SECTION 9

Pilot's Operating Handbook Supplement AS-24

Air Traffic AT-1
Traffic-Sensor with Display ATD-57

This supplement is applicable and must be integrated into the Airplane Flight Manual if an AIR Traffic AT-1 with Display ATD-57 from Garrecht Avionik GmbH / Air Avionics is installed into the AQUILA. Information in this supplement compliments or replaces chapters in the basic Airplane Flight Manual.

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Date, Signature Office of Airworthiness

0.1 RECORD OF REVISIONS

Issue	Reason for Change	Affected Pages	Date of Issue
A.01	Initial Issue	all	30.05.2019

0.2 LIST OF CURRENT PAGES

Page	Issue	Date		Page	Issue	Date
1 - 8	A.01	30.05.2019				

0.3 TABLE OF CONTENTS

1. General

1.1. Introduction

The information found in this Airplane Flight Manual Supplement is to be used alongside the basic Airplane Flight Manual.

This Airplane Flight Manual Supplement contains additional information required for the safe operation of an AQUILA equipped with an AIR Traffic AT-1 and its display ATD-57.

The chapters of this Airplane Flight Manual Supplement follow the same structure as the basic Airplane Flight Manual. Only the chapters listed in this document are affected by the installation of the AIR Traffic AT-1.

For further information and comprehensive operating instructions, please reference the current issue of the AIR Traffic AT-1 and ATD-57 user manuals and the user manuals of the avionic units optionally connected to the AIR Traffic AT-1. Please keep in mind that the user and operating manuals must be kept on board the aircraft and be accessible to the pilot at all times. It is the pilot's responsibility to familiarize him or herself with the operation, characteristics and limitations of the AIR Traffic AT-1 System.

It can not be guaranteed, that other avionics, connected to the AIR Traffic AT-1 System, e.g. MFD´s will remain compatible in the future due to soft- / hardware changes in these devices, which is out of the influence of Air Avionics company.

2. Operating Limitations

Using AIR Traffic AT-1 may impose significant workload on the fight crew if not adequately familiar with AT-1 and trained on its use. In order to use the AT-1 effectively, familiarization with the unit's capabilities, limitations, and modes of operation is essential.

WARNING

Do not fly with AIR Traffic AT-1 if you are unfamiliar with its use and limitations!

The operating limitations of the aircraft are in no way affected by the installation of the AIR Traffic AT-1.

The AIR Traffic AT-1 is optional equipment. Its failure is not critical in any phase of flight.

The AIR Traffic AT-1 System is to be used as aid for situational awareness only.

Decisions in flight may not be based solely on visual or acoustic information generated by the AIR Traffic AT-1. The AIR Traffic AT-1 offers no Resolution Advisories (RA).

The AIR Traffic AT-1 can only display aircrafts equipped with a FLARM, a FLARM compatible device, an ADS-B Out or active (interrogated from ATC or an active TAS) Mode-S Transponder. The AIR Traffic AT-1 itself can not request transponder replies. All other aircrafts will not be detected by the AIR Traffic AT-1.

Mode-S Transponder with deactivated altitude mode and all Mode-A/C Transponder can not be detected.

Mode-S Transponder signals include no position data so the AIR Traffic AT-1 can only estimate the distance based on signal strength.

Devices not updated onto the actual FLARM software will not be displayed to and also get no display of other FLARM targets!

AIR Traffic AT-1 will warn only of the target that it has calculated to be most dangerous. It may not always be able to give reliable warnings based on the relative bearing.

AIR Traffic AT-1 is not able to recognize all traffic, terrain or obstacles dangerous to the own aircraft, only a fraction can be detected.

AIR Traffic AT-1 may under certain conditions give false warnings or may give no warning at all. It may be defective or faulty.

It remains the sole responsibility of the pilot to maintain a complete picture of the actual situation in flight. Factors such as position, direction of flight, local traffic, obstacles, terrain, and weather must all be considered before any evasive action is initiated. Use of the AIR Traffic AT-1 may under no circumstances lead to changes in pilot behavior or habits.

The frequencies used by the FLARM system are restricted in some countries. It is therefore the pilot's responsibility to make sure that these frequencies are unrestricted before entering that countries airspace. If this is not the case, the AIR Traffic AT-1 must be switched off by pulling the circuit breaker "**Traffic Monitor**". Verification of the FLARM frequencies is to be completed as part of the flight planning process for any border crossing flight!

Pilots should not fly in a manner that may cause unexpected reactions from other pilots caused by misleading warnings.

WARNING

It is not allowed to use the AIR Traffic AT-1 as a heading source for connected avionics systems! Configuration parameter "ARINC429 Send Heading" (A429SENDHDG) must be OFF.

2.12 Flight Conditions / Basic Equipment

Use of the AIR Traffic AT-1 is restricted to operations under VFR. The AIR Traffic AT-1 and its display ATD-57 are not certified for navigational use.

The AIR Traffic AT-1 and its display ATD-57 are not part of the basic equipment of the aircraft in either Day-VFR or Night-VFR operations.

3. Emergency Procedures

3.1 Introduction

This section contains procedures recommended in the case of an emergency. If the preflight inspection is properly completed and all maintenance requirements are met, the failure of critical components is highly unlikely.

The following procedures are recommended if an emergency does occur none the less. Not all types of emergency situations or combinations can be described in the AFM. A pilot must therefore always use good airmanship and have a sound knowledge of the aircraft and its systems.

3.10 Electrical System Emergencies

3.10.1 Suspected Electrical Fire

If fire, smoke, or the smell of a cable fire gives any indication that they may be caused by the AIR Traffic AT-1 or the ATD-57, then the circuit breaker **Traffic Monitor** is to be pulled immediately! The emergency procedures in the basic Airplane Flight Manual continue to apply.

3.10.2 Alternator Failure

3.10.2.1 Failure of ALT 1 (external alternator)

In addition to the procedures described in the Airplane Flight Manual, the AIR Traffic AT-1 and the ATD-57 are to be switched off by pulling the circuit breaker **Traffic Monitor**.

3.10.2.2 Failure of ALT 2 (internal alternator)

> **NOTE**

If the aircraft is certified for N/VFR or an AT01-200, the electrical system has 2 alternators.

The entire power requirement of the aircraft can be supplied by **ALT 1**. A failure of the internal alternator is therefore not critical. It is nonetheless advisable to reduce power consumption to a minimum, as outlined in the Airplane Flight Manual.

4. Normal Procedures

4.1 General

The user manuals of the AIR Traffic AT-1 and the ATD-57 have to be kept on board the aircraft.

4.2 Starting Up

It is powered up as soon as the switch **Avionics** is turned on.

4.3 GPS Signal Quality

To function properly the AIR Traffic AT-1 requires accurate position information from its integrated GPS receiver. The quality of the GPS signal depends on a number of factors such as the position of the GPS antenna and the attitude of the aircraft, especially in a turn. Proximity to terrain and areas of poor GPS coverage also reduce the signal strength. Poor signal strength or quality has a pronounced effect on the altitude calculation capability of the System. The AIR Traffic AT-1 returns to full functionality as soon as the GPS signal is strong enough.

4.4 Flight and Warnings

Targets (other aircraft), with an active FLARM compatible system or an active (being interrogated by air traffic control) transponder, are displayed on the MFD as soon as the targets are thought to be a possible threat. Which target is displayed and how targets are displayed is explained in the pilot manuals (current issues) of the AIR Traffic AT-1, ATD-57 and other avionics, connected to the AIR-Traffic AT-1.

The AIR Traffic AT-1 was designed only to assist the pilot and may not always give reliable warnings. With the exception of periodically transmitting ADS-B Out transponders, it cannot identify transponder signals that are not currently being interrogated by air traffic control or are out of rage of Secondary Surveillance Radar (SSR) stations.

The AIR Traffic AT-1 gives no Resolution Advisories (RA). Which action, if any, is required remains the sole responsibility of the pilot in command. These actions should be based on proper airspace observation.

4.5 Signal Reception

FLARM compatible systems and transponders must be within range of the AIR Traffic AT-1 for it to offer any warnings. The reception range is affected to a large degree by the attitude of the antenna and the relative position of the transmitting and receiving aircraft. Transmissions function on a line of sight basis. Terrain will block any transmission.

5. Performance

No change to the basic POH.

6. Weight and Balance

No change to the basic POH.

7. System Description

NOTE

This supplement includes a general description of the integration of the AIR Traffic AT-1 system in the AQUILA instrument panel. Complete descriptions and extensive operating instructions are found in the AIR Traffic AT-1 and ATD-57 user manuals.

7.1 Introduction

The AIR Traffic AT-1 obtains position and velocity information from an integrated GPS unit. The position information is supplemented by an integrated pressure sensor. The system calculates the aircraft's anticipated position in advance and broadcasts this information every second as a digital message with a unique identification code. Almost simultaneously, the signals from other FLARM systems are received, along with ADS-B and Mode-S transponder signals. The information broadcasted and received are then compared to determine the expected relative positions. As an option, obstacle information such as transmission lines, antennas, and cable cars, stored in the AIR Traffic AT-1, are compared to the current and anticipated flight path.

If a possibly dangerous situation is anticipated, the AIR Traffic AT-1 warns the user of the currently most dangerous target. If the AIR Traffic AT-1 is attached to the audio system the warning is acoustic as well as visual.

The warning intensity depends on the time remaining to a possible collision, not the distance to the object. Due to system characteristics, the warning time is only a few seconds. More information on the warning times can be found in the current issue of the AIR Traffic AT-1 user manual.

AIR Traffic AT-1 Systems communicate to each other using a proprietary and copyrighted transmission protocol from FLARM. As well, FLARM radio transmissions are protected against unauthorized interference. The frequency bands in use are regional.

7.2 Integration into the AQUILA

The AIR Traffic AT-1 and its display ATD-57 are connected to the power supply of the AQUILA through the avionics bus. The system is protected by a push pull type circuit breaker labeled **Traffic Monitor**. The circuit breaker is located with the other circuit breakers on the right hand side of the instrument panel. The avionics bus is operated by the safety switch **Avionics**. The AIR Traffic AT-1 unit and its display ATD-57 are installed into the instrument panel. Connected to the AIR Traffic AT-1 unit are 3 antennas. The GPS antenna is attached to the mount below the instrument panel covering. The FLARM and ADS-B antennas are mounted below the fuselage. Optionally, AIR Traffic AT-1 can be connected to other avionics with the ability to display traffic information, e.g. on MFD´s.

Information how to do Software and Database updates can be found in the AIR Traffic AT-1 user manual. The USB-connector is accessible from the bottom of the instrument panel near the AIR Traffic AT-1 unit and its display ATD-57.

8. Handling, Servicing and Maintenance

8.6 Operation of Avionics

The AIR Traffic AT-1 should be turned off while starting or shutting down the engine. During this phase voltage peaks can occur, which could damage the unit.