

Product Name :
Motorized Tail Empennage System

Product Code :
NLAB-TECHNICALAB30019



Description :

Motorized Tail Empennage System

Technical Specification :

This system allows to do practical works in Mechanical and electrical engineering :

Structural analysis of the tail empennage control mechanism

Function of the tail empennage in the flight dynamics of the A320 plane

Functional analysis of the tail empennage control mechanism

Identification of the components of tail empennage control mechanism

Schematic and geometric representations of this mechanism

Kinematic's behaviour of this mechanism

Static's behaviour of this mechanism

Technical analysis, feature of the assemblies and guiding,

Definition, structure of a controlled system and definition of the performances

Functioning in opened loop of the system with drawing of the graphs of the kinematics and dynamics functions

Functioning in Closed loop of the system controlled (proportional setting) with drawing of the graphs of the kinematics and dynamics functions

Technical specifications

A mechanical system :

A tail empennage support articulated according to the frame,

Possibility to create manually, a complementary disturbance strength on the tail empennage.

A direct current motor

A pair of conical gearings, with right gear teeth (ratio $\frac{1}{2}$)

A ball screw – nut system, step : 2 mm

Two spring pots of 12.1 N/mm (simulating the aerodynamic forces),

A control and data acquisition system :

A PCI data acquisition card “National Instrument “

A dedicated software designed on “Labview “

An angular position sensor mounted on the ball screw system

A potentiometer sensor situated on the swivelling case, measuring the rotation angle of the tail empennage,

Data acquisition of the following parameters: voltage of the motor, moment of the motor torque, angular positions of the motor shaft and of the tail empennage, angular velocities of the input and output of the mechanism, global reduction gearing ratio,

An electric cabinet including:

A power control card driving the step-by-step motor , a power supply, the connexion cable to link the cabinet to the PC computer via the data acquisition card.

A visualization device for the functioning of the ball screw

Technical manual in English with practical works and CAD files on CD-ROM

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