

# APPARATUS FOR STUDYING THE BEHAVIOR OF A 3D PART UNDER

**REFERENCE : ER400**



*Non contractual photo*

**SERVICE : 6-WAY EXTENSOMETRY  
BRIDGE, EI616. IBM PC OR COMPATIBLE  
COMPUTER. FINITE ELEMENT  
CALCULATION SOFTWARE  
RECOMMENDED : "RDM LE MANS"  
DIMENSIONS : 0,35 X 0,35 X 0,08 MM**

**WEIGHT : 7KG**

The apparatus for studying the behavior of a 3D part under static load ER400 consists of a lightweight alloy part mounted on the wings of the ATR42 aircraft, which serves as a support for the hot air circulation piping. A bench of measurements is used to faithfully reproduce the conditions of connections and flat load on this support of piping. The student, after having measured certain displacements, determined the constraints and justified the shapes of the part, compares these results with those obtained by finite element calculation software.

## Technical specifications :

Knowing the complete geometry of this support, its connections with neighboring parts and the resultant of the efforts applied to it, we can :

Measure the displacements, the deformations, the stresses in points chosen judiciously. Confront the experimental results obtained by the deformations recorded by each of the 5 gauges and the displacements measured by the 4 comparators to those obtained by the finite element calculation software in the case of simple solicitations. The student is asked to make a static justification of the dimensioning based on the simplified theory of the beams.

- **The test bench faithfully reproduces the conditions of connections and flat load of the pipe support. It comprises :**

- 1 loading screw acting on the lifter via a force sensor with a capacity of 500 daN. The latter performs a mechanical action on the pipe support and makes it possible to measure the static load applied.

- 4 mechanical comparators making it possible to measure the 2 components of displacement in 2 points.

- **AU4G piping support equipped with 5 strain gauges :**

- 4 gauges glued on the outer contour of the part to determine, locally, the normal stress.

- 1 gauge stuck on the core of a U-shaped section to determine, locally, the tangential stress.

- 1 15-pin connector for connection to the EI616 extensometry bridge.