

SECTION 9

Pilot's Operating Handbook Supplement AS-16

Bendix/King KR 87 Digital ADF



This supplement is applicable and must be inserted into Section 9 of the Pilot's Operating Handbook when a Bendix/King KR 87 ADF is installed in the AQUILA AT01-100. The information in this supplement adds to or replaces information in the basic Pilot's Operating Handbook.

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Document No.:	Issue:	supersedes Issue:	Date:	Page:
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-1



0.1 LIST OF REVISIONS AND AMENDMENTS

Issue	Reason for Amendment/Revision	Affected Pages	Date of Issue
A.01	Initial Issue	All	15.10.2013

0.2 LIST OF EFFECTIVE PAGES

Page	Issue	Date
1 - 6	A.01	15.10.2013

Page	Issue	Date

0.3 TABLE OF CONTENTS

- 1. GENERAL.....3
- 2. OPERATING LIMITATIONS3
- 3. EMERGENCY PROCEDURES3
- 4. NORMAL PROCEDURES4
- 5. PERFORMANCE5
- 6. WEIGHT AND BALANCE.....5
- 7. SYSTEMS DESCRIPTION.....6
- 8. HANDLING, SERVICE AND MAINTENANCE.....8

Document No.:	Issue:	supersedes Issue:	Date:	Page:
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-2

1.0 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 is comprised of a receiver, a built-in electronic timer, a bearing indicator and a KA-44B combined loop and sense antenna.

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 pre-selected "STANDBY" and "ACTIVE" frequencies by pressing the frequency transfer button. Both preselected frequencies are stored in a non-volatile memory circuit (no battery power required) and displayed in self-dimming gas discharge numerics. 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 timer.

The built-in electronic timer has two separate and independent timing functions:

(1) an automatic flight timer that starts whenever the unit is turned on. This timer functions up to 59 hours and 59 minutes.

(2) An elapsed timer which 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 and the bearing indicator are internally lighted.

2.0 Limitations

There is no change regarding the information in the basic Airplane Flight Manual.

3.0 Emergency Procedures

There is no change regarding the information in the basic Airplane Flight Manual.

<i>Document No.:</i>	<i>Issue:</i>	<i>supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-3

4.0 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 - PRESS to move the desired frequency from the standby to the active position.
4. ADF SPEAKER/PHONE - Selector Switch (on audio control panel) - SELECT as desired.
5. OFF/VOL Control - SET to desired volume level and check morse code for correct station.
6. ADF Button - SELECT ADF mode and note relative bearing on indicator.

ADF Test (Pre-flight 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.

NOTE

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

<i>Document No.:</i>	<i>Issue:</i>	<i>supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-4

To Operate Elapsed Time Timer-Count Down Mode:

1. OFF/VOL Control - ON.
2. FLT/ELT 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 is 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.

5.0 Performance

There is no change regarding the information in the basic Airplane Flight Manual.

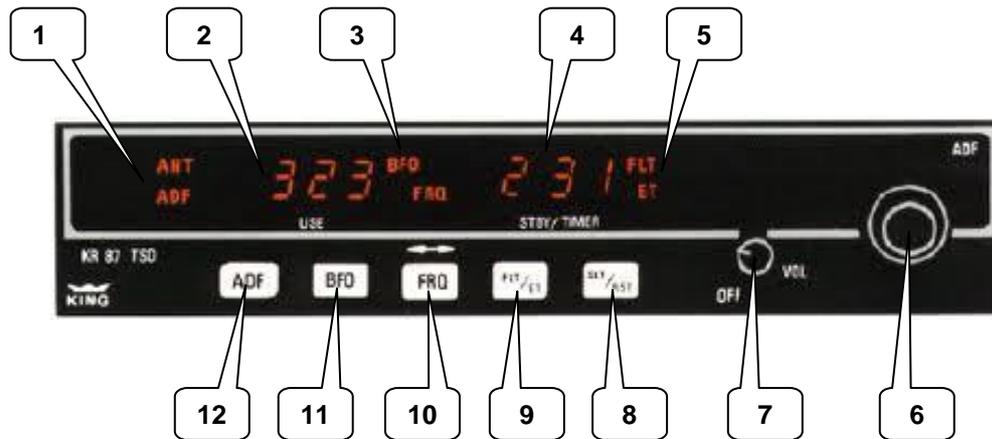
6.0 Weight and Balance

There is no change regarding the information in the basic Airplane Flight Manual.

<i>Document No.:</i>	<i>Issue:</i>	<i>supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-5

7.0 System Description

7.14 COM- / Nav-Equipment



1. Mode Annunciation - Antenna (ANT) is selected by the "out" Position of the ADF button. This mode improves the aural 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 the depressed position of the ADF button. This mode activates the bearing pointer. The bearing pointer 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 are selected.
3. Beat Frequency Oscillator (BFO) - The BFO mode, activated and annunciated when the "BFO" button is depressed, permits the carrier wave and associated morse code identifier broadcast on the carrier wave to 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 Annunciation (FRQ) - When FRQ is displayed, the STANDBY frequency is displayed in the right hand display. The STANDBY frequency is selected using the frequency select knobs. The selected STANDBY frequency is put into the ACTIVE frequency window by pressing the frequency transfer button.
5. Standby Frequency Display - Either the standby frequency, the flight timer, or the elapsed time is displayed in this position. The flight timer and elapsed timer are displayed replacing the standby frequency which goes into "blind" memory to be

Document No.:	Issue:	supersedes Issue:	Date:	Page:
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-6

- called back at any time by depressing the FRQ button. Flight time or elapsed time are displayed and annunciated alternatively by depressing the FLT/ET button
6. Timer Mode Annunciation - Either the elapsed time (ET) or flight time (FLT) mode is annunciated here.
 7. Frequency Selector Knobs - Selects the standby frequency when FRQ is displayed and directly selects the active frequency whenever either of the timer functions is selected. The frequency selector knobs may be rotated 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. These knobs are also used to set the desired time when the elapsed timer is used in the countdown mode.
 8. Off/Volume Control (OFF/VOL) - Controls primary power and audio output level. Clockwise rotation from OFF Position applies primary power to receiver; further clockwise rotation increases audio level. Audio muting causes the audio output to be muted unless the receiver is locked on a valid station.
 9. Set/Reset Button (SET/RST) - The set/reset button, when pressed, resets the elapsed timer whether it is being displayed or not. Flight Time/Elapsed Time Mode Selector Button (FLT/ET) - The Flight Timer/Elapsed Time mode selector button, when pressed, alternatively selects either Flight Timer mode or Elapsed Timer mode.
 10. Frequency Transfer Button (FRQ) - The FRQ transfer button, when pressed, exchanges the active and standby frequencies. The new frequency becomes active and the former active frequency goes into standby.
 11. BFO Button - The BFO button selects the BFO mode when in the depressed position (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 with the ADF button in the out position. The ADF mode is selected with the ADF button in the depressed position

<i>Document No.:</i>	<i>Issue:</i>	<i>supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-7

ADF Operation NOTES:*Erroneous ADF Bearing Due to Radio Frequency Phenomena:*

Occasionally, the same frequency will be assigned 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 station 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 relative 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.

8. HANDLING, SERVICE AND MAINTENANCE

There is no change regarding the information in the basic Pilot's Operating Handbook.

<i>Document No.:</i>	<i>Issue:</i>	<i>supersedes Issue:</i>	<i>Date:</i>	<i>Page:</i>
FM-AT01-1010-255	A.01	--	15.10.2013	AS-16-8