

# ADS-B and TDR Mode S Transponder

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*Maintaining airspace compliance is important for aging fleets. Don't be caught off guard and looking for a solution when it comes time to fly.*

Be prepared to meet the new Mode S Surveillance and ADS-B Out functionality required for future operation throughout the world, including Canada, Europe, Australia, Indonesia, and the United States. As a part of the long-range plan to improve airspace capacity, safety and efficiency, regulatory authorities have mandated the carriage and operation of Mode S transponders with Elementary and Enhanced Surveillance functionality and will soon mandate the use of ADS-B Out DO-260B.

***For a limited time, Rockwell Collins is offering an Early Adopter Incentive for a DO-260B upgrade (See Note 5).***

## MODE S ELEMENTARY SURVEILLANCE IMPLEMENTATION

The Mode S Elementary Surveillance (ELS) feature includes an eight-character aircraft identification parameter corresponding to that used in voice communications with air traffic services. This aircraft identification parameter, or Flight ID, is entered by a control device such as a radio tuning unit (RTU), control display unit (CDU) or dedicated transponder control unit (CTL).

Mode S transponders are required to have Surveillance Identifier (SI) code capability and the automatic reporting of aircraft identification in accordance with ICAO Standards and Recommended Practices (SARPS).

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## MODE S ENHANCED SURVEILLANCE IMPLEMENTATION

Enhanced Surveillance (EHS) extends the Elementary Surveillance capability and consists of the extraction of additional aircraft parameters and is also known as Downlink of Airborne Parameters (DAPs). This is intended to facilitate an increase in the safety and efficiency of the Air Traffic Management System.

In support of these requirements, the Rockwell Collins TDR-94/TDR-94D Mode S Transponder, RTU-870/4000/4200 and CDU-3000/5200/6200 are available with the Mode S Elementary and Enhanced Surveillance features.

The CTL-92E has been developed as a drop-in replacement for the CTL-92 with minor repinning of existing aircraft wiring required. Rockwell Collins has AML Supplemental Type Certificates (STCs) for Elementary Surveillance for configurations using the TDR-94/TDR-94D with a CTL-92E or an RTU-4210/4220 that can be applied to a variety of aircraft types. The AML STC data does not apply to Pro Line 4 or Pro Line 21 equipped aircraft and does not apply to Enhanced Surveillance due to the wide variety of different equipment and interface possibilities. Rockwell Collins' AML STC documentation for Elementary Surveillance will be provided at no charge in conjunction with an order for equipment or service bulletin modifications.

For further technical information, please refer to All Avionics Service Information Letter 1-02 Elementary Surveillance (Flight ID) Installation Guidelines and All Avionics Service Information Letter 1-04 Enhanced Surveillance Installation Guidelines.

The available -409 version of our TDR-94/94D provides Elementary Surveillance (ELS) and Enhanced Surveillance (EHS). The -409 status meets current requirements in place in Australia and the Hudson Bay. This capability improves ATC aircraft separation services by increasing surveillance capability in remote regions that are beyond the range of existing ATC Secondary Radar Systems (SSR).

ADS-B technology provides the avenue for aircraft to continuously broadcast data containing aircraft position, heading, and velocity (PVT). Use of ADS-B for ground-based surveillance requires only ADS-B Out (transmit) capability on the aircraft. For the ATC Ground System, these modernizations provide en-route surveillance, terminal area surveillance, non-radar area surveillance, and surface movement surveillance enhancements.

Our -409 version of the TDR-94/94D adds ADS-B capability fully compliant with RTCA DO-260A, change 2. Compliance with RTCA DO-260A uniquely positions the TDR-94/94D to provide both integrity and accuracy of the data necessary to fully support future surveillance applications proposed for airspace modernization. The -410 version is recommended when the TDR-94/94D is interfaced with a CSDB air data source.

The new -501 version of the TDR-94/94D complies with RTCA DO-260B.

Due to complexity and a wide variety of system architecture, Pro Line 4 and Pro Line 21 equipped aircraft will require special considerations when developing the STC. Due to additional wiring needed the -501 transponder is not backwards compatible and should only be installed on aircraft that have a STC for DO-260B.

Position accuracy requirements exist under ADS-B guidelines. A TSO-C145/C146 GNSS receiver, such as the Rockwell Collins GPS-4000S, is recommended. The GPS-4000S is known to comply with current and known future requirements. Please see Special Pricing Bulletin BRS-110109.4 GPS-4000S for pricing and information.

## TRADE-IN CREDITS

(A) A trade-in credit will be issued towards the purchase of a CTL-92E upon Rockwell Collins' receipt of a transponder control of any make and model.

(B) A trade-in credit will be issued towards the purchase of a TDR-94 (CPN 622-9352-409/410/500) upon Rockwell Collins receipt of a transponder of any make or model.

(C) A trade-in credit will be issued towards the purchase of a TDR-94D (CPN 622-9210-409/410/501) upon Rockwell Collins' receipt of a transponder of any make or model.

A credit will be issued to the dealer after the existing equipment is received at the Rockwell Collins Wichita Service Center, 2051 Airport Road, Wichita, Kansas 67209, phone number 316-677-4808. Dealer acceptance of special pricing in this bulletin obligates the dealer to pass the applicable equipment trade-in amount to the aircraft end operator.

The trade-in discounts listed above cannot be combined with any other discounts.

For DO-260B capability, please see page 6 "Upgrade Package 5" and select a transponder from the section labeled "DO-260B Upgrade". This upgrade program replaces the previous offer for a free-of-charge upgrade from a -409/410 TDR-94/94D to a -501.

#### UPGRADE PACKAGE 1

For aircraft that are not currently equipped with a Rockwell Collins transponder and require ADS-B Out DO-260A capability, please select from the following transponders and controllers.

- Please verify the quantity required for your particular installation.
- Minimum purchase required to take advantage of the program below is one transponder (TDR-94 or TDR-94D) and one controller (RTU-4210/4220 or CTL-92E). Maximum quantity of transponders allowed per shipset order is two.

#### SELECT A TRANSPONDER

Type Number	Part Number	Description
TDR-94 or	622-9352-409	Transponder (non-Diversity)
TDR-94D	622-9210-409	Transponder (with Diversity)
TDR-94 or	622-9352-501	Transponder (non-Diversity)
TDR-94D	622-9210-501	Transponder (with Diversity)

#### SELECT A CONTROLLER

Type Number	Part Number	Description
RTU-4210 or RTU-4210 or RTU-4220 or RTU-4220 or	822-0836-233/234 or 822-0836-333/334 or 822-0730-231/232 or 822-0730-333/336	Radio Tuning Unit, <i>select from below</i>
CTL-92E	822-1807-00X	Control head w/Flight ID, <i>select from below</i>

Part Number	Type	8.33 KHz	ARINC 718/735 XPDR	Voice Data Switching	HSI	TCAS	HF and 3rd COM	2nd HF	Flight ID	ON/OFF Switch	Volume Control	Black	Gray	1-2 Switch	Off Position
822-1807-001	CTL-92E												X		X
822-1807-002	CTL-92E											X			X
822-1807-003	CTL-92E												X	X	X
822-1807-004	CTL-92E											X		X	X
822-1807-005	CTL-92E												X		
822-1807-006	CTL-92E												X	X	
822-0836-233	RTU-4210	X	X	X		X	X		X	X		X			
822-0836-234	RTU-4210	X	X	X		X	X		X	X				X	
822-0836-333	RTU-4210	X	X	X		X	X		X	X	X	X			
822-0836-334	RTU-4210	X	X	X		X	X		X	X	X		X		
822-0730-231	RTU-4220	X	X	X	X	X	X	X	X	X		X			
822-0730-232	RTU-4220	X	X	X	X	X	X	X	X	X				X	
822-0730-333	RTU-4220	X	X	X	X	X	X	X	X	X	X	X			
822-0730-336	RTU-4220	X	X	X	X	X	X	X	X	X	X		X		



## UPGRADE PACKAGE 2

For aircraft that are not equipped with Flight ID capability and lack Enhanced Surveillance, but have a Rockwell Collins transponder controller, the upgrade path to ADS-B Out DO-260A is to replace the transponder and upgrade the controller using the following tables.

Examples of equipment that fit this category are any TDR-90, and the TDR-94 or TDR-94D version -003,-004,-005 and -006.

For these installations select the replacement ADS-B Out DO-260A transponder and Service Bulletin controller upgrade from the following choices.

- Please verify the quantity required for your particular installation.
- Trade-in credits from page two apply to this package.

Type Number	Part Number	Description
TDR-94 or TDR-94D	622-9352-409	Transponder (non-Diversity)
TDR-94 or TDR-94D	622-9352-501	Transponder (non-Diversity)
TDR-94 or TDR-94D	622-9210-409	Transponder (with Diversity)
TDR-94 or TDR-94D	622-9210-501	Transponder (with Diversity)

Depending on your aircraft type, when upgrading to DO-260A, you will also need to purchase selected Service Bulletins for various pieces of equipment according to the following information.

- Please verify the quantity required for your particular installation.

## CONTROLLERS/CONCENTRATORS

Current Part Number	Service Bulletin Number
RTU-42XX	501/503
RTU-40XX	501
RTU-870B/C	501
CDU-3000	505/507/511
CDU-5200	No modification required
CDU-6200 <sup>3</sup>	502/504/509
IOC-851A	502 Elementary Surveillance 504 Enhanced Surveillance
IOC-3100	505 Elementary and Enhanced Surveillance
IOC-4100	505 Elementary and Enhanced Surveillance
IOC-4000	506 Elementary Surveillance 507 Enhanced Surveillance
SDD-640C (Gulfstream GV equipped with RTU-4280)	501
ICC-3001 (Bombardier Challenger 300 only)	501
ICC-3001 (All Others)	501

### UPGRADE PACKAGE 3

For aircraft installations that are equipped with Flight ID capability, but lack Enhanced Surveillance or ADS-B Out DO-260A capability, the following upgrade packages are available. For these installations, select the replacement ADS-B Out DO-260A transponder version -409 from the following choices.

- Please verify the quantity required for your particular installation.

Current Part Number	Service Bulletin Number	New Part Number
622-9352-007 (TDR-94) <sup>1</sup> 622-9210-007 (TDR-94D)	29, 507 <sup>2</sup>	622-9352-409 622-9210-409
622-9352-207 (TDR-94) <sup>1</sup> 622-9210-207 (TDR-94D)	29, 507 <sup>2</sup>	622-9352-409 622-9210-409
622-9352-008 (TDR-94) <sup>1</sup> 622-9210-008 (TDR-94D) 622-9352-308 (TDR-94) <sup>1</sup> 622-9210-308 (TDR-94D)	507 <sup>2</sup>	622-9352-409 622-9210-409 622-9352-409 622-9210-409

Depending on your aircraft type, you will also need to purchase selected Service Bulletins for Input/Output concentrator (IOC) according to the following information.

- Please verify the quantity required for your particular installation.

Current Part Number	Service Bulletin Number
IOC-851A	502 Elementary Surveillance 504 Enhanced Surveillance
IOC-3100	505 Elementary and Enhanced Surveillance
IOC-4100	505 Elementary and Enhanced Surveillance
IOC-4000	506 Elementary Surveillance 507 Enhanced Surveillance

### UPGRADE PACKAGE 4

For aircraft installations that are already equipped with ADS-B Out DO-260 capability (-108, -408, -309 transponder versions) and want to upgrade to DO-260A the following service bulletins need to be purchased.

- Upgrade to a -409 transponder if ARINC 429 interface capability is required.
- Upgrade to a -410 transponder if CSDB interface capability is required. A -409 is the only transponder that can be upgraded to a -410 transponder.
- Please verify the quantity required for your particular installation.

Current Part Number	Service Bulletin Number	New Part Number
622-9352-108 (TDR-94) <sup>1</sup> 622-9210-108 (TDR-94D) 622-9352-408 (TDR-94) <sup>1</sup> 622-9210-408 (TDR-94D)	505	622-9352-409 622-9210-409 622-9352-409 622-9210-409
622-9352-309 (TDR-94) <sup>1</sup> 622-9210-309 (TDR-94D)	507 <sup>2</sup>	622-9352-409 622-9210-409
622-9352-409 (TDR-94) <sup>1</sup> 622-9210-409 (TDR-94D)	509	622-9352-410 622-9210-410

## UPGRADE PACKAGE 5

### DO-260B UPGRADE<sup>4</sup>

For aircraft installations that are already equipped with ADS-B Out DO-260A capability (-409 or -410 transponder) and want to upgrade to DO-260B, the following service bulletins will be available soon. For aircraft installations that are already equipped with ADS-B Out DO-260A capability (-409 or -410 transponder) and want to upgrade to DO-260B, the following service bulletin is available now. This package replaces any previous offer for free of charge upgrade from a -409/410 TDR-94/94D to -501. If a -409 upgrade was completed under previous Marketing Bulletins, Rockwell Collins will still honor the free of charge upgrade.

- In addition to a transponder upgrade, ADS-B Out DO-260B capability requires a WAAS-capable Global Positioning System unit.
- Installation of ADS-B Out DO-260B equipment is accomplished via an STC for each specific aircraft model. See your Rockwell Collins dealer for STC details and availability.
- Please verify the quantity required for your particular installation.

Current Part Number	Service Bulletin Number	New Part Number
622-9352-409(TDR-94) <sup>1</sup>	514	622-9352-501
622-9352-410(TDR-94) <sup>1</sup>		622-9352-501
622-9210-409 (TDR-94D)	514	622-9210-501
622-9210-410 (TDR-94D)		622-9210-501

### TERMS AND CONDITIONS

Unless otherwise noted, this program is valid for orders placed between April 1, 2015 and December 31, 2015, with delivery requested by April 1, 2016. Warranty period is two years for new equipment and one year for modified equipment. Standard warranty does not apply to software.

For additional information, please contact your Rockwell Collins Authorized Dealer.

#### NOTES:

1. To convert a TDR-94 to a TDR-94D, please contact a Rockwell Collins Service Center.
2. SB 24 is a prerequisite for SB 507 and is no charge if the unit is still in warranty.
3. Some aircraft configurations may require additional modifications not listed above, please contact your Rockwell Collins Service Center for information.
4. Units that were upgraded to a -409 or -410 status prior to January 1, 2014 and did so using a previous version of this Marketing Bulletin, will receive the upgrade free of charge.
5. Early Adopter Incentive: Program service bulletin pricing will increase as the ADS-B DO-260B mandate date gets closer. Early adopter pricing is only valid up to December 23, 2015.

### How can we help?

Please call Rockwell Collins Customer Support at +1.319.295.5000.

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Rockwell Collins delivers smart communication and aviation electronics solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

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