

OLGA - Open Loop Gust Alleviation

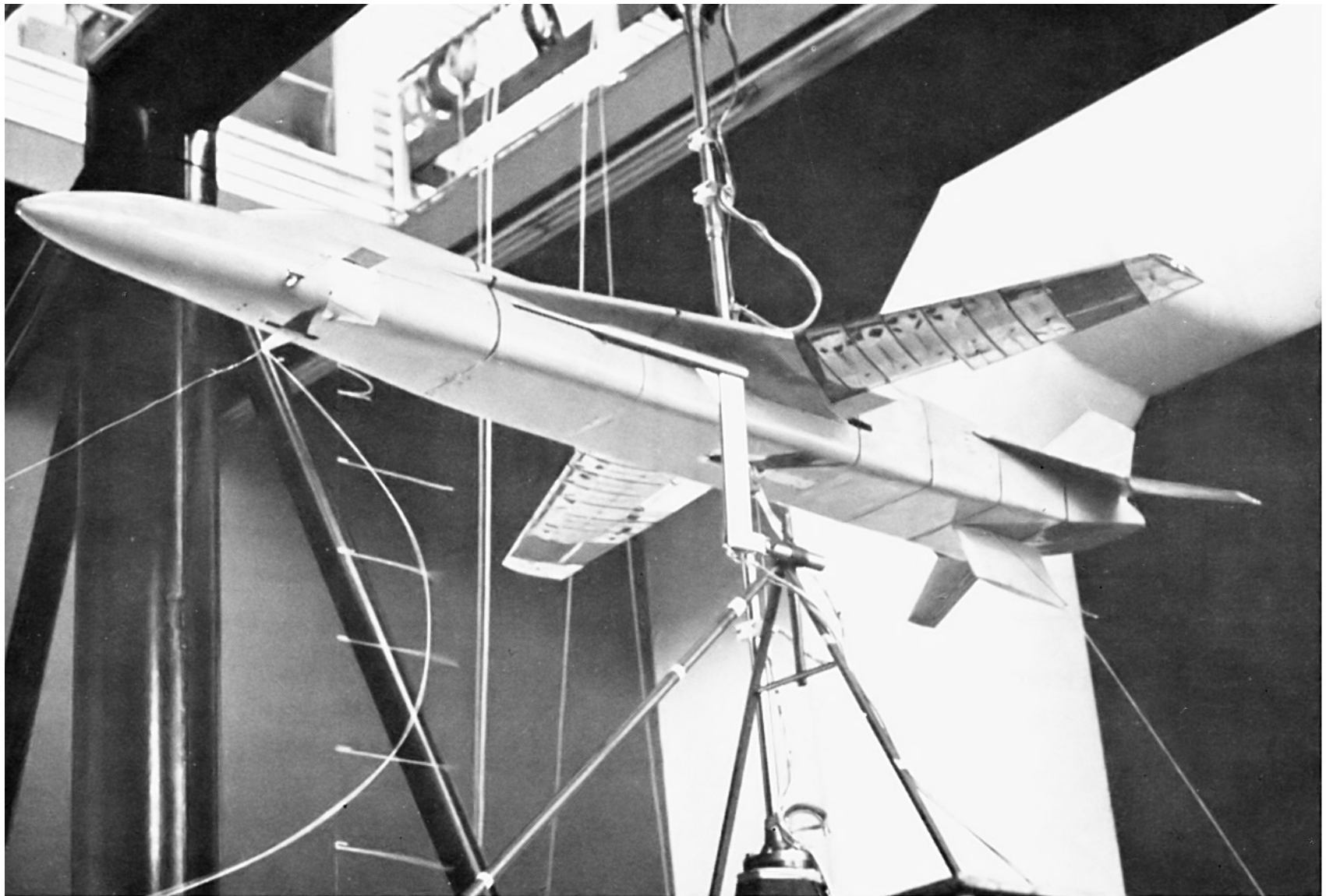


Foto by courtesy of DLR

In the years 1973 - 1976 the German Aircraft Research Institute DLR hat started investigations about the control of elastic aircraft models in a windtunnel.

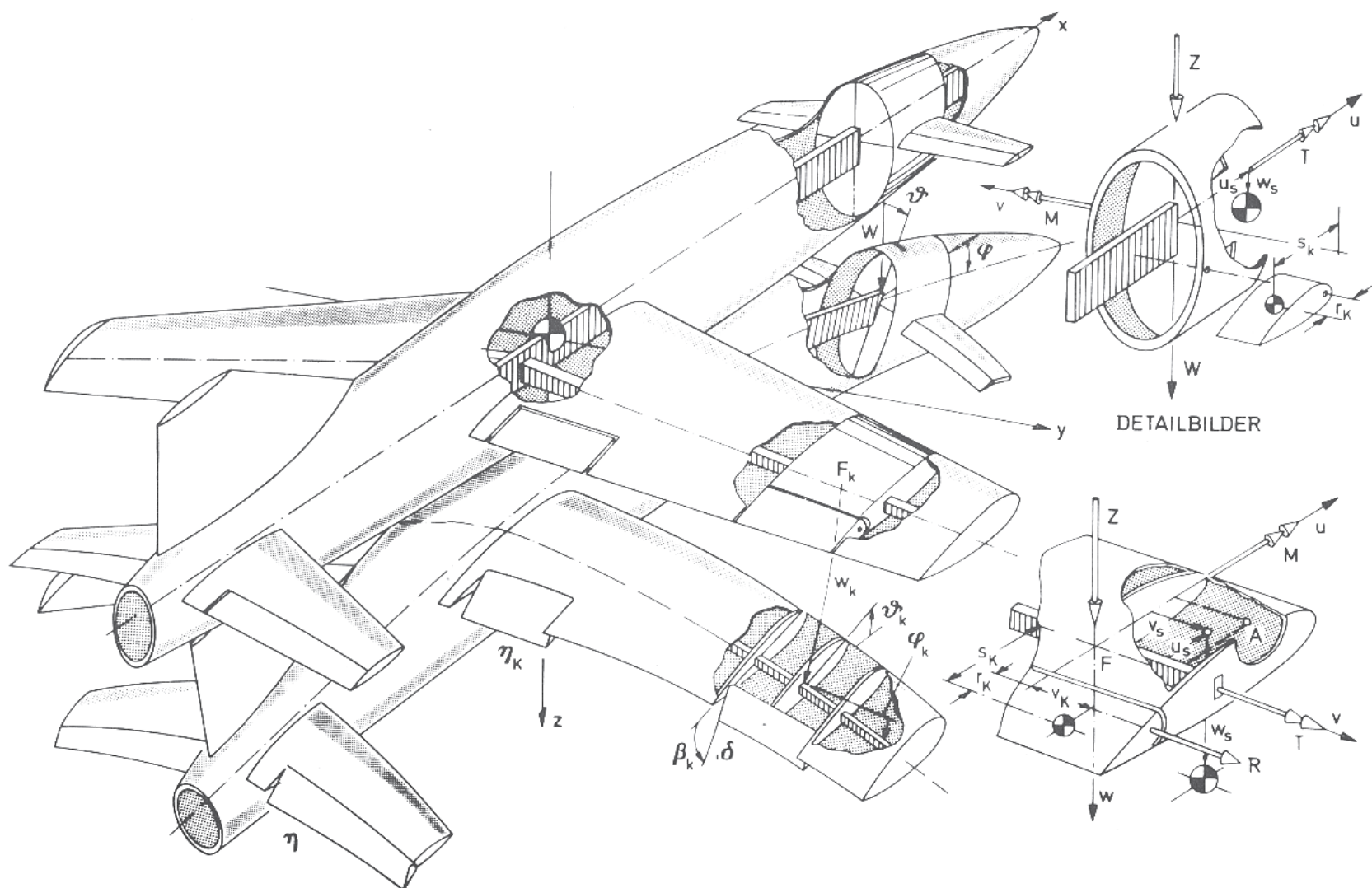
The project was initiated by Dr. Peter Hamel. Staff members were Dr. Bernd Krag, Dr. Henning Subke and the author of this document, Gernot Hoffmann, who wrote his PhD thesis about the research.

Of course many others contributed - the mechanical and the electronic workshop, the windtunnel group, engineers for mechanical and electronics design and last but not least the secretaries.

Aim of the research was the investigation of control laws for the improvement of riding qualities of elastic aircraft in gusts.

At this time, the author was a member of the Technical University in Braunschweig in the Institutes for Technical Mechanics (Prof. Dr. E. Brommundt) and Flight Mechanics (Prof. Dr. G. Brüning). The simulations were supported by Dr. K. Andresen, head of the Mechanics Computing Center.

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Drawing by the author

The author had developed the elastomechanical model of the aircraft, supported by Dr. Robert Luckner, who was at that time a student.

The eigenvalues and the modes were calculated and matched with experimental results from another institute in Göttingen.

The next step was the simulation on analog computers. The simulation was divided into four parts: the aircraft, the gusts, the measurement system and the controller. After the evaluation of the control strategies, the controller module was installed at the wind-tunnel - now using the real aircraft, the real gusts in the windtunnel and the real measurement equipment.

After successful experiments the results were also used to improve the mathematical description of the gusts.

Hoffmann, G.:

Stabilisierung, Böenkompensation und Schwingungsdämpfung am elastischen beweglichen Flugzeugmodell im Windkanal.

DLR-FB 74-44, 1976

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