

## VIBRATION TESTS

### Measurements and analysis of structural dynamics:

- Vibration measurements and analysis.
- Resonant tests – measurement of modal parameters of structures – frequency, modal mass and damping, and modes shapes.
- Calculations and verification of vibration properties of structures.
- Investigation into the aeroelastic characteristics of aircraft (verte).



### Measurement range:

- frequency: 0.1 Hz - 50 kHz,
- amplitude: 0.01g - 50g.



### Equipment:

- 256 channel system LMS.
- 300 light accelerometers (from 2g).
- Contactless vibration measurements using laser unit 3D with software PSV-500 Polytec.
- 8 shakers  $F_{max} = 1600\text{ N}$ .
- LMS software for measurements analysis.



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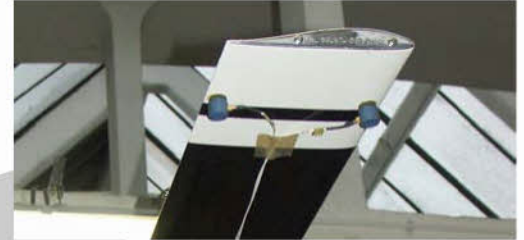


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# INVESTIGATIONS INTO THE AEROELASTIC CHARACTERISTICS OF AIRCRAFT

## Scope of research:

- Ground vibration tests (GVT).
- Determination of flutter speed and shape based on the results of GVT.
- Calculation of free vibrations and flutter using the FE methods.
- Preparation of flutter flight tests programs.
- Execution of flutter flight tests.
- Support towards the certification of new or modified aircraft.

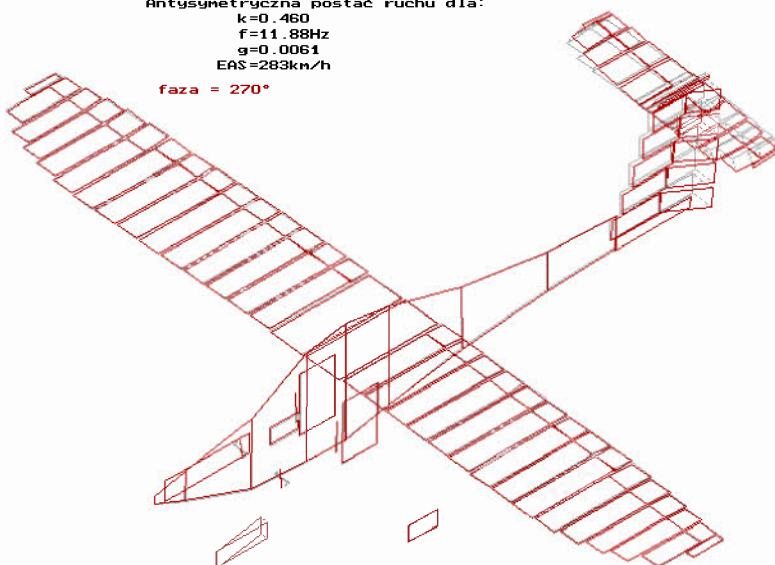


## Software:

- MSC.Patran, Siemens FEMAP.
- MSC.Nastran.
- JG2 (IPPT PAN).
- ZAERO (ZONA Technologies Inc.).
- SAF (Subsonic Aerodynamic Flutter).



MP-02 "Czajka"  
wariant 240  
Antysymetryczna postać ruchu dla:  
k=0.460  
f=11.88Hz  
g=0.0061  
EAS=283km/h  
faza = 270°



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