



Installation Instructions

for

TRT800A / TRT800H Mode S Transponder

Installed in an Aircraft as listed in List of EASA Certified Aircraft Subjected to the Minor Change: "Replacement of Existing Transponder with TRT800A or TRT800H Mode S Transponder, Doc. No.: DWG 145.0079-ACLIST-800H/A-3, Latest Revision"

DWG 145.0079-GEN23-800AH-3 Rev. 1.00

Prepared.	Klaus Jaegel	08.052008	
Checked:			



Table of Contents

1.	SHORT DESCRIPTION	3
2.	REFERENCE DOCUMENTS	3
3.	GENERAL WORKING PROCEDURES.....	4
4.	DETERMINATION OF THE INITIAL STATE	4
5.	REMOVAL OF THE EQUIPMENT TO BE REPLACED	4
6.	INSTALLATION OF THE NEW EQUIPMENT	5
7.	DOCUMENTATION AND RELEASE.....	7

Drawing List

Title	Drawing Number
Wiring KT76A-A30	DWG No. 145.0079-76A-100
Wiring KT76A-8140B	DWG No. 0079-76A-101
Wiring AT150-A30	DWG No. 0079-150-105
Wiring AT150-8140B	DWG No. 0079-150-106
Wiring RT777-8140B	DWG No. 0079-777-107
Wiring RT777-A30	DWG No. 0079-777-108
Wiring ATC2000-A30	DWG No. 0079-2000-109
Wiring ATC2000-8140B	DWG No. 0079-2000-110
Installation Instruction TRT800A / TRT800H	DWG No. 145.0079-GEN23-800A-3
Installation Drawing TRT800A	DWG No. 145.0079-800A-2
Installation Drawing TRT800H	DWG No. 145.0079-800H-2
Pitot / Static TRT800A/H	DWG No. 145.0079-800A/H-113
Wiring TRT800A/H	DWG No. 145.0079-800A/H-103



1. SHORT DESCRIPTION

This installation instruction describes the change of the transponder-system installed in the aircraft. The existing A/C transponder and the existing blind encoder will be removed and replaced by installation of a Mode S Transponder TRT800A or TRT800H.

The existing and approved transponder antenna will be used at the approved installation position for the Mode S Transponder.

2. REFERENCE DOCUMENTS

Aircraft List

List of EASA Certified Aircraft Subjected to the Minor Change: "Replacement of Existing Transponder with TRT800A or TRT800H Mode S Transponder, Doc. No.: DWG 145.0079-ACLIST-800H/A-3, Latest Revision"
--

Equipment Manuals

Manual Installation and Operation Mode S Transponder TRT800A, Document Number 03.2111.010.71
Manual Installation and Operation Mode S Transponder TRT800H, Document Number 03.2121.010.71

Installation Drawing

Installation Drawing TRT800A	DWG No. 145.0079-800A-2
Installation Drawing TRT800HA	DWG No. 145.0079-800H-2

Wiring Diagram

Wiring TRT800A/H	DWG No. 145.0079-800AH-103
------------------	----------------------------

Pitot / Static

Pitot / Static TRT800A/H	DWG No.145.0079-800AH-113
--------------------------	---------------------------

Ground Test

Ground Test Report	.GEN23-230408-01-GTR-02 Rev. 1-00
--------------------	-----------------------------------

Basic Documents

FAA AC-43.13-1B	Aircraft Inspection and Repair
FAA AC-43.13-2A	Acceptable Methods, Techniques, and Practices - Aircraft Alterations
CAP 457	Approved Aerial Positions, Civil Aviation Authority, ISBN 0 86039 546 4, Fifth edition April1993, Reprinted May 2002



3. GENERAL WORKING PROCEDURES

All work shall be performed following the general guidelines given in documents FAA AC-43.13-1B, Aircraft Inspection and Repair, and FAA AC-43.13-2A, Acceptable Methods, Techniques, and Practices - Aircraft Alterations.

4. DETERMINATION OF THE INITIAL STATE

Check that the present aircraft is airworthy and the aircraft is in conformity with the state of the last inspection.

Check that the transponder antenna is installed at an approved position.

5. REMOVAL OF THE EQUIPMENT TO BE REPLACED

5.1.1 Preparation of the Aircraft

Disconnect the negative power supply line from the aircraft battery.

Pull the circuit-breaker for the transponder power supply.

Remove equipment from the instrument panel as required for accomplishing the change.

Remove all covers required to get access to the equipment for the work to be accomplished.

5.1.2 Removal of the Equipment to Be Replaced

Remove the mounting tray of the transponder to be replaced.

Remove the coaxial connector from the coaxial antenna line. Leave the coax line as long as possible.

Identify and mark the positive and negative power supply lines according to drawing Wiring KT76A-A30 DWG No. 145.0079-76A-100. Cut these lines as near as possible at the unit connector of the transponder to be replaced.

In case a DME is installed in the aircraft and the DME Suppression Line is used, identify and mark this line. Cut this line as near as possible at the unit connector of the transponder to be replaced.

5.1.3 Removal of the Blind Encoder

If the installed Blind Encoder is supplying data only to the transponder, remove the Blind Encoder, as it will no longer be required for operation of the new Transponder TRT800A. Remove the complete Blind Encoder wiring.



6. INSTALLATION OF THE NEW EQUIPMENT

6.1 Mechanical Installation

The mechanical installation of the Mode S Transponder TRT 800A / TRT800H shall be accomplished according to the following documents:

Installation Drawing TRT800A	DWG No. 145.0079-800A-2
Installation Drawing TRT800H	DWG No. 145.0079-800H-2
Wiring TRT800A/H	DWG No. 145.0079-800A/H- 103
Pitot / Static TRT800A/	DWG No.145.0079-800A/H-113
Manual Installation and Operation Mode S Transponder TRT800A	Document Number 03.2111.010.71
Manual Installation and Operation Mode S Transponder TRT800H	Document Number 03.2121.010.71

6.2 Electrical Installation of TRT800A or TRT800H

NOTE: If a DME system is installed in the aircraft, connecting the DME Suppression Line to the transponder is required.

6.2.1 Converting the „ADDRESS“ Connector P/N 800EM

The connector P/N 800EM for **TRT800A / TRT800H** is supplied with three wires connected:

- 1.) one red wire for + 13,75 / 27,5 VDC
- 2.) one blue wire for GND Minus
- 3.) one brown wire for illumination..

The brown wire is not required for installation of the TRT800A, as the transponder has no control input for the display backlight illumination,
Remove this brown wire from pin 14 of the connector and solder it to pin 13 (Suppression in /out).

6.2.2 Installation of the Connectors

Splice the negative power supply line (as marked in paragraph 5.1.2) with the blue wire of the new connector

Splice the positive power supply line (as marked in paragraph 5.1.2) with the red wire of the new connector

If a DME system is installed in the aircraft, connect the DME Suppression Line to the brown wire previously soldered to pin 13 of the equipment connector (para. 5.1.2).

Connect the new TNC connector to the coaxial antenna line by crimping.



6.3 Change of Static Pressure Port

Connect the existing pitot-static of the removed encoder to the static port of the transponder. If necessary, extend the length of the pitot-static of the Blind Encoder using suitable tubing (silicone tubing having 5 mm inner diameter and 1.5 mm insulation thickness) and connect it to the static port of the transponder.



7. DOCUMENTATION AND RELEASE

7.1 Ground Test Prior to Connecting the Transponder

Prior to connecting the new equipment conduct the following test using a multimeter:

- 1.) Check conductivity between the blue wire and aircraft ground..
- 2.) Connect the negative power supply line to the aircraft battery Push the circuit-breaker for the transponder power supply, Check that the power supply voltage 13,75/27,5 VDC is present at the red wire.
- 3.) Check that no conductivity is between the center conductor and the outer conductor of the coaxial antenna connector exists.

7.2 Preparation for Ground Test

Conduct the configuration procedure following the procedure given in paragraph 3.2 of Manual Installation and Operation Mode S Transponder TRT800A, Document Number 03.2111.010.71, resp. Manual Installation and Operation Mode S Transponder TRT800H, Document Number 03.2121.010.71. Store the 24-Bit-Aircraft Address issued by the National Aviation Authority.

7.3 Ground Test after Installation

The new installation shall be tested by a Maintenance Inspector Class 1 or B2 according to the requirements for Mode S Transponder. This test includes a transponder test using a ramp test equipment, pitot / static verification, encoder test, bonding and EMI testing.

7.4 Pitot-Static System Integrity Test

Connect an air data test set to the Pitot / Static source.

Set the air data test set to a pressure altitude 1000 ft. above the aircraft elevation at the time of test. Maintain the pressure for at least one minute without pumping. Verify that the loss of reported altitude does not exceed 100 ft.

7.5 Encoder Test

Connect an air data test set to the Pitot / Static source.

Set the air data test set to each of the pressure altitude values given in the table below:

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

For each selected altitude, verify that the Mode C and Mode S altitude reporting is within tolerance (± 125 feet), and record the altitude reported in the Ground Test Report.:



7.6 EMI Test

- a) Check for mutual interference of the Mode S Transponder against other aircraft radio systems as follows:
- b) Set the VHF COMM to 127.500 MHz and monitor the receiver output with volume set to a medium value.
- c) Using a transponder ramp test equipment, interrogate the transponder in Mode S (UF4) at 50 interrogations per second. The reply ratio shall be at least 99 %.
- d) Verify that the audio output is not disturbed by interference generated from the transponder emissions.
- e) Key the VHF COMM transceiver and, speaking into the microphone, verify that the transponder reply ratio does not decrease when the VHF COMM is transmitting.
- f) Repeat steps b) to e) using test frequencies 118.000 MHz and 136.975 MHz.
- g) If the aircraft has dual COMM installation, repeat steps b) to f) for the second COMM.



GROUND TEST REPORT GEN23-230408-01-GTR-02 Rev. 1-00

Test Object: Mode S Transponder Filter TRT800A/TRT800H **S/N:** _____

Aircraft registration number

Date of Test:

Test Results

Test:	Mode A/C Timing		PASS/FAIL
Parameter:	Measured:	Expected:	Result:
Mode A/C F1 width (ED-73B, 6.4.3.3)	us	0.35 us ... 0.55 us	PASS/FAIL
Mode A/C F2 width (ED-73B, 6.4.3.3)	us	0.35 us ... 0.55 us	PASS/FAIL
Test:	Mode S Aircraft Address		PASS/FAIL
Parameter:	Measured:	Expected:	Result:
UF11 assigned ICAO addr. (ED-73B, 6.4.3.9 a)		Assigned Aircraft Address	PASS/FAIL
UF 4 Replies to assigned address (ED-73B, 6.4.3.9 b)		1 ... 10	PASS/FAIL
UF 5 Replies to assigned address (ED-73B, 6.4.3.9 b)		1 ... 10	PASS/FAIL

Test:	Maximum Air Speed		PASS/FAIL
Parameter:	Measured:	Expected:	Result:
Indicated Airspeed RI (ED-73B, 6.4.3.10)		10 (75 kt ... 150 kt)	PASS/FAIL

Test:	Aircraft ID		PASS/FAIL
Parameter:	Measured:	Expected:	Result:
Aircraft ID (ED-73B, 6.4.3.12)		<<Aircraft ID>>	PASS/FAIL

Test:	TX Power		PASS/FAIL
Parameter:	Measured:	Expected:	Result:
Mode A/C Tx Power (ED-73B, 6.4.3.8)	dBW	21 ... 27 dBW	PASS/FAIL
ModeS Tx Power (ED-73B,	dBW	21 ... 27 dBW	PASS/FAIL



6.4.3.8)			
----------	--	--	--

Test:	Reply Frequency		PASS/FAIL
Parameter:	Measured:	Expected:	Result:
Mode A/C Reply_Frequency (ED-73B, 6.4.3.1)	MHz	1089 ... 1091 MHz	PASS/FAIL
Mode S Reply Frequency (ED-73B, 6.4.3.1).	MHz	1089 ... 1091 MHz	PASS/FAIL

Test:	RX Sensitivity		PASS/FAIL
Parameter:	Measured:	Expected:	Result:
Mode A MTL (ED-73B, 6.4.3.7 a)	dBm	-77 dBm ... -69 dBm	PASS/FAIL
Mode C MTL (ED-73B, 6.4.3.7 a)	dBm	-77 dBm ... -69 dBm	PASS/FAIL
Mode S MTL (ED-73B, 6.4.3.7 b)	dBm	-77 dBm ... -71 dBm	PASS/FAIL

Test:	Pitot-Static System Integrity		PASS/FAIL
Selected altitude	Change in indicated altitude		Tolerance
1,000 ft. above aircraft elevation		ft.	±100 ft.
Test:	Encoder Test		PASS/FAIL
Selected altitude	Mode C report	Mode S report:	Tolerance
1,000 ft.	ft.	ft.	±125 ft.
4,100 ft	ft.	ft.	±125 ft.
15,700 ft	ft.	ft.	±125 ft.
31,000 ft.	ft.	ft.	±125 ft.

EMI Test Result

The COMM receiver audio output is not disturbed by interference caused by transponder emissions. Requirement: No interference.

The transponder reply ratio does not decrease when VHF COMM is transmitting. on 118.000 MHz, 127.500 MHz and 136.375 MHz. Requirement: The reply ratio shall be at least 99 %.

Ground Test performed on _____ Inspector: _____