

MOTORIZED EMPENNAGE SYSTEM



Non contractual photo

SERVICE : A PC TYPE COMPUTER WITH WINDOWS, SOLIDWORKS AND COSMOSMOTION A POWER SUPPLY: 220V - 50 HZ - SINGLE PHASE
DIMENSIONS : EX600 : 700 X 500 X 400 MM /
ELECTRICAL CABINET : 300 X 220 X 150 MM
WEIGHT : EX600 : 4 KG / ELECTRICAL CABINET : 1 KG

REFERENCE : EX600-A

The proposed horizontal empennage is part of the aerodynamic model of the Airbus A320 aircraft, intended for wind tunnel tests, carried out on a 1 / 11th scale.

Educational Objectives :

This system makes it possible to approach the fields of Mechanical Engineering and Electrical Engineering :

- Structural analysis of the empennage control mechanism
- 1 TD with corrected : role of empennage in the flight dynamics of the A320
- Functional analysis of the empennage control mechanism
- Identification of the components of the empennage control mechanism
- Schematic and geometric representations of this mechanism
- Kinematic behavior of this mechanism
- Static behavior of this mechanism
- Technical analysis, characteristics of assemblies and guides
- Definition, structure of a slave system and definition of performance
- Open loop operation of the system with obtaining graphs of kinematic and dynamic functions
- Closed-loop operation of the slave system (gain adjustment) with obtaining kinematic and dynamic function graphs

Technical specifications :

Part energy chain composed :

- An articulated tail support relative to the attachment armature,
- The support was conceived to allow to create, manually, a complementary effort of perturbation on the empennage
- A DC motor
- A bevel gear pair, with straight teeth,
- A screw system - ball nut,
- Two spring rods (simulating the aerodynamic forces), with springs of two different stiffness.
- A display device for the operation of the ball screw.
- Part information and piloting chain:
- A card to acquire the data
- An angular position sensor, located on the ball screw
- A potentiometric sensor located on the tilting box, measuring the angle of rotation of the empennage
- Of an acquisition chain of the following functions: voltage at the motor terminals, moment of the engine torque,
- Angular positions of the empennage, angular input and output speeds of the mechanism, overall reduction ratio
- An electrical box including the power card, a power supply, the connections required to connect the model and the PC.
- Technical file, pedagogical, resource, on cd-rom.