

SECTION 9

Pilot's Operating Handbook Supplement AS-12

**Garrecht TRX 1500
Traffic-Sensor**



This supplement is applicable and must be integrated into the Airplane Flight Manual if a Garrecht Traffic-Sensor is installed in the AQUILA AT01-100 aircraft. Information in this supplement compliments or replaces chapters in the basic Airplane Flight Manual.

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0.1 RECORD OF REVISIONS

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A.01	Initial Issue	All	28.05.2013
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0.2 LIST OF CURRENT PAGES

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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 AT01-100 with a Garrecht TRX-1500 installed.

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 TRX-1500.

For further information and comprehensive operating instructions, please reference the current issue of the TRX-1500 user manual and the user manual of the installed MFD (for example a Flymap L). The TRX-1500 is operated solely through the MFD. 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 TRX-1500 System.

2. Operating Limitations

The operating limitations of the aircraft are in no way affected by the installation of the TRX-1500 Traffic Sensor.

The TRX-1500 Traffic Sensor is optional equipment. Failure of the Traffic Sensor is not critical in any phase of flight.

The Traffic Sensor is only to be used to aid situational awareness.

Decisions in flight may not be based solely on visual or acoustic information generated by the TRX-1500 Traffic Sensor. The Traffic Sensor offers no Resolution Advisories (RA).

The TRX-1500 Traffic Sensor can only display aircraft equipped with a FLARM, a FLARM compatible device, or an active transponder. All other aircraft will not be displayed the the TRX-1500.

The TRX-1500 will warn only of the target that it has calculated to be most dangerous. The Traffic Sensor may not always be able to give reliable warnings based on the relative bearing. The system may under certain conditions give false warnings or may give no warning at all.

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 TRX-1500 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 TRX-1500 must be switched off by pulling the

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appropriate circuit breaker. Verification of the FLARM frequencies is to be completed as part of the flight planing process for any boarder crossing flight!

Due to the nature of the Traffic Sensor, pilots should not fly in a manner that may cause unexpected reactions from other pilots.

2.12 Flight Conditions / Basic Equipment

Use of the TRX-1500 Traffic Sensor is restricted to noncommercial operations in VMC (VFR Meteorological Conditions). The TRX-1500 is not certified for navigational use or acrobatics. The TRX-1500 is not part of the basic equipment of the aircraft in either D/VFR or N/VFR.

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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 emergencies 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 TRX-1500, 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 TRX-1500 is 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, 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.

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4.0 Normal Procedures

4.1 General

The user manual of the Garrecht TRX-1500 is to be kept on board the aircraft.

4.2 Starting Up

The Garrecht TRX-1500 has no separate power switch. It is powered up as soon as the switch **Avionics** is turned on.

The Garrecht TRX-1500 also has no separate controls and is operated completely through the MFD (for example a Flymap L), to which it is attached. Please read the operating manual of the MFD for specifics.

4.3 GPS Signal Quality

To function properly the TRX-1500 requires accurate information on its position, which is supplied by a GPS antenna. 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 measuring capability of the System. The TRX-1500 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 current issue of the TRX-1500 user manual.

The TRX-1500 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 range of Secondary Surveillance Radar (SSR) stations.

The TRX-1500 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.

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4.5 Signal Reception

FLARM compatible systems and transponders must be within range of the TRX-1500 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 a transmission.

5.0 Performance

No change to the basic POH.

6.0 Weight and Balance

No change to the basic POH.

7.0 System Description

NOTE

This supplement includes a general description of the integration of the TRX-1500 system in the AQUILA AT01-100 instrument panel. A complete description and extensive operating instructions are found in the Garrecht TRX-1500 user manual.

7.1 Introduction

The Garrecht TRX-1500 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, Mode-C and S transponder signals. The information broadcast and received are then compared to determine the expected relative positions. As a future option, obstacle information such as transmission lines, antennas, and cable cars can be stored in the TRX-1500 and compared to the current and anticipated flight path.

If a possibly dangerous situation is anticipated, the TRX-1500 warns the user of the currently most dangerous target. If the TRX-1500 is attached to the audio system the warning is acoustic as well as visual, through the attached MFD.

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 Garrecht TRX-1500 user manual.

TRX-1500 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.

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7.2 Integration in the AQUILA AT01-100

The TRX-1500 is attached to the power supply of the AQUILA AT01-100 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 breaker on the right hand side of the instrument panel. The avionics bus is operated by the safety switch **Avionics**. The TRX-1500 unit is located behind the instrument panel. Connected to the TRX-1500 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.

8. Handling, Servicing and Maintenance

8.6 Operation of Avionics

The TRX-1500 must be turned off while starting or shutting down the engine. During this phase voltage peaks can occur, which could damage the unit.

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