



ADS-B - A Boeing Perspective

ICAO Asia Pacific Surveillance Seminar & Surveillance
Implementation Coordination Group (SURICG/6)

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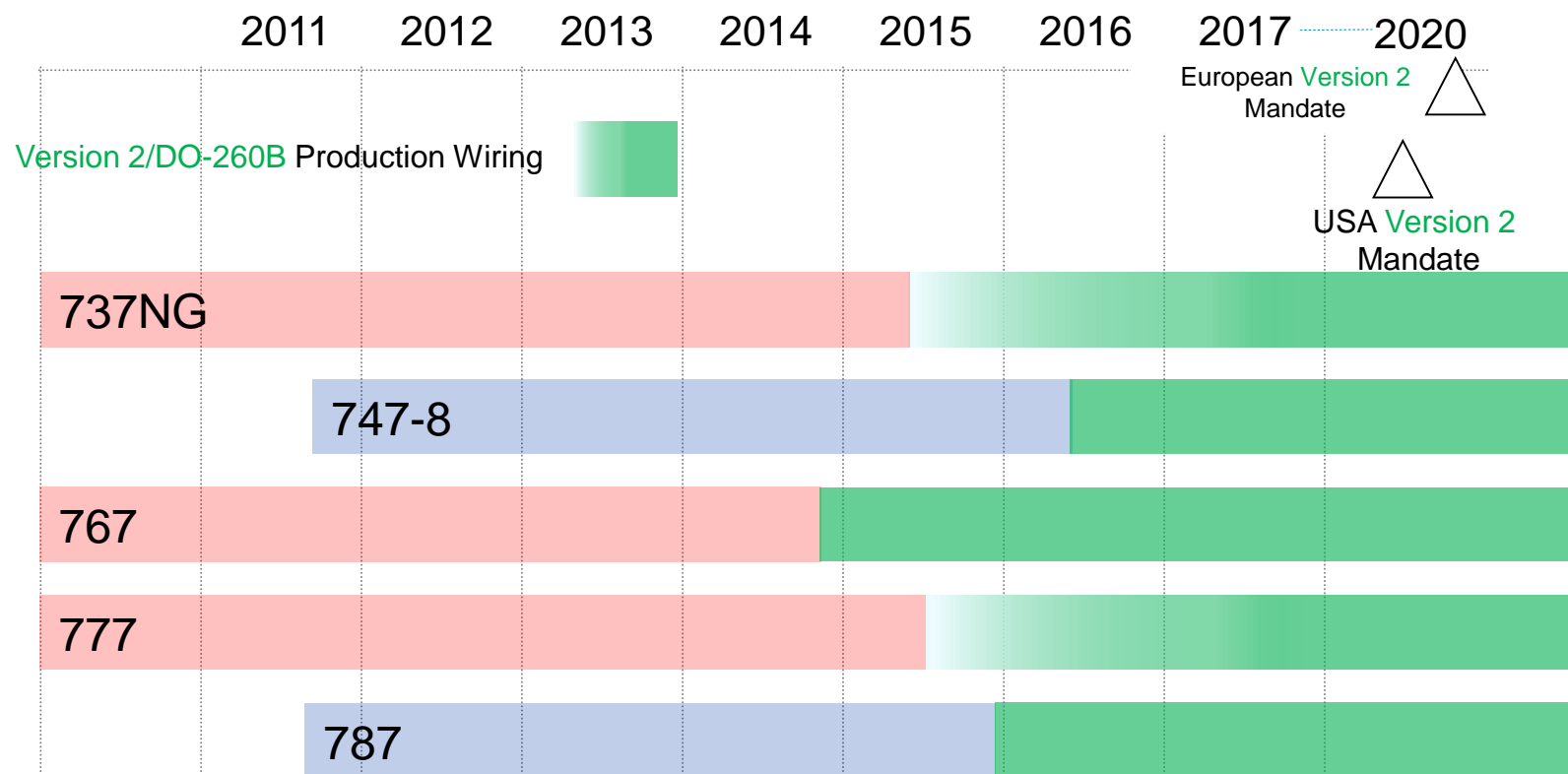
Agenda

Boeing Commercial Airplanes – Avionics / Air Traffic Management

- **ADS-B Out Implementations**
- **ADS-B Out Certification Status**
- **ADS-B In for 787**
- **Summary**

ADS-B Out Implementations (by Model)

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737MAX & 777-9
Version 2/DO-260B
at Entry Into Service

ADS-B Out Standard	Version Number
DO-260	0
DO-260A	1
DO-260B	2

Boeing Compliant with
US & European Version 2/DO-260B
Mandates

Version 2/DO-260B ADS-B Out Certification

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■ **ADS-B Out System certification includes:**

- ATC Transponder (Version 2/DO-260B compliant)
- GPS receiver (MMR) part number – paired with a specific ATC Transponder part number
- ATC Transponder interface wiring and program pin wiring
 - Interface wiring was incorporated into 737, 747, 767, and 777 production starting in 2003
 - ATC Transponder program pin wiring was incorporated into 737, 747, 767, and 777 production starting in 2013
 - Service Bulletins available for interface and/or program pin wiring
 - Network-based aircraft (787 & 777-9) with Integrated Surveillance System (ISS) do not have interface and program pin wiring

■ **Each ATC Transponder/MMR part number pairing must be certified on each aircraft sub-model**

- For example, a pairing must be separately certified on 737-8 and 737-9. Requires a unique certification, even if the means of compliance is by similarity/analysis.

ADS-B Out – Version 2 ATC Transponders

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Boeing In-production Version 2 (DO-260B) ATC Transponder Capability

	737 MAX	747-8	767	777-300ER/F	787/777-9
Buyer Furnished Equipment (BFE)	ACSS (NXT-800) Honeywell (TRA-100B) Collins (TPR 901 -205)	N/A	ACSS (NXT-800) Honeywell (TRA-100B) Collins (TPR 901-205)	ACSS (NXT-800) Honeywell (TRA-100B) Collins (TPR 901 -205)	N/A
Supplier Furnished Equipment (SFE)	N/A	Collins ⁽¹⁾ (TPR 901 -205)	N/A	N/A	Collins ISS-2100 ⁽²⁾

(1) Same unit as Buyer Furnished Equipment

(2) Integrated Surveillance System (ISS) includes ATC Transponder, ADS-B Out, TCAS/ACAS, Terrain Awareness, and Weather Radar

BFE – Equipment selected/provided by buyer
SFE - Equipment basic to airplane

Supplier	Model	Part No.
ACSS	NXT-800	9008000-10000
Collins	TPR-901	822-1338-205
Honeywell	TRA-100B	066-01212-0301
Collins (ISSPU)	ISS-2100 (787/777-9)	822-2120-102/-103

ADS-B Out – Multi-Mode Receivers (MMRs)

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- Satellite-based Augmentation System (SBAS) MMRs are currently certified on 737NG (737-600/ 700/ 800/900ER), 737 MAX (737-8/-9), 747-8, 767F, and 777 (777-200/300/F) models.
- New 777-9 model is planned to be type certified with both Collins GLU-2100 and Honeywell iMMR SBAS capable MMRs.
- Customers of new 737 MAX and 777-9 production aircraft have the option of selecting either the Collins SBAS MMR (GLU-2100) or the Honeywell SBAS MMR (iMMR). SA-On and SA-Aware MMRs are no longer listed as catalog options for 737 MAX and 777-9 aircraft.
- 787 is currently certified with an SA-Aware position source with expected certification of an Aircraft-based Augmentation Systems (ABAS) [Hybrid GNSS/Inertial] position source in 4Q 2022.

Supplier	Model	Part No.	Selective Availability (SA)
Collins	GLU-920	822-1152-XXX	-001/-002/-003: SA-On -004: SA-Aware
Collins	GLU-925	822-1821-XXX	SA-Aware
Collins	GLU-2100	822-2532-100	SBAS
Honeywell	RMA-55B	P/N 066-50029-1201	SA-On
Honeywell	iMMR	69002600-0101	SBAS
Honeywell	INR (787)	940-2001-004 or -008	SA-Aware

Boeing – Currently In-Production Models ADS-B Out Certifications

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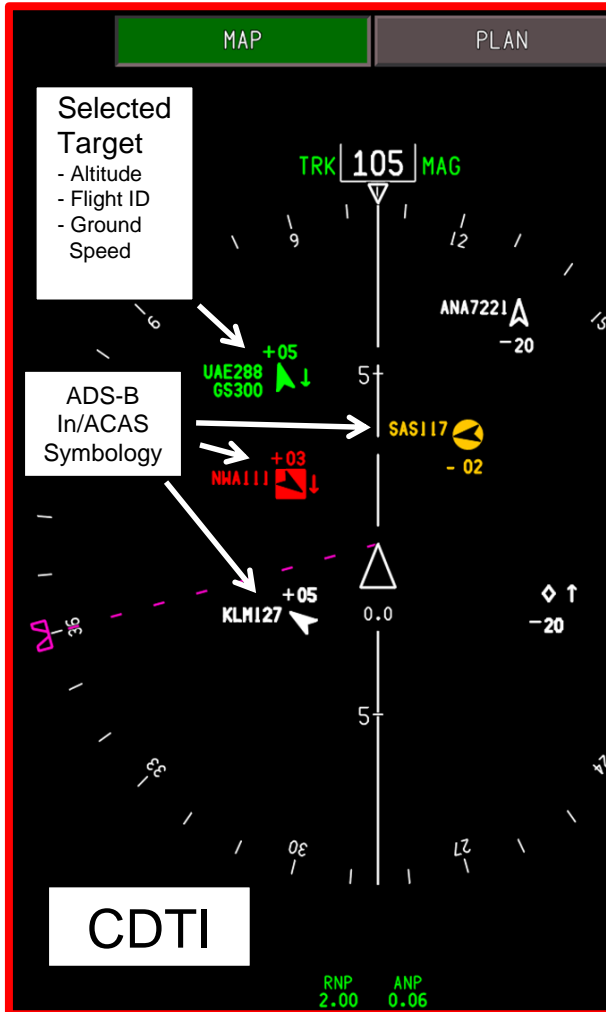
GNSS Source (MMR)	ATC TRANSPONDERS						ISS PROCESSOR UNITS	
	737MAX			747-8/747-8F	767F	777-300ER/777F	777-9*	787
	-8	-9	-7/-10*					
Honeywell RMA-55B P/N 066-50029-1201 (SA-On)	ACSS	ACSS	N/A	N/A	N/A	ACSS NXT-800 P/N 9008000-10000	N/A	
	Collins	Collins				Collins TPR-901 P/N 822-1338-205		
	Honeywell	Honeywell				Honeywell TRA-100B P/N 066-01212-0301		
Collins GLU-920 P/N 822-1152-004 (SA-Aware)	N/A	N/A	N/A	N/A	N/A	ACSS NXT-800 P/N 9008000-10000	N/A	Collins ISS-2100 interfaced with Honeywell Integrated Navigation Receiver (INR) [SA-Aware].
						Collins TPR-901 P/N 822-1338-205		
						Honeywell TRA-100B P/N 066-01212-0301		
Collins GLU-925 P/N 822-1821-XXX (SA-Aware)	ACSS	ACSS	N/A	Collins TPR-901 P/N 822-1338-205	ACSS NXT-800 P/N 9008000- 10000	ACSS NXT-800 P/N 9008000-10000	N/A	
	Collins	Collins				Collins TPR-901 P/N 822-1338-205		
	Honeywell	Honeywell				Honeywell TRA-100B P/N 066-01212-0301		
Honeywell iMMR P/N 69002600-0101 (SBAS)	ACSS	ACSS	ACSS	N/A	N/A	ACSS NXT-800 P/N 9008000-10000	Collins ISS-2100 (2022) Hybrid GNSS/Inertial (2023)	Hybrid GNSS/Inertial 4Q2022
	Collins	Collins	Collins			Collins TPR-901 P/N 822-1338-205		
	Honeywell	Honeywell	Honeywell			Honeywell TRA-100B P/N 066-01212-0301		
Collins GLU-2100 P/N 822-2532-100 (SBAS)	ACSS	ACSS	ACSS	Collins TPR-901 P/N 822-1338-205	ACSS NXT-800 P/N 9008000- 10000	ACSS NXT-800 P/N 9008000-10000	Collins ISS-2100 (2022) Hybrid GNSS/Inertial (2023)	
	Collins	Collins	Collins			Collins TPR-901 P/N 822-1338-205		
	Honeywell	Honeywell	Honeywell			Honeywell TRA-100B P/N 066-01212-0301		

* 737-7 & 737-10 and 777-9 in development

Certified Configuration
Not Yet Certified Configuration

787 CDTI and VSA

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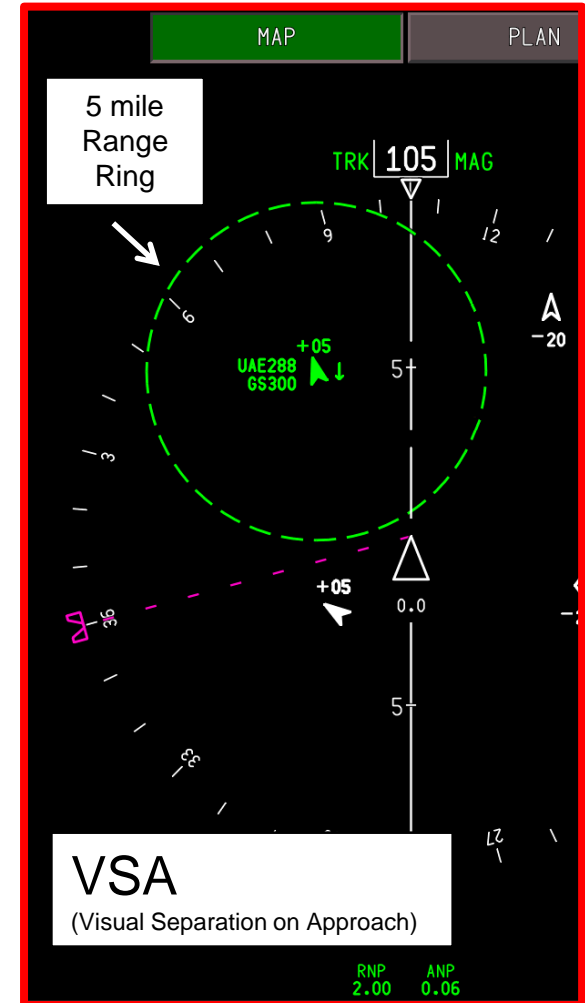


Traffic List

TRAFFIC LIST

FLY #	DIST	CAT	GND SPEED	RANGE RING
UAE288	5.6 NM	HVY	300 KTS	5
ANA111	2.9 NM	HVY	240 KTS	--
KLM127	3.3 NM	HVY	440 KTS	--
SAS117	3.9 NM	HVY	240 KTS	--
ANA7221	8.0 NM	MED	440 KTS	--
AAL123	57 NM	HVY	325 KTS	--
ANA722	107 NM	MED	209 KTS	--
HVN344	113 NM	HVY	241 KTS	--
JAL256	121 NM	MED	231 KTS	--
KAL851	122 NM	HVY	162 KTS	--
SIA677	127 NM	HVY	259 KTS	--
QTR257	142 NM	HVY	190 KTS	--
CPA118	149 NM	MED	202 KTS	--
UAE2687	154 NM	HVY	194 KTS	--
ANA2687	174 NM	MED	294 KTS	--

FLT # Search: -----



787 In Trail Procedure (ITP)

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INFO MENU
IN TRAIL PROCEDURE
TRAFFIC LIST

IN-TRAIL PROCEDURES

SEPARATION CRITERIA

ALONG TRACK NM VERTICAL FT CALC ALT

FLIGHT LEVEL LIST

FLIGHT LEVEL	TCAS TRAFFIC	TIME
FL400	---	---
FL390	---	01:37z
FL380	SAS12345	01:34z
FL370	AAL123	12:45z
FL360	---	---
FL350	ANA23456	12:39z
FL340	JAL456 ANA56789	12:47z
FL330	---	12:55z
FL320	---	01:05z

REFERENCE AIRPLANE LIST

FLT LVL	FLT #	ITP DIST	ITP SPD DIFF
FL380	SAS12345	16 NM DECR	14 KTS
FL370	AAL123	15 NM INCR	10 KTS

CREATE REQUEST

Vertical Display

Comm Page

ATC
FLIGHT INFORMATION
COMPANY

REVIEW
MANAGER
NEW MESSAGES

1843z ITP LEVEL REQUEST

LEVEL : FL390

16 NM AHEAD OF SAS12345

15 NM BEHIND AAL123

FREE TEXT : _____

SEND
PRINT
RESET
RETURN
EXIT

MAP
PLAN

TRK 228 MAG

2.00
0.06

Nav Display

Summary

Boeing Commercial Airplanes – Avionics / Air Traffic Management

- Meeting mandates for ADS-B Out
- Working with Air Navigation Service Providers to ensure common airborne requirements and global harmonization
- Developing ADS-B In solutions which maximize value of equipage
 - Conducting forward-fit studies targeting primary field-of-view to ensure cost-effective architectures with growth capability
 - Evaluating retrofit solutions including auxiliary displays
- Continuing ADS-B industry standards (RTCA/EUROCAE/AEEC) support

**Boeing is actively engaged in ADS-B development,
a key capability for improved airline operations**

