

Garmin AT SBS Briefing

August 28, 2006

Garmin Briefing

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Garmin Overview - Global Presence



- Olathe, KS**
- Headquarters
 - R&D Center
 - Aviation Mfg.
 - Sales & Distribution for Americas
 - 1300 Associates



- New Century, KS**
- Aviation Flight Test & Certification Facility
 - New Century Airport
 - 10 Associates



- Romsey, U.K.**
- Sales & Distribution for Europe and Africa
 - 120 Associates



- Salem, OR**
- R&D Center
 - Aviation Mfg.
 - 175 Associates



- Taipei, Taiwan**
- Consumer Mfg.
 - Sales & Distribution for Pacific Rim
 - Software & Cartography Development
 - 1,400 Associates

- Tempe, AZ**
- Software Development
 - 12 Associates

- Cayman Islands**
- Administrative Offices



■ GARMIN Products Sold

Garmin Mission Statement

- “Garmin’s mission is to enrich the lives of its customers, suppliers, distributors, employees and stockholders by designing, manufacturing and selling navigation and communication products that provide superior quality, safety and operational features, lower cost of manufacturing and ownership, and sufficient profits to support desired company growth.”
- All ADS-B related activities at Garmin support the mission
- ADS-B market opportunities are consistent with Garmin’s mission in every way

Garmin Support of ADS-B

- Garmin has made a substantial investment in R&D of ADS-B products and applications over the last 10 years
- Garmin has certified and fielded reliable ADS-B products for:
 - ▶ Air Transport
 - ▶ General Aviation
- Garmin provides ongoing support of existing government and industry ADS-B programs
- Actively working on forward-fit and retrofit compatibility within Garmin product line

Garmin Alignment With ADS-B Mission

- Responses to domestic ADS-B RFI's and RFQ's
- Participated in early programs and leveraging technology developed during:
 - ▶ Ohio River Valley Tests, UPS 757/767 fleet equipped
 - ▶ Capstone Phase I and II, resulted in first certified UAT
 - ▶ Embry Riddle, North Dakota, MTSU, Daniel Webster
 - ▶ SafeGuard, Navy evaluation, NASA SATS
 - ▶ State initiatives in NC, OR and other States
 - ▶ Civil Aviation Flight University of China equipage
- RTCA participation on standards
- Continuing ADS-B product development efforts

ADS-B and TIS-B Traffic on MX20



Certified Air Transport Products

- AT9000 LDPU
(1090 link)
- AT2000 CDTI/MFD
- AT2901 Control Panel
- AT7000 Mode S Transponder
- GPS WAAS Engine



- **GDL 90 (Certified May, 2004)**
 - ▶ UAT data link radio, C154 and C145a approvals
 - ▶ AML STC on 100's Part 23 aircraft, AS-350 approved
 - ▶ Features
 - A1H Class of UAT
 - RX/TX of ADS-B traffic
 - RX FIS-B and TIS-B, TFR's
 - ▶ MSRP \$7,995 USD



- **GSL 71**
 - ▶ Standalone control head for GDL 90
 - ▶ 4096 entry and Flight ID
 - ▶ MSRP \$1,200



GDL 90 Compatibility - MFD

- MX20/ GMX 200 MFD
 - ▶ ADS-B traffic display
 - ▶ Graphical/Textual weather (UAT, XM)
 - ▶ World wide terrain alerts
 - ▶ VFR and IFR charts
 - ▶ Airways
 - ▶ Surface diagrams
 - ▶ Enhances situational awareness



GDL 90 Compatibility - G1000

- Forward-fit ADS-B solutions
- ADS-B traffic available Q1 07 (UAT wx pending)
- Upgrade path for existing G1000 users
- CAP and Flight Schools pushing for ADS-B capability
- Requires version 2.1s/w for GDL 90



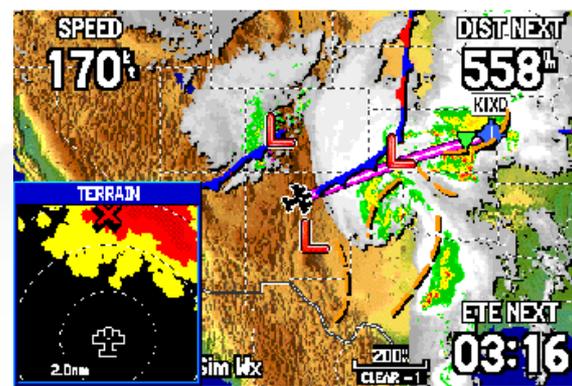
GDL 90 Compatibility - GNS 400/500

- Large install base of users
 - ▶ 70,000 in use
- Integrated avionics, graphical displays
- WAAS upgradeable Oct 06
- Traffic (TIS-B and ADS-B) initially, FIS-B pending
- Requires version 2.1s/w for GDL 90



GDL 90 Compatibility - Portables

- Interfaces to GDL 90 via panel plug for 396/496
- No control of UAT, displays UAT traffic only
- UAT weather interface pending Alaska Statewide JRC decision
- Compatible with version 2.1s/w for GDL 90



GDL 90 Compatibility - Transponders

- Provides transponder and UAT control
- GTX 327 Mode A/C and GTX 330 Mode S models
- Provides a single source for pilot squawk code entry
- Remote transponders also compatible for G1000 and GNS 480



- UAT and 1090 requirement (TSO) changes
- Position back-up source (eLoran, inertial, DME/DME)
- Equipment approvals for separation and ATC services
- Single device for entry of 4096 squawk codes
 - ▶ Existing GA transponders no serial comm ports
- Occasional TIS-B phantom targets and self alerts
- Equipment and installation cost impacts on early adoption
 - ▶ (ADS-B Tx/Rx, Diversity, WAAS, DME/DME, Controller, Display, system too expensive for GA)

- Advisory Circular is needed for install guidance
 - ▶ Single squawk code entry point
 - ▶ Interference checks (VHF harmonics)
 - ▶ Primary position source
 - ▶ Back up position source
 - ▶ UAT Class of Equipment and limitations

Next Steps – UAT Equipment Class

<u>Class</u>	<u>TX power</u>	<u>Antenna</u>	<u>Diversity</u>	<u>Notes</u>
A0	11 watts	1	None	<18,000
A1L	11 watts	2	Switched	<18,000
A1H	25 watts	2	Switched	(GDL 90)
A2	25 watts	2	Full	
A3	160 watts	2	Full	Narrow rcvr
B2	1 watt	1	None	Surface area only

- Garmin is committed to providing our customers with affordable and reliable ADS-B solutions
- We have experienced engineering resources with a good understanding of what it takes to build and certify reliable ADS-B products
- We have world class manufacturing capability with the capacity to fill the authorized channel with product
- We look forward to being a part of this important and exciting program



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