Bendix King KR 87A Pilot's Guide (for normal single ADF installation)
ADF radio for a normal single ADF installation.
Filename: **BendixKingADF!KR87A_JD**
(For a dual ADF installation see KR87A Dual ADF Installation Pilots Guide.pdf)

Hotspots:

1.   **ADF** switch
2.   **BFO** switch
3.   **FRQ** Frequency Transfer (Flip-Flop) button
4.   **FLT/ET** (timer) button
5.   **SET/RST** (timer) button
6.   **VOL** (Volume) and ON/**OFF** switch
7.   Tune 100 kHz
8.   Tune 10/1 kHz

A comprehensive simulation of the real Bendix King KR87A ADF radio.
Advanced features found on this complex radio system have been accurately simulated, with far greater functionality than is found on the default Flight Simulator radios. The real Bendix King Silver Crown Plus Pilot's Guide (available on the web for download) may be used instead of the description found here.

Operation of this radio has been made as close as possible to their real-life counterpart.
To this end the simulation uses right and left mouse clicks for knobs (right-click for increment, left-click for decrement). This is considered superior the standard Flight Simulator method of left clicks only, and more closely simulates real-life operation. Alternatively, the mouse wheel can also be used on all knobs to increment or decrement values. Knobs that can be pulled out and pushed in use middle mouse clicks. All standard Flight Simulator shortcut key assignments operate normally. If a previously saved "Flight" is loaded, all relevant frequencies and operating modes are correctly selected.

This radio defaults to the On state, as the majority of aircraft are fitted with an Avionics Master switch, in which case all individual radios are (and should be) normally left On for convenience and consistency.

Standby Frequencies
Due to a limitation in Flight Simulator 2004 it is not possible to save the ADF Standby Frequency when saving a Flight. To overcome this problem the DyerNamics ADF radio for a normal single ADF installation uses the ADF2 Active Frequency to save the Standby Frequency.

Decimal kHz Digit

Most ADF radios in Flight Simulator need a decimal kHz digit to select any NDB with a frequency ending in 0.5 kHz. However, the real life most ADF radios including the KR 87 <u>do not</u> display the decimal kHz digit. While NDB frequencies of (for example) 367.5 kHz do exist, the real KR 87 would simply be tuned to 367 kHz. Setting an ADF radio to 367.0 kHz would not normally work in Flight Simulator.

For this reason a more realistic KR 87 radio was developed (version 3) with a resolution of 1kHz, and with no unrealistic decimal kHz digit.

To get around this problem, if no signal is detected, the KR87_v6 will search 0.5 kHz up for a signal, and will lock onto that signal. (If no signal is found, the unit will cycle up and down.) This mechanism will be transparent to the user, and the radio will apparently operate just like a real

KR 87. To tune to an ADF with a decimal 0.5kHz digit (for example Cardiff ADF on 388.5 kHz) the unit is tuned to the whole kHz frequency (388 kHz), and the radio will transparently lock onto 388.5 kHz, just like the real KR 87.
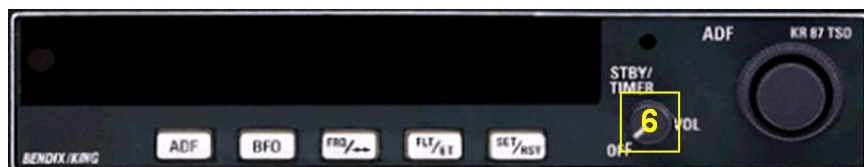
(Note: Some real ADF radios can also be tuned in steps of 0.5 kHz, and do display the decimal kHz digit, but no real ADF radio tunes in steps of 0.1 kHz – this was an invention of Microsoft Flight Simulator.)

Volume and ON/OFF switch (6)

The animated volume knob (6) can be rotated through 270° just like the real unit (although in this simulation the volume does not change - it is not possible to change individual volumes in Flight Simulator). Use right-click to rotate clockwise, left-click to rotate anti-clockwise, or use the mouse wheel. To switch the unit OFF rotate fully anti-clockwise. A click will be heard and the unit will be "dead".

(Note: for sounds to be heard, the gauge dsd_fsx_xml_sound.gau must be installed – see Note 1.)

Rotate clockwise to turn the unit back on. A non-volatile memory stores the Active and Standby frequencies on power down. When the unit is turned on again they will be restored to the display.

Set ADF Frequency - Normal Active/Standby Operation

Click the Tune 100 kHz (7) and Tune 10/1 kHz (8) hotspots to change the Standby Frequency. Use right-click to increment, left-click to decrement, or use the mouse wheel.

The Tune 10/1 kHz knob can be pushed in and pulled out using a mouse middle-click. A quiet click is heard. The knob is animated – it can be seen to be in or out.

When pushed in the Standby Frequency is changed in steps of 10 kHz, and when pulled out in steps of 1 kHz. The knob initially defaults to the "in" (10 kHz) position.

To exchange frequencies, making the Standby Frequency the Active Frequency and vice-versa, click the ADF Frequency Transfer (Flip-Flop) button (3).

The **FRQ** indicator will be displayed when in the normal Active/Standby mode.

Set ADF Frequency – Direct Active Operation
If the Flight Timer or Elapsed Timer are being displayed, clicking the Tune 100 kHz (7) and Tune 10/1 kHz (8) hotspots will directly change the Active Frequency rather than the Standby Frequency, without affecting the Standby Frequency. This feature is particularly useful when searching for stations with unknown frequencies.

Flight Timer
Click the FLT/ET button (4) to show Flight Time, a **FLT** indicator is displayed.
(The Flight Timer will count (in the background) even when not being displayed.)
The Flight Timer can be programmed to count continuously whenever the KR 87 is powered up (default mode).
Optionally it can be programmed to count only when the aircraft is airborne. This simulates the use of an undercarriage squat switch to provide automatic flight timing. If the aircraft lands the count stops, and when the aircraft takes off again the timer continues with the count, and is only reset to zero if power is removed from the radio. This would be of use during a non-refuelling stop.

Squat Switch
A squat switch (otherwise known as a strut switch or "weight-off-wheels" switch) is often fitted to aircraft with a retractable undercarriage to prevent inadvertent retraction when on the ground.
This switch can also be used to start the Flight Timer when airborne, and stop the Flight Timer when on the ground, providing automatic flight timing.

Programming the Squat Switch status
The squat switch can be programmed ("on-the-fly") as follows:
1. Place the aircraft on the ground.
2. Press the FLT/ET (4) button to display the Flight Timer - the **FLT** indicator will be displayed.
3. Right-click the FLT/ET button (4) to toggle the squat switch status. Two beeps are heard.
When the squat switch is activated the Flight Timer will stop, as the aircraft is on the ground.
When the squat switch is de-activated the Flight Timer will count.
If Logger is installed - see Note 2 the (now non-volatile) squat switch status is saved in a file, and is restored next time Flight Simulator is run.
The code is saved in the following file: **..\DataJD\KR87_SqSw.ini** (This file is generated automatically.)

Elapsed Timer

Click the FLT/ET button (4) for a second time to display the Elapsed Timer, **ET** is displayed.
The Elapsed Timer can count up and count down. It has five basic modes of operation:

1. *Count Up*
2. *Reset to zero, and continue to count up from zero*
3. *Reset and Pause*
4. *Set Count Down time*
5. *Count Down*

1. *Count Up*
    The Elapsed Timer starts to count up (in the background) as soon as the radio is powered-up.

2. *Reset to zero, and continue to count up from zero*
    To reset the elapsed time to zero, click the SET/RST button (5). The elapsed time will then restart to count up from zero. Note that pressing the SET/RST button (5) will reset the Elapsed Timer whether it is being displayed or not.

3. *Reset and Pause*
    To reset the Elapsed Time to zero and pause counting, click and hold the SET/RST button (5) for two seconds. The **ET** indicator will start to flash. From this Reset and Pause mode, click the SET/RST button (5) again to resume counting up from zero. The **ET** indicator will stop flashing.

4. *Set Count Down Time*
    To activate the Set Count Down time mode, click and hold the SET/RST button (5) for two seconds. The **ET** indicator will start flashing. Click the Tune 100 kHz (7) and Tune 10/1 kHz (8) hotspots to set the required Count Down time, of up to 59 minutes and 59 seconds.
    The Tune 100 kHz knob selects minutes, the Tune 10/1 kHz knob in the "in" position selects 10 second intervals, and in the "out" position selects individual seconds. Use right-click to increment, left-click to decrement, or use the mouse wheel.

5. *Count Down*
    Click the SET/RST button (5) to start the Count Down. Once the count reaches zero an audible alarm will sound, the counter will then begin to count up and the display will flash for the first 15 seconds.

During timer operation, the Standby Frequency remains in "blind storage".
The ADF Frequency Transfer (Flip-Flop) button (3) can be pressed to display the Standby Frequency, and pressed for a second time to exchange frequencies. Regardless of the operating mode selected, the Flight Timer and Elapsed Timer will continue to operate in the background.

ADF/ANT Operation

Normally the KR 87 operates in ADF mode, with the **ADF** indicator displayed.
Click the ADF switch (1) to select the ANT (antenna) mode – the **ANT** indicator will be displayed.
This is normally used to clarify audible reception of the NDB signal. Note that the ADF gauge
bearing pointer will not work in this mode – it will normally be parked in the 3 o'clock position.

BFO switch

Click the BFO switch (2) to switch on the BFO (beat frequency oscillator). The **BFO** indicator will
be displayed. This is used in real life to clarify those NDB stations that are not modulated. NDB
modulation is not simulated in Flight Simulator.
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Extra "Spoof" Feature – Signal Strength

(This extra "hidden feature" is not available on the real radio, but may be of some use to the user.)
For the signal strength of the NDB, right-click the ADF switch (1). The signal strength will be
shown in the top left corner of the display.
This "signal strength" is simply a number inversely proportional to the distance to the beacon, and
for a MH class beacon will read 050 if approximately 20 nm from the beacon.
If reading becomes less than 025 (at about 38 nm from the beacon) the signal drops out and will
then read 0.

Note 1. Sounds
For custom sounds to be heard, the gauge dsd_fsx_xml_sound.gau must be installed.
This is a freeware gauge from Doug Dawson. See Credit for Sound Gauge below.

Installation
Download the file: dsd_fsx_xml_sound.zip available from FlightSim.com.
Unzip the zip file.

Step 1.
Install the file: dsd_fsx_xml_sound.gau into the flight simulator Gauges sub-folder.
(Normally ...\fsx\Gauges or ...\Flight Simulator 9\Gauges)

Step 2.
Install the file: SoundJD.ini into the flight simulator Gauges sub-folder.
(The file SoundJD.ini, and the folder: SoundJD are included in the KX155A package.)

Step 3.
Install the folder SoundJD into the flight simulator Sound sub-folder.
(Normally ...\fsx\Sound or ...\Flight Simulator 9\Sound)

Step 4.
Copy and paste the line:
gaugenn=dsd_fsx_xml_sound!Sound, 2,2,2,2, ./gauges/SoundJD.ini into the
[Window00] section in the Panel.cfg file for every aircraft that has the KX155A installed.
(Where nn is the next available gauge number). Note the dot before /gauges !

Credit for Sound Gauge
Many thanks to Doug Dawson, for his excellent freeware sound gauge.
It is available from various flightsim websites (e.g. Flightsim.Com and Avsim.)
This is a very sophisticated and versatile application - the above installation only used a fraction of
the capability available.

Note 2. Logger
In order to save and recall the squat switch status, an application called Logger must be installed.
Logger is a FS9 and FSX module that provides file read and write capability for XML gauges.

Installation
Download the file:Logger Modules v1.1.zip available from:
https://robbiemcelrath.com/fs/logger/about
This is a freeware application from Robbie McElrath. See Credit for Logger below.
Unzip the zip file.

Step 1:
For FS9 copy the file Logger9.dll into the flight simulator Modules sub-folder.
For FSX copy the file LoggerX.dll into the flight simulator Modules sub-folder and
follow the instructions provided on the above website in the Help section.

Step 2:
Create a folder in the flight simulator root folder called DataJD.
(The flight simulator root folder is normally ...\fsx or ...\Flight Simulator 9)

Credit for Logger
Many thanks to Robbie McElrath, for his excellent freeware logger9.dll and loggerX.dll modules.
This is an incredibly useful application – it can do much more than just save and recall files.
Please read the documentation provided on the website.
Logger is available from Robbie McElrath at https://robbiemcelrath.com/fs/logger/about .