STC SA00705WI

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Chesapeake, Va. 23321
HM1R197K

FAA Approved Airplane Flight Manual Supplement
Garmin GNS 430 VHF Communications Transceiver/VOR/ILS Receiver/GPS Receiver

Airplane Make: Cessna
Airplane Model: R172K
Airplane Serial No: R172K3040
Registration No: ~~N758ET~~ C-GZCW

This Flight Manual Supplement must be attached to or with the FAA approved Flight Manual when the Garmin GNC 430 is installed for use in accordance with FAA Form 337 dated 3-2-00. The information contained herein supplements or supersedes the basic Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this document, consult the basic Airplane FlightManual.

FAA APPROVED

Chris Olsen Date: FEB 24 2000

Federal Aviation Administration
Flight Standard District Office
Richmond International Airport
Sandston, VA 23120

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SECTION 1
GENERAL

1. The GNS 430 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 systems consists of a GPS antenna, GPS receiver, VHF VOR/ILS/GS antenna, VOR/ILS receiver and a VHF Communications Transceiver. The primary function of the VHF Communications portion of the equipment is to facilitate communications with Air Traffic Control. The primary function of the VOR/ILS Receiver portion of the equipment is to receive and demodulate VOR, Localizer, and Glide Slope signals. The primary function of the GPS portion of the system is to acquire signals from the GPS 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 430'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 instrument approach (GPS, Loran-C, VOR, VOR-DME, TACAN, NDB, NBD-DME, RNAV) operation within the U.S. National Airspace System in accordance with AC-20-138.

   The systems 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 0f America.

SECTION II
LIMITATIONS

1. The Garmin GNS 430 Pilot's Guide P/N 190-00140-00, Rev. A, dated October, 1998, or later appropriate revision, must be immediately available to the flight crew whenevcer navigation is predicated on the use of this system.

2. The GNS 430 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
GS	2.00

The main software is displayed on the GNS 430 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 430'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 approved data.

4. Instrument approach navigation predicated upon the GNS 430'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 in 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 430's GPS receiver is not authorized.

(c) Use of the GNS 430 VOR/ILS receiver to fly approaches not approved for GPS require VOR/ILS navigation data to be present on the external 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 Loran-C navigation, the aircraft must have the operational equipment capable of using that navigational aid, and the required navigational 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 430 prior to operation (refer to Pilot's Guide for procedure if necessary):

(a) **dis,spd** $^{n}m\ ^{k}t$ (sets navigation units to "nautical miles" and "knots")

(b) **alt, vs** ^{f}t fpm (sets altitude units to "feet" anf "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)

NOTE: In some areas outside the United States, datums other than WGS-84 or NAD-83 may be used. If the GNS 430 is authorized for use by the appropriate Airworthiness authority, the required geodetic datum must be set in the GNS 430 prior to its use for navigation.

SECTION III
EMERGENCY PROCEDURES

ABNORMAL PROCEDURES

1. If Garmin GNS 430 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 430 VOR/ILS receiver or an alternate means of navigation other than the GNS 430's GPS receiver.
3. **If "RAIM IS NOT AVAILASBLE"** message is displayed on 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 430'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 430's VOR/ILS receiver or another IFR-approved navigation system.
4. **If "RAIM IS NOT AVAILABLE"** is displayed while on the final approach segment, GPS based navigation will continue for up to 5 minutes with approach CDI sensitivity (0.3 nautical mile). After 5 minutes the system will flag and no longer provide course guidance with approach sensitivity. Miss approach guidance may still be available with 1 nautical mile CDI sensitivity by executing the missed approach.
5. In an inflight 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.

SECTION IV
NORMAL PROCEDURES

1. **DETAILED OPERATING PROCEDURES**

   Normal operating procedures are described in the GARMIN GNS 430 Pilot's Guide. P/N190-00240-00, Rev. A, dated October 1998, or later appropriate revision.

2. **PILOT'S DISPLAY**

   The GNS 430 System data will appear on the Pilot's ST-180 HSI. The source of data is either GPS or VLOC as annunciated on the display ajacent to the CDI key and "NAV1/GPS1" annunciator located on the pilot's instrument panel.

3. AUTOPILOT OPERATION

Coupling of the GNS 430 System steering information to the S-TEC 50 autopilot can be acccomplished by engaging the autopilot in the NAV or LOC mode with Nav1 selected on the autopilot Nav Select switch.

When the autopilot director system is using course information supplied by the GNS 430 System and the course pointer is not automatically driven to the desired track, the course pointer on the HSI must be manually set to the desired track (DTK) indicated by the GNS 430. For detailed autopilot operational instructions, refer to the FAA Approved Flight Manual Supplement for the autopilot/flight director.

4. AUTOMATIC LOCALIZER COURSE CAPTURE

By default, the GNS 430 automatic localizer course capture feature is enabled. This feature provides a method for system navigation data present on the external indicators to beswitched automatically from GPS guidance to localizer/glide slope guidance at the point of course intercept on a localizer at which GPS derived course deviation equals localizer derived course deviation. 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 guidance will not occur. It is the pilot's responsibility to ensure correct system navigation data is present on the external indicator before continuing a localizer based approach beyond the final approach fix.

SECTION V
PERFORMANCE

No change.

SECTION VI
WEIGHT AND BALANCE

See current weight and balance data.

SECTION VII
AIRPLANE & SYSTEM DESCRIPTIONS

The GNS 430 is located in the radio stack and is designated as Com 1/Nav 1. It is tied to the pilot's HSI for presentation of either VOR/ILS or GPS outputs. The Nav source is selected with the "CDI" switch on the front of the GNS 430.

See GNS 430 Pilot's Guide for a complete description of the GNS 430 system.