Cessna
A Textron Company

Pilot's Operating Handbook and FAA Approved Airplane Flight Manual

CESSNA MODEL 172S

NAV III AVIONICS OPTION

Serials 172S9810 and On

SUPPLEMENT 7

BENDIX/KING KR87 AUTOMATIC DIRECTION FINDER (ADF)

SERIAL NO._____

REGISTRATION NO._____

This supplement must be inserted into Section 9 of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the Bendix/King KR 87 Automatic Direction Finder (ADF) is installed.

APPROVED BY

FAA APPROVED UNDER 14 CFR PART 21 SUBPART J
Cessna Aircraft Co.
Delegation Option Authorization DOA-630594-CE

Member of GAMA

DATE OF APPROVAL 22 DECEMBER 2005

22 DECEMBER 2005

SUPPLEMENT 7

BENDIX/KING KR87 AUTOMATIC DIRECTION FINDER (ADF)

Use the Log of Effective Pages to determine the current status of this supplement.

Pages affected by the current revision are indicated by an asterisk (*) preceding the page number.

Supplement Status	Date
Original Issue	22 December 2005

LOG OF EFFECTIVE PAGES

Page Number	Page Status	Revision Number
S7-1 thru S7-12	Original	0

SERVICE BULLETIN CONFIGURATION LIST

The following is a list of Service Bulletins that are applicable to the operation of the airplane, and have been incorporated into this supplement. This list contains only those Service Bulletins that are currently active.

Number	Title	Airplane Serial Effectivity	Revision Incorporated	Incorporated in Airplane

BENDIX/KING KR87 AUTOMATIC DIRECTION FINDER (ADF)

GENERAL

The Bendix/King Digital 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 1799-kHz and eliminates the need for mechanical band switching. The system has a receiver, a built-in electronic timer, a bearing pointer shown on the G1000 Horizontal Situation Indicator (HSI), and a KA-44B combined loop and sense antenna. Controls and displays for the Bendix/King Digital ADF are shown and described in Figure S7-1. The Garmin GMA 1347 Audio Panel is used to control audio output. Audio panel operation is described in the Garmin G1000 Cockpit Reference Guide.

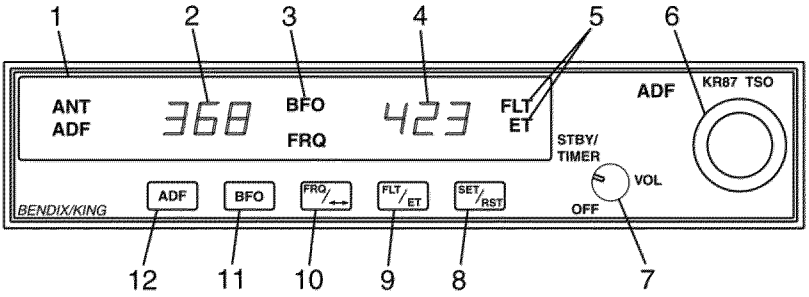
The Bendix/King Digital ADF can be used for position plotting and homing procedures, and for aural reception of amplitude modulated (AM) signals.

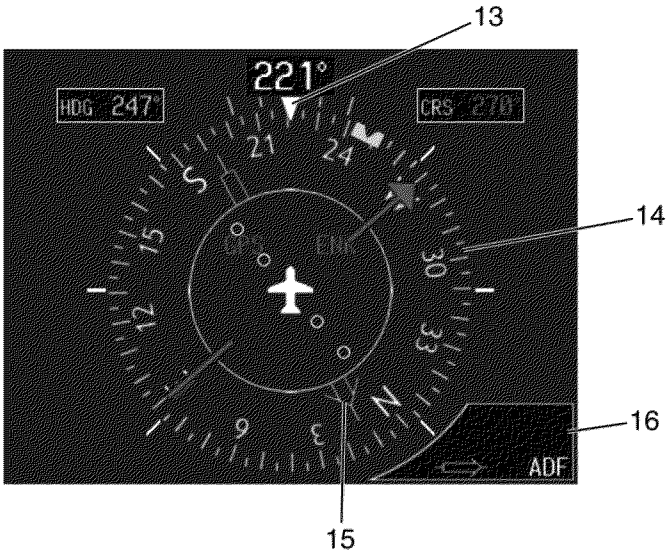
The flip-flop frequency display allows switching between preselected standby and active frequencies by pushing the frequency transfer button. Both preselected frequencies are stored in a nonvolatile memory circuit (no battery power required) and displayed in large, easy-to-read, self-dimming gas discharge numbers. The active frequency is continuously displayed in the left window, while the right window will display either the standby frequency or the selected readout from the built-in electronic timer.

The built-in electronic timer has two timing functions that operate independently. An automatic flight timer starts when the unit is turned on. This timer counts up to 59 hours and 59 minutes. An elapsed timer will count up or down for up to 59 minutes and 59 seconds. When a preset time interval has been programmed and the countdown reaches:00, the display will flash for 15 seconds. Since both the flight timer and elapsed timer operate independently, it is possible to monitor either one without disrupting the other. The pushbutton controls are internally lighted. The light intensity is controlled by the AVIONICS dimmer control.

(Continued Next Page)

BENDIX/KING KR87 AUTOMATIC DIRECTION FINDER (ADF)





0585T1043
0585T1065

Figure S7-1

GENERAL (CONTINUED)

1. ANT/ADF MODE ANNUNCIATOR - Antenna (ANT) is selected when the ADF button is in the OUT position. This mode improves the audio reception and is usually used for station identification. The bearing pointer is deactivated and will park in the 90° relative position. Automatic Direction Finder (ADF) mode is selected by pushing the ADF button. This mode activates the bearing pointer and will point in the direction of the station relative to the aircraft heading.
2. ACTIVE FREQUENCY DISPLAY - The frequency to which the ADF is tuned is displayed here. The active ADF frequency can be changed directly when either of the timer functions is selected.
3. BFO (Beat Frequency Oscillator) ANNUNCIATOR - The BFO mode is activated and annunciated by pushing the BFO button. When BFO mode is active, the carrier wave and its morse code identifier can be heard.

NOTE

CW signals (Morse Code) are unmodulated and no audio will be heard without use of BFO. This type of signal is not used in the United States air navigation. It is used in some foreign countries and marine beacons.

4. STANDBY FREQUENCY/FLIGHT TIME OR ELAPSED TIME DISPLAY - When FRQ is shown, the STANDBY frequency is shown in the right display. The STANDBY frequency is selected using the frequency select knobs. The selected STANDBY frequency is put into the active frequency window by pushing the frequency transfer button. Either the standby frequency, the flight timer, or the elapsed time is shown in this position. The flight timer and elapsed timer replace the standby frequency which goes into blind memory to be called back at any time by pushing the FRQ button. Flight time or elapsed time are shown and annunciated by depressing the FLT/ET button.
5. FLIGHT TIMER AND ELAPSED TIMER MODE ANNUNCIATION - Either the elapsed time (ET) or flight time (FLT) mode is annunciated here.

(Continued Next Page)

GENERAL (CONTINUED)

6. FREQUENCY SELECT KNOBS - Selects the standby frequency when FRQ is displayed and directly selects the active frequency whenever either of the time functions is selected. The frequency selector knobs may be turned either clockwise or counterclockwise. The small knob is pulled out to tune the 1's. The small knob is pushed in to tune the 10's. The outer knob tunes the 100's with rollover into the 1000's up to 1799. These knobs are also used to set the desired time when the elapsed timer is used in the countdown mode.
7. ON/OFF/VOLUME CONTROL SWITCH (ON/OFF/VOL) - Controls power and audio output level. Turn the control switch clockwise from the OFF position to energize the receiver and increase audio volume. The KR87 has audio muting which causes the audio output to be muted unless the receiver is locked on a valid station.
8. SET/RESET ELAPSED TIMER BUTTON (SET/RST) - The SET/RST button resets the elapsed timer whether it is being displayed or not.
9. FLIGHT TIMER/ELAPSED TIMER MODE SELECTOR BUTTON (FLT/ET) -- The FLT/ET button selects either Flight Timer mode or Elapsed Timer mode when pushed.
10. FREQUENCY TRANSFER BUTTON (FRQ) - The FRQ transfer button interchanges the active and standby frequencies when pushed.
11. BFO (Beat Frequency Oscillator) BUTTON - The BFO button selects the BFO mode when pushed in. (See note under item 3).
12. ADF BUTTON - The ADF button selects either the ANT mode or the ADF mode. The ANT mode is selected when the ADF button is in the out position. The ADF mode is selected when the ADF button is pushed in.
13. LUBBER LINE - Indicates magnetic heading of the airplane.
14. ROTATING COMPASS ROSE (HSI COMPASS CARD) - The rotating compass rose turns as the heading of the airplane changes. The magnetic heading of the airplane is under the lubber line.
15. BEARING POINTER - Shows magnetic bearing to the station.
16. BEARING INFORMATION WINDOW - Shows the type of pointer that is being used as the ADF bearing pointer. If ADF is not shown, push the BRG1 or BRG2 softkey until ADF is shown.

OPERATING LIMITATIONS

Refer to Section 2 of the Pilot's Operating Handbook and FAA Approved Flight Manual (POH/AFM).

EMERGENCY PROCEDURES

There is no change to the airplane emergency procedures when the Bendix/King KR 87 Automatic Direction Finder (ADF) is installed.

NORMAL PROCEDURES

TO OPERATE AS AN AUTOMATIC DIRECTION FINDER:

1. OFF/VOL Control - ON
2. Frequency Selector Knobs - SELECT desired frequency in the standby frequency display.
3. FRQ Button - PUSH to move the desired frequency from the standby to the active position.
4. ADF Selector Switch (on audio control panel) - SELECT as desired.
5. OFF/VOL Control - SET to desired volume level and identify that desired station is being received.
6. PFD Softkey (on PFD) - PUSH to show BRG1 and BRG2 softkeys.
7. BRG1 or BRG2 Softkey (on PFD) - PUSH to show ADF in Bearing Information Window.
8. ADF Button - SELECT ADF mode and note magnetic bearing on HSI.

(Continued Next Page)

NORMAL PROCEDURES (CONTINUED)

ADF TEST (PREFLIGHT or IN FLIGHT):

1. ADF Button - SELECT ANT mode and note pointer moves to 90° position.
2. ADF Button - SELECT ADF mode and note the pointer moves without hesitation to the station bearing. Excessive pointer sluggishness, wavering or reversals indicate a signal that is too weak or a system malfunction.

TO OPERATE BFO:

1. OFF/VOL Control - ON
2. BFO Button - PRESS ON
3. ADF Selector Buttons (on audio control panel) - SET to desired mode.
4. VOL Control - ADJUST to desired listening level.

NOTE

A 1000-Hz tone and Morse Code identifier is heard in the audio output when a CW signal is received.

TO OPERATE FLIGHT TIMER:

1. OFF/VOL Control - ON
2. FLT/ET Mode Button - PRESS (once or twice) until FLT is annunciated. Timer will already be counting since it is activated by turning the unit on.
3. OFF/VOL Control - OFF and then ON if it is desired to reset the flight timer.

TO OPERATE AS A COMMUNICATIONS RECEIVER ONLY:

1. OFF/VOL Control - ON
2. ADF Button - SELECT ANT mode
3. Frequency Selector Knobs - SELECT desired frequency in the standby frequency display.
4. FRQ Button - PRESS to move the desired frequency from the standby to the active position.
5. ADF Selector Buttons (on audio control panel) - SET to desired mode.
6. VOL Control - ADJUST to desired listening level.

(Continued Next Page)

NORMAL PROCEDURES (CONTINUED)

TO OPERATE ELAPSED TIME TIMER-COUNT UP MODE:

1. OFF/VOL Control - ON
2. FLT/ET Mode Button - PRESS (once or twice) until ET is annunciated.
3. SET/RST Button - PRESS momentarily to reset elapsed timer to zero.

NOTE

The Standby Frequency which is in memory while Flight Time or Elapsed Time modes are being displayed may be called back by pushing the FRQ button, then transferred to active by pushing the FRQ button again.

TO OPERATE ELAPSED TIME TIMER COUNT DOWN MODE:

1. OFF/VOL Control - ON
2. FLT/ET Mode Button - PRESS (once or twice) until ET is annunciated.
3. SET/RST Button - PRESS until the ET annunciation begins to flash.
4. FREQUENCY SELECTOR KNOBS - SET desired time in the elapsed time display. The small knob is pulled out to tune the 1's. The small knob is pushed in to tune the 10's. The outer knob tunes minutes up to 59 minutes.

NOTE

Selector knobs remain in the time set mode for 15 seconds after the last entry or until the SET/RST, FLT/ET or FRQ button is pressed.

5. SET/RST Button - PRESS to start countdown. When the timer reaches 0, it will start to count up as display flashes for 15 seconds.

NOTE

While FLT or ET are displayed, the active frequency on the left side of the window may be changed, by using the frequency selector knobs, without any effect on the stored standby frequency or the other modes.

(Continued Next Page)

NORMAL PROCEDURES (CONTINUED)

ADF OPERATION NOTES:

ERRONEOUS ADF BEARING DUE TO RADIO FREQUENCY PHENOMENA:

In the U.S., the FCC, which assigns AM radio frequencies, occasionally will assign the same frequency to more than one station in an area. Certain conditions, such as Night Effect, may cause signals from such stations to overlap. This should be taken into consideration when using AM broadcast stations for navigation.

Sunspots and atmospheric phenomena may occasionally distort reception so that signals from two stations on the same frequency will overlap. For this reason, it is always wise to make positive identification of the station being tuned, by switching the function selector to ANT and listening for station call letters.

ELECTRICAL STORMS:

In the vicinity of electrical storms, an ADF indicator pointer tends to swing from the station tuned toward the center of the storm.

NIGHT EFFECT:

This is a disturbance particularly strong just after sunset and just after dawn. An ADF indicator pointer may swing erratically at these times. If possible, tune to the most powerful station at the lowest frequency. If this is not possible, take the average of pointer oscillations to determine station bearing.

MOUNTAIN EFFECT:

Radio waves reflecting from the surface of mountains may cause the pointer to fluctuate or show an erroneous bearing. This should be taken into account when taking bearings over mountainous terrain.

COASTAL REFRACTION:

Radio waves may be refracted when passing from land to sea or when moving parallel to the coastline. This also should be taken into account.

PERFORMANCE

There is no change in airplane performance when the Bendix/King KR 87 Automatic Direction Finder (ADF) is installed. However, the installation of an externally mounted antenna or related external antennas, will result in a minor reduction in cruise performance.