

AERODATA PRODUCTS

Frank Musmann
Dipl. Ing.

Project Manager and System Engineer
Aerodata AG
Hermann-Blenk-Straße 34-36
D-38108 Braunschweig, Germany
internet: <http://www.aerodata.de>
E-mail: musmann@erodata.de



Licenses and Certificates

- EASA 21J.040 Design Organization
- EASA 21/G Production Organization
- EASA 145 Maintenance
- Airline Operator Certificate
- Flight Inspection Organization
- DIN EN ISO 9001

Introduction System Concept AeroFIS Software Position Reference

May 2006

Aerodata equipped Flight Inspection Aircrafts

Introduction System Concept AeroFIS Software Position Reference

May 2006

Aerodata Facilities at Braunschweig Research Airport

In-House capabilities:

- Design Organization
- Production Organization
- Maintenance Organization

Facilities:

- 2500 m² office space
- 100 m² workshops (mechanical, electrical)
- 500 m² laboratory space
- 3600 m² hangar space
- Test facilities for temperature and electromagnetic compatibility

Runway 08
Offices, laboratories & test facilities
Workshops
Aircraft hangars

... All Responsibility in One Hand!

Introduction System Concept AeroFIS Software Position Reference

May 2006

Aerodata equipped Flight Inspection Aircrafts (2)

Introduction System Concept AeroFIS Software Position Reference

May 2006

Employees

Staff members from 15 nations; average age: 39 years; approx. 50 % engineering graduates

148 employees in:
Braunschweig (Germany)
USA
Norway
Australia

Introduction System Concept AeroFIS Software Position Reference

May 2006

Aerodata equipped Flight Inspection Aircrafts (3)

- ✓ 1989-2006
- ✓ 17 Years Flight Inspection System Experience
- ✓ 28 Aerodata Flight Inspection Systems
- ✓ Holder of STCs for a wide range of aircraft

Introduction System Concept AeroFIS Software Position Reference

May 2006



Basic: Single Console Solutions

- Minimum space requirement for a portable system:
 - Operator Console with Workstation
- Mounting of the AeroFIS console and workstation by standard seat rail attachments
- Installation/Removal time: < 1 hours
- The AeroFIS modular console architecture allows upgrades at any time...

Introduction System Concept AeroFIS Software Position Reference

Fully Automatic Flight Inspection System Series AeroFIS®

Key Features of Aerodata's System Technology . . .

- Efficiency
- Precision
- High Integration
- Fully Digital
- Dual Display Screen
- Full Life-Cycle Support
- Autopilot Coupling
- Hybrid Position Reference

Introduction System Concept AeroFIS Software Position Reference

Enhanced: Two-Console Solution

- The solution for enhanced capabilities (e.g.: Spectrum Analyzer + Oscilloscope + Signal Generator + Printer + CNS/ATM):
 - Operator Console with Workstation and
 - Customized Equipment Console
- Electrical interfaces via AeroFIS Aircraft Distribution Panel in the airframe

Introduction System Concept AeroFIS Software Position Reference

Customized Solutions

Introduction System Concept AeroFIS Software Position Reference

High End: Four-Console "Office in the Sky" Solution

- The modular architecture of the AeroFIS provides flexibility for a wide spread of systems: from Single Console Solution to the Four Console "office in the sky" Solution:
 - Operator Console
 - Observer Console
 - RF Measurement Console
 - Aircraft Condition Monitoring System (ACMS) Console

Introduction System Concept AeroFIS Software Position Reference

Customized Operator Workstations

Introduction System Concept AeroFIS Software Position Reference

Reliable Flight Inspection Computers

- Line replaceable Units (LRU)
- Standardized ATR Trays
- Compact
- Robust for rugged environment
- Tested according to RTCA/DO160D
- Approved Reliability
- Integrated Watchdog function
- USB Port
- High Speed Ethernet

Introduction System Concept AeroFIS Software Position Reference

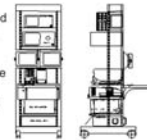
State-of-the-Art Flight Inspection Receiver AD-RNZ-850

- Enhanced Honeywell RNZ-850
- Integrates:
 - ✓ VOR
 - ✓ LLZ
 - ✓ GP
 - ✓ DME
 - ✓ 4 Channel Scan DME
 - ✓ Marker
- Precise
- Fully Digital
- Small dimensions
- Less weight
- Warm up time < 2 min



Ground Support Equipment

- Aerodata provides a set of laboratory equipment which can be used for automatic calibration, testing and maintenance of the AeroFIS and its components.
- All the units of the Ground Support Equipment except the rack can be directly used as spare parts for the airborne equipment.
- On the GSE the same software is installed as on the airborne AeroFIS for post flight analysis
- All the software functions that are available on the airborne AeroFIS are also executable on the GSE computer system.



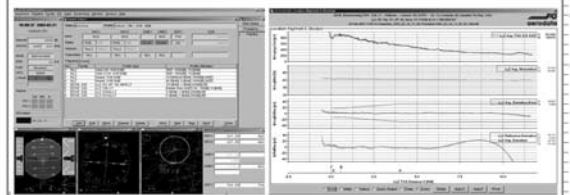
Antenna Concept

- Dual ILS/VOR antenna installation
- Automatic- or User-Defined antenna switching
- Antenna position lever arm corrected by pitch roll and heading
- Antenna Azimuth, Elevation and Frequency Pattern compensation for precise Field Strength measurement



Graphical User Interface of AeroFIS

- Based on Windows XP
- Intuitive Operation: Provides rapid familiarization with the Flight Inspection system
- Dual Screen concept: Command and Control Screen / Data Analysis Screen
- Fully operational also in Single Screen Mode
- Online Help function



Flight Guidance on Cockpit EFIS

- The AeroFIS provides an interface to the primary EFIS or a dedicated FIS EHSI in the cockpit for flight guidance.
- AeroFIS can be coupled to the Autopilot for automatic flying measurement procedures
- The following flight inspection procedures are supported for automatic flying: approach, offset approach, level flight, radial and orbit flights
- Allows to flight check new (unpublished) procedures coupled to the autopilot (SID, STAR, SIAP)



Aerodata Hybrid Position Reference

All Sensors in One Position Solution:

- Single GPS
- Differential GPS (FIS-DGPS or WAAS option)
- Integer Ambiguity Resolution Phase DGPS System P-DGPS
- Inertial Navigation System (INS) or Attitude and Heading Reference System (AHRS)
- Air Data Computer (Barometric Altitude)
- Radio Altimeter
- Laser Tracking System AEROTRACK
- Laser Altimeter
- Scanning DME
- Camera System



Unrivalled level of Integrity, Accuracy and Reliability!



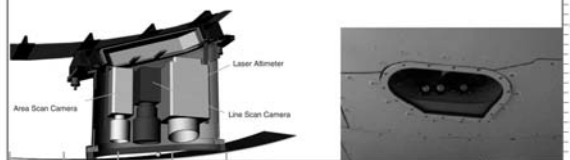
Aerodata Cockpit Information Display

- Real Moving Map controlled by the Flight Inspection System
- Full situational awareness during flight inspection
- Map based on Jeppesen Database
- Reduced workload for pilots and flight inspector
- Overlaid Flight Inspection Path



Aerodata Camera System

- INS position update by camera system
- Automatic threshold detection
- Provides accuracies for ILS CATIII calibration
- Comprises a CCD line scan camera and a CCD area scan camera.
- Additional laser altimeter is installed as height reference for low altitude flights (threshold detection).



Principle of Operation

The procedure for camera updating is divided into the following steps:

- Automatic Acquisition of camera data during threshold crossing,
- Post-processing of camera data,
- Estimation of INS accelerometer and barometric altimeter errors,
- Backward integration for the horizontal and vertical channel.

Threshold Update

Landmark Update

aerodata

