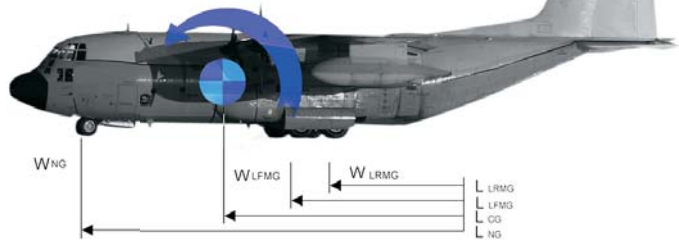


# AirWeights™ Onboard Weight and Balance System



- Redundant design architecture
- Computes aircraft gross weight and center of gravity
- Capable of retrofit
- Comprehensive Built-in test (BIT)
- Military and commercial applications



## Onboard Weight and Balance

The patented AirWeights™ Weight and Balance system utilizes a unique method of automatically establishing the gross weight (GW) and center of gravity (CG) of an aircraft. Accurate determination of GW and CG are critical to the safe and economic operation of an aircraft. AirWeights™ combines these attributes, plus ease of retrofit, to improve operations, aircraft performance, maintenance, and utilization while enhancing safety.

## Weight and Balance Procedures Used Today

Current dispatching procedures 'calculate' the aircraft GW based on personnel and cargo (baggage) weight, which are based on historical averages and may be affected by unknown cargo variances or other operational conditions. Likewise, CG is calculated based on factors that include baggage count, cargo, and passenger location. At best, these calculations are only estimates and any error resulting from their derivation must lean toward the conservative. Likewise, even when establishing and certifying the operational CG envelope,

aircraft manufacturers and certification authorities must consider the practical limitations imposed by a manual system and provide appropriate restrictive compensation.

## Converting Aircraft Struts to Scales

The AirWeights™ system measures actual aircraft GW and determines CG in real time by converting aircraft landing gear struts to on-aircraft 'scales' that accurately determine the load bearing pressure (proportional to weight) at each strut. Unique to the AirWeights™ system, is a means of detecting and correcting for the frictional effects in the struts. With the frictional effects cancelled, knowing the load bearing pressure at each strut enables the system to accurately determine both aircraft GW and CG.



## Benefits

The integration of the AirWeighs™ Onboard Weight and Balance System into operations and maintenance practices produces the greatest benefits. These benefits that allow the operator to fly their aircraft more efficiently while enhancing safety include:

### Operate with a less restrictive operating envelope:

AirWeighs™ eliminates the need to impose random seating curtailments on the aircraft's center of gravity CG envelope. Operating without random seating curtailments will enlarge the operational envelope. The increase in operational envelope depends upon the operators current weight and balance program that may be built around one to four zone cabins.

### Reduce turn times:

Improved turn times result from replacing today's manual weight and balance computation with a system that produces a GW and CG measurement in about two minutes.

### Reduce gate delays though automation:

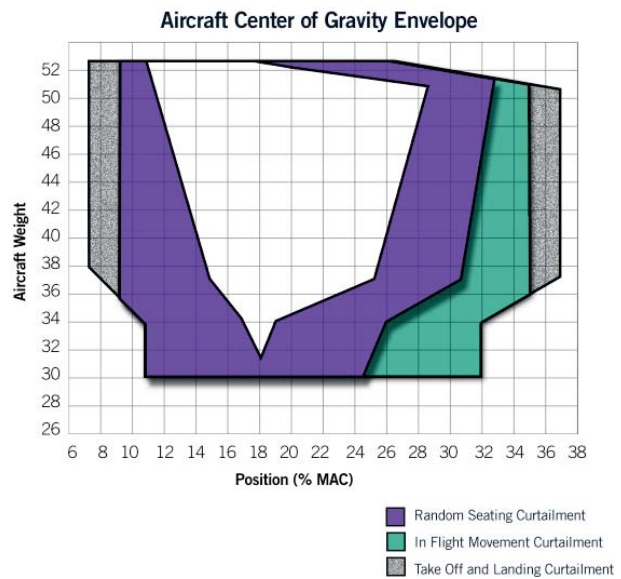
Operators attribute a large number of delays to both weight and balance related issues and unexpected strut servicing. Automation of the weight and balance process reduces delays when the arrival of late passengers require a second weight and balance determination before flight. Automation also eliminates human error, and the need for special processes created to ensure the aircraft is within the certified operating envelope. In addition, AirWeighs™ can provide notification when a strut will soon require service, reducing unscheduled maintenance action.

### Improve fuel efficiency with aft center of gravity management:

AirWeighs™ generates the actual CG with every weigh cycle. This information enables an operator to practice aft CG fuel management during loading.

### Enhance aircraft utility with multiple forward center of gravity operations:

Aircraft OEMs have the ability to certify aircraft with multiple forward CG operation. This certification increases the utility of the aircraft by providing an aircraft with multiple performance characteristics. With these characteristics, operators can reduce aircraft take-off and landing speeds, and, therefore, land on shorter runways and higher altitudes. The AirWeighs™ system complements multiple forward CG envelopes by accurately determining the aircraft's CG.



### Reduce the need for ballast with a less restrictive operating envelope:

Many operators utilize ballast to move the aircraft CG within the performance envelope. The logistics of these ballast programs consume time and resources on the ground and fuel in the air. Many ballast programs disappear with the operation of AirWeighs™, because AirWeighs™ removes random seating curtailments from the operational envelope.

### Central load control efficiencies:

Many operators utilize a Central Load Control (CLC) to provide load planning and to address daily weight and balance issues. The introduction of AirWeighs™ reduces daily weight and balance issues, allowing an operator to determine if they actually need a CLC, or if they can improve the efficiency of an existing CLC by providing actual weight and balance information.