

**MDS**  
**Motion Simulator**  
**Control Systems**

**Thomson Venturer V-14**  
**Operations Manual**

**Updated February 14, 2011**

**Multi-Dimensional Studios**  
**Draper, Utah USA**

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Multi-Dimensional Studios, L.C. (MDS)

1192 E Draper Parkway #414

Draper, UT 84020 USA.

Telephone: (801) 706-5939

Fax: (801) 562-1045

Website: [www.mds3d.com](http://www.mds3d.com)

E-mail: [info@mds3d.com](mailto:info@mds3d.com)

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# Chapter 1: Installation

## Getting Started

Your MDS Motion Simulator Control System includes a computer, control box, and extra accessories (depending on which items you purchased from Multi-Dimensional Studios).

## Computer



*Computer*



*Software*



*Keyboard*



*Mouse*



*VGA Adapter*

The computer comes installed with the MDS Movie Controller software, which synchronizes video files with the motion control programs. The video files and motion programs for the ride experiences you have licensed are also installed on the computer.

**Note:** MDS does not include a computer monitor with the kit, because it is less expensive for you to find one locally than to ship one from our offices. Any PC compatible monitor with a 15-pin VGA or DVI cable that supports 800 x 600 resolution at 60hz or better will work.

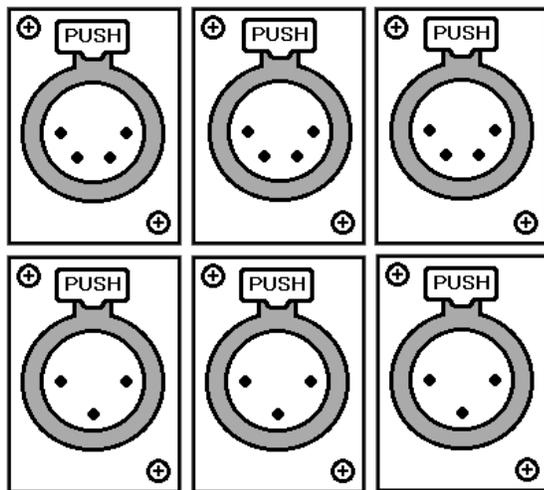
The computer uses the dual-display feature found in most modern video cards to display video to the projector. The video is played to the secondary display of the computer, which is connected to the projector using a VGA adapter. The VGA adapter can convert the VGA signal to s-video or composite video, which can be used by the projector. Refer to the connection diagram included with the computer for more information on the computer connections.

## Control Box

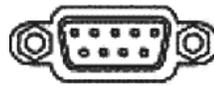


The control box is the interface between the computer and the motion simulator. The control box receives commands from the computer and sends them to the simulator. The control box also receives information from the simulator (emergency stop activations, cylinder positioning, etc.) and relays this information to the computer.

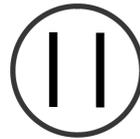
The V-14 connectors on the back of the control box look like this:



*Potentiometer and Valve Signals*



*Serial Port*



*Emergency Stop Button*



*Main Control Cable*

Unplug the connectors from the V-14 simulator and plug them into the MDS control box. Refer to the wiring diagram included with the control box for more information on these connections.

## **Accessories**

Your system may also include the following items, depending on which upgrades you purchased from Multi-Dimensional Studios.

- 1) Video projector(s)
- 2) 3D silver screen
- 3) Sound system
- 4) Exterior locking control console
- 5) Cabin rain system
- 6) Individual seat leg ticklers
- 7) Seat vibrators

## Chapter 2: Basic Simulator Operation

### **Safety**

At all times during operation of the Motion Simulator Control System, safety is the number one concern. Verify that all participants have been briefed on the risks of participating and the safety procedures for the simulator. Make sure everyone is seated comfortably before starting the show. Seat belts are not required but are recommended.

It is recommended that small children under 40" in height, elderly people, or individuals who are in any way incapacitated not participate in the motion simulators. Examples of incapacity include pregnancy, back or spine injuries, tendency for dizziness or motion sickness, upset stomach, or any other condition that may be affected by rapid movement.

Prior to starting the show, the audience should be clearly instructed on the following precautions to take effect once the ride starts:

- 1) Attach seat belts.
- 2) Never attempt to leave the seats until the ride is over.
- 3) Inform the ride operator to stop the ride if there is an emergency.

### **Maintenance**

The simulator motion is controlled by a hydraulic system that must be carefully maintained according to the original manufacturer's specifications. MDS does not assume any responsibility for the mechanical maintenance of the system.

### **Operating the simulator**

**Note:** do not operate the simulator with the MDS Control System conversion until you have calibrated it. Refer to Chapter 5 for more information on calibrating the simulator.

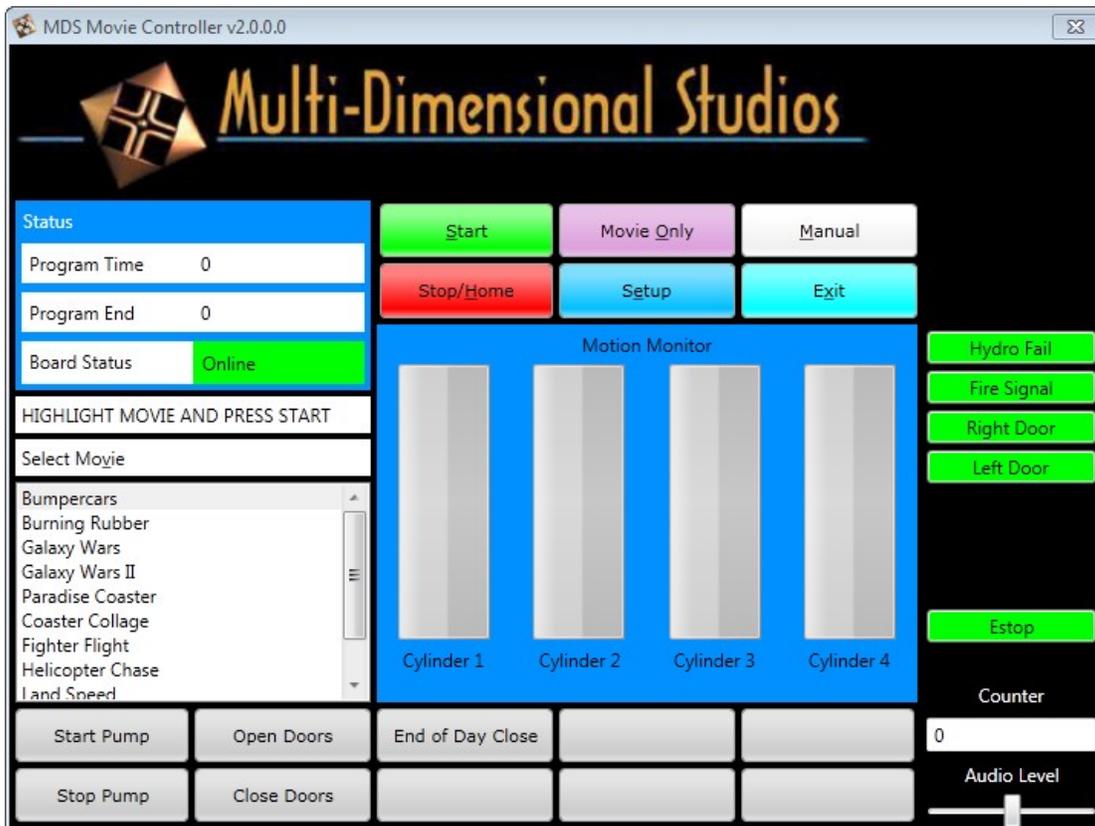
To prepare the simulator for operation, follow these steps as well as any others you are accustomed to using:

- 1) Turn on power to all audio/visual equipment, the computer, and the hydraulics.
- 2) Turn on power to the MDS control box.
- 3) Open the MDS Movie Controller program by clicking on the icon if it does not open automatically.



MDS Movie  
Controller

- 4) This will open the MDS Movie Controller main window:



MDS Movie Controller

- 5) Select the desired movie program by clicking on it in the movie list window.
- 6) To begin a show, simply click on the Start button.

## **Chapter 3: Projector and Sound System**

### ***Projectors***

The original projection equipment in most V-14 simulators is a CRT projector from Sony or Barco. If the projector is replaced by MDS, it will be either a LCD or DLP type projector. Consult your projector manual for more information on your specific projector.

The bulbs in the projectors have a limited life. They turn themselves off automatically if the projectors are not used for a predetermined period of time. To conserve energy and maintain bulb life, the projectors should be turned off whenever the simulator is not being used for more than one hour.

### ***Sound System***

The sound system on the V-14 uses an amplifier to control the sound to the simulator. You can also control the sound level from the computer using the audio level slider on the MDS Movie Controller software or the system sound setting in Windows. Note that if the sound level on the amplifier is turned all the way down (or the amplifier is turned off), increasing the sound on the computer will not have any effect on the sound in the simulator.

# Chapter 4: MDS Movie Controller Software

## Starting the Software

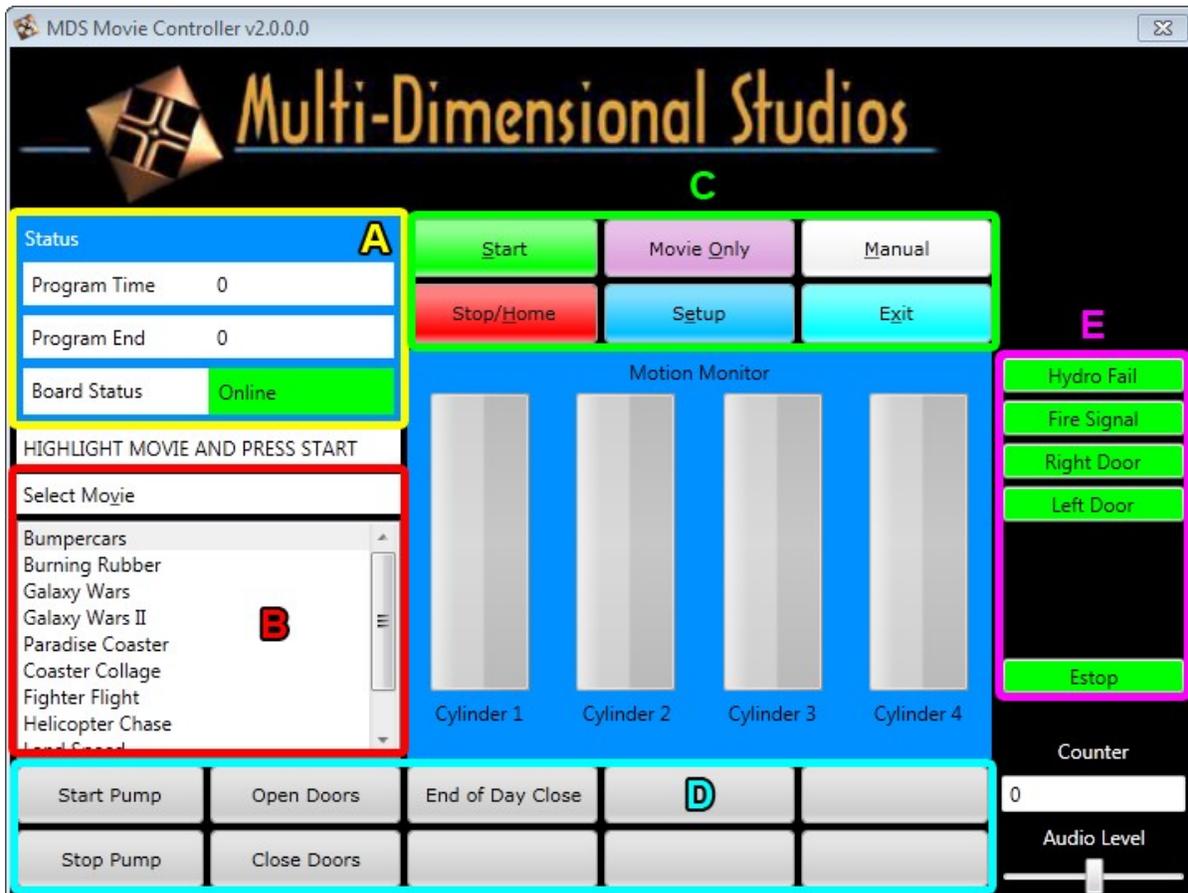
The MDS Movie Controller is operated through the computer display. The program should open automatically when the computer is started, using a shortcut added to the user's Windows startup folder. If not, or if you need to quit the program and then open it again, simply double-click on the desktop icon to launch program.



You can also launch the software using the start menu. The software is located under Start → All Programs → Multi-Dimensional Studios → MDS Movie Controller.

## Overview of Display

The initial screen is the Main Page. It consists of a status window (A), a movie selection window (B), main commands (C), programmable buttons (D) and inputs (E).

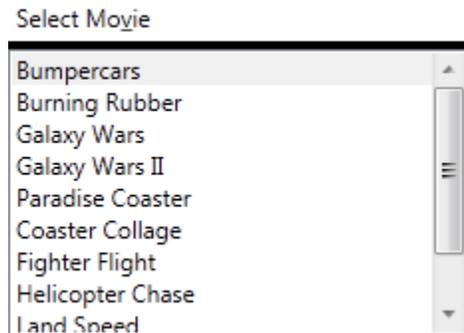


(A) The status window reports the movie play time and the current status of the control box board.

Status	
Program Time	0
Program End	0
Board Status	Online

“Program Time” reports the progress of the movie that is currently running (in seconds). “Program End” reports how long the movie is. “Boards Online” reports whether the control box is recognized by the computer. If the computer recognizes the control box, this will display “Online.” If it does not read “Online,” the control box is not connected to the computer or is not turned on. In this case, check the connections between the control box and the computer, as well as the power supply to the control box.

(B) Movie Selection Window



This window lets you select the movie you want to show. Pressing the “v” key on the keyboard will scroll through the movies.

(C) Main Commands



**Start** starts the movie and motion program.

**Movie Only** will play the video file without the motion.

**Manual** opens the manual control window.

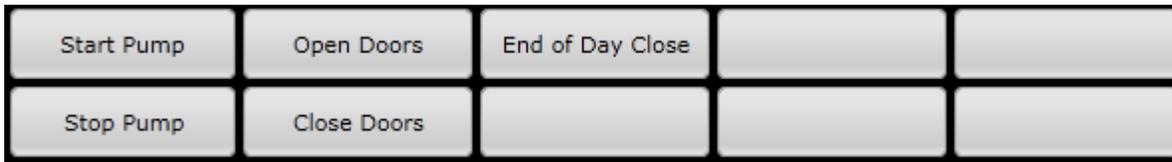
**Stop/Home** stops and resets the motion base cylinders and sends them to their home position, which is all the way down on all three cylinders. This is programmable for speed and position. This operates as an emergency stop button.

**Setup** will open the software setup window.

**Exit** exits the program when clicked.

All these keys also have keyboard shortcuts. The shortcut key is underlined in the button name. For example, the shortcut key for the **Start** button is the “s” key.

(D) Additional programmable buttons are located along the bottom of the screen.



These buttons control the simulator pump, doors, lights and other accessories. For more information on programming these buttons, refer to the section of this chapter on the setup window.

(E) Inputs



The inputs can be independently programmed using the setup window. They are usually programmed as emergency stops. If an input is activated, the input button will turn red and the simulator ride will not start. If a ride has already started and one of the inputs is activated, the machine will be put into emergency stop mode and it will return to the home position.

Other window elements:

The bars in the middle of the window display the cylinder feedback position when the simulator is in operation.

The counter box will count how many times a complete ride is shown during the day.

The other setting is a volume control, which can be used to adjust the movie audio volume.

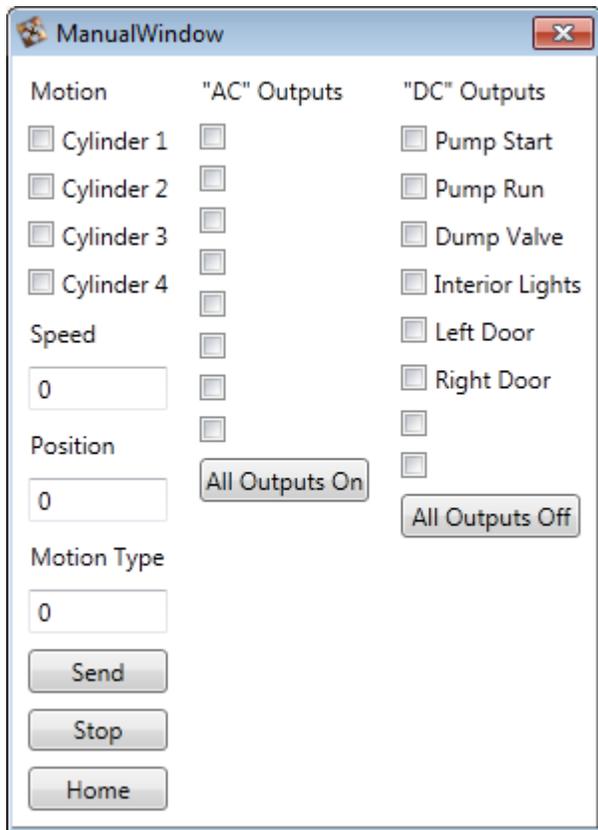
### ***Simulator Operation***

The lower left window on the MDS Movie Controller lists the movies available. These can be selected with the mouse or by pressing the “v” key on the keyboard.

Once a movie is selected, the next step is to start the program by selecting the **Start** button with the mouse or by pressing the “s” key on the keyboard. This downloads the program for the selected movie to the motion control board and starts the ride.

### ***Manual Window***

The manual window display is accessed by clicking on the **Manual** button.



This window allows for manual operation of any of the outputs on the control box. The operator may turn any control box output on or off by simply clicking on the box next to the output label and then clicking on the **Send** button. The **Stop** button stops the current motion command and the **Home** button sends the simulator to the home position.

The top left window controls the cylinders. These correspond to cylinders 1, 2, and 4 in the motion control programs (note: “Cylinder 4” is used for 4DOF systems only and so is not used on the V-14 simulators). To test a particular motion cylinder, simply click on the box to the left of the desired cylinder specify a speed and position, and then click the **Send** button. The cylinder will move to the specified position at the specified speed. Note that position “100” is all the way up while “0” is all the way down. You can select any combination of cylinders for testing. See the programming codes in Chapter 5 for details about how the motion is programmed.

The boxes in the right two columns are for testing the various outputs. There are columns for the DC and the AC relay outputs. Check your wiring diagram to determine which effect is controlled by which output. The output labels can be changed using the setup window.

To activate an output:

- 1) Verify from the wiring information which output affects which system.
- 2) Click on the box to the left of the desired output label.
- 3) The box will now be checked.
- 4) Click the **Send** button.

The corresponding red light on the control box circuit board comes on and the output is activated (along with the relay in the control box).

To turn an output off:

- 1) Click on the box to the left of the desired output label.
- 2) The box will now be unchecked.
- 3) Click the **Send** button.

The corresponding red light on the control box circuit board goes off and the output is deactivated.

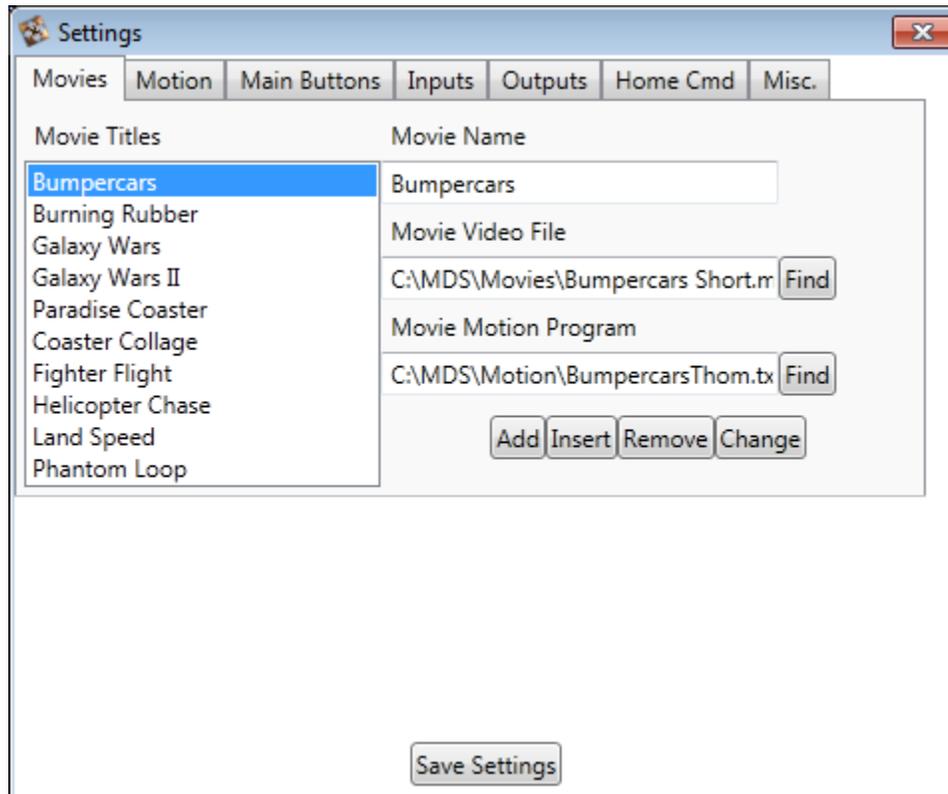
The **All Outputs On** and **All Outputs Off** buttons check all the DC and AC relay effects on and off,

respectively. You can close the manual window by clicking on the x in the top right corner of the window.

## Setup Window

The setup window is accessed by clicking on the **Setup** button. There are seven tabs across the top of the window: Movies, Motion, Main Buttons, Inputs, Outputs, Home Cmd and Misc.

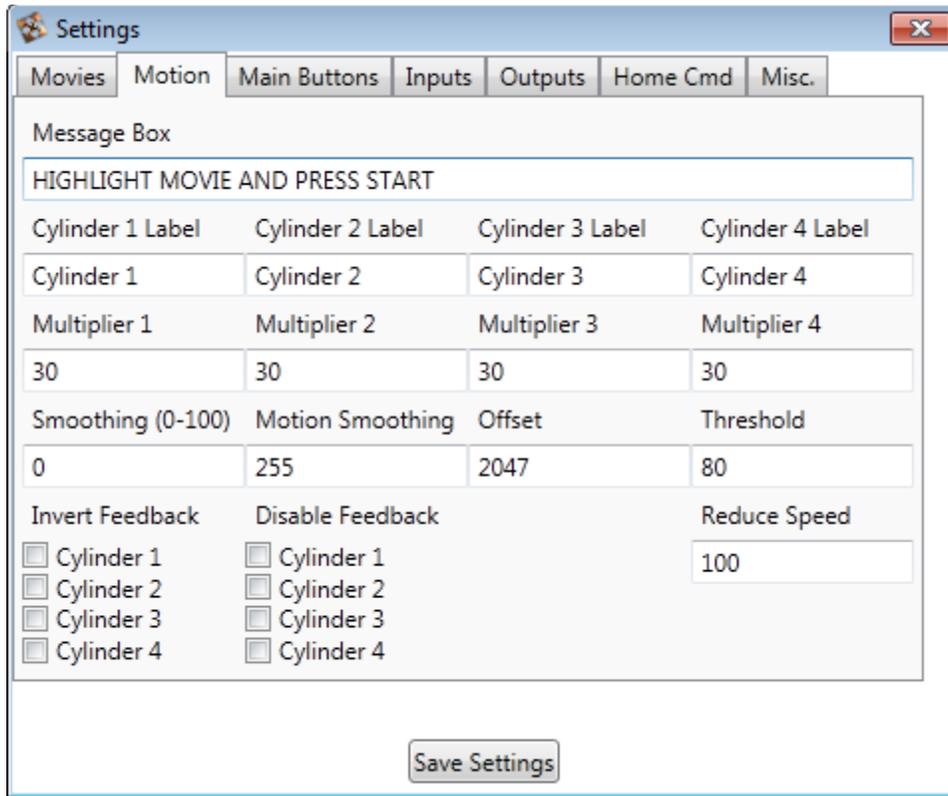
### Movies



You can add and remove movies using this tab. When you click on a movie title in the list, the information about the movie will be shown in the text fields on the right. In this example, the movie “Bumpercars” is selected in the list. The text field for movie name is the name the movie has in the list. You can change the movie name to whatever you want. The movie video file is the path to the movie file on the computer. You can use the find button to select a movie file on the computer. The movie files can be stored anywhere on the computer. The movie motion program is the path to the text file motion program.

You can add, insert, remove and change movies using the buttons on this screen. However, it is important to note where the current selected movie is. In the picture above, if you change the movie name to “test” and then click the **Change** button, the Bumpercars movie will now be named “test” and it will show in the list as “test” but the movie file and the motion program will be the same as they were before.

# Motion



The second tab is the motion tab. The settings are as follows:

**Message Box:** specifies the text that appears above the movie list.

**Cylinder Labels:** specify the labels for the motion cylinders. These can be changed to reflect another naming scheme. For example, some Thomson documentation refers to the cylinders as port and starboard rather than left and right. You can change the cylinder names here to port and starboard if you prefer.

**Cylinder Multipliers:** The multiplier commands control the power to each cylinder. These settings allow you to adjust the power for your particular simulator. You can test your cylinders using the manual window. Give all three cylinders the same speed and position command, click the send button and observe how they move. Cylinders that move slower should get more power. Keep adjusting this until they all move the same. If you put the power too high (e.g., on a command from position 0 to position 90, it will go fast, slow down, then go fast again), you need to decrease it.

**Smoothing (0-100):** Allows a global adjustment to the smoothness of the motion. This parameter averages the feedback voltage readings from the cylinders. The normal range is 0 to 20.

**Motion Smoothing:** This is the high motion smoothing factor (should not be changed by the operator).

**Offset:** Should be left at 2047.

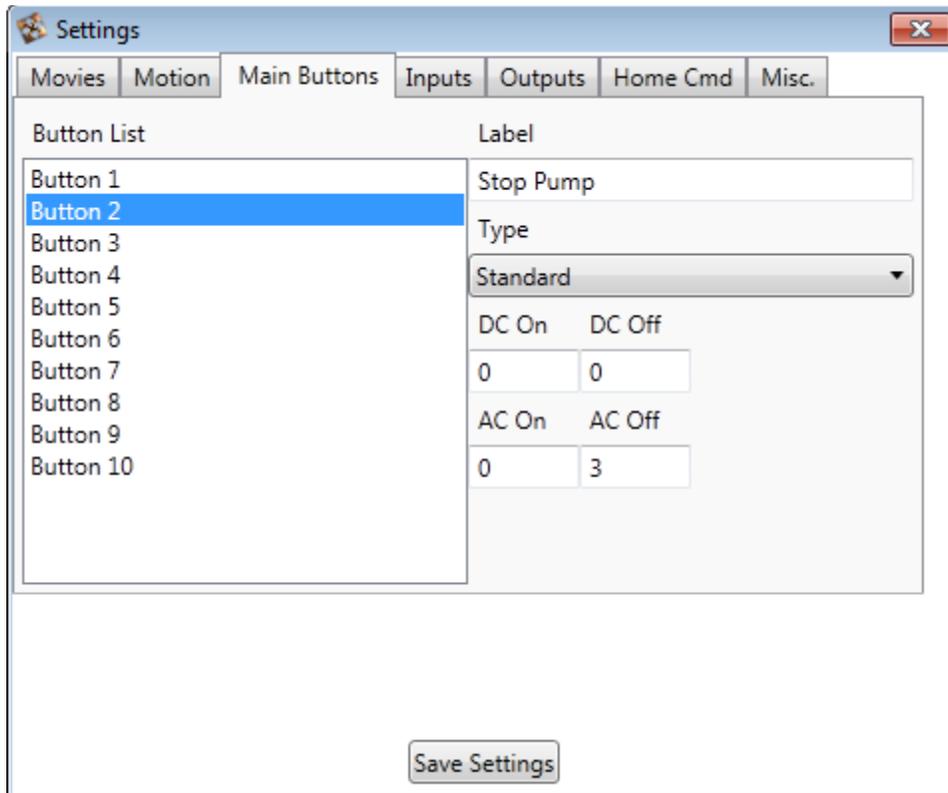
**Threshold:** The threshold command allows you to adjust the responsiveness of your simulator. If it seems to respond too slowly to the commands when in the manual mode, increase this number. If it then responds too quickly, lower the number. The ideal setting allows the simulator to sit perfectly still after executing a motion command. If you set the threshold too high, the cylinders will oscillate randomly.

**Reduce Speed Factor:** Allows a global adjustment to the speed of the motion. Expressed in percentages of the specified speed.

**Invert Feedback:** Inverts the signal from the cylinder potentiometer. This setting is not usually used for the V-14 simulator.

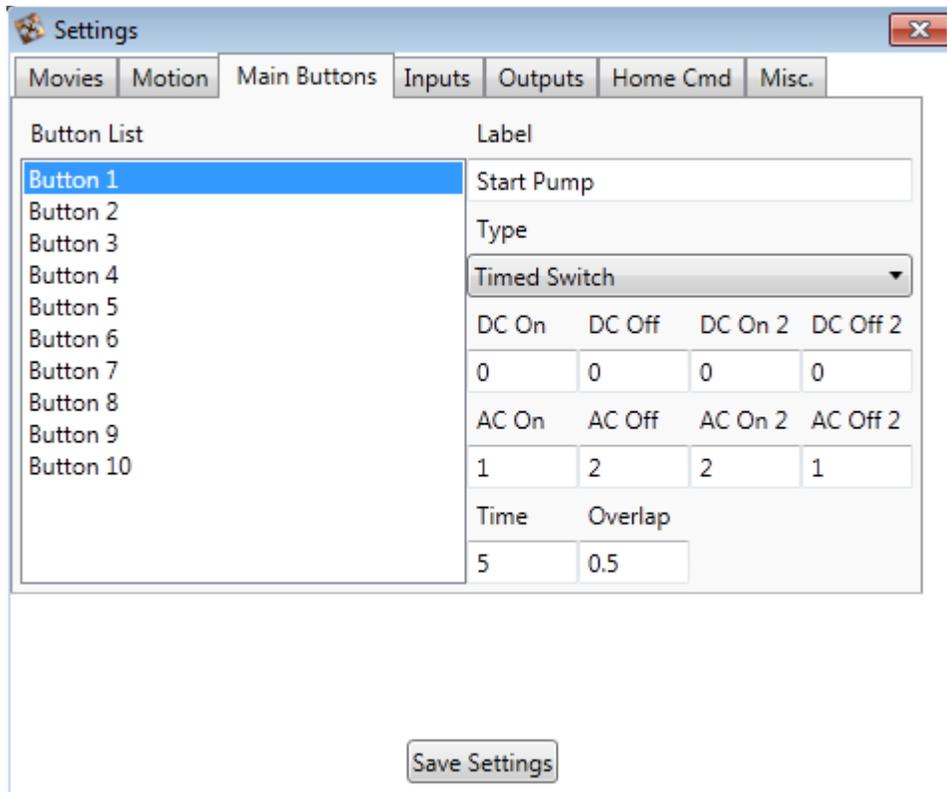
**Disable Feedback:** Disables the feedback reading on the selected cylinders.

## Main Buttons



These are programmable buttons that appear on the main control screen. The title is given in the label field. There are two types of commands a button can execute. The first is a standard command, where the outputs specified in the boxes labeled DC On and AC on will be activated, and the outputs specified in the the boxes labeled DC Off and AC Off will be turned off. If there is a “0” in the box, no outputs will be turned on or off.

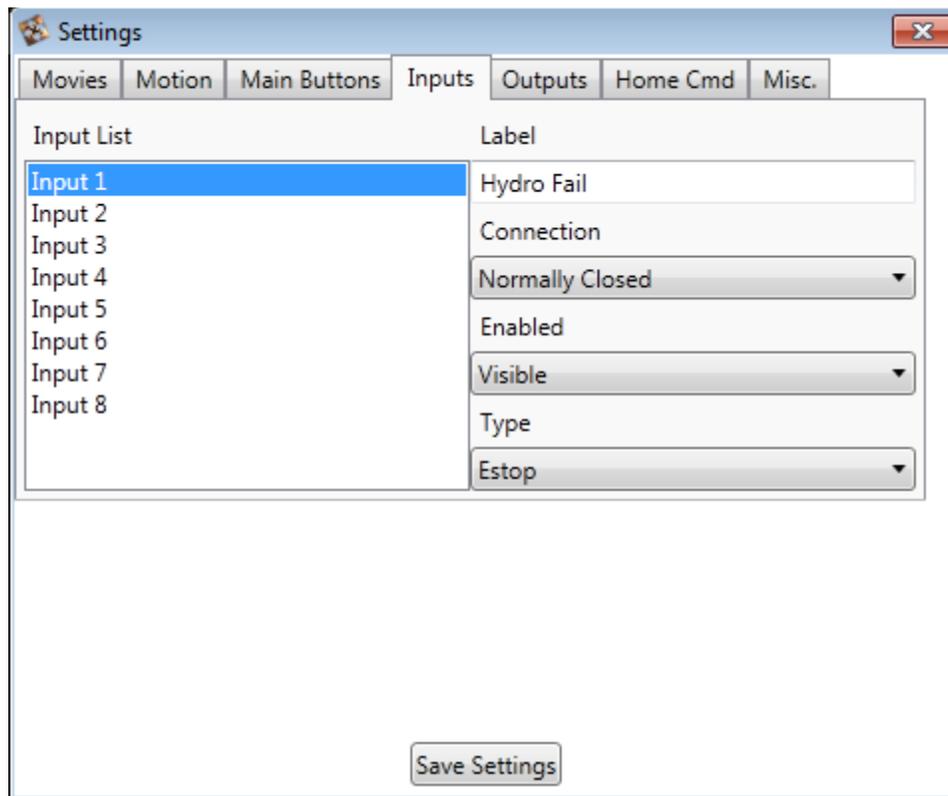
The other type of command is a timed switch.



This command is similar to the first type of command, but it adds a second field for each DC and AC output state, as well as a time and overlap setting. This type of command allows you to activate two different output commands, separated by a time. In the above example, when the command button is clicked on the main screen, AC output 1 (pump start) will be activated and AC output 2 (pump run) will be deactivated. After 5 seconds, AC output 2 (pump run) will be activated. A half second (0.5 seconds) later, AC output 1 will be deactivated.

This may seem a little complicated but it is necessary to properly control the hydraulic pump on the V-14. The V-14 pump has two motors, a starter motor and the main motor. The starter motor needs to be started and run for a few seconds (5 seconds in this example) and then switched off at the same time the main motor is turned on. The control box uses mechanical relays to activate the motors. Normally it would be enough to switch the starter motor off and then immediately switch the main motor on, but mechanical relays have a delay from the time they are de-energized and when they actually disconnect the circuit. The overlap setting is required to compensate for this problem.

## Inputs



The control box has 8 inputs, though usually only 5 of them are used for the V-14. The inputs are connected to the emergency stop circuits in the V-14.

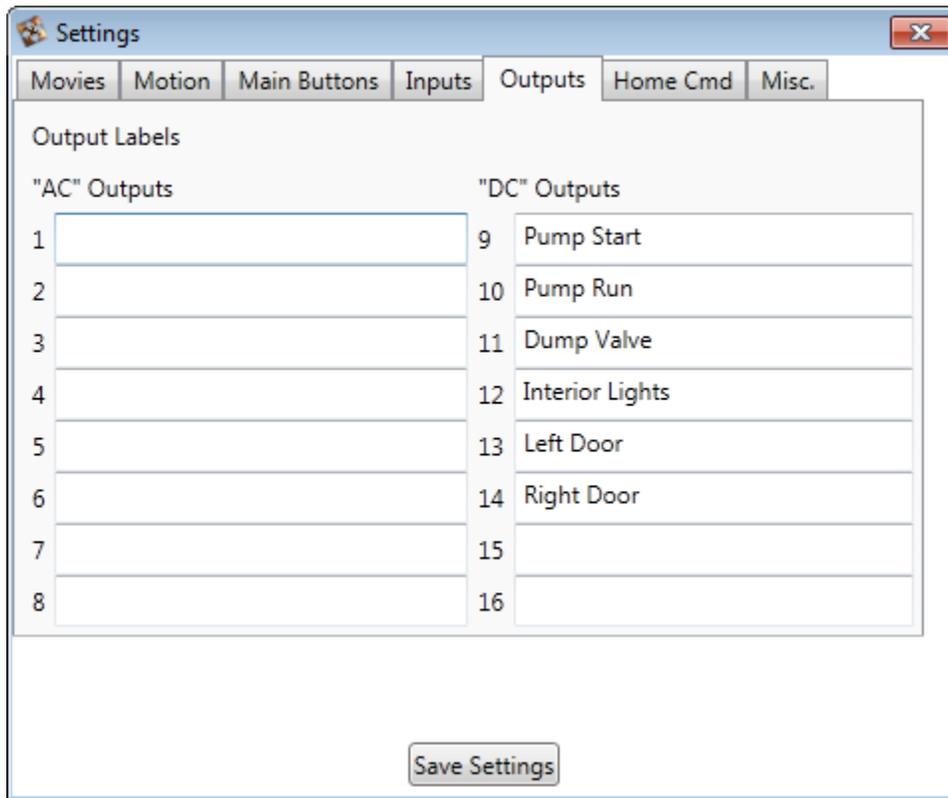
**Label:** The label is the text that appears on the main screen.

**Connection:** The connection can be set to “normally closed” or “normally open” though the V-14 emergency stop circuits are all normally closed circuits. They can be set to normally open if they are not functioning or hooked up to the V-14 circuits.

**Enabled:** The inputs can also be enabled or disabled using this setting. If enabled is set to “visible” then the input buttons will be visible on the main screen. If they are set to “hidden” then they will not be visible.

**Type:** There are currently two types of input commands: Estop and Movie Estop. Both types will put the simulator into an emergency stop mode if they are activated, but the Movie Estop setting will only put the simulator into an emergency stop mode if a ride is currently playing. On the V-14, the door emergency stops are usually set to Movie Estop because the doors can be open while people are loading into the machine but they should activate if the doors open during a ride.

# Outputs



Here you can set the labels for the control box outputs. The above settings are the default settings for the V-14. See your wiring diagram for more information on the control box outputs.

## Home Command

Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
Speed	Speed	Speed	Speed
90	90	90	90
Position	Position	Position	Position
0	0	0	0
DC On Estop	AC On Estop	DC On End Ride	AC On End Ride
0	8	0	8
DC Off Estop	AC Off Estop	DC Off End Ride	AC Off End Ride
0	48	0	48
Home Pos. Req.			
15			

Save Settings

Here you can set the speed and position for each cylinder when the home command is activated (at the end of a ride or if an emergency stop is activated).

**Speed:** Speed at which the cylinder will return to the home position. See the chapter on motion programming for more information.

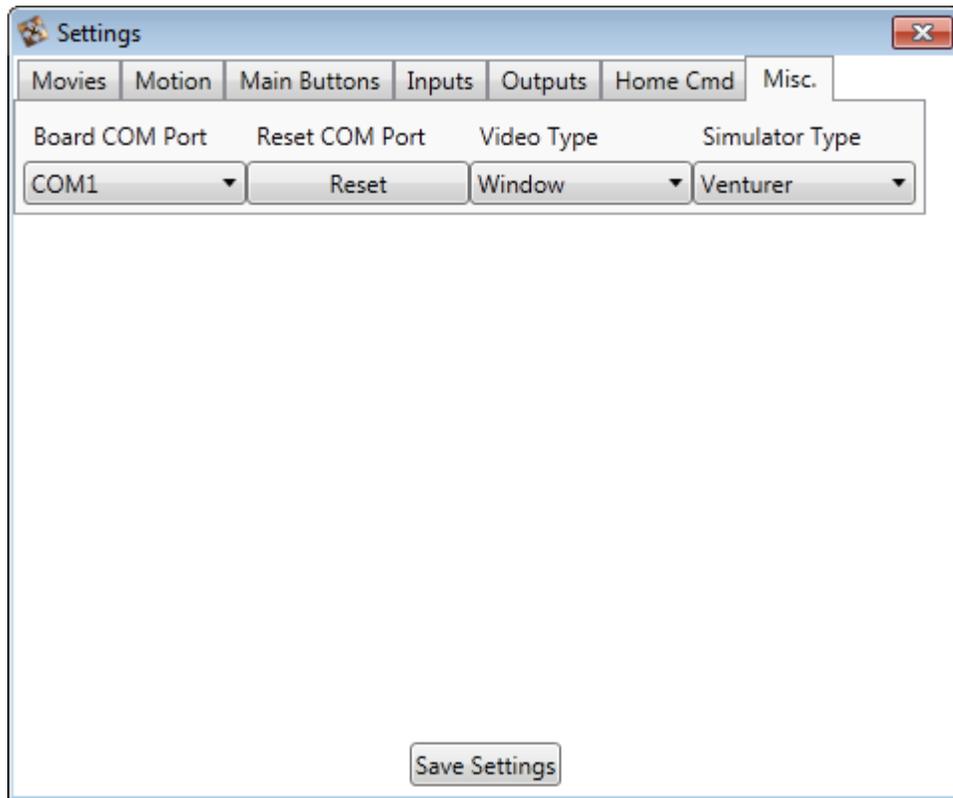
**Position:** The position the cylinder will move to for the home command.

**DC/AC On/Off Estop:** DC/AC outputs that will be activated or turned off during a home command.

**DC/AC On/Off End Ride:** DC/AC outputs that will be activated or turned off at the end of a ride.

**Home Pos. Req:** The position of the cylinders required for the home AC/DC outputs to be activated. The cylinder feedback must reach this level (the feedback is read on a scale from 0 to 100) for the outputs to activate.

## Misc



Additional settings for the simulator.

**Board COM Port:** Serial port on the computer that the control box is connected to.

**Reset COM Port:** If you change the Board COM Port setting and do not want to reload the software for the setting to take effect, you can click this Reset button and the serial port will reconnect.

**Video Type:** There are 3 settings for the video player: Window, External and Embedded. The Window setting will show the video in a small popup window. The External setting will show the video on a secondary monitor. This is the default setting for the V-14, as it will show the video to your projector if the computer is configured correctly for the secondary monitor.

**Simulator Type:** This should be set to Venturer V-14.

## Chapter 5: Motion Control and Programming

### **Programming Code**

The motion programming follows a simple digital code. Correct programming requires familiarity with the motion of the cylinders. Motion file programs are plain text and may be modified using a text editor program.

### **Motion Command**

Each text line for a motion command has six fields, such as these:

```
,0,61,1,70,50,1.0,  
,0,61,2,40,30,3.0,  
,0,61,4,60,80,5.5,  
,0,61,6,80,40,26,
```

Field 1: [circuit board address (always 0)],

Field 2: [type of command (always 61 for motion)],

Field 3: [cylinder number],

Field 4: [speed],

Field 5: [position],

Field 6: [time (in seconds)],

**Note:** each field must begin and end with a comma!!!

Example: ,0,61,1,70,50,1.0,

This line tells the computer to do the following:

```
,Specifies circuit board 0,  
,use command 61,  
,tells cylinder 1 to move,  
,tells cylinder to move at speed 70,  
,tells cylinder to move to position 50,  
,tells cylinder to start moving at 1.0 seconds,
```

The cylinder commands may apply to more than one cylinder at a time by simply adding the numbers. In the last line of the four examples above, a “6” is used for the cylinder number. This means the computer will move cylinders 2 and 4 at the same time, at the same speed, to the same position.

On all cylinders, 100 is at the top and 0 is the bottom. If a cylinder is told to go to position 100, it will all go to the top of its stroke. The speed is calculated in 1/10ths of a second, subtracted from 100. A speed of 90 will take 10/10ths of a second (or one second) to reach the specified position. A speed of 80 will take 2 seconds, and a speed of 75 will take 2.5 seconds. The speed is calculated to ramp up and ramp down, so the motion is smooth on both ends of the stroke. If you want a more sudden movement,

you can interrupt a motion on its path. For example, you can send a cylinder from position 0 to position 80 at speed 50 (so it will take 5 seconds), but then give it a different command after 3 seconds. This will abruptly stop the first command for a “bump” effect.

## **Output Command**

**Note:** while the MDS Movie Controller main command buttons and the outputs that turn on at the end of a ride or an emergency stop are additive (they will leave previous effects that were activated on), the outputs controlled by a motion program are absolute. That is, the output command in a motion file can turn outputs on and off, but if you do not specify that an output should turn on, it WILL be turned off. In other words, all output commands from a motion file force each output to be either on or off. For this reason, you always want to add output 2 to each command because output 2 is the output used to control the pump. If you do not have output 2 turned on, the pump will be shut off during a ride and the simulator will be unable to move.

The pump, dump valve, lights, doors and any other effects are controlled by the AC relay outputs. There are also DC outputs on the control box that may be controlled if desired. Each line of commands has six fields, such as these:

,0,71,3,2,0,5,

Field 1: [circuit board address (always 0)],  
Field 2: [type of command (always 71 for effects)],  
Field 3: [address of dc effect],  
Field 4: [address of ac effect],  
Field 5: [leave at 0],  
Field 6: [time (in seconds)],

**Note:** each field must begin and end with a comma!

The effects use a binary code as follows:

AC Output 1 = 1  
AC Output 2 = 2  
AC Output 3 = 4  
AC Output 4 = 8  
AC Output 5 = 16  
AC Output 6 = 32  
AC Output 7 = 64  
AC Output 8 = 128

To turn on any effect, simply put its corresponding number into the field on the text line. On the V-14, the left door pneumatic cylinder is wired to AC5 and the right door wired to AC6, so to turn them both on (and close both doors at the same time), the command would be a 48 (which is 16 + 32). Do not forget to add the output for the pump though, which is 2. So the final command would be 50. The dump valve for the V-14 is wired to AC output 3 (which is 4 in binary code) so you will often find that the first line of a motion program is an output command like this:

,0,71,0,54,0,0,

This command tells the control box to keep the doors closed (16 + 32), keep the pump running (2) and turn on the dump valve (4). All of those commands added together equal 54. Output 4 (which is 8 in the binary code) controls the interior lights on the simulator, so the lights will be turned off. The pump start motor is 1, but because the pump is already running at this point, it also does not have to be activated.

You usually do not see any other output commands in a motion ride because at the end of a ride (or if an emergency stop is activated), the outputs specified in the setup window will be activated automatically. Usually the output command at the end of a ride is to turn off the dump valve and the doors (the doors will open when they are turned off) but activate the interior lights (binary code 4).

## **Other Commands**

To adjust the cylinder multipliers and threshold during a ride, use the following commands:

,0,90,40,0,0,0,  
,0,91,30,0,0,0,  
,0,92,35,0,0,0,  
,0,93,25,0,0,0,

This puts the threshold at 40, cylinder 1 multiplier to 30, cylinder 2 multiplier to 35 and cylinder 3 multiplier to 25. It is not affected by a time command, so it can be placed anywhere in the motion program file. At the end of a ride, the threshold and cylinder multipliers will automatically be set back to the setting specified in the setup window. For more information on the multiplier settings, see the setup window section.

**Note:** only adjust the threshold setting a little at a time before testing.

You may see some other command types in the motion programs provided by Multi-Dimensional Studios. These command codes are used for legacy systems that needed additional codes, but they are not used by newer versions of the software.

## **Comments**

You can add any text you want after the last comma of a command, or even before or after the program itself. For example, often motion programs will start like this:

Paradise Coaster Thomson Jan 2010

,0,71,0,54,0,0,  
,0,61,7,50,40,1,  
,0,61,1,80,20,5,

The first line includes a title (Paradise Coaster Thomson) and a date (Jan 2010). This text is ignored by the MDS Movie Controller but it can be helpful to put notes and other information at the beginning of the motion program. Here is another example:

,0,61,1,90,50,16.2, start  
,0,61,1,90,80,20.7,  
,0,61,1,90,50,25.7,  
,0,61,1,90,10,32, tunnel  
,0,61,7,80,10,32.3, shake  
,0,61,7,80,90,32.6, shake  
,0,61,7,80,10,32.9, shake

The text after the last comma in the command line is also ignored, but it can be helpful to put notes like this on each line so you know where the motion file corresponds to something happening in the movie.

### ***Motion Calibration and Troubleshooting***

It is common for individual hydraulic cylinders to react differently to the same commands. This can be caused by wear and tear, different pump settings, or many other factors. If the motion appears to be properly synchronized, but some cylinders respond too quickly or too slowly, the power settings in the setup window can be adjusted for each cylinder by changing the multiplier value. If the simulator shakes when it is not given a command, adjust the threshold setting.

Because the motion control is fully open to the operator, we find that some operators make changes to the motion program, but in so doing they may make errors that invalidate the whole motion program. Operators should be informed to always make a backup of the original motion files before making changes, so that if they make an error, they still have the original file. The most common error is the deletion of a comma between the commands. Also, sometimes a period is inadvertently added instead of a comma.

## **Chapter 6: Warranty and Technical Support**

### ***Warranty***

The simulator audio/visual components are warranted to the extent of the original manufacturer's warranty. All components manufactured by Multi-Dimensional Studios, L.C., including the control box and special effects equipment, if any, are warranted against defects in material and workmanship for a period of one year as specified in the purchase contract. During this time, Multi-Dimensional Studios, L.C., will, at its option, either repair or replace products that prove to be defective, free of charge. After this period and until one full year from date of installation, Multi-Dimensional Studios, L.C., will furnish, free of charge, replacement parts for defective parts. Installation labor will be charged. This limited warranty does not include cleaning or any damage caused by accident, neglect, or misuse. The warranty is not transferable without the prior written consent of Multi-Dimensional Studios, L.C.

Warranty service of defective parts will be performed at the location selected by Multi-Dimensional Studios, L.C. (normally its facility in Draper, Utah) at no charge to the Buyer. Products returned to Multi-Dimensional Studios, L.C. for warranty service must be shipped freight prepaid to Multi-Dimensional Studios, L.C.. Buyer shall pay all shipping charges, duties, and taxes for products returned to Multi-Dimensional Studios, L.C. from outside the United States.

Multi-Dimensional Studios, L.C. also warrants that its software designated for use with the simulator will execute properly when installed by Multi-Dimensional Studios, L.C.. Multi-Dimensional Studios, L.C. does not warrant that the operation of the simulator will be uninterrupted or error free.

### ***Limitation of Warranty***

The foregoing warranty does not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environment specifications for the product, or improper site preparation or maintenance.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. MULTI-DIMENSIONAL STUDIOS, L.C. SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

### ***Exclusive Remedies***

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. MULTI-DIMENSIONAL STUDIOS, L.C., SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

### ***Technical Support***

Multi-Dimensional Studios, L.C., offers product maintenance agreements and other customer assistance agreements for the installations. For more information, contact your distributor or Multi-Dimensional Studios, L.C., directly at 1192 East Draper Parkway #414, Draper, Utah 84020.