

**THIS BULLETIN DOES NOT CHANGE AIRCRAFT TYPE DESIGN**

SUBJECT: Garmin G1000 upgrade required to support ADS-B for Mooney Aircraft Equipped with WAAS position source.

MODELS/ SN AFFECTED: Mooney Aircraft equipped with GARMIN G1000, and WAAS position source installed.

TIME OF COMPLIANCE: **BEFORE THE YEAR 2020**

INTRODUCTION: This Service Bulletin lets Mooney Aircraft owners know of new hardware/software, to meet the ADS-B "Out" requirement, for Garmin G1000 Aircraft.

ADS-B, or Automatic Dependent Surveillance-Broadcast, is the Next Generation air traffic modernization. The FAA has mandated that aircraft operating in airspace now requires a Mode C or S transponder and must be equipped with ADS-B "Out" by Jan 1, 2020. The basis of the ADS-B "Out" mandate is to support the FAA's Next Generation Air Transportation System (NextGen). The FAA has said the mandate will not greatly increase or decrease safety, but is necessary to move forward with NextGen for all aircraft that flies at or above 18,000 ft over the U.S., or anywhere internationally; you will be required to use the 1090 MHz frequency using a Mode S Extended Squitter (ES) transponder.

Garmin has recently developed the GTX 33X and GTX 3X5 all-in-one transponders which include "Extended Squitter" (ES) ADS-B "Out" with an option for built-in WAAS position source as well as dual-link ADS-B "In" to display on select G1000 integrated flight decks. The transponder features wireless connectivity to portable device using Garmin Pilot, ForeFlight or compatible Garmin portable.

Aircraft will require new software and/or new hardware installed to be completed by a Mooney Authorized Service Center or a GARMIN Authorized Service Center who can access and load the new software revision and hardware (if applicable) required to comply with this Service Bulletin.

-NOTE-

AIRCRAFT THAT DOES NOT HAVE WAAS WITH POSITION SOURCE INSTALLED, WILL BE REQUIRED TO COMPLY WITH SERVICE BULLETIN M20-305B OR LATER FAA APPROVED REVISION OPTION 2 UPGRADE. CALL YOUR NEAREST AUTHORIZED MOONEY SERVICE CENTER FOR DETAILS.

INSTRUCTIONS: **Read entire procedures before beginning work.**

ABOUT THE GTX 330 ES & GTX 33 ES Transponder: (Only for ADS-B out capability)

The FAA has certified Garmin's new GTX 330 ES and GTX 33 ES transponders. These new transponders are qualified as ADS-B NextGen compliant (with an accompanying WAAS position source). Existing GTX ES transponders need to have their software updated before they are ADS-B compliant. You can get this upgrade right from your authorized Garmin dealer. Upgrades from a non-ES transponder to an ES transponder will require your dealer to ship the unit back to Garmin for the upgrade.

ABOUT THE GTX 33X:

The **GTX 33X** performs the following functions: (see Figure SB M20-321-1)

- Transmission of ADS-B "Out" data on 1090 extended squitter (1090ES) (1090 MHz)
 - Integration of data from internal and external sources to transmit the following data per 14 CFR 91.227:
 - GPS Position, Altitude, and Position Integrity
 - Ground Track and/or Heading, Ground Speed, and Velocity Integrity
 - Air Ground Status



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- Flight ID, Call Sign, ICAO Registration Number
- Capability and Status Information
- Transponder Squawk Code, IDENT, and Emergency Status
- Pressure Altitude Broadcast Inhibit
- Reception of TIS-A traffic data from a ground station
- Provide TIS-A traffic alerting to the pilot via interfaced display and audio output

ABOUT THE GTX 3X5:

The **GTX 3X5** performs the following functions: (see Figure SI M20-321-2 and M20-321-3)

- Transmission of ADS-B "Out" data on 1090 extended squitter (1090ES) (1090 MHz)
 - Integration of data from internal and external sources to transmit the following data per 14 CFR 91.227:
 - GPS Position, Altitude, and Position Integrity
 - Ground Track and/or Heading, Ground Speed, and Velocity Integrity
 - Air Ground Status
 - Flight ID, Call Sign, ICAO Registration Number
 - Capability and Status Information
 - Transponder Squawk Code, IDENT, and Emergency Status
 - Pressure Altitude Broadcast Inhibit

The **GTX 335** performs the following additional functions:

- Reception of TIS-A traffic data from a ground station
- Provide TIS-A traffic alerting to the pilot via interfaced display and audio output.

The **GTX 345** performs the following additional functions:

- Reception of ADS-B "In" data on 1090 MHz
 - ADS-B (Data directly from another transmitting aircraft)
 - ADS-R (Rebroadcast of ADS-B data from a ground station)
- Reception of ADS-B "In" data on UAT (978 MHz)
 - ADS-B (Data directly from another transmitting aircraft)
 - ADS-R (Rebroadcast of ADS-B data from a ground station)
 - TIS-B (Broadcast of secondary surveillance radar) (SSR) derived traffic information from a ground station.
 - FIS-B (Broadcast of aviation data from a ground station)
- Provide ADS-B traffic information and alerting to the pilot via an interfaced display
 - Correlation and consolidation of traffic data from multiple traffic sources
 - Aural and visual traffic alerting
- Provide FIS-B data to the pilot via an interfaced display
 - Graphical and textual weather products
 - NEXRAD
 - PIREPs
 - AIRMET/SIGMETs
 - METARs
 - TAFs
 - Winds Aloft
 - Aviation Data
 - TFRs
 - NOTAMs

WARRANTY: N/A

REFERENCE: 1. Garmin FAA approved STC - Can be obtained from Garmin Dealer.

DATA:

PARTS LIST: Mooney International Corporation, Parts Kit: Refer to your local Garmin Dealer



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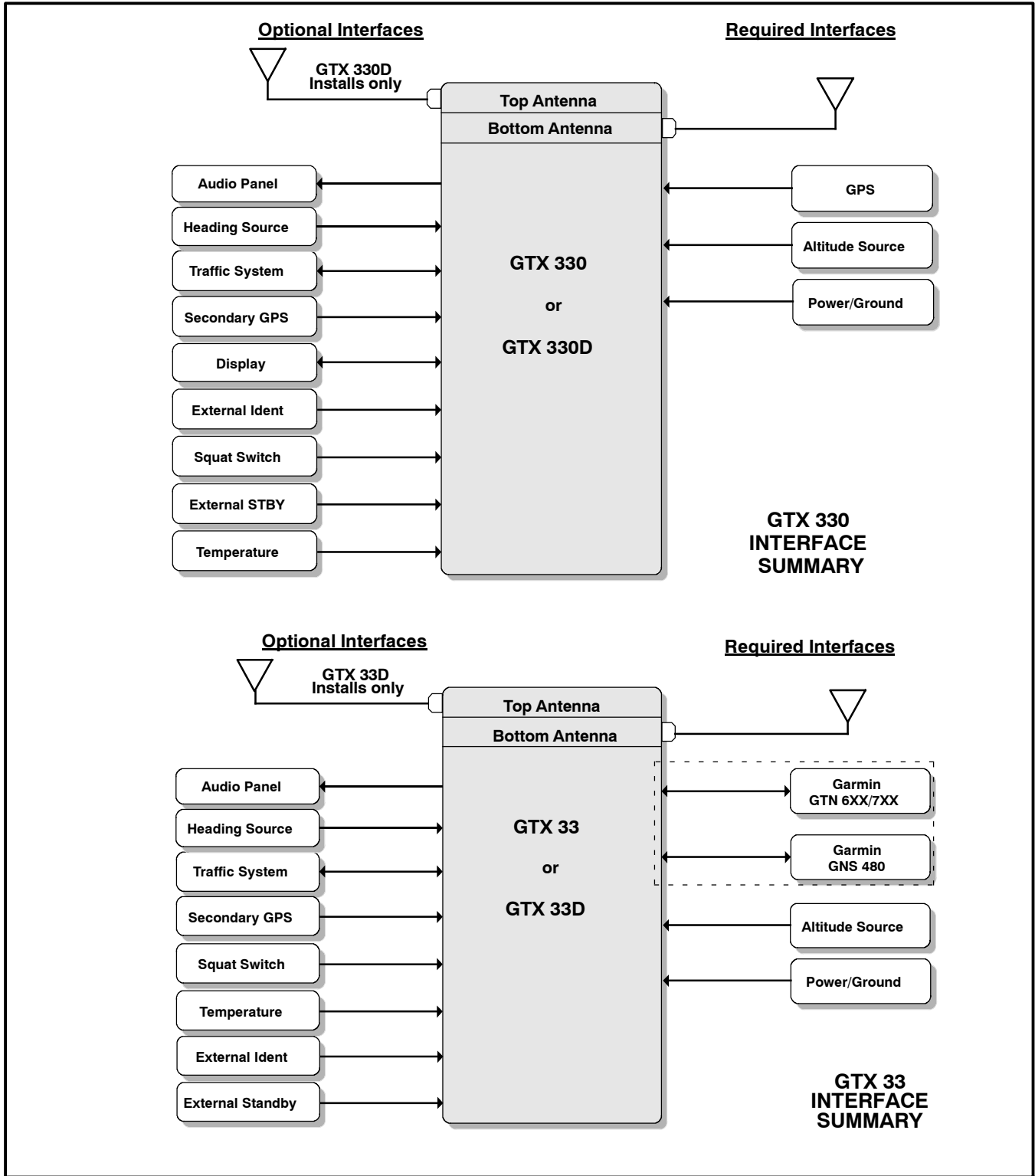


Figure SB M20-321-1 - GTX 330 and GTX 33 INTERFACE SUMMARY



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Function	GTX 335	GTX 335 w GPS	GTX 335R	GTX 335R w GPS	GTX 345	GTX 345 w GPS	GTX 345R	GTX 345R w GPS
Panel mount	X	X			X	X		
Remote mount			X	X			X	X
Mode S	X	X	X	X	X	X	X	X
ADS-B (out)	X	X	X	X	X	X	X	X
ADS-B Traffic					X	X	X	X
FIS-B					X	X	X	X
Internal GPS		X		X		X		X
Bluetooth					X	X	X	X
Optional Garmin Altitude Encoder	X	X	X	X	X	X	X	X

Figure SB M20-321-2 - GTX 3X5 UNIT CONFIGURATION

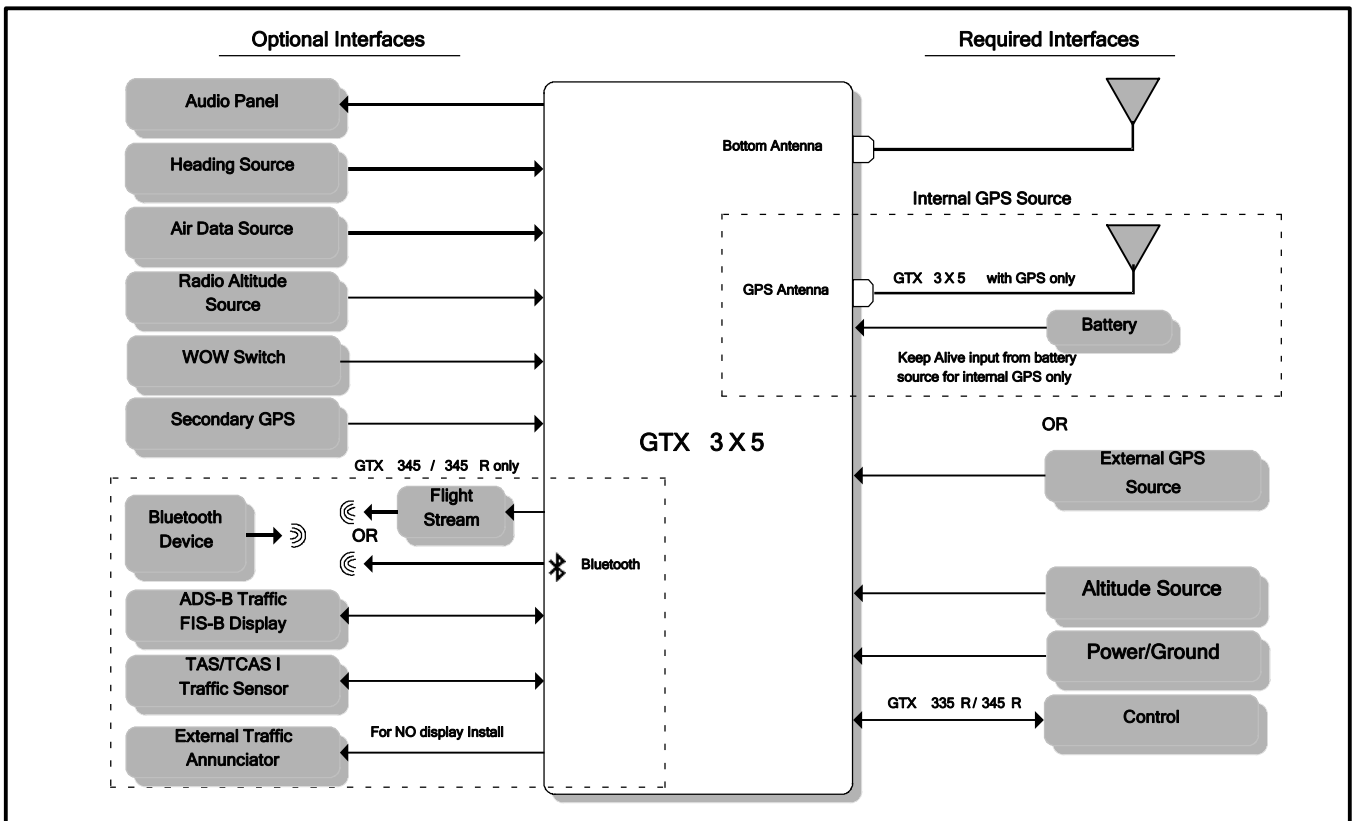


Figure SB M20-321-3 - GTX 3X5 INTERFACE SUMMARY



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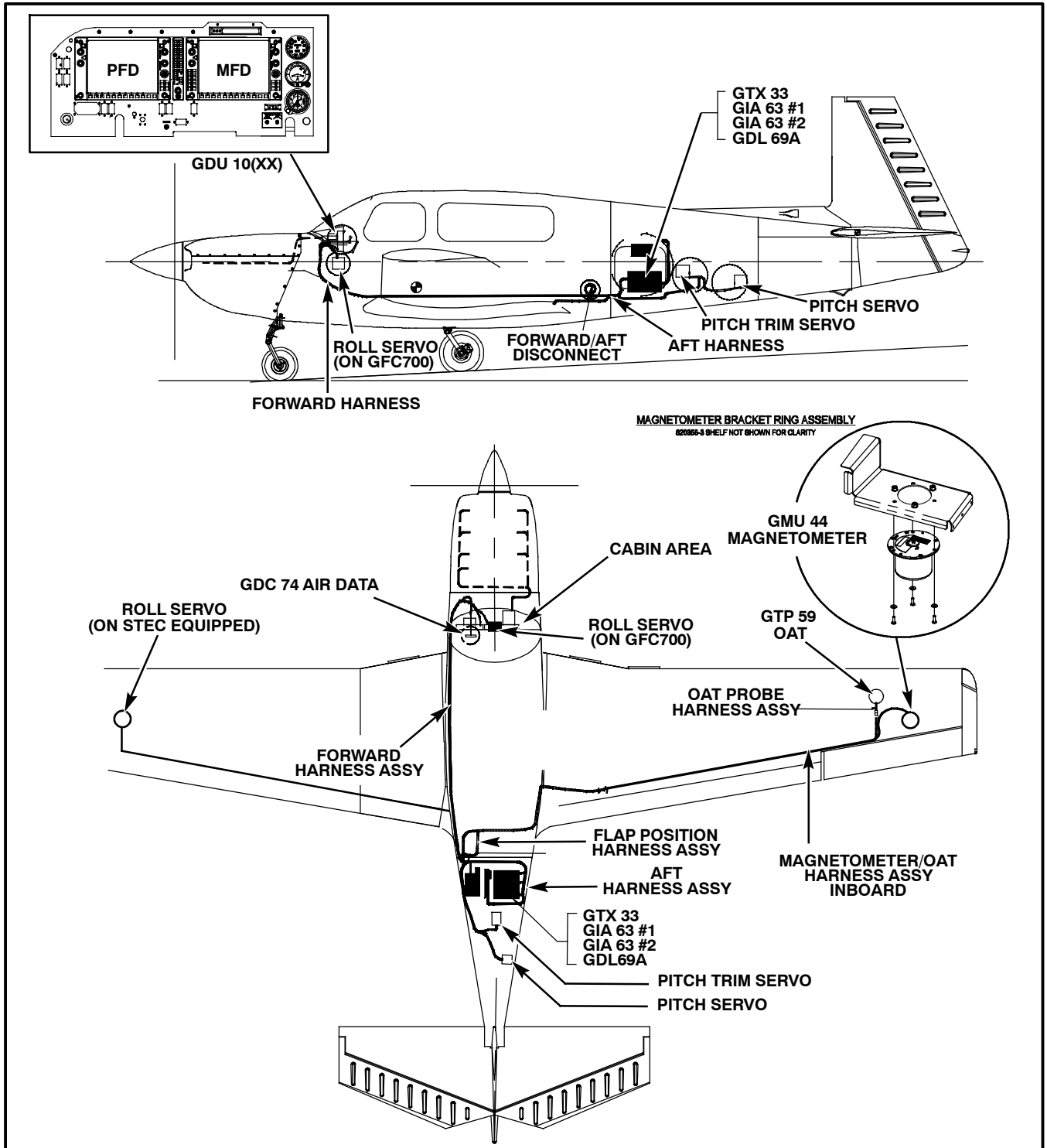


Figure SB M20-321-4 - G1000 COMPONENTS



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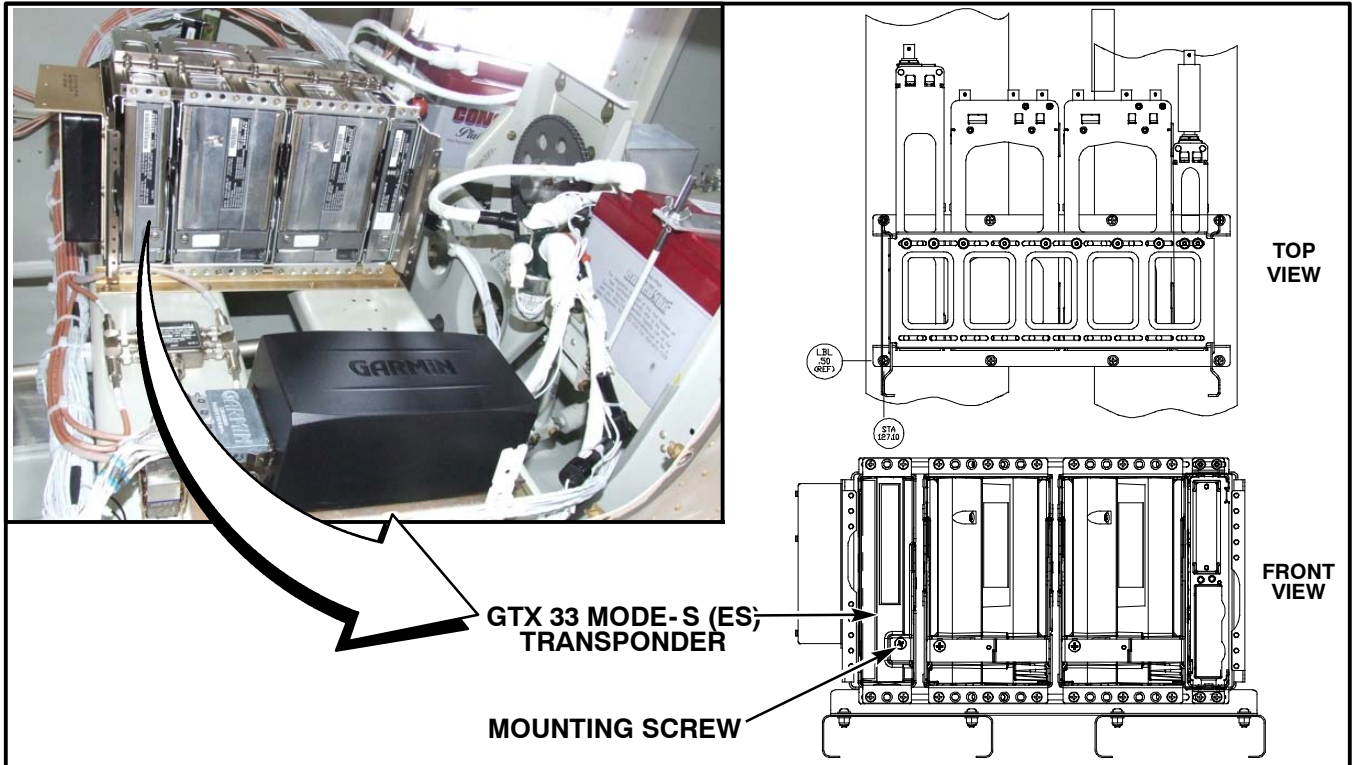


FIGURE SB-321-5 - GTX 33 MODE-S TRANSPONDER



FIGURE SB-321-6 - GTX 3X5 ALL-IN-ONE TRANSPONDER



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FIGURE SB-321-7 - ADS-B "OUT" and "IN" DISPLAYED ON G1000



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MOONEY INTERNATIONAL CORPORATION
KERRVILLE, TEXAS 78028 - FAX 830-257-4635

SERVICE (BULLETIN) (INSTRUCTION) NO. _____ HAS BEEN COMPLIED
WITH ON AIRCRAFT MODEL _____ SERIAL NUMBER _____

Tach. Time: _____ N-Number _____ (Reg. No.)
Owner: _____ Date of Compliance: _____
_____ Complied By: _____

Inspection Report: _____

Form 07-0001

PLACE
STAMP
HERE

MOONEY INTERNATIONAL CORPORATION
ATT'N: TECHNICAL SUPPORT
165 Al Mooney Road, North
Kerrville, Texas 78028

SEND TO: Mooney International Corporation
165 Al Mooney Road North
Kerrville, TX 78028
FAX: (830) 257-4635 or EMAIL support@mooney.com