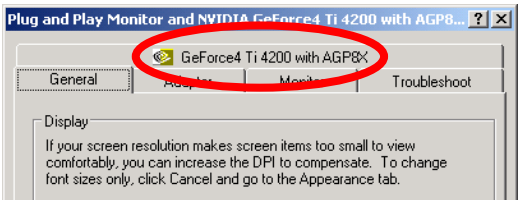


Figure 20 – Selecting the Video Card Name Tab

11. Use the *Tab* and cursor keys to move to the **GeForce4** tab. (The name of the video card will change depending on cabinet age and model). The following window will be displayed:

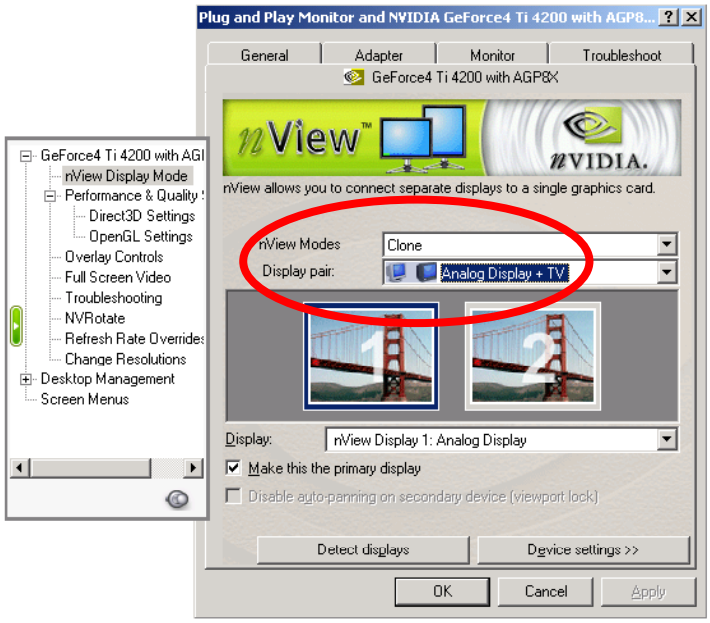


Figure 21 – Choosing a Display Pair with Cloning

12. Use the *Tab* and cursor keys to change the **nView Modes** option to "**Clone**", and the **Display pair:** option to "**Analog Display + TV**". After making those changes, move down to the **OK** button and press *Enter*.

13. You should now see the video image displayed on the external monitor. You will also see the following dialog box displayed:

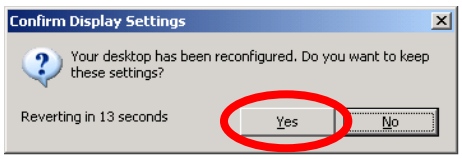


Figure 22 – Confirming Display Settings

14. Press the **Tab** key to select **Yes**, and then press *Enter*. This will save the setting.
15. If you do not see the image in the external monitor, check the S-Video cable, and check that the external monitor is set to receive video from the S-Video input.
16. Turn the cabinet power OFF, and unplug the keyboard from the computer.
17. Turn the cabinet power ON. The game can now be viewed on the external monitor.

Checking and Setting the Computer Clock

The game computer is shipped from the factory with the correct date set. If this date becomes lost or corrupted, you may be unable to install software upgrades. Perform this procedure only if you suspect that the computer clock is set incorrectly:

1. Turn the cabinet power OFF. Plug the PS/2 keyboard into the purple-colored PS/2 port on the back of the computer. Turn the cabinet power ON.
2. With the cabinet powered ON, and the game running, press the Windows *Start* key on the keyboard (between the *Ctrl* and *Alt* keys). This will launch the Windows Start menu:

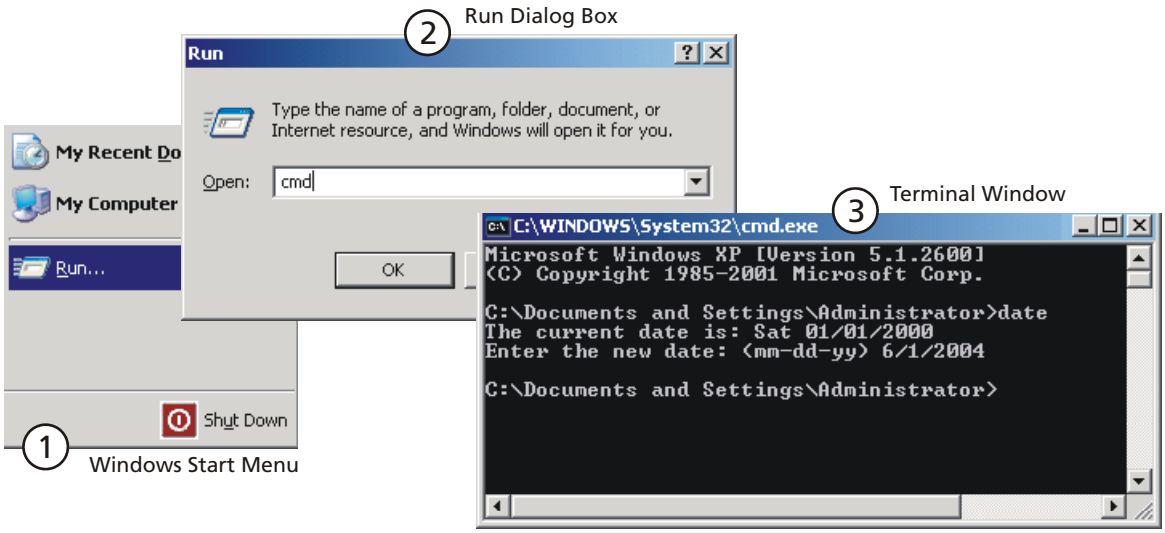


Figure 23 – Changing the Date on the Computer

3. Use the cursor keys to select **Run...**, and press *Enter*. This will launch the Run dialog box.
4. Type **cmd** into the dialog box and press *Enter*. This will launch a terminal window.
5. Type **date** and press Enter. The current date will display.
6. If the date is correct, type **exit** to close the window and return to the game.

7. If the date is not correct, type in a new date. The format is <month> / <day> / <year>. For example, you might type in **6/1/2004**, and the press *Enter*. The date is now set. Type **exit** to close the window and return to the game.
8. Turn the cabinet power OFF before unplugging the keyboard.

Checking Game Dongle

Figure 24 – Game Dongle

The cabinet comes with a USB game dongle to activate the game software. The game dongle plugs directly into the USB ports on the back of the computer. When the USB dongle is installed and working properly a red LED light will illuminate inside the dongle. In order for a dongle to be recognized correctly, it must be inserted into the USB port before the cabinet is powered ON. If for some reason the USB Dongle is not recognized, power the cabinet OFF then ON to see if this resolves the problem.

The dongle supplied with the cabinet is specific to that game and software version. Some software upgrades may require you to upgrade the dongle after you upgrade the software.

Chapter 3 – Upgrading an Older Cabinet

Upgrading a cabinet to *Need for Speed GT* software requires the following steps:

- Installing the Software
- Installing the Cabinet Artwork

Kit Contents

The Upgrade Kit contains the following items:

- (1) Emergency Recovery Disk
- (2) NFS Game Software Disks, version 1.1
- (1) ¼-20H Torx Security Bit
- (1) of the following:
  - Marquee Artwork Panel (Standard)
  - Marquee Artwork Panel (Deluxe)
  - Marquee Artwork Panel (Upright)
- Upgrade Kit Instruction Manual

Installing the Upgrade

This upgrade kit updates the software from version 1.0 to version 1.1. Total install time for one cabinet is approximately 15 minutes. If the cabinet links to other cabinets, you must unlink it before installing the new software. Unlink the cabinet by disconnecting the Ethernet cable from the back of the cabinet. All linked cabinets must run the same game software version.

Follow the instructions below to install the software update. Please be aware that this process will erase all cabinet settings including sound and coin/game audits.

Note: When the instructions say "reboot the computer," this is the same as turning the cabinet off by unplugging the power cord, and then plugging it back in again.

1. The cabinet should be powered on with the game running. Open the coin door and press the red operator button. This will launch the Operator Menu.
2. Use the Operator Menu to record the following information:
   - Machine Menu: Cabinet Volume _____ , Attract Volume _____% , and Cabinet Link ID# _____
   - Options Menu: Credit Display _____ , Cost/Credits per Play_____
   - Coin/game stats (optional)
3. Open the rear of the cabinet to gain access to the computer.
4. Open the CD drive and insert the CD labeled **Emergency Recovery Disk**. Reboot the computer
5. After reboot, the CD will automatically start installing. After about 30 seconds, the monitor will display a status window labeled "Image Center 5.0 – Scripting Progress."
6. When the process finishes, you will see the message "*Please remove the CD and reboot your Need for Speed System.*" Remove the Emergency Recovery Disk from the drive.
   DO NOT PUT THE GAME CD IN THE DRIVE YET.
7. Reboot the computer.
8. When the computer restarts, it will display the message "*XP Embedded Install. Finalizing settings... Please wait for reboot.*" Allow this process to finish. The computer will eventually reboot itself. **DO NOT INTERRUPT THIS PROCESS OR PRESS ANY KEYS UNTIL COMPLETE.**

9. When the automatic reboot is complete, you will see a black screen with the Windows Start menu and taskbar.
10. Open the CD drive and insert **Need For Speed Disk 1 of 2**. The installer will automatically start (wait about 30 seconds). This install process will take approximately 10 minutes. You will see several different windows appear while game files copy to the hard drive.
11. When the first CD is complete, the computer will eject the CD. The screen will tell you to insert CD Disk 2. Remove CD Disk 1 of 2 and insert **Need For Speed CD Disk 2 of 2**.
12. The computer will copy the remaining files from Disk 2 and will reboot when finished.
13. After reboot is complete, the cabinet will check for a valid NFS game dongle. Then the game will prompt you to perform a set of simple calibration tasks.
14. When the calibration is complete, the game attract mode will begin. Press the operator button behind the coin door to enter the Operator Menus. You will need to set the Sound Volume, Attract Mode Volume, and Cabinet ID# (for linked cabinets). You will have recorded these numbers in Step 2. You should play one complete game to ensure correct operation.
15. Once the Cabinet ID# has been set, you can reconnect the Ethernet cable to the back of the cabinet. Note that some cabinets may automatically reboot when linked. For more information about the linking process, refer to the *Need for Speed Instruction Manual*.
16. After the install process is complete, you may remove CD Disk 2 of 2. Keep the CD set in a safe place in case you need to reinstall the software.

You have now completed the software installation process for this cabinet. Repeat the process for any other NFS cabinets you have.

Upgrading the Marquee – Standard Cabinet

Use the following procedure to install the new marquee artwork in the standard NFS cabinet:

1. Using a ¼-20H Security Torx bit (included), remove the (6x) screws holding the marquee shield.
2. Remove the old artwork. Insert the new artwork included in the update package.
3. Reinstall the shield. Take care not to scratch the shield or artwork during installation.

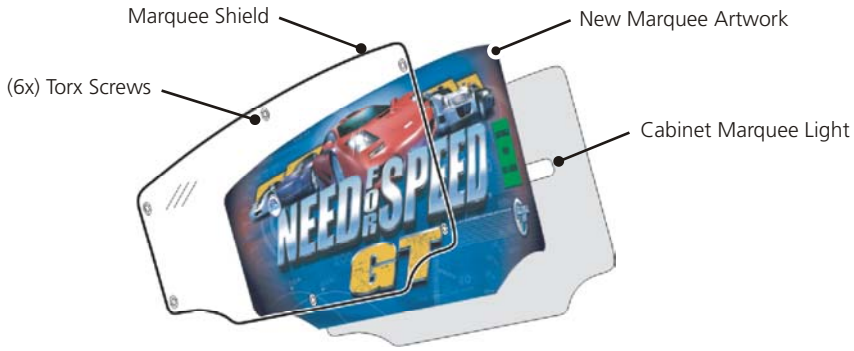


Figure 25 – Standard Cabinet Marquee

Upgrading the Marquee – Deluxe Cabinet

Use the following procedure to install the new marquee artwork in the deluxe NFS cabinet:

1. Remove the (9x) screws holding the rear, hinged marquee cover plate in place. DO NOT remove the (3x) screws below the hinge. CAUTION: The front monitor bezel may slide forward after the last screw is undone. Hold the bezel in place to prevent damage.
2. Tilt the plate back on the hinge. You may need a stepladder to access the marquee interior.
3. Using a Philips screwdriver, remove the two top retainer blocks. Leave the bottom and side blocks in place. Remove the old artwork.
4. Install the new artwork. Take care not to scratch the clear shield or artwork during installation.
5. Replace the retainer blocks holding the artwork in place.
6. Tilt the hinged marquee cover plate back in place and reinstall the (9x) screws.

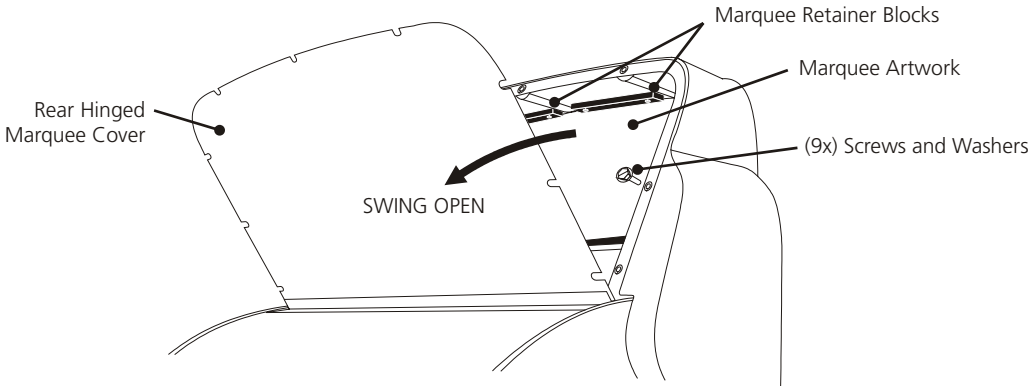


Figure 26 – Deluxe Cabinet Marquee

Chapter 4 – Game Setup

This chapter describes how to use the Game Operator menu to perform basic cabinet set up.

All game audits, game adjustments, and control diagnostics are options of the Game Operator Menu. Press the red operator button behind the coin mech door as shown in the figure below:

Figure 27 – Launching the Game Operator Menu

After you press the operator button, the Game Operator menu will appear. There is no mouse pointer seen when using the Operator Menu buttons to navigate the Game Operators Menu; instead, each option or menu button will highlight when it is ready to be selected.

Setting Game Options and Resets

Once in the Operator's Menu you will use driving controls to navigate and select. Use the *Up* and *Down* buttons to scroll through the settings. Use the *Select* button to confirm, and the *Back* button to navigate back a menu screen. When you are finished making adjustments, press the *Back* button repeatedly to exit the menu and return to attract mode. See the following example:

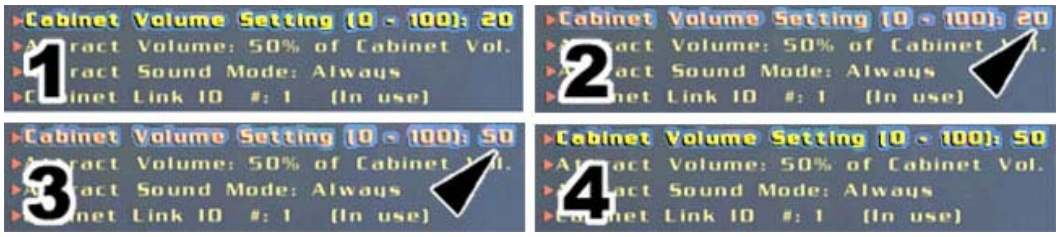


Figure 28 – Setting Cabinet Volume

1. Use the Operator menu *Up* and *Down* buttons to navigate and highlight a game option.
2. Press the *Select* Button to select the game option. The game option should now turn to red, as shown by the arrow in step 2 of the picture above.
3. Use the Operator menu *Up* and *Down* buttons to scroll up and down through the available game settings, shown by the arrow in step 3 of the picture above
4. When you have the correct game setting highlighted, press the *Back* button again to set the new game option. The game option will now turn back to yellow, as shown in step 4 of the picture above.

Machine Menu

The Machine menu is the default screen displayed when you press the Operator Button. See below.

Figure 29 – Machine Menu

Following are the functions of the Machine menu:

- **Status.** Displays the Tournament Status of the cabinet. This is reserved for future use.
- **Version.** Displays the software version of this cabinet.
- **Available Credits.** Displays the number of credits inserted on this cabinet.
- **Reset Credits.** Resets the Available Credits number on this screen.
- **Cabinet Volume.** Sets the game play sound volume. Options are 0 - 100 in increments of 10.
- **Attract Volume.** Sets the attract mode volume as a percentage of the cabinet's volume volume. Options are 0 - 100 in increments of 10.
- **Attract Sound Mode.** Sets attract mode to be with sound or without. Options are *Always*, *Sometimes*, and *Never*. The *Sometimes* setting will play sound in the attract mode movie 10% of the time.
- **Monitor Gamma Setting.** Sets the relative brightness of the monitor to compensate for age-related dimming (cabinet age, not your age!). Higher numbers increase the brightness. The default value is *1.0*. The maximum allowed value is *3.97*.
- **Cabinet Link ID#.** Sets the Cabinet ID number for linked cabinets. Each cabinet you link must have a unique Cabinet ID number (1, 2, 3, or 4).

Game Options

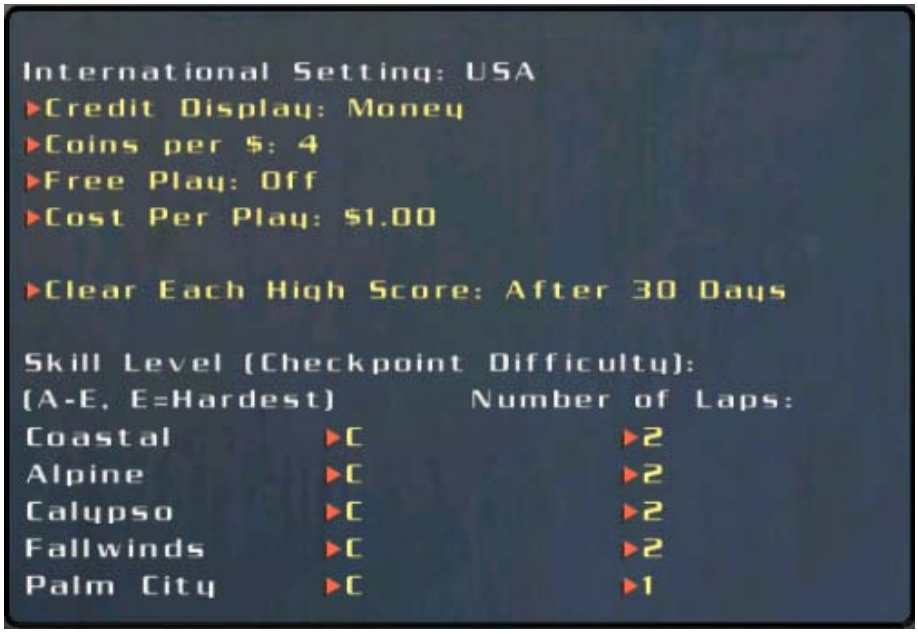


Figure 30 – Setting Game Options

The Game Options menu is used to set up the type of money or credits used at your location, the amount of coins that are needed to start a game, and game play difficulty.

- **International Settings.** Defines what type of money that will be used in this cabinet. This option is set by the USB Game Dongle
- **Credit Display.** Sets whether *Money* or *Credits* are used to play this cabinet.
- **Coins Per $.** Sets how many coin drops it takes to reach a dollar. In the USA this would be 4 (4 quarters per dollar). In the UK this would be 10 (10 pence per pound). Options are *1–20*.
- **Free Play.** Sets free play *ON* or *OFF*.
- **Coins Per Play.** Sets how many coins it takes to play. Options are *1–10*.
- **Clear Each High Score.** Sets the number of days to keep high scores. By default, each high score on the cabinet is erased after 30 days. This option allows the operator to choose to erase high scores *Never*, in *7 days*, or in *30 days* (default).
- **Skill Level.** Sets the time to reach each checkpoint in the race. Default skill for each racetrack is medium or *C*. Options are *A* (easiest), *B*, *C*, *D*, or *E* (hardest).
- **Number of Laps.** Sets the number of laps for each racetrack. Options are *1–5*.

Game Resets

Figure 31 – Game Resets Screen

- **Restore Factory Settings.** Sets the cabinet to the default settings below.

Table 1 – Factory Default Settings

	US (Dollar)	UK (Pound)
International Setting	USA	UK
Credit Display	Money	Money
Coins per $	4	10
Free Play	OFF	OFF
Cost Per Play	$1.00	£1.00
Game Volume	50	50
Attract Volume	100%	100%
Skill Level on All Racetracks	C	C

- **Reset Coin Stats.** Resets the Coin Stats for the cabinet.
- **Reset Game Stats.** Resets the Game Stats on the cabinet.
- **Reset Track Records.** Resets the Track Records for the cabinet.

Coin Stats

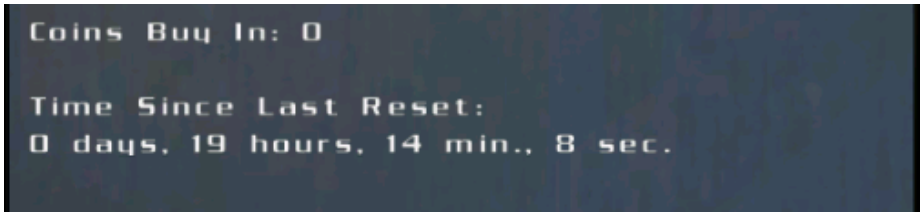


Figure 32 – Checking Coin Statistics

The Coin Stats menu shows the total number of coins collected for the cabinet, as well as the last date and time the stats were reset. The Coin Stats can be reset through the Game Resets menu.

Game Stats

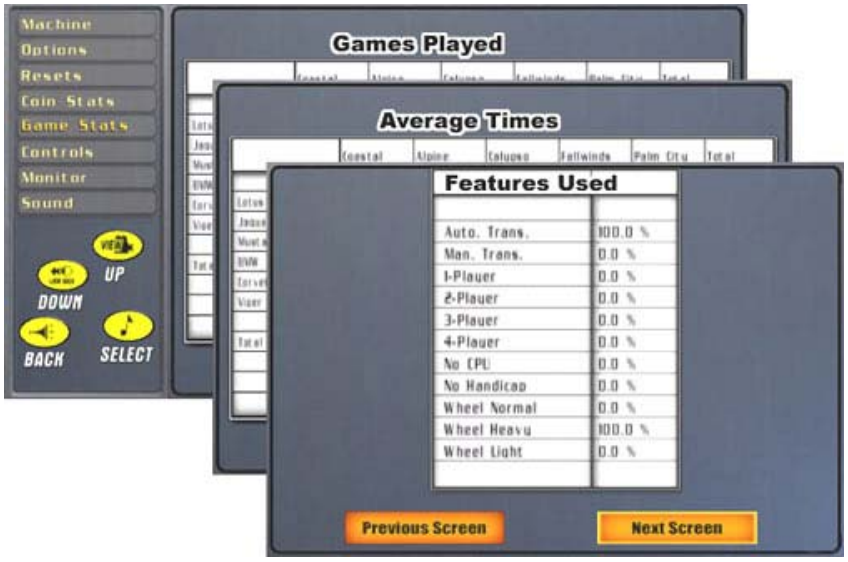


Figure 33 – Checking Game Statistics

The Game Stats menu shows the total number of games played, which racetrack was used most, and car features used in the game. Use the **Previous Screen** and **Next Screen** buttons to move through the available Game Stats pages. You can reset Game Stats data through the Game Resets menu.

Controls Menu

Figure 34 – Testing Game Controls

The Controls Menu allows the operator to test the cabinet controls. The Controls Menu is a graphical representation of all the controls on the cabinet. If you press a button, move the steering wheel, step on the gas, or move the shifter, you should see the same action or movement on screen. To exit from this menu, press the **Start** and **View** button at the same time (or press the Operator button).

- **Buttons.** When any button is pressed, it will light up on screen.
- **Steering Wheel.** Turn the Steering Wheel to the left or right. When it is working properly, you should see a change in the numerical reading just above the center of the steering wheel.
- **Gas & Brake Pedal.** When you step on the pedals you will see the same action on screen. The numerical readings show the high, low, and current values.
- **Shifter.** Moving the shifter up or down will appear on the screen. If you press the E-Brake button, it will light up on screen.
- **Credits.** When you insert money or credit into the coin mech or bill validator, you will see CREDITS OK on screen.
- **Calibration.** You can calibrate the steering wheel and pedals at any time by pressing the **Start** and **Horn** buttons simultaneously. DO NOT touch the steering wheel during the calibration process as this is done automatically with the Force Feedback motor. You will need to step on the gas and brake pedals when the calibration process asks you on screen.
- **Force Feedback Test.** Validates that the Force Feedback motor and Immersion Controller cards are working properly. Press the **View** and **Horn** buttons simultaneously to start the test. If everything is working properly, the steering wheel should move to the left and right momentarily.
- **Start Button, Leader Light and Brake Light.** When you enter the Controls Menu, the **Start** button, **Leader Light** and **Brake Lights** on the cabinet will begin to blink. If you do not see these lights blinking, verify the bulb for that light is in working condition.

Monitor Calibration Test

When you begin the Monitor Calibration Test, use the *Music* button to start the test, and the *View* button to scroll through the screens. To exit the Monitor Calibration Test, press the *Horn* button or the Operator button. See below.

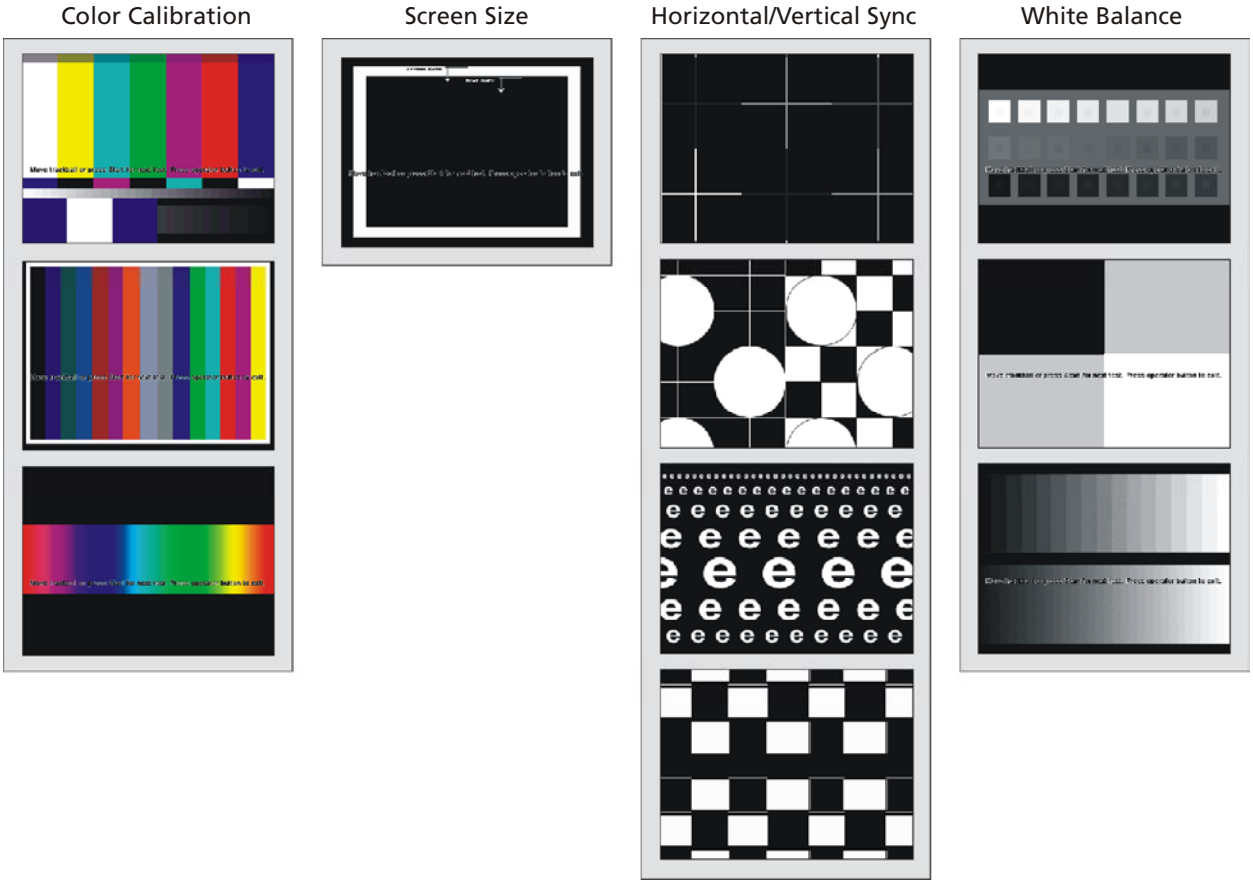


Figure 35 – Performing Monitor Calibration Tests

Use the monitor calibration screens to evaluate monitor performance. Each screen is designed to help you align the horizontal and vertical sync, or adjust the white balance and color hues.

Use the monitor control panel buttons to adjust the monitor. The monitor control panel is located next to the Game Operator button. Use the buttons on the monitor control panel to select, adjust, and set the available options.

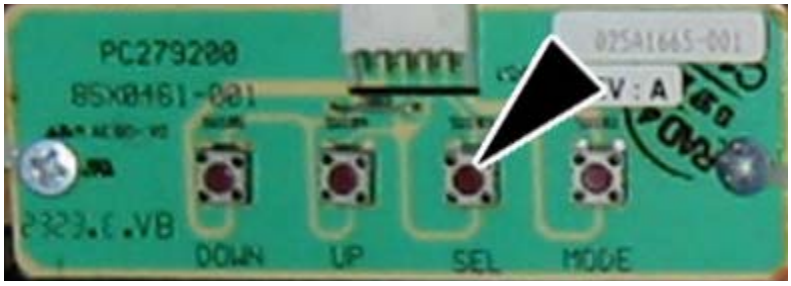


Figure 36 – Monitor Control Panel

Sound Test

Figure 37 – Sound Test Screen

The Sound Test menu will validate that each speaker is working properly on the cabinet. When you enter the sound test, each speaker will begin to call out its speaker name one at a time. You should hear the words "Left Front Speaker" coming out of the left front speaker on the cabinet, then 5 seconds later you should hear the words "Right Front Speaker" coming out of the right front speaker, and so on. You can press the *Start* button to stop the sound rotation and test one speaker at a time. The Sound test will continue to rotate sound through each speaker until you exit the test. Exit the Sound test by pressing the *Horn* button.

The picture on the screen will show the cabinet style (sit-down or upright). Note that the upright cabinet does not have rear speakers.

You should verify the audio connections on the computer to the u5.1AMP board if you find that sound is coming from the wrong speaker, or your speakers are not working properly.

Chapter 5 – Playing a Game

Starting a Game

With the proper amount of coins inserted, press the red *Start* button next to the steering wheel. Begin by choosing the track. Each track is rated by difficulty of play: *Easy*, *Medium*, or *Hard*. Turn the Steering wheel to highlight the track you want to race, and use the gas pedal to select. As you highlight each race track across the top of the screen, the race track map is displayed on the left showing the design of the course.

Figure 38 – Starting a Game

At the next screen you choose the car, car color, and transmission. Manual shifting will usually result in better speed control, and faster race times. There is no clutch used for the manual shifter; only the gear shift is needed.

Figure 39 – Choosing a Car

Figure 40 – Setting Handling and Performance Options

At any time during the car selection screens you can press the *View* and *Music* buttons to bring up the Handling and Options menus. Press the *View* button to bring up the car handling menu and scroll through the handling options. Each option changes the cars overall speed and the ability to grip to the road, once you have the car handling selected the menu will disappear in 5 seconds.

Press and hold the *Music* button to bring up the game options menu. Press the *View*, *Look Back*, and *Horn* buttons while you have the *Music* button pressed to change the options in the menu.

- You can race by yourself on the track with no other cars by turning the **AI** off. Press the View button to change this option.
- The Handicap option gives players a chance to win the race a little easier by slowing the AI cars down for the last ¼ lap of the race, press the *Look Back* button to change this option.
- You can choose Low, Medium, or High Force Feedback on the steering wheel by pressing the *Horn* button to change this option.

Once you have selected the available options for the track and your car, the game will begin to load. The next screen shows the other players that are racing against you, and how each car is setup in the race:

Figure 41 – Competitor List

Playing a Game

Use the Steering Wheel, Gas, Brake and Shifter as in any driving game to control the car. The buttons can enhance the game play by allowing you to look behind the car, change the view from the inside the car to the front bumper, and honk at other cars. Hold the music button to change the song on the radio, or tap it to turn the music off. Use the information on screen to tell you your position in the race, speed, and lap time as you race against other players.

Figure 42 – Driving Screen Functions

1. **Position in the race**. As you move ahead of other drivers your position will move up. It also shows how much ahead or behind you are of other drivers in time.
2. **Rear View Mirror**. Use this to look behind you as you drive, and block other drivers from passing you.
3. **Check Point Time**. This shows how much time is left for you to cross the next checkpoint in the race.
4. **Laps and Race Time**. This shows the total number of laps there on the racetrack, and how many you have completed. The clock shows the current time for your lap and the best lap time recorded.
5. **Track Map**. This shows the map of the racetrack. Each colored dot represents the other drivers and their location on the track.
6. **RPM and Speed**. This shows the RPM gauge for your car and the speed you are traveling
7. **Shifter**. The number shows what gear you are in, and the letter stands for whether you are driving an **A**utomatic or **M**anual transmission.

Chapter 6 – Service

Cabinet Specifications

STANDARD CABINET
Height = 76"
Width = 34"
Depth = 62"

DELUXE CABINET
Height = 82"
Width = 40"
Depth = 82"

UPRIGHT CABINET
(shown with optional seat)
Height = 74"
Width = 27"
Depth = 54"

Figure 43 – Cabinet Dimensions

Hardware Features

- Pentium 4 computer
- Nvidia GeForce 4 graphics
- 1 Gigabyte DDR RAM
- 32-bit color
- Force-Feedback Steering
- 800 x 600 Super VGA monitor

Troubleshooting

Video Troubleshooting

Problem	Cause	Possible Solution
No picture on monitor	Power problem	Verify the AC power connection to the monitor. You can verify that the monitor has power by looking for a small glow in the neck of the CRT.
	Bad video cable	Verify that the video cable is firmly connected from the monitor to the video card on the computer. While the monitor is powered ON, unplug the video cable from the monitor. You should see a message on screen saying *No Signal* to verify the monitor is working.
	Bad chassis PCB	Verify that the fuses on the chassis PCB are good.
Picture is out of color or misaligned	Picture is dim or faded	Use the monitor control panel to adjust the brightness and contrast settings. Adjust the monitor gamma setting (see page 24).
	Picture is out of color	Use the monitor control panel to adjust the red, green, and blue color settings.
	Picture geometry is misaligned	Use the monitor control panel to adjust the height and width as well as other geometric adjustments to see if this corrects the problem.
	Distorted colors on screen	Press the degausser button on the monitor control panel to see if this corrects the problem.

Audio Troubleshooting

Problem	Cause	Possible Solution
No audio	Volume setting	Enter the Operator Menu and adjust volume the volume setting for the cabinet. Verify that the attract volume is ON. Verify the adjustable volume setting on the audio amp is not turned off.
	Bad wiring	Turn off the cabinet. Verify that all the wires are firmly connected to each speaker. Verify that no wires are frayed or improperly shorting to ground.
	Blown speakers	Remove the speaker's grill covers, and visually inspect each speaker is in working order. Run the Sound Test from the Operator Menu to verify each speaker is working.
	Bad audio amp	You can verify the audio amp next to the Operator button is working by installing it into another working cabinet. If that is unavailable to you, plug a simple computer speaker into the audio ports on the computer and verify that sound is working from the computer.
Audio is distorted or muffled	Blown speakers	Remove the speaker's grill covers, and visually inspect each speaker is in working order. Run the Sound Test from the Operator Menu to verify each speaker is working.
	Faulty wiring	A weak or low muffled sound is a sign of reversed speaker wires. Check for reversed wires on each speaker.
	Bad Power Supply	A constant low hum in the speakers can be a faulty or bad power supply.
Bad sound channel	Bad audio amp	You can verify the audio amp next to the Operator Button is working by installing it into another working cabinet. If that is unavailable to you, plug a simple computer speaker into the audio ports on the computer and verify that sound is working from the computer.
	Blown Speakers	Remove the speaker grill covers and visually inspect each speaker is in working order. Run the Sound Test from the Operator Menu to verify each speaker is working.
	Bad Wiring	Turn off the cabinet. Verify that all the wires are firmly connected to each speaker. Verify that no wires are frayed or improperly shorting to ground.

Computer Troubleshooting

Problem	Cause	Possible Solution
No video	Loose or bad video card	Verify the video card is firmly plugged into the AGP slot on the computer. When the computer is ON verify the fan on the video card is spinning and working properly. When the computer boots up, it performs a PC self-diagnostic test. If there is a problem with the video card, you will hear 3 beeps from the computer.
	Loose or bad video cable	Verify that the video cable is firmly connected to the computer 15-pin video port and the 15-pin video port on the monitor. Check the video cable and make sure it is not pinched or frayed.
No video, no audio	Faulty hard drive	If you are getting no audio and no video, and the computer is powered on, you might have a faulty hard drive or corrupted software on the hard drive. Reload the software from the System Restore CDs to see if this solves the problem. If you continue to have hard drive problems after you reload the software, you may have a faulty hard drive.
	No power to computer	Verify the line voltage is set to the correct voltage for your area: 115V or 230V. Unplug the AC power cord from the computer and re-plug it back in to power on the computer.
No control panel or button functions	No power to the USB I/O card	If the USB I/O card is bad, all buttons and controls on the cabinet will not work. Make sure that the USB I/O card has power plugged into it from inside the computer.
	Bad wiring	Verify that the DB-25 and DB-37 connectors are firmly connected to the USB I/O card. Verify that no wires are frayed or improperly shorting to ground in the wire harness.
	Bad power supply	Verify that the external PC power supply is working. This provides 12 volt and 5 volt DC power to the hardware connected to the wiring harness.

Control Troubleshooting

Problem	Cause	Possible Solution
Buttons do not work	Bad micro switch	Replace the micro switch on the button and re-test. Verify that the wires are connected to the correct spades on the micro switch.
	Bad wiring	Turn off the cabinet. Verify that all the wires are firmly connected to each button. Verify that no wires are frayed or improperly shorting to ground.
	Bad USB I/O Card	If the USB I/O card is bad, all buttons and controls on the cabinet will not work. Make sure that the USB I/O card has power plugged into it from inside the computer.
Steering pulls to one side	Bad immersion board	Verify that the Immersion boards are getting 24 volts DC power. Test the faulty Immersion Force Feedback boards on a working cabinet.
	Bad force-feedback motor	Verify the motor in a working cabinet. Verify the Force Feedback Power Supply is putting out 24 volts DC
Sloppy or bad steering	Bad steering wheel sensor	Go into the operator menu and run the steering wheel calibration test. turn the steering wheel from left to right and verify that you are getting a good calibration.
	Loose or worn drive belt	Turn off the cabinet. Open the driving control panel and verify the belt on the on the force feedback motor and steering column. Check for loose or worn parts on the force feedback assembly.
	Bad immersion board	Verify that the immersion boards are getting 24 volts DC power. Verify the 25amp fuse on the immersion power board is not blown. Test the faulty immersion force feedback boards on a working cabinet.
No force feedback in the steering wheel	Force feedback settings too low in game	Go in the operator menu and verify the force feedback settings, and adjust them as necessary.
	Bad force feedback motor	Verify the motor in a working cabinet. Verify the force feedback power supply is putting out 24 volts DC
	Properly grounded force feedback motor with frame	Make sure the force feedback motor frame is properly grounded. Static shock can stop the steering wheel from responding during game play. Powering the cabinet Off then ON will correct this problem.
	Bad immersion board	Verify that the immersion boards are getting 24 volts DC power. Verify the 25amp fuse on the immersion power board is not blown. Test the faulty immersion force feedback boards on a working cabinet.

Cabinet Linking Troubleshooting

Problem	Cause	Possible Solution
Cabinet will not Connect	Bad Wiring	Verify that an Ethernet cable is connected between the Ethernet port on the A/C power panel and the computer. While the cabinet is powered on and connected to another cabinet, check the green LED is lit to verify a good hardware connection. If you are using an Ethernet hub, verify the LEDs light up for each Ethernet port used.
	Wrong Hardware Being Used	A cross-over coupler can only be used to link two cabinets. When linking 3 or more cabinets, use a hub.
Cabinet does not link in software	Duplicate linking ID numbers	If you get a duplicate Linking ID number error on screen you will need to go into the Operator menus and correct the Linking ID number for each cabinet that displays the error message. Make sure each cabinet in the networked group has a unique linking ID number.
	Faulty wiring	Verify that an Ethernet cable is connected between the Ethernet port on the A/C power panel and the computer. While the cabinet is powered on and connected to another cabinet, check the green LED is lit to verify a good hardware connection. If you are using an Ethernet hub, verify the LEDs light up for each Ethernet port used.
	Ethernet hub is faulty	Verify the LEDs on the Ethernet hub are lit up and working. Verify the Ethernet hub is working by connecting it to a known working computer network if possible, or try connecting the Ethernet hub to a working set of linked cabinets.
	Mixed software version	Verify that all cabinets are running the same software version.

Note: For all linked cabinets to recognize each other, it is very important to reboot all cabinets in the group when adding or removing linked cabinets or changing the cabinet link ID numbers.

Miscellaneous Troubleshooting

Problem	Cause	Possible Solution
USB game dongle not found	Game dongle not plugged in	Plug the game dongle into the computer. Power the cabinet off then on to see of this resolves the problem.
	Faulty USB game dongle	If you have a USB game dongle that does not illuminate, it is not recognized by the computer. Replace the game dongle with a working one.
Cabinet gets very warm	Faulty ventilation fan	Verify that the exhaust fan is working. It is located near the vents at the top of the cabinet. Replace the fan if worn or spinning slow.
	Ventilation holes on cabinet are blocked	Make sure you have proper clearance between the cabinet rear and the wall. Make sure the vent's holes are clear of dust and that air can flow freely.
Marquee lamp is bad or Intermittent	Faulty fluorescent tube	Check the fluorescent tube for darkened or cracked end. Replace the fluorescent tube if it looks worn.
	Faulty fluorescent fixture	Verify the fluorescent tube pins make a good connection with the lamp fixture. Check the ballast for proper operation.
Improper amount of credits given when coins or bills are inserted	Incorrect setting in operator menu	Go in the Operator Menu and verify the coin settings, and adjust them as necessary.
	Faulty wiring	Turn off the cabinet. Verify that all the wires are firmly connected to the coin mech and bill validator. Verify that no wires are frayed or improperly shorting to ground.
Game will not accept coins or bills	Faulty coin mech	Verify the coin mech is not jammed. Make sure the coin mech is properly aligned and latched to the coin door.
	Faulty bill validator	Verify the bill validator is powered on and working. If the bill validator is faulty it will usually blink an error code on the inside of the coin door.

Cabinet Service

GLOBAL VR assumes no liability for any damages or injuries incurred while servicing the cabinet. As such, only qualified service personnel should perform service and installation of cabinet hardware! Always turn the cabinet off and unplug the power cord from wall before performing any repair work.

Figure 44 – Major Hardware Components (Standard Cabinet)

Please read through the service instructions before working on the cabinet to insure there is no damage to the cabinet or hardware while you are removing the parts. Following are the major parts (see **Figure 44**):

1. Immersion USB Force Feedback I/O boards
2. Super VGA Monitor 800 x 600
3. 24 Volt DC Power Supply used for Force Feedback Steering wheel
4. u5.1AMP Audio Amplifier
5. Computer
6. External PC Power supply for u5.1AMP, Lights, Fans, and the Coin Mechs
7. Pedal Assembly – Gas and Brake only
8. A/C Power Panel with ON / OFF switch and External Ethernet Jack
9. Marquee Assembly with Leader light and Front Speakers
10. Monitor Plastic Frame Assembly
11. Driving / Control Panel Assembly
12. Coin Mechs and Cash Box
13. Rear Speakers
14. Bass Speaker (Sub-Woofer)
15. Shifter

Driving Control Panel Service

The Force Feedback Steering wheel, Immersion Force Feedback controller cards, Force Feedback 24 volt power supply, and buttons are all part of the Driving Control Panel assembly. The Immersion Force Feedback controller cards and 24 volt power supply are mounted in the rear of the cabinet.

To gain access to the Force Feedback Motor and buttons, remove the 3x T-25H Security Torx bolts from the top of the Driving Control Panel bezel as shown by the arrows in the picture below. The Driving Control Panel assembly is mounted to a hinge and will fold down.

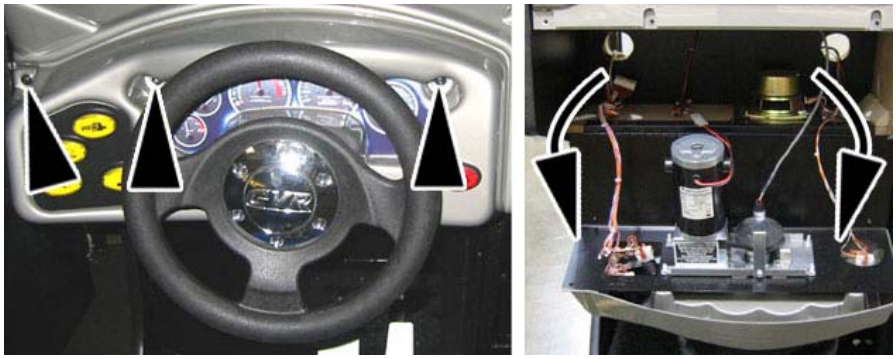


Figure 45 – Servicing the Driving Controls

The steering system has the following major components (see figure below):

A. Immersion Steering Wheel Sensor Connector

B. Power from Force Feedback 24 Volt Power Supply

C. Force Feedback Power to Force Feedback Motor

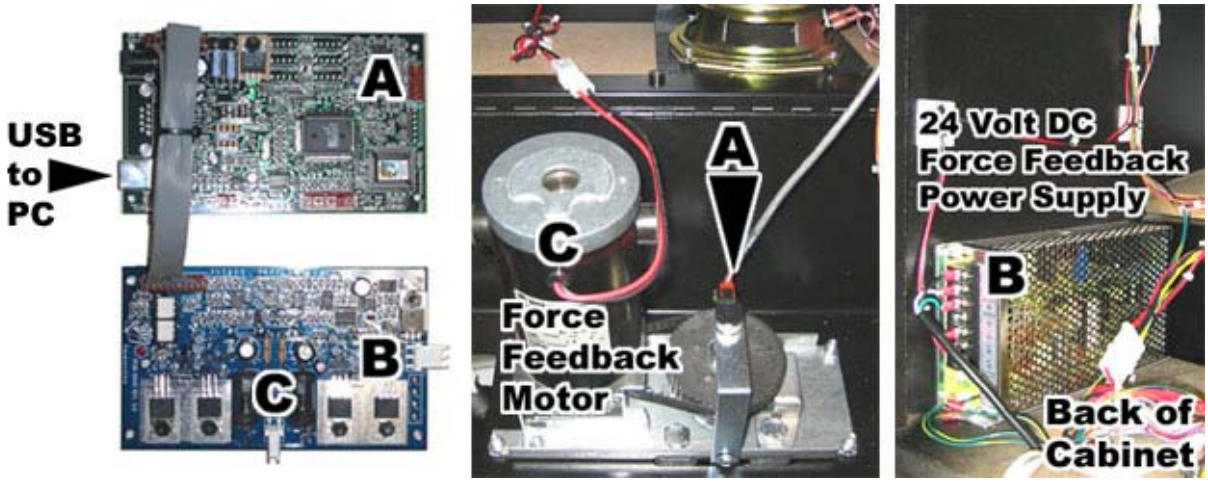


Figure 46 – Steering System Components

The Immersion Force Feedback controller cards connect through the USB cable to the computer on USB Port 2. The Immersion Force Feedback controller cards then connect to the Force Feedback Motor (C) and the steering wheel sensor (A) located on the Force Feedback motor frame. The 24 Volt DC Force Feedback power supply (B) connect directly to the Immersion Force Feedback Controller cards. Do not connect the Force Feedback power supply directly to the Force Feedback motor, as this will damage the motor and the power supply.

You can remove the force feedback motor, sensor, or belt if they ever need repair. Always replace the belt between the motor and the steering column if it looks cracked or worn. See the figure below.

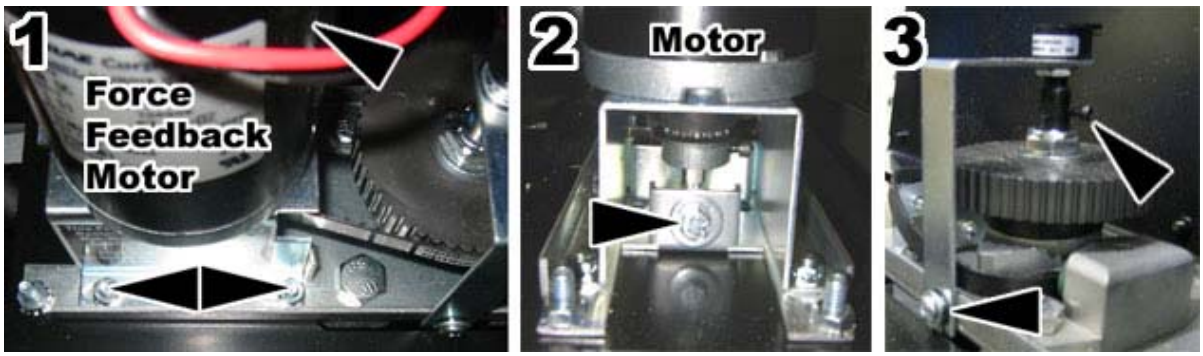


Figure 47 – Servicing the Force-Feedback Motor

Begin by loosening the (4x) 10mm nuts with lock washers that hold the force feedback motor to the frame, shown by the arrows in step 1 of the picture above. Next loosen the tension on the belt by unscrewing the tension adjustment bolt with a 10mm socket wrench shown by the arrow in step 2 of the picture above. You will need to unscrew the bolt until you can slip the belt off of the motor and steering column. Unplug the electric connector from the motor, and with the tension removed from the belt, remove the nuts that hold the motor to the frame. The motor is now free from the Driving Assembly. When installing a new belt tighten the tension adjustment bolt in step 2 until the belt is fully stretched, then loosen the bolt by ½ a turn.

To replace the steering wheel sensor, or replace the belt loosen the Phillips screw and loosen the 7/64 Allan wrench bolt shown by the arrows in step 3 of the picture above. The sensor with bracket can now be removed.

Driving Control Panel Button Service

The buttons on the cabinets are illuminated with 5-volt C555 bulbs. To replace the bulbs and micro switches, open the Driving Control Panel assembly. Gently rock the white plastic bulb house from side to side to loosen it from the button housing. When reconnecting the wiring to the micro switch and bulb, do not connect the 5-volt power wire to the micro switch, as this will damage the computer and other electrical hardware connected to the wiring harness.

Figure 48 – Replacing Button Light Bulbs

Monitor Service

At some point it may be necessary to remove the monitor from the cabinet for service or replacement. Please follow the instructions below, and follow all safety standards while working with a monitor. When removing the monitor from the cabinet it is always best to have 2 people support the weight of the monitor.

Figure 49 – Cable Connections to the Monitor Chassis

To remove the monitor, begin by unplugging the cables from the Monitor chassis. You will need to remove 3 cables from the chassis, and make sure there are no wire ties holding these cables to the monitor frame. See the figure above.

1. Remove the VGA Video cable from the back of the Monitor
2. Remove the Monitor Control Panel cable located near the center of the chassis. The cable is a 5 wire black cable.
3. Remove the Power Cable located on the left hand side of the chassis closest to you as you face the monitor from the back of the cabinet.

Next remove the (3x) T-25H Security Torx screws holding the Driving Control Panel assembly and lower the assembly down. At the top of the cabinet fold the Marquee forward and remove the two Phillips screws holding the top of the monitor cover to the cabinet. See the following figure:

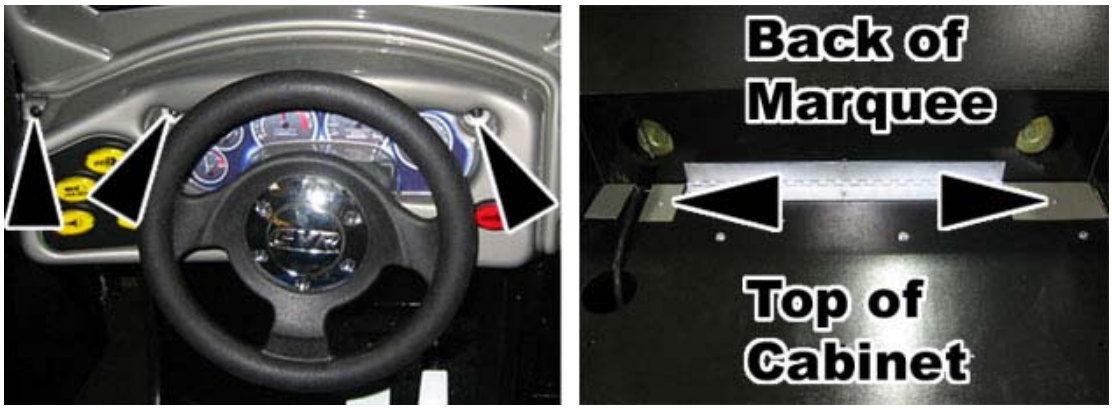


Figure 50 – Releasing the Driving Control Panel and Marquee

Once you have removed the screws, fold the Marquee back. See the following figure. You can now pull forward on the monitor cover and remove it from the cabinet. Remove the 4 bolts holding the monitor to the cabinet. Most of the weight of the monitor is located in the CRT at the front of the monitor. Carefully remove the monitor and set it in a safe place. To re-install a monitor reverse this process. Always clean the front of the CRT before re-installing the monitor bezel back in place.

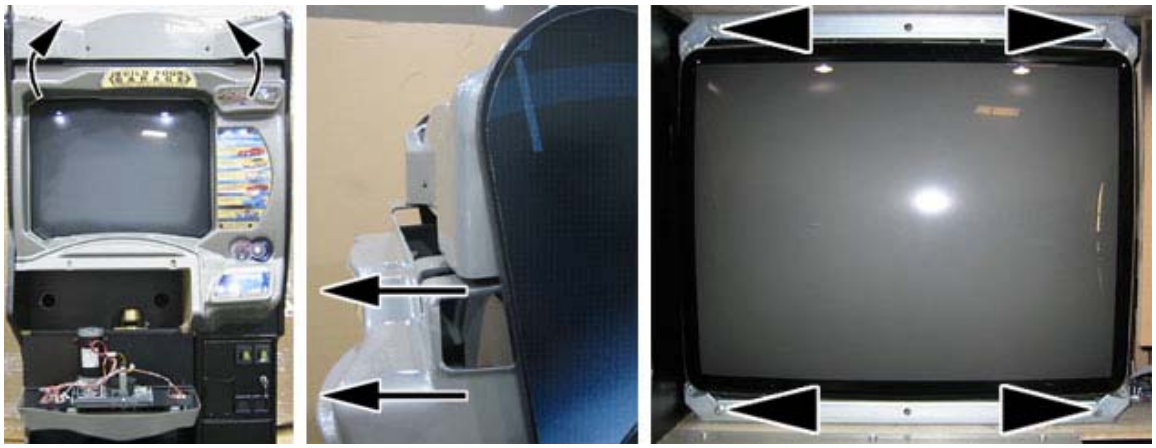


Figure 51 – Removing the Monitor

Wells Monitor Chassis PCB Removal

You can uninstall the monitor chassis PCB if you should have problems with just the PCB. Only a certified technician should perform the service steps to remove the PCA. GLOBAL VR assumes no responsibility for damage while removing the PCB.

1. Begin by removing the (4x) nuts that holding the monitor chassis to the monitor frame. Next remove the (2x) 4/40 Jack nuts that hold the video signal PCB to the monitor frame. See the figure below.

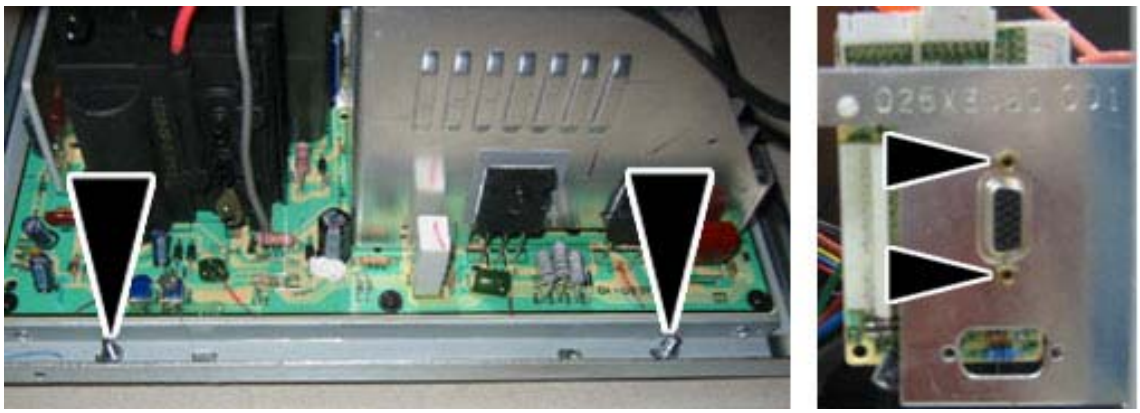


Figure 52 – Removing the Monitor PCB Mounting Hardware

2. Next unplug the Chassis Neck PCB from Chassis Tube Neck of the CRT by pulling back on the Chassis Neck PCB. You will need to slide the Chassis Neck PCB off to the side to clear the Chassis Tube Neck. The Fly-back cable that connects to the CRT just above the Chassis Tube Neck will need to be disconnected next. Be very careful as the Fly-back cable can hold 250volts even when powered OFF. Pinch the gray rubber flange, and slightly push in to un-hook the metal prongs that hold the Fly-back cable to the CRT, shown by the arrows in the picture below.

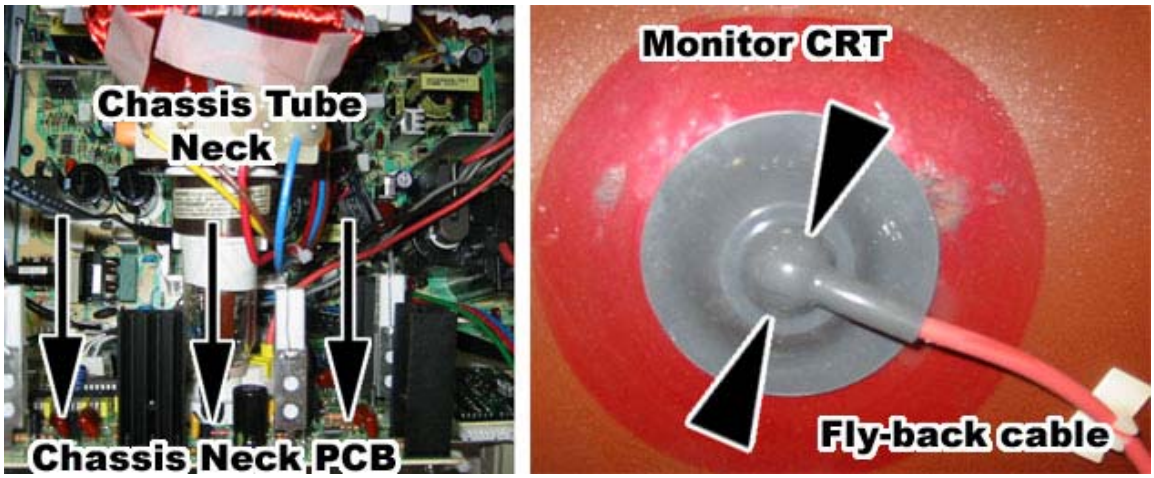


Figure 53 – Disconnecting the Chassis Neck PCB and Fly-Back Cable

3. Finally you will need to unplug 2 cables from the monitor chassis PCB and 1 from the chassis neck PCB that are directly connected to the CRT shown by the arrows in the figure below.
   - Unplug the CRT 2 wire ground cable that connect to the Chassis Monitor PCB (Item 1 below).
   - Unplug the CRT 2 wire ground cable that connects to the Chassis Neck PCB (Item 2 below).
   - Unplug the Color and Sync 4 wire cable that connects from the Chassis Tube Neck to the Monitor chassis PCB. Be sure to remember the color alignment of this connector when installing the new monitor chassis PCB (Item 3 below).

4. You can now slide the monitor chassis PCB and other PCB's out the side of the monitor as one unit.

U5.1 AMP and Speakers Service

The u5.1AMP supports 6-channel 5.1 Surround Sound. The u5.1AMP is powered by the external PC power supply and connects using two of the standard PC power supply connectors. A fuse has been installed on the board to help prevent any electrical damage to the board.

The volume level for each channel on the u5.1AMP can be manually adjusted using a small screwdriver to adjust the pots, shown by the circles in the figure below. Turn the each pot counter clockwise to turn the volume levels all the way down. Next, turn each pot 1/5 of a turn clockwise to bring the audio levels up. You can fine-tune the sound levels for your location from there.

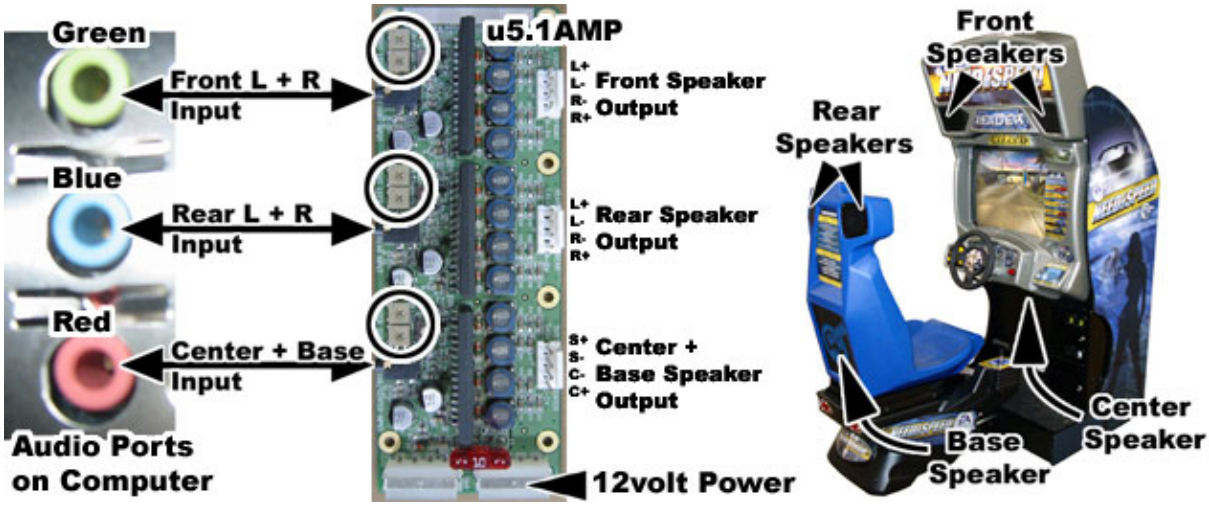


Figure 54 – AMP Connections, Volume Adjustment, and Speaker Location

There are three 3.5mm stereo audio cables used to connect the audio ports on the computer to the u5.1AMP. Each audio port on the computer is color coded to help identify the channel.

- The green audio port is front speakers left and right
- The blue audio port is rear speakers left and right
- The red audio port is center channel and base speaker (sub woofer)

The speakers are then directly wired to the correct Speaker Output on the u5.1AMP. The arrows in the figure above show the location of each speaker.

To remove the u5.1AMP, unplug the speaker output wires and the 3.5mm audio cables from the board. Use a small Phillips screwdriver to remove the 4 screws holding the card to the cabinet. Always keep the u5.1AMP inside an ESD static bag after it is removed from the cabinet to prevent electrical damage.

To remove the speakers you will need a 1/4-20H Security Torx bit to remove the screws holding the grill covers in place. Use the picture above to locate the speakers. The center speaker is located behind the driving control assembly.

Computer Service

The computer is serviced as one unit. You will void your warranty if you open the computer to replace parts yourself without the direct authorization from a GLOBAL VR technical support staff.

To remove the computer from the cabinet, unplug all the cables that are connected to the computer. Unplug the USB Game Dongle and keep this with your cabinet. Do not ship the game dongle with the computer if you send it in for repair. Use a 7/16" wrench to unscrew the (4x) ¼ -20 x 1" bolts from underneath the computer as shown by the arrows in the figure below.

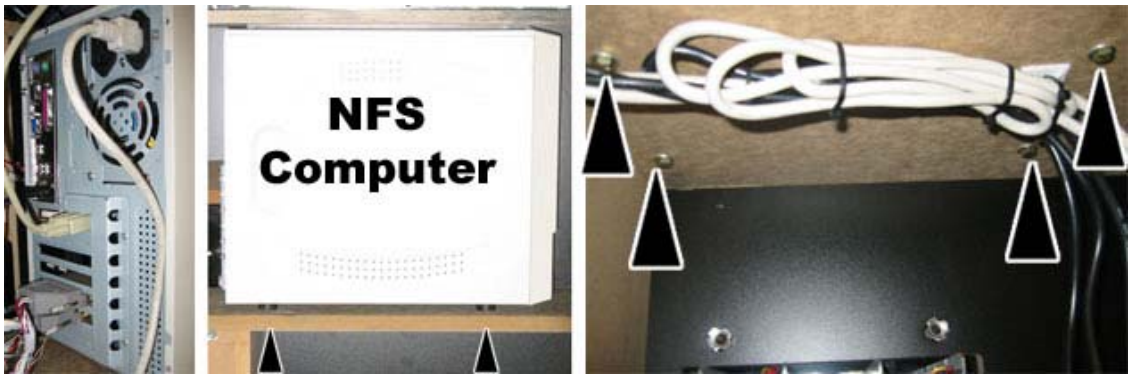


Figure 55 – Unbolting the Computer

When shipping the computer, always use plenty of padding and protection. GLOBAL VR recommends shipping the computer with 3 inches of foam padding on all sides. Shipping the computer inside a box that has insufficient padding can void the warranty if the computer is visibly damaged from shipping.

Coin Mech & Coin Meter

You can replace the coin mech with any standard arcade coin mech (including the NRI coin mech for international customers) to meet the needs of your location.

To remove the coin mech, unscrew the bolts on the latches as shown by the arrows in step 1 of the figure below. Then slide the latches apart from each other, and remove the Coin Mech as shown in steps 2 and 3. To re-install a coin mech, reverse this process. It is important to verify the operation of the newly installed coin mech with both good and bad coins.

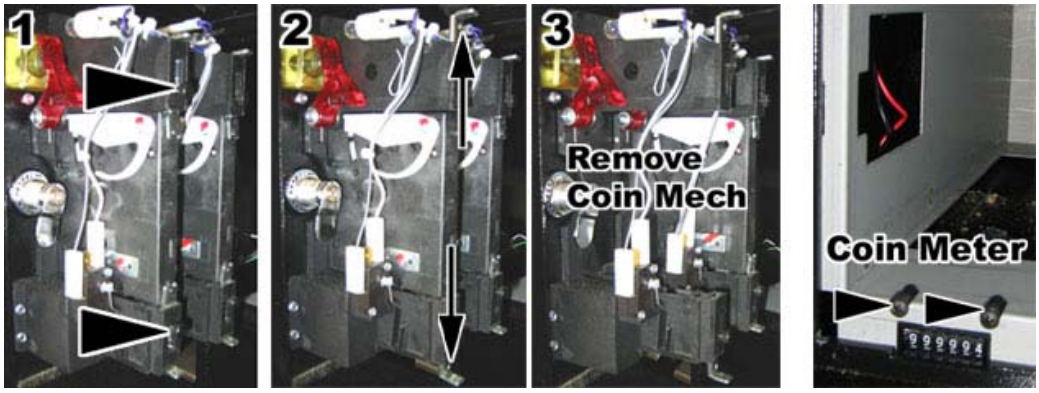


Figure 56 – Servicing the Coin Mech and Coin Meter

The coin meter is located in the bottom left-hand corner of the cash box. To remove the coin meter, disconnect the two wires from the coin meter to the wire harness. Next, unscrew the 2 Phillips screws holding the coin meter to the cash box. Slide the coin meter straight back and out the hole in the bottom of the cash box.

Pedal Assembly

The pedal assembly installs as one unit. To remove the pedal assembly you will need to unplug the pedal cable assembly from the wire harness from the backside of the cabinet, as shown by the arrow in the picture below. Then remove the (4x) 1/4-20H Security Torx bolts as shown by the arrows. Pull the pedal assembly towards the seat to remove.

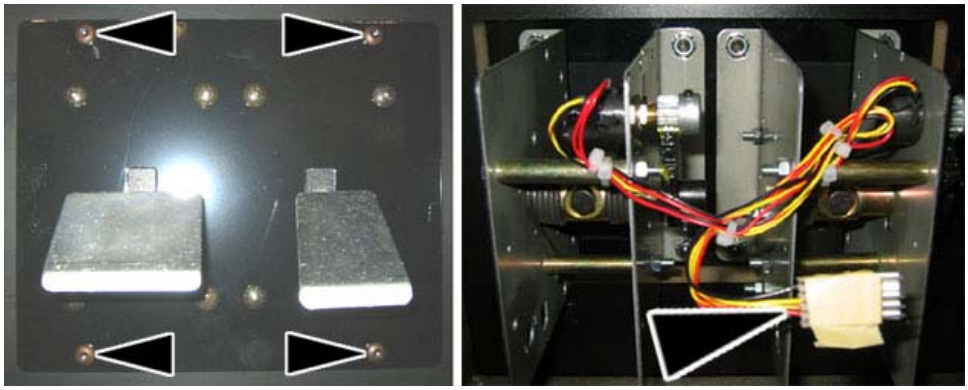


Figure 57 – Pedal Removal (Standard Cabinet)

AC Power Panel

The AC power panel distributes power to the inside of the cabinet, and provides ports for the Ethernet and phone connections from the computer. Inside the cabinet is a 6-outlet AC power strip that is connected to the power panel. An AC EMI Filter removes the electrical noise or dirty power that can cause electrical interference with the hardware inside the cabinet.

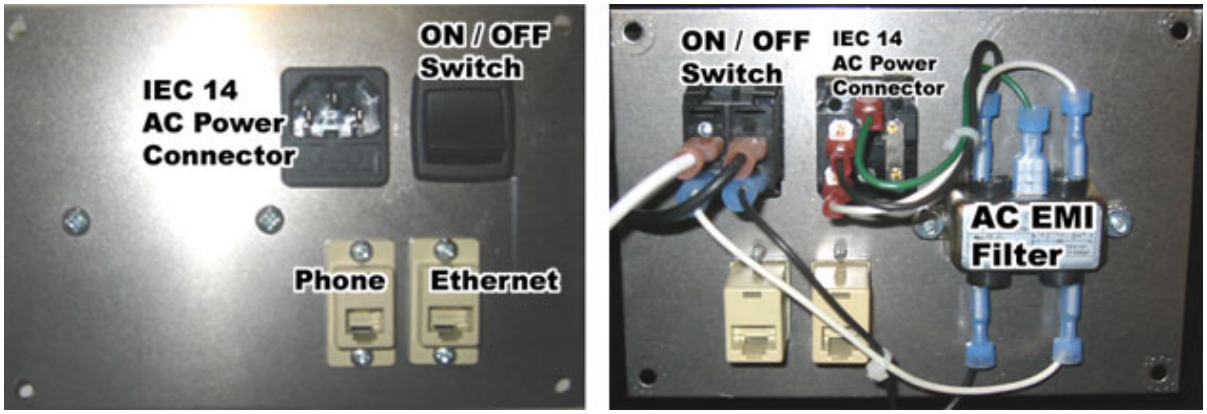


Figure 58 – Power Panel Front and Back

External PC Power Supply

The external PC power supply powers internal PCB cards like the u5.1AMP, illuminated buttons on the driving control panel, ventilation fan, and all the lights on the cabinet. If you are experiencing a power problem with all of this hardware it is likely that the power supply has gone bad. To replace the external PC power supply, unplug the 2 power cables and 1 AC power cord connected to the power supply. Then pull the power supply out. It is held to the cabinet with Velcro.

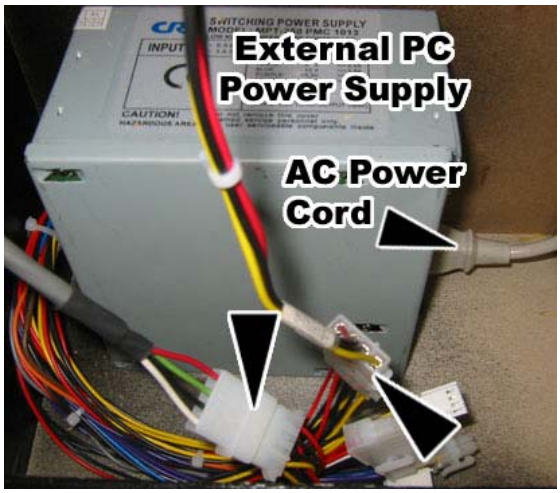


Figure 59 – PC Power Supply Connections

Marquee Lights and Speakers

To gain access to the light bulbs and speakers behind the marquee artwork you will need a 1/4-20H Security Torx bit for the screws. Remove the screws holding the artwork or speaker grills. The speaker wires can be removed from the speakers from the back side of the marquee sign.

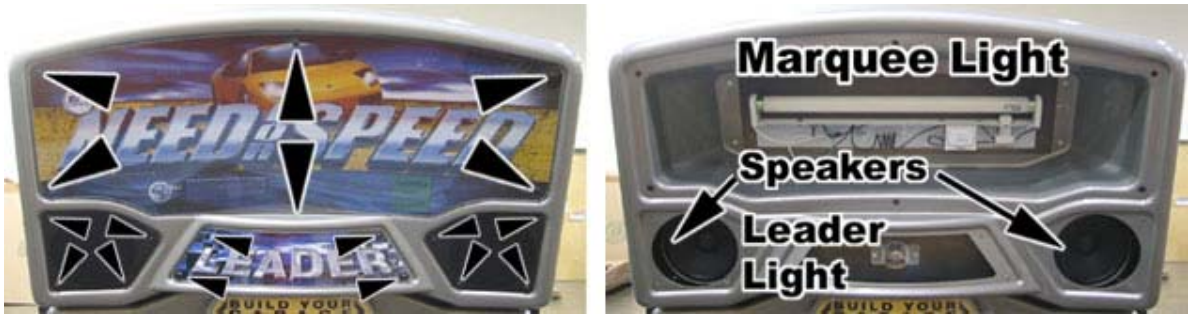


Figure 60 – Accessing the Marquee Light and Speakers

Shifter

You will need to remove the shifter from the seat to service the micro switches inside. To replace the shifter, remove the (4x) T-10H Security Torx screws, pull up on the shifter vertically, and unplug the shifter at the Molex connector.

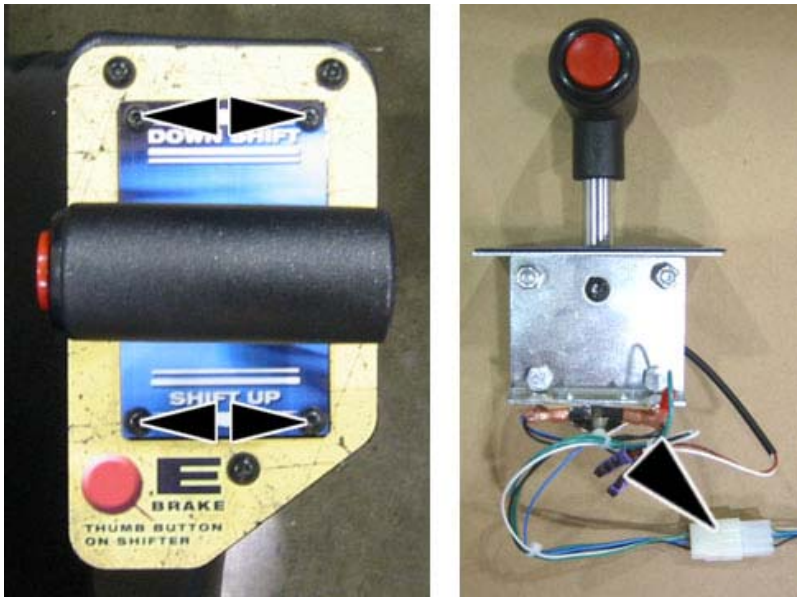


Figure 61 – Removing the Shifter

Standard Cabinet Wiring Diagram

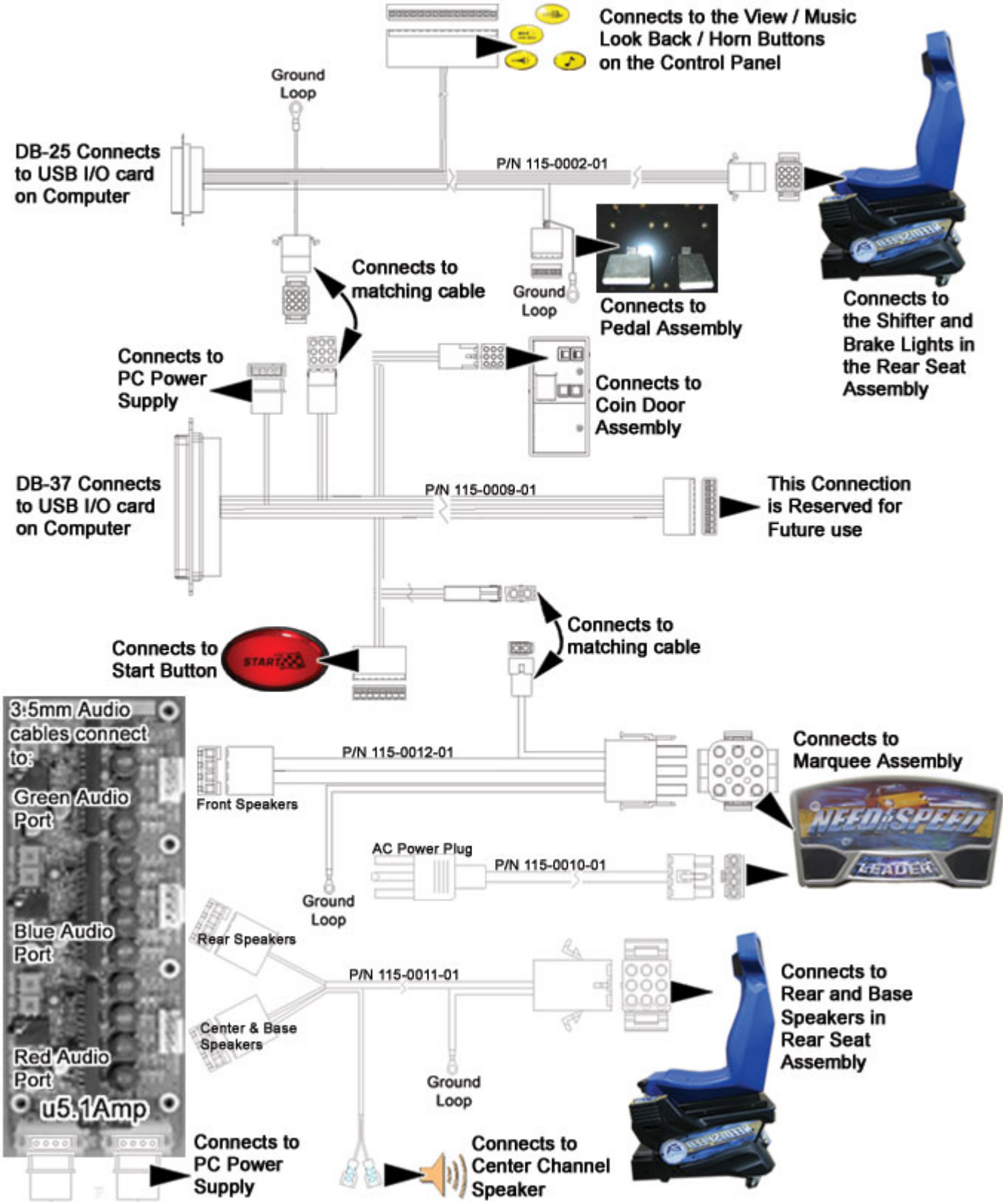


Figure 62 – Cabinet Wiring Diagram

Force Feedback Steering Wiring Diagram

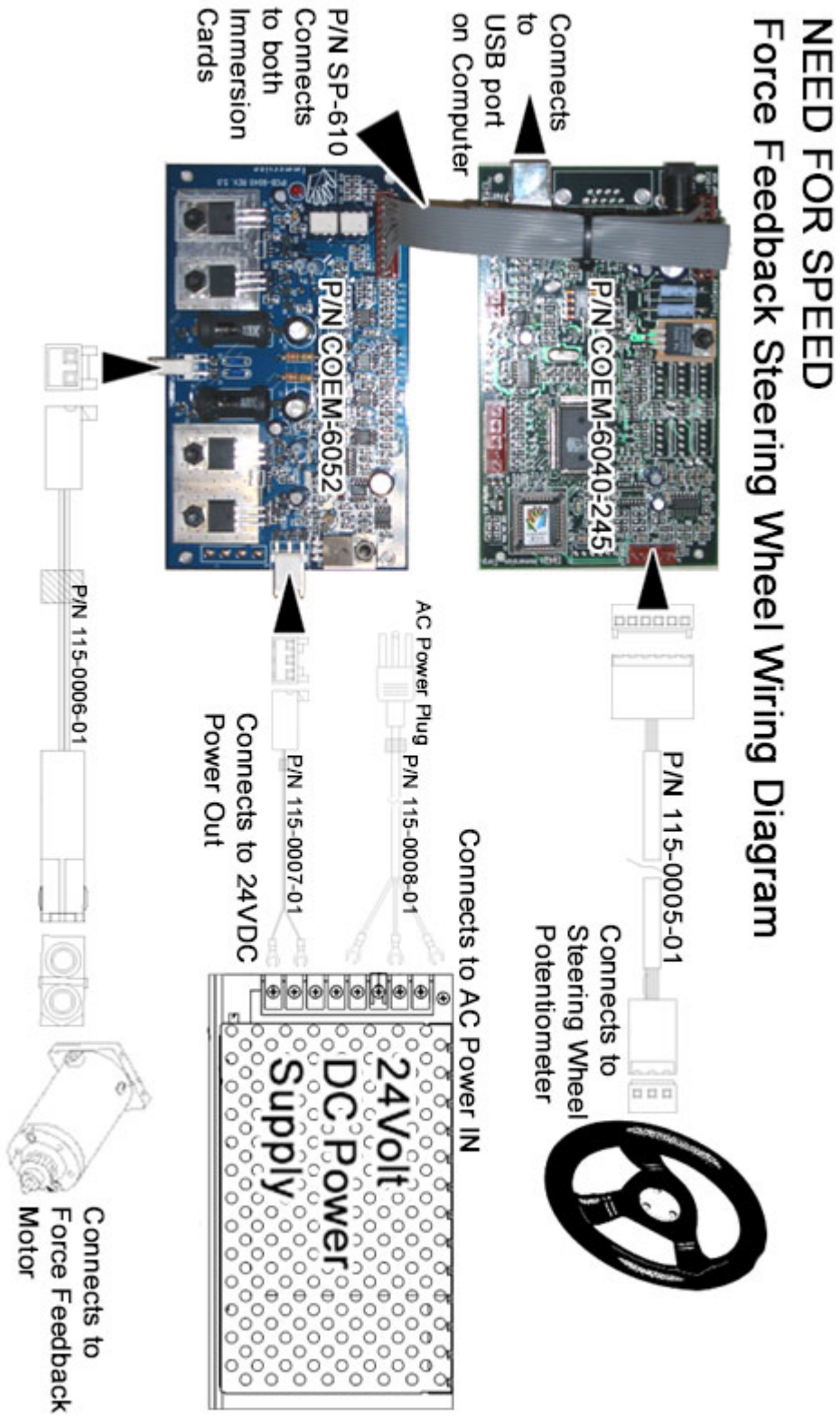


Figure 63 – Force Feedback Steering Wheel Wiring Diagram

Cabinet Specifications

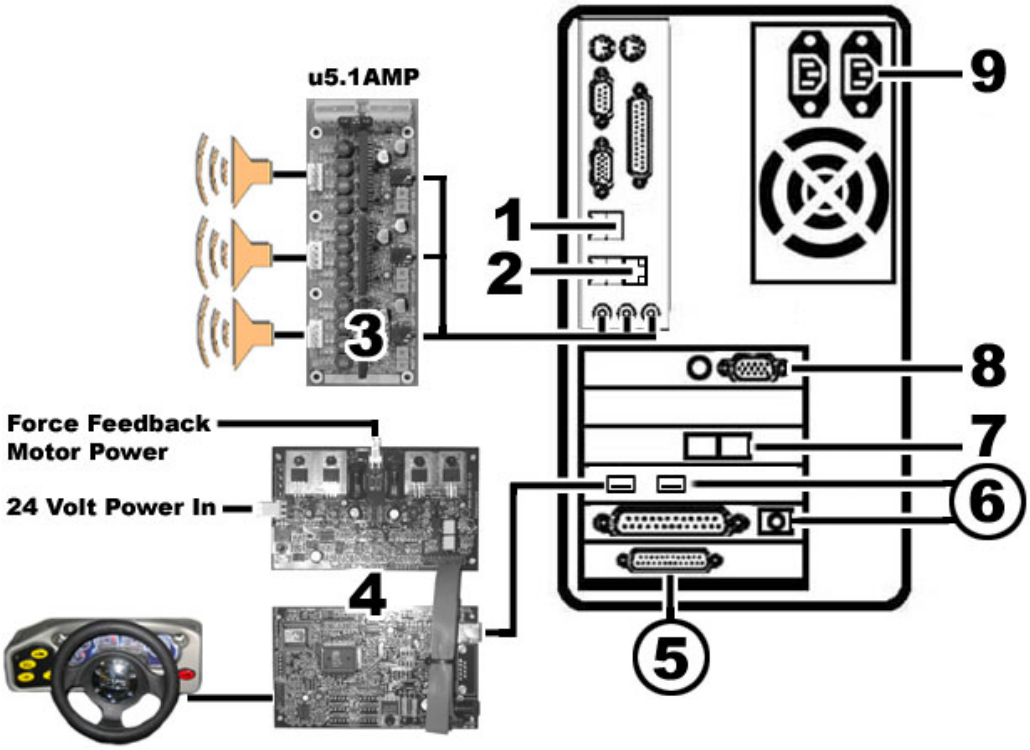
If you need replacement parts, use the part numbers listed below when you contact GLOBAL VR Tech Support.

Table 2 – Cabinet Parts List

Description	Qty	Part Number
DFI NFS Computer	1	NFS-PS35-BL
NVIDIA G4 TI 4200 128MB AGP	1	AS421284XAR
GLOBAL VR Game Card 3	1	USBIO
POWER STRIP, 6 OUTLETS	1	23-191300
Coin Door Assembly NFS w/ Service Switch	1	40-3000-31
NFS, Dual Pedal Assembly	1	50-2978-00
NFS, SEAT ASSEMBLY	1	970-0001-00 REV A
NFS, SEAT Support Bracket	2	04-13168
NFS, MARQUEE ASSEMBLY	1	970-0003-00 REV A
NFS, MONITOR COVER ASSEMBLY	1	970-0002-00 REV A
Monitor, 27" Wells Gardner SVGA	1	WGM2792-U0TS42A
WELLS MONITOR CHASSIS PCB	1	CHASSIS-27D9200
NFS, CONTROL PANNEL ASSEMBLY	1	970-0004-00 REV A
Force Feedback Motor Controller	1	COEM-6040-245
Force Feedback Power Card	1	COEM-6052
Force Feedback Motor	1	50-4043-00
Steering Wheel Pulley Belt	1	50-4041-00
Steering Wheel with GVR Chrome Cap	1	50-0102-00
24 Volt DC Power Supply	1	S-150-24
Audio AMP 5.1	1	990-0105-01 REV A
NFS Shifter Assembly	1	50-8110-00
Center Channel Speaker	1	50-9005-00
Base Speaker - Sub Woofer	1	5555-15142-00
3 Inch Rear Speakers	1	5555-16234-00
5.5 Inch Front Speakers	1	5555-15098-00
CBL, DB-25 to Driving Controls	1	115-0002-01 REV B
CBL, USBIO to DB-25	1	115-0003-01 REV A
CBL, PC Power to AMP5.1, Fans, Lamps	1	115-0004-01 REV A
CBL, Steering Sensor to Immersion FF Board	1	115-0005-01 REV B
CBL, Motor Power to Immersion FF Board	1	115-0006-01 REV A
CBL, +24VDC to Immersion FF Board	1	115-0007-01 REV B
CBL, Power 110VAC to +24VDC Power Supply	1	115-0008-01 REV B
CBL, DB-37 to Coin, Keypad, and Controls	1	115-0009-01 REV D
CBL, 110VAC to Fluorescent Lamp	1	115-0010-01 REV B
CBL, Audio AMP5.1 to Seat	1	115-0011-01 REV A
CBL, Audio AMP5.1 to Marquee and Center	1	115-0012-01 REV A
CBL, Stereo 3.5mm 6FT M-M	3	96-0539-00
CBL, Immersion Board Interconnect	1	SP-610
CBL, USB Cable 6FT	2	USB-AB06MM
System Manual	1	040-1201-01 REV A
Software, PQI, OS Recovery CD	1	050-0025-01 REV A
Software, Game Install, NFS (2 CD SET)	1	050-0026-01 REV A
PS2 KEYBOARD	1	PS2-KEYBOARD
Keys, Rear Door	2	
Keys, Coin Mech	2	
Keys, Coin Vault	2	
ARTWORK, MARQUEE, NFS	1	AW-NFS-01 REV A
ARTWORK, RIGHT SIDE, NFS	1	AW-NFS-03 REV A
ARTWORK, LEFT SIDE, NFS	1	AW-NFS-04 REV A
ARTWORK, DASHBOARD, NFS	1	AW-NFS-05 REV A

Description	Qty	Part Number
ARTWORK, MONITOR BEZEL, SIDE	1	AW-NFS-06 REV A
ARTWORK, PEDESTAL, RIGHT SIDE, NFS	1	AW-NFS-07 REV A
ARTWORK, PEDISTAL LEFT SIDE, NFS	1	AW-NFS-08 REV A
ARTWORK, SEAT BACK, NFS	1	AW-NFS-09 REV A
ARTWORK, CARD READER AREA	1	AW-NFS-10 REV A
ARTWORK, PEDISTAL BACK, NFS	1	AW-NFS-11 REV A
ARTWORK, LEADER BACKLIT, NFS	1	AW-NFS-12 REV A
ARTWORK, KEY PAD, NFS	1	AW-NFS-13 REV A
ARTWORK, MIRROR BEZEL, NFS	1	AW-NFS-14 REV A
ARTWORK, CENTER BEZEL, NFS	1	AW-NFS-15 REV A
ARTWORK, SHIFT PLATE, NFS	1	AW-NFS-16 REV A
ARTWORK, SHIFT PLATE TOP, NFS	1	AW-NFS-17 REV A
Need for Speed Linking Kit (Optional)	-	345-08013-01

Computer Rear Panel Diagram



	Port	Description
1	USB 1	For the USB Game Dongle.
2	Ethernet Port	The Ethernet port is used to Link Cabinets for Multi-Player games.
3	U5.1AMP	The u5.1AMP connect to the 3 audio ports on the computer. Each audio port is used for a specific channel on the cabinet speakers.
4	Immersion Force Feedback	The Immersion Force Feedback boards connect to the USB Port 2 on the computer. The Force Feedback motor and steering wheel then connect to the Immersion boards.
5	DB-37 and DB-25	The USB I/O card connects to the Operator Buttons, Coin Mechs, and Control Assemblies on the cabinet.
6	USB 3 to USB I/O card	The USB Port on the USB I/O card connects to USB Port 3 on the computer.
7	Modem Line Out	The right side plug is the Modem Line out port that connects to the analog phone line (for future use).
8	Video Out	The 15-pin video port connects to the Super VGA Monitor cable inside the cabinet.
9	AC Power	AC Power input must use a IEC 14 connector.

Technical Support

Free telephone, e-mail and online support are provided for systems during the warranty period. In addition to helping with troubleshooting and diagnosing defective parts, GLOBAL VR technical support is prepared to help you with questions about the operation of your game.

When you contact technical support, please provide the following background information to aid our technical support process:

- Cabinet's Game Serial Number (found in the Machine Menu page of the Operator Menu, and on the back of the cabinet).
- Your mailing address and telephone number.
- A summary of the question or a detailed description of the problem with your cabinet.

Technical support is available from 9:00AM to 5:00PM, Pacific Standard Time, Monday–Friday.

Call 408-597-3400 to reach a Technical Support staff member.

E-mail support is available at this address: support@globalvr.com

Tournament E-mail Support is available at this address: tournament@globalvr.com

Warranty Service

If at some point you require warranty service, contact your distributor. If technical support staff determines that your game is defective, a Return Merchandise Authorization (RMA) number will be issued.

Warranty Information

LIMITED WARRANTY

GLOBAL VR warrants that its computer circuit boards, hard drives, power supplies, monitors, displays, controls, sensors, and mechanical structures are free from defects in materials and workmanship under normal use and service for a period of ninety (90) days from the date of shipment.

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

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

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

GLOBAL VR will return the repaired Product freight prepaid to the Purchaser. All freight costs associated with replacement of warranty parts after expiration of the original warranty period are the responsibility of the Purchaser. GLOBAL VR is not obligated to provide the Purchaser with a substitute unit or on-site service during the warranty period or at any time. If after investigation GLOBAL VR determines that the reported problem was not covered by the warranty, Purchaser shall pay GLOBAL VR for the cost of investigating the problem at its then prevailing per incident billing rate. No repair or replacement of any Product or part therein shall extend the warranty period as to the entire Product. The warranty on the repaired part only shall be in effect for a period of ninety (90) days following the repair or replacement of that part or the remaining period of the Product parts warranty, whichever is greater.

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

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

THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON GLOBAL VR'S PART, EXCEPT FOR ANY EXPRESS WARRANTY SET FORTH IN A WRITTEN CONTRACT BETWEEN GLOBAL VR AND PURCHASER CONTAINING SPECIFIC TERMS WHICH SUPERSEDE THE TERMS HEREIN. THIS WARRANTY DOES NOT AUTHORIZE ANY OTHER PERSON TO ASSUME OTHER LIABILITIES, IF ANY, CONNECTED WITH THE SALE OF PRODUCTS BY GLOBAL VR.