

Flight Avionics, Ltd.
"V.R. Voyager"
Non-Kiddie

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Operation and Installation
manual

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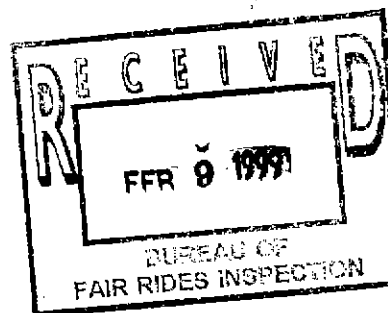
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Rin Hart
850 488-9023

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SAFETY FIRST

However enthusiastic you may be about getting on with the job of installing and running your Motion Simulator, do take time to ensure that safety is not put at risk. A moment's lack of concentration can result in a serious accident, as can failure to observe certain elementary precautions. There will always be new ways of having accidents, and the following points do not pretend to be a comprehensive list of all dangers; they are intended rather to make you aware of the risks and to encourage a safety-conscious approach.

- DON'T allow anybody to operate the Motion Simulator before they have read these Safety instructions and the operating instructions.
- DO ensure that any lifting equipment has a safe working load rating adequate for the job, and is used precisely as recommended by the manufacturer.
- DON'T allow children to tamper with the controls. You must be 18 years or over to operate this machine.
- DON'T alter the specifications or attempt to modify the Motion Simulator in any way.
- DON'T attempt to start the machine without adequate barriers around the Motion Simulator.
- DON'T start the machine without first checking that the Pressure switch is positioned to OFF on the Control Console.
- ALWAYS check that people are well clear of the Motion Platform and Capsule sides before turning the Pressure to ON.
- DON'T leave the Pressure switch ON the Control Console while people are embarking and disembarking.
- ALWAYS ensure people are well clear of the Capsule before opening or closing the Doors.



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Unpacking.

On arrival the simulator will be packed up. The control console, monitor, and cables will all be inside the simulator capsule. The skirt, roof bungs, computer disks etc will also be packaged inside. The capsule may be separate from the motion base.

To remove the items it is necessary to open the door, disconnect a door cylinder at the bottom by removing the clevis pin, disconnect the air pipes (push on connectors are fitted.) and swing the cylinder outwards. Prop the door open and remove the items stowed inside.

If necessary bolt the body to the motion frame with the bolts and washers supplied

Connecting Up

Connect all cables up. (They will only fit in one position) Visually check for any damage. If everything is in good order, connect the electrical mains supply. This will be a three phase, neutral and Earth supply. The terminals are marked in our main isolator switch. Always take the supply from a suitably fused isolator switch.

The Hydraulic power unit (HPU) will be separate from the motion base. It has dry break couplings for the connection of the hydraulic hoses. It is imperative that these connections are clean before assembly. The pneumatic pipes to the motion base connect into a distribution block situated at the rear left of the motion base. The block is stamped to enable correct connection. The coiled air pipes from the top of the distribution block supplies air to the body for the door operation. The blocks are marked with UP /DOWN /RIGHT /LEFT to enable correct connection

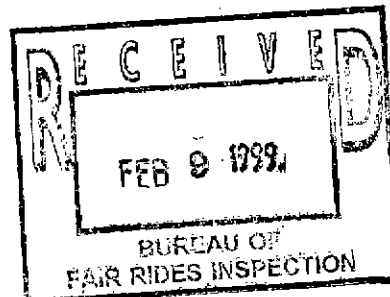
Power.

Turn on the main power. The console has a sounder, which will buzz until the blue reset button is pressed. This re sets all the electrical contactors. Check in the main distribution cabinet, the phase control relay should have both a red and green light showing. If not, change over any two phases.

On the operator console check that the *Emergency Stop Button* is not pressed down (this cuts all power to the motors), check that the light switch is in the *Auto* position. That the hydraulic pressure is *Off* and that the door switch is set to *Closed*. Start the motors and check their direction of rotation.

Check that the air compressor is operating and building up pressure. If not, check if the emergency release buttons have become pressed in on the door control box. If so pull out each button to close valve.

Stop the motors



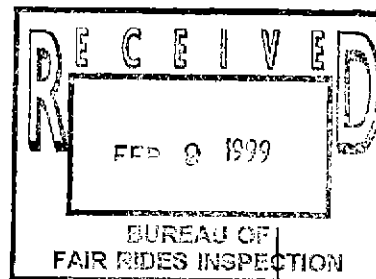
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In all instances, refer to the electrical manual and schematics supplied with the computer.

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Computer

When power is connected the computer will boot up and be either waiting to start a ride or be in the Menu system. **When in the menu system, hydraulic pressure must be OFF unless performing a hydraulic test.**

To enter the Menu system, press and release the Lower ride select button. Release the button and it will now be possible to increment or decrement the ride number shown on the screen by the use of these buttons : Select ride Zero. Press the ride start button to store the selection.

The menu will now appear on the screen. This has several selections. User options are as follows:

Replay Ride, Hydraulic Test, Set Gain, Set tone Value, Set options,

Replay Ride.

This is the way out of the menu and back to the rides. Select the option and press both the lower ride select button and the keyboard enter key at the same time. It will now be possible to select a ride number, and store it by pressing the ride start button.

Hydraulic test.

Used for testing the motion base in a controlled way. It is recommended that a hydraulic test is to be performed before the first ride is run. This will ensure that there is adequate clearance for stairs, railings etc.

Method of operation:

Select the option, the computer screen will change and six horizontal bars will appear. Type OK on the computer keyboard. Start the motors, and turn hydraulic pressure on. The cursor control keys (up and down arrow) on the keyboard will now be controlling the hydraulic cylinders.

IMPORTANT On the 2 axis simulator only, the bars on the screen must be taken to half way (position 128) before turning on the hydraulic pressure. **(see appendix III)**

Depending on the simulator model, the cylinders will be linked to different numbers E.g.

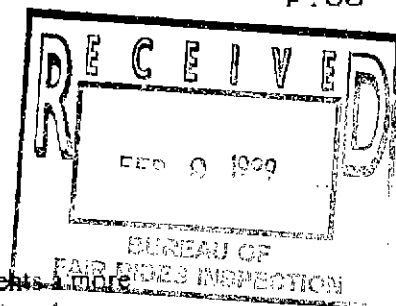
On the three axis cylinders are controlled by selecting numbers 1, 3, 5. Representing cylinders a, b, c. To return control of all cylinders together select number 7.

Before lowering the motion base to the stops, ensure that it is level.

The Six axis uses all six numbers and the Two axis use XXXXXXX3, 5.

Always return the base to its rest position and turn off the hydraulic pressure before pressing escape on the keyboard to return to the menu.

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Set Gain

This option is used to control the severity of the ride. A higher number represents a more severe ride. It is possible to alter the gain on each cylinder individually, following the numbering conventions of the hydraulic test. The numbers increment or decrement by using the cursor control keys. Press *escape* to save the selected number.

Set Tone Value

The tone value is used by the computer to recognise the start of a motion program when the video source is from tape or laser disk. It is not used by the Mpeg2 video system. When operating from tape or laser disk it is important to have the tone lead (thin lead with RCA jack, joined to the Audio Video output plug on the back of the computer) plugged into either audio channel between the video source and the amplifier.

To adjust the tone value, select the option. The screen changes and a horizontal bar crosses the screen. When it reaches the end, the question is asked if you would like to enter a new value? Type *Y* for yes. Followed by *Enter*. Then type the value shown on the label on the front of the computer. Press *enter*. The new value will be saved to disk.

Set Options (press F1 for help)

This has settings for the door system, the video system and the number of Axles, the configuration page no and the trailer timeout.

Doors: There are 4 options for the doors. On machines equipped with auto door systems option 2, 3, and 4 are various sequences of automatic operation. Option 1 is for standard manual operation, and option 0 (zero) disables the door switches, and allows the computer to operate with the doors open. Note. The hydraulic pressure will be disabled whenever the door is open, regardless of this switch setting.

Video: There are options for various video-input sources. Zero is for the use of the old U-Matic tape systems or VHS Video (as backup). For computer control of laser disk or tape systems the correct serial cable needs to be connected.

1. This option is for Pioneer Laser Player
3. 2. This option is for Sony Laser Player.
5. 3. This option is for the Betacam Tape player
7. 4. This option is for the Mpeg2

Please Note: If option 1, 2 or 3 is chosen and a tape or laser player are not connected, restating the computer will be difficult. Contact Flight Avionics for more information if required.

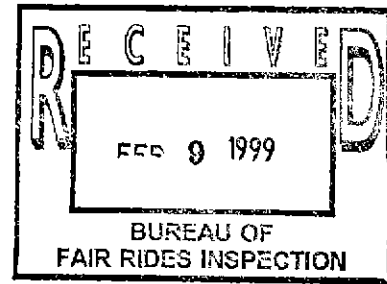
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Axis: This is simply two three or six axis and should be set to match the motion base in use.

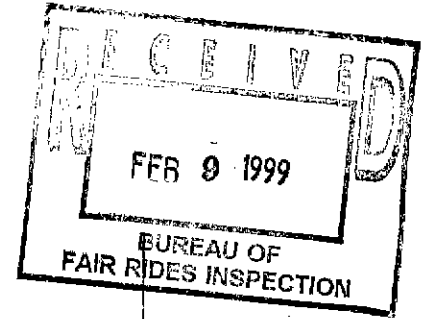
Config Page: This option will allow multiple pages of configuration.(for future use.)

Trailer Timeout: This option is for future use with a pre-show video which will play in the simulator if a ride has not been started within a set time (which is set using this option.) select zero to disable this feature.

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Operation of Simulator.

Initial Checks

Power

Turn on the main power. The console has a sounder, which will buzz until the blue reset button is pressed. This re-sets all the electrical contactors.

Check in the main distribution cabinet, the phase control relay should have both a red and green light showing. If not, change over any two phases.

On the operator console check that the Emergency Stop Button is not pressed down (this cuts all power to the motors), turn the light switch is in the Auto position, the hydraulic pressure switch to Off and that the door switch is set to Closed. Start the motors. Check that the air compressor is operating and building up pressure. If not, check if the emergency release buttons have become pressed in on the door control box. If so pull out each button to close valve.

Stop the motors.

Internal checks.

Open the capsule doors by means of the switches on the operator console. Check the interior of the capsule for any damage, sharp edges or lights not working. Check that air is blowing from the vents in front of the screen and that the screen is clean.

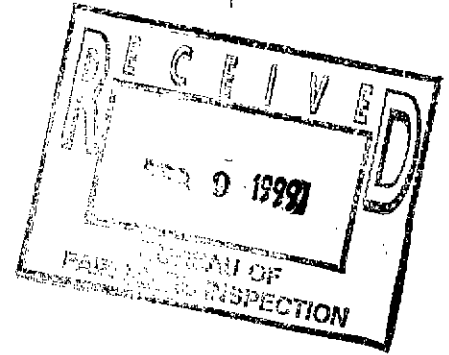
The first time that the simulator is used, and weekly thereafter, check in the nose of the simulator. Check that the mirror mountings are secure and that the mirror is clean. Remove the cover from the smoke detector. The vent fans and projector are powered from a distribution block below the screen, check that this is turned on.

External checks

Daily visual checks of all hydraulic hoses and cylinders for leakage. Check all transducer cables and the main computer connection. It is important that the two cables connected to the capsule are allowed to move freely when the simulator is in operation. Under no circumstances should they be fastened to the scissor frame. If these cables are fastened up so that they flex through too tight a radius, internal failure will occur.

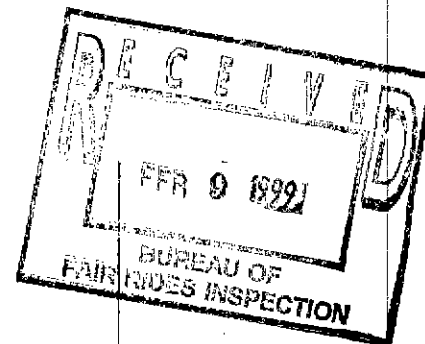
Check the oil level in the Hydraulic Power Unit (68 grade hydraulic oil) and the level of the lubricant (air oil) in the 3 air lubricators. (Two under the capsule, one on the main pressure regulator) The air system must be depressurised before filling. A bottle of air oil is supplied with each machine.

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Daily Operation.

1. Turn on the power as detailed above. Ensure that the computer boots up, and that the amplifier is set correctly. If fitted with Surround sound, check that the amplifier is using the Dolby Pro Logic settings. The computer should boot up and will always return to the ride last used before turning off. Never turn on the Hydraulic pressure until the computer has booted up.
- 3.2. Press the Blue RE-SET button.
- 5.3. Turn the light switch to AUTO.
- 7.4. Start the motors. Check that the Main hydraulic motor, the cooling fan and the air compressor are running.
- 9.5. Open the doors. If being used in Auto mode, turn the switches to the AUTO position.
- 11.6. Check that a ride is selected, if not select a ride as detailed in a previous section.
- 13.7. Turn the hydraulic pressure switch to ON.
- 15.8. Press the Ride Start button firmly.

The ride will now run. The video will be displayed on the computer monitor for systems using the MPEG2 video system. When the ride stops, the doors should open if in AUTO mode. Assuming that daily maintenance has been carried out, the ride is now ready.

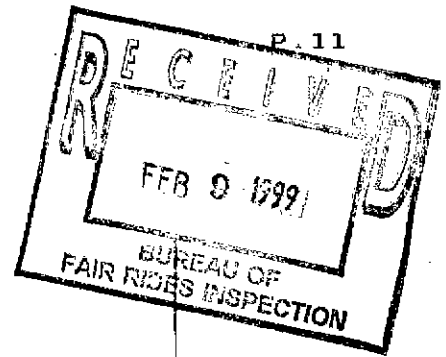
Shut down procedure.

At the end of a period of use, and before closing up, the following checks should be performed.

1. Stop the simulator.
- 3.2. Turn off the hydraulic pressure.
- 5.3. Stop the motors.
- 7.4. Open the doors, if not open. Check inside for damage, rubbish etc.
- 9.5. Close the doors by use of the door switch.
- 11.6. Drain the air compressor of any condensate by use of the tap under the air receiver.
- 13.7. Turn the light switch to OFF.
- 15.8. Turn off the air at the air receiver tap on the end of the tank.
- 17.9. Turn off the power.

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Adding new films to the hard disk.



The UP/DOWN select ride buttons can now be used to move about the main menu system, the start switch has the same function as enter key on the keyboard.

Our standard film package now consists of 16 films supplied with Mpeg 2 video stored on CD. (see appendix I) Each CD contains one film. Our standard supply Hard Disk in the computer is capable of storing eight to ten films at any one time. This seems adequate for most users, however there is the facility to remove a ride from the hard disk and replace it with another ride. This is a simple process, however it does take time. There are two other options, either to have a larger hard disk fitted or to have an additional hard disk. To facilitate this we fit the hard disk in a removable caddy. Please contact Flight Avionics for more information.

The procedure for changing rides on the hard disk is as follows, select the appropriate menu item and press enter.

- Check for disk space displays the rides installed plus the free space available. (There must be at least 300 to 400 Mbytes free to install a new ride, totally filling the disk could cause the drive to corrupt.) The screen will display a list of directory name i.e. RIDE1 RIDE3 etc. These are the rides, which are installed, it also gives the free space. (1Mb = 1000,000 bytes) The information will stay on the screen for up to 20 seconds or a timer and then return to the main menu.
- Delete ride will remove the files from the hard drive to allow the user to make space for a new ride if the disk is near full, e.g. remove a non popular ride. Press enter, the screen will now display the loaded rides, press the ride select down button, the screen changes to the ride select screen. Use the ride select buttons to chose the ride number to delete, press the start button to store this number. There is now a prompt asking for confirmation of the ride to delete. Press the ride start button to confirm, or the ride up / down buttons to cancel the operation. If you press start the ride will be deleted from the hard disk freeing up space for a new ride to be loaded. NOTE! The ride is not lost, you still have the CD for the deleted ride, and it can be reinstalled at any time.
- Copy Ride from CDROM to system disk. This option will copy the MPEG2 video files to the hard drive and create the necessary directories. All that is necessary to install the CDROM is to place the CD in the drive press the start button and wait till the copy ends. This may take several minutes. If this is a re-installation because of a faulty of damaged drive, the operator can chose to only copy 1 or 2 rides until there is sufficient down time to install the rest.

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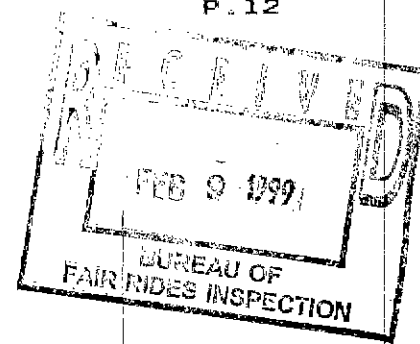
Appendix I

Mpeg2 Rides

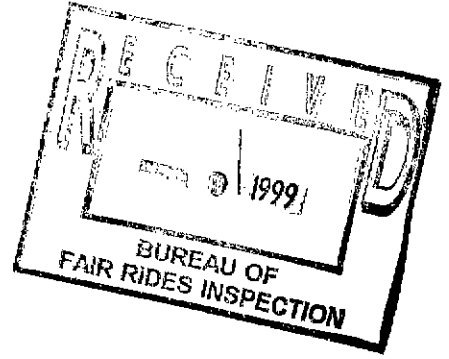
Standard supply rides in **bold**

<u>Ride 1</u>	Volcano Mine Ride
<u>Ride 2</u>	Timegate to Egypt short version
<u>Ride 3</u>	Timegate to Egypt long version
<u>Ride 4</u>	Cavalcade
<u>Ride 5</u>	Mach Six
<u>Ride 6</u>	Alton Towers
<u>Ride 7</u>	Coasters Extreme
<u>Ride 8</u>	Desert Storm Strike
<u>Ride 9</u>	Amazing Journey long version
<u>Ride 10</u>	Fun and Thrills
<u>Ride 11</u>	UK Rides
<u>Ride 12</u>	Watermania
<u>Ride 13</u>	Helicopter Gunship long version
<u>Ride 14</u>	Air Boat Ride
<u>Ride 15</u>	Helicopter Gunship short version
<u>Ride 16</u>	TT Racer long version
<u>Ride 17</u>	TT Racer short version
<u>Ride 18</u>	Amazing Journey short version
<u>Ride 19</u>	Slot Car Boogie
<u>Ride 20</u>	Hi Chip Tour long version
<u>Ride 21</u>	Hi Chip Tour Short version
<u>Ride 22</u>	Andromeda Rescue
<u>Ride 23</u>	Earthquake Escape Short version
<u>Ride 24</u>	Astro Canyon Coaster
<u>Ride 25</u>	Kid Coaster
<u>Ride 26</u>	Slot Car Boogie, short version
<u>Ride 27</u>	Aqua Ride
<u>Ride 28</u>	RGB Adventure
<u>Ride 29</u>	Grand Prix (Nwave)
<u>Ride 30</u>	Virtual Time Machine
<u>Ride 31</u>	Schumacher (Ifc)
<u>Ride 32</u>	Astro Cops

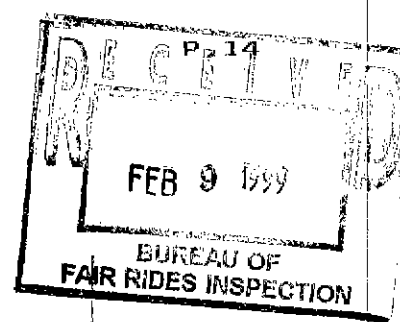
Note! 2 Axis may have different standard supply rides



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Appendix II

Modification to Motion Simulator Hardware and Control Program

David Morley (Morley Electronics) 27/09/97

The following modules have been added to the motion program to encompass the playback of MPEG2 video and the control of 2 axis and 6 axis motion rigs.

The system is now as follows: Pentium CPU
8 Mb Memory
4.3 GB Hard Drive with exchangeable module
Jetsix Hydraulic control board
MPEG2 Video decompression board
S3 Video
20 Speed CDROM for the installation of MPEG2 video
19" Rack mount case for CE Conformity

The main difference to all previous versions software is the booting and support for large Hard drives, to gain this support the operating system has been upgraded to Windows95 Rev2 with 32 Bit fat support.

All the system, video/audio, control programs and ride data is held on the hard drive, this should need no maintenance other than the installation of a new ride or deletion of an existing. If there is a major corruption, the entire system can be re-installed by a non-computer personnel, this is achieved by the use of two floppy disks supplied with the system. On screen high quality video is displayed on the system monitor.

Disk 1 (System Disk)

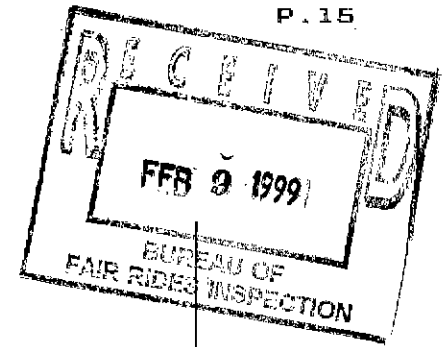
This system disk is self-booting and when booted starts a menu system that will create format and install all necessary programs.

If the disk is a new replacement then a partition has to be created, this is the first prompt, if 'y' is entered than the "Fdisk" program is run. The "Fdisk" program will ask if support for large drives has to be installed, yes must be entered, the whole disk and make active partition active options must be entered. On exit, the system must be re-booted e.g. reset switch above the mains on/off switch or re-power. When the system re-boots the menu system will re-start. This time answer no to the "Fdisk" prompt, the next prompt is to re-format the partition, answer 'y' and the disk will be formatted and a system automatically installed (can take many minutes) After the system is installed the next prompt is for installation of programs, enter 'y' to complete the process. If the system is faulty or a corrupt program file is suspected, then this last stage can be tried to recover the system without the total re-format of the system disk.

Disk2 (Rides Disk) This disk is self booting and will automatically copy the rides to the hard disk.

These two disk have a slightly different format to a dos or windows95 disk and must be created or copied with the diskcopy program that is resident after program installation. Not any other office PC running dos, windows3.11, version 1 windows 95, etc. e.g. the PC must be running windows 95 rev 2 with 32 fat support.

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The main menu has the following new items.

The UP/DOWN select ride buttons can now be used to move about the main menu system, the start switch has the same function as enter key on the keyboard.

- Copy Ride from CDROM to system disk. This option will copy the MPEG2 video files to the hard drive and create the necessary directories. The rides are now controlled by the system e.g. all rides will have an incrementing number so that each user will have the same set of files. When a new ride becomes available this will be given the next sequential number. All that is necessary to install the CDROM is to place the CD in the drive press the start button and wait till the copy ends. If this is a re-installation because of a faulty or damaged drive, the operator can chose to only copy 1 or 2 rides until there is sufficient down time to install the rest.
- Delete ride will remove the files from the hard drive to allow the user to make space for a new ride if the disk is near full, e.g. remove a non popular ride.
- Check for disk space displays the rides installed plus the free space available, e.g. there must be at least 500 to 400 Mbytes free to install a new ride, totally filling the disk could cause the drive to corrupt. The information will stay on the screen for up to 20 seconds on a timer.

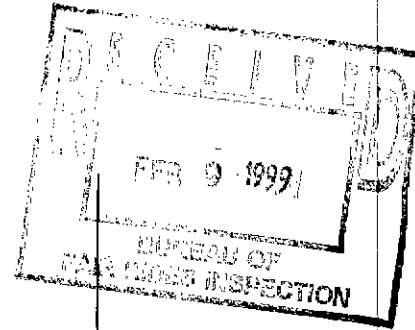
The sub menu system has the following additional menu items: When "options" is selected there is a new item called "number of axis" this can now be 2, 3 or 6.

- 2 Axis will disable the adding of the "yump" (or up/down) channel to the rams, and also the rise to center working position, all other operations the same as three axis.
- 3 Axis is the normal operation e.g. 3 rams 1 ram at the front or rear.
- 6 Axis is the Stuart platform configuration.

The above must be set to match the motion platform being used or damage to the motion rig may result.

The six-axis motion rig will use the new Moog valves with Direct control. If spares or service is required contact Flight Avionics.

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Appendix III

IMPORTANT additional information for 2 Axis Motion Base.

DO NOT TURN PRESSURE ON IN HYDRAULIC TEST UNTIL ALL BARS HAVE BEEN TAKEN TO POSITION 128 ON THE COMPUTER SCREEN.

Failure to observe this will cause the simulator to move violently to an extreme position.

In hydraulic test channel C controls the Roll axis, and E controls the pitch. Always test for clearance by performing a hydraulic test after first set up. Always return to position 128 before turning off pressure.

Factory set Limits: Important do not change limits unless instructed by Flight Avionics personnel
Top limit 216
Bottom limit 40
Rest position 128

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