AACS
Advanced Aircraft Cockpit Simulator

» AACS is a cockpit simulator specifically designed for the ground validation of all area navigation (RNAV) procedures, for assessing the workload of a flight crew in nominal operation and in the case of contingencies, and for research in the area of cockpit human-machine interfaces.

AACS can be configured to simulate different aircraft, equipment and environments and can easily be integrated with other systems including tower and air traffic simulators such as IDS AirNav's TBA3D as well as IDS AirNav's FPDAM flight procedure design suite.

The simulator's flexibility also allows it to be used for testing and experimenting with new operational concepts requiring advanced airborne capabilities, such as Performance Based Navigation (PBN), 4D Trajectories (4DTs) and ASAP manoeuvres.

Simulation is key to the validation of flight procedures and AACS can be used to determine that:

- The procedure operates to its design accuracy with the supporting systems and navigation aids

- All obstacle and navigation data on which the design is based is verified for accuracy and completeness

- The flyability of the procedure on the basis of the pilot's workload is assessed as suitable

- The aerodrome infrastructure is adequate for the procedure and to assess the visual impact of trajectories

- The presentation of instrument procedure charts is in accordance with the requirements

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Features and Characteristics

AACS's main features:

- Automatic landing capabilities (up to CAT III landings)
- Complete fly-by-wire reproduction
- Perfect reproduction of a real flight environment in a WGS84 standard Earth model
- Tools for importing ARINC 424 navigation data (e.g. for importing procedures from IDS AirNav's FPDAM) as well as tools for editing the simulator's database (import, modify and export of data)
- Integrated DIS interface allows interaction with other simulators and systems
- Fully functional Airborne Separation Assurance System (ASAS), an evolution of TCAS, connectable with the Flight Management System (FMS)
- Controller Pilot Data Link Communications (CPDLC) with the ground station
- FMS is capable of flying RNAV procedures managing all ARINC 424 paths and terminators, holding patterns, arrival procedures, SID procedures and airways
- Can be integrated with additional AACSs or virtual AACSs in order to simulate complex traffic situations Out the Window visualization includes:
- Large area terrain generation and customizable scenarios
- Detailed representations of airports including buildings, towers, runways, taxiways and typical airport light systems. Terrains are based on real GPS terrain data to achieve the desired level of accuracy in accordance with hardware capabilities.
- Traffic generation
- Heads Up Display
- Enhanced Vision System
- Weather simulation can depict rain, fog, cloud cover, wind and wind shear
- Day-night-dusk scenes including depiction of sun, moon and stars in accordance with date, time and geographical position
- Electronic Flight Bag (EFB)
- Aircraft system aural reproduction provides the typical sounds of all on board systems including aural warnings

Benefits

Cockpit simulators used for training pilots to fly particular aircraft require certification and therefore cannot be modified to simulate different aircraft characteristics and cannot be used for experimental purposes. AACS is not limited by these constraints and can therefore be customized as needed while still maintaining total compliance with the ICAO PBN Manual. This flexibility allows:

- The reproduction of critical flight conditions in order to collect all the essential information related to flight procedure design required for maximizing flight safety
- Easy loading of flight procedures and flight plans
- The possibility to tailor the software in order to simulate different aircraft, equipment and environments Use of IDS AirNav's Advanced Aircraft Cockpit Simulator for ground based validation of flight procedures provides:
- An increase in safety due to the use of an intermediate ground validation step prior to flight validation
- Dramatically reduced costs for the validation of procedures
- Shortened IFP production cycle as a result of designers and pilots working side-by-side