

Bendix King KFC 200 with KA 285 Pilots Guide

Autopilot and Flight Director with Autopilot Annunciator

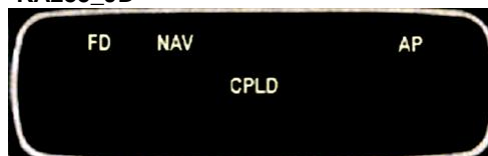
Filenames: **BendixKingAP20!KFC200_JD**
BendixKingAP20!KFC200_noYD_JD
BendixKingAP20!KA285_JD

This Autopilot was often installed on light twins, such as the Beechcraft Baron, Piper Seneca, etc. The KFC 200 Autopilot System consists of a KC 290 Autopilot Mode Controller and (optional) KC 291 Yaw Damper Controller, with a KA 285 Autopilot Annunciator.

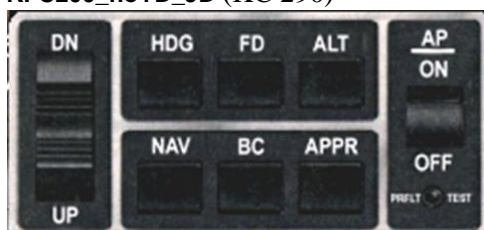
KFC200_JD (KC 290 + KC 291)



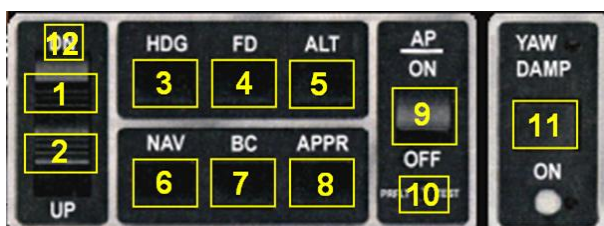
KA285_JD



KFC200_noYD_JD (KC 290)



Hotspots KFC 200:



1. DN (nudge down) rocker switch
2. UP (nudge up) rocker switch
3. HDG (Heading) button
4. FD (Flight Director) button
5. ALT (Altitude Hold) button
6. NAV (Navigation) button
7. BC (Backcourse) button
8. APPR (Approach) button
9. AP ON / OFF (Autopilot Engage) button
10. PRFLT TEST (Pre-flight Test) button
11. YAW DAMP (Yaw Damper) button (optional)
12. Hidden click-spot for GA (Go-Around) mode

A comprehensive simulation of the real Bendix King KFC 200 autopilot with KA 285 autopilot annunciator. Advanced features found on this autopilot have been accurately simulated, with greater functionality than is found on the default Flight Simulator autopilot. The real Bendix King Autopilot Pilot's Guide (available on the web for download) may be used instead of the description found here.

Operation of this autopilot has been made as close as possible to their real-life counterpart.

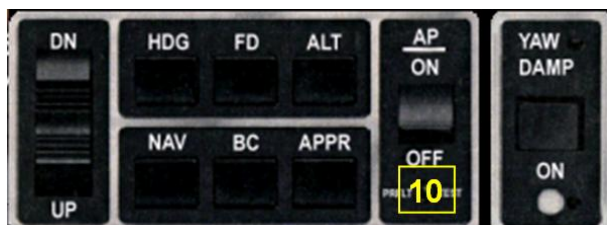
All standard Flight Simulator shortcut key assignments operate normally unless otherwise stated.

If a previously saved “Flight” is loaded, all relevant operating modes are correctly selected. This simulation is also applicable to the KFC 250 Autopilot System, if configured for 3” instruments.

Note: for this autopilot to be engaged the **PRFLT TEST** button (10) must be pressed to initiate the pre-flight test, and the flight director must be engaged – see below for more information.

Autopilot Test

Just like the real KFC 200, the PRFLT TEST button (10) must first be pressed (clicked) for the unit to operate. All indicators on the KA 285 Autopilot Annunciator including the marker beacon lights will be displayed for 5 seconds, the TRIM indicator flashes, and in real life the unit goes through a system self-test routine.



Following the self-test routine all indicators on the KA 285 are extinguished, indicating the unit has passed all the self-tests.

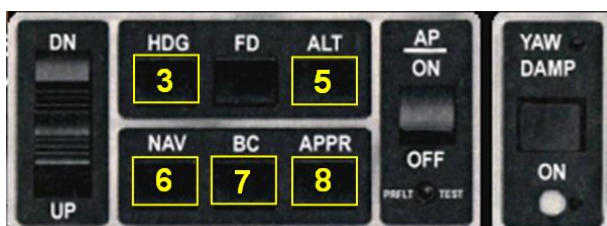


Flight Director (4)

To engage the flight director click the FD button (4). This selects the flight director but leaves the autopilot disengaged. The **FD** indicator will be displayed on the KA 285, and a command bar will be activated on the aircraft’s Attitude Indicator (AI). With no autopilot mode selected the command bar will command wings level and pitch hold, using the pitch attitude existing at the time of engagement.



Click any of the autopilot mode buttons (3 and 5 to 8) to activate any of the autopilot modes (as described below) for the FD function. The relevant mode indicator will be displayed on the KA 285. The pilot can elect to manually fly the aircraft using the flight director command bar, or can engage the autopilot and let it satisfy the commands.

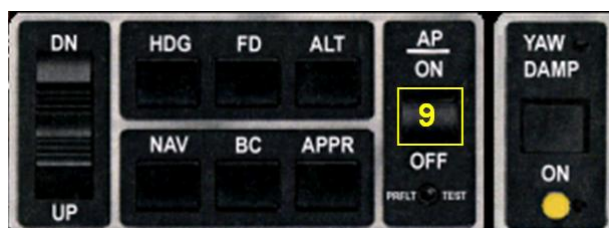


AP Engage Button (9)

Note: The autopilot cannot be engaged until the flight director is engaged.

To engage the autopilot, click the AP ON/OFF button (9). If fitted, the optional yaw damper will be also be engaged. The **AP** indicator will be displayed on the KA 285.

If the autopilot is engaged with none of the autopilot modes selected, the autopilot will be in Wing Leveller mode and Pitch Hold mode, using the pitch attitude existing at the time of engagement.



Click any of the autopilot mode buttons (3 and 5 to 8) to activate any of the autopilot modes. The relevant mode indicator will be displayed on the KA 285.

Pressing the AP ON/OFF button for a second time will disengage the autopilot, and a tone will sound.

HDG button (3)

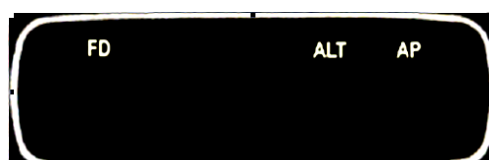
When pressed, will engage the Heading mode, which commands the aircraft to turn to and maintain the heading selected by the heading bug on the Horizontal Situation Indicator (HSI). The **HDG** indicator will be illuminated on the KA 285. A new heading may be selected at any time and will result in the aircraft turning to the new heading. The HDG button will toggle between Heading and Wing Leveller modes.



ALT button (5)

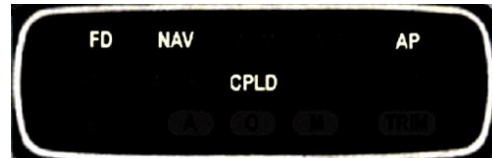
When pressed, will engage the Altitude Hold mode, and the **ALT** indicator will be illuminated on the KA 285. The altitude maintained is the altitude at the moment the ALT button is pressed.

If the ALT button is pressed when ALT hold mode is engaged, it will disengage the mode, defaulting to Pitch Hold mode.



NAV button (6)

When pressed, will arm the Navigation mode. If the selected navigation Course Deviation Indicator (CDI) is less than 50% deflected when armed, the system will automatically capture, and the **NAV** and **CPLD** indicators will be illuminated on the KA 285 as the active roll mode.



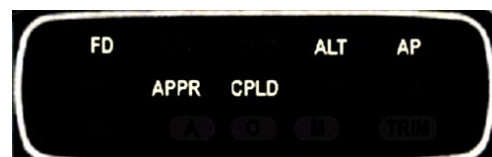
Otherwise the autopilot will remain in either Wing Leveller or Heading mode, and the **NAV** and **ARM** indicators will be illuminated on the KA 285 to signify that the Navigation mode is armed.



If the Navigation mode captures from Heading mode, then the **HDG** indicator will extinguish. The Navigation mode provides automatic beam capture and tracking of VOR, LOC or GPS as selected for presentation on the HSI. Navigation mode is recommended for en-route navigation tracking. If the NAV button is pressed when the Navigation mode is either armed or coupled, it will disengage the mode.

APR button (8)

When pressed, will arm the Approach mode. If the selected navigation CDI is less than 50% deflected when armed, the system will automatically capture and the **APPR** and **CPLD** indicators will be illuminated on the KA 285 as the active roll mode.



Otherwise the autopilot will remain in either ROL or HDG mode, and the **APPR** and **ARM** indicators will be illuminated on the KA 285.



When the glideslope is captured the **GS** indicator is displayed.

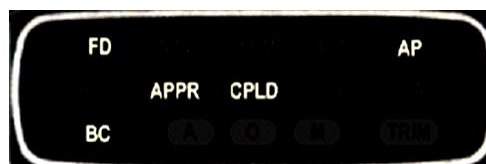


If the Approach mode captures from Heading mode, then the **HDG** indicator will extinguish.

The Approach mode provides automatic beam capture and tracking of VOR, GPS or LOC with Glideslope (GS) on an ILS, as selected for presentation on the HSI. If the APPR button is pressed when the Approach mode is either armed or coupled, it will disengage the mode.

BC button (7)

When pressed, will arm the Backcourse Approach mode. If the selected navigation CDI is less than 50% deflected when armed, the system will automatically capture, and the **APPR**, **BC** and **CPLD** indicators will be illuminated on the KA 285 as the active roll mode.



Otherwise, the autopilot will remain in either Wing Leveller or Heading mode, and the **APPR**, **BC** and **ARM** indicators will be illuminated on the KA 285 to signify that the Backcourse mode is armed.



This mode functions similarly to the Approach mode except that the autopilot response to LOC signals is reversed and the glideslope is inhibited. If the BC button is pressed when the Backcourse mode is either armed or coupled, it will disengage the mode.

YAW DAMP button (11)

If the optional yaw damper is fitted, pressing this button will engage or disengage the yaw damper independent of autopilot operation. When engaged the yaw damper indicator will be illuminated.



The yaw damper engages automatically when the autopilot is engaged; however, the yaw damper may then be disengaged or re-engaged as desired.



Nudge Up/Down rocker switch (2/1)

The response of the animated rocker switch is dependent upon the vertical mode present when pressed.

If Pitch Hold mode is active the pitch angle is moved up or down by 0.9° per key press.

If Altitude Hold mode is active, the altitude is increased/decreased by 100 feet per press, resulting in a climb/descent with a vertical speed of approximately 500 feet/minute.

If a **BendixKingAP29IKAS297B_JD** has been installed on the instrument panel, and if the Vertical Speed mode has been selected, the rocker switch will increment/decrement the vertical speed by 100 feet/min up to a maximum of $\pm 3,000$ ft/min.



Go-Around (GA) function (12)

On the real aircraft the Go-around (GA) button is normally located on the throttle assembly.

In this simulation a hidden click-spot (12) is provided. Alternatively the standard flight simulator key assignment for GA (CTRL+SHIFT+G) can be used, or an external control button can be programmed as a GA button.

When GA is activated the command bar (V-bar) on the aircraft's HSI will command wings level and an 8° pitch-up, and **GA** will be displayed on the KA 285.

The GA mode will be cancelled if any of the pitch mode buttons are pressed.

While in GA mode the autopilot can be re-engaged, and any other required mode can be selected. The GA mode can also be used for takeoff for climb-out attitude guidance.



Optional GA Activation Mode

It is normal for the autopilot to be disengaged when the GA mode is activated, with all existing flight director modes cancelled. This is the default action with this simulation. However some aircraft are certified with the AP remaining engaged when GA is selected. This is provided as an option – see below.

Programming GA Activation Mode

The non-volatile GA Activation Mode can be programmed “on the fly” as follows:

For the AP to remain engaged when GA is activated, engage the AP and right-click the hidden click-spot (12). Two beeps will be heard.

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

The autopilot pitch hold mode is activated to follow the command bar (V-bar).

For the AP to be disengaged when GA is activated, disengage the AP and right-click the hidden click-spot (12). Two beeps will be heard.

If Logger is installed – see Note 2 the GA Activation Mode is saved in the file, and is restored next time Flight Simulator is run. The mode is saved in the following file: `..\DataJD\KFC200_GA.cfg` (This file is generated automatically.)

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 channel files, 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

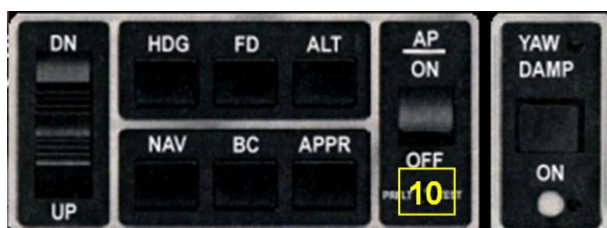
Many thanks to Robbie McElrath, for his excellent freeware `logger9.dll` and `loggerX.dll` modules.
This is an incredibly useful application – it can do much more than just save and recall files.
Please read the documentation provided on the website.
Logger is available from Robbie McElrath at <https://robbiemcelrath.com/fs/logger/about>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

Note 3. An external Autopilot Master switch (**BendixKingAP20!APMaster_Switch_JD**) can be used with this autopilot. This simulates removing the power from the unit.
(This switch is provided without labeling so that the user can provide their own labels in the colour and style appropriate for the aircraft panel.)



When switched back on the autopilot will be disengaged, and the PRFLT TEST button (10) must first be pressed to make the unit operational, as described above.

When re-engaged the autopilot will revert to the default Wing Leveller mode and Pitch Hold modes.



Note 4. When saving and recalling a Flight in Flight Simulator, all flights will be recalled with operating modes as saved, including pitch modes (Pitch Hold or Altitude Hold).

Note 5. This KFC 200 autopilot simulation is a very accurate representation of the real KFC 200. However any autopilot gauge has to interface with the Flight Simulator “core” autopilot. This has a number of “issues” which makes it difficult if not impossible to achieve total accuracy and realism. For this (and other) reasons, not every feature described in the Bendix King KFC 200 Pilot’s Guide has been implemented.

Note 6. For the flight director to work correctly the aircraft must have the following:
(1) An Attitude Indicator (Artificial Horizon) with a flight director (such as the one on the default Beechcraft Baron).
(2) An entry in the [autopilot] section of Aircraft.cfg: `flight_director_available = 1`

Note 7. For the version of the KFC 200 with Yaw Damper this simulation assumes that the aircraft has a Yaw Damper installed. For the Yaw Damper to work correctly the aircraft must have an entry in the [autopilot] section of Aircraft.cfg: `yaw_damper_gain = 1.0`

Note 8. The Bendix King KI 525 Horizontal Situation Indicator is an integral part of this autopilot system.

Note 9. This autopilot can be used with a KAS 297B Altitude Selector/Alerter and VS Selector. See the **BendixKingAP29!KAS297B_JD**.