Need for Speed
System Documentation
040-1201-01 Rev 99

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

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Table of Contents

Safety

- The following safety instructions apply to all game operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you 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:
  - o 115 volts / 60Hz in most of North and South America and some Far Eastern countries such as Japan, South Korea and Taiwan
  - o 230 volts / 50Hz in most of Europe, the Middle East and the Far East
- To help prevent electric shock, plug the system into 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, transient 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 heat sources.
- Always return the cabinets leg levelers to the extreme upright position, before attempting to move the game
- Do not block cooling vents.

Warnings

⚠ **CAUTION**	**WARNING** **To avoid electrical shock, unplug the cabinet before performing the installation procedures.**
(STOP)	**GLOBAL VR assumes no liability for any damages or injuries incurred while setting up the cabinet. As such, only qualified service personnel should perform this installation!**

Environmental Conditions

The Need for Speed cabinet is intended for indoor use only. Be sure to keep the cabinet dry and maintain operating temperatures of 10-40 Celsius or 50-104 Fahrenheit.

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 a 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 limed, 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, include computer systems, contribute to the electromagnetic environment.

Elector magnetic 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, 1986, to be helpful. It is available from the U.S. Government Print Office, Washington, DC 20402, Stock No. 004-000-00450-7 or on the word wide web at http://www.fcc.gov/bureaus./compliance/www/tvibookt.html.

This device has been tested and found to comply 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 an 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.

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Need for Speed Game 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 2 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 and force feedback steering. Need For Speed is linkable, allowing blistering head-to-head competition for up to 4 players.

Cabinet Inspection

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.

The 1st set of keys will be located in the coin return slot shown by the arrow. The 2nd set will be hanging on the inside of the coin mech door shown by the circle in the picture below.
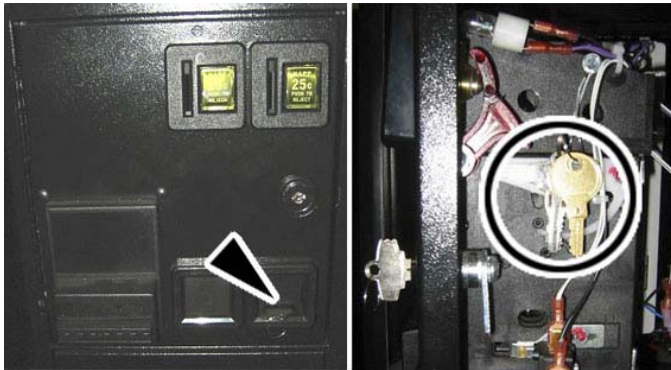
Remove the back door from the cabinet and inspect the computer system. Verify that all cables and major assemblies are securely connected to the computer and mounted to the side of the cabinet. Page 36 has a Computer Rear Panel Diagram to help verify the cable connections.

Connect AC the Power cord to a grounded (3-terminal) AC wall outlet.

Power on the game using the On/Off switch located on the lower rear of the cabinet to verify proper operation.

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Driving Seat Installation

The Drivers Seat will need to be assembled to the cabinet before the game can be played. 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 Security bolts with lock washers and fender washers to secure the Drivers Seat to the runners. The bolts and washers that are used to assemble the Drivers Seat to the cabinet are located in the cash box just under the Coin Mechs.

1. The Seat Runners are installed into the cabinet backwards for shipping. Remove the 4 Hex bolts holding each seat runner inside the cabinet using a 7/16 socket wrench. Pull the Seat Runners out and reverse them to install using the 4x Hex bolts with lock washers for each bracket. The angled end of the set runners should be pointed out and away from the cabinet as shown in part C of the picture below.

2. Slide the Drivers Seat onto the Seat Runners, and leave enough space to connect the wire harnesses. Locate the two wire harness inside the Drivers Seat and inside the cabinet were the Seat Runners are installed. Connect each wire harness together as shown in part A of the picture below, the connectors are keyed so you can not miss wire the Driver Seat. Slide the Drivers Seat towards the cabinet while guiding the wire harnesses inside. Attach the Drivers Seat to the Seat Runners using 4x ¼-20 T-25H Security Torx screws with lock washers and fender washers as shown in part B of the picture below for each side of the Drivers Seat.
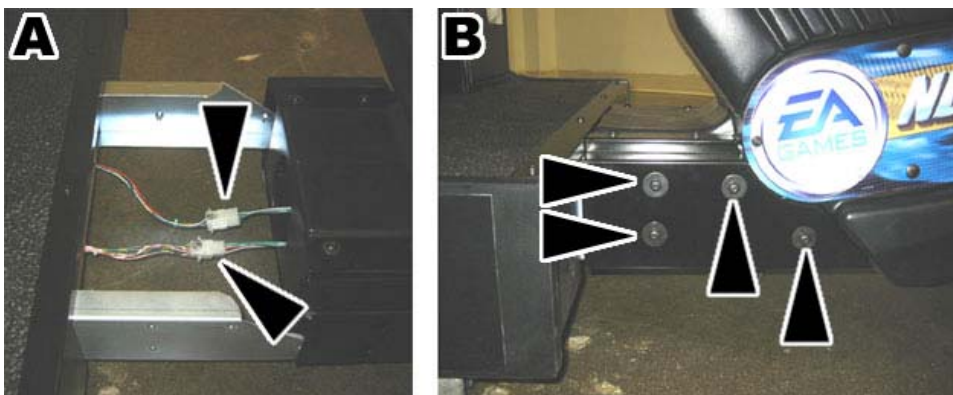
1. Rotate the Marquee forward towards the front of the cabinet as shown in the picture below.

2. Install the Marquee support bracket on the back side for the Marquee using 6x ¼-20 x 1" Hex bolts with a 7/16 socket wrench. Install the bracket with the sharper angle towards the top of the marquee as shown in part A of the picture below. Secure the top of the bracket to the Marquee first, then install the bottom bolts last. You can align the bottom holes in the bracket by bending the Marquee sign slightly back.

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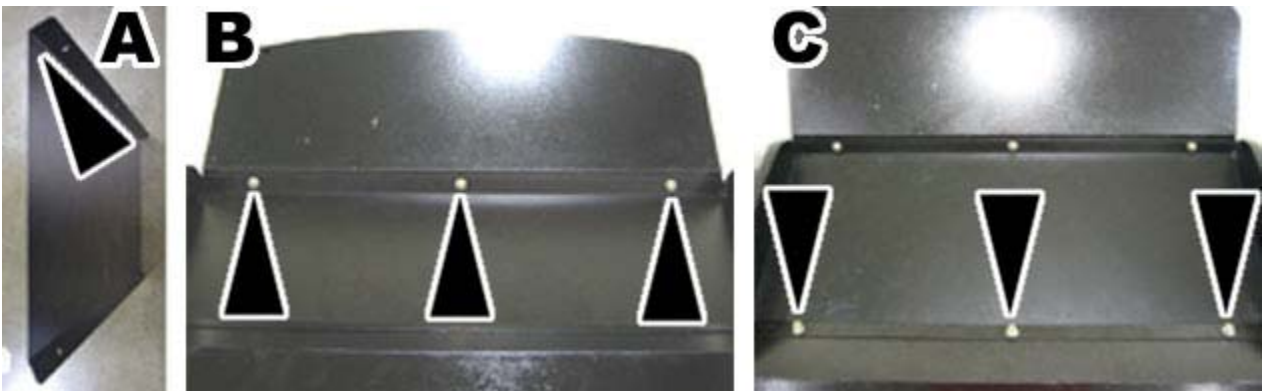
Game Operators Menu

All of Need for Speed's game audits, game adjustments, and control diagnostics are options of the Game Operator Menu. Press the red Operator Button behind the coin mech door in the cabinet to activate the Game Operator Menu shown by the arrow in the picture below:
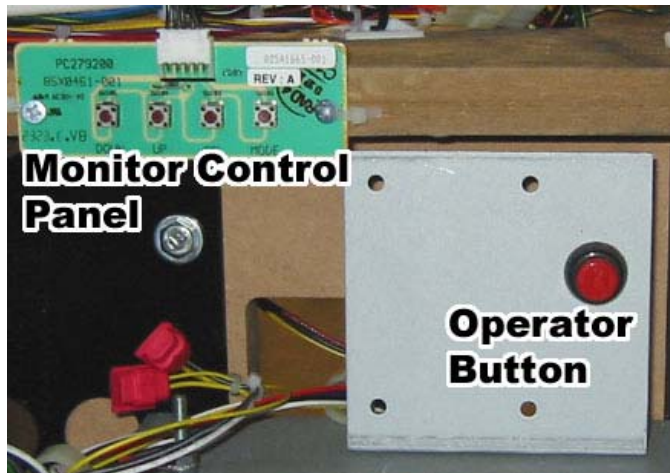
After you press the Operator Button, the following screen will appear. There is no mouse pointer seen when using the Operator Menu buttons to navigate the Game Operators Menu; instead each option or menu button will highlight in yellow when it is ready to be selected.

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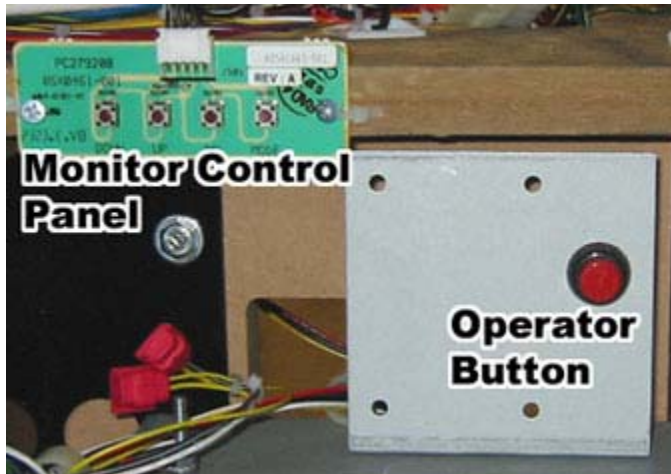## Setting Game Options and Resets

Once in the Operator's Menu you will use the Operator Menu buttons to navigate and set the game software. Most of the game options are set by using the Up / Down buttons to scroll up and down through the game settings. The Select Button is then used to select and confirm game settings; to navigate back a menu screen, press the Back button.

Example 1 Setting Game Options
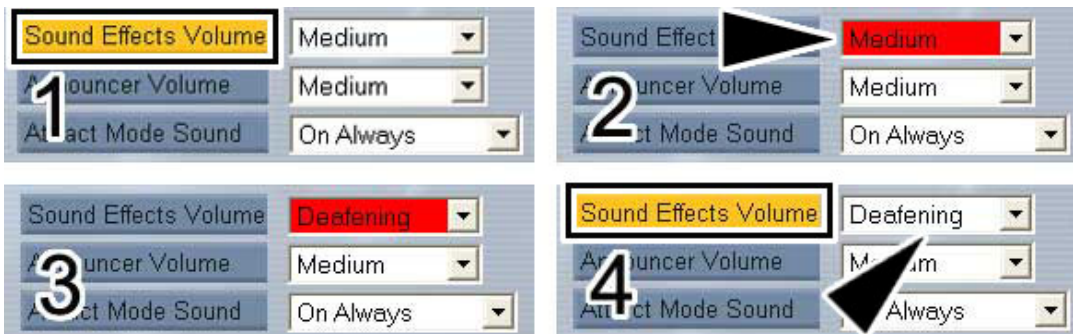
1. Use the Operator menu up and down buttons to navigate and highlight a game option.
2. Press the Select Button to select the game option. The game option window should now turn to red shown by the arrow in step 2 of the picture above.
3. Use the Operator menu UP and Down buttons to scroll up and down through the available game settings
4. When you have the correct game setting highlighted in the game option window press the Select Button again to set the new game option. The game option window will turn back to white shown by the arrow in step 4 of the picture above.

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The Machine menu is the default screen displayed when you press the Operator Button to enter into the Operator Menus.

Status	This gives the Tournament Status of the Cabinet. This is reserved for future use.
Version	This tells the Software Version of the Game Software you are running on your cabinet.
Available Credits	This tells the number of credits that have been inserted on this cabinet.
Reset Credits	This button is used to RESET or zero out the Available Credits number on this screen.
Cabinet Volume	This will adjust the sound volume during game play. The options to choose from are 0 - 100 in increments of 10.
Attract Volume	This will adjust the attract volume during the attract loop while the game is not being played. The options to choose from are 0 - 100 in increments of 10.
Attract Sound Mode	This sets the attract Mode to be with sound or without. The available options to choose from are Always, Sometimes, and Never. The Sometimes setting will only remove the sound from the Attract Mode movie.
Cabinet Link ID #	This is the Cabinet ID number when you link multiple cabinets together. Each cabinet you link together must have a unique Cabinet ID number in order for the cabinets to link correctly in software.

Game Options

The Game Options menu is used to setup 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 options is set by the USB Game Dongle
Credit Display	Defines whether Money or Arcade Credits are used to play this cabinet. The options to choose from are: Money, or Credits.
Coins Per $	This sets how many coin drops it takes to reach a dollar. In the USA you would set this to 4, because 4 quarters equal a dollar. In the UK this would be set to 10, because 10 pence equal a pound. The options to choose from are 1- 20.
Free Play	This will turn free play ON or OFF. The options to choose from are: ON and OFF.
Coins Per Play	This number defines how many coins or credits it will take to start a Game. The options to choose from are 1-10.
Skill Level	This sets the Check Point difficulty and number of laps for each race. The default Skill Level for each race track is medium or C. The options to choose from are A – E with A being the easiest and E being the hardest. Next set the number of laps for each race track the options to choose from are 1 – 5.

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Game Resets

Restore Factory Settings	Sets the Game Mode optional settings to the Factory Settings listed below

U.S.A. Factory Settings

International Setting	U.S.A.
Credit Display	Money
Coins Per $	4
Free Play	OFF

Cost Per Play	$1.00
Game Volume	50
Attract Volume	100%
Skill Level on all Race Tracks	C

U.K. Factory Settings

International Setting	U.K.
Credit Display	Money
Coins Per $	10
Free Play	OFF

Cost Per Play	1.00
Game Volume	50
Attract Volume	100%
Skill Level on all Race Tracks	C

Reset Coin Stats	Resets the Coin Stats menu for the cabinet. This reset does not affect the Lifetime records held by the game.
Reset Game Stats	Resets the Game Stats for the Game Stats menu on the cabinet.
Reset Track Records	Resets the Best Lap time and Track records held for each of the race tracks on the cabinet.

Coin Stats

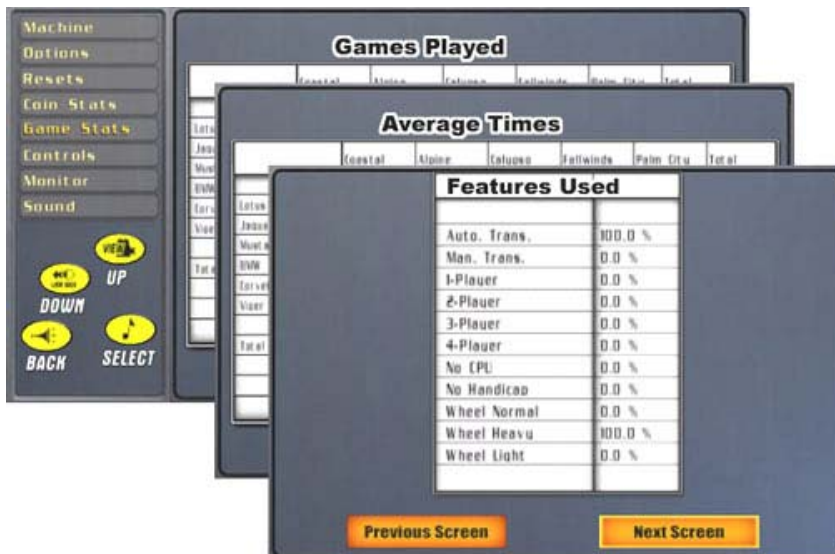Coins Buy In: 0

Time Since Last Reset:
0 days, 14 hours, 45 min., 3 sec.

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

Games Played

Average Times

Features Used

Auto. Trans.	100.0 %
Man. Trans.	0.0 %
1-Player	0.0 %
2-Player	0.0 %
3-Player	0.0 %
4-Player	0.0 %
No CPU	0.0 %
No Handicap	0.0 %
Wheel Normal	0.0 %
Wheel Heavy	100.0 %
Wheel Light	0.0 %

Previous Screen   Next Screen

The Game Stats menu shows the total number of games played, average lap time per race track, and car features used in the game Use the Previous and Next Screen buttons to move through the available Game Stats pages. You can reset Game Stats data through the Game Resets menu.

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Controls Menu

The Controls menu will perform different cabinet hardware tests to verify the hardware on the cabinet is working properly. 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. A description of each control test is described below. In order to exit from this menu you will need to press the Start and View button at the same time.

|	
Buttons	Press the buttons on the control panel, when they are working properly you should see the same button light up on screen including the E-Brake button on the shifter handle.
Steering Wheel	Turn the Steering Wheel to the left or right, when it is working properly you should see the steering wheel on screen turn left and right along a change in the potentiometer reading.
Gas & Brake Pedal	When you step on the Gas or Brake pedal you will see the same action on screen. The potentiometer reading shows the high and low reading for the pedal along with the actual reading as you step on the Gas or Brake pedal in the middle.
Shifter	Move the shifter up and down and you will see the same action on screen. If you press the E-Brake button this will light up on screen to show that it has been pressed.

Credits	When you insert money or credit into the coin Mech or through a Bill Validator you will see the CREDITS light up on screen.
Calibration	You can calibrate the Force Feedback Steering Wheel along with the Gas & Brake pedal at anytime by pressing the Start and Horn button at the same time. 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 pedal when the calibration process ask you to on screen.
Force Feedback Test	The Force Feedback test will validate that the Force Feedback motor and Immersion Controller cards are working properly. Press the View and Horn button at the same time to activate the test. If everything is working properly the steering wheel should move to the left and right momentarily.
Leader Light and Brake Light	As soon as you enter the Controls Menu the Leader Light and Brake Lights on the cabinet will begin to blink. If you do not see one of these lights blinking please verify the bulb is in working condition.

Monitor Calibration Test
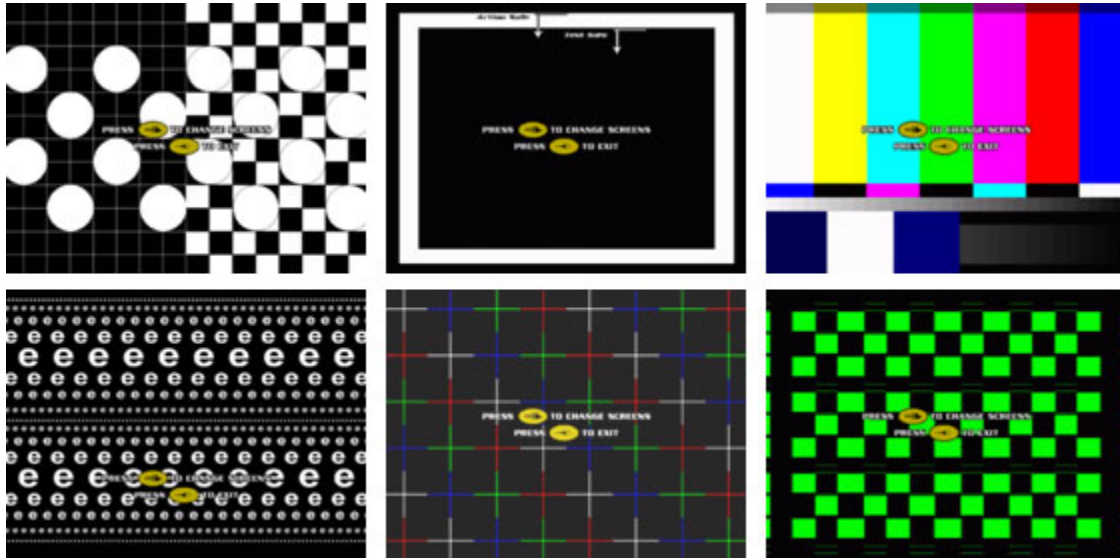
When you begin the Monitor Calibration Test; use the Music Button to start the test and the Change View button to scroll through each monitor screen test. To exit the Monitor Calibration Test, press the Horn button. Use each monitor calibration screen test separately to adjust and fine-tune the picture on your monitor. Each screen is designed to either align the horizontal and vertical sync, or adjust the white balance, and color hues. If you notice a color distortion on the monitor; press the degausser button on the Monitor Control Panel shown by the arrow in the picture below to fix the color distortion.

Use the Monitor Control Panel to adjust and fine-tune the picture quality on your monitor. The Monitor Adjustment Options display on screen, use the buttons on the Monitor Control Panel to select, adjust, and set the available options. The Monitor Control Panel is located next to the Game Operator button behind the Coin Mech door.
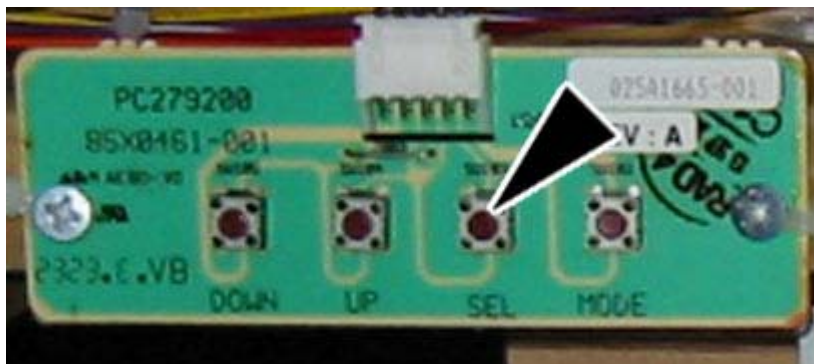
Starting a Game

With the proper amount of credits inserted press the Start Button next to the Steering wheel to start a game. You begin by choosing the track you want to race. 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.

At the next screen players can choose what car they would like to drive. There are 6 cars to choose from: Lotus Elise, Jaguar XKR Coupe, Ford Mustang Cobra, BMW Z8, and a Chevy CorvetteZ06. The Dodge Viper GTS requires 2 First Place finishes to unlock the car selection. While you are in the car selection screen you can press the VIEW button to change the cars response and handling. Continue to press the VIEW button to scroll through the available options of Normal, Advanced, and Expert.
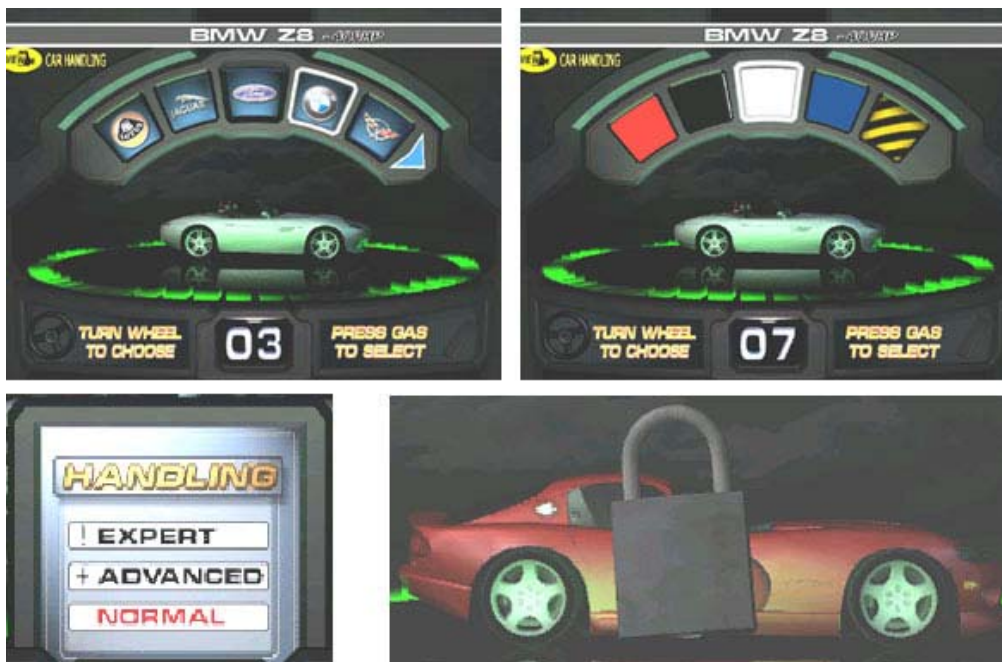
One you have selected a car you can choose between Automatic, or Manual Transmission for you car at the next screen. Manual shifting will usually result in better speed control, and faster race times. There is no clutch used for the manual shifter only the gear shifter is used on the side of the Drivers seat to shift UP or Down a gear.

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 if your game is linked with other players.

Playing a Game
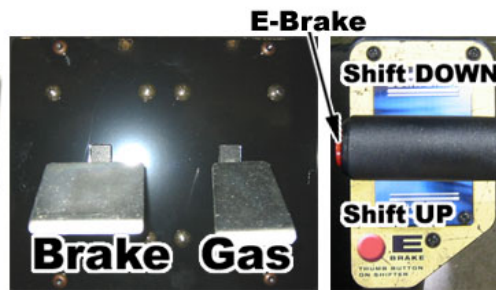
1 – Look Behind Button
2 – Chang View Button
3 – Horn Button
4 – Change Music Button

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, honk at other cars, and change the music on the radio. Use the information on screen to tell you your current position in the race, speed, and lap time as you race against other players.

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 check point in the race.
4. **Laps and Race Time** - This shows the total number of laps there on the race track, and how many you have completed. The clock shows the current time for you lap and the best lap time recorded.
5. **Track Map** - This shows the map of the race track, each color dot represent 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.

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USB Game Dongles

USB Game Dongle Activated

USB Game Dongle Not Activated

The Need for Speed cabinet comes with a USB Game Dongle to activate the game software. The Need for Speed game dongle plugs directly into the USB ports on the back of the computer, no USB HUB is used as shown in the picture above. When the USB Dongle is installed and working properly a Red LED light will illuminate inside the Dongle. In order for a USB Game 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.

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System Restore CD's

In the event the software running on the computer becomes corrupt, or you run into software problems GLOBAL VR provides a way of restoring the software running on your Need for Speed computer. The System Restore CD's will load the Operating System on 1 CD first; then the game software is on separate CD's that will be installed second. Please be aware when you use the System Restore CD's you will erase all history for the coin and game audits held in the game software.

Operating System Restore CD

1. Power ON the computer and open the CD drive to INSERT the CD labeled Disk 1. The CD should automatically start up (wait about 60 seconds) and on the screen you should see the Hard-Drive Image process starting.
2. When the Hard-Drive Image process has finished remove the CD and reboot the computer

Game Software CD

1. While the cabinet is powered ON and the computer has finished booting up; open the CD drive and INSERT the Game CD. The CD should automatically start up (wait about 60 seconds) and on the screen the Install Wizard windows is displayed. During the installation, which will take approximately 10 minutes, you will see several windows pop up copying various components and files to the hard drive.

2. The system will automatically begin copying files from the Game CD. When the CD is complete, the system will automatically reboot. Once the game has restarted, you may now remove the CD. Keep this CD in a safe place in case it is needed for future use.

3. When the game loads up for the first time, it is important to synchronize the new game software with the cabinet's hardware. This is done by coining up the machine (insert 2 credits), then verify that the two credits are shown (i.e., $0.50) on the monitor. Finally, power the system Off and On to complete the synchronization process.

GLOBAL VR assumes no liability for any damages or injuries incurred while servicing the Need for Speed 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.

All of the major hardware components for the Need for Speed cabinet are listed in the picture above by number with a brief description of the part below. Please read through the service instructions before working on the NFS cabinet to insure there is no damage to the cabinet or hardware while you are removing the parts.

1. Immersion USB Force Feedback I/O boards
2. Wells Gardner 9120 Digital Super VGA Monitor 800 x 600
3. 24 Volt DC Power Supply used for Force Feedback Steering wheel
4. u5.1AMP Audio Amplifier for Surround Sound 5.1 specs
5. NFS Computer – Pentium 4 / 512MB Ram / G4 Ti 4200
6. External PC Power supply used to power the external hardware like the 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. Base Speaker (Sub-Woofer)
15. Shifter

Driving Controls Panel Assembly

The Force Feedback Steering wheel, Immersion Force Feedback controller cards, Force Feedback 24 volt power supply, and buttons are all apart 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.
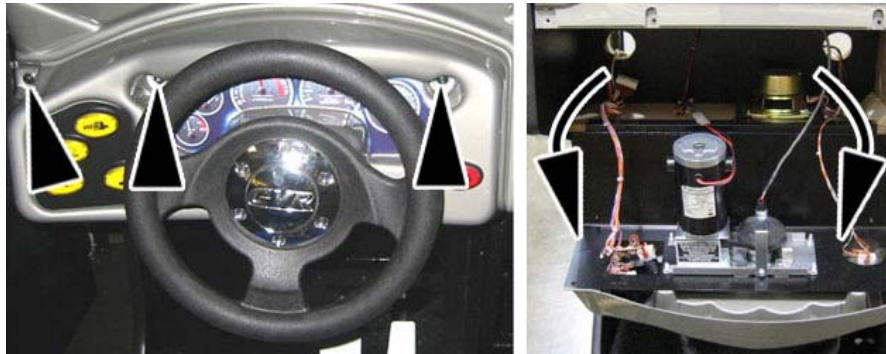

To gain access to the Force Feedback Motor and buttons remove the 3x T-25H Security Torx bolts from the top of the Driving Control Panel bezel as shown by the arrows in the picture above. The Driving Control Panel assembly is mounted to a hinge and will fold down.
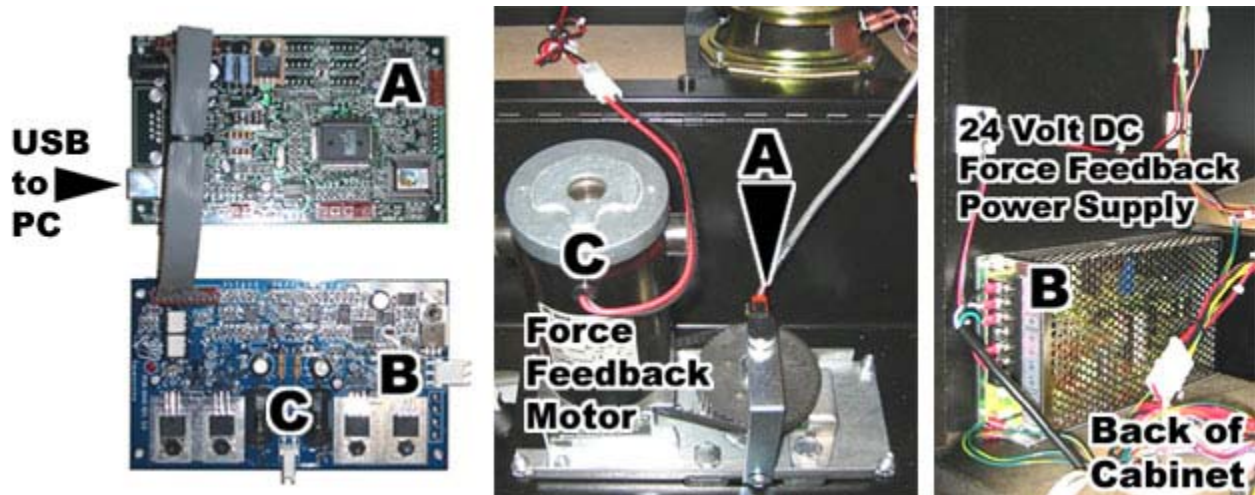
   A. Immersion Steering Wheel Sensor Connector
   B. Power from Force Feedback 24 Volt Power Supply
   C. Force Feedback Power to Force Feedback Motor

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.

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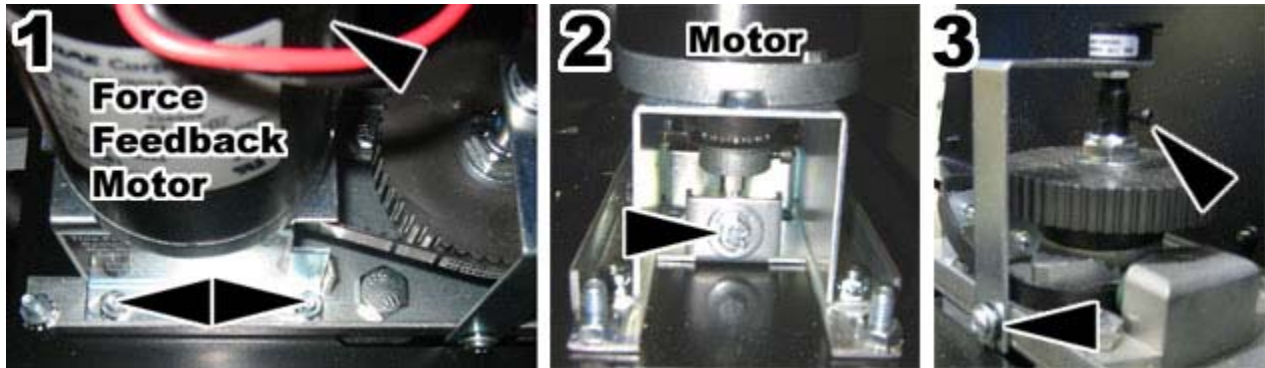
You can remove the force feedback motor, sensor, or belt if they ever need repair. Always replace the belt between the motor and the steering column if it looks cracked or worn.

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 Buttons

The buttons on the NFS 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.

Monitor

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.
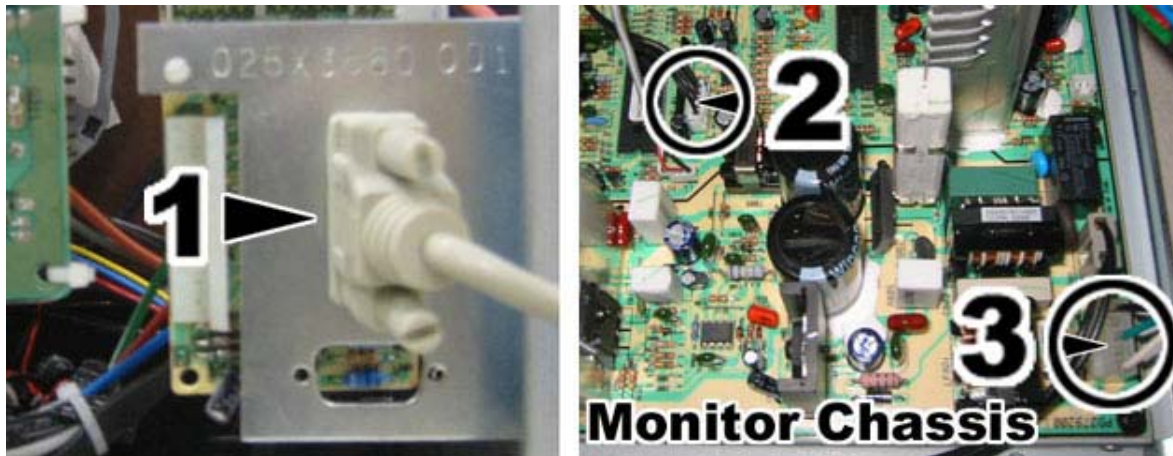
To remove the monitor, begin by unplugging the cables from the Monitor chassis. You will need to remove 3 cables from the chassis, and make sure there are no wire ties holding these cables to the monitor frame
1. Remove the VGA Video cable from the back of the Monitor
2. Remove the Monitor Control Panel 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.

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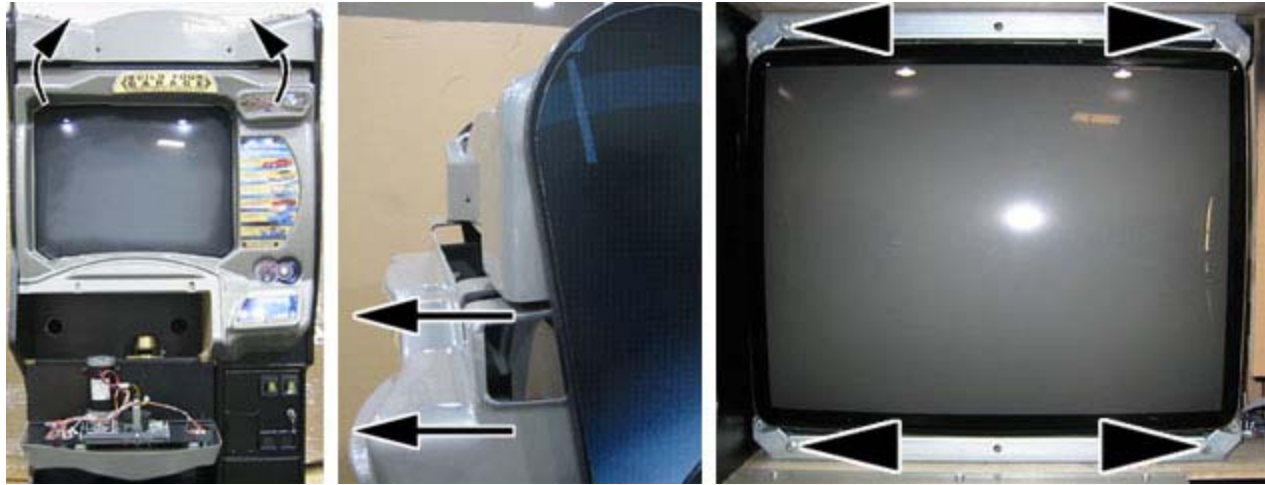
Once you have removed the screws, fold the Marquee back. You can now pull forward on the monitor cover and remove it from the cabinet. Remove the 4 bolts holding the monitor to the cabinet. Most of the weight of the monitor is located in the CRT at the front of the monitor. Carefully remove the monitor 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.

Wells Monitor Chassis PCB Removal

You can un-install just the Chassis PCB from the monitor if you should have problems with just the Monitor Chassis PCB on your monitor. Only a certified technician should perform the service steps to remove the Monitor Chassis PCB. GLOBAL VR assumes no responsibility for damage while removing the Monitor Chassis PCB.

Begin by removing the 4 nuts that hold 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.
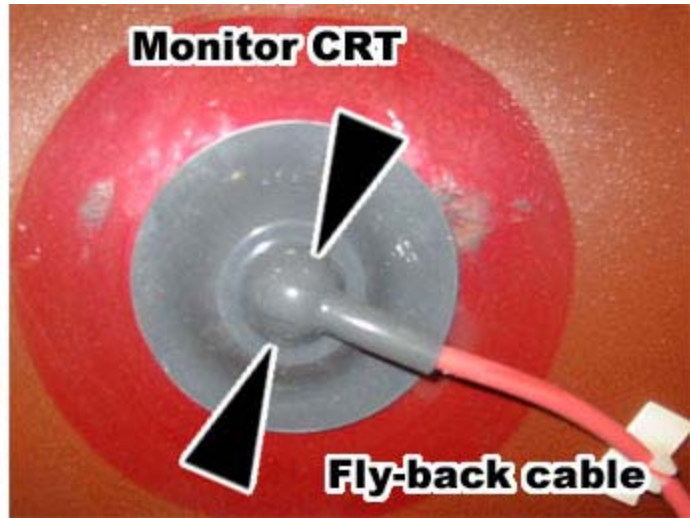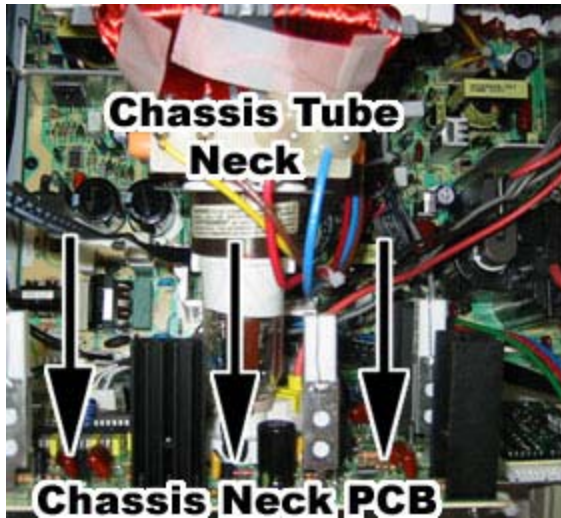
Next unplug the Chassis Neck PCB from Chassis Tube Neck of the CRT by pulling back on the Chassis Neck PCB. You will need to slide the Chassis Neck PCB off to the side to clear the Chassis Tube Neck. The Fly-back cable that connects to the CRT just above the Chassis Tube Neck will need to be disconnected 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 above.

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 picture above.

1. Unplug the CRT 2 wire ground cable that connect to the Chassis Monitor PCB
2. Unplug the CRT 2 wire ground cable that connects to the Chassis Neck PCB
3. 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.

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
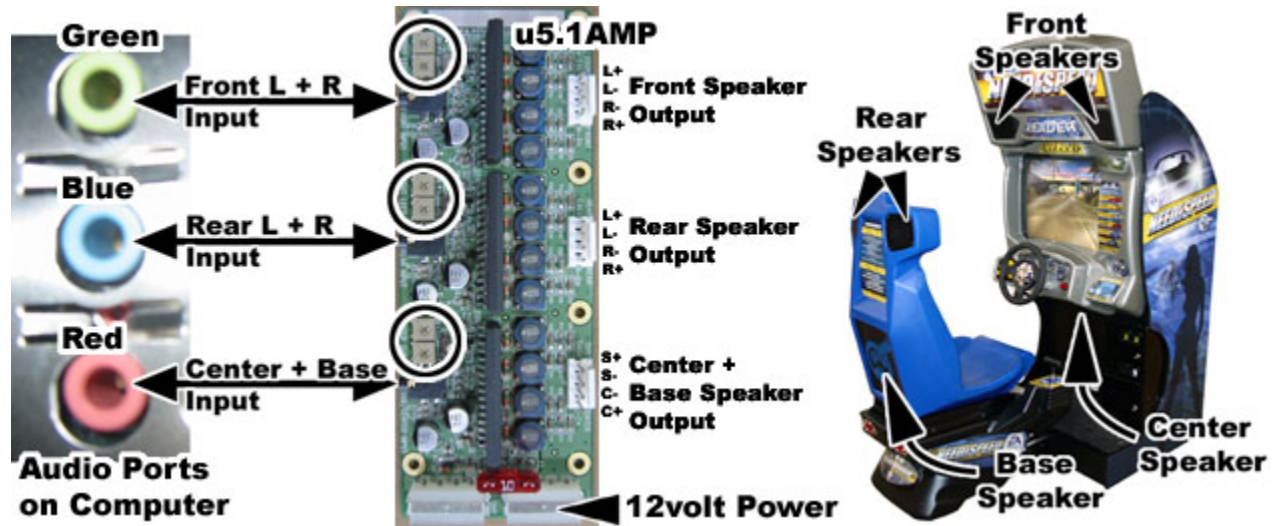
The u5.1AMP supports 6 channel 5.1 Surround Sound, which is used for the Need for Speed cabinet. The u5.1AMP is powered by the External PC power supply and connects using 2 of the standard PC power supply connectors. A fuse has been installed on the board to help prevent any electrical damage to the 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 picture above.

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 what channel each port is.
- 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 location of each speaker is shown by the arrows in the picture of the NFS cabinet above.

To remove the u5.1AMP unplug the speaker output wires and the 3.5mm audio cables plugged into 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 while it is removed from the cabinet to prevent electrical damage.

To remove the speakers you will need a T-20H Security Torx bit to remove the screws holding the grill covers in place. Use the picture above to locate the speaker locations, the Center Speaker is located behind the Driving Control Assembly.
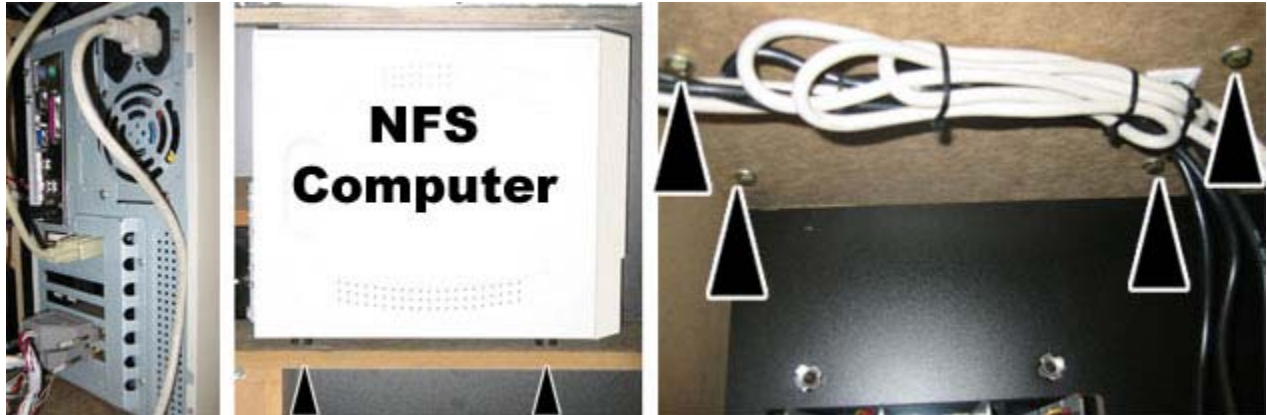
The NFS computer is serviced as one unit. You will void your warranty if you open up the computer to replace parts yourself without the direct authorization from a GLOBAL VR technical support staff.

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 USB GAM DONGLE with the computer if you send it in for repair. Using a 7/16 wrench unscrew the 4 T-20 x 1" bolts from underneath the computer as shown by the arrows in the picture above.

When shipping the computer back, you should always use plenty of padding and protection. GLOBAL VR recommends shipping the computer with 3 inches of foam padding on all sides when packed inside the box. Shipping the computer back inside a box that has insufficient padding to protect the computer can void the warranty if the computer is visibly damaged from shipping.
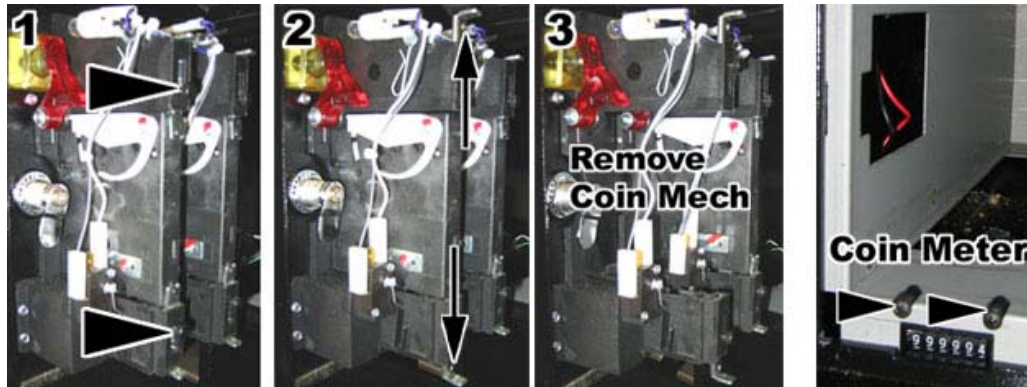
You can replace the coin mech with any standard Arcade coin mechs including NRI Coin Mechs for international customers to meet the Coin Op needs of your location.

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

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
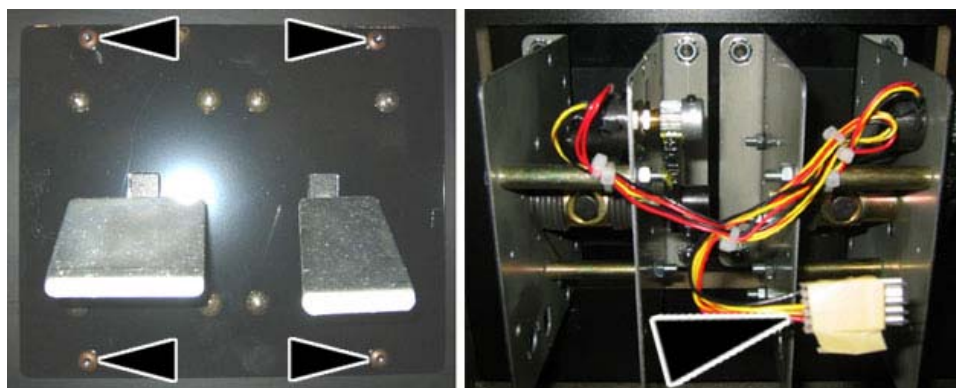
The Pedal Assembly installs as one unit. To remove the pedal assembly you will need to unplug the pedal cable assembly from the wire harness from the back side of the cabinet as shown by the big arrow in the picture above. Then remove the 4x T-20H Security Torx bolts as shown by the arrows in the picture above. Pull the pedal assembly towards the seat to remove.

A/C Power Panel
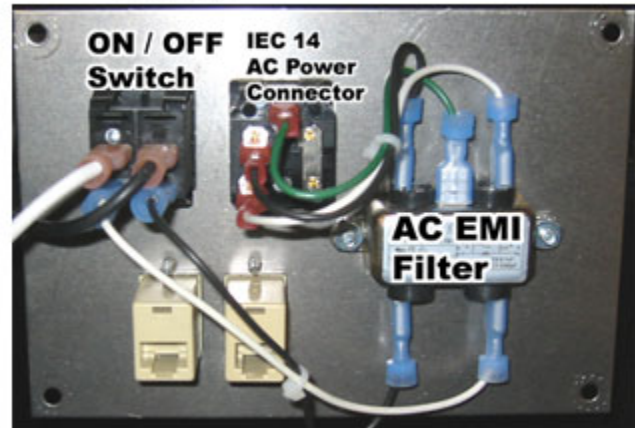
The A/C Power Panel distributes the A/C Power to the inside of the cabinet and ports the Ethernet and Phone connections from the computer to the outside of the cabinet. Just inside the cabinet you will find a 6 outlet A/C power strip that is connected to the power panel. An AC EMI Filter is used to remove the electrical noise or dirty power that can cause electrical interference with the hardware inside the cabinet.

External PC Power Supply
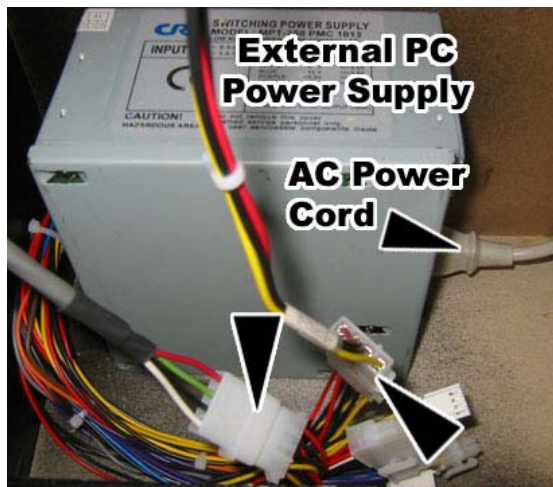
The External PC Power Supply powers internal PCB cards like the u5.1AMP, illuminated buttons on the Driving Control Panel, Ventilation Fan, and all the lights on the cabinet. If you are experiencing a power problem with all of this hardware it is likely that the power supply has gone bad. To replace 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.

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Marquee Lights and Speakers

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

Shifter
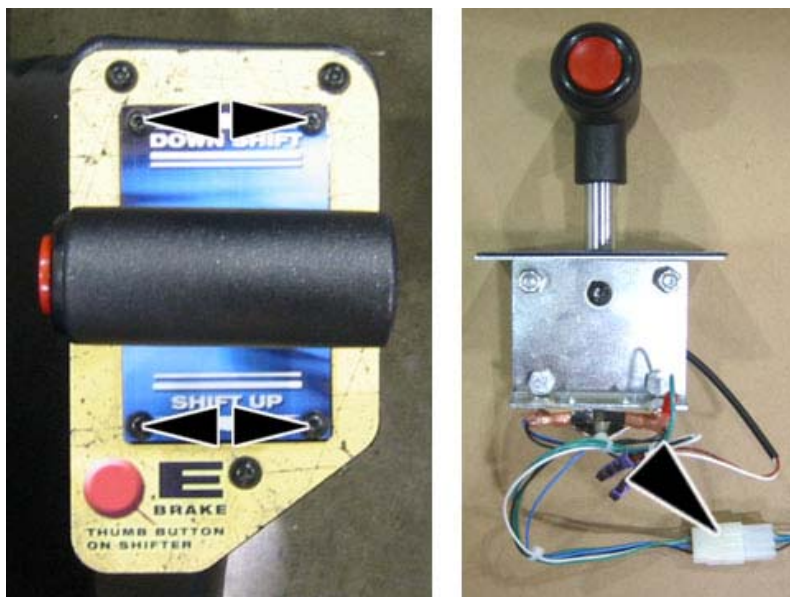
The gear shifter is one of the few items that should never break, but incase it does. To replace the shifter, remove the 4x T-10H Security Torx screws, pull up on the shifter vertically and unplug the shifter at the Molex connector.

Cabinet Specifications

If your Need for Speed cabinet is damaged and you need some new hardware or artwork please use the part numbers listed below when you contact GLOBAL VR Tech Support.

Description	QTY	Part #
DFI NFS Computer	1	NFS-PS35-BL
ASUS 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
Coin Vault NFS	1	42-8040-00 GVR
Dual Pedal Assembly	1	50-2978-00
NFS, SEAT ASSEMBLY	1	970-0001-00 REV A
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	???
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	???
Steering Wheel Pulley Belt	1	???
Steering Wheel	1	???
24 Volt DC Power Supply	1	S-150-24
Audio AMP 5.1	1	990-0105-01 REV A
NFS Game Dongle	1	USB-KQRTG
Center Channel Speaker	1	???
Base Speaker - Sub Woofer	1	???
5.25 Speakers	1	???
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
Need for Speed 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

The PS/2 Keyboard is provided for future game software updates, and should not be plugged into the computer during normal game operation.

Description	QTY
Keys, Rear Door	2
Keys, Coin Mech	2
Keys, Coin Vault	2

NFS Cabinet Artwork

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
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 Cabinet Features

Hardware Features:

- **Pentium 4 Computer**
- **NVIDIA GeForce 4 Graphics**
- **512 Megabytes of DDR RAM**
- **32 bit Color**
- **Force Feedback Steering**
- **800 x 600 Super VGA Monitor**

Computer Rear Panel Diagram
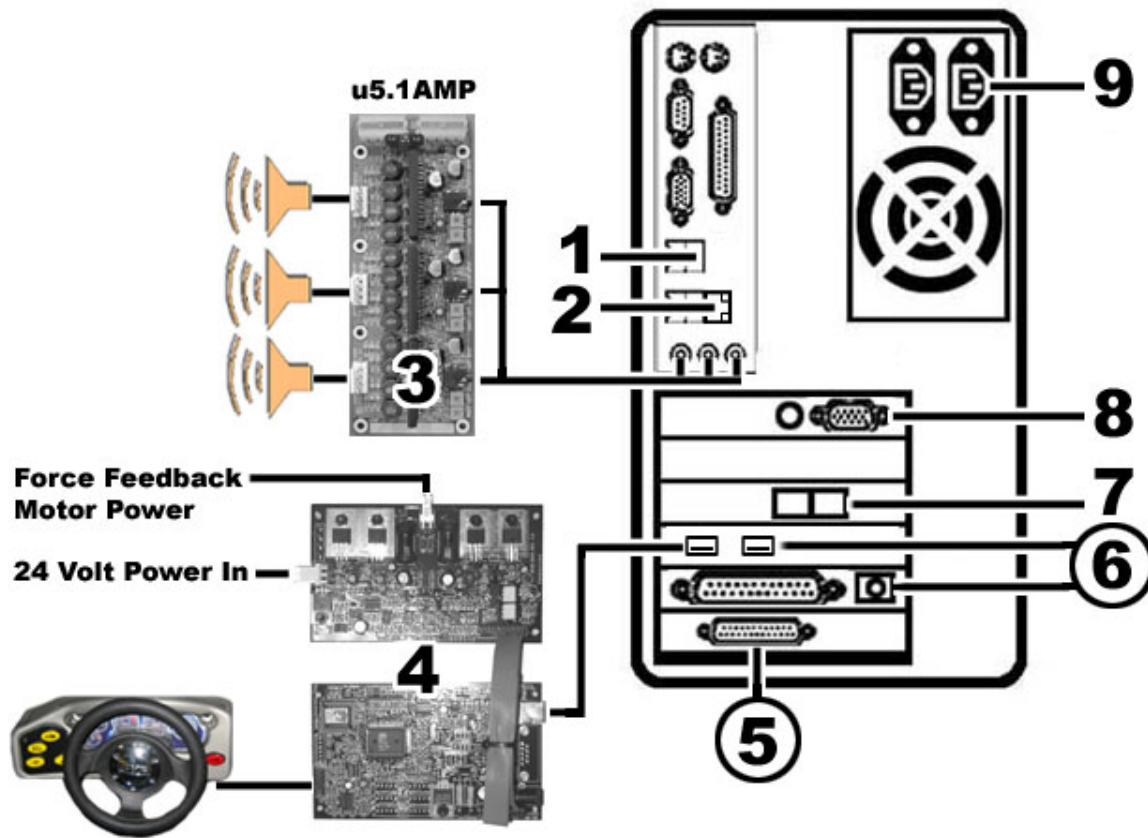
	Port	Computer Ports Description or Use
1	USB 0	USB Port 1 on the computer connects to the USB Game Dongle.
2	Ethernet Port	The Ethernet port is used to Link Cabinets for Multi-Player games.
3	U5.1AMP	The u5.1AMP connect to the 3 Audio ports on the computer. Each audio port is used for a specific channel on the cabinet speakers Front, Rear, Center and Base.
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 used only for Tournament Play.
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.

Trouble Shooting Video Problems

Problem ??	Cause	Possible Solution
No Picture on Monitor	Power Problem	Verify the AC power connection to the monitor. You can verify 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 Computer. If you unplug the video cable from the monitor while it is powered on, a No Signal message will appear on the monitor if everything is working correctly.
	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	Press the Menu button on the Monitor Control Panel to adjust the Brightness and Contrast settings to see if this corrects the problem.
	Picture is out of Color	Press the Menu button on the Monitor Control Panel to adjust the Red, Green, and Blue color settings to see if this corrects the problem.
	Picture Geometry is Misaligned	Press the Menu button on 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 Degasser button on the Monitor Control Panel to see if this corrects the color problem.

Trouble Shooting Audio Problems

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
	Bad Wiring	Turn off the NFS 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 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 u5.1AMP	You can verify the u5.1AMP is working by installing it into another working NFS cabinet. If that is unavailable to you, plug a simple computer speaker into the audio ports on the computer an verify that sound is working from the computer.
Audio is Distorted or Muffled	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.
	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 that contains a ripple or noise in the power that is being based through to the speakers
Bad Sound Channel	Bad u5.1AMP	You can verify that a channel is good on the u5.1AMP by plugging the speaker output from a working channel into the channel that is currently not working on the board.
	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 NFS cabinet. Verify that all the wires are firmly connected to each speaker. Verify that no wires are frayed or improperly shorting to ground.

Trouble Shooting Computer Problems

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 here 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	Bad Hard Drive	If you are getting No Audio and No Video, and the computer is powered on you might have a bad Hard Drive or corrupted software on the Hard Drive. Reload the software from the System Restore CD's to see if this solves the problem. If you continue to have Hard Drive problems while you reload the software you have a bad Hard-Drive.
	No Power to Computer	Verify the line voltage is set to the correct Voltage for your area 115V or 230V. Un plug the AC power cord from the computer and re-plug it back it 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.

Trouble Shooting Driving Control Problems

Problem ??	Cause	Possible Solution
Buttons Do Not Work	Bad Micro Switch	Replace the micros switch on the button and re-test. Verify that the wires are connected to the correct spades on the micros switch.
	Bad Wiring	Turn off the NFS cabinet. Verify that all the wires are firmly connected to each speaker. 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 NFS cabinet.
	Bad Force Feedback Motor	Verify the motor in a working NFS 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 NFS 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 NFS cabinet.
No Force Feedback in the Steering Wheel	Force Feedback Settings to 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 NFS 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 NFS cabinet.

Trouble Shooting Miscellaneous Problems

Problem ??	Cause	Possible Solution
USB Game Dongle not Found	Game Dongle not plugged IN	Plug the USB Game Dongle into the computer. Then power the cabinet off then on and see of this resolves the problem.
	Bad Game Dongle	If the USB Game Dongle does not illuminate it is not recognized by the computer. Replace the Game Dongle with a working one.
Cabinet gets Very Warm	Bad Ventilation Fan	Verify that the exhaust fan is working 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 rear of the cabinet and the wall of the arcade. Make sure the vents holes are clear of dust and that air can flow freely.
Marquee Lamp is Bad or Intermittent	Bad Fluorescent Tube	Check the Fluorescent Tube for darkened or cracked end. Replace the Fluorescent tube if it looks worn.
	Bad 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.
	Bad Wiring	Turn off the NFS cabinet. Verify that all the wires are firmly connected to each coin mech or Bill Validator. Verify that no wires are frayed or improperly shorting to ground.
Game will not accept Coins or Bills	Bad Coin Mech	Verify the Coin Mech is not jammed. Make sure the Coin Mech is properly aligned and latched to the Coin Door
	Bad Bill Validator	Verify the Bill Validator is powered on and working. If the Bill Validator is bad it will usually blink an error code on the inside of the Coin Door.

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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:

1) Purchaser believes that the Product is defective in material or workmanship and promptly notifies GLOBAL VR in writing with an explanation of the claim;

2) All claims for warranty service are made within the warranty period;

3) Products are returned adequately packed and freight prepaid to GLOBAL VR's designated service center;

4) 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.

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Technical Support

Free telephone, email and online support are provided for the Need for Speed systems during the warranty period. In addition to helping with trouble shooting and diagnosing defective parts technical support is prepared to help you with questions about the operation of your Need for Speed game.

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

Your mailing address and telephone number

Your Need for Speed cabinet Serial Number

A summary of the question or a detailed description of the problem with your Need for Speed cabinet

Technical Support is available from 9:00-5:00PST, Monday through Friday.

Call +1-408-597-3400 to reach a technical support staff member.

Email support is available if you email techsupport@globalvr.com

Warranty Service
If at some point you require warranty service, contact your distributor. If technical support staff determines that parts on your Need for Speed cabinet are defective, a Return Merchandize Authorization (RMA) number will be issued.

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