



Australian Government  
Department of Defence  
Science and Technology

DST  
GROUP

Science and Technology for Safeguarding Australia

# Sting Mounted Balance Device

## Improved wind tunnel load measurements

The fundamental design of wind tunnel sting mounted balance devices has not changed in over 70 years. DST's novel sting mounted balance device design provides superior force and torque measurements in wind tunnels. The device design takes advantage of additive manufacturing techniques to improve the instrument's stiffness and robustness.

### How is it different?

The new design for the axial component of the balance device replaces the traditional arrangement of two beams connected by flexures with overlapping coaxial cylinders connected using flexures and internal ribs. The benefits include:

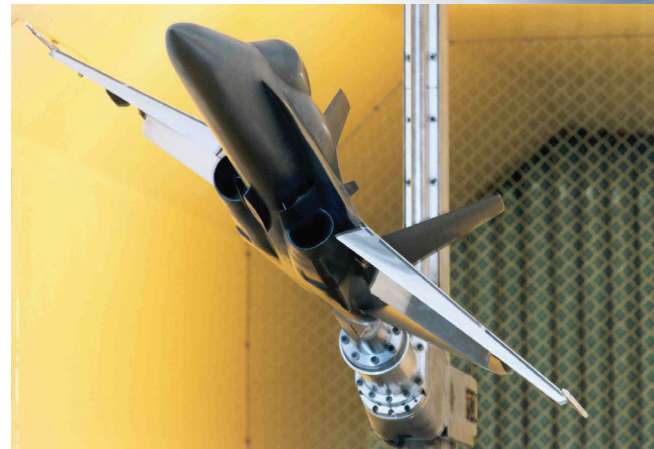
- ▶ Increased stiffness in the transverse directions for a given axial stiffness
- ▶ Interlocking mechanism integral to the device
- ▶ Improved uniformity of transverse stiffness

### Advantages over current sting balances

- ▶ Greater load bearing capacity
- ▶ Increased frequency range for unsteady measurements
- ▶ Reduced cross talk
- ▶ Inherent overload / catastrophic failure protection
- ▶ More uniform response for measurements in any transverse direction

### Stage of development and patent protection

TRL 4 - Prototype versions have been manufactured in plastic and stainless steel.



Patent applications filed: Australia, USA and Europe.

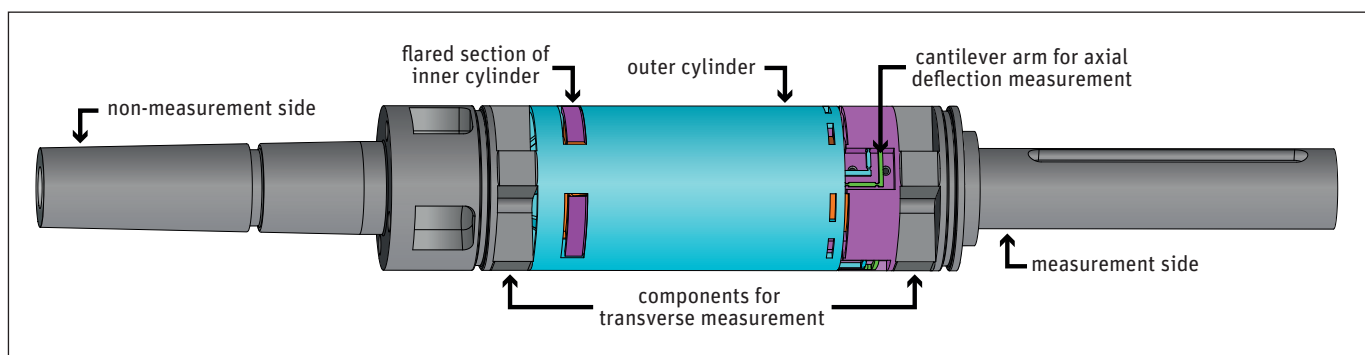
The additive manufacture of the device has been refined over the last three years in conjunction with RMIT University.

### Commercial opportunities

The DST sting mounted balance device can be utilised in every wind tunnel in the world undertaking internal force/moment measurements. DST welcomes licensing or collaboration enquiries for the commercialisation of this innovative technology.

### For further information contact:

*PartnerWithDSTGroup@dsto.defence.gov.au*



[PartnerWithDSTGroup@dsto.defence.gov.au](mailto:PartnerWithDSTGroup@dsto.defence.gov.au)

[www.dst.defence.gov.au](http://www.dst.defence.gov.au)