



ADS-B

(Automatic Dependent Surveillance-Broadcast)

Program Update and Mandate Compliance

Rotorcraft Options

Prince George's County

Aviation Section



OUTLINE

- The Basics
- Manufacturers
- Costs vs Gains
- What we did and why
- Speed bumps and Road blocks



BASICS

- **What Rotorcraft operations need ADS-B in the US?**
 - Any where you need a transponder now: A, B, C , Mode C ring, most E above 10,000 MSL
- **What minimum ADS-B equipment do Rotorcraft need?**
 - ADS-B 'out' 978UAT (Universal Access Transceiver) provides location to ground receivers and other aircraft equipped with ADS-B 'in' (CONUS only). 978UAT can also carry WX via FIS-B Flight Information Service Broadcast data.
 - 1090ES (Extended Squitter) is the world standard, so if you fly OCONUS, get a 1090ES system. For now you would need a separate WX receiver.
- **What will a basic compliance system cost?**
 - Regardless of the prices you see in advertisements, a certified basic system will cost you at least \$5000.00 once you add install kits and labor. (Assuming you have an existing WAAS GPS)



MANUFACTURERS

Non- all inclusive list with current Rotorcraft Certifications as of June 1 2018 *

ADS-B 'out'

Brand	Model # ADS-B out	Approved Position Source(s)	Aircraft
Aspen Av	ATX100	GNS430W/530W	Bell206
BendixKing	KT 74	GNS400W/500W, BendixKing KGX 150R	Part 27 Rotorcraft
FreeFlight	FDL-978	FreeFlight WAAS 1201 GNS430W/530W	Part 27 Rotorcraft
Garmin	GTX-330, GTX-33H GTX- 345&R, GDL-84H and 88H	GNS400/430W/ 500/530W,GTN625/635/650/725/750	Part 27 Rotorcraft
L3 Aviation	NGT-1000/2000/9000	Internal	Part 27 Rotorcraft
Rockwell	TDR-94/94D550-551	Universal UNS	S-92/S-76

*The Prince George's County Police, Aviation Section does not endorse any avionics brand.



MANUFACTURERS

Non- all inclusive list with current Rotorcraft Certifications as of June 1 2018 *

ADS-B 'in - out'

Brand	Model # ADS-B out	Approved Position Source(s)	Aircraft
Aspen Av	ATX100G	GNS430W/530W	Bell206
BendixKing	KGX-130/150	GNS400W/500W, BendixKing KGX 150R	Part 27 Rotorcraft
FreeFlight	FDL-978-XVR/RX	FreeFlight WAAS 1201 GNS430W/530W	Part 27 Rotorcraft
Garmin	GTX-330, GTX-33H GTX- 345&R, GDL-84H and 88H	GNS400/430W/ 500/530W,GTN625/635/650/725/750	Part 27 Rotorcraft
L3 Aviation	NGT-2000/2500/9000	Internal	Part 27 Rotorcraft

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GAINS vs COSTS

Costs are rounded and approximate only – vendor pricing, install kits, STCs, field approvals, and labor rates vary

Compliance only

- ADS-B 'out' with existing Position Source \$5000
- ADS-B 'out' without existing Position Source \$18,000

Compliance with traffic & WX displayed (FIS-B) Nexrad, METAR, TAF, Airmet ,etc

- ADS-B 'in & out' with existing Position Source \$8,000
- ADS-B 'in & out' without existing Position Source \$21,000

Compliance with traffic & WX, on PFD/ MFD charts, safe-taxi and other display benefits

- ADS-B 'in & out' with existing Position Source, add PFD/MFD \$38,000
- ADS-B 'in & out' without existing Position Source, add PFD/MFD \$51,000

Compliance with traffic & WX, on PFD/ MFD, and Synthetic Vision

Adds 3D depiction on PFD of terrain, traffic, airports, obstacles, wires, cardinal headings, and realistic pitch angles.
Most manufacturers include audible warnings in addition to visual warnings.

- ADS-B 'in & out' existing Position Source, PFD/MFD, Synthetic Vision \$45,000
- ADS-B 'in & out' existing Position Source, PFD/MFD, Synthetic Vision \$58,000



What we did and Why

Being a municipal government operation, our budget is fixed and limited. The only area of our budget that we can affect is the portion related to Direct Operating Costs. We used the funds saved by the hours we projected would not be flown during any phase of the modification and upgrade plan. The plan was 3 phases. The first in 2014, the second in 2016 and the final in 2018 . Our equipment choice was based on certification and familiarity.

Original 1999 equipment

- Garmin 430 (non WAAS) and BendixKing K176 transponder.

Phase I – Upgrade Position Source to WAAS

\$12,500

- Garmin GTN 650H touchscreen navigation with remote transponder capability.
- Garmin GTX-33R remote transponder for to gain panel space.
- *Not included in cost was Garmin GTN 635H for redundancy but not required.*

Phase II – Add ADS-B 'in-out'

\$6,000

- Garmin GDL-88H with free FIS-B WX, Nexrad, METAR, TAF, Sigmet, Airmet

Phase III – Add PFD/MFD and Synthetic Vision

\$40,000

- Garmin G500H
- Synthetic Vision Card
- In addition we added Flight Stream 510 for Auto loading updates to all devices and flight plans from any of the App source planners i.e. ForeFlight, Garmin Pilot.



What we did and Why

Phase I – Update Position Source and remote transponder



Phase III– Add PFD/MFD Synthetic Vision

SPEED BUMPS and ROAD BLOCKS

- **Do your homework first!**
 - When you begin shopping, look for 'H' or Part 27 Rotorcraft approved Model numbers if certification is essential.
 - Talk to operators who operate the same or similar model of aircraft.
 - Contact the Avionics manufacturer. They know what aircraft their product can be used in. If it is not STC'ed, ask them if there have been any field approvals you can use as precedence. Try to find one approved through your installers FSDO.
 - Contact your vendor and installer. You will need specific install kits to meet the STC for most aircraft.
- **Plan your installation carefully.**
 - Antenna map your aircraft. Spend a day at your installers facility testing antenna placement and interference with other radios, avionics and systems. Moving antennas and the associated metal work and painting is expensive.



SPEED BUMPS and ROAD BLOCKS

- **Do not schedule your aircraft until everything is ready.**
 - Make sure all equipment, kits, preliminary drawings, paperwork and approvals are in hand or as complete as possible before you give up your aircraft.
 - Require an installation plan and weekly updates depending on the complexity of the installation and existing STCs .
- **Make sure everything in your aircraft works correctly before accepting. Check all your systems.**
 - Depending on the complexity of your installation, there is a chance something may not function correctly due to the installation process.
 - Acceptance includes proper airframe logbook entries, weight and balance, and STC or field approval paperwork which must be in the aircraft POH.
- **Receive training on your new avionics and displays.**
 - Online trainers for your devices are a minimum. Set up a class from the vendor or manufacturer. Make flight record entries for your pilots.
 - If you incorporate new PFD/MFD systems, there is the potential for lots of head down flying as you learn and enjoy your new systems.

