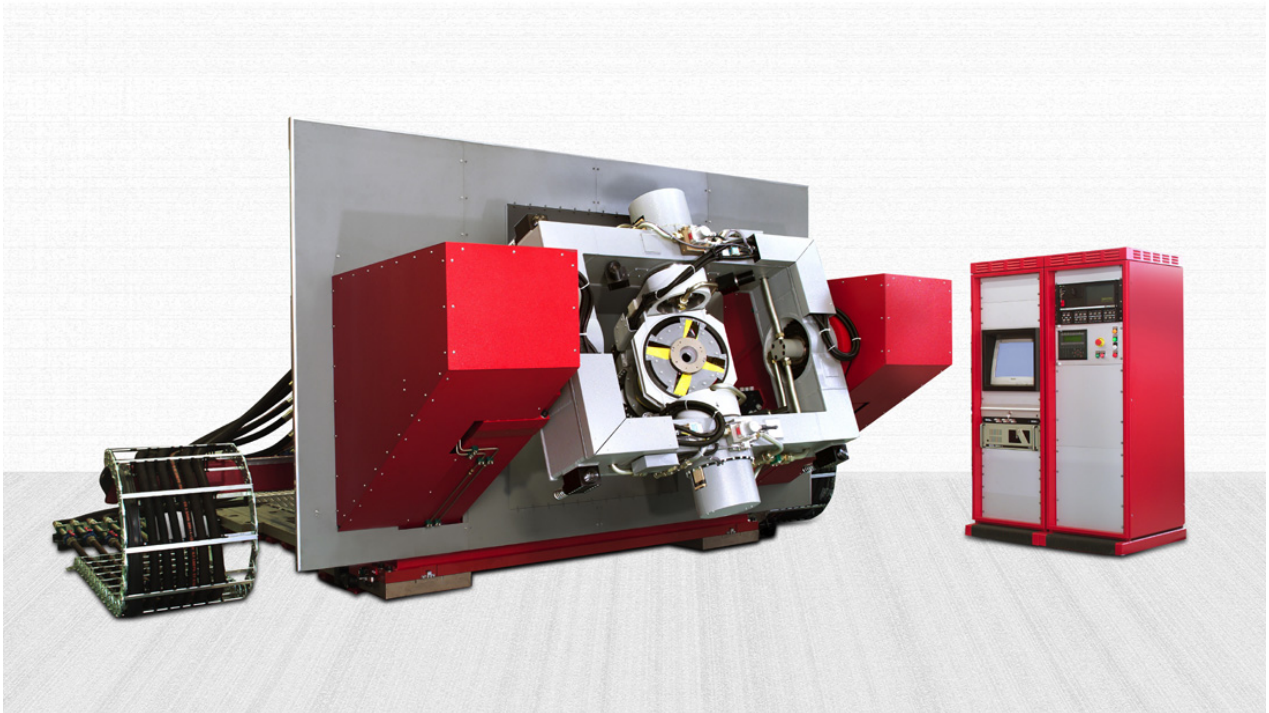


Hardware-in-The Loop Flight Motion Simulator

## Three Axis Flight Motion Simulator Model HD7767



### Modes of Operation

- Rate – absolute and relative
- Absolute Positioning: 0.00001 deg. resolution
- Track Mode – for real time simulation of motion profiles
- Synthesis mode – Sinusoidal motion, command amplitude and frequency
- Local or remote control via touch sensitive operator panel or digital interface
- Analog readout and command with 16 bit resolution

### Description

The Model HD7767 Flight Motion Simulator (FMS) is a precision 3-Axis Flight Motion Simulator with hydraulic actuators in the roll, yaw and pitch axes. The system is designed for flight simulation where high dynamic motion is required. The HD7767 FMS provides a comprehensive platform for Hardware-in-the-Loop (HWIL) simulation of guided missiles, munitions and other inertial systems.

The Three Axis Motion Simulator is configured with a horizontal outer (pitch) axis, a middle (yaw) axis, which is orthogonal to the outer axis and an inner (roll) axis supported by the middle axis gimbal. The inner axis is the payload mounting area.

The axes have limited rotational freedom. A hard-anodized aluminum tabletop on the roll axis serves as the payload mounting surface. A bearing ring attached to the middle axis supports the UUT during high dynamic motion.

Construction materials used are treated for long term dimensional stability. The stiffness of the system is such that orthogonality of the axes and bearing wobbles are maintained, virtually independent of axis rate or position. Protective coatings are used to prevent corrosion and outer surfaces are painted.

The inner axis can optionally be driven by an electric brushless motor. For continuous roll applications slipping can be fitted. A wide variety of slipping capsule designs and wiring schematics are optional available.

The ACUTROL<sup>®</sup> Model ACT3000 controls the table. The digital controller has a touch sensitive operator interface and scalable analog input/output interface. Programmable Event Pulses can be used for calibration and synchronization with external computers or test equipment. Typically, the standard digital interface IEEE-488 is supplemented with a real time computer interface. SCRAMNet and VMIC reflective memory interfaces are the preferred standard

**Dimensions**

Height of System	2200 mm
Height of Axis Intersection	1186 mm
Width across Outer Axis	3200 mm
Weight approx	8000kg
Base Area	2880mm x 3200mm
Offset, axis intersection to table top	630mm
Table Top Dia	500mm

**Unit under Test (UUT)**

Payload mass, nominal	70kg (100kg Max)
Payload Size	500mm dia x 600mm
Payload Inertia	Pitch and yaw 10kgm <sup>2</sup> Roll 2.0 kgm <sup>2</sup>

**Hydraulic Power Supply**

Power Supply	3 x 460 VAC / 60 Hz, PE, 350 A
Hydraulic Pump's	3 x 55 kW
System Pressure	160 bar

	<b>Roll, inner axis</b>	<b>Yaw, middle axis</b>	<b>Pitch, outer axis</b>
Orthogonality	+/-30"	+/-30"	
Axis Intersection		<1mm	
Angular freedom	+/-120°	+/-45°	+90° / -30°
Positioning accuracy	+/-0.002°	+/-0.002°	+/-0.002°
Position repeatability	+/- 0.002°	+/- 0.002°	+/- 0.002°
<b>Dynamic Parameters</b>			
Rate range	+/-800°/s	+/-350°/s	+/-350°/s
Min Rate	0.001°/s	0.001°/s	0.001°/s
Acceleration, with load	35'000°/s <sup>2</sup>	10'000°/s <sup>2</sup>	12'000°/s <sup>2</sup>
<b>Bandwidth</b>			
F (A±1dB) excitation 0.5°pp	> 12 Hz	> 11 Hz	> 11 Hz
F(A±2dB) excitation 0.5°pp	> 20 Hz	> 16 Hz	> 16 Hz
F(A±3dB) excitation 0.5°pp	> 28 Hz	> 25 Hz	> 25 Hz
F(-10°) excitation 0.5°pp	> 6 Hz	> 5 Hz	> 5 Hz
F(-45°) excitation 0.5°pp	> 20 Hz	> 16 Hz	> 16 Hz
F(-90°) excitation 0.5°pp	> 30 Hz	> 20 Hz	> 20 Hz
F (A±2dB) excitation 0.05°pp	> 5 Hz	> 5 Hz	> 5 Hz
F(-10°) excitation 0.05°pp	> 5 Hz	> 5 Hz	> 5 Hz

**Options**

- Digital interface in addition to the std. IEEE-488 and Ethernet; optional available are: RS-422, SCRAMNet or VMIC
- Non standard slippings
- Special UUT adapters

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