

Approved Model List (AML) For

**Automatic Dependent Surveillance – Broadcast (ADS-B) Out & In System using the
Garmin GTX 335R and GTX 345R Transponders and a Qualified Position Source**

STC No. ST00835DE

FAA Approved: /s/ Todd Dixon

Todd Dixon, Manager
Denver ACO Branch

Revision D: April 17, 2019

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1. Revision Log

Revision	Pages	Description	FAA Approval	Date
IR	Cover, Page ii, Pages 1-10	Initial Release	<u>/s/ Gregory Johnson</u> Program Manager, Denver Aircraft Certification Office Federal Aviation Administration Transport Airplane Directorate Date: <u>10-31-16</u>	Original Issue Oct 31, 2016
A	7, 8	Corrected E-SE-16-0002 date for Rev D from October 28, 2016 to October 27, 2016	<u>/s/ Gregory Johnson</u> Program Manager, Denver Aircraft Certification Office Federal Aviation Administration Transport Airplane Directorate Date: <u>11-16-16</u>	November 16, 2016
B	Page ii, Pages 1-10	Updated footer with current revision level.	<u>/s/ R. Caldwell For Gregory Johnson</u> Program Manager, Denver Aircraft Certification Office Federal Aviation Administration Transport Airplane Directorate Date: <u>11-18-16</u>	November 18, 2016
C	Page ii, Pages 2, 7-9	Added limitations 13 and 14. Added models: Falcon 10, IAI Westwind, Astra and Sabreliner. Added HS.125 Series 600, Lear 55B, 55C.	<u>/s/ Todd Dixon</u> Manager, Denver ACO Branch Compliance and Airworthiness Federal Aviation Administration Date: <u>10-6-17</u>	October 6, 2017

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D	Page 9	Corrected typographical error on line 9, was “NA-656-80” is “NA-265-80”.	<p data-bbox="703 289 898 323"><u>/s/ Todd Dixon</u></p> <p data-bbox="703 359 1222 464">Manager, Denver ACO Branch Compliance and Airworthiness Division Federal Aviation Administration</p> <p data-bbox="703 499 881 533">Date: 4/18/19</p>	April 17, 2019
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2. Introduction

This document is the Federal Aviation Administration (FAA) Approved Model List (AML) for Supplemental Type Certificate (STC) Number ST00835DE, for installing Automatic Dependent Surveillance – Broadcast (ADS-B) Out System (with optional ADS-B In functionality) using the Garmin GTX 335R and GTX 345R Transponders plus a qualified Global Position System (GPS) with Wide Area Augmentation System (WAAS) into eligible Part 25 aircraft. Qualified ADS-B equipage is listed in Section 4, and approved models are listed in Section 5.

This AML is only applicable to the 14 CFR Part 25 aircraft, listed in Section 5. Installations in 14 CFR Part 23, Part 27, and Part 29 and unlisted Part 25 aircraft are not authorized under this AML.

Revisions to this AML must be coordinated between the STC holder and the responsible Aircraft Certification Office (ACO), and require FAA approval.

2.1. Prerequisites

This AML assumes the following equipment is installed on the candidate aircraft via another FAA approval, and is properly linked to satisfy the intended function for the system.

1. Transponder system, including
 - i. Standalone transponder, and,
 - ii. Technical Standard Order (TSO) Approved transponder antenna which meets the requirements of TSO-C66, TSO-C112, TSO-C74.
2. A digital altitude encoder that outputs either Gillham code (ARINC 429) or serial altitude data (RS-232).

2.2. Specific Limitations

The following limitations apply to this AML STC:

1. Installation of the following required equipment is outside the scope of this AML STC. This AML STC does **NOT** include installation approval of the following required equipment:
 - i. an altitude encoder,
 - ii. an air data computer,
 - iii. new or replacement transponder antenna,
 - iv. new or replacement GPS antenna,
 - v. new or replacement Universal Access Transceiver (UAT) antenna,
 - vi. a weight on wheels (WOW) system.

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2. Installation of the following position sensors is outside the scope of the AML STC. This AML STC does **NOT** include installation of the following position sensors.
 - i. Garmin GNS 400W/500W Series GPS/WAAS receiver,
 - ii. Garmin GTN 650 Series GPS/WAAS receiver, nor,
 - iii. Garmin GTN 750 Series GPS/WAAS receiver.
3. If any of the positions sensors listed above is utilized to provide position data to the ADS-B Out System, then the GPS/WAAS receiver and associated GPS antenna must be installed in the aircraft via another FAA approval.
4. This AML STC does **NOT** allow or provide instructions for installation on aircraft equipped with Traffic Collision Avoidance System (TCAS) II.
5. This AML STC does **NOT** allow or provide instructions for interfacing with aircraft displays or alerting systems, including traffic advisory systems or TCAS I. If ADS-B data is displayed on a Portable Electronic Device (PED) via the Garmin Flight Stream 110, the ADS-B In data is for situational awareness only.
6. This AML STC does **NOT** allow or provide instructions for an interfacing the Flight Stream 110 with any position sensor listed above.
7. This AML STC does **NOT** include installation approval of software updates to the position sensors identified in Specific Limitation #2.
8. This AML STC does **NOT** include the implementation of any 978 MHz UAT ADS-B Out transmit functionality.
9. This AML STC does **NOT** allow or provide instructions for penetrating the pressure vessel.
10. The installation of the replacement GTX 335R and GTX 345R transponder systems does **NOT** affect the airworthiness of the Reduced Vertical Separation Minimums (RVSM) system. The installer should review the RVSM equipment list and determine if the transponder is listed by model number.

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11. This STC provides optional ADS-B In functionality of Traffic Information Services – Broadcast (TIS-B) and Flight Information Service - Broadcast (FIS-B). Approval of the TIS-B functionality is limited to basic airborne (AIRB) and Enhanced Visual Acquisition (EVAcq) only. Approval of the FIS-B functionality does **NOT** include the following:
 - i. Aviation Selected Special Weather Reports (SPECI),
 - ii. Convective Significant Meteorological Information (SIGMETS), and,
 - iii. Flight Data Center (FDC) Notices to Airmen (NOTAM)
12. This AML STC does NOT allow ADS-B In functionality to be activated without operating ADS-B Out functionality.
13. This AML STC does NOT allow or provide instructions for Enhanced Surveillance Mode functionality.
14. Use of transponder formats other than those identified within the STC Master Drawing List is not allowed.

3. Certification Basis

The certification basis for each qualified model is specified in the type certificate data sheet (TCDS) and modified by the amendment levels noted in the appendix identified in the approved model list of Section 5 below.

4. Approved ADS-B Equipage

4.1. ADS-B Out

This AML STC approves the installation of Garmin GTX 345R part number (p/n) 011-03303-00 and 011-03303-40, in the Transponder #1 position and the Garmin GTX 335R, p/n 011-03301-00 and 011-03301-40, in the Transponder #2 position, using their respective internal GPS, or external GPS via direct connection, to provide ADS-B Out functionality, when arranged as one of the six (6) configurations in Table 1 below.

Each ADS-B Out System below must interface directly with an air data computer or other source of digital barometric altitude that outputs either Gillham code (ARINC 429) or serial date (RS-232).

Each transponder in this installation must interface directly with the Gables Transponder Control Panel, listed below per the approved installation instructions.

- G7534-1005/-1006 or G7534-05/-06 running system software version 164I or later
- G7614-505/-506 running system software version 0375A or later

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Table 1 Approved Transponder/GPS Pair.

Configuration Number	Transponder (Position, Model, and Part Number)	Position Source	GPS Antenna Interface
1	Transponder Position #1 GTX 345R (011-03303-40)	Internal	Dedicated antenna
	Transponder Position #2 GTX 335R (011-03301-40)	Internal	Dedicated antenna
2	Transponder Position #1 GTX 345R (011-03303-40)	Internal	GPS Splitter (See Note 1)
	Transponder Position #2 GTX 335R (011-03301-40)	Internal	GPS Splitter (See Note 1)
3	Transponder Position #1 GTX 345R (011-03303-40)	Internal	Dedicated antenna
	Transponder Position #2 GTX 335R (011-03301-00)	External (See Note 2)	Dedicated antenna
4	Transponder Position #1 GTX 345R (011-03303-40)	Internal	GPS Splitter (See Note 1)
	Transponder Position #2 GTX 335R (011-03301-00)	External (See Note 2)	GPS Splitter (See Note 1)
5	Transponder Position #1 GTX 345R (011-03303-00)	External (See Note 2)	Dedicated antenna
	Transponder Position #2 GTX 335R (011-03301-00)	External (See Note 2)	Dedicated antenna
6	Transponder Position #1 GTX 345R (011-03303-00)	External (See Note 2)	GPS Splitter (See Note 1)
	Transponder Position #2 GTX 335R (011-03301-00)	External (See Note 2)	GPS Splitter (See Note 1)

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Table 2 Qualified Garmin GNS Series GPS/WAAS Position Sources (See Note 3)

Model Number	Part Number	Description
GPS 400W	011-01057-()	GPS/WAAS
GNC 420W	011-01058-()	GPS/WAAS & VHF COM (10W)
GNC 420AW	011-01059-()	GPS/WAAS & VHF COM (16W)
GNS 430W	011-01060-()	GPS/WAAS, VHF COM (10W) & VHF NAV (VOR/LOC/GS)
GNS 430AW	011-01061-()	GPS/WAAS, VHF COM(16W) & VHF NAV (VOR/LOC/GS)
GPS 500W	011-01062-()	GPS/WAAS
GPS 500W TAWS	011-01063-()	GPS/WAAS with Terrain Awareness & Warning System
GNS 530W	011-01064-()	GPS/WAAS, VHF COM (10W) & VHF NAV (VOR/LOC/GS)
GNS 530W TAWS	011-01065-()	GPS/WAAS, VHF COM (10W) & VHF NAV (VOR/LOC/GS) with Terrain Awareness & Warning System
GNS 530AW	011-01066-()	GPS/WAAS, VHF COM (16W) & VHF NAV (VOR/LOC/GS)
GNS 530AW TAWS	011-01067-()	GPS/WAAS, VHF COM (16W) & VHF NAV (VOR/LOC/GS) with Terrain Awareness & Warning System

Table 3 Qualified Garmin GTN Series GPS/WAAS Position Sources (See Note 4).

Model Number	Part Number	Description
GTN 625	011-02254-()	GPS/WAAS
GTN 635	011-02255-()	GPS/WAAS & VHF COM
GTN 650	011-02256-()	GPS/WAAS, VHF COM & VHF NAV (VOR/LOC/GS)
GTN 725	011-02281-()	GPS/WAAS
GTN 750	011-02282-()	GPS/WAAS, VHF COM & VHF NAV (VOR/LOC/GS)

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Table 4 Qualified Garmin GTX Series GPS/WAAS Position Sources (See Note 5)

Model Number	Part Number	Description
GTX 335R	011-03301-40	Transponder with internal GPS/WAAS
GTX 345R	011-03303-40	Transponder with internal GPS/WAAS

NOTE(S)

1. *The installed Garmin GTX Transponders may utilize either of the following GPS Splitters to share a single antenna:*
 - a. *GPS Source MS12-TF GPS Signal Splitter*
 - b. *GPS Source MS12-PMS1275/5-TF GPS Signal Splitter*
2. *Qualified external GPS/WAAS position sources for this AML STC are listed in Table 2 through Table 4 above.*
3. *The GNS Series GPS/WAAS position sources listed in **Table 2**, must be running Main software version 5.20 or later, and GPS software version 5.0 or later.*
4. *The GTN Series GPS/WAAS position sources listed in **Table 3**, must be running Main software version 5.10 or later, and GPS software version 5.0 or later.*
5. *The GTX Series equipment listed in **Table 4**, must be running Main System software version 2.02 or later, ADS-B System software version 2.01, and GPS software version 6.0 or later.*

4.2. ADS-B In

This AML STC approves the installation of Garmin Flight Stream 110 WiFi Module, p/n 011-03257-00, to interface directly with the Garmin GTX 345R used in an ADS-B Out configuration of Table 1, above, to make ADS-B In functionality available via wireless (WiFi) connectivity.

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5. Approved Model List

Item	Aircraft Make	Aircraft Model	TCDS	Certification Basis	Master Drawing List/Date	AFM Supplement Number/Date	Instructions for Continued Airworthiness	Notes	Initial Approval / Amendment Date
1.	Beechcraft Corporation	BH.125 Series 600A HS. 125 Series 600A HS. 125 Series 600B HS. 125 Series 600B/1 HS. 125 Series 600B/2 HS. 125 Series 600B/3 HS. 125 Series F600B HS.125 Series 700A HS.125 Series 700B BAe.125 Series 800A BAe.125 Series 800B Hawker 800, Hawker 800XP	A3EU	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev D, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 10/31/16, or later FAA approved revision.	(1) (2)	Initial Approval Oct 31, 2016 Amended Oct 6, 2017
2.	Beechcraft Corporation	MU-300-10, 400, 400A, 400T	A16SW	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev D, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 10/31/16, or later FAA approved revision.	(1) (2)	Initial Approval Oct 31, 2016
3.	Dassault Aviation	Fan Jet Falcon Fan Jet Falcon C, Fan Jet Falcon D, Fan Jet Falcon E, Fan Jet Falcon F, Fan Jet Falcon G, Mystere-Falcon 20, Mystere-Falcon 20-C5, Mystere-Falcon 20-D5, Mystere-Falcon 20-E5, Mystere-Falcon 20-F5, Mystere-Falcon 200	A7EU	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev D, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 10/31/16, or later FAA approved revision.	(1) (3)	Initial Approval Oct 31, 2016

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4.	Dassault Aviation	Falcon 10	A33EU	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev J, dated 10/4/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 8/30/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 8/29/17, or later FAA approved revision.	(1)	Initial Approval Oct 6, 2017
5.	Dassault Aviation	Mystere-Falcon 50, Mystere-Falcon 900	A46EU	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev D, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 10/31/16, or later FAA approved revision.	(1)	Initial Approval Oct 31, 2016
6.	IAI Westwind	1121, 1121A, 1121B, 1123, 1124, 1124A	A2SW	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev J, dated 10/4/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 8/30/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 8/29/17, or later FAA approved revision.	(1)	Initial Approval Oct 6, 2017
7.	Gulfstream	1125 Westwind Astra, Astra SPX	A16NM	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev J, dated 10/4/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 8/30/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 8/29/17, or later FAA approved revision.	(1) (6)	Initial Approval Oct 6, 2017
8.	Learjet	24, 24A, 24B, 24B-A, 24C, 24D, 24D-A, 24E, 24F, 24F-A, 25, 25A, 25B, 25C, 25D, 25F, 28, 29, 31, 31A, 35, 35A (C-21A), 36, 36A, 55, 55B, 55C	A10CE	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev D, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 10/31/16, or later FAA approved revision.	(1)	Initial Approval Oct 31, 2016 Amended Oct 6, 2017

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9.	Sabreliner Aviation	NA-265-40, NA-265-60, NA-265-65, N-265-70, NA-265-80	A2WE	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev J, dated 10/4/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 8/30/17, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 8/29/17, or later FAA approved revision.	(1) (7)	Initial Approval Oct 6, 2017
10.	Textron Aviation Inc.	500, 550, S550, 552, 560	A22CE	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev D, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 10/31/16, or later FAA approved revision.	(1) (4)	Initial Approval Oct 31, 2016
11.	Textron Aviation Inc.	650	A9NM	14 CFR 25 per TCDS as amended by Appendix A	Peregrine Doc. No. E-SE-16-0002, Rev D, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0009, Initial Release, dated 10/21/16, or later FAA approved revision.	Peregrine Doc. No. E-SE-16-0008, Initial Release, dated 10/31/16, or later FAA approved revision.	(1) (5)	Initial Approval Oct 31, 2016

NOTES:

- (1) Eligible serial numbers are those identified in the type certificate data sheet (TCDS) as eligible.
- (2) Type Certificate Holder Record: Raytheon Aircraft Company transferred to Hawker Beechcraft Corporation on March 26, 2007. Hawker Beechcraft Corporation transferred to Beechcraft Corporation on April 12, 2013.
- (3) Eligible serial numbers are those that meet the import requirements under Type Certificate No. A7EU.
- (4) Type Certificate Holder Record: Cessna Aircraft Company transferred to Textron Aviation Inc. on July 29, 2015.
- (5) Type Certificate Holder Record: Cessna Aircraft Company transferred to Textron Aviation Inc. on June 16, 2015.
- (6) Type Certificate Holder Record: Israel Aircraft Industries transferred ownership to Gulfstream Aerospace LP on March 26, 2002.
- (7) Type Certificate Holder Record: North America Rockwell Corporation transferred to Rockwell International Corporation on April 19, 1968. Rockwell International Corporation transferred to Sabreliner Corporation on June 30, 1983. Sabreliner Corporation transferred to Sabreliner Aviation LLC on April 29, 2014.

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Appendix A: All Models

Based on 14 CFR § 21.115 and 21.101, and the FAA policy for significant changes in FAA Order 8110.48, the certification basis is as follows:

- a. As determined by the Type Certificate Data Sheet (TCDS) of the aircraft for parts **not changed or not affected** by this STC.
- b. Regulations at the amendment levels listed in Table 1 below for parts **changed or affected** by the STC since the reference date of application, May 5, 2016.

Table 5: Certification Basis Including Amendments

Regulations	Amdt.
§ 25.301	25-23
§ 25.303	25-23
§ 25.305	25-86
§ 25.307	25-72
§ 25.337	25-23
§ 25.341	25-86
§ 25.473	25-23
§ 25.561 (c)	25-64
§ 25.601	25-0
§ 25.603	25-46
§ 25.605	25-46
§ 25.607	25-23
§ 25.609	25-0
§ 25.611	25-23
§ 25.613	25-72
§ 25.619	25-23
§ 25.625 (a)(b)(c)	25-72
§ 25.671 (a)	25-23
§ 25.771 (a)	25-4

Regulations	Amdt.
§ 25.773 (a)(2)	25-72
§ 25.777 (a)(b)	25-46
§ 25.853 (a)	25-83
§ 25.1301 (a)(b)(c)(d)	25-0
§ 25.1309 (a)(b)(d)(e)	25-41
§ 25.1316 (b)	25-134
§ 25.1317 (c)	25-122
§ 25.1321 (d)(e)	25-41
§ 25.1322 (d)	25-38
§ 25.1351 (a)	25-72
§ 25.1357 (a)(b)(c)(d)	25-0
§ 25.1359 (a)(b)(d)	25-32
§ 25.1431 (a)(b)(c)	25-0
§ 25.1529	25-54
§ 25.1555 (a)	25-0
§ 25.1581	25-72
§ 25.1583 (c)	25-72