TEMPORARY REVISION NO. 07
To: Eclipse SE™, Total Eclipse Plus™, Eclipse 500 Plus™ POH and FAA-Approved Airplane Flight Manual

ADS-B OUT

This Temporary Revision affects the AFM Part Number 06-123844, Revision 01, dated September 18, 2015. Remove this TR when Revision 02 is inserted. Record this TR insertion (or removal) on the Log of Temporary Revisions.

Insert this page behind LOTR-1.

06-123844-TR07

Signature: _____ Date: 8-16-17

DERT-833747-SW

FOR Steven L. Lardinois
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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)*

If Smoke Appears to Be Electrical:

CAUTION

Ensure that the left PFD is displaying attitude and air data prior to executing the following steps for right bus isolation.

1. BUS TIE Switch ..... OPEN
2. R GEN Switch..... OFF
3. START BATT Switch..... OFF

Functions **INOPERATIVE** with START BATT Switch OFF. (Display may not indicate actual system state, & "---" indicate other inop systems.)

- R PFD
- MFD
- L SDU
- R SDU (Degraded to DG Mode, if installed)
- 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
- Transponder 2
- ADS-B 2
- 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
- Autothrottle
- ABS

If Smoke clears:

--- END ---

If Smoke does not clear:

1. START BATT Switch..... ON
2. R GEN Switch.....AUTO

CAUTION

Ensure that the right PFD is displaying attitude and air data prior to executing the following steps for left bus isolation.

Smoke or Fumes *(Cont'd)*

3. L GEN Switch ..... OFF
4. SYS BATT Switch ..... OFF

Functions **INOPERATIVE** with SYS BATT Switch OFF. (Display may not indicate actual system state, & "---" indicate other inop systems.)

- L PFD
- R SDU
- Pitch Trim will not have full authority and pitch asymmetry may occur when pitch is trimmed.
- Aileron Trim
- Landing Gear
- Stick Pusher
- Autopilot
- Yaw Damper
- COM 1
- NAV 1
- GPS 1
- GPS 2
- Transponder 1
- ADS-B 1
- ADS-B 2
- ABS
- L Keyboard (if installed)
- L Eng Ignition
- L Eng Fuel Shutoff Valve failed ON
- L Eng Fire Det. & Ext
- L Electric Fuel Pump
- START & SYSTEM BATT Heaters
- L AIR SOURCE failed ON
- CABIN DUMP switch
- Cockpit/Cabin temperature control (degraded)
- L Eng Anti-Ice failed ON
- WING Deice
- Strobe Lights
- L Windshield Heat
- Autothrottle

If Smoke Clears:

-- END --

If Smoke Does Not Clear:

1. SYS BATT Switch ..... ON
2. L GEN Switch ..... AUTO
3. BUS TIE Switch ..... AUTO

If Bleed Air Was Not Initially Suspected:

1. Go to "If Smoke Appears to Be Bleed Air Related:" at the beginning of this procedure.

ADS-B 1(2) FAIL

ADS-B 1 FAIL
or
ADS-B 2 FAIL

Active transponder in the transmit mode fails to receive the position data (ADS-B function is unavailable).

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

NOTE

Switching to XPDR 2, to regain ADS-B functionality, results in RVSM requirements no longer met.

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XPDR 1(2) FAIL

XPDR 1 FAIL
or
XPDR 2 FAIL

Transponder 1 or 2 has failed.

ADS-B function of a failed transponder is unavailable.

1. Select opposite XPDR.

If XPDR 1 Fail:

1. LEFT PFD & CNS1 (CB - Left inst. Panel) ..... Reset If Tripped
2. XPDR 1/KYBD 1 (CB - Pilot Armrest) ..... Reset If Tripped

If XPDR 1 Remains Failed:

1. RVSM equipment requirements no longer met. Advise ATC.

If XPDR 2 Fail:

1. R PFD CNS2 ACP (ECB Page - AVIONICS)..... Reset If Tripped
2. XPDR 2 (CB - Copilot Armrest) ..... Reset If Tripped

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Insert facing page 3-71

BATTERY POWER ONLY *Cont'd*

NGEM-03-1-A

Flap Position	Final Approach Speed - KEAS ICE PROT - OFF or ENG (ICE PROT - ENG/WING) 6000 lb	5500 lb	5000 lb	4500 lb	4000 lb	*ADD (%) to Landing Distance
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.)

- R PFD
- ADC 3
- Stick Pusher
- Landing Gear
- Yaw Damper
- COM 2
- NAV 2
- GPS 2
- Transponder 2
- ADS-B 2
- Autopilot
- Autothrottle
- Sys Battery Heater
- Start Battery Heater
- Air Cond System
- Windshield Heat
- R Landing Light
- Taxi Lights
- Strobe Lights
- Position Lights
- Beacon Light
- Weather Radar
- ABS

BATTERY POWER ONLY *Cont'd*

AUTO LOAD SHED

THESE ARE THE AVAILABLE FUNCTIONS AFTER LOAD SHED:

- L PFD
- MFD*
- L SDU
- ADC 1 or 2
- AHRS 1 or 2
- Pitch Trim
- Aileron Trim
- Rudder Trim
- Flaps
- Landing Gear Emergency Extension
- Stall Warning
- COM 1
- NAV 1
- GPS 1
- Transponder 1
- ADS-B 1
- L & R Eng FADEC
- L & R Eng Fire Extinguisher
- ECB Control
- L & R Generator Control
- Oxygen
- AIR SOURCE
- Cabin Dump
- Pitot/AOA Heat
- Static Heat*
- Eng Anti-Ice
- Wing Deice
- L Landing Light
- Wing Inspection Light
- Master Dim
- Dome Light
- Map Lights
- Cabin Lights

***** Lost after manual load shed.

NOTE

After Emergency Gear Extension, inspect gear according to the *Aircraft Maintenance Manual* prior to the next flight.

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LIST OF FIGURES

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OPS Tab

The OPS page provides display and control interface with several operation items to:

- View Flight and Engine Times
- Enter Weight and Balance
- Set T/O TEMP and V Speeds
- Takeoff and Landing Performance
- Perform System Tests
- Enter USER FLIGHT ID

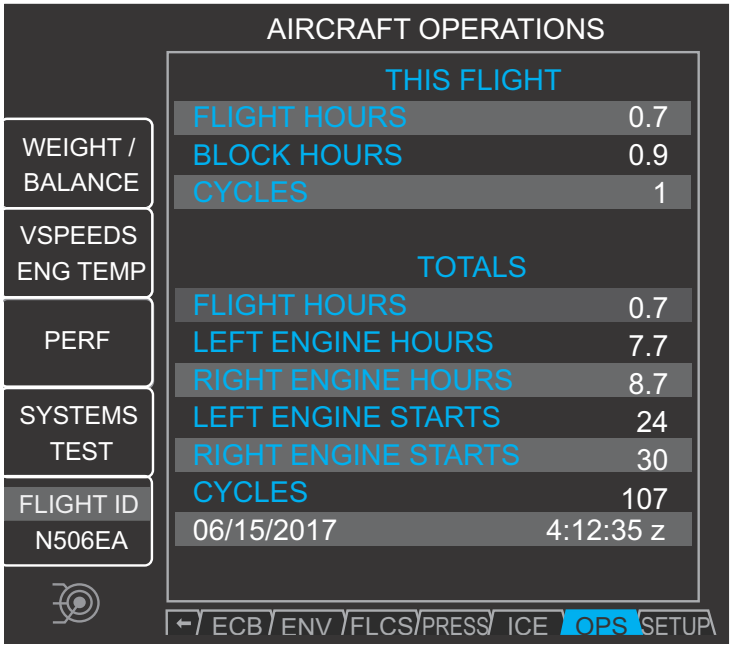

Figure 7-21. MFD, OPS Tab, Aircraft Operations

When the OPS page is selected, a detailed breakdown of aircraft operations information is displayed. From this default OPS page, the following sub-pages may be selected using the LSKs:

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d. PERF

Displays either Takeoff Performance or Landing Performance. Flight crew can toggle between Landing and Takeoff Performance using LSK2 "LANDING/TAKEOFF PERF"

e. SYSTEM TESTS

From the OPS page, select SYSTEM TESTS to display a list of available system tests. Select the system to be tested by rotating the outer concentric knob. The tests available depend on what options are installed. Optional system tests are described in the relevant system description section.

f. FLIGHT ID Displays the currently used Flight ID selection configured for use by the transponder system. The Aircraft Registration Number is the default value for this field at the aircraft's power-up. To change the FLIGHT ID value, select the FLIGHT ID LSK, push in the dual concentric knob until edit mode is displayed, use the outer knob to select character position, and inner knob to change alpha/numeric characters. The entered value will be stored as the USER FLIGHT ID value that is shown on the SETTINGS page. The FLIGHT ID value may be then toggled between the default (which is Aircraft Registration Number) and the USER FLIGHT ID value by pushing the dual concentric knob.

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SETTINGS

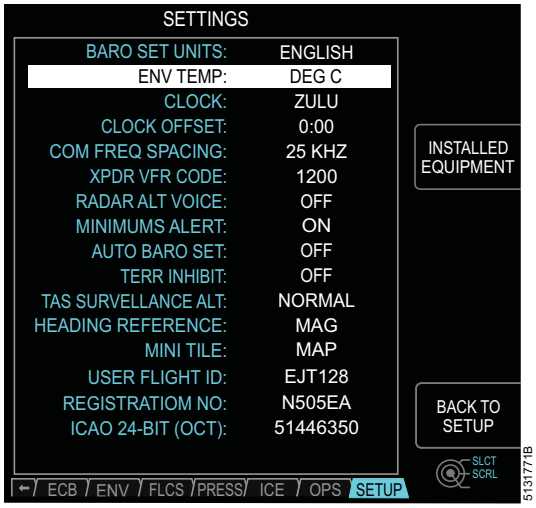

Figure 7-24. MFD, Setup Tab, Settings Page

From the SETUP tab, SETTINGS is used to select and configure pilot-selectable options. These settings persist through power cycles except where noted.

- BARO-SET UNITS: Toggles through available units. When METRIC is selected, the BARO-SET units change from ENGLISH, IN (inHg) to HPA (hPa).
- ENV TEMP: Toggles temperature units on the ENV synoptic page between DEG C and DEG F.
- CLOCK: Select between 12HR LOCAL, 24HR LOCAL and ZULU time for display on the PFDs.
- CLOCK OFFSET: Allows for setting an offset of ± 1-23 hours when local time is selected for display.
- COM FREQ SPACING: Select com radio frequency spacing between 25 kHz and 8.33 kHz.
- XPDR VFR CODE: Select the code that is transmitted when the transponder VFR mode is active. Available selections are 1200, 1400 and 1700.
- RADAR ALT VOICE: Not selectable.
- MINIMUMS ALERT: Select whether the aural "Approaching Minimums" and "Minimums" callouts are annunciated.
- AUTO BARO SET: Select whether baro-set is automatically selected to standard when climbing through FL180.

- TERR INHIBIT: (if optional TAWS system installed): Switches OFF all forward-looking terrain alerts to avoid nuisance warnings at airports that are not in the system database. This item defaults to OFF following a power cycle.
- TAS SURVEILLANCE ALT: (if optional TAS system installed): Selects the display of traffic to ABOVE, BELOW, NORMAL, or UNRESTRICTED modes. This item defaults to NORMAL following a power cycle.
- HEADING REFERENCE: Switches between true and magnetic heading references.
- MINI TILE: Toggles through FMS Active, FMS Progress, and moving map for display on the MFD mini tile.
- USER FLIGHT ID: Displays the last Flight ID value entered by the pilot in the FLIGHT ID field on the OPS tab. The USER FLIGHT ID value is retained across power cycles. This value becomes an alternate to the default FLIGHT ID value on the OPS page.
- REGISTRATION NO: Displays the aircraft registration number.
- ICAO 24-BIT (OCT): The International Civil Aviation Organization (ICAO) octal version of the registration number.

The SETTINGS page also provides the following LSK options:

- INSTALLED EQUIPMENT: Lists all optional equipment installed on the aircraft.
- BACK TO SETUP: Returns to the Main SETUP page.

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Composite Group Keys

Figure 7-27. Keyboard, Composite Group Keys

The Composite group keys allow switching the L or R PFD into or out of Composite Mode.

Transponder Group Keys

The Transponder Group Keys provide an alternative means to select active transponder and transponder operating mode. In combination with the numerical keypad, it also allows entry of XPDR codes.

Figure 7-29. Keyboard, Transponder Group Keys

COM/NAV Group Keys

Figure 7-28. Keyboard, COM/ NAV Group Keys

The COM/NAV group provides an alternate means of selecting the active and monitored COM radio, and setting or swapping COM and NAV frequencies.

The group also includes controls for Master Volume, Marker Beacon Audio and minimums.

Alpha-Numeric Keys

The alpha-numeric group is used to enter numbers and characters for navigation ID, COM/NAV frequencies, transponder code and minimums.

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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 (resides in the transponders)

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.

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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 7-47.

ADS-B

The transponders may be configured for ADS-B OUT functionality. If configured, the ADS-B OUT function that resides in the installed transponders meets the equipment requirements of 14 CFR 91.227. The list of transmitted parameters is shown is shown in Figure 7-48.

Figure 7-47 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

Figure 7-48 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.

NOTE

In Garmin transponder model GTX 33(D)(ES), GND mode selection is not supported by the software version 8.xx and up. For aircraft in the iFMS 2.7.8/2.8 and up configurations, this mode selection is no longer available.

- **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 liftoff, the transponder mode automatically changes to ALT, and at touch-down it automatically changes to STBY.

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

NOTE

For aircraft in the iFMS 2.7.8/2.8 and up configurations, the transponder will no longer automatically transition on touch-down.

If the transponder is not in ALT mode in flight, a 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 either the aircraft registration number or user selected flight ID. Refer to OPS page for Flight ID entry.

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.

The ADS-B OUT function failure (ADS-B x FAIL) is posted only when a transponder fails to receive the required position source data. In the installed system, a transponder receives its position information from the onside GPS only. An onside GPS failure results in the ADS-B function failure (ADS-B x FAIL), and other transponder functionality (such as Mode S) would still be available. XPDR x FAIL manifests total loss of the onside transponder functionality including the ADS-B system

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