SECTION 9

Supplement AVE13

Garmin GNS 530 GPS Navigator with NAV and COM

When the Garmin GNS 530 GPS Navigator with NAV and COM is installed in the AQUILA AT01, this Supplement is applicable and must be inserted in the Supplements Section (Section 9) of the Airplane Flight Manual. Information in this supplement either adds to, supersedes, or deletes information of the basic AQUILA AT01 Airplane Flight Manual.

Approved by: _____ Date: 30.6.05

Alfred Schmiderer
Head of Airworthiness AQUILA GmbH
Approved under the authority of EASA Design-Organisation DOA-No.: EASA.21J.025

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1.0 General

1. The GNS 530 System is a fully integrated, panel mounted instrument, which contains a VHF Communications Transceiver, a VOR/ILS receiver, and a Global Positioning System (GPS) Navigation Computer. The system consists of a GPS antenna, GPS Receiver, VHF VOR/LOC/GS antenna, VOR/ILS receiver, VHF COMM antenna and a VHF Communications Transceiver. The primary function of the VHF Communication portion of the equipment is to facilitate communication with Air Traflic Control. The primary function of the VOR/ILS Receiver Portion of the equipment is to receive and demodulate VOR, Localizer, and GlideSlope Signals. The primary function of the GPS Portion of the system is to acquire signals from the GPS System satellites, recover orbital data, make range and Doppler measurements, and process this information in real-time to obtain the user's position, velocity, and time.

2. Provided the GARMIN GNS 530's GPS receiver is receiving adequate usable signals, it has been demonstrated capable of and has been shown to meet the accuracy specifications for:

    - VFR/IFR enroute, terminal, and non-precision instrunent approach (GPS, Loran-C, VOR, VOR-DME, TACAN, NDB, NDB-DME, RNAV) Operation within the U.S. National Airspace System in accordance with AC 20-138.

    - One of the approved sensors, for a single or dual GNS 530 installation, for North Atlantic Minimum Navigation Performance Specification (MNPS) Airspace in accordance with AC 91-49 and AC 120-33.

    - The system meets RNPS airspace (BRNAV) requirements of AC 90-96 and in accordance with AC 20-138, and JAA AMJ 20x2 Leaflet 2 Revision 1, provided it is receiving usable navigation information from the GPS receiver.

Navigation is accomplished using the WGS-84 (NAD-83) coordinate reference datum. Navigation data is based upon use of only the Global Positioning System (GPS) operated by the United States of America.

2.0 Operating Limitations

1. The GARMIN GNS 530 Pilot's Guide, P/N 190-00181-00, Rev. C, dated April 2003 or later appropriate revision must be immediately available to the flight crew whenever navigation is predicated on the use of the System.

2. The GNS 530 must utilize the following or later FAA approved Software Versions:

Sub-System	Software Version
Main	2.00
GPS	2.00
COMM	1.22
VOR/LOC	1.25
G/S	2.00

The Main software version is displayed on the GNS 530 self test page immediately after turn-on for 5 seconds. The remaining system software versions can be verified on the AUX group sub-page 2, ,,SOFTWARE/DATABASE VER".

3. IFR enroute and terminal navigation predicated upon the GNS 530's GPS Receiver is prohibited unless the pilot verifies the currency of the data base or verifies each selected waypoint for accuracy by reference to current approved data.

4. Instrument approach navigation predicated upon the GNS 530's GPS Receiver must be accomplished in accordance with approved instrument approach procedures that are retrieved from the GPS equipment data base. The GPS equipment database must incorporate the current update cycle.

   (a) Instrument approaches utilizing the GPS receiver must be conducted in the approach mode and Receiver Autonomous Integrity Monitoring (RAIM) must be available at the Final Approach Fix.

   (b) Accomplishment of ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay with the GNS 530's GPS receiver is not authorized.

   (c) Use of the GNS 530 VOR/ILS receiver to fly approaches not approved for GPS requires VOR/ILS navigation data to be present on the extemal indicator.

(d) When an alternate airport is required by the applicable operating rules, it must be served by an approach based on other than GPS or Lotran-C navigation, the aircraft must have the operational equipment capable of using that navigation aid, and the required navigation aid must be operational.

(e) VNAV information may be utilized for advisory information only. Use of VNAV information for Instrument Approach Procedures does not guarantee Step-Down Fix altitude protection, or arrival at approach minimums in normal position to land

5. If not previously defined, the following default settings must be made in the ,,SETUP 1“ menu of the GNS 530 prior to operation (refer to Pilot´s Guide for procedure if necessary):

(a) **dis, spd** .... nm kt (Sets navigation units to ,,nautical miles“ and knots“)

(b) **alt, VS** ..... ft fpm (Sets altitude units to ,,feet“ and ,,feet per minute“)

(c) **map datum** . WGS 84 (Sets map datum to WGS-84, see note below)

(d) **posn** .....deg-min (Sets navigation grid units to decimal minutes)

(e) **fuel** .....gl (Sets fuel units to gallons)

NOTE

In some areas outside the United States, datums other than WGS-84 or NAD-83 may be used. If the GNS 530 is authorized for use by the appropriate Airworthiness authority, the required geodetic datum must be set in the GNS 530 prior to its use for navigation.

3.0 Emergency Procedures

ABNORMAL PROCEDURES

1. If GARMIN GNS 530 navigation information is not available or invalid, utilize remaining operational navigation equipment as required.

2. If “RAIM POSITION WARNING” message is displayed the system will flag and no longer provide GPS based navigational guidance. The crew should revert to the GNS 530 VOR/ILS receiver or an alternate means of navigation other than the GNS 530’s GPS Receiver.

3. If “RAIM IS NOT AVAILABLE” message is displayed in the enroute, terminal, or initial approach phase of flight, continue to navigate using the GPS equipment or revert to an alternate means of navigation other than the GNS 530’s GPS receiver appropriate to the route and phase of flight. When continuing to use GPS navigation, position must be verified every 15 minutes using the GNS 530’s VOR/ILS receiver or another IFR-approved navigation System.

4. If “RAIM IS NOT AVAILABLE” message is displayed while on the final approach segment, GPS based navigation will continue for up to 5 minutes with approach CD1 sensitivity (0.3 nautical mile). After 5 minutes the System will flag and no longer provide course guidance with approach sensitivity. Missed approach course guidance may still be available with 1 nautical mile CDI sensitivity by executing the missed approach.

5. In an in-flight emergency, depressing and holding the Comm transfer button for 2 seconds will select the emergency frequency of 121. 500 Mhz into the “Active” frequency window.

6. If GNS 530 Communication is inoperative, use the remaining operational COMM-equipment (if installed) or follow standard communication failure procedure by using transponder Code 7600 and appropriate flight procedures.

4.0 Normal Procedures

1. DETAILED OPERATING PROCEDURES

Normal operating procedures are described in the GARMIN GNS 530 Pilot's Guide, P/N 190-00 18 1-00, Rev. C, dated April 2003 or later appropriate revision.

2. PILOT'S DISPLAY

The GNS 530 System data will appear on the Pilot's CDVHSI. The source of data is either GPS or VLOC as annunciated on the display above the CD1 key.

NOTE

It is the pilot's responsibility to assure that published or assigned procedures are correctly complied with. Course guidance is not provided for all possible ARINC 424 leg types. See the GNS 530 Pilot´s Guide for detailed operating procedures regarding navigation capabilities for specific ARINC 424 leg types.

3. AUTOMATIC LOCALIZER COURSE CAPTURE

By default, the GNS 530 automatic localizer course capture feature is enabled. This feature provides a method for system navigation data present on the extemal indicators to be switched automatically from GPS guidance to localizer / glide slope guidance as the aircraft approaches the localizer course inbound to the final approach fix. If an offset from the final approach course is being flown, it is possible that the automatic switch from GPS course guidance to localizer / glide slope course guidance will not occur. It is the pilot's responsibility to ensure correct System navigation data is present on the extemal indicator before continuing a localizer based approach beyond the final approach fix. Refer to the GNS 530 Pilot's Guide for detailed operating instructions.

5.0 Performance

No significant change.

6.0 Weight & Balance

Upon removal or installation of the GNS 530 GPS / Receiver System the change of empty mass and corresponding center of gravity of the airplane must be recorded according to chapter 6 of the Airplane Flight Manual (AFM).

7.0 Airplane and Systems Description

See GNS 530 Pilot´s Guide (Rev. C, dated April 2003 or later appropriate version) for a complete description of the GNS 530 system.