

TEMPORARY REVISION NO. 32
To: EA500 POH and
FAA-Approved Airplane Flight Manual

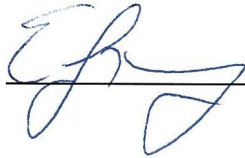
ADS-B OUT

This Temporary Revision affects the AFM Part Number 06-122204, Revision 04, dated July 23, 2012. Remove this TR when Revision 05 is inserted. Record this TR insertion (or removal) on the Log of Temporary Revisions.

Insert this page behind LOTR-1.

06-122204-TR32

Signature: _____



Date: _____

6/25/18

Manager, Southwest Flight Test Section, AIR-713
Federal Aviation Administration
Ft. Worth, TX

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Insert facing page 2-21

**Automatic Dependent Surveillance Broadcast (ADS-B)
System (if installed)**

The installed ADS-B OUT system has been shown to meet the equipment requirements of 14 CFR §91.227.

Smoke or Fumes		(Cont'd)
<i>If Smoke Appears to Be Electrical:</i>		
1. BUS TIE Switch.....AHRS 2		
<div style="border: 1px dashed black; padding: 5px; width: fit-content; margin: 0 auto;">CAUTION</div>		
Ensure that the left PFD is displaying attitude and air data prior to executing the following steps for right bus isolation.		
2. BUS TIE Switch..... OPEN		
3. R GEN Switch..... OFF		
4. START BATT Switch..... OFF		
Functions INOPERATIVE with START BATT Switch OFF. (Display may not indicate actual system state, & "---" indicate other inop systems.)		
<ul style="list-style-type: none"> • R PFD • MFD • L SDU • Pitch Trim will not have full authority and pitch asymmetry may occur when pitch is trimmed. • Rudder Trim • Flaps • Stick Pusher • Autopilot • Yaw Damper • COM 2 • NAV 2 • GPS 2 	<ul style="list-style-type: none"> • Transponder 2 • ADS-B • Crew Intercom • R Keyboard (if installed) • R Eng Ignition • R Eng Fuel Shutoff Valve cannot be shut off • R Eng Fire Extinguisher • R Electric Fuel Pump • R AIR SOURCE failed ON • Cockpit/Cabin temperature control (degraded) • R Eng Anti-Ice failed ON • Defog • Cabin Power Outlets • R Windshield Heat 	
<i>If Smoke clears:</i>		
--- END ---		
<i>If Smoke does not clear:</i>		
1. START BATT Switch..... ON		
2. R GEN Switch.....AUTO		
<div style="border: 1px dashed black; padding: 5px; width: fit-content; margin: 0 auto;">CAUTION</div>		
Ensure that the MFD is displaying attitude and air data prior to executing the following steps for left bus isolation.		

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Insert facing page 3-37

ADS-B FAIL



Loss of the ADS-B OUT position source data. ADS-B OUT function is unavailable

1. Advise ATC of loss of ADS-B functionality.

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Insert facing page 3-65

BATTERY POWER ONLY						Cont'd
	Final Approach Speed - KEAS					NGEM-03-1A
Flap Position	ICE PROT - OFF or ENG		ICE PROT - ENG/WING			*ADD (%) to Landing Distance
	6000 lb	5500 lb	5000 lb	4500 lb	4000 lb	
T/O	107 (134)	103 (128)	98 (122)	93 (116)	87 (109)	+30% (+30%)
LDG	98 (123)	93 (117)	89 (112)	85 (106)	80 (100)	-- --

*Use landing distance from the appropriate ICE PROT selection table
Speeds may exceed Maximum Tire Speed but may be used in emergencies

5. V_{REF} (OPS Page) Enter Final Approach Speed
6. Approach Setup and Brief..... Complete
7. Airspeed in Coordinated Straight Flight 195 to 200 KEAS
8. EMERGENCY GEAR RELEASE Handle PULL
(Pull in one continuous motion until latched)
9. GEAR Indication Verify Three Green
(Do not retract gear after successful extension)

NOTES

- If gear fails to fully extend, decrease airspeed to 180 KEAS (VO) and apply G force in attempt to extend gear.
- LANDING GEAR FAIL CAS message will be displayed; no action required.

10. EMERGENCY GEAR RELEASE Handle PUSH Fully In
11. GEAR Handle DOWN
12. FLAPS LDG
13. Airspeed..... V_{REF}

Functions INOPERATIVE when on battery power only: (Display may not indicate actual system state, & "---" indicate other inop systems.)

<ul style="list-style-type: none"> • R PFD • ADC 3 • Stick Pusher • Landing Gear • Yaw Damper • COM 2 • NAV 2 • GPS 2 • Transponder 2 • ADS-B • Autopilot 	<ul style="list-style-type: none"> • Autothrottle (if installed) • Sys Battery Heater • Start Battery Heater • Air Cond System • Windshield Heat • R Landing Light • Taxi Lights • Strobe Lights • Position Lights • Beacon Light • Weather Radar
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COMMUNICATION, NAVIGATION, AND SURVEILLANCE (CNS)

General

The Communication, Navigation and Surveillance (CNS) system consists of several receiver and/or transmitter units with their associated antennas and wiring. Some units are part of the basic aircraft while others are options.

The baseline system consists of the following units:

- Audio Mixer
- 2 x VHF Communication Radios
- 2 x VHF Navigation Radios
- Marker Beacon
- 2 x Mode S Transponders
- Weather Radar (*Optional*)

The optional systems available for installation are:

- Diversity Transponder
- Distance Measuring Equipment
- Automatic Direction Finder
- Terrain Awareness and Alerting System
- Traffic Advisory System
- ADS-B OUT

Display and control of the CNS equipment is primarily through the PFDs and MFD. Some systems have alternate means of control through the keyboard.

Audio Mixer System

Each pilot armrest has connectors for a headset, a hand-held microphone and the oxygen mask microphone. These connectors and the audio sources are connected to an audio mixer. The headset microphone and hand-held microphone should not be plugged in simultaneously. The performance of the audio system will be degraded if both are plugged in. Use the COM MIC MASK HEADSET switch in the left or right switch panel to select the headset/hand-held microphone and the Oxygen mask microphone.

Speakers are mounted in the ceiling by each pilot.

Controls and Indications

The MFD AUDIO page is the primary indication of what audio sources are selected for monitoring at each pilot station and for control of relative volume and other related settings. The AUDIO page is selected with a single press of the AUDIO primary function key on the MFD or the AUDIO button on the keyboard (if installed).

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Transponders

Two transponders are installed in the aircraft. Each is capable of operating in modes A, C, S, and ADS-B, if installed. An optional GTX 33D diversity transponder is available to satisfy the data requirements of ICAO Doc 7030/4 Regional Supplementary Procedures for SSR Mode S Enhanced Surveillance in designated European Airspace. The capability to transmit data parameters is shown in [Figure 7-45](#).

Figure 7-45 Transponder Capability

Parameter	Available / Not Available
Magnetic Heading	Available
Indicated Airspeed	Available
Mach No	Available
Vertical Rate	Available
Roll Angle	Available
Track Angle Rate / True Airspeed	Available
True Track Angle	Available
Groundspeed	Available
Selected Altitude	Available
Barometric Pressure Setting	Available

ADS-B

The transponders may be configured for ADS-B OUT functionality. If configured, the ADS-B OUT function meets the equipment requirements of 14 CFR 91.227. The list of transmitted parameters is shown in [Figure 7-46](#).

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Figure 7-46 ADS-B Capability

Parameter
The length and width of the aircraft.
An indication of the aircraft's latitude and longitude.
An indication of the aircraft's barometric pressure altitude.
An indication of the aircraft's velocity.
An indication if TCAS II or ACAS is installed and operating in a mode that can generate resolution advisory alerts.
If an operable TCAS II or ACAS is installed, an indication if a resolution advisory is in effect.
An indication of the Mode A transponder code specified by ATC.
An indication of the aircraft's call sign that is submitted on the flight plan, or the aircraft's registration number.
An indication if the flight crew has identified an emergency, radio communication failure, or unlawful interference.
An indication of the aircraft's "IDENT" to ATC.
An indication of the aircraft assigned ICAO 24-bit address.
An indication of the aircraft's emitter category.
An indication of whether an ADS-B In capability is installed.
An indication of the aircraft's geometric altitude.
An indication of the Navigation Accuracy Category for Position (NAC _P).
An indication of the Navigation Accuracy Category for Velocity (NAC _V).
An indication of the Navigation Integrity Category (NIC).
An indication of the System Design Assurance (SDA).
An indication of the Source Integrity Level (SIL).
GPS Antenna Longitudinal Offset.
Vertical Rate.
Selected Altitude.
Barometric Pressure Setting.
1090 ES Version Number.
Heading/Ground Track.
Movement (based on surface ground speed).

Transponder Mode

The transponder operating mode is selected using the MODE button on the PFD XPDR tab. Pushing the button cycles through the available modes:

- **STBY** – the transponder is powered but not transmitting. This is the default mode at power-up.
- **GND** – the transponder is active in mode S only. This mode can only be selected while on the ground.

In Garmin transponder model GTX 33(D)(ES), GND mode selection is not supported by the software version 8.xx and up. For aircraft with ADS-B Fail Indicator installed, this mode selection is no longer available.

Ground mode is replaced by ALT mode on the ground. ALT mode with weight-on-wheels will reply to Mode S selective interrogations.

- **ON** –the transponder will generate Mode A and Mode S replies, but Mode C altitude reporting is inhibited.
- **ALT** – the transponder is active in modes A, C and S, and if installed, ADS-B OUT.

The STBY, ON and ALT modes, also have dedicated keyboard buttons (if installed) for direct mode selection.

In addition to manual mode selection there are two cases where the mode is automatically changed. During take-off, the transponder mode automatically changes to ALT, and at touch-down it automatically changes to STBY.

For aircraft with NG 1.5 or later, if the transponder is not in ALT mode in flight, an XPDR NOT ALT MODE caution message will display.

VFR Mode

VFR mode is selected by pushing the VFR button on the PFD XPDR tab or by pushing the VFR button on the keyboard. This changes the active code to the VFR code. When the VFR mode is deselected, the previously active mode becomes active again. The VFR code is selected using the XPDR VFR CODE selection on the SETTINGS page. The available selections are; 1200, 1400 and 1700.

IDENT

The transponders IDENT function is activated by pushing the ID switch on either sidestick or by pushing the IDNT button on the keyboard. The transponder must be ON or in ALT for the IDENT to function. When IDENT is active an ID indication is displayed next to the active code in the full-time display to the right just below the AI.

Flight ID

The FLT ID code is transmitted as part of the Mode S transmission and ADS-B, if installed. The Flight ID is the aircraft registration number and can not be changed by the pilot.

Diversity Transponder (Optional)

As an option, the transponders can be replaced with diversity transponders which contain all the same features of the baseline transponder and adds antenna diversity for improved visibility to TCAS-equipped aircraft. An RF coaxial relay is also added to switch the aircraft's transponder antennas between the (#1) transponder and the (#2) transponder. The installation of a diversity transponder is indicated by a "D-" in front of the XPDR label on the PFD.

Antenna diversity provides improved visibility to TCAS-equipped aircraft operating above own aircraft, as well as to TCAS-equipped aircraft and/or ground-based radar below. When an interrogation signal is received from an external emitter at the two antennas (one each, located on the top and bottom of the aircraft), the transponder's diversity selection logic determines which antenna received the stronger signal. The diversity logic then selects the antenna to which the reply transmission is to be directed. Transponder operation is thereby optimized regardless of the aircraft's position in relation to other aircraft and ground stations.

Transponder Failures

If a transponder fails, an XPDRx FAIL advisory message is posted and the associated data on the PFD XPDR tab is replaced by white dashes. There is no automatic reversion to the remaining functional transponder.

If the ADS-B OUT function is installed, a transponder receives its ADS-B OUT position information from GPS 3 which is internal to Garmin GDL 88. GPS 3 is powered by ADS-B ECB and supplies the ADS-B OUT position information to both transponders.

The ADS-B OUT function failure indicator ADS-B FAIL is annunciated only when GPS 3 fails to output the required position data to the transponders. This failure results in the ADS-B function failure (ADS-B FAIL) and loss of the required GPS data for the Enhanced Surveillance (EHS). Other transponder functionality (such as Mode S) would still be available.

The XPDR x FAIL CAS messages manifest total loss of the onside transponder functionality.