

Helicopter Pilot Station (HPS)

Research simulation facility



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“NLR IS USING A FIXED-BASE RECONFIGURABLE HELICOPTER PILOT STATION (HPS) FOR PILOT-IN-THE-LOOP SIMULATION PURPOSES”

HPS can be configured for a variety of rotorcraft such as:

- Single mainrotor, tail rotor (e.g. NH90, Apache, Cougar, BO-105)
- Tandem rotor (e.g. Chinook)
- Co-axial rotor (e.g. Kamov 32)
- Side-by-side rotor (e.g. Kaman, tilt rotors)



“HPS IS A FLEXIBLE TOOL THAT CAN BE APPLIED FOR A WIDE RANGE OF ENGINEERING SUPPORT ACTIVITIES”

Simulation set-up

The rotorcraft flight controls consist of a set of mechanical helicopter controls (collective, cyclic stick and pedals) and a high-fidelity four-axis electrical control loading system to generate the control forces. This control loading system is programmable and able to reproduce almost any flight control characteristic.

Cockpit instruments and cockpit displays are simulated using four colour touch screens. Software to drive these displays is developed with Vincent. Vincent (<http://vincent.nlr.nl/>) is a NLR tool that allows rapid display development cycles.

The outside world is displayed by four projectors providing a high resolution image with a total field of view of 180° horizontally by 70° vertically.


NLR uses ART FlightLab software as the main engineering environment for helicopter and tilt-rotor flight dynamics modeling and simulation. NLR has a great deal of expertise in helicopter modeling and validation. The modular design and the graphical user interface enable users to rapidly modify model definitions.

HPS Facility

HPS has the capability to flexibly interoperate with other NLR research simulation facilities, including mission support systems and Computer Generated Forces (CGF).

These facilities are:

- Fighter 4-Ship (generic multi-ship fast-jet simulator)
- MUST (ground control station simulator for unmanned aircraft)
- GRACE/ APERO (civil research flight simulator)
- NARSIM RADAR and TOWER (air traffic control simulator)
- VROOM (virtual reality room with capability to simulate helicopter rear crew stations or ground crew stations)



The HPS has been developed with particular emphasis on handling qualities and human factors research. The flexible model environment and its level of sophistication allow detailed pilot-in-the-loop stability and control analyses for complex tasks such as tactical maneuvering, external load operations or ship deck landings.

Broad range of application:

- Human factors research
- Accident investigation
- Establishment and assessment of operating procedures
- Evaluation aircrew training equipment and simulator prototyping
- Research towards education and training of pilots
- Research towards avionics, Helmet Mounted Display (HMD) and sensor simulation

Please contact us for a free demonstration

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