



**APPAREO**  
SYSTEMS

July 16, 2009

# Appareo FDM Products

**Ben Wright**

# Paradigm Shift in On-Board Data Collection

## Legacy Aircraft Challenges

- Ongoing demands on aging fleet
- Airframes flying beyond planned service life

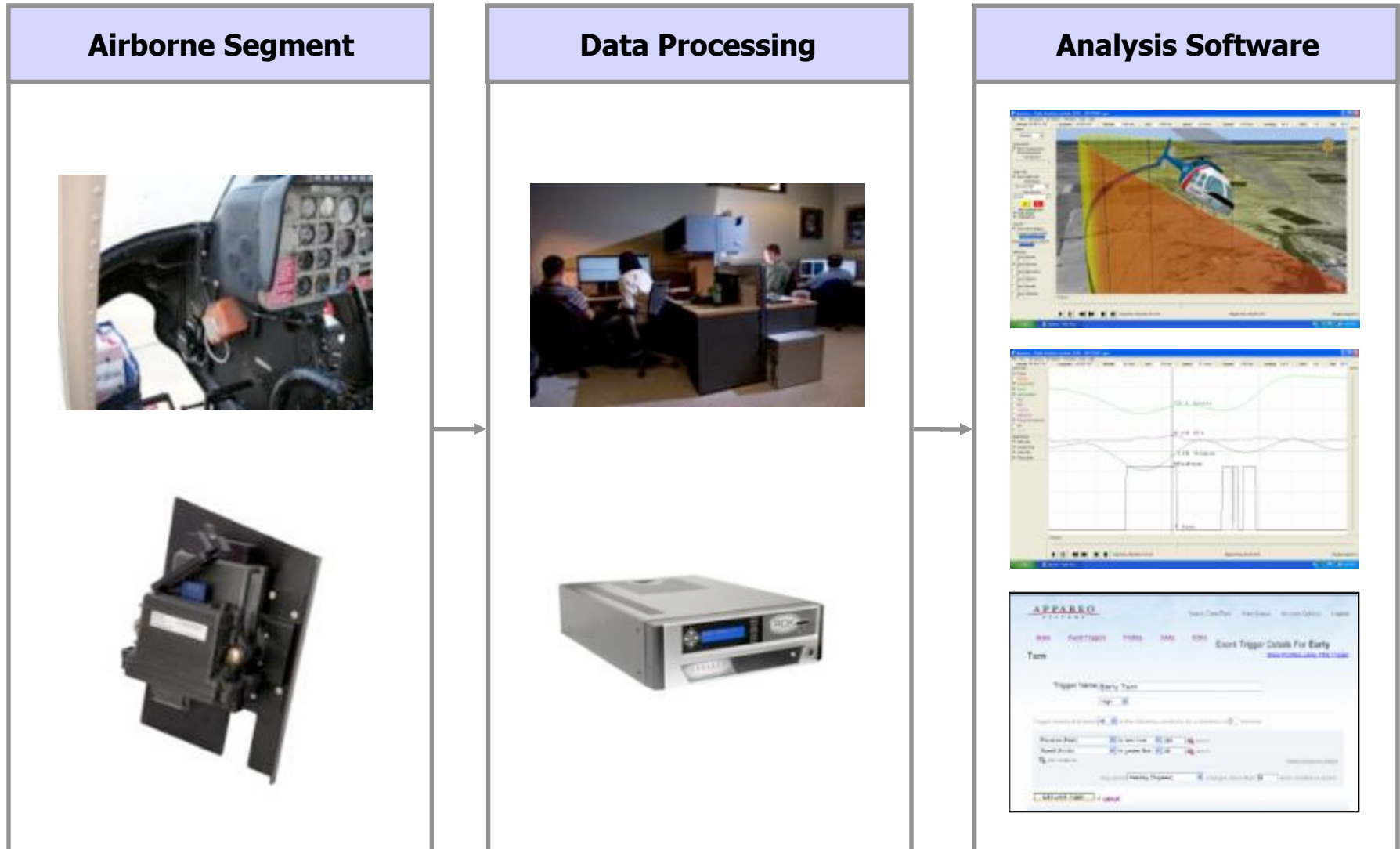


## Traditional data collection impractical

- Bulky, intrusive hardware
- Implementation difficulties
- Heavy equipment
- Expensive



# ALERTS Software System



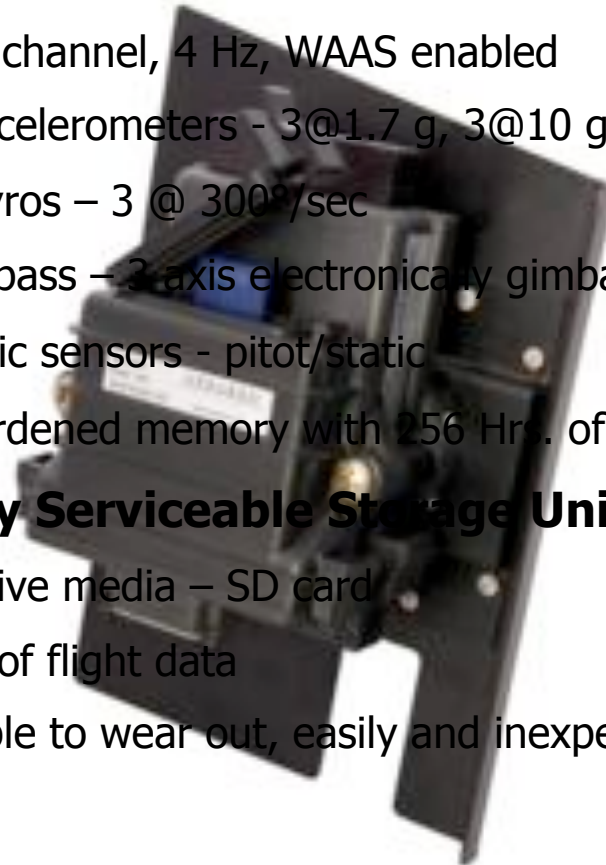
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# ALERTS Recorder – GAU 2000

## Integrated Inertial Sensor and Flight Data Recorder

- **Aircraft Powered – 125mA @ 28 VDC**
- **Self-contained Inertial Measurement and GPS System**
  - GPS - 16 channel, 4 Hz, WAAS enabled
  - MEMS Accelerometers - 3@1.7 g, 3@10 g
  - MEMS Gyros – 3 @ 3000/sec
  - Flux compass – 3 axis electronically gimballed
  - Barometric sensors - pitot/static
  - Crash-hardened memory with 256 Hrs. of flight data storage
- **Separately Serviceable Storage Unit with Removable Media**
  - Inexpensive media – SD card
  - 128 Hrs. of flight data
  - Susceptible to wear out, easily and inexpensively replaced



# Vision 1000

## Self Contained Data Acquisition

- Image acquisition – 5 fps, 2.2 mp
- Ambient audio capture to 14KHz
- GPS / IMU
- Lightweight – 250 g (9 oz.)
- Capable of 2 channel ICS capture



## Data Storage

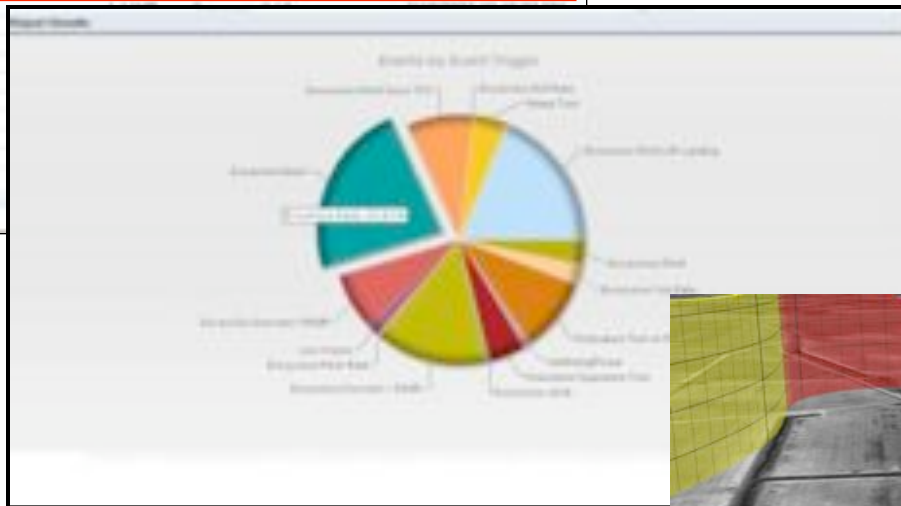
- Removable memory (SD) 8 hr image
- Crash hardened memory
- 2 hr image/audio; 200 hr inertial data

# ALERTS FDM Software

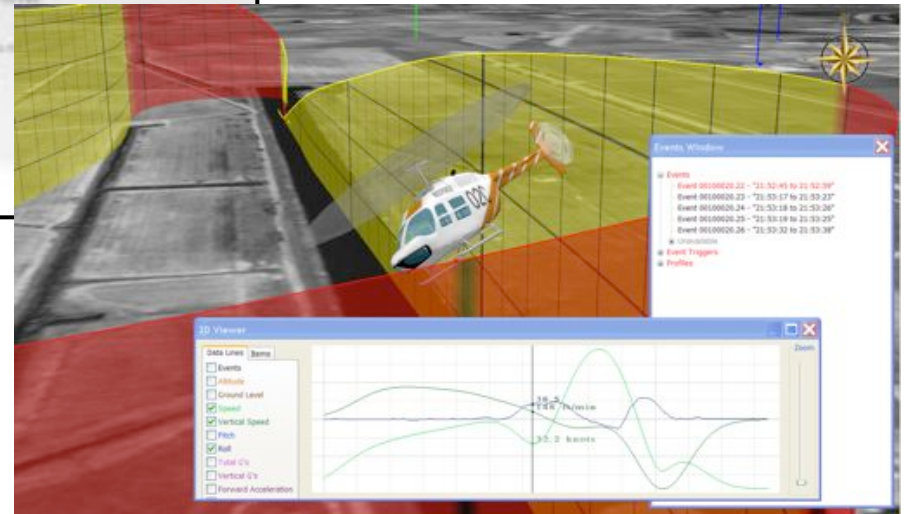
Detect Events

Row ID	Data File	File Size	Flights	Events Received	Recording Date (GMT)
10000	001000012.gpr.gz	2.27MB	0	0/7.5k	07/09/2017 01:27:00 PM
10001	001000013.gpr.gz				
10002	001000014.gpr.gz				
10003	001000015.gpr.gz				
10004	001000016.gpr.gz				
10005	001000017.gpr.gz				
10006	001000018.gpr.gz				
10007	001000019.gpr.gz				
10008	001000020.gpr.gz				
10009	001000021.gpr.gz				
10010	001000022.gpr.gz				
10011	001000023.gpr.gz				
10012	001000024.gpr.gz				
10013	001000025.gpr.gz				
10014	001000026.gpr.gz				
10015	001000027.gpr.gz				

Generate Powerful Reports



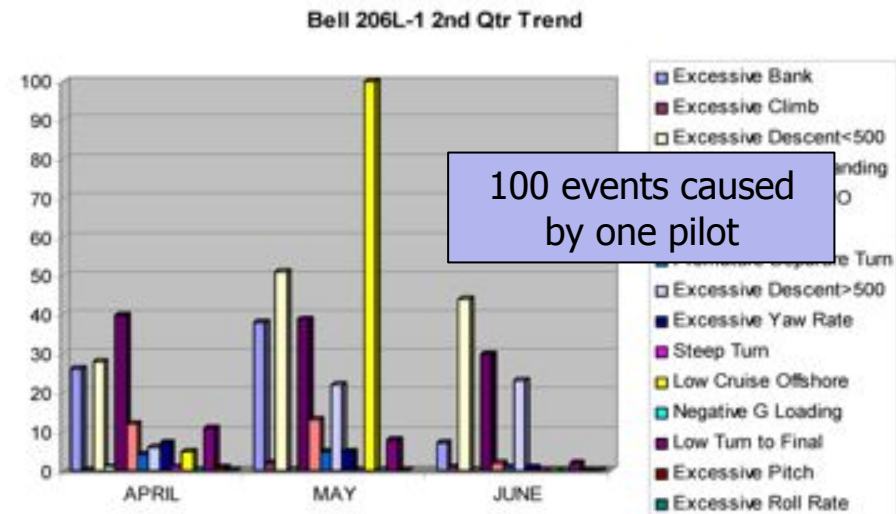
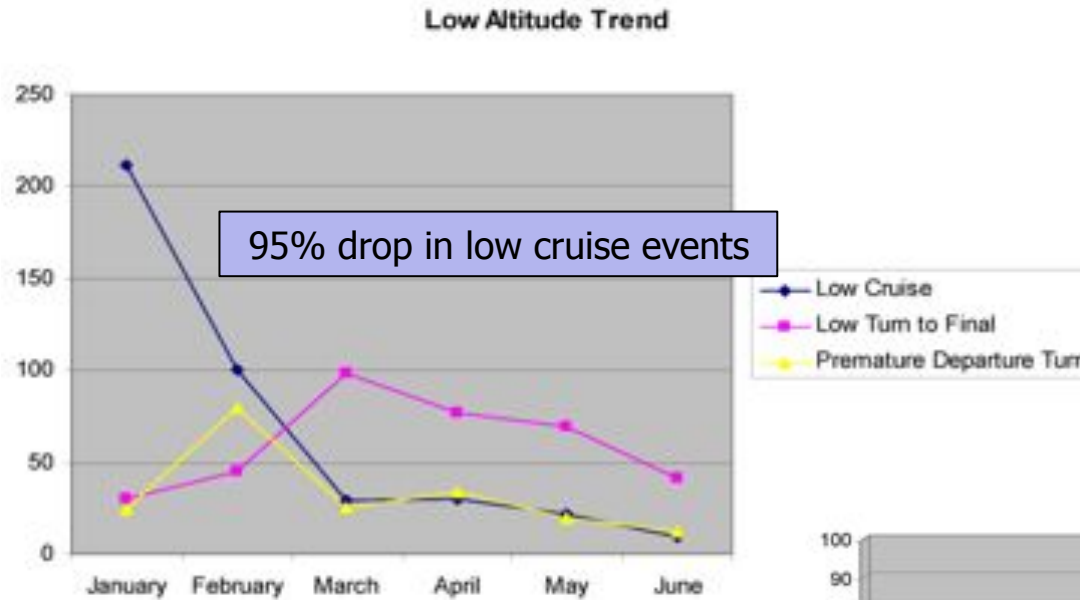
Visualize Flights



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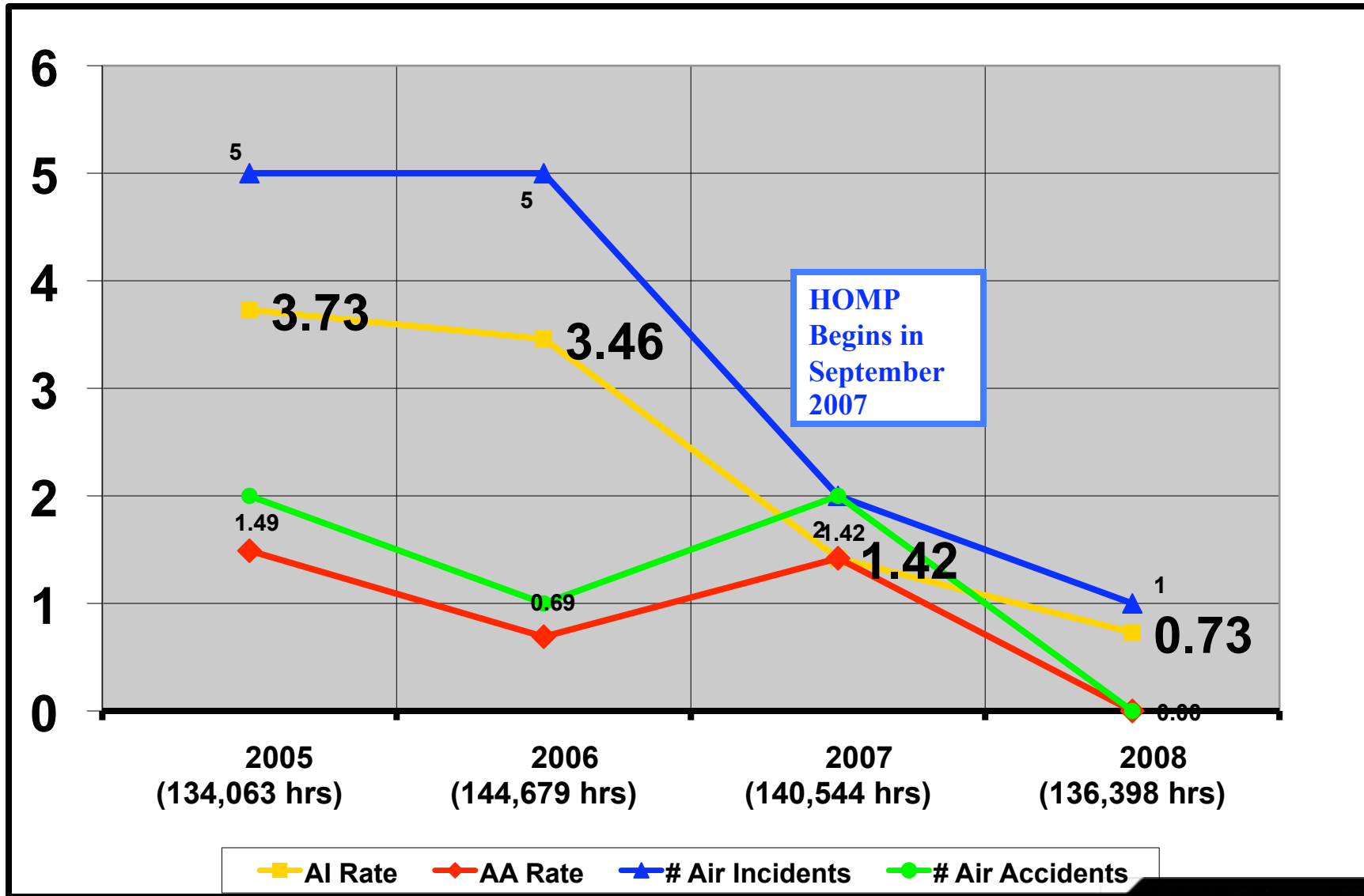
# ALERTS Provides Actionable Information



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# Commercial Operator Results with ALERTS



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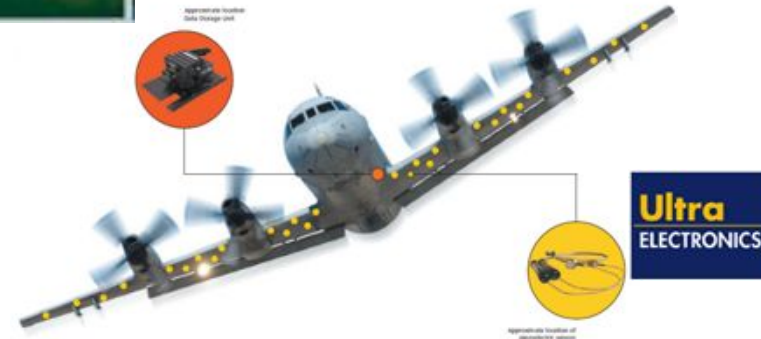
# Appareo Onboard Data Acquisition



**USFS Operational Loads Monitoring**

**Health and Usage Monitoring (HUMS)**

**In-flight Crack Detection**

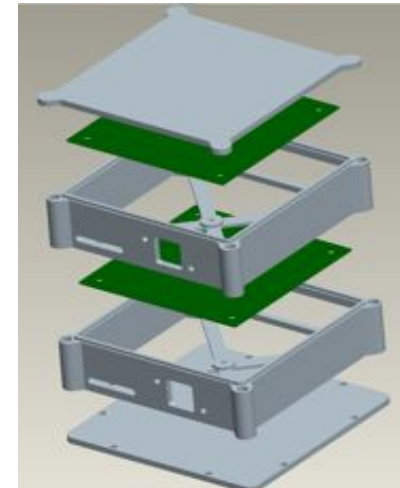
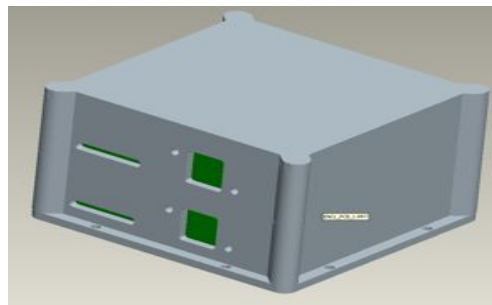


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# Next Generation ALERTS

- **Upgrade to existing GAU 2000**
- **Modular based architecture allowing customization**
- **Optional Features:**
  - **ARINC 429 Interface**
  - **Wireless data transfer (Cellular and Wi-fi options)**
  - **Flight following**
  - **Real-time alerting functionality**
  - **Camera**



# Questions and Discussions



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