TRT800

ATC Transponder Mode A, A-C, S

P/N 800ATC-(1XX)-(1XX)

Operation Manual

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Record of Revisions

Revision	Date	Affected Page(s)	Description of Change
1.0	19.4.06	all	Initial release

Record of Service Bulletins

ON RECEIPT OF SERVICE BULLETINS, INSERT SERVICE BULLETINS IN THE MANUAL, AND ENTER DATE INSERTED AND INITIALS.				
SB Number	REV No.	Date	Insertion Date	Inserted by

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1 GENERAL INFORMATION

The TRT800 is a Level 2es Class 2 (SSR Mode S Elementary and Enhanced Surveillance Transponder) approved up to a maximum altitude of 15,000 ft and a maximum cruising TAS of 175 knots. It has Mode A, Mode A/C and Mode S capability. In Mode S the transponder provides acquisition and extended squitter capability. Furthermore, the TRT800 has a built-in barometric pressure altitude coder.

Safety symbols:

This manual uses the following symbols to point out specific information:

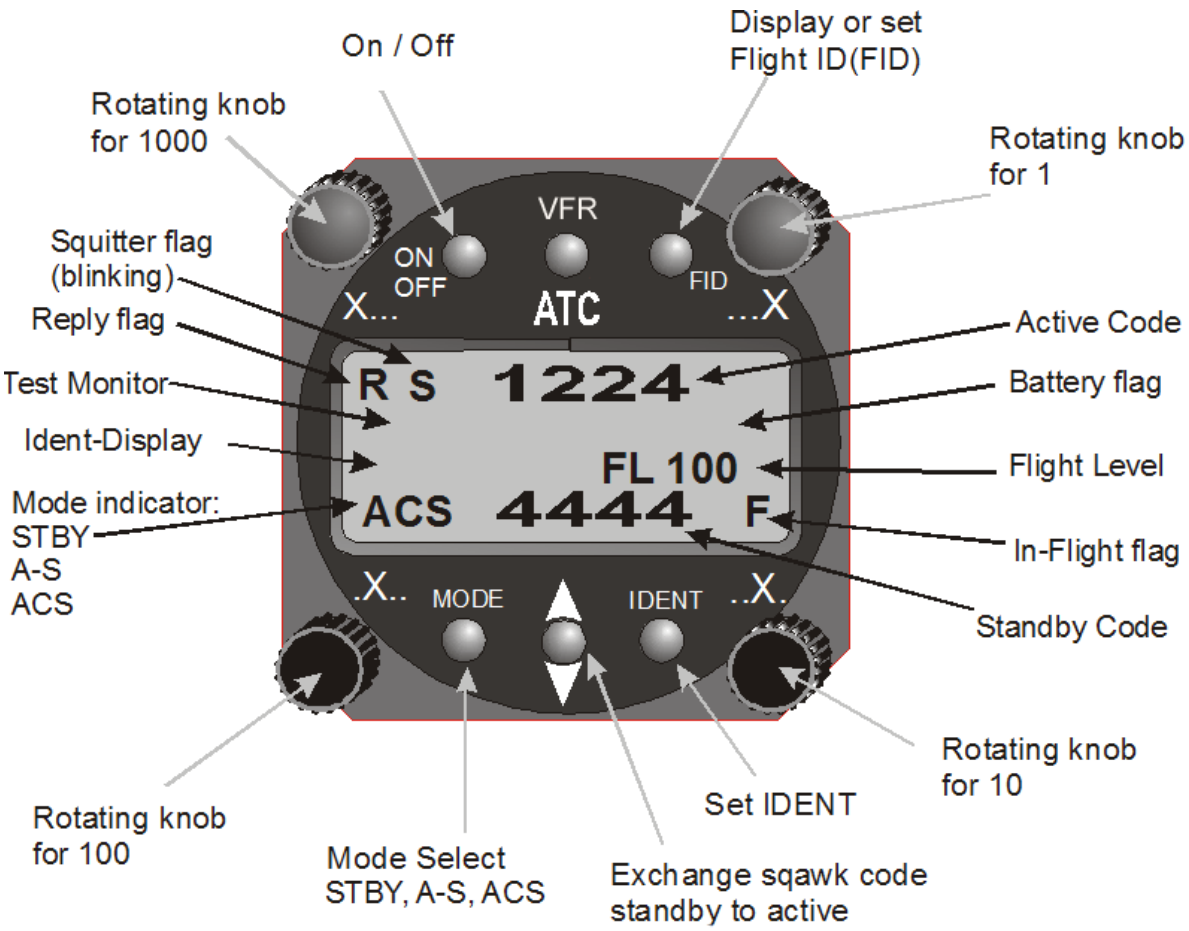
	Warning Identifies an instruction which, if not followed, may cause serious injury including the possibility of death.

	*Caution* Denotes an instruction which, if not followed, may severely damage the equipment or other component.

	*Note* Indicates supplementary information which may be needed to fully complete or understand an instruction.

The following illustration of the front panel of the TRT800 and the different display configurations will assist the operator to understand this Mode S Transponder.

2 FRONT PANEL OPERATION



The input elements consist of four rotating knobs and six push buttons.

2.1 Rotating knobs

Four rotating knobs are used to select the Sqawk code. The assignments **X… , .X.. , ..X. , …X** indicate the position of the code number set by each knob.

2.2 Push buttons

ON OFF

The unit can be turned **on** by pressing the **ON OFF** button for less then 1 second.

The unit can be turned **off** by pressing the **ON OFF** button for more then 2 seconds.

MODE

The following modes can be selected in sequence by pressing the **MODE** button:

- **STBY** Standby Mode used for aircraft on ground with reduced squitter rate, only Mode S with altitude reporting all ZERO only
- **A-S** Mode A active with Mode C frames only and Mode S with altitude reporting all ZERO only
- **ACS** Mode A ,C and S active

⇳

To activate the selected SQAWK CODE from the lower standby line to the upper active position, press the button with the up/down arrows ⇳ .

IDENT

Shortly pressing the **IDENT** push button causes the special position identification pulse (SPI) to be transmitted for a period of 18 seconds.

VFR

Shortly pressing the **VFR** push button activates VFR sqawk 0021 below 5,000 ft., resp. 0022 above 5,000 ft. The VFR sqawk changes automatically when climbing above or descending below 5,000 ft. Pressing the VHR buttom again activates the international VFR code 7000. When switched off, the transponder memorizes the VFR code that was set last.

FID

In the **STBY** Mode, the Aircraft Identification (Flight Identification) and Aircraft Address can be checked by pressing the push button **FID**. The Flight Identification is displayed on the right side of the lower line. By pressing the button **FID** for more than 3 seconds the input mode can be set or the Flight Identification can be changed.

2.3 Flags

Squitter Flag

When the extended squitter is active the letter **S** is displayed on the left top side of the display. As the squitter is transmitted periodically, the displayed **S** is blinking.

Reply Flag

In case of the transponder replying to interrogations the letter **R** is displayed on the left top side of the display.

In-Flight Flag

When there is an On-ground switch installed, the display will toggle between the letters **F** whether the aircraft is in the In-flight condition or the letter **G** whether the aircraft is in the “on-ground” condition. The flag is displayed on the right bottom side of the display.

Battery Flag

If the power supply to the transponder drops below 10 Volts, the flag **BAT** appears and starts flashing.

3 SYSTEM OPERATION

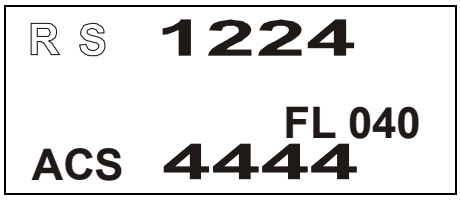
The Transponder should be turned off before starting or shutting down aircraft engines.

3.1 ON /OFF

The unit is turned on by pressing the button ON/OFF for less then one second. The display will first show the transponder type and the software and firmware version.

To turn off the unit the button ON/OFF must be pressed for more than two seconds.

ACS is the default operation mode and the transponder replies to Mode A,C and S interrogations.



The pressure altitude will be displayed as Flight Level. (Flight Level is a term to indicate that the altitude is not true altitude, but barometric altitude referenced to 1013hPa , which is not corrected for local pressure.

For example, FL 070 corresponds to a pressure altitude of 7000 ft.

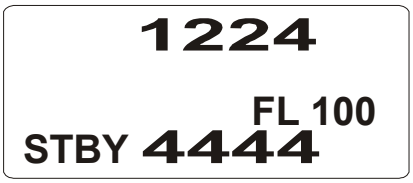
3.2 SQAWK SELECTION

SQAWK selection is done using the four rotating knobs to provide 4096 identification codes. The assignments of the knobs, starting at top left, are:

X… selection of thousands (0-7)
.X.. selection of hundreds (0-7)
..X. selection of ten (0-7)
…X selection of one (0-7)

The code is entered in the lower line and remains inactive .The SQAWK is activated after it is transferred to the upper line by pressing the button ⇳

3.3 STANDBY MODE



The standby mode is activated by pressing the MODE button once. This sets STBY in the Flight status field. The transponder will now only reply to direct addressed Mode S interogations.

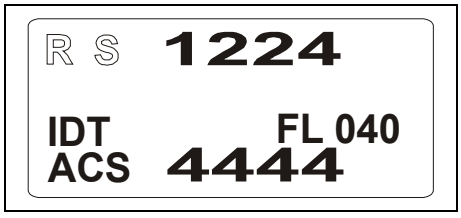
The squitter remains active at a lower rate. If the transponder is wired to the “aircraft on-ground” -switch the transponder automatically switches to standby.

3.4 ALTITUDE OFF

Switching off altitude reporting will be necessary if requested by the ATC controller.

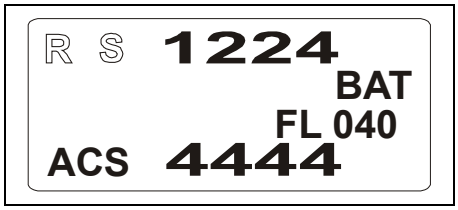
For switching off altitude reporting the **MODE** button has to be pressed until **A-S** is displayed. The altitude display shows **FL ----** to indicate that the altitude reporting is not active. Now the transponder will reply on Mode C interrogations with Mode C frames only and Mode S interrogations with FL000 (= 0000ft) instead of the actual altitude.

3.5 IDENT



Pressing the “IDT” push button causes the special position identification pulse (SPI) to be appended to Mode A replies for a period of 18 seconds and IDT is shown in the display.

3.6 LOW POWER SUPPLY

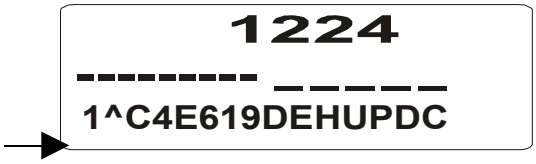


If the power supply voltage of the transponder drops below 10 Volts, the flag “BAT” appears and starts flashing.

3.7 AIRCRAFT ADDRESS

DISPLAYING AIRCRAFT ADDRESS AND FLIGHT IDENTIFICATION

Aircraft address
= 6 digits
Aircraft Category
= 2 digits
e.g. 19 for gliders



Flight Identification=
7 digits

By pressing, the "**FID**" button for less than 3 seconds, while the unit is in **STBY**-mode, the left side of the bottom line will show the aircraft address. The aircraft address has to be entered as part of the installation procedure (refer to Installation Manual). This Address is stored in the aircraft connector that is part of the installation and the pilot should not change it. The transponder can be exchanged without entering a new address as the Address Code forms part of the aircraft installation.

	Note *Only an authorized service station is allowed to enter or change the ICAO aircraft address. If you do not have the ICAO aircraft address please refer to your national aviation authority to apply for your aircraft address.*

The Aircraft Identification (FID) code is displayed on the right bottom line and consists of seven alphanumerical characters.

	Caution The ICAO Flight Plan specifies only 7 characters as Flight Identification. Filser reserves 8 characters as stated in ED-73B for further expansion of the flight plan. The user shall only program 7 characters for FID. See guiding instructions below.

3.8 GUIDANCE FOR ENTERING FLIGHT IDENTIFICATION

ICAO Document 8168-OPS/611 Volume I (Procedures for Air Navigation Services) requires that flight crew of aircraft equipped with Mode S shall set the aircraft identification, commonly called Flight-ID, into the transponder. This is necessary to ensure that the correlation between flight plan and radar data will work automatically.

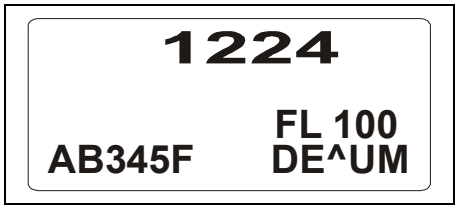
The Flight-ID setting is required to correspond to the aircraft identification that has been specified at item 7 of the ICAO flight plan and consists of no more than seven charters. If the aircraft identification consists of less than seven characters, it shall be entered left-aligned with blanks added.

For an aircraft using a company call sign, the Flight-ID consists of the ICAO three-letter designator for the aircraft operator, followed by an identification code, e.g. KLM511, BAW213, JTR25.

If no company call sign is used or even no flight plan is filed, the Flight-ID to be set consists of the registration marking (tail number) of the aircraft, e.g. GXXXX, 4XBCD, DEABC. DO NOT use additional zeros, spaces or dashes, and do not use dashes even if they are included in the aircraft registration marking (tail number).

3.9 SELECTING FLIGHT IDENTIFICATION

By pressing the button “**FID**” for more than 3 seconds, the unit will change into the Flight Identification input menu. This FID code is a changeable alphanumerical flight number.



The right lower knob is used to set the cursor position (flashing ^) and with the left lower knob the figures A..Z, blank, and 0..9 can be selected.

To enter the code, press the MODE button or the **FID** button again.

The FID code is stored in the external aircraft connector.

a. Factory setting for the FID is **ZZZZZZZ**
b. The authorized service station should program a default FID that can be the tail-number of the aircraft.
c. The pilot has to change the FID manually if necessary.

3.9.1 ERROR REPORTING / FAULT CODES

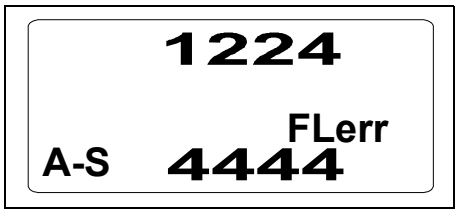
The transponder receiver, transmitter, altitude encoder and power supply functions are monitored periodically. This monitoring routine is permanently active in the background.

If any error occurs due to an internal malfunction or from an external disturbance at the antenna, the transponder changes to the STANDBY mode and "**Error**" is displayed on the lowest line.

Additionally the result of the internal analysis is displayed in the second line.

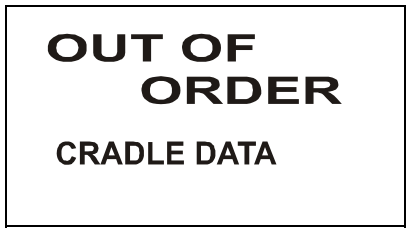
3.10List of possible errors:

1. "**ANT**" will appear if the antenna is defective (e.g. broken cable).
2. "**FLerr**" instead of the altitude appears on the display, if there is an error with the altimeter or if the aircraft is outside the altitude range(FL-010 to FL350). If the mode ACS was active before, it will change to mode A-S automatically.



3. "**DC**" for a faulty transmitter power supply
4. "**FPG**" for internal communication errors,
5. "**TRX**" will appear for transmitter error. In this case, the unit will change to "STBY" and will stop all transmission.

To meet ICAO specifications the TRT800 uses an external memory inside the aircraft connector housing of the cable set, which is a part of the aircraft.



Because this cable is installed permanent into the aircraft, a change of the transponder will not affect the aircraft address and the Flight ID. In the event there is a Cradle error, (empty memory or

data error) “OUT OF ORDER” will be displayed .The first line shows which kind of error is present:

Cradle OFF displayed meens no or defective data.

Cradle Data displayed meens digital checksum error.

After a few seconds the display shows normal operating condition but with inhibited Mode S. The transponder will operate in Mode A/C only.

You will need to consult an authorized service station to enter the ICAO aircraft address (see TRT800 Installation Manual). Please consult your airworthiness authority for national procedures.

Note

If no valid ICAO 24 bit aircraft address is programmed to the unit or if the memory is inoperative the transponder will inhibit the Mode S functions. In this case only Mode A/C function will be available**.**

4 COMMON AND EMERGENCY ID CODES

The following emergency codes should be noted:

7500	Hijacking
7600	Loss of communication
7700	Emergency

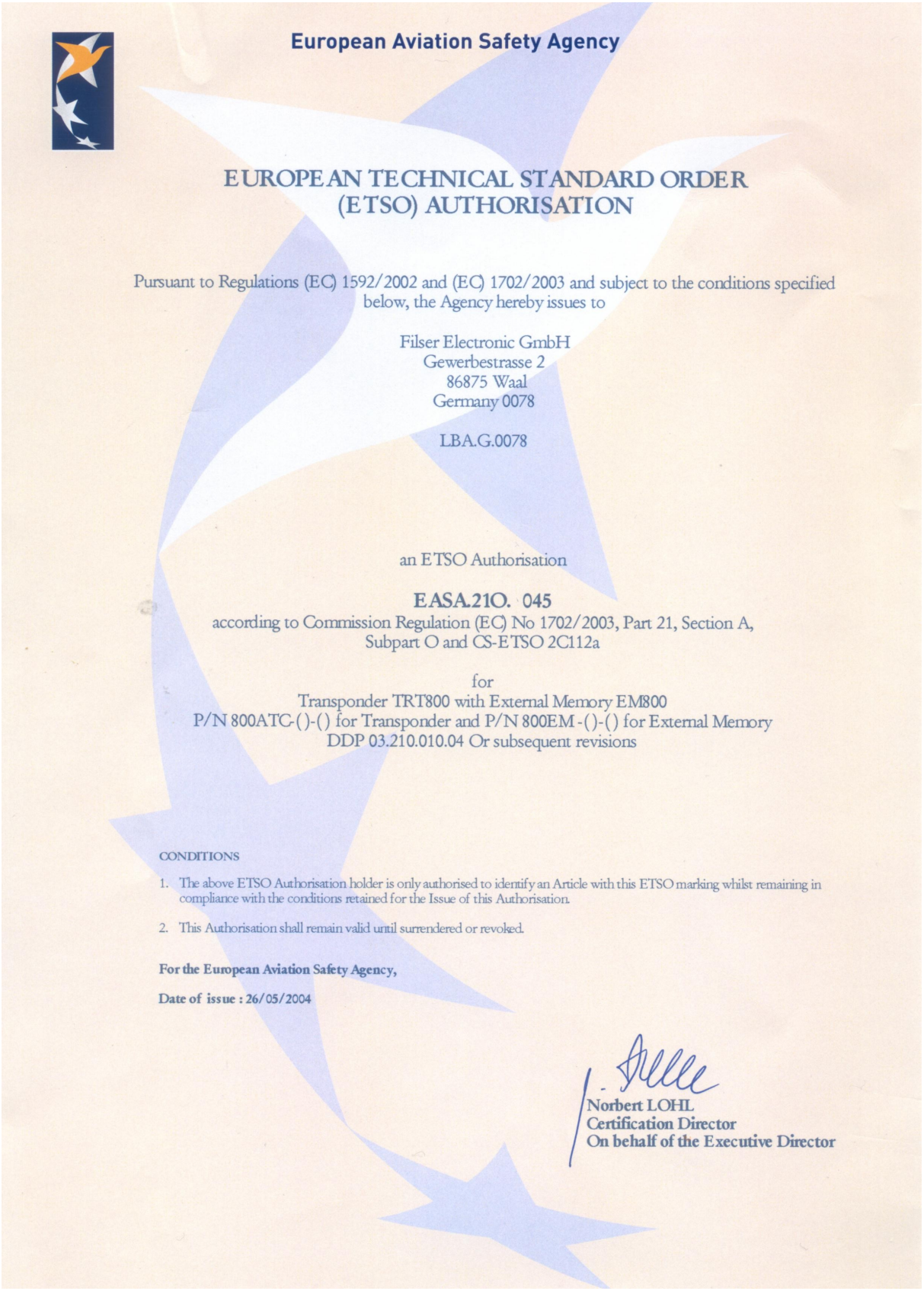
Common ID Codes*:*

0022	Select in case of VFR flight above 5000ft MSL or 3500ft above GND (the higher value counts).
0021	Select in case of VFR flight below 5000ft MSL (except airfield pattern).
0032	Select in identification areas along borderlines.

Note

Codes 0022, 0021 and 0031 are country-dependent, please consult your national airworthiness authority for national procedures.

5 Approval



European Aviation Safety Agency

EUROPEAN TECHNICAL STANDARD ORDER
(ETSO) AUTHORISATION

Pursuant to Regulations (EC) 1592/2002 and (EC) 1702/2003 and subject to the conditions specified below, the Agency hereby issues to

Filser Electronic GmbH
Gewerbestrasse 2
86875 Waal
Germany 0078

LBA.G.0078

an ETSO Authorisation

EASA.21O. 045
according to Commission Regulation (EC) No 1702/2003, Part 21, Section A, Subpart O and CS-ETSO 2C112a

for
Transponder TRT800 with External Memory EM800
P/N 800ATC-()-() for Transponder and P/N 800EM-()-() for External Memory
DDP 03.210.010.04 Or subsequent revisions

CONDITIONS

1. The above ETSO Authorisation holder is only authorised to identify an Article with this ETSO marking whilst remaining in compliance with the conditions retained for the Issue of this Authorisation.
2. This Authorisation shall remain valid until surrendered or revoked.

For the European Aviation Safety Agency,

Date of issue : 26/05/2004

Norbert LOHL
Certification Director
On behalf of the Executive Director