GBAS Flight Tests and Data Collection

Presented to: GBAS Program Office
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Nature of Flight Testing

- Accuracy/Resolution of MMR receivers
- Terminal Area Approaches
- Procedure turn Radii/Speeds
- Flight Control Parameters
- Replicate any RWY approach at ACY
- Support other GBAS programs
Equipment on the Plane

- Dual GNLU-930 MMRs
  - Gables Control Head
  - Analog CDI
- TSPI reference receiver
- Sandel Multifunction Display
- Ballard DCS/Time Code Generator
- Media for data collection
- Cabling
GNLU 930 MMR Shelf

- GNLU 930 MMR
- GABLES Control Head
- Control Display Indicator (CDI)
- ARINC 429 outputs
- RS-422 outputs
Ballard 429 Collector

- 12 Channel Receive 429 ports
- 4 Channel Transmit 429 Ports
  Drives Convair flight control system
- 16 Channel RS-422 Ports
- Two Ethernet Ports
- Compact Flash Drive
- Linux OS/ C software
Ballard Data Collector
TSPI Receiver

- Z Extreme GPS receiver
- Reference Receiver ground based
- Provides positional data and time
- 1, 2, 5 or 10 Hz data rate
ES-291 IRIG Time Code Generator

- GPS Based
- IRIG – B TTL output
- 1 PPS output
- AC/DC Power
ES – 291 Time Code Generator
SANDEL SN3500 DISPLAY

- Electronic HSI
- Features of EFIS but fraction of cost
- Waypoint/Moving Map Display
- Perfect for TAP profiles
- Weather/Traffic display
- Distance to Waypoint
SANDEL 3500 DISPLAY
Typical FAA Aircraft Installation

Ballard DCS

- 429 TX
- 429 RX
- 429 RX 4
- 429 RX (3)
- Z extreme

• Cockpit CDI Display

• MMR 1
  - ILS LAL -- AUX DATA
  - GNSS -- EFIS

• MMR 2
  - ILS LAL AUX DATA
  - GNSS -- EFIS

• Aircraft
  • Signals

• Z extreme

• IRS – ADC -- FMS

Sandell Display

• 429 RX
• RS 422 RX
• RS 422 RX
• 429 RX 4
• 429 RX 4

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MMR – DCS Rack
Aircraft Racks
FUTURE GBAS TESTING

- Different Airport Procedures
- Honeywell INR CAT III receiver
- GNLU 925 MMR
Integrated Navigation Radio (INR)

- CAT IIIb ILS/GS
- GLS
- GPS
- VOR
- Marker Beacon
Flight Test Procedures For INR

- Twenty Mile Orbits
- Twenty Mile Radials
- 25 and 10 Mile Approaches
- All runways
LAAS Flight Inspection

- FAA National Policy Notice N8200.116
- Flight Inspection/Validation GBAS Procedures
- Precision Approach/Analysis/Tolerances
- FAA Website:

Approach Sector Centerline, FASAP and FASLTP
Right /Left Boundary Points and Alignment Points

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## Flight Inspection Procedures

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