

# GM Series

## Gimbal Balancing Machines



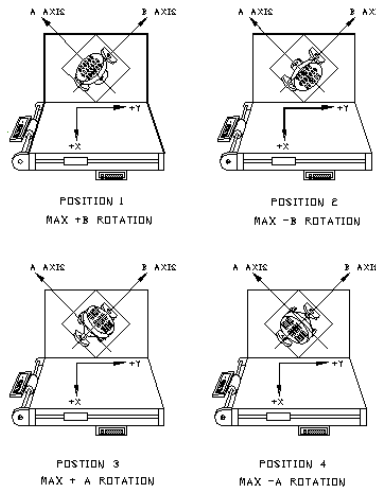
### Description

Gimbal Balance Machines are highly sensitive measuring instruments used to achieve static balance of gimballed devices such as missile guidance systems and airborne sensors and cameras. A high degree of balance is needed so that acceleration of a missile or vibration of an aircraft, helicopter, or UAV does not apply excessive torque to the sensor platform.

### Basic Concept

Space Electronics gimbal balance machines measure the unbalance of a gimbal about each of its own axes of rotation within tolerances smaller than 0.1 g-cm. These unique systems simultaneously measure the CG location for each pivoting assembly of the gimbal. In order to achieve simultaneous measurement, the machine so that the axes of

gimballed sensor is mounted on the gimbal are in a vertical plane and each axis is oriented at 45 degrees from the horizontal. The gimbal is then rotated to 4 positions and the change of CG position is detected. If the gimbal is perfectly balanced, its CG will not move as the gimbal is rotated about its own axes.



### Custom Weight Correction Software

After the gimbal's unbalance is measured, it is compared to a set tolerance. Unbalances outside the tolerance must be corrected, typically done by adding or moving ballast weights. Space Electronics provides custom software to examine all combinations of

allowed weights and locations and present the best balance solution.

### Choosing the Right Gimbal Balance Machine

The three primary factors affecting selection of a gimbal balance machine are weight of the gimbal, its unbalance tolerance, and the maximum rotation angle for the pivoted assemblies.

You should select a machine that is at least 5 times more sensitive than the balance tolerance for the gimbal.

### Advantages of the Space Electronics Balancing Method

Reduces balance time from days to minutes.

All measurements are made in one setup.

Unbalance is reported in terms of gimbal coordinates.

Our force rebalance technology provides with highest sensitivity combined with ruggedness and speed.

Fully assembled gimbals (complete with wiring) are tested, significantly improving accuracy over methods which balance individual components.

### General Technical Specifications (see specific product sheet for a particular model)

Payload Weight Range Available .....	From 0 to 115 kg
Machine Sensitivity .....	To better than 0.1 g-cm
Electrical Power Requirements .....	115 VAC, 60 Hz or 220 VAC, 50 Hz, single phase
Facility Requirements .....	Concrete floor, 15 cm thick
Calibration Hardware .....	Provided with all our instruments, traceable to NIST