Flight Data Monitoring for General Aviation
GA Flight Data Monitoring

- GA-FDM provides an affordable FDM foundation for individuals or fleet operations
  - Robust flight data, analysis and reports to guide your SMS
  - Firewalled privacy protections
  - On-board ETMS and FOQA analysis and backend algorithms turn mountains of data into useable intelligence
  - Immediate, secure web-accessible reports, available 24/7
  - Automated and totally hands-free
  - Guided by experts focused on FDM as a core competency

- Better, safer training, operations and validation through GA-FDM and The Silent Mentor™
Web-centric tools and reports

- GA-FDM built using a terrabyte-capacity SQL relational database
- Automatic uploads after every flight
- Web-based analysis and reports
- FOQA/MOQA analysis tools
- Flight simfiles for replays
- GoogleEarth trackfiles
- Analysis graphs
- Comprehensive on-line reports
- On-line access from any browser

© 2010 GA-FDM. All rights reserved.
What are the benefits of an FDM program?

- An enhanced understanding of how flights are really being conducted
- Data to support existing procedures
- Development of tools to enhance safety
- Information to address operational concerns
- Improvements in operational behavior
- Potential to significantly reduce costs
- Aggregate data to discover systemic trends
GA-FDM Process Model

(1): Embedded Analysis (technology)
- Onboard processing of MOQA and FOQA events
- Onboard analysis of Engine Trends
- Human-readable files
- No custom analysis station
- Onboard web/mail server
- Totally automated reporting

(2): Experienced analysts (people)
- Review - validate - classify
- Act - actionable reporting
- Continually monitor
GA-FDM Features

Fleet-oriented, with monthly summary reports

- Guaranteed data privacy (Gatekeeper w/ De-ID data)
- AvMail, FDMail, TrendMail
- Flight graphs, GE trackfiles, SimFile playback
- Professional analysis (GA-FDM Reports)
- 24/7 Database and Report access
- Optimized for fleet operations
- FDM data focused on pilot actions and safety
- Individual as well as fleet monitoring and diagnostics
- Organization-based FOQA benefits
- Analysts review - validate - classify
- Analysts monitor and provide actionable reports
- Aggregate data on airframe and engine use
- Aggregate data to discover systemic trends
- Electronic logbook integration
- Electronic Out - Off - On - In times
- Daily access to all online reports and data
- Monthly summary data by tail number or fleet
- Top 10 FOQA and MOQA reports
- Flight playback (virtual flight sim)
- Trackfile playback (GoogleEarth)
- Leverage with Suppliers (engine, insurance)
- eMOST benefits
- Special Studies (Analysis & Reports)

Fee per report, by request
GA-FDM’s Scalable FDM Architecture

Flight Monitoring System with 3-axis AHRS, audio, and web / email servers

© 2010 Alakai Technologies. All rights reserved.
Low-cost flight data recorder with embedded processor for real-time engine and FOQA analysis

Multiple databus interfaces and types

Self-contained AHRS, air data, analog, audio and discrete interfaces for non-databus aircraft

Qualified to DO-160F (full lightning and HIRF protection)

FAA certified (STC)
  - Proven in Air Taxi, Flight School and individual use

Wireless (802.11 b/g and/or 3G/4G broadband)

Robust Memory Unit option for data survivability
  - Waterproof
  - 1000 G crash force
  - 2012°F flame

Meets or exceeds ED-155 standards
Equipment Capabilities

Interfaces and Environmental:

- Dual-core embedded processor for real-time engine and FOQA analysis
- Self-contained AHRS and Air Data interfaces for non-databus aircraft
- Qualified to DO-160F (full lightning and HIRF protection)
- Arinc 429 (3), RS-232 (5), RS-422, USB 2.0 (4), 100Mb Ethernet (2), MIL-1553 (Option), Audio (option)
- Discretes (16 in/8 out), ±10V analog (6), Torque (2), Diff (6) (±40V CMV, 0.5V diff) and Tach (2) inputs (add’l inputs available)
- FAA certified (multiple STCs)
- Meets or exceeds ED-155 standards
- Power Consumption: Less than 8 watts
- Weight – DFDS: 2.9 pounds; Wireless: 1.6 pounds
Options for 2-Way Messaging and Flight Following

Iridium satellite network

Position and in-flight FOQA Events (periodic or on-condition)

Cockpit 2-way Texting

Type your message here...
Send Cancel
140 character remaining

gryphon_pc.1
What is your ETA?
2009/11/10 20:08:12

Ground / OPS center

2-way Texting

Tracking, Mapping, and FDM Reporting (periodic, or on-condition)

Messaging Servers

© 2010 GA-FDM. All rights reserved.
Data aggregation is the empowering factor in improving safety
- Flying a smarter, more connected airplane
  - On-board and backend algorithms turning mountains of data into decisions and actions
  - Internet-accessible maintenance and operational (FOQA) corrections and improvements
  - Operating procedure changes
- Leverage with suppliers (i.e. engine manufacturer, aircraft providers)
- Leverage for fleet operators
  - Immediate access to analysis and reports
  - How’s this airplane performing vs the fleet

FDM programs shift the focal point from single incidents to aggregate systemic trends

Anecdote becomes action; safety is enhanced, and maintenance data supports real savings
Operator Benefits

- Real data to support Maintenance and Operations
  - Automated Out, Off, On, and In times
  - Daily / Weekly summary data by tail or by fleet
  - Maintenance data
  - FOQA data and Top 10
  - Flight replays
  - GoogleEarth trackfiles
  - Operating cost reductions
  - Electronic logbooks

- Enhanced Safety and Training
  - Mentoring, standardization, and pilot operational feedback

- Automatic flight following (option) via satcom
  - Position reports, FOQA advisories, 2-way text messages

- Comprehensive, survivable flight data recorder
Owner/Customer Benefits

- Continuing aviation proficiency
  - ‘Silent mentor’ for VLJs
- Reduced operating costs
- Increased engine Time Between Overhaul (TBO)
- Electronic logbooks
- Simplified maintenance (similar to On-Star)
- Comfort that aircraft is ‘talking to the factory’
- Enhanced resale value
- Peace of mind / safety
In single pilot operations, sometimes a “Virtual Co-pilot” is a good idea

- Early identification of
  - Adverse safety trends
  - Misinterpreted SOPs

- Risk and Resource Management
  - Uncover threats and errors
  - Mitigate risk
# GA-FDM (ALAKAI / CAPACG) FDM PRODUCT SUITE

**AVAILABLE / IN-PROCESS STCS**
- AS350, EC130: JAN 2011
- BH206, BH212: FEB 2011
- FIXED-WING STCS ALREADY FIELDED

**MEETS ALL 5 R’S**
- RECORD
- RETRIEVE
- REVIEW
- REPORT
- REPEAT
- 80 TO 175 PARAMETERS
- PROFESSIONAL ANALYSIS FOR FLEET OPS
- WEB-ACCESSIBLE REPORTS & ANALYSIS
- PROVEN FEEDBACK FOR SMS

**INPUT CHANNELS**
- RS-232: 5
- RS-422: 1
- RS-423: 1
- ARINC 429: 3 CHANNELS
- MIL-1553B: 3 CHANNELS
- ETHERNET: 2 10/100 PORTS
- USB 2.0: 2 EXTERNAL
- ANALOG INPUTS, 0-10V: 6
- DIFF ANALOG HIGH CMV 0-2.5V: 6
- TORQUE: 2
- TACH / RPM: 2

**DISCRETES**
- OPTO-ISOLATED INPUTS: 16
- OPTO-ISOLATED 2A FET SWITCH: 8

**FEATURES**
- AHRS: BUILT-IN 6 DOF
- AIR DATA: OPTIONAL
- MEETS ED-155: YES
- DO-160F: YES
- AUTO FLIGHT FOLLOWING: OPTIONAL IRRIDIUM SATCOM AFF
- 2-WAY TEXT TO COCKPIT: OPTIONAL VIA IRRIDIUM
- DIGITAL VIDEO: OPTION
- COCKPIT VOICE: OPTION
- HARDENED STORAGE: OPTION

**ENVIRONMENTAL**
- DO-160F: YES
- ED-155: YES
- LIGHTNING / HIRF IMMUNITY: YES
- POWER: LESS THAN 8 WATTS
- WEIGHT: 2.9 LBS

**PROVEN SYSTEM**
- AIR TAXIS, FLIGHT SCHOOLS, OFF-SHORE HELICOPTERS, OEMS, HUMANITARIAN AID (UN)
- COMPLETE, ROBUST FDM FOR GA

**FDM/FOQA FEATURES**
- EMBEDDED ANALYSIS
- AUTOMATIC UPLOADS
- AUTOMATIC DATABASE LINK
- AFFORDABLE: DESIGNED SPECIFICALLY FOR GA
- FULL FDM ANALYSIS AND REPORTS WEB-ACCESSIBLE
- PERFORMANCE MONITORING: YES
- ENGINE TREND MONITORING: YES
- DATA AGGREGATION: AUTOMATIC
- SILENT MENTOR™: MENTORING FOR CONTINUAL IMPROVEMENT
- LOW-LATENCY REPORTS: WITHIN SECONDS OF TOUCH-DOWN
- OPEN ARCHITECTURE: YES
- IMMEDIATE EMAIL TO PDA/IPHONE: YES
- WEB-ACCESSIBLE, 24/7: YES
- DE-IDENTIFIED DATA: YES
- NO GROUND STATION FEES: NONE
- FIREWALLED DATA PRIVACY: YES
- ACTIONABLE REPORTS: YES
- LOGBOOK INTEGRATION: OPTION
- EXECUTIVE SUMMARIES ON-LINE: INSTANT
- TOP 10 REPORTS: INSTANT
- PLAYBACK ANY FLIGHT: INSTANT
- TRACKFILES: INSTANT
- PERFORMANCE GRAPHS: INSTANT
- SPECIAL EVENT STUDIES: YES
- ON-CONDITION MAINTENANCE: YES
- ANALYSIS-ONLY OPTIONS: JUST REPORTS
- FULL FOQA PROGRAM OPTIONS: WE ASSIST, OR ACT AS YOUR FOQA TEAM
- FOQA, FDM, ASAP EXPERIENCE: MULTIPLE PROGRAMS, YEARS OF EXPERIENCE
- EARLY IDENTIFICATION: FIND ADVERSE SAFETY TRENDS
- EMOIST: ECONOMICS, FOCUSED ON MOST
- RISK AND RESOURCE MANAGEMENT: UNCOVER AND MITIGATE OPERATIONAL RISKS
- PROFESSIONAL ANALYSIS: GA-FDM SPECIALIZES IN DESIGNING AND IMPLEMENTING FDM AND FOQA PROGRAMS

**PROVEN SOLUTIONS**
- WWW.GA-FDM.COM