

**Model 2443H-HR  
Three-Axis Hydraulic  
Flight Motion Simulator (FMS)**

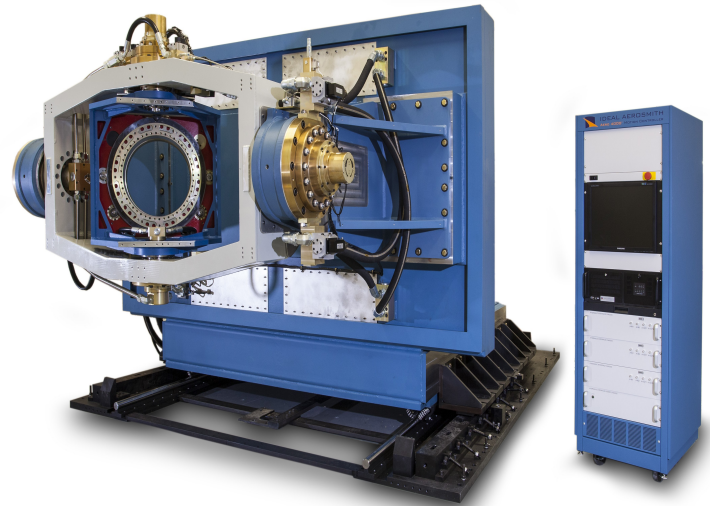
**STANDARD FEATURES**

- Position Accuracy:  $\pm 10$  arc sec
- Rate Accuracy:  $\pm 0.05\%$
- Inner axis rate: 360 deg/sec
- Rack-mounted AERO 4000 Digital Controller
  - Front panel display of status and data
  - Local and remote operation
  - Trapezoidal velocity profiles (in rate mode) with programmable velocity and acceleration
  - Sinusoidal motion generator, with programmable amplitude and frequency
  - Profile mode for position, velocity, and flight (PVA) commands
  - Programmable analog inputs and outputs

**DESCRIPTION**

The 2443H-HR is one of Ideal Aerosmith's standard Three-Axis Flight Motion Simulator models designed for Hardware-In-The-Loop (HWIL) Seeker Guidance Testing. This system is configured for interfacing to an RF chamber. Extremely efficient hydraulic actuators allow high system utilization, such as Monte Carlo-type test scenarios, on a time-continuous basis. This three-axis FMS system is controlled with Ideal's flexible AERO 4000 Controller which provides real-time motion control via several industry-standard high-speed interfaces.

The 2443H-HR features a geared hydraulic drive on the innermost axis, high-performance direct drive hydraulic vane actuators on the Middle and Outer axes and precision optical encoders on all axes. The AERO 4000 digital signal processor-based (DSP) controller provides accurate and reliable motion control. The user can operate the FMS from the AERO 4000 Graphic User Interface for local control, or remotely via a computer interface. It affords easy operation and can accommodate the Ideal Aerosmith Table Language (ATL) for remote operation. The AERO 4000 controller comes standard with IEEE-488, RS-232, and Ethernet communication interfaces.



**SPECIAL FEATURES**

- Optional servo valves and manifolds available to provide higher axis rates
- RF shielding enclosure integrated into the base structure design with accommodations for interfacing table base to RF chamber and customer wiring penetrations
- Table base configured with an actuated linear positioning system and multiple mounting/anchoring positions to simplify test article loading and system calibration
- Vertical base design that will accommodate either a vertical or horizontal outer axis orientation. (horizontal outer axis shown in photograph)
- Middle axis gimbal that accommodates interchangeable inner axis drive designs to satisfy future testing requirements

**OPTIONS**

- Various slip ring packages or wire wrap configurations
- Electric drive assembly on inner axis to satisfy high-speed test requirements
- SCRAMNet or VMIC shared-memory interfaces
- GPS and/or 10MHz timing synchronization module

***For more detailed information, contact Ideal to request a Specification Document.***

| <b>Performance Specifications</b>                                   |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|
|   | <b>Inner</b>          | <b>Middle</b>         | <b>Outer</b>          |
| <b>Rotational Freedom (deg)</b>                                     | $\pm 540$             | $\pm 60$              | $\pm 55$              |
| <b>Positioning</b>  |                       |                       |                       |
| • Accuracy, arc sec (deg)   | $\pm 20 (\pm 0.006)$  | $\pm 10 (\pm 0.003)$  | $\pm 10 (\pm 0.003)$  |
| • Repeatability, arc sec (deg)                                      | $\pm 3.6 (\pm 0.001)$ | $\pm 3.6 (\pm 0.001)$ | $\pm 3.6 (\pm 0.001)$ |
| • Resolution, (deg)   | 0.0001                | 0.0001                | 0.0001                |
| <b>Rate</b>   |                       |                       |                       |
| • Maximum, deg/sec  | $\pm 360$             | $\pm 300$             | $\pm 300$             |
| • Minimum, deg/sec  | $\pm 0.001$           | $\pm 0.001$           | $\pm 0.001$           |
| • Display Resolution, deg/sec                                       | $\pm 0.0001$          | $\pm 0.0001$          | $\pm 0.0001$          |
| <b>Acceleration, max., deg/sec<sup>2</sup></b><br>(sinusoidal move) | 10,000                | 6,000                 | 6,000                 |
| <b>Bandwidth, -3dB,</b><br>(with nominal payload)                   | 18                    | 14                    | 14                    |

\*Values listed are maximum values and are dependent upon system configuration. Performance parameters may vary between various configurations of the Model 2443H.

| <b>System Physical Configuration</b> |  |
|--------------------------------------|--|
| <b>Inner (roll) axis</b>             | The nominal test load may be secured to a precision mounting diameter and corresponding hole pattern. Custom tabletop and interface patterns available upon request. |
| <b>Number of User Lines</b>          | Optional slip ring package is 48 lines at 5 amps per line. Custom packages are available. System shown has limited travel configuration without slip rings.          |
| <b>Test Load</b>                     |  |
| • Nominal                            | 100 lbs (45.5kg), 15" (380mm) diameter, 50" (1270mm overall) (30" (762mm) long from intersection of axes to rear of payload)   |
| • Maximum                            | 275 lbs (125kg), 15" (380mm) diameter, 50" (1270mm overall) (30" (762mm) long from intersection of axes to rear of payload)  |
| <b>AERO 4000 Digital Controller</b>  | Request an AERO 4000 Controller data sheet for more information.   |
| • Type & Configuration               | AERO 4000 Test Table Controller configured in a 19-inch Cabinet.   |
| • Communication Interfaces           | IEEE-488, RS-232 and Ethernet ports available to user. SCRAMNet or VMIC reflective-memory interfaces available as options.   |

For additional information or special requirements, contact Ideal Aerosmith. Specifications subject to change without notice. Please call for pricing.

Rev B