SECTION 9
SUPPLEMENTS
(Optional Systems Description & Operating Procedures)

TABLE OF CONTENTS

INTRODUCTION

This section consists of a series of supplements, each covering a single optional system which may be installed in the airplane. Each supplement contains a brief description, and when applicable, operating limitations, emergency and normal procedures, and performance. As listed in the Table of Contents, the supplements are classified under the headings of general and avionics, and have been provided with reference numbers. Also, the supplements are arranged alphabetically and numerically to make it easier to locate a particular supplement. Other routinely installed items of optional equipment, whose function and operational procedures do not require detailed instructions, are discussed in Section 7.

Limitations contained in the following supplements are FAA approved. Observance of these operating limitations is required by Federal Aviation Regulations.

SUPPLEMENT

CARBURETOR AIR TEMPERATURE GAGE

SECTION 1
GENERAL

The carburetor air temperature gage provides a means of detecting carburetor icing conditions. The gage is located on the upper right corner of the instrument panel. It is marked in 5° increments from -30°C to +30°C, and has a yellow arc between -15°C and +5°C which indicates the temperature range most conducive to carburetor icing.

SECTION 2
LIMITATIONS

There is no change to the airplane limitations when the carburetor air temperature gage is installed.

SECTION 3
EMERGENCY PROCEDURES

There is no change to the airplane emergency procedures when the carburetor air temperature gage is installed.

SECTION 4
NORMAL PROCEDURES

There is no change to the airplane normal procedures when the carburetor air temperature gage is installed. It is good practice to monitor the gage periodically and keep the needle out of the yellow arc during possible carburetor icing conditions. Refer to Section 4 of the basic handbook for procedures used when operating with carburetor heat applied.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when the carburetor air temperature gage is installed. However, if it is necessary to operate with carburetor heat applied, a small performance loss may be expected at any given power setting due to the warmer induction air temperature.

SUPPLEMENT

DIGITAL CLOCK

SECTION 1
GENERAL

The Astro Tech LC-2 Quartz Chronometer (see figure 1) is a precision, solid state time keeping device which will display to the pilot the time-of-day, the calendar date, and the elapsed time interval between a series of selected events, such as in-flight check points or legs of a cross-country flight, etc. These three modes of operation function independently and can be alternately selected for viewing on the four digit liquid crystal display (LCD) on the front face of the instrument. Three push button type switches directly below the display control all time keeping functions. These control functions are summarized in figures 2 and 3.

The digital display features an internal light (back light) to ensure good visibility under low cabin lighting conditions or at night. The intensity of the back light is controlled by the RADIO LT rheostat. In addition, the display incorporates a test function (see figure 1) which allows checking that all elements of the display are operating. To activate the test function, press the LH and RH buttons at the same time.

SECTION 2
LIMITATIONS

There is no change to the airplane limitations when the digital clock is installed.

SECTION 3
EMERGENCY PROCEDURES

There is no change to the airplane emergency procedures when the digital clock is installed.

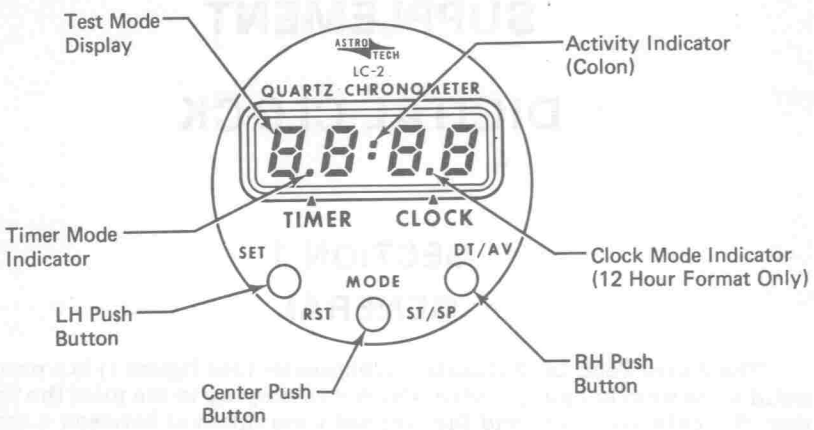


Figure 1. Digital Clock

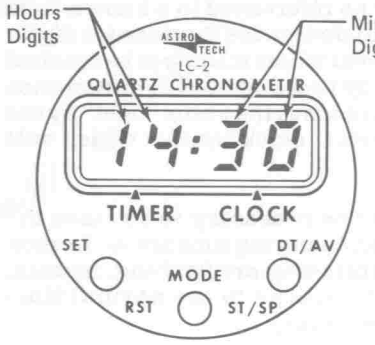
SECTION 4
NORMAL PROCEDURES

CLOCK AND DATE OPERATION

When operating in the clock mode (see figure 2), the display shows the time of day in hours and minutes while the activity indicator (colon) will blink off for one second each ten seconds to indicate proper functioning. If the RH push button is pressed momentarily, while in the clock mode, the calendar date appears numerically on the display with month of year to the left of the colon and day of the month shown to the right of the colon. The display automatically returns to the clock mode after approximately 1.5 seconds. However, if the RH button is pressed continuously longer than approximately two seconds, the display will return from the date to the clock mode with the activity indicator (colon) blinking altered to show continuously or be blanked completely from the display. Should this occur, simply press the RH button again for two seconds or longer, and correct colon blinking will be restored.

NOTE

The clock mode is set at the factory to operate in the 24-hour format. However, 12-hour format operation may be selected by changing the position of an internal slide switch accessible through a small hole on the bottom of the instrument case. Notice that in the 24-hour format, the clock mode indicator does not appear.

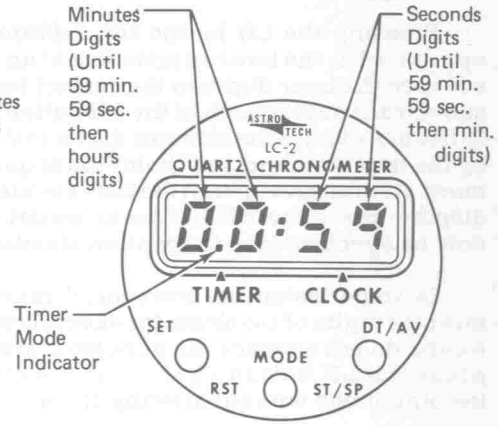


LH Button: Sets date and time of day (when used with RH button).

Center Button: Alternately displays clock or timer status

RH Button: Shows calendar date momentarily; display returns to clock mode after 1.5 seconds.

Figure 2. Clock Mode



LH Button: Resets timer to "zero".

Center Button: Alternately displays clock or timer status

RH Button: Alternately starts and stops timer; timer starts from any previously accumulated total.

Figure 3. Timer Mode

SETTING CORRECT DATE AND TIME

The correct date and time are set while in the clock mode using the LH and RH push buttons as follows: press the LH button once to cause the date to appear with the month flashing. Press the RH button to cause the month to advance at one per second (holding button), or one per push until the correct month appears. Push the LH button again to cause the day of month to appear flashing, then advance as before using RH button until correct day of month appears.

Once set correctly, the date advances automatically at midnight each day until February 29 of each leap year, at which time one day must be added manually.

SUPPLEMENT

GROUND SERVICE PLUG RECEPTACLE

SECTION 1
GENERAL

The ground service plug receptacle permits the use of an external power source for cold weather starting and lengthy maintenance work on the electrical and electronic equipment. The receptacle is located behind a door on the left side of the fuselage aft of the baggage compartment door.

NOTE

If no avionics equipment is to be used or worked on, the avionics power switch should be turned off. If maintenance is required on the avionics equipment, it is advisable to utilize a battery cart external power source to prevent damage to the avionics equipment by transient voltage. Do not crank or start the engine with the avionics power switch turned on.

The battery and external power circuits have been designed to completely eliminate the need to "jumper" across the battery contactor to close it for charging a completely "dead" battery. A special fused circuit in the external power system supplies the needed "jumper" across the contacts so that with a "dead" battery and an external power source applied, turning the master switch ON will close the battery contactor.

SECTION 2
LIMITATIONS

The following information must be presented in the form of a placard located on the inside of the ground service plug access door:

CAUTION 24 VOLTS D.C.
This aircraft is equipped with alternator and a negative ground system.
OBSERVE PROPER POLARITY
Reverse polarity will damage electrical components.

SECTION 3
EMERGENCY PROCEDURES

There is no change to the airplane emergency procedures when the ground service plug receptacle is installed.

SECTION 4
NORMAL PROCEDURES

Just before connecting an external power source (generator type or battery cart), the avionics power switch should be turned off, and the master switch turned on.

WARNING

When turning on the master switch, using an external power source, or pulling the propeller through by hand, treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

The ground service plug receptacle circuit incorporates a polarity reversal protection. Power from the external power source will flow only if the ground service plug is correctly connected to the airplane. If the plug is accidentally connected backwards, no power will flow to the electrical system, thereby preventing any damage to electrical equipment.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when the ground service plug receptacle is installed.

SUPPLEMENT

STROBE LIGHT SYSTEM

SECTION 1
GENERAL

The high intensity strobe light system enhances anti-collision protection for the airplane. The system consists of two wing tip-mounted strobe lights (with integral power supplies), a rocker switch, labeled STROBE LT, and a 5-amp push-to-reset circuit breaker. The rocker switch and circuit breaker are located on the left side of the switch and control panel.

SECTION 2
LIMITATIONS

Strobe lights must be turned off when taxiing in the vicinity of other airplanes, or during night flight through clouds, fog or haze.

SECTION 3
EMERGENCY PROCEDURES

There is no change to the airplane emergency procedures when strobe lights are installed.

SECTION 4
NORMAL PROCEDURES

To operate the strobe light system, proceed as follows:

1. Master Switch -- ON.
2. Strobe Light Switch -- ON.

SECTION 5
PERFORMANCE

The installation of strobe lights will result in a minor reduction in cruise performance.

SUPPLEMENT

WINTERIZATION KIT

SECTION 1
GENERAL

The winterization kit consists of two cover plates (with placards) which attach to the air intakes in the cowling nose cap, a restrictive cover plate for the aft side of the oil cooler, insulation for the engine crankcase breather line, and a placard to be installed on the instrument panel. This equipment should be installed for operations in temperatures consistently below 20°F (-7°C). Once installed, the crankcase breather insulation is approved for permanent use, regardless of temperature. The attachment brackets for the nose cap cover plates may be left installed for the winter season, but must be removed for warm weather operation.

SECTION 2
LIMITATIONS

The following information is presented in the form of placards when the airplane is equipped with a winterization kit.

1. On each nose cap cover plate and oil cooler cover:

REMOVE WHEN OAT EXCEEDS 20°F

2. On right hand nose cap cover plate:

REMOVE OIL COOLER COVER PLATE FROM OIL COOLER WHEN OAT EXCEEDS 20°F

3. On right side of instrument panel:

WINTERIZATION KIT (RIGHT AND LEFT NOSE-CAP COVER AND OIL COOLER COVER PLATE) MUST BE REMOVED WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 20°F.

SECTION 3
EMERGENCY PROCEDURES

There is no change to the airplane emergency procedures when the winterization kit is installed.

SECTION 4
NORMAL PROCEDURES

There is no change to the airplane normal procedures when the winterization kit is installed.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when the winterization kit is installed.

SUPPLEMENT

Removed

DME

(TYPE 190)

SECTION 1
GENERAL

The DME 190 (Distance Measuring Equipment) system consists of a panel mounted 200 channel UHF transmitter-receiver and an externally mounted antenna. The transceiver has a single selector knob that changes the DME's mode of operation to provide the pilot with: distance-to-station, time-to-station, or ground speed readouts. The DME is designed to operate at altitudes up to a maximum of 50,000 feet at ground speeds up to 250 knots and has a maximum slant range of 199.9 nautical miles.

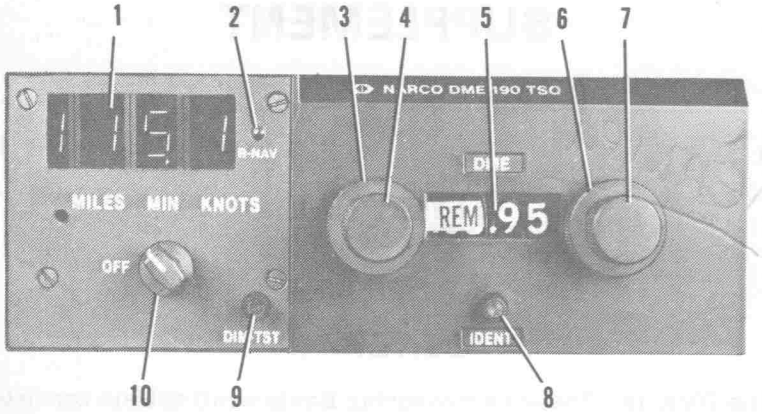
The DME can be channeled independently or by a remote NAV set. When coupled with a remote NAV set, the MHz digits will be covered over by a remote (REM) flag and the DME will utilize the frequency set by the NAV set's channeling knobs. When the DME is not coupled with a remote NAV set, the DME will reflect the channel selected on the DME unit. The transmitter operates in the frequency range of 1041 to 1150 MHz and is paired with 108 to 117.95 MHz to provide automatic DME channeling. The receiver operates in the frequency range of 978 to 1213 MHz and is paired with 108 to 117.95 MHz to provide automatic DME channeling.

All operating controls (except for a SPEAKER/PHONE selector switch mounted on the audio control panel supplied with one or two transmitters as described in Section 7) for the DME are mounted on the front panel of the DME and are described in Figure 1.

SECTION 2
LIMITATIONS

There is no change to the airplane limitations when this avionic equipment is installed.

Removed



1. READOUT WINDOW - Displays function readout in nautical miles (distance-to-station), minutes (time-to-station) or knots (ground speed).

2. R-NAV INDICATOR LAMP - The green R-NAV indicator lamp is provided to indicate the DME is coupled to an R-NAV system. Since this DME is not factory installed with an R-NAV system on Cessna airplanes, the R-NAV indicator lamp should never be illuminated. However, if an R-NAV system is coupled to the DME, and when in R-NAV mode, the R-NAV lamp will light which indicates that the distance readout is the "way point" instead of the DME station. The DME can only give distance (MILES) in R-Nav mode.

3. REMOTE CHANNELING SELECTOR - Two position selector. In the first position, the DME will utilize the frequency set by the DME channeling knobs. In the second position, the MHz digits will utilize the frequency set by the NAV 1 unit's channeling knobs.

4. WHOLE MEGAHERTZ SELECTOR KNOB - Selects operating frequency in 1-MHz steps between 108 and 117 MHz.

5. FREQUENCY INDICATOR - Shows operating frequency selected on the DME or displays remote (REM) flag to indicate DME is operating on a frequency selected by the remote NAV 1 receiver.

6. FRACTIONAL MEGAHERTZ SELECTOR KNOB - Selects operating frequency in 50 kHz steps. This knob has two positions, one for the 0 and one for the 5.

7. FRACTIONAL MEGAHERTZ SELECTOR KNOB - Selects operating frequency in tenths of a Megahertz (0-9).

Figure 1. DME 190 Operating Controls (Sheet 1 of 2)

Removed

8. IDENT KNOB - Rotation of this control increases or decreases the volume of the received station's Ident signal. An erratic display, accompanied by the presence of two Ident signals, can result if the airplane is flying in an area where two stations using the same frequency are transmitting.

9. DIM - TST KNOB -

DIM: Controls the brilliance of the readout lamp's segments. Rotate the control as desired for proper lamp illumination in the function window (The frequency window is dimmed by the aircraft's radio light dimming control).

TST (PUSH TEST): This control is used to test the illumination of the readout lamps, with or without being tuned to a station. Press the control, a readout of 188 8 should be seen with the mode selector switch in the MIN or KNOTS position. The decimal point along with 188.8 will light in the MILES mode. When the control is released, and had the DME been channeled to a nearby station, the distance to that station will appear. If the station channeled was not in range, a "bar" readout will be seen (--,- or -- -).

10. MODE SELECTOR SWITCH -

OFF: Turns the DME OFF.

MILES: Allows a digital readout to appear in the window which represents slant range (in nautical miles) to or from the channeled station.

MIN: Allows a digital readout (in minutes) to appear in the window that it will take the airplane to travel the distance to the channeled station. This time is only accurate when flying directly TO the station and after the ground speed has stabilized.

KNOTS: Allows a digital readout (in knots) to appear in the window that is ground speed and is valid only after the stabilization time (approximately 2 minutes) has elapsed when flying directly TO or FROM the channeled station.

Figure 1. DME 190 Operating Controls (Sheet 2 of 2)

SUPPLEMENT

EMERGENCY LOCATOR TRANSMITTER (ELT)

SECTION 1
GENERAL

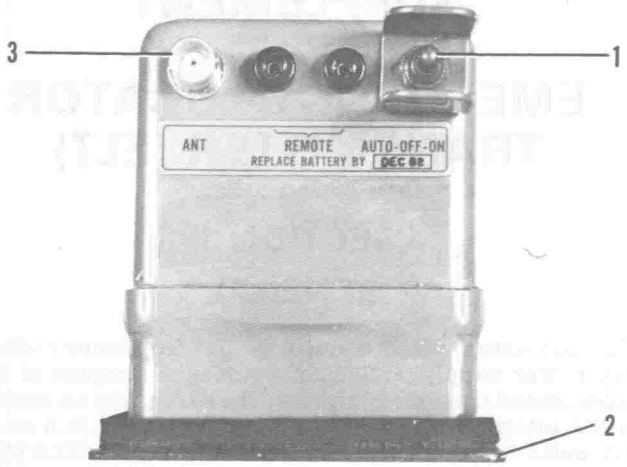
The ELT consists of a self-contained dual-frequency radio transmitter and battery power supply, and is activated by an impact of 5g or more as may be experienced in a crash landing. The ELT emits an omni-directional signal on the international distress frequencies of 121.5 and 243.0 MHz. (Some ELT units in export aircraft transmit only on 121.5 MHz.) General aviation and commercial aircraft, the FAA, and CAP monitor 121.5 MHz, and 243.0 MHz is monitored by the military. Following a crash landing, the ELT will provide line-of-sight transmission up to 100 miles at 10,000 feet. The ELT supplied in domestic aircraft transmits on both distress frequencies simultaneously at 75 mw rated power output for 50 continuous hours in the temperature range of -4°F to +131°F (-20°C to +55°C). The ELT unit in export aircraft transmits on 121.5 MHz at 25 mw rated power output for 50 continuous hours in the temperature range of -4°F to +131°F (-20°C to +55°C).

The ELT is readily identified as a bright orange unit mounted on the right hand side of the baggage compartment wall in the tailcone. To gain access to the unit, remove the cover. The ELT is operated by a control panel at the forward facing end of the unit (see figure 1).

SECTION 2
LIMITATIONS

The following information must be presented in the form of a placard located on the baggage compartment wall.

EMERGENCY LOCATOR TRANSMITTER
INSTALLED BEHIND THIS COVER.
MUST BE SERVICED IN ACCORDANCE
WITH FAR 91.52



1. FUNCTION SELECTOR SWITCH (3-position toggle switch):

   ON - Activates transmitter instantly. Used for test purposes and if "g" switch is inoperative.

   OFF - Deactivates transmitter. Used during shipping, storage and following rescue.

   AUTO - Activates transmitter only when "g" switch receives 5g or more impact.

2. COVER - Removable for access to battery pack.

3. ANTENNA RECEPTACLE - Connects to antenna mounted on top of tailcone.

Figure 1. ELT Control Panel

SECTION 3
EMERGENCY PROCEDURES

Immediately after a forced landing where emergency assistance is required, the ELT should be utilized as follows.

1. ENSURE ELT ACTIVATION --Turn a radio transceiver ON and select 121.5 MHz. If the ELT can be heard transmitting, it was activated by the "g" switch and is functioning properly. If no emergency tone is audible, gain access to the ELT and place the function selector switch in the ON position.

2. PRIOR TO SIGHTING RESCUE AIRCRAFT -- Conserve airplane battery. Do not activate radio transceiver.

3. AFTER SIGHTING RESCUE AIRCRAFT -- Place ELT function selector switch in the OFF position, preventing radio interference. Attempt contact with rescue aircraft with the radio transceiver set to a frequency of 121.5 MHz. If no contact is established, return the function selector switch to ON immediately.

4. FOLLOWING RESCUE -- Place ELT function selector switch in the OFF position, terminating emergency transmissions.

SECTION 4
NORMAL PROCEDURES

As long as the function selector switch remains in the AUTO position, the ELT automatically activates following an impact of 5g or more over a short period of time.

Following a lightning strike, or an exceptionally hard landing, the ELT may activate although no emergency exists. To check your ELT for inadvertent activation, select 121.5 MHz on your radio transceiver and listen for an emergency tone transmission. If the ELT can be heard transmitting, place the function selector switch in the OFF position and the tone should cease. Immediately place the function selector switch in the AUTO position to re-set the ELT for normal operation.

SECTION 5
PERFORMANCE

There is no change to the airplane performance data when this equipment is installed.

Removed

SUPPLEMENT

FOSTER AREA NAVIGATION SYSTEM (Type 511)

SECTION 1
GENERAL

The Foster Area Navigation System (RNAV - Type 511) consists of a 511 Area Nav Computer, a compatible VHF navigation receiver, a DME Adapter Module and DME.

The RNAV 511 is a basic Area Navigation Computer with two thumbwheel programmable waypoints. It performs continuous computation of triangulation problems.

The VOR and DME equipment in the aircraft provides information to the computer on aircraft position relative to the VORTAC station. A waypoint is dialed into one set of waypoint thumbwheels by inserting the RADIAL and DISTANCE of the waypoint (the position the pilot would like to fly over, or to) relative to the VORTAC station. The RNAV 511 computer calculates the Magnetic Bearing (BEARING) and Distance (RANGE NM) from the aircraft to the waypoint repeatedly to provide continual information on WHICH WAY and HOW FAR to the waypoint.

The pilot can monitor BEARING and RANGE on RNAV 511 to fly straight line paths to waypoints up to 200 NM distance from the aircraft position. Waypoints can be precisely dialed into the thumbwheels to 0.1° and 0.1 NM resolution.

The RNAV 511 also provides immediate position orientation relative to the VORTAC (VOR/DME) station being used for computation. Merely press the VOR/DME pushbutton to display the RADIAL and DME distance from the VORTAC.

Another feature of the RNAV 511 is its ability to provide evidence of proper computation in the system. The system can be tested at anytime before flight or while airborne to confirm proper computer operation. An acceptable "test" is evidenced by the active waypoint's RADIAL/DISTANCE being displayed in the BEARING and RANGE windows of the RNAV 511 while TEST pushbutton is pressed. In addition to the "test" feature, diagnostic functions are provided to alert the pilot of why the system is not functional.

SUPPLEMENT Removed

HF TRANSCEIVER
(TYPE PT10-A)

SECTION 1
GENERAL

The PT10-A HF Transceiver, shown in Figure 1, is a 10-channel AM transmitter-receiver which operates in the frequency range of 2.0 to 18.0 Megahertz. The transceiver is automatically tuned to the operating frequency by a Channel Selector. The operating controls for the unit are mounted on the front panel of the transceiver. The system consists of a transceiver, antenna load box, fixed wire antenna and associated wiring.

The Channel Selector Knob determines the operating frequency of the transmitter and receiver. The frequencies of operation are shown on the frequency chart adjacent to the channel selector.

The VOLUME control incorporates the power switch for the transceiver. Clockwise rotation of the volume control turns the set on and increases the volume of audio.

The meter on the face of the transceiver indicates transmitter output.

The system utilizes the airplane microphone, headphone and speaker. Operation and description of the audio control panel used in conjunction with this radio is shown and described in Section 7 of this handbook.

SECTION 2
LIMITATIONS

There is no change to the airplane limitations when this avionic equipment is installed.

SUPPLEMENT Removed

SSB HF TRANSCEIVER
(TYPE ASB-125)

SECTION 1
GENERAL

The ASB-125 HF transceiver is an airborne, 10-channel, single sideband (SSB) radio with a compatible amplitude modulated (AM) transmitting-receiving system for long range voice communications in the 2 to 18 MHz frequency range. The system consists of a panel mounted receiver/exciter, a remote mounted power amplifier/power supply, an antenna coupler and an externally mounted, fixed wire, medium/high frequency antenna.

A channel selector knob determines the operating frequency of the transceiver which has predetermined crystals installed to provide the desired operating frequencies. A mode selector control is provided to supply the type of emission required for the channel, either sideband, AM or telephone for public correspondence. An audio knob, clarifier knob and squelch knob are provided to assist in audio operation during receive. In addition to the aforementioned controls, which are all located on the receiver/exciter, a meter is incorporated to provide antenna loading readouts.

The system utilizes the airplane microphone, headphone and speaker. Operation and description of the audio control panel used in conjunction with this radio is shown and described in Section 7 of this handbook.

SUPPLEMENT

CESSNA NAVOMATIC 200A AUTOPILOT
(Type AF-295B)

SECTION 1
GENERAL

The Cessna 200A Navomatic is an all electric, single-axis (aileron control) autopilot system that provides added lateral and directional stability. Components are a computer-amplifier, a turn coordinator, an aileron actuator, and a course deviation indicator(s) incorporating a localizer reversed (BC) indicator light

Roll and yaw motions of the airplane are sensed by the turn coordinator gyro. The computer-amplifier electronically computes the necessary correction and signals the actuator to move the ailerons to maintain the airplane in the commanded lateral attitude.

The 200A Navomatic will also capture and track a VOR or localizer course using signals from a VHF navigation receiver.

The operating controls for the Cessna 200A Navomatic are located on the front panel of the computer-amplifier, shown in Figure 1. The primary function pushbuttons (DIR HOLD, NAV CAPT, and NAV TRK), are interlocked so that only one function can be selected at a time. The HI SENS and BACK CRS pushbuttons are not interlocked so that either or both of these functions can be selected at any time.

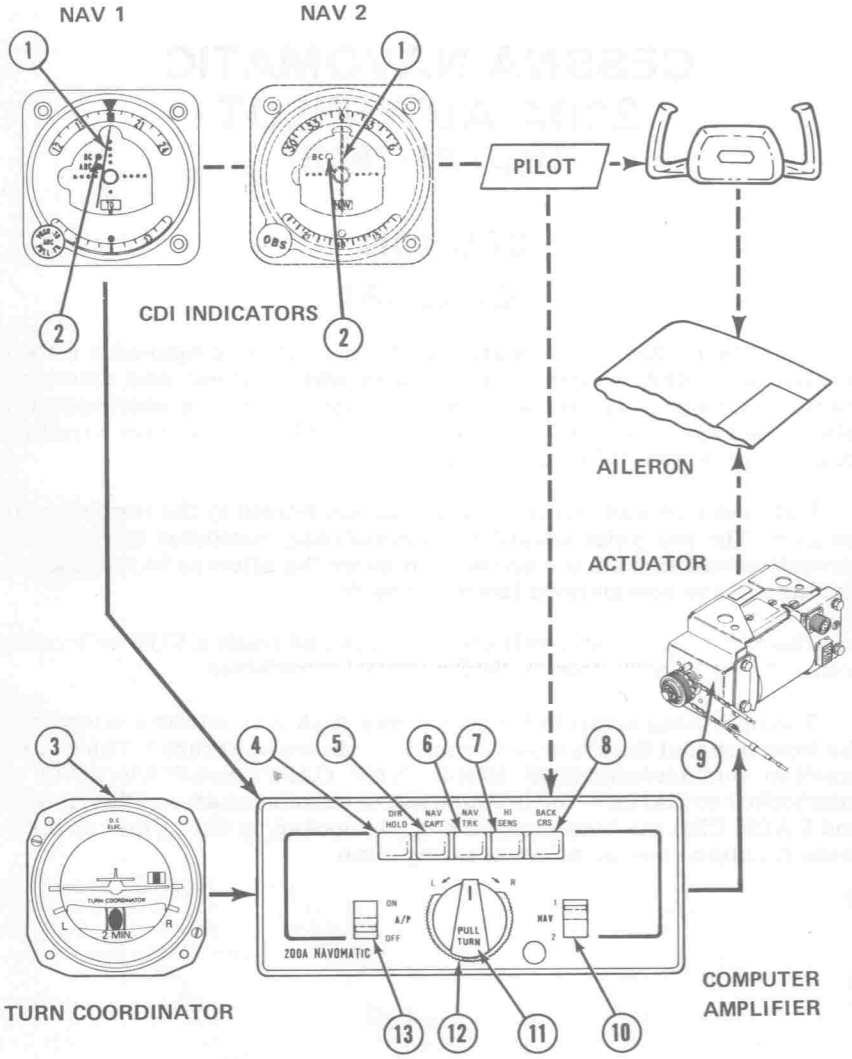


Figure 1. Cessna 200A Autopilot, Operating Controls and Indicators
(Sheet 1 of 2)

1. COURSE DEVIATION INDICATOR - Provides VOR/LOC navigation inputs to autopilot for intercept and tracking modes.

2. LOCALIZER REVERSED INDICATOR LIGHT - Amber light, labeled BC, illuminates when BACK CRS button is pushed in (engaged) and LOC frequency selected. BC light indicates course indicator needle is reversed on selected receiver (when turned to a localizer frequency). This light is located within the CDI indicator.

3. TURN COORDINATOR - Senses roll and yaw for wings leveling and command turn functions.

4. DIR HOLD PUSHBUTTON - Selects direction hold mode. Airplane holds direction it is flying at time button is pushed.

5. NAV CAPT PUSHBUTTON - Selects NAV capture mode. When parallel to desired course, the airplane will turn to a pre-described intercept angle and capture selected VOR or LOC course.

6. NAV TRK PUSHBUTTON - Selects NAV track mode. Airplane tracks selected VOR or LOC course.

7. HI SENS PUSHBUTTON - During NAV CAPT or NAV TRK operation, this high sensitivity setting increases autopilot response to NAV signal to provide more precise operation during localizer approach. In low sensitivity position (pushbutton out), response to NAV signal is dampened for smoother tracking of enroute VOR radials; it also smooths out effect of course scalloping during NAV operation.

8. BACK CRS PUSHBUTTON - Used with LOC operation only. With A/P switch OFF or ON, and when navigation receiver selected by NAV switch is set to a localizer frequency, it reverses normal localizer needle indication (CDI) and causes localizer reversed (BC) light to illuminate. With A/P switch ON, reverses localizer signal to autopilot.

9. ACTUATOR - The torque motor in the actuator causes the ailerons to move in the commanded direction.

10. NAV SWITCH - Selects NAV 1 or NAV 2 navigation receiver.

11. PULL TURN KNOB - When pulled out and centered in detent, airplane will fly wings-level; when turned to the right (R), the airplane will execute a right, standard rate turn; when turned to the left (L), the airplane will execute a left, standard rate turn. When centered in detent and pushed in, the operating mode selected by a pushbutton is engaged.

12. TRIM - Used to trim autopilot to compensate for minor variations in aircraft trim or weight distribution. (For proper operation, the aircraft's rudder trim, if so equipped, must be manually trimmed before the autopilot is engaged.)

13. A/P SWITCH - Turns autopilot ON or OFF.

Figure 1. Cessna 200A Autopilot, Operating Controls and Indicators
(Sheet 2 of 2)

SECTION 2
LIMITATIONS

The following autopilot limitation must be followed during airplane operation:

1. Autopilot must be OFF for takeoff and landing.

OPERATING LIMITATION WITH AUTOPILOT ENGAGED:

1. Maximum Airspeed -- 155 KIAS.

SECTION 3
EMERGENCY PROCEDURES

TO OVERRIDE THE AUTOPILOT:

1. Airplane Control Wheel -- ROTATE as required to override autopilot.

NOTE

The servo may be overpowered at anytime without damage.

TO TURN OFF AUTOPILOT:

1. A/P ON-OFF Switch -- OFF.

SECTION 4
NORMAL PROCEDURES

BEFORE TAKE-OFF AND LANDING:

1. A/P ON-OFF Switch -- OFF.
2. BACK CRS Button -- OFF (see Caution note under Nav Capture).

NOTE

Periodically verify operation of amber warning light(s), labeled BC on CDI(s), by engaging BACK CRS button with a LOC frequency selected.

INFLIGHT WINGS LEVELING:

1. Airplane Rudder Trim -- ADJUST for zero slip ("Ball" centered on Turn Coordinator).
2. PULL-TURN Knob -- CENTER and PULL out.
3. A/P ON-OFF Switch -- ON.
4. Autopilot TRIM Control -- ADJUST for zero turn rate (wings level indication on Turn Coordinator).

NOTE

For optimum performance in airplanes equipped as floatplanes, use autopilot only in cruise flight or in approach configuration with flaps down no more than 10° and airspeed no lower than 75 KIAS on 172 and R172 Series Models or 90 KIAS on 180, 185, U206 and TU206 Series Models.

COMMAND TURNS:

1. PULL-TURN Knob -- CENTER, PULL out and ROTATE.

DIRECTION HOLD:

1. PULL-TURN Knob -- CENTER and PULL out.
2. Autopilot TRIM Control -- ADJUST for zero turn rate.
3. Airplane Rudder Trim -- ADJUST for zero slip ("Ball" centered).
4. DIR HOLD Button -- PUSH.
5. PULL-TURN Knob -- PUSH in detent position when airplane is on desired heading.
6. Autopilot TRIM Control -- READJUST for zero turn rate.

NAV CAPTURE (VOR/LOC):

1. PULL-TURN Knob -- CENTER and PULL out.
2. NAV 1-2 Selector Switch -- SELECT desired VOR receiver.
3. Nav Receiver OBS or ARC Knob -- SET desired VOR course (if tracking omni).

NOTE

Optional ARC knob should be in center position and ARC amber warning light should be off.

4. NAV CAPT Button -- PUSH.
5. HI SENS Button -- PUSH for localizer and "close-in" omni intercepts.

6. BACK CRS Button -- PUSH only if intercepting localizer front course outbound or back course inbound.

CAUTION

With BACK CRS button pushed in and localizer frequency selected, the CDI on selected nav radio will be reversed even when the autopilot switch is OFF.

7. PULL-TURN Knob -- Turn airplane parallel to desired course.

NOTE

Airplane must be turned until heading is within ±5° of desired course.

8. PULL TURN Knob -- CENTER and PUSH in. The airplane should then turn toward desired course at 45° ±10° intercept angle (if the CDI needle is in full deflection).

NOTE

If more than 15 miles from the station or more than 3 minutes from intercept, use a manual intercept procedure.

NAV TRACKING (VOR/LOC):

1. NAV TRK Button -- PUSH when CDI centers and airplane is within ±5° of course heading.
2. HI SENS BUTTON -- DISENGAGE for enroute omni tracking (leave ENGAGED for localizer).
3. Autopilot TRIM Control -- READJUST as required to maintain track.

NOTE

Optional ARC function, if installed, should not be used for autopilot operation. If airplane should deviate off course, pull out PULL TURN knob and readjust airplane rudder trim for straight flight on the Turn Coordinator. Push in PULL TURN knob to reintercept course. If deviation persists, progressively make slight adjustments of autopilot TRIM control towards the course as required to maintain track.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when this avionic equipment is installed.

Removed

~~SUPPLEMENT~~

CESSNA 300 ADF
(Type R-546E)

SECTION 1
GENERAL

The Cessna 300 ADF is a panel-mounted, digitally tuned automatic direction finder. It is designed to provide continuous 1 kHz digital tuning in the frequency range of 200 kHz to 1,699 kHz and eliminates the need for mechanical band switching. The system is comprised of a receiver, a bearing indicator, a loop antenna, and a sense antenna. Operating controls and displays for the Cessna 300 ADF are shown and described in Figure 1. The audio system used in conjunction with this radio for speaker-phone selection is shown and described in Section 7 of this handbook.

The Cessna 300 ADF can be used for position plotting and homing procedures, and for aural reception of amplitude-modulated (AM) signals.

With the function selector knob at ADF, the Cessna 300 ADF provides a visual indication, on the bearing indicator, of the bearing to the transmitting station relative to the nose of the airplane. This is done by combining signals from the sense antenna with signals from the loop antenna.

With the function selector knob at REC, the Cessna 300 ADF uses only the sense antenna and operates as a conventional low-frequency receiver.

The Cessna 300 ADF is designed to receive transmission from the following radio facilities: commercial AM broadcast stations, low-frequency range stations, non-directional radio beacons, ILS compass locators.

SECTION 2
LIMITATIONS

There is no change to the airplane limitations when this avionic equipment is installed.

Removed SUPPLEMENT

CESSNA 300 NAV/COM
(720-Channel - Type RT-385A)

SECTION 1
GENERAL

The Cessna 300 Nav/Com (Type RT-385A), shown in figure 1, consists of a panel-mounted receiver-transmitter and a single or dual-pointer remote course deviation indicator.

The set includes a 720-channel VHF communications receiver-transmitter and a 200-channel VHF navigation receiver, both of which may be operated simultaneously. The communications receiver-transmitter receives and transmits signals between 118.000 and 135.975 MHz in 25-kHz steps. The navigation receiver receives omni and localizer signals between 108.00 and 117.95 MHz in 50-kHz steps. The circuits required to interpret the omni and localizer signals are located in the course deviation indicator. Both the communications and navigation operating frequencies are digitally displayed by incandescent readouts on the front panel of the Nav/Com.

A DME receiver-transmitter or a glide slope receiver, or both, may be interconnected with the Nav/Com set for automatic selection of the associated DME or glide slope frequency. When a VOR frequency is selected on the Nav/Com, associated VORTAC or VOR-DME station frequency will also be selected automatically; likewise, if a localizer frequency is selected, the associated glide slope will be selected automatically.

The course deviation indicator includes either a single-pointer and related NAV flag for VOR/LOC indication only, or dual pointers and related NAV and GS flags for both VOR/LOC and glide slope indications. Both types of course deviation indicators incorporate a back-course lamp (BC) which lights when optional back course (reversed sense) operation is selected. Both types may be provided with Automatic Radial Centering which, depending on how it is selected, will automatically indicate the bearing TO or FROM the VOR station.

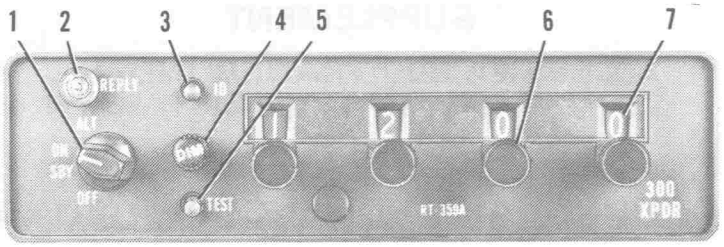
SUPPLEMENT
CESSNA 300 TRANSPONDER (Type RT-359A)
AND
OPTIONAL ALTITUDE ENCODER (BLIND)

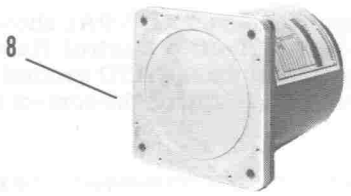
SECTION 1
GENERAL

The Cessna 300 Transponder (Type RT-359A), shown in Figure 1, is the airborne component of an Air Traffic Control Radar Beacon System (ATCRBS). The transponder enables the ATC ground controller to "see" and identify the aircraft, while in flight, on the control center's radarscope more readily.

The Cessna 300 Transponder system consists of a panel-mounted unit and an externally mounted antenna. The transponder receives interrogation pulse signals on 1030 MHz and transmits pulse-train reply signals on 1090 MHz. The transponder is capable of replying to Mode A (aircraft identification) and also Mode C (altitude reporting) when coupled to an optional altitude encoder system. The transponder is capable of replying on both modes of interrogation on a selective reply basis on any of 4,096 information code selections. The optional altitude encoder system (not part of a standard 300 Transponder system) required for Mode C (altitude reporting) operation consists of a completely independent remote-mounted digitizer that is connected to the static system and supplies encoded altitude information to the transponder. When the altitude encoder system is coupled to the 300 Transponder system, altitude reporting capabilities are available in 100-foot increments between -1000 and +20,000 feet.

All Cessna 300 Transponder operating controls are located on the front panel of the unit. Functions of the operating controls are described in Figure 1.





1. FUNCTION SWITCH - Controls application of power and selects transponder operating mode as follows:

   OFF - Turns set off.
   SBY - Turns set on for equipment warm-up or standby power.
   ON - Turns set on and enables transponder to transmit Mode A (aircraft identification) reply pulses.
   ALT - Turns set on and enables transponder to transmit either Mode A (aircraft identification) reply pulses or Mode C (altitude reporting) pulses selected automatically by the interrogating signal.

2. REPLY LAMP - Lamp flashes to indicate transmission of reply pulses; glows steadily to indicate transmission of IDENT pulse or satisfactory self-test operation. (Reply lamp will also glow steadily during initial warm-up period.)

Figure 1. Cessna 300 Transponder and Altitude Encoder (Blind)
(Sheet 1 of 2)

3. IDENT (ID) SWITCH - When depressed, selects special pulse identifier to be transmitted with transponder reply to effect immediate identification of aircraft on ground controller's display. (Reply lamp will glow steadily during duration of IDENT pulse transmission.)

4. DIMMER (DIM) CONTROL - Allows pilot to control brilliance of reply lamp.

5. SELF-TEST (TST) SWITCH - When depressed, causes transponder to generate a self-interrogating signal to provide a check of transponder operation. (Reply lamp will glow steadily to verify self-test operation.)

6. REPLY-CODE SELECTOR KNOBS (4) - Select assigned Mode A reply code.

7. REPLY-CODE INDICATORS (4) - Display selected Mode A reply code.

8. REMOTE-MOUNTED DIGITIZER - Provides an altitude reporting code range of -1000 feet up to the airplane's maximum service ceiling.

Figure 1. Cessna 300 Transponder and Altitude Encoder (Blind)
(Sheet 2 of 2)

SECTION 2
LIMITATIONS

There is no change to the airplane limitations when this avionic equipment is installed. However, the following information must be displayed in the form of a placard located near the altimeter.

ALTITUDE ENCODER EQUIPPED

SECTION 3
EMERGENCY PROCEDURES

TO TRANSMIT AN EMERGENCY SIGNAL:

1. Function Switch -- ON.
2. Reply-Code Selector Knobs -- SELECT 7700 operating code.

TO TRANSMIT A SIGNAL REPRESENTING LOSS OF ALL COMMUNICATIONS (WHEN IN A CONTROLLED ENVIRONMENT):

1. Function Switch -- ON.
2. Reply-Code Selector Knobs -- SELECT 7700 operating code for 1 minute; then SELECT 7600 operating code for 15 minutes and then REPEAT this procedure at same intervals for remainder of flight.

SECTION 4
NORMAL PROCEDURES

BEFORE TAKEOFF:

1. Function Switch -- SBY.

TO TRANSMIT MODE A (AIRCRAFT IDENTIFICATION) CODES IN FLIGHT:

1. Reply-Code Selector Knobs -- SELECT assigned code.

2. Function Switch -- ON.
3. DIM Control -- ADJUST light brilliance of reply lamp.

NOTE

During normal operation with function switch in ON position, reply lamp flashes indicating transponder replies to interrogations.

4. ID Button -- DEPRESS momentarily when instructed by ground controller to "squawk IDENT" (reply lamp will glow steadily, indicating IDENT operation).

TO TRANSMIT MODE C (ALTITUDE REPORTING) CODES IN FLIGHT:

1. Reply-Code Selector Knobs -- SELECT assigned code.
2. Function Switch -- ALT.

NOTE

When directed by ground controller to "stop altitude squawk", turn Function Switch to ON for Mode A operation only.

NOTE

Pressure altitude is transmitted by the transponder for altitude squawk and conversion to indicated altitude is done in ATC computers. Altitude squawked will only agree with indicated altitude when the local altimeter setting in use by the ground controller is set in the aircraft altimeter.

3. DIM Control -- ADJUST light brilliance of reply lamp.

TO SELF-TEST TRANSPONDER OPERATION:

1. Function Switch -- SBY and wait 30 seconds for equipment to warm-up.
2. Function Switch -- ON or ALT.
3. TST Button -- DEPRESS (reply lamp should light brightly regardless of DIM control setting).
4. TST Button -- Release for normal operation.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when this avionic equipment is installed. However, the installation of an externally mounted antenna or several related external antennas, will result in a minor reduction in cruise performance.

SUPPLEMENT

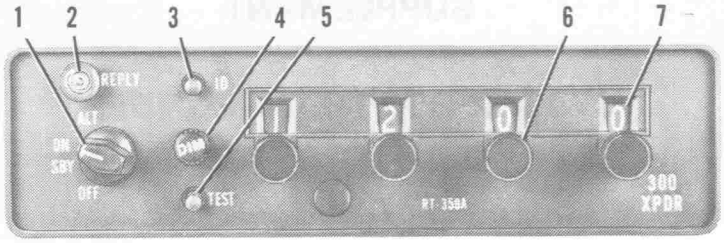
CESSNA 300 TRANSPONDER (Type RT-359A) AND OPTIONAL ENCODING ALTIMETER (Type EA-401A)

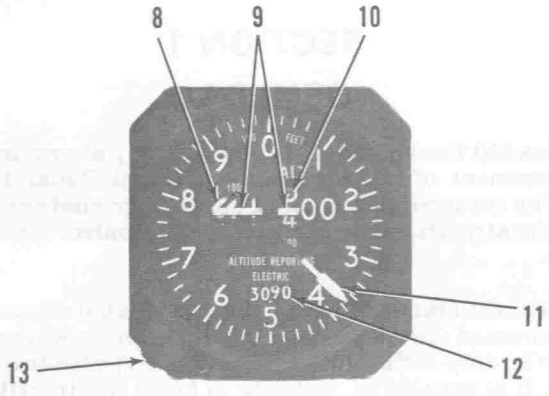
SECTION 1
GENERAL

The Cessna 300 Transponder (Type RT-359A), shown in Figure 1, is the airborne component of an Air Traffic Control Radar Beacon System (ATCRBS). The transponder enables the ATC ground controller to "see" and identify the aircraft, while in flight, on the control center's radarscope more readily.

The Cessna 300 Transponder consists of a panel-mounted unit and an externally mounted antenna. The transponder receives interrogating pulse signals on 1030 MHz and transmits coded pulse-train reply signals on 1090 MHz. It is capable of replying to Mode A (aircraft identification) and Mode C (altitude reporting) interrogations on a selective reply basis on any of 4,096 information code selections. When an optional panel-mounted EA-401A Encoding Altimeter (not part of a standard 300 Transponder system) is included in the avionic configuration, the transponder can provide altitude reporting in 100-foot increments between -1000 and +35,000 feet.

All Cessna 300 Transponder operating controls, with the exception of the optional altitude encoder's altimeter setting knob, are located on the front panel of the unit. The altimeter setting knob is located on the encoding altimeter. Functions of the operating controls are described in Figure 1.





1. FUNCTION SWITCH - Controls application of power and selects transponder operating mode as follows:

   OFF - Turns set off.
   SBY - Turns set on for equipment warm-up.
   ON - Turns set on and enables transponder to transmit Mode A (aircraft identification) reply pulses.
   ALT - Turns set on and enables transponder to transmit either Mode A (aircraft identification) reply pulses or Mode C (altitude reporting) pulses selected automatically by the interrogating signal.

2. REPLY LAMP - Lamp flashes to indicate transmission of reply pulses; glows steadily to indicate transmission of IDENT pulse or satisfactory self-test operation. (Reply Lamp will also glow steadily during initial warm-up period.)

Figure 1. Cessna 300 Transponder and Encoding Altimeter (Sheet 1 of 2)

3. IDENT (ID) SWITCH - When depressed, selects special pulse identifier to be transmitted with transponder reply to effect immediate identification of aircraft on ground controller's display. (Reply Lamp will glow steadily during duration of IDENT pulse transmission.)

4. DIMMER (DIM) CONTROL - Allows pilot to control brilliance of reply lamp.

5. SELF-TEST (TST) SWITCH - When depressed, causes transponder to generate a self-interrogating signal to provide a check of transponder operation. (Reply Lamp will glow steadily to verify self test operation.)

6. REPLY-CODE SELECTOR KNOBS (4) - Select assigned Mode A reply code.

7. REPLY-CODE INDICATORS (4) - Display selected Mode A reply code.

8. 1000-FOOT DRUM TYPE INDICATOR - Provides digital altitude readout in 1000-foot increments between -1000 feet and +35,000 feet. When altitude is below 10,000 feet, a diagonally striped flag appears in the 10,000 foot window.

9. OFF INDICATOR WARNING FLAG - Flag appears across altitude readout when power is removed from the altimeter to indicate that readout is not reliable.

10. 100-FOOT DRUM TYPE INDICATOR - Provides digital altitude readout in 100-foot increments between 0 feet and 1000 feet.

11. 20-FOOT INDICATOR NEEDLE - Indicates altitude in 20-foot increments between 0 feet and 1000 feet.

12. ALTIMETER SETTING SCALE - DRUM TYPE - Indicates selected altimeter setting in the range of 27.9 to 31.0 inches of mercury on the standard altimeter or 950 to 1050 millibars on the optional altimeter.

13. ALTIMETER SETTING KNOB - Dials in desired altimeter setting in the range of 27.9 to 31.0 inches of mercury on the standard altimeter or 950 to 1050 millibars on the optional altimeter.

SECTION 2
LIMITATIONS

There is no change to the airplane performance when this avionic equipment is installed. However, the encoding altimeter used in this installation does have a limitation that requires a standard barometric altimeter to be installed as a back-up altimeter.

Figure 1. Cessna 300 Transponder and Encoding Altimeter (Sheet 2 of 2)

SECTION 3
EMERGENCY PROCEDURES

TO TRANSMIT AN EMERGENCY SIGNAL:

1. Function Switch -- ON.
2. Reply-Code Selector Knobs -- SELECT 7700 operating code.

TO TRANSMIT A SIGNAL REPRESENTING LOSS OF ALL COMMUNICATIONS (WHEN IN A CONTROLLED ENVIRONMENT):

1. Function Switch -- ON.
2. Reply-Code Selector Knobs -- SELECT 7700 operating code for 1 minute; then SELECT 7600 operating code for 15 minutes and then REPEAT this procedure at same intervals for remainder of flight.

SECTION 4
NORMAL PROCEDURES

BEFORE TAKEOFF:

1. Function Switch -- SBY.

TO TRANSMIT MODE A (AIRCRAFT IDENTIFICATION) CODES IN FLIGHT:

1. Reply-Code Selector Knobs -- SELECT assigned code.
2. Function Switch -- ON.
3. DIM Control -- ADJUST light brilliance of reply lamp.

NOTE

During normal operation with function switch in ON position, reply lamp flashes indicating transponder replies to interrogations.

4. ID Button -- DEPRESS momentarily when instructed by ground controller to "squawk IDENT" (reply lamp will glow steadily, indicating IDENT operation).

TO TRANSMIT MODE C (ALTITUDE REPORTING) CODES IN FLIGHT:

1. Off Indicator Warning Flag -- VERIFY that flag is out of view on encoding altimeter.
2. Altitude Encoder Altimeter Setting Knob -- SET IN assigned local altimeter setting.
3. Reply-Code Selector Knobs -- SELECT assigned code.
4. Function Switch -- ALT.

NOTE

When directed by ground controller to "stop altitude squawk", turn Function Switch to ON for Mode A operation only.

NOTE

Pressure altitude is transmitted by the transponder for altitude squawk and conversion to indicated altitude is accomplished in ATC computers. Altitude squawked will only agree with indicated altitude when the local altimeter setting in use by the ground controller is set in the encoding altimeter.

5. DIM Control -- ADJUST light brilliance of reply lamp.

TO SELF-TEST TRANSPONDER OPERATION:

1. Function Switch -- SBY and wait 30 seconds for equipment to warm-up.
2. Function Switch -- ON or ALT.
3. TST Button -- DEPRESS and HOLD (reply lamp should light with full brilliance regardless of DIM control setting).
4. TST Button -- Release for normal operation.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when this avionic equipment is installed. However, the installation of an externally mounted antenna or several related external antennas, will result in a minor reduction in cruise performance.

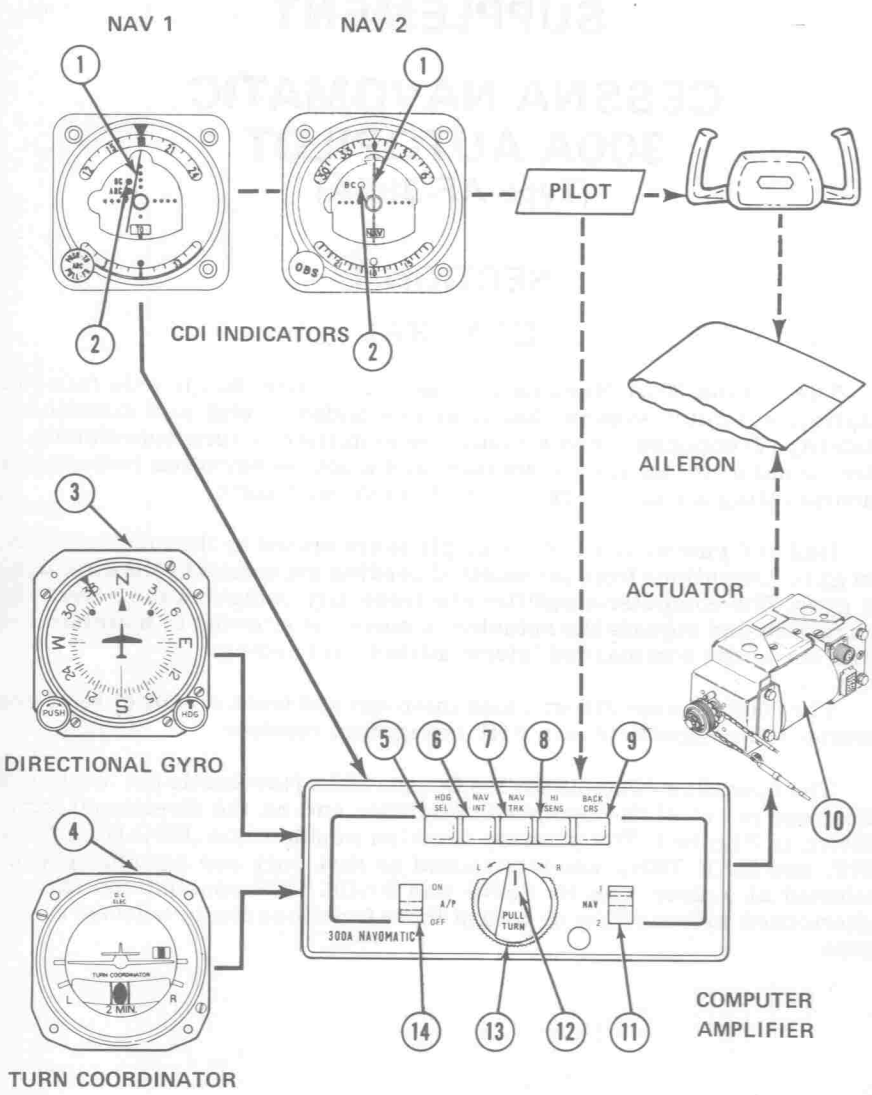


Figure 1. Cessna 300A Autopilot, Operating Controls and Indicators (Sheet 1 of 2)

1. COURSE DEVIATION INDICATOR - Provides VOR/LOC navigation inputs to autopilot for intercept and tracking modes.

2. LOCALIZER REVERSED INDICATOR LIGHT - Amber light, labeled BC, illuminates when BACK CRS button is pushed in (engaged) and LOC frequency selected. BC light indicates course indicator needle is reversed on selected receiver (when tuned to a localizer frequency). This light is located within the CDI indicator.

3. DIRECTIONAL GYRO INDICATOR - Provides heading information to the autopilot for heading intercept and hold. Heading bug on indicator is used to select desired heading or VOR/LOC course to be flown.

4. TURN COORDINATOR - Senses roll and yaw for wings leveling and command turn functions.

5. HDG SEL PUSHBUTTON - Aircraft will turn to and hold heading selected by the heading "bug" on the directional gyro.

6. NAV INT PUSHBUTTON - When heading "bug" on DG is set to selected course, aircraft will turn to and intercept selected VOR or LOC course.

7. NAV TRK PUSHBUTTON - When heading "bug" on DG is set to selected course, aircraft will track selected VOR or LOC course.

8. HI SENS PUSHBUTTON - During NAV INT or NAV TRK operation, this high sensitivity setting increases autopilot response to NAV signal to provide more precise operation during localizer approach. In low-sensitivity position (pushbutton out), response to NAV signal is dampened for smoother tracking of enroute VOR radials; it also smooths out effect of course scalloping during NAV operation.

9. BACK CRS PUSHBUTTON - Used with LOC operation only. With A/P switch OFF or ON, and when navigation receiver selected by NAV switch is set to a localizer frequency, it reverses normal localizer needle indication (CDI) and causes localizer reversed (BC) light to illuminate. With A/P switch ON, reverses localizer signal to autopilot.

10. ACTUATOR - The torque motor in the actuator causes the ailerons to move in the commanded direction.

11. NAV SWITCH - Selects NAV 1 or NAV 2 navigation receiver.

12. PULL TURN KNOB - When pulled out and centered in detent, airplane will fly wings-level; when turned to the right (R), the airplane will execute a right, standard rate turn; when turned to the left (L), the airplane will execute a left, standard rate turn. When centered in detent and pushed in, the operating mode selected by a pushbutton is engaged.

13. TRIM - Used to trim autopilot to compensate for minor variations in aircraft trim or lateral weight distribution. (For proper operation, the aircraft's rudder trim, if so equipped, must be manually trimmed before the autopilot is engaged.

14. A/P SWITCH - Turns autopilot ON or OFF.

Figure 1. Cessna 300A Autopilot, Operating Controls and Indicators (Sheet 2 of 2)

SECTION 2
LIMITATIONS

The following autopilot limitation must be followed during airplane operation:

1. Autopilot must be OFF for takeoff and landing

OPERATING LIMITATION WITH AUTOPILOT ENGAGED:

1. Maximum Airspeed -- 155 KIAS.

SECTION 3
EMERGENCY PROCEDURES

TO OVERRIDE THE AUTOPILOT:

1. Airplane Control Wheel -- ROTATE as required to override autopilot.

NOTE

The servo may be overpowered at any time without damage.

TO TURN OFF AUTOPILOT:

1. A/P ON-OFF Switch -- OFF.

SECTION 4
NORMAL PROCEDURES

BEFORE TAKE-OFF AND LANDING:

1. A/P ON-OFF Switch -- OFF.
2. BACK CRS Button -- OFF (see Caution note under Nav Intercept).

NOTE

Periodically verify operation of amber warning light(s), labeled BC on CDI(s), by engaging BACK CRS button with a LOC frequency selected.

INFLIGHT WINGS LEVELING:

1. Airplane Rudder Trim -- ADJUST for zero slip ("Ball" centered on Turn Coordinator).
2. PULL-TURN Knob -- CENTER and PULL out.
3. A/P ON-OFF Switch -- ON.
4. Autopilot TRIM Control -- ADJUST for zero turn rate (wings level indication on Turn Coordinator).

NOTE

For optimum performance in airplanes equipped as floatplanes, use autopilot only in cruise flight or in approach configuration with flaps down no more than 10° and airspeed no lower than 75 KIAS on 172 and R172 Series Models or 90 KIAS on 180, 185, U206 and TU206 Series Models.

COMMAND TURNS:

1. PULL-TURN Knob -- CENTER, PULL out and ROTATE.

HEADING SELECT:

1. Directional Gyro -- SET to airplane magnetic heading.
2. Heading Selector Knob -- ROTATE bug to desired heading.
3. Heading Select Button -- PUSH.
4. PULL-TURN Knob -- CENTER and PUSH.

NOTE

Airplane will turn automatically to selected heading. If airplane fails to hold the precise heading, readjust autopilot TRIM control as required or disengage autopilot and reset manual rudder trim (if installed).

NAV INTERCEPT (VOR/LOC):

1. PULL-TURN Knob -- CENTER and PULL out.
2. NAV 1-2 Selector Switch -- SELECT desired receiver.
3. Nav Receiver OBS or ARC Knob -- SET desired VOR course (if tracking omni).

NOTE

Optional ARC knob should be in center position and ARC warning light should be off.

4. Heading Selector Knob -- ROTATE bug to selected course (VOR or localizer - inbound or outbound as appropriate).
5. Directional Gyro --SET for magnetic heading.
6. NAV INT Button -- PUSH.
7. HI SENS Button -- PUSH for localizer and "close-in" omni intercepts.
8. BACK CRS Button -- PUSH only if intercepting localizer front course outbound or back course inbound.

CAUTION

With BACK CRS button pushed in and localizer frequency selected, the CDI on selected nav radio will be reversed even when the autopilot switch is OFF.

9. PULL-TURN Knob -- PUSH.

NOTE

Airplane will automatically turn to a 45° intercept angle.

NAV TRACKING (VOR/LOC):

1. NAV TRK Button -- PUSH when CDI centers (within one dot) and airplane is within ± 10° of course heading.
2. HI SENS Button -- Disengage for enroute omni tracking (leave engaged for localizer).

NOTE

Optional ARC feature, if installed, should not be used for autopilot operation. If airplane should deviate off course, pull out PULL TURN knob and readjust airplane rudder trim for straight flight on the turn coordinator. Push in PULL TURN knob and reintercept the course. If deviation persists, progressively make slight adjustments of the autopilot TRIM control towards the course as required to maintain track.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when this avionic equipment is installed.

SUPPLEMENT
CESSNA 400 GLIDE SLOPE (Type R-443B)

SECTION 1
GENERAL

The Cessna 400 Glide Slope is an airborne navigation receiver which receives and interprets glide slope signals from a ground-based Instrument Landing System (ILS). It is used with the localizer function of a VHF navigation system when making instrument approaches to an airport. The glide slope provides vertical path guidance while the localizer provides horizontal track guidance.

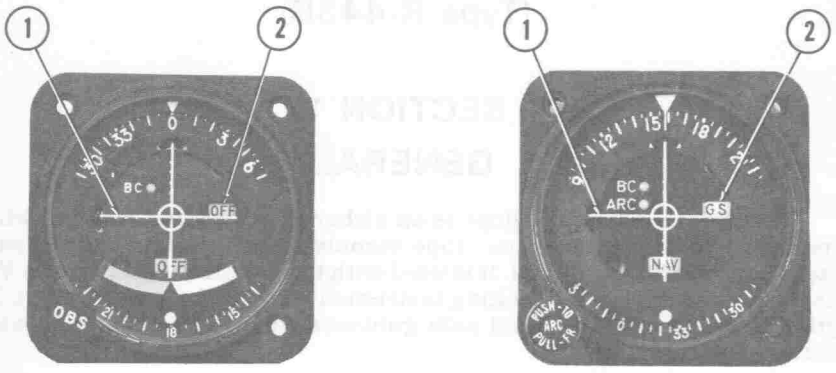
The Cessna 400 Glide Slope system consists of a remote-mounted receiver coupled to an existing navigation system, a panel-mounted indicator and an externally mounted antenna. The glide slope receiver is designed to receive ILS glide slope signals on any of 40 channels. The channels are spaced 150 kHz apart and cover a frequency range of 329.15 MHz through 335.0 MHz. When a localizer frequency is selected on the NAV receiver, the associated glide slope frequency is selected automatically.

Operation of the Cessna 400 Glide Slope system is controlled by the associated navigation system. The functions and indications of typical 300 series glide slope indicators are pictured and described in Figure 1. The 300 series glide slope indicators shown in Figure 1 depict typical indications for Cessna-crafted glide slope indicators. However, refer to the 400 Nav/Com or HSI write-ups if they are listed in this section as options for additional glide slope indicators.

SECTION 2
LIMITATIONS

There is no change to the airplane limitations when this avionic equipment is installed.

TYPICAL 300 SERIES GLIDE SLOPE INDICATORS



1. GLIDE SLOPE DEVIATION POINTER - Indicates deviation from normal glide slope.
2. GLIDE SLOPE "OFF" OR "GS" FLAG - When visible, indicates unreliable glide slope signal or improperly operating equipment. The flag disappears when a reliable glide slope signal is being received.

CAUTION

Spurious glide slope signals may exist in the area of the localizer back course approach which can cause the glide slope "OFF" or "GS" flag to disappear and present unreliable glide slope information. Disregard all glide slope signal indications when making a localizer back course approach unless a glide slope (ILS BC) is specified on the approach and landing chart.

Figure 1. Typical 300 Series VOR/LOC/ILS Indicator

SECTION 3
EMERGENCY PROCEDURES

There is no change to the airplane emergency procedures when this avionic equipment is installed.

SECTION 4
NORMAL PROCEDURES

TO RECEIVE GLIDE SLOPE SIGNALS:

NOTE

The pilot should be aware that on many Cessna airplanes equipped with the windshield mounted glide slope antenna, pilots should avoid use of 2700 ±100 RPM on airplanes equipped with a two-bladed propeller or 1800 ±100 RPM on airplanes equipped with a three-bladed propeller during ILS approaches to avoid oscillations of the glide slope deviation pointer caused by propeller interference.

1. NAV Frequency Select Knobs -- SELECT desired localizer frequency (glide slope frequency is automatically selected).
2. NAV/COM VOX-ID-T Switch -- SELECT ID position to disconnect filter from audio circuit.
3. NAV VOL Control -- ADJUST to desired listening level to confirm proper localizer station.

CAUTION

When glide slope "OFF" or "GS" flag is visible, glide slope indications are unusable.

SECTION 5
PERFORMANCE

There is no change to the airplane performance when this avionic equipment is installed.

SUPPLEMENT Removed

CESSNA 400 MARKER BEACON
(Type R-402A)

SECTION 1
GENERAL

The system consists of a remote mounted 75 MHz marker beacon receiver, an antenna which is either flush mounted or externally mounted on the under side of the aircraft and operating controls and annunciator lights which are mounted on the front of the audio control panel.

Operating controls for the marker beacon system are supplied on the front of the two types of audio control panels used in this Cessna aircraft. The operating controls for the marker beacon are different on the two audio control panels. One type of audio control panel is supplied with one or two transmitters and the other is supplied with three transmitters.

The marker beacon operating controls and annunciator lights used on the audio control panel supplied with two or less transmitters are shown and described in Figure 1. The operating controls consist of three, three-position toggle switches. One switch is labeled "HIGH/LO/MUTE" and provides the pilot with HIGH-LO sensitivity selection and marker beacon audio muting, for approximately 30 seconds, to enable voice communication to be heard without interference of marker beacon signals. The marker beacon audible tone is automatically restored at the end of the 30 second muting period to continue marker audio for passage over the next marker. Another switch is labeled "SPKR/OFF/PHN" and is used to turn the set on and select the desired speaker or phone position for marker beacon signals. The third toggle switch labeled, "ANN LT", is provided to enable the pilot to select the desired DAY or NITE lighting position for annunciator lights, and also a "TEST" position to verify operation of marker beacon annunciator lights.

The marker beacon operating controls and annunciator lights used on the audio control panel supplied with three transmitters are shown and described in Figure 2. The operating controls consist of two, three-position toggle switches, and two concentric control knobs. One switch is labeled "SPKR/PHN" and is used to select the desired speaker or phone position for marker beacon signals. The other switch is labeled "HI/LO/TEST" and

SUPPLEMENT Removed

CESSNA 400 TRANSPONDER (Type RT-459A)

AND

OPTIONAL ALTITUDE ENCODER (BLIND)

SECTION 1
GENERAL

The Cessna 400 Transponder (Type RT-459A), shown in Figure 1, is the airborne component of an Air Traffic Control Radar Beacon System (ATCRBS). The transponder enables the ATC ground controller to "see" and identify the aircraft, while in flight, on the control center's radarscope more readily.

The Cessna 400 Transponder system consists of a panel-mounted unit and an externally mounted antenna. The transponder receives interrogating pulse signals on 1030 MHz and transmits pulse-train reply signals on 1090 MHz. The transponder is capable of replying to Mode A (aircraft identification) and also to Mode C (altitude reporting) when coupled to an optional altitude encoder system. The transponder is capable of replying on both modes of interrogation on a selective reply basis on any of 4,096 information code selections. The optional altitude encoder system (not part of a standard 400 Transponder system) required for Mode C (altitude reporting) operation, consists of a completely independent remote-mounted digitizer that is connected to the static system and supplies encoded altitude information to the transponder. When the altitude encoder system is coupled to the 400 Transponder system, altitude reporting capabilities are available in 100-foot increments between -1000 feet and the airplane's maximum service ceiling.

All Cessna 400 Transponder operating controls are located on the front panel of the unit. Functions of the operating controls are described in Figure 1.

NOT IN PLANE

SUPPLEMENT
CESSNA 400 TRANSPONDER (Type RT-459A)
AND
OPTIONAL ENCODING ALTIMETER (Type EA-401A)

SECTION 1
GENERAL

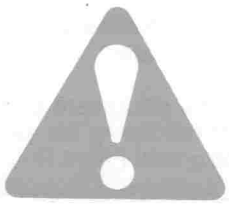
The Cessna 400 Transponder (Type RT-459A), shown in Figure 1, is the airborne component of an Air Traffic Control Radar Beacon System (ATCRBS). The transponder enables the ATC ground controller to "see" and identify the aircraft, while in flight, on the control center's radarscope more readily.

The 400 Transponder consists of a panel-mounted unit and an externally mounted antenna. The transponder receives interrogating pulse signals on 1030 MHz and transmits coded pulse-train reply signals on 1090 MHz. It is capable of replying to Mode A (aircraft identification) and Mode C (altitude reporting) interrogations on a selective reply basis on any of 4,096 information code selections. When an optional panel mounted EA-401A Encoding Altimeter (not part of 400 Transponder System) is included in the avionic configuration, the transponder can provide altitude reporting in 100-foot increments between -1000 and +35,000 feet.

All Cessna 400 Transponder operating controls, with the exception of the optional altitude encoder's altimeter setting knob, are located on the front panel of the unit. The altimeter setting knob is located on the encoding altimeter. Functions of the operating controls are described in Figure 1.

PLACE IN PILOT'S OPERATING HANDBOOK

SAFETY WARNING



Vacuum / Pressure Gyroscopic Flight Instrument Power System

ATTENTION: **MECHANIC/SERVICE FACILITY**
This important notice must be given to the Owner/ Operator of the aircraft into which this air pump is installed. FAILURE TO DO SO MAY RESULT IN DEATH, BODILY INJURY, OR PROPERTY DAMAGE.

ATTENTION: **AIRCRAFT OWNER/OPERATOR**
This important notice must be (1) read and understood and followed before operating the aircraft into which this air pump is installed, (2) distributed to all pilots using the aircraft, and (3) permanently retained in the Pilot's Operating Handbook for this aircraft. FAILURE TO DO SO MAY RESULT IN DEATH, BODILY INJURY, OR PROPERTY DAMAGE.

Parker Aerospace

Parker Hannifin Corporation
Airborne Division
711 Taylor St.
P.O. Box 4032
Elyria, Ohio 44036 USA
(440) 284-6300

SI 300-7 12/8/86 (Reprint 6/00)

Subject: SAFETY WARNING - Vacuum/Pressure Gyroscopic Flight Instrument Power System.

Applicability: This document communicates safety warning information concerning aircraft using air pumps to power gyro flight instruments while flying Instrument Flight Rules (IFR).

WARNING: FAILURE TO FOLLOW THE FOLLOWING INSTRUCTIONS MAY RESULT IN DEATH, BODILY INJURY, OR PROPERTY DAMAGE:

1. A BACK-UP PNEUMATIC POWER SOURCE FOR THE AIR DRIVEN GYROS, OR A BACK-UP ELECTRIC ATTITUDE GYRO INSTRUMENT, MUST BE INSTALLED IN ALL AIRCRAFT WHICH FLY IFR.
2. ANY INOPERATIVE AIR PUMP OR OTHER COMPONENT OF THE GYRO SYSTEM, AND ANY INOPERATIVE BACK-UP SYSTEM OR COMPONENT, MUST BE REPLACED PRIOR TO THE NEXT FLIGHT.
3. THIS PILOT SAFETY WARNING MUST BE PERMANENTLY RETAINED IN THE PILOT'S OPERATING HANDBOOK FOR THE AIRCRAFT INTO WHICH THIS AIR PUMP IS INSTALLED.

Explanation: Failure of the air pump or any other component of the pneumatic system during IFR flight in Instrument Meteorological Conditions (IMC) can lead to spatial disorientation of the pilot and subsequent loss of aircraft control. This could result in an accident causing death, bodily injury, or property damage.

Use of single-engine aircraft in IMC is increasing. Many single-engine aircraft do not have a back-up pneumatic power source or back-up electric attitude gyro instruments. In aircraft without such back-up devices, the pilot due to added workload may not be able to fly the aircraft with only "partial panel" instruments (that is, turn and slip indicator, altimeter, and airspeed indicator) in the event of primary air pump or pneumatic system failure during IMC.

Air pump or pneumatic system failures can and do occur without warning. This can be a result of various factors, including but not limited to normal wear-out of components, improper installation or maintenance, premature failure, or the use of substandard overhauled components. It is recommended that an annunciator light or other device be installed to warn the pilot of loss of gyro power so that the pilot can take corrective action prior to the loss of correct gyro information.

Since air pump life cannot be accurately predicted and air pumps can fail without warning, the instructions set forth in this document must be followed.

PLACE IN PILOT'S OPERATING HANDBOOK

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

CESSNA 172RG
~~PIPER PA32~~

WITH

GARMIN GNS 430 VHF COMMUNICATION
TRANSCEIVER / VOR/ILS RECEIVER / GPS RECEIVER

Reg. No. 172DP S/N 172RG0465

This Supplement must be attached to the FAA Approved Airplane Flight Manual when the GARMIN GNS 430 VHF Communication Transceiver / VOR/ILS Receiver / Global Positioning System is installed in accordance with STC# SA00705WI. The information contained herein supplements the information of the basic Airplane Flight Manual. For Limitations, Procedures and Performance information not contained in this Supplement, consult the basic Airplane Flight Manual.

FAA APPROVED

for Ronald K. Rathgeber
Manager, Aircraft Certification Office
Federal Aviation Administration
Wichita, Kansas 67209

Date: 11/21/02

GARMIN International, Inc.
1200 E. 151st Street
Olathe, KS 66062 USA

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
GARMIN GNS 430 VHF COMMUNICATION
TRANSCEIVER / VOR/ILS RECEIVER / GPS RECEIVER

6. DISPLAY OF TRAFFIC INFORMATION SERVICE DATA

TIS surveillance data uplinked by Air Traffic Control (ATC) radar through the GTX 330 Mode S Transponder will appear on the moving map and traffic display pages of the GNS 430. For detailed operating instructions regarding the interface of the GNS 430 with the GTX 330, refer to the GNS 430 Pilot's Guide Addendum for the TIS System interface.

SECTION V
PERFORMANCE

No change.

SECTION VI
WEIGHT AND BALANCE

See current weight and balance data.

SECTION VII
AIRPLANE & SYSTEM DESCRIPTIONS

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

CESSNA 172R6
~~PIPER PA32~~

FAA APPROVED
DATE: 11/21/02

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 CDI 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.

SECTION IV
NORMAL PROCEDURES

1. DETAILED OPERATING PROCEDURES

Normal operating procedures are described in the GARMIN GNS 430 Pilot's Guide, P/N 190-00140-00, Rev. A, dated October 1998, or later appropriate revision.

2. PILOT'S DISPLAY

The GNS 430 System data will appear on the Pilot's HSI. The source of data is either GPS or VLOC as annunciated on the display above the CDI key.

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~~PIPER PA32~~
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DATE: 11/21/02

3. AUTOPILOT / FLIGHT DIRECTOR OPERATION

Coupling of the GNS 430 System steering information to the autopilot/flight director can be accomplished by engaging the autopilot/flight director in the NAV or APR mode.

When the autopilot/flight 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/flight director 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 be switched 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 course 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.

5. DISPLAY OF LIGHTNING STRIKE DATA

Lightning strike data detected by the BFGoodrich WX-500 Stormscope® will appear on the moving map and weather pages of the GNS 430. For detailed operating instructions regarding the interface of the GNS 430 with the WX-500, refer to the WX-500 Pilot's Guide and the GNS 430 Pilot's Guide Addendum for the WX-500 Stormscope interface.

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" 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)

   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 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 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.

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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 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 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 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.

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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.

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 whenever navigation is predicated on the use of the system. In addition to the Pilot's Guide, the appropriate Pilot's Guide Addendum also must be immediately available to the flight crew for lightning detection and traffic information service (TIS) equipment interfaced to the system.

2. The GNS 430 must utilize the following or later FAA approved software versions:

Sub-System	Software Version
Main	4.00
GPS	2.00
COMM	1.22
VOR/LOC	1.25
G/S	2.00

The Main software version 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 current approved data.

GARMIN International, Inc.
1200 E. 151st Street
Olathe, KS 66062 USA

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
GARMIN GNS 430 VHF COMMUNICATION TRANSCEIVER / VOR/ILS RECEIVER / GPS RECEIVER

SECTION I
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 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 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 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 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, 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 430 installation, for North Atlantic Minimum Navigation Performance Specification (MNPS) Airspace in accordance with AC 91-49 and AC 120-33.

   - 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.

CESSNA 172 RG
~~PIPER PA32~~

FAA APPROVED
DATE: 11/21/02

GARMIN International, Inc.
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FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
GARMIN GNS 430 VHF COMMUNICATION TRANSCEIVER / VOR/ILS RECEIVER / GPS RECEIVER

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GARMIN International, Inc.
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FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
GARMIN GNS 430 VHF COMMUNICATION TRANSCEIVER / VOR/ILS RECEIVER / GPS RECEIVER

LOG OF REVISIONS				
Revision Number	Page Number(s)	Description	* FAA Approved	Date of Approval
A	All	Initial Release	G.M. Baker	10/02/98
B	9, 10	Add BFGoodrich WX-500 and SKYWATCH Interfaces	G.M. Baker	10/15/99
C	5, 10	Remove SKYWATCH and add GTX 330 TIS		11/21/02

* For Manager Wichita Aircraft Certification Office

CESSNA 172RG
~~PIPER PA32~~
FAA APPROVED
DATE: 11/21/02

United States of America

Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SA00705WI

This certificate issued to GARMIN International
1200 E 51st St.
Olathe, KS 66062

certifies that the change in the type design for the following product with the limitations and condition therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air *Regulations.*

Original Product - Type Certificate Number : A3SO

Make : ~~Piper~~ CESSNA

Model : ~~PA-32-260~~ 172 RG

Description of Type Design Change:
Installation of GARMIN GNS 430 or GNS 430A in accordance with GARMIN Master Drawing List, Drawing No. 005-0005 Revision V, dated 04/25/02 or later FAA approved revision, and FAA Approved Airplane Flight Manual Supplement for Pip with GARMIN GNS 430, Document No. 190-00140-03, Revision B, dated 10/22/99, or later FAA approved revision.

Limitations and Conditions:
Compatibility of this design change with previously approved modifications must be determined by the installer.

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person v evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of Federal Aviation Administration.

Date of application : November 26, 1997

Date of issuance : October 02, 1998

Date reissued :

Date amended : October 29, 1999; July 25, 2002

By direction of the Administrator

Harvey E. Nero
(*Signature*)
Harvey E. Nero
Program Manager
Wichita Aircraft Certification Office

(*Title*)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or b

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
For FAA Use
Office Identification

INSTRUCTIONS: Print or type all entries. See FAR 43.9 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty nc $1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make **CESSNA**	Model **172RG**
	Serial No. **172RG0465**	Nationality and Registration Mark **N172DP**
2. Owner	Name *(As shown on registration certificate)* **AIR WOLF HOLDINGS LLC**	Address *(As shown on registration certificate)* **160 GREENTREE DR STE 101** **DOVER DE 19904-7620**

3. For FAA Use Only

4. Unit Identification

Unit	Make	Model	Serial No.	**5. Type** Repair
AIRFRAME	~~~~~~~~~~ *(As described in Item 1 above)* ~~~~~~~~~~			
POWERPLANT				
PROPELLER				
APPLIANCE	**Type**			
	Manufacturer			

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency	C. Certificate No
ISAAC D. WHITE **134 ROLLING HILL RD** **LIBERTY, SC 29657**	X U.S. Certified Mechanic Foreign Certified Mechanic Certificated Repair Station Manufacturer	**3067**

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attach have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the infor furnished herein is true and correct to the best of my knowledge.

Date	Signature of Authorized Individual
10/25/2010	

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed b Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY						Other *(Specify)*
	☐ FAA Flt. Standards Inspector	☐ Manufacturer	☒ Inspection Authorization			
	☐ FAA Designee	☐ Repair Station	☐ Person Approved by Transport Canada Airworthiness Group			

Date of Approval or Rejection	Certificate or Designation No.	Signature of Authorized Individual
10/25/2010	**3067784**	

alance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with lterations to assure continued conformity with the applicable airworthiness requirements.

on of Work Accomplished

pace is required, attach additional sheets, Identify with aircraft nationality and registration mark and date work accomplished.)

N172DP **S/N: 172RG0465**

moved the existing #1 Bendix/King KT-76 communications radio and removed the #1 Bendix/King KNS-80 navigation radio. talled a Garmin GNS 430 P/N: 011-00280-00 in the #1 radio location and interface IAW 400 Series Installation Manual P/N: 190-140-02.

Equipment was previously installed under Supplemental Type Certificate Number **SA00705WI** dated July 25, 2002 and qualifies w on installation.

C FAA APPROVED FLIGHT MANUAL SUPPLEMENT DATED (**November 21, 2002**) WAS PROVIDED. FLIGHT MANUAL MENT **IS REQUIRED TO BE IN THE AIRCRAFT AT ALL TIMES DURING OPERATION.**

ANT: Reference should be made to the **FAA Approved Flight Manual Supplement** describing limitations and operational ns.

lance and Electrical Loads were not appreciably affected and were not revised after review.
ional checked normal, completed a logbook entry, and secured aircraft for flight.

or Continued Airworthiness (ICA)-See the following ICA documentation specific to this installation, however, reference should be facturers' publications, established inspection procedures and servicing requirements.

RODUCTION: This document identifies the Instructions for Continued Airworthiness for the modification of the aircraft by allation of the Garmin Model 400 Series GPS/Nav/Com.
SCRIPTION: The Garmin Model 400 Series GPS/Nav/Com unit is a 6 ¼ inch wide panel mounted unit with all the interface nections behind the instrument panel. The 400 Series units combine a large number of easily acceptable controls to use the color ifunction display, Nav and Com transceiver, and GPS navigator in a single unit.
NTROL AND OPERATION INFORMATION: See 400 Series Installation Manual P/N: 190-00140-02 Rev T, or later.
RVICING INFORMATION: N/A.
NTENANCE INSTRUCTIONS: The 400 Series units are designed to detect internal failure. A thorough self-test is executed matically upon application of power to the units, and built-in test is continuously executed. Detected errors are indicated on the pment via failure annunciations and maintenance is on-condition. Operation of the 400 Series unit is not permitted unless an ection as described in this section has been completed within the preceding 12 calendar months. Conduct a visual inspection on 400 series unit and its wire harness to insure installation integrity, inspect the unit for security of attachment, inspect all knobs and ons for legibility, and inspect condition of wiring, routing and attachment/clamping.
UBLESHOOTING INFORMATION: See 400 Series Installation Manual P/N: 190-00140-02 Rev T, or later.
MOVAL/REPLACEMENT INFORMATION: If the 400 series unit is removed and reinstalled, verify that the 400 series unit power-elf-test sequence is successfully completed and no failure messages are annunciated. If the 400 series unit is removed for repair reinstalled, or if the 400 unit is removed and replaced with a different 400 series unit, then follow 'Post Installation Configuration & ckout Procedures' procedures contained in the 400 Series Installation Manual listed in paragraph 2.1 of this document, and verify 400 unit power-up self-test sequence is successfully completed and no failure messages are annunciated. If any work has been e on the aircraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify the 400 series unit er-up self-test sequence is successfully completed and no failure messages are annunciated. To remove the 400 series unit from mounting rack, insert a 3/32-inch hex drive tool into the access hole at the bottom of the unit face. Rotate the hex tool nterclockwise until the unit is forced out about 3/8 inches and can be freely pulled from the rack. The 400W unit is installed in the by sliding it straight in until it stops, about 1 inch short of the final position. Insert the hex drive tool into the access hole at the om of the unit face. Rotate the hex tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the . Note: There are no special handling requirements for the 400W series units.
GRAMS: See 400 Series Installation Manual P/N: 190-00140-02 Rev T, or later.
CIAL INSPECTION REQUIREMENTS: There are no special inspection requirements.
LICATION OF PROTECTIVE TREATMENTS: N/A
A: N/A
ING OF SPECIAL TOOLS/EQUIPMENT: N/A
COMMUTER AIRCRAFT CATEGORY: N/A
OMMENDED OVERHAUL PERIODS: There are no recommended overhaul periods.
WORTHINESS LIMITATIONS: There are no additional Airworthiness Limitations as defined in 14 CFR § 23, Appendix G. G23.4 result from this modification. The Airworthiness Limitations section is FAA approved and specifies maintenance required under 3.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.
REVISION: For revision of this ICA, a letter will be submitted to the local FSDO with a copy of the revised form 337 and revised The FAA inspector accepts the change by signing block 3 and including the following statement: "*Major alterations have been pted by the FAA superseding the Instructions for Continued Airworthiness.*" Once the revision has been accepted, a ntenance entry will be made identifying the revision, its location, and a date on the form 337.

---END---

☐ Additional Sheets Are Attached

Appendix B. STC PERMISSION

Consistent with N8110.69 or Order 8110.4, Aviation authority approved installers are hereby granted permission to use STC's #SA00705WI (GNS 430 and GNS 430A), #SA00801WI (GNC 420 and GNC 420A), and #SA00800WI (GPS 400) data to modify aircraft.

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SA00705WI

This certificate issued to GARMIN International
1200 E 51st St.
Olathe, KS 66062

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air *Regulations.*

Original Product - Type Certificate Number: A3SO

Make: ~~Piper~~ CESSNA
Model: ~~PA-32-260~~ 172 RG

Description of Type Design Change:
Installation of GARMIN GNS 430 or GNS 430A in accordance with GARMIN Master Drawing List, Drawing No. 005-00051-00, Revision V, dated 04/25/02 or later FAA approved revision, and FAA Approved Airplane Flight Manual Supplement for Piper PA32 with GARMIN GNS 430, Document No. 190-00140-03, Revision B, dated 10/22/99, or later FAA approved revision.

Limitations and Conditions:
Compatibility of this design change with previously approved modifications must be determined by the installer.

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 26, 1997

Date of issuance: October 02, 1998

Date reissued:

Date amended: October 29, 1999; July 25, 2002

By direction of the Administrator

Harvey E. Nero
(*Signature*)
Program Manager
Wichita Aircraft Certification Office

(*Title*)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

FAA FORM 8110-2(10-68) PAGE 1 of 2 PAGES This certificate may be transferred in accordance with FAR 21.47.