

RVSM

Reduced Vertical Separation Minimum

DATA



Aero Express, Inc.

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RVSM Benefits

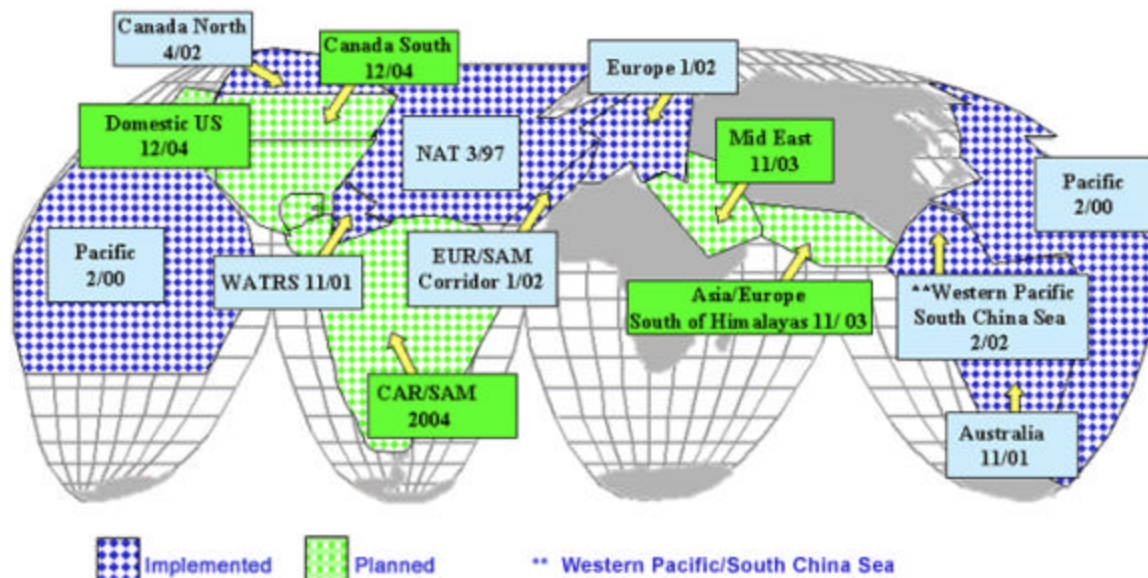
Domestic RVSM is projected to accrue the following benefits:

Air Traffic

- Improved operational efficiency
- Enhanced airspace capacity
- Enhanced controller flexibility to manage traffic through an increased number of available altitudes
- Increased throughput of en route traffic

Airlines

- Greater availability of the more fuel-efficient altitudes
- Greater availability of the most fuel-efficient routes
- Increased probability that an aircraft will be cleared onto the desired route or altitude
- Domestic fleet fuel savings of approximately 2%



** Western Pacific/South China Sea

February 2002 Implementation

Bangkok, Ho Chi Minh, Kota Kinabalu, Kuala Lumpur, Manila, Phnom Penh, Sanya, Singapore, Taipei

October 2002 Implementation

Hanoi, Hong Kong, Jakarta, Ujung Pandang, Vientiane

RVSM WORLD WIDE STATUS

> Key Events

- **FAA OEP Plan:**
Inclusion of Domestic RVSM in the NAS OEP. The NAS OEP is a commitment to meet the air transportation needs for the U.S. for the next 10 years. **May 2001**
- **Concept of Operations:**
Document containing the operational description of DRVSM including the goals/benefits, procedural changes/issues, system modifications, etc. **Dec 2001**
- **MOU with DoD:**
Memorandum of Understanding with the Department of Defense regarding accommodation of non-approved military aircraft. **Dec 2001**
- **ATC Simulations:**
Simulation & modeling of scenarios to determine effectiveness, efficiencies or problems, human factors, and controller workload issues associated with various altitude bands considered for DRVSM implementation. **Oct-Dec 2001**
- **NPRM Publication:**
Publish Notice of Proposed Rulemaking and Regulatory Evaluation. **Apr 2002**
- **Airspace Standardization:**
Establish measures to identify aircraft/operators in RVSM airspace without approval. **Apr 2002**
- **Monitoring System:**
Deploy system to monitor aircraft altitude-keeping performance. **Jun 2003**
- **Publish Final Rule:**
Publication of the Final Rule on Domestic RVSM. **Jun 2003**
- **Readiness Review:**
DRVSM Team reviews all factors affecting implementation decision. **Mar 2004**
- **Safety Assessment/Fleet Readiness:**
Complete safety analysis and review fleet readiness assessment. **Jun 2004**
- **ATC System Modifications:**
Complete all NAS ATC system modifications required for Domestic RVSM, e.g. Conflict Alert. **Jul 2004**
- **Readiness Review:**
Final DRVSM Team review of all factors affecting RVSM implementation decision. **Sep 2004**
- **Proposed DRVSM Implementation:**
RVSM implemented FL290 – FL410. **January 20, 2005**

> Rulemaking Schedule

A notice of Proposed Rulemaking was published in May 2002. The comment period closed August 8, 2002. The final rule is scheduled to be published in June 2003. A supplemental Notice of Proposed Rulemaking is being promulgated. No schedule for publishing has been set yet. There are two issues to be addressed in the Supplemental NPRM

1. Withdrawal of NPRM proposal to revise existing requirement for two RVSM compliant altimeters to allow General Aviation turbo-prop aircraft to be equipped with a single RVSM compliant altimeter.
2. Proposal to add Miami to San Juan Corridor and San Juan FIR as airspace where RVSM may be applied in January, 2005.

Reduced Vertical Separation Minimum Manufacturers' Points of Contact

✈ Boeing: Asher Chen asher.c.chen@Boeing.com	Phone: 1-425-342-2781 Fax: 1-425-342-0238
✈ Airbus: Xavier Barriola xavier.barriola@airbus.com	Phone: 33 56 211-8108 Fax: 33 56 193-4425
✈ Lockheed: Wayne Cummings wayne.s.cummings@lmco.com	Phone: 1-864-236-3231 Fax: 1-864-299-7527
✈ Bombardier/Canadair/Learjet: Andre Chalifoux andre.chalifoux@notes.canadair.ca	Phone: 1-514-855-8369 Fax: 1-514-855-8798
✈ Aeromech (Non-group Aircraft) Gary Simmons gds@aeromechinc.com	Phone: 1-425-252-3236 Fax: 1-425-257-9756
✈ Astra/Galaxy: Ric Norton ric.norton@gulfaero.com	Phone: 1-912-965-3489 Fax: 1-912-965-3928
✈ Cessna: Marcelo Casenove mcasenove@cessna.textron.com	Phone: 1-316-517-7462 Fax: 1-316-206-6497
✈ Dassault: Philippe Clavery falconfsr@compuserve.com	Phone: 33 1 4083 2712 Fax: 33 1 4083 9896
✈ Gulfstream: Ric Norton ric.norton@gulfaero.com	Phone: 1-912-965-3489 Fax: 1-912-965-3928
✈ Raytheon/Hawker: Ross Nicholls ross_nicholls@rac.ray.com	Phone: 1-316-676-3401 Fax: 1-316-676-8381
✈ General Aviation Manufacturers Association (GAMA): Ron Swanda Rswanda@generalaviation.org	Phone: 1-202-393-1500 Fax: 1-202-842-4063

FAA REGIONAL RVSM FOCAL POINTS

<u>REGION</u>	<u>SYMBOL</u>	<u>SPECIALTY</u>	<u>PHONE</u>	<u>FAX</u>
<u>ALASKA</u>				
RICHARD GIRARD	AAL-203	OPERATIONS	907-271-3578	907-271-1665
CLINT WEASE	AAL-233A	OPERATIONS	907-271-2091	
<u>CENTRAL REGION</u>				
MAX TIDWELL	ACE-251B	OPERATIONS	816-329-3228	816-329-3208
JIM ORCHARD	ACE-252D	AIRWORTHINESS	816-329-3230	816-320-3208
<u>EASTERN REGION</u>				
WILLIAM MORSE	AEA-230C	OPERATIONS	718-553-3224	
JOSEPH RACHIELE	FSDO-11	AVIONICS	631-755-1300, x257	
<u>GREAT LAKES</u>				
RANDY M. JONES	AGL-230K	AVIONICS	847-294-7149	847-294-7884
MICHAEL L. EBELS	AGL-205	OPERATIONS	847-294-8002	847-294-8001
<u>NEW ENGLAND</u>				
DAVID HALL	ANE-230K	OPERATIONS	781-238-7213	781-238-7245
FRANK RYS	FSDO-03	AVIONICS	860-654-1023	860-654-1009
<u>BACK-UPS</u>				
GERARD K. HOLTORF	ANE-236	OPERATIONS	781-238-7215	781-238-7245
JOHN FELICIANO	ANE-FSDO 3	AVIONICS	860-654-1019	860-654-1009
<u>NORTHWEST MOUNTAIN</u>				
MIKE A. SULLIVAN	ANM-230MS	AVIONICS	425-227-2560	206-227-1200
CJ COLLINS	ANM-230	OPERATIONS	425-227-1731	CJ.COLLINS@FAA.GOV
<u>SOUTHERN REGION</u>				
PHILIP HUTCHINSON	ASO-200			
<u>SOUTHWEST REGION</u>				
AMOS K. LAPP	ASW-230	AVIONICS	817-222-5250	
<u>WESTERN-PACIFIC REGION</u>				
JAMES P. WEBB	SFO CMO	AVIONICS	650-876-9060	650-697-2386
ANDERSON DAVIE	#SF INTL FIELD OFFICE	OPERATIONS	650-876-2771	650-697-7231

FAA HEADQUARTERS RVSM FOCAL POINTS

ROBERT SWAIN	AFS-400	PRGM COORDINATOR	202-385-4576	202-385-4653
DAVID MALOY	AFS-400	N.ATLANTIC	860 654-1006	860-654-1009
ROBERT G. HANSON	AFS-400	OPERATIONS	202-385-4575	202-385-4653
CHARLEY FELLOWS	AFS-350	AVIONICS	202-267-3922	202-267-5115
LORENCE BESSETTE	AFS-350	MAINTENANCE	202-267-8177	202-267-5115
BRAD MILLER	AIR-130	ENGINEERING	202-385-4643	
ROY GRIMES	AFS-400	PRGM SUPPOORT	#202-385-4577	#202-385-4653

#EXPECT NEW NUMBER AFTER 11/1/02

OEM Min. Requirements for RVSM Testers

OEM	a/c Model Nbr	T/S Spec Airspeed	T/S Spec Altitude	ADC AOEM	ADC Model #	ADC Accuracy Airspeed	ADC Accuracy Altitude	Documentation	ADTS Specified	
Airbus										
Boeing A/C	All Models		± 0.00030 inHg							
Bombardier	CRJ-100/-200/-700			Collins	ADC-850A					
Bombardier	CL600/CL601		Test Ste Spec***	Honeywell	AZ-850		±62 Ft @ RVSM Alt.	OEM Supplied Info.	Druck ADTS405F Honeywell ADT-222C	
Bombardier	CL601/3A/3R		Test Ste Spec***	Honeywell	AZ-850		±62 Ft @ RVSM Alt.	OEM Supplied Info.	Druck ADTS405F Honeywell ADT-222C	
Bombardier	Challenger 604		Test Ste Spec***	Collins	ADC-850E		±48 Ft @ RVSM Alt.	OEM Supplied Info.	Druck ADTS405F Barfiled DPS500	
Bombardier	Global Express		Test Ste Spec***	Honeywell	AZ-850		±40 Ft @ RVSM Alt. ±42.5 Ft @ RVSM Alt. ±45 Ft @ RVSM Alt.	OEM Supplied Info.	Druck ADTS405F	
Bombardier	Lear 31							SB 31-34-11		
Bombardier	Lear 45			Honeywell	AZ-850	±3.5Kts @ 80Kts ±2.5Kts @ 100 Kts ±2.5Kts @ 150 Kts ±2.5Kts @ 200 Kts ±3.0Kts @ 250 Kts ±3.5Kts @ 300 Kts		M45MM	Druck ADTS405F	
Bombardier	Lear 60	±1.0Kts @ 50Kts ±0.5Kts @ 100Kts ±0.3Kts @ 200Kts ±0.2Kts @ 300Kts ±0.2Kts @ 400Kts	±5 Ft. @ 0Ft ±5 Ft. @ 10Ft ±7 Ft. @ 20Ft ±10 Ft. @ 30Ft ±15 Ft. @ 400Ft ±25 Ft. @ 500Ft ±40 Ft. @ 60Ft	Collins	ADC0850d			MM 34-17-00	Barfield DPS500 Druck ADTS-405F (RVSM) DPS400 (non-RVSM)	
			Accuracy req.o over temp. range of approx. 41° to 95° (5° to 35°)							
Cessna	Citation Jet I							SB525-34-30		
Cessna	Citation Jet II							SB525A-34-01		
Cessna	Citation II									
Cessna	Citation III							SB650-34-107		
Cessna	Citation IV							SB650-34-105		
Cessna	Citation V									
Cessna	Citation III/VII							SB650-34-97 Rev 2		
Cessna	Bravo			Honeywell	AZ-850			SB550-34-70		
Cessna	Excell			Honeywell	AZ-850			SL560XL-34-02		
Cessna	Encore			Honeywell	AZ-850			Maintenance Man.		
Cessna	Ultra			Honeywell	AZ-850			SB560-34-79 Rev 1		
Cessna	Citation X			Honeywell	AZ-850			SB750-34-05 Rev 2		
Dassault	Falcon 20E		±0.0030 inHg	Collins	ADC-850F			SB743		
Dassault	Falcon 2000		±0.0030 inHg					S/B 104		
Dassault	Falcon 50EX/F50		±0.0030 inHg	Collins	ADC-850F			S/B 246		
Dassault	Falcon 900		±0.0030 inHg					S/B 186		
Dassault	Falcon 900 EX		±0.0030 inHg	Honeywell	AZ-850			S/B 004		
Dassault	Falcon 2000		±0.0030 inHg	Collins	ADC-850F			S/B 063		
Embraer	ERJ-135/145			Honeywell	AZ-850					

Air Carrier RVSM Service Bulletin Status

Model	Service Bulletin	Operational Changes	Air Data Computer	Skin Check	Pitot Static Probe Life
737-300/400/500	737-53-1180 (2/96) IN-03	No Change	No Change	Visual	Unplated, no limit
737-600/700/800/900/BBJ	N/R	Service letter: 737-SL-02-017 (1/98)			
747-400 5" Probes	747-53-2394 IN-03 (7/95) 747-53-2398 (11/95)	Mach \leq 0.90 in RVSM airspace	No Change	Detailed Measurement	Unplated: 3 years Plated: no limit
747-400, 10" Probes	747-53-2393 (11/95)	Mach \leq 0.90 in RVSM airspace	No Change	Visual	Plated: no limit
757-200	757-34-0132 IN-02 (12/95) 757-53-0074 (10/95)	No Change	ADC Upgrade & new SSEC	Visual	N/A
757-300	N/R	Service letter 757-SL-02-016C (3/99)			
767-200/300	767-34-0237 IN-02 (1/95) 767-53-0068 (7/95) Rev 2 - 5/97	No Change	Use 767-300 SSEC on all models	Visual	Unplated: 3 years Plated: no limit
767-400	N/R	Service Letter 767-02-011-B 8/2000			
777-200/300	777-53-0007 (4/97)	No Change	No Change	Visual	N/A
707	STC group approval is under development by AeroMech, Inc. and is expected 2 nd Quarter of 2001.				
727-100/200	727-53-0220 (Contact Boeing for AFM update)	No Change	New ADC and SSEC	Visual	N/A
737-200	737-53-1191 IN-01 (7/96)	No Change	New ADC	Visual	Unplated: no limit
747-100/200/300/SP	747-53-2405 (5/96) 747-53-2394 (7/95) 747-34-2135 (11/80)	Mach \leq 0.90 or 0.87 @ low weight in RVSM airspace	Specific SSEC	Detailed Measurement	Unplated: 4 years Plated: no limit
MD-81/82/83/87/88	MD-80 34-289 (2/97) Rev 2 - 5/98	No Change	No Change	Detailed Measurement (Static Plate)	N/A
MD-90-10/30/40	MD-90 34-006 (5/97)	No Change	No Change	Detailed Measurement (Static Plate)	N/A
717	N/R	N/R			

N/R – Not Required

Model	Service Bulletin	Operational Changes	Air Data Computer	Skin Check	Pitot Static Probe Life
MD-11 Combi, Freighter, Passenger	MD-11 34-065 (3/96) Rev 2 – 2/97	No Change	No Change	Detailed Measurement (Static Plate)	N/A
DC-10	DC-10 34-134 (3/96) Rev 7 – 6/99	No Change	No Change	Detailed Measurement (Static Plate)	N/A
DC-9	STC group approval is under development by AeroMech, Inc. and is expected 15 January 2001. Boeing equipment analysis indicates that some equipment requires upgrade (ADC, altimeters, altitude alerters, ATC transponders). Aircraft will require detailed measurements of both static plates and skin mounted ports depending on static plate production cut-in.				
DC-8	STC group approval has been developed by AeroMech, Inc. ST01073LA - issued 22 September 2000. Service Bulletin DC-8 34-134 (11/96) is a static port skin waviness inspection bulletin only. Boeing equipment analysis indicates that some equipment requires upgrade (ADC, altimeters, altitude alerters, ATC transponders). All static ports are skin mounted.				
A319	A320-34-1137		No Change	Visual	
A320	A320-34-1137		MSN <621 : Pitot 1 relocation A320-34-1122	Visual	
	or A320-34-1115	MMEL/FCOM restriction: ADR1 and 2 operative	No Change	Visual	
A321	A320-34-1137		MSN < 621 Pitot 1 relocation A320-34-1122 ADIRU 3 modification A320-34- 1129(Hwl) A320-34- 1129(Lit)	Visual	
	or A320-34-1115	MMEL/FCOM restriction: ADR1 and 2 operative	No Change	Visual	
A340	A340-34-4034		No Change	Visual	
A330	A330-34-3031		No Change	Visual	
A300-600	A300-34-6101		No Change	Visual	
A310 GE	A310-34-2112		No Change	Visual	
A310 PW	A310-34-2112		MSN < 698 DADC-914 required A310-34-2114	Visual	
A300 B2/B4	A300-34-0139		No Change	Visual	

N/R – Not Required

Model	Service Bulletin	Operational Changes	Air Data Computer	Skin Check	Pitot Static Probe Life
L-1011	L1011-093-34-204	No Change	No Change	Detailed Measurement	6 years or 10 years
F100	FBF100-34-072		Functional test	Visual	

N/R – Not Required

Aircraft Type	ICAO Type Designator	Aircraft Engineering Status
Canadair		
Global Express	GLEX	Released SB-700-34-014
Challenger 604	CL60	Released SB-604-34-012
Challenger 601	CL60	Released SB-601-0484
Challenger 600	CL60	Released SB-600-0673
CL-601R C-RJ	CRJ2	Released SB-601R-34-080
CL-601R SE	CRJ2	Released SB-601R-34-080
Cessna		
Citation I (S/N 500-0275 thru -0689)	C500	Released SB-500-34-65
Citation ISP	C501	Released SB-500-34-60
CitationJet	C525	Released SB-525-34-41
CitationJet CJ2	C525A	Released SB525A-34-01
CitationJet I	C525	Released SB-525-34-40
CitationJet II	C525A	Released SB-525A-34-01 (factory option)
Citation SII	CSII	Released SB-550-34-36
Citation II (S/N 550-0002 thru -0733)	C550	Released SB-550-34-79
Citation IISP	C551	Released SB-550-34-79
Citation II Bravo	C550	Released SB-550-34-70
Citation V (S/N 560-001 thru -0259)	C560	Released SB-560-34-97
Citation V Ultra	C560	Released SB-560-34-79
Citation V Encore	C560	Factory RVSM-ready
Citation Excel	C56X	Released SL-560XL-34-02
Citation III	C650	Released SB-650-34-107
Citation VI	C650	Released SB-650-34-105
Citation VII	C650	Released SB-650-34-97
Citation X	C750	Released SB-750-34-05
Conquest	C441	TBD
**Cessna - Other Known RVSM Solutions		
Citation I	C500	Released ST01636CH (Garrett Aviation Services)
Citation ISP	C501	Released ST01637CH (Garrett Aviation Services)
Citation II	C550	Released ST01636CH (Garrett Aviation Services)
Citation IISP	C551	Released SA01637CH (Garrett Aviation Services)
Citation V	C560	Released ST01636CH (Garrett Aviation Services)
Dassault Falcon Jet		
2000	F2TH	Released SB-063
900	F900	Released SB-186
900EX	F900	Released SB-004
50	FA50	Released SB-246
50EX	FA50	Released SB-246
200	FA20	Released SB-104
20	FA20	Released SB-743
10	FA10	Expected 1Q 2003
**Falcon - Other Known RVSM Solutions		
10	FA10	Expected 3Q 2002 (Garrett Aviation Services)
20	FA20	Released ST01262CH-D (Garrett Aviation Services)
50	FA50	Released ST01047CH-D (Garrett Aviation Services)
Embraer		
ERJ 135	E135	Released SB-145-34-032
ERJ 145	E145	Released SB-145-34-032
Israel Aircraft Industries / Galaxy		
Astra / SP	ASTR	STC Available 4Q 2002
Westwind 1124	WW24	STC Expected 1Q 2003
Westwind 1124A	WW24	STC Expected 3Q 2003
Gulfstream		
G2	GLF2	Released ASC499 (aircraft equipped with SPZ-800)
G2	GLF2	Released ASC498 (aircraft equipped with SP50)
G2B	GLF2	Released ASC505 (aircraft equipped with SPZ-800)

Aircraft Type	ICAO Type Designator	Aircraft Engineering Status
Gulfstream (continued)		
G2B	GLF2	Released ASC504 (aircraft equipped with SP50)
G3	GLF3	Released ASC308
G4	GLF4	Released ASC380
G5	GLF5	Released ASC13
G-100 (Formerly Astra SPX)	G100	Released SB-1125-34-168 (Rev. 2)
G-200 (Formerly Galaxy)	G200	Released SB-GALAXY-34-022
**Gulfstream - Other Known RVSM Solutions		
G2 (aircraft equipped with SP50)	GLF2	Released ST01090LA (Garrett Aviation Services)
G2B (aircraft equipped with SP50)	GLF2	Released ST01635CH (Garrett Aviation Services)
Learjet		
20 Series	LJ23,LJ24,LJ25	None planned
31	LJ31	Expected Dec. 2002
31A	LJ31	Released SB-31-34-11
35/36 (FC200)	LJ35	Released ST00952SE
35/36 (FC530)	LJ35	Released ST00952SE
45	LJ45	Factory RVSM-ready
55	LJ55	Released ST01050SE
55 BC	LJ55	Released ST01050SE
60	LJ60	Released SB-60-34-06
**Learjet - Other Known RVSM Solutions In Development		
20 Series	LJ24,LJ25	TBD - Avcon Industries
20 Series	LJ24,LJ25	Expected 1Q 2003 - Bizjet International
20 Series	LJ24,LJ25	Expected 2Q 2003 - LSJC
20 Series	LJ24,LJ25	TBD - Spirit Wing
Lockheed		
Jetstar 731	L29B	Expected 2Q 2003
Jetstar 2	L29B	Released ST01082SE
Piaggio		
Avanti P180	P180	Expected 3Q. 2002 (U.S.)
Pilatus		
PC-12	PC12	TBD
Piper		
PA-42-1000 Cheyenne 400	PAY4	TBD
Raytheon		
Beech King Air 200	BE20	Released SB-34-3506 (ADC-85/APS-65H equipped a/c)
Beech King Air 350	B350	Released SB-34-3507 (ADC-85 equipped a/c)
Beechjet 400	BE40	TBD
Beechjet 400A	BE40	Released SB-34-343 (except 2-Tube AMS-850 equipped a/c)
Diamond MU-300	MU30	TBD
HS 125 Series 1 through 600	H25A	None planned
HS 125 Series 700 A	H25A	Expected 3Q 2002
HS 125 Series 700 B	H25A	TBD
HS 125 Series 800 and 800XP	H25B	Released SB-34-3110 (Honeywell)
HS 125 Series 800 and 800XP	H25B	Released SB-34-3166 (Collins)
HS 125 Series 1000	H25C	Released SB-34-3216
Premier I	PRM1	Expected 4Q 2002
Beech Starship 2000	STAR	TBD
**Raytheon - Other Known RVSM Solutions In Development		
HS 125 Series 700 A	H25A	Expected 2003 - Midcoast Aviation
HS 125 Series 700 B	H25A	Expected 2003 - Midcoast Aviation
Sabreliner		
NA-265	SBR2	Aircraft to be modified in accordance with FAA-Approved Drawing 65E-011-0012

**It is requested that organizations developing RVSM solutions beyond those reflected in this table provide information regarding their programs and expected availability dates to burton@cssiinc.com for inclusion in this report.*

RVSM

Reduced Vertical Separation Minimum

REFERENCES:

Web-sites:

<http://www.faa.gov>

<http://www.tc.faa.gov/act-500/niaab/drvsm/Default.asp>

<http://www1.faa.gov/fsdo/orl/files/pp/rvsm.ppt>

<http://dms.dot.gov/search/document.cfm?documentid=168451&docketid=12261>

Other:

Barfield, Inc.

Tel-Instruments

Nav-aids, Ltd.



Aero Express, Inc.

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