GSAC

AIRWORTHINESS DIRECTIVE

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Inspection and/or modifications described below are mandatory. No person may operate a product to which this Airworthiness Directive applies except in accordance with the requirements of this Airworthiness Directive.

Translation of 'Consigne de Navigabilité' ref. : 2000-080(B)
In case of any difficulty, reference should be made to the French original issue.

ALL MANUFACTURERS

Mode A/C and mode S on board transponder systems

Erroneous altitude transmission (ATA 34)

1. APPLICABILITY:

This Airworthiness Directive applied to all FAR/JAR 25 transport airplanes equipped with one or several Mode A/C or S transponders receiving the pressure altitude under GILLHAM format. A non exhaustive transponders' list is attached in exhibit 1.

These equipment could be installed - but not only - on certain DASSAULT, BOEING, AIRBUS, BOMBARDIER, BRITISH AEROSPACE, CASA, FOKKER and GULFSTREAM aircraft …

2. REASON:

Recent incident's analysis revealed inaccurate pressure altitude transmission that could result in mid-air collision between aircraft (example: Wrong ACASII order) and harms to the Air Traffic Control services.

In most cases, the type of altitude coding used was of the GILLHAM type (parallel coding). This type of coding remains the only solution to certain aircraft of the old generation.

This Airworthiness Directive will allow to verify that the pressure altitude information transmitted by installations using transponder mode A/C or S and GILLHAM altitude code are correct.

3. ACTIONS AND COMPLIANCE:

To prevent inaccurate transmission of pressure altitude information, accomplish the following actions according to the type of transponder installation:

3.1. Installation with one or several Mode A/C airborne transponders:

Within 90 days, perform the tests described in paragraph 3.4 of this AD to verify the good functioning of the altitude transmission link including transponder, cabling, and altitude origin (ADC, encoder, ...).

This verification must be performed on all transponders installed on aircraft and for all combinations transponder aircraft altitude origin.

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3.2. Installation with one Mode S transponder:

3.2.1. Mode S airborne transponder with a single altitude source under GILLHAM format

Within 90 days, perform the tests (1a to 1d) described in paragraph 3.4 of this AD to verify the good functioning of the altitude transmission link including transponder, cabling, and altitude origin (ADC, encoder, ...).

This verification must be performed on all transponders installed on aircraft.

3.2.2. Mode S airborne transponder with two altitude source under GILLHAM format

Within 90 days, perform the following test to verify the activation of the altitude comparison function:

Apply a 600-ft altitude difference between the two sources and verify that the airborne transponder show this failure in the cockpit.

3.3. Mixed installation with one airborne mode A/C transponder and one mode S transponder:

Apply paragraph 3.1 above for the mode A/C transponder,
Apply paragraph 3.2 above for the mode S transponder.

3.4. Verification of the pressure altitude transmission:

Forewords:

The following test is subject to a Statement Of Results (see § 3.5).
It must imperatively be performed in its entirety before any repair on wires or equipment declared defective.

At any time, the air data test bench utilization's and installation's procedures must be in conformance with the instructions and limitations given in the Aircraft Maintenance Manuals and the Component Maintenance Manual under test.

Test performance:

3.4.1.a Connect a Test Bench to the Capt. Air data system (System 1)

3.4.1.b Select Transponder Nbr 1 on Altitude source 1

3.4.1.c Using the test bench, apply the following altitude:

- 1,000ft
- 4,100ft
- 15,700ft
- 31,000ft

3.4.1.d For each of the altitude applied under 3.4.1 c) verify that the transponder transmitted altitude is respectively:

- 1,000ft (+/- 125ft)
- 4,100ft (+/- 125ft)
- 15,700ft (+/- 125ft)
- 31,000ft (+/- 125ft)

3.4.2.a Keeping on the altitude source 1, a pressure altitude at least 1,000 ft higher than the pressure altitude at the time and place of the tests, select the transponder Nbr1 on the altitude source 2.

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3.4.2.b Verify that the airborne transponder transmitted altitude is within +/- 125ft of the there and then ground barometric altitude.

3.4.3.a Connect a Test Bench to the F/O air data system (System 2)

3.4.3.b Select Transponder Nbr 1 on Altitude source 2

3.4.3.c Using the test bench, apply the following altitude:

- 1,000ft
- 4,100ft
- 15,700ft
- 31,000ft

3.4.3.d For each of the altitude applied under 3.4.3 c) verify that the transponder transmitted altitude is respectively:

- 1,000ft (+/- 125ft)
- 4,100ft (+/- 125ft)
- 15,700ft (+/- 125ft)
- 31,000ft (+/- 125ft)

3.4.4.a On the altitude source 2, keeping a pressure altitude at least 1,000 ft higher than the pressure altitude at the time and place of the tests, select the transponder Nbr1 on the altitude source 1.

3.4.4.b Verify that the airborne transponder transmitted altitude is within +/- 125ft of the there and then ground barometric altitude.

3.4.5. Perform the tests described from 3.4.1 a) to 3.4.4 b) selecting the transponder Nbr 2.

3.5. Results' Synthesis:

Within 30 days following the tests performance, transmit the results records to the French "Direction Générale de l'Aviation Civile (DGAC)"

By mail to the following address:
GSAC/T
14 rue Rouget de l'Isle
92441 Issy-les-Moulineaux Cedex
France

By Facsimile to: GSAC/T (33) 01 41 08 47 61

The tests must be recorded using the Form described in exhibit 2 or 3 of this AD. The Form described in exhibit 3 shall be used when the installation is in conformance with the conditions stated in § 3.2.2.
In all other cases, the Form described in exhibit 2 shall be used.

3.6. Corrective actions:

Any discrepancy discovered during a test must be corrected prior to further flight.

This AD supersedes the FAA AD 99-23-22 R1 for French registered aircraft.

EFFECTIVE DATE : MARCH 04, 2000

EXHIBIT 1

Mode A/C or mode S transponders list, but not limited to, which are likely affected.

MODELS	MANUFACTURERS
ATC2000	BECKER
ATC2000R2	BECKER
ATC3401	BECKER
AT150TSO	NARCO
AT50	NARCO
AT50A	NARCO
AT6A	NARCO
AT840	LMT
AT880R	E.A.S.
AVQ60E	R.C.A.
AVQ65	R.C.A.
AVQ65C	R.C.A.
AVQ95	R.C.A.
BCR500	BADIN CROUZET
BCR500A	BADIN CROUZET
BCR500R	BADIN CROUZET
BCR550	BADIN CROUZET
BETA5000	GENAV
GTX320	GARMIN
KT667A	EDO AIRE
KT70	ALLIEDSIGNAL
KT71	ALLIEDSIGNAL
KT75	ALLIEDSIGNAL
KT75R	ALLIEDSIGNAL
KT76	ALLIEDSIGNAL
KT76A	ALLIEDSIGNAL
KT76C	ALLIEDSIGNAL
KT78	ALLIEDSIGNAL
KT78A	ALLIEDSIGNAL
KT79	ALLIEDSIGNAL
KXP750	ALLIEDSIGNAL
KXP750A	ALLIEDSIGNAL
KXP7500	ALLIEDSIGNAL
KXP7510	ALLIEDSIGNAL
KXP755	ALLIEDSIGNAL
KXP756	ALLIEDSIGNAL
MST67A	ALLIEDSIGNAL
RADAIR250	RADAIR
RCZ833B	HONEYWELL
RCZ833D	HONEYWELL
RCZ833E	HONEYWELL
RCZ833G	HONEYWELL
RCZ850	HONEYWELL
RCZ851B	HONEYWELL
RCZ851E	HONEYWELL
RCZ851F	HONEYWELL
RCZ852	HONEYWELL

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RCZ854E	HONEYWELL

MODELS	MANUFACTURERS
RCZ854G	HONEYWELL
RT1060A	ARC
RT359A	ARC
RT360A	ARC
RT459A	ARC
RT506A	ARC
RT667	EDO AIRE
RT667A	EDO AIRE
RT777	EDO AIRE
RT859A	ARC
TDR90	ROCKWELL COLLINS
TDR94	ROCKWELL COLLINS
TDR94D	ROCKWELL COLLINS
TDR950	ROCKWELL COLLINS
TDR950L	ROCKWELL COLLINS
TPR610	ALLIED SIGNAL
TPR710A	ROCKWELL COLLINS
TPR720	ROCKWELL COLLINS
TPR720	ROCKWELL COLLINS
TPR900	ROCKWELL COLLINS
TP114B	SPERRY
TRA61A	ALLIEDSIGNAL
TRA61AL	ALLIEDSIGNAL
TRA63A	ALLIEDSIGNAL
TRA67A	ALLIEDSIGNAL
TR2061A	ALLIEDSIGNAL
TR421A	ALLIEDSIGNAL
TR421B	ALLIEDSIGNAL
TR641A	ALLIEDSIGNAL
TR641B	ALLIEDSIGNAL
TR661A	ALLIEDSIGNAL
TSR718	T.R.T
TSR718S	T.R.T
XS950	HONEYWELL
1014A	WILCOX
621A3	ROCKWELL COLLINS
621A6	ROCKWELL COLLINS
621A6A	ROCKWELL COLLINS
814B	WILCOX
914A	WILCOX
914B	WILCOX

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EXHIBIT 2

Statement Of Results following AD 2000-080(B) accomplishment

Workshop/Repair Station having applied this AD
(Name and Certification Number): .....

Airplane Type: .....

Serial Number: .....

Registration Number: .....

24 Bit OACI Tag Number (if given): .....

Installation's Description:

Equipment	Reference (Trade Name, P/N , and Serial Number):
Transponder #1	
Transponder #2	
Altitude Source #1	
Altitude Source #2	

Verification of the transmitted altitude accuracy

Transponder #1	Altitude Source #1		
Transponder Altitude Source selection	Altitude given by the Test Bench on Altitude Source #1	Transponder transmitted Altitude (ft)	Error (ft)
Source #1	1000 ft		
Source #1	4100 ft		
Source #1	15700 ft		
Source #1	31000 ft		
Source #2	> by 1000 ft from the source #2		

* The Altitude source 2 is the barometric altitude at the test place and time.

Transponder #1	Altitude Source #2		
Transponder Altitude Source selection	Altitude given by the Test Bench on Altitude Source #2	Transponder transmitted Altitude (ft)	Error (ft)
Source #2	1000 ft		
Source #2	4100 ft		
Source #2	15700 ft		
Source #2	31000 ft		
Source #1	> by 1000 ft from the source #1		

* The Altitude source 1 is the barometric altitude at the test place and time.

Transponder #2	Altitude Source #1		
Transponder Altitude Source selection	Altitude given by the Test Bench on Altitude Source #2	Transponder transmitted Altitude (ft)	Error (ft)
Source #1	1000 ft		
Source #1	4100 ft		
Source #1	15700 ft		
Source #1	31000 ft		
Source #2	> by 1000 ft from the source #2		

* The Altitude source 2 is the barometric altitude at the test place and time.

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EXHIBIT 2 (continued)

Transponder #2	**Altitude Source #1**		
Transponder Altitude Source selection	Altitude given by the Test Bench on Altitude Source #2	Transponder transmitted Altitude (ft)	Error (ft)
Source #2	1000 ft		
Source #2	4100 ft		
Source #2	15700 ft		
Source #2	31000 ft		
Source #1	> de 1000 ft à la source #1		

* The Altitude source 1 is the barometric altitude at the test place and time.

Describe the cause of the discrepancy or discrepancies (if any occurred):

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EXHIBIT 3

Statement Of Results following AD 2000-080(B) accomplishment

Workshop/Repair Station having applied this AD
(Name and Certification Number): .....

Airplane Type: .....

Serial Number: .....

Registration Number: .....

24 Bit OACI Tag Number (if given): .....

Installation's Description:

Equipment	Reference (Trade Name, P/N and Serial Number):
Transponder #1	
Transponder #2	
Altitude Source #1	
Altitude Source #2	

Verification of the altitude comparison function.

Is the function installed and wired on the aircraft:

YES ☐ NO ☐

Failure Warning verification following a 600 ft difference between two Altitude sources:

Failure Warning:

YES ☐ NO ☐

Type of Warning:

Describe the cause of the discrepancy or discrepancies (if any occurred):