

KFC225 Autopilot



Version 1.5
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EULA

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Getting Started

This system utilizes advanced computer technology normally found only in high end 'jet' autopilots into the cockpits of General Aviation Aircraft. It does this by utilizing a state of the art autopilot computer combining the functions of computer, mode selector, altitude pre-selector, and the optional yaw damper into one unit. It is strongly recommended that pilots acquaint themselves with the features and controls described in this manual prior to using it in flight.

To take full advantage of the capabilities of this system it is important that the pilot understand its capabilities and limitations. The pilot should take time to read and thoroughly understand both this handbook, and the operating handbook that is specific to the aircraft. This handbook should be used to gain additional insight into the operation of the system through the specific operating scenarios.

System Requirements

- Microsoft Flight Simulator X
- Windows XP, Windows Vista, or Windows 7 - 32 or 64 bit versions.

About This Manual

Keywords used throughout this manual are expressed in *dark italics* to distinguish them from the surrounding text.



Keywords are usually defined in the terminology, and in this case, clicking on the keyword will take you to the terminology definition.

Specific functions and important concepts may be underlined for quick reference.



You can link to the description of the concept or function by clicking on the underlined text.

1. Basic Operation

The KFC 225 is a three-axis system that provides lateral, vertical and yaw modes with altitude preselect. This diagram shows the components and their relationship in a typical KFC 225 system. The actual components on individual aircraft will vary according to your specifications.



1.1 POWER APPLICATION AND PREFLIGHT TESTS



A preflight test is performed when power is supplied via the avionics master power switch. This test is a sequence of internal checks that validate proper system operation prior to allowing autopilot engagement. The preflight test (PFT) sequence is indicated by "PFT" with an increasing number for

the sequence steps. Successful completion of self test is identified by all display segments being illuminated.

1.2 CONTROLS AND DISPLAYS

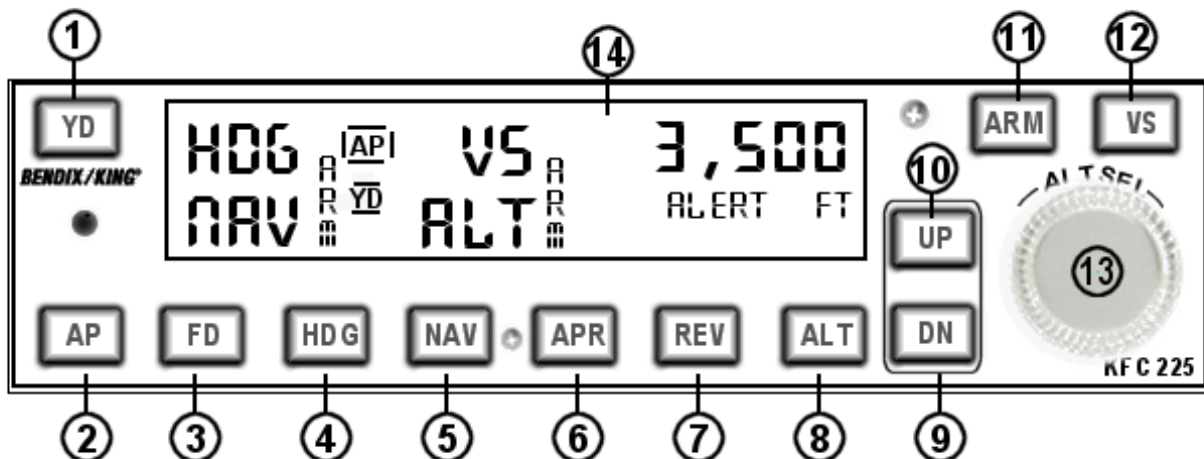


Figure 1a

- | | | | |
|------------------------|------------------------|-----------------------|-----------------------|
| 1. Yaw Damper Key | 5. NAV Control Key | 9. VS speed Down Key | 13. Preselect Control |
| 2. Autopilot Key | 6. Approach Hold Key | 10. VS Speed Up Key | 14. Digital Display |
| 3. Flight Director Key | 7. Reverse Course Hold | 11. ALT Alarm Arm Key | |
| 4. HDG Control Key | 8. Altitude Hold Key | 12. VS Display Key | |

Display Panel

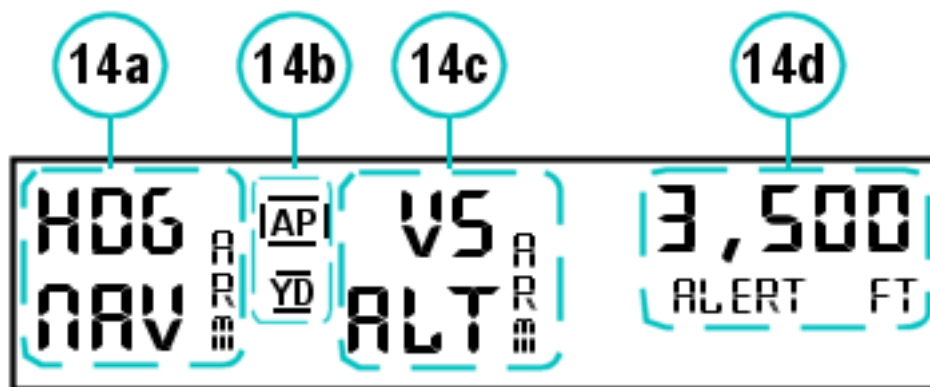


Figure 1b

- | | | | |
|------------------------|------------------|-------------------------|----------------------|
| 14a Lateral Ctrl. Data | 14b Annunciators | 14c Vertical Ctrl. Data | 14d Altitude/VS Data |
|------------------------|------------------|-------------------------|----------------------|

1.2.0 TOGGLE RADIO STACK POPUP



In the upper left-hand corner of the unit, a small mouse hotspot can toggle the radio stack popup panel on/off, for convenience.

1.2.1 AUTOPILOT MASTER



The position of the *AP Master Key* determines whether the autopilot is in *Active Mode* or *Standby Mode*. In Standby Mode, selections can be made without the autopilot issuing any instructions to servo or trim controls. When the AP Master is ON the autopilot is in Active Mode, and servos/control tabs are actively set to achieve the desired roll and pitch.

1.2.2 FLIGHT DIRECTOR



Depress the *Flight Director Key* to toggle the Flight Director bars on your Automatic Direction Indicator (ADI) on and off.

Important Note:
Not all Flight Simulator aircraft have Flight Director capability. This is based on the plane's aircraft.cfg file.

In order for the Flight Director to work the following entry must be present in the [autopilot] section of the aircraft.cfg file:

```
flight_director_available=1
```

If this value is set to zero the Flight Director system will not be available in Flight Simulator! Note that the *Control Center* tool can format this setting for you. See the Control Center Documentation for more details.

Important!

The FD Key must be switched **ON** in order for the KFC225 to operate in Fixed Trim Modes, as described below.

1.2.3 SYSTEM OPERATING MODES

There are two basic modes of operation; *Fixed Trim Modes* and *Servo Control Modes*. The Roll and Pitch axis operate independently, depending on the control selections outlined below.



AP Servo Annunciator - When the KFC225 is in *Active Mode* (AP Master ON) and in *Servo Control Modes* this annunciator will illuminate, indicating that the unit is actively pursuing the course and/or altitude selected.



Arm Indicator - When the KFC225 is actively pursuing its course, roll, or pitch, an ARM indicator will annunciate on the *Display Panel*

. When the roll/course/pitch has been achieved, the ARM annunciator will extinguish.

Note

The *AP Servo Annunciator* will illuminate if any of the *Servo Control Modes* is active. For example, if the unit is in *Roll Mode* and *Altitude Preselect Mode*, and the *AP Master Key* is ON, this annunciator will illuminate, but the servo for altitude hold will be the only one active. The *Roll Axis* is still being controlled in *Roll Mode* (fixed roll trim).

1.3 CONTROL AXIS

The KFC225 is a three-axis control Flight Director System, providing Pitch Axis, Roll Axis and Yaw Damper Axis operation.

1.3.1 YAW DAMPER AXIS



Yaw Damper Key. Depress this key to change the present setting. When the key is illuminated, the mode is active. The yaw damper is independent of autopilot operation. It is a device designed to reduce the rolling and yawing oscillations due to *Dutch Roll*. It requires the installation of yaw rate sensors in the aircraft. The microprocessor in the KFC225 provides a signal to an actuator connected to the rudder, providing a more comfortable flight.

Important Note:

Not all Flight Simulator aircraft have yaw damper sensors installed. This is based on the plane's aircraft.cfg file.

In order for the yaw damper to function the following entry must be present in the [autopilot] section of the aircraft.cfg file:

```
yaw_damper_gain = 1.0
```

If this value is set to zero the yaw damper system will not work in Flight Simulator!

If this value is set to zero the Yaw Damper system will not be available in Flight Simulator! Note that the *Control Center* tool can format this setting for you. See the Control Center Documentation for more details.

1.3.2 ROLL AXIS

Roll Axis

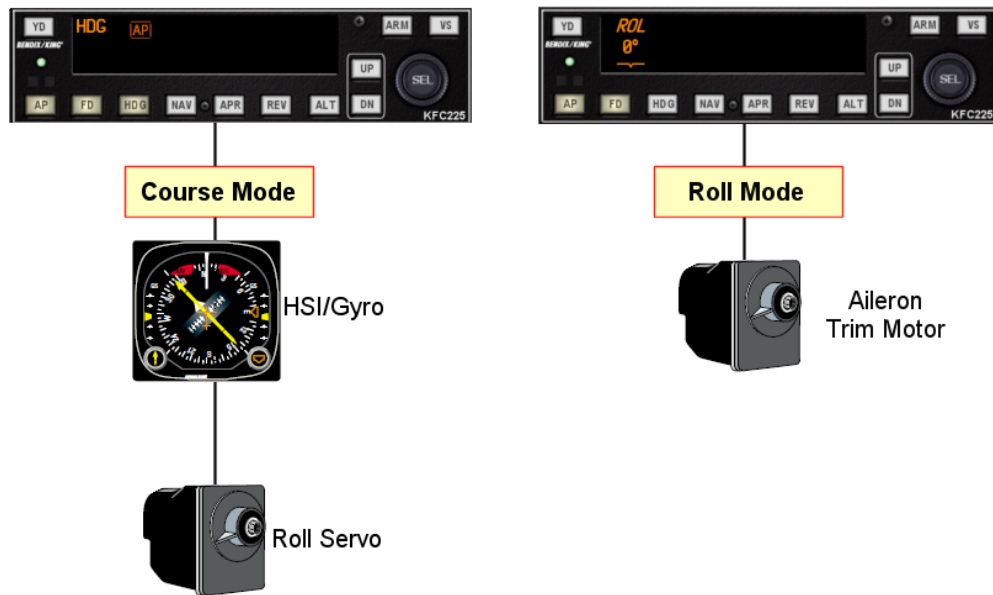


Figure 1c

Course Mode utilizes the aircraft's HSI or Gyro inputs and/or navigation radios to provide reference inputs that determine the desired course. The microprocessor in the KFC225 commands the control servos for aileron and rudder trim to maintain this course. *Roll Mode* allows pilot selection of a fixed roll value. The aircraft maintains that roll until the setting is changed or the mode is switched OFF.

1.3.2.1 ROLL MODE

To engage *Roll Mode*:



Cycle the AP Master **OFF** (Fig. 1a #2)



Check to ensure that the FD Button is **ON** (Fig. 1a #3)

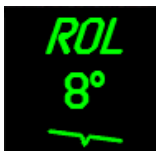
All other mode keys should be **OFF**. The display will annunciate *ROL* and *PIT*, as illustrated below.



Press the center of the Preslector Knob. The selector will change to Roll Select Mode and the Roll Display will turn green.



Turn the Selector Knob clockwise or counter-clockwise to increase or decrease the selected roll value, in degrees. The selector and display will revert back to normal mode after 5 seconds.



The chevron below the ROL display indicates a port or starboard roll.



Press the *AP Master Key* to engage *Active Mode*.

Once engaged in *Active Mode* the *ARM* indicator will annunciate on the *Display Panel*.



The aircraft will maintain a constant roll at the selected value until the setting is changed, or Roll Mode is discontinued.

To discontinue *Roll Mode*, simply turn the *AP Master OFF*, to go into *Standby Mode*, or engage any of the *Roll Axis Function Keys* (*HDG*, *NAV*, *APR* or *REV*), to change the *Roll Axis* to *Servo Control Modes*.



Note
In order to operate in *Roll Mode*, the *Flight Director Key* must be engaged.

1.3.2.2 COURSE MODE

In this section:

1. *Heading Hold Function*
2. *NAV Hold Function*
3. *Approach Hold Function*
4. *Reverse (Backcourse) Function*

Course Mode is a servo controlled operating mode. Operating in this mode entails selecting one of the *Roll Axis Function Keys* (HDG, NAV, APR, REV).



Course Mode engages the unit's microprocessor and control servos, to provide precise control and maintain a specific course.



The Flight Director (FD) key can be ON or OFF while operating in this mode, and toggles the attitude indicator/PFD flight director bars ON/OFF.



The *AP Master Key* must be pushed ON in order for the unit to be in *Active Mode* and engage the control servos.

1.3.1.3 COURSE MODE FUNCTIONSHeading Hold Function

Depress the HDG Key to toggle the Heading mode on/off. When the mode is engaged the key will illuminate.

This system commands the airplane to turn to and maintain the heading selected by the heading bug on the HSI/Gyro control. A new heading may be selected at any time and will result in the airplane turning to the new heading.





The display will annunciate HDG and the AP Servo Annunciator will illuminate when the unit is in *Active Mode*.

The aircraft will hold this course as long as:

- The HSI/Gyro HDG Bug is not changed.
- The unit is still in Heading Hold Function.
- The *AP Master Key* is on and the unit is in *Active Mode*.
- Heading Hold Function is not overridden by the .
- No **Error! Reference source not found.**exists.

NAV Hold Function



Depress the NAV Key to toggle this mode on/off. When the system is engaged, the key will illuminate. This function is one of three that receives its input data from the NAV 1 Radio. This function is designed to follow the radial, selected on the HSI/Gyro *Omnibearing Selector (OBS)*.



The NAV Hold Function is available if a signal is tuned in on the NAV 1 radio. The display will annunciate NAV when the NAV Key is depressed.



If a NAV 1 signal is not being received, the NAV annunciator on the panel will flash, indicating that no NAV Function is possible until such time as a signal is being received.



When the NAV Hold Function is engaged, if the selected *CDI Indicator* is less than 50% deflected when armed, the system will automatically capture.

The mode provides automatic beam capture and tracking of VOR, LOC or GPS as selected.



NAV Mode can be selected simultaneously with other modes, for example, HDG mode.



In this case the KFC225 will guide the aircraft Heading Hold Function until the *CDI Indicator* is less than 50% deflected, at which time the system will automatically convert to NAV mode.

The KFC225 will lock the aircraft on this radial heading as long as:

- The unit remains in NAV Hold Function.
- The OBS setting is not changed.
- The signal is being received from the NAV 1 radio.
- The *AP Master Key* is on and the unit is in *Active Mode*.
- The NAV Hold Function is not overridden by APR or REV modes.
- No **Error! Reference source not found.**exists.

Approach Hold Function



Depress this key to toggle the Approach Hold mode on/off. When the system is engaged, the key will illuminate. This function requires a valid localizer signal from the NAV 1 radio in order to operate.

When engaged, if the *CDI Indicator* is less than 50% deflected, the system will automatically capture.

This 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. APR ARM will annunciate.





When the APR button is selected, the display will annunciate APR.



Approach Mode can be selected simultaneously with other modes, for example, HDG mode. In this case the KFC225 will guide the aircraft Heading Hold Function until the *CDI Indicator* is less than 50% deflected, at which time the system will automatically convert to APR mode.



If a valid localizer signal is not being received from the NAV 1 radio, the display will flash, and Approach Hold will not function.

The autopilot will continue tracking the runway heading until:

- Landing.
- NAV 1 is no longer receiving the localizer signal.
- APR mode is switch OFF, or to another *Course Mode*.
- AP Master is switched OFF.

Reverse (Backcourse) Function



Depress this key to toggle the Reverse Hold mode on/off. When the system is engaged, the key will illuminate. This function requires a valid localizer backcourse signal from the NAV 1 radio in order to operate.

Identical in function to *Approach Hold Function*, except in the requirement for a valid backcourse localizer signal.

1.3.1.4 ROLL AXIS FAILURE

Failure Annunciators



When illuminated, indicates failure of the roll axis and will disengage the autopilot. Illuminates whenever the continuous monitoring system detects a roll axis fault, or is not receiving information from the gyro compass..



The *AP Servo Annunciator* will annunciate a fault, indicating that the AP Servos are temporarily disengaged.



The ARM indicator for the roll axis will also flash red whenever a fault condition exists. The mode indicator (i.e. HDG, NAV, APR) will also flash. This annunciates to the pilot that the autopilot will not capture the heading, or NAV radial track.



Fault Condition Display

1.3.3 PITCH AXIS

Pitch Axis

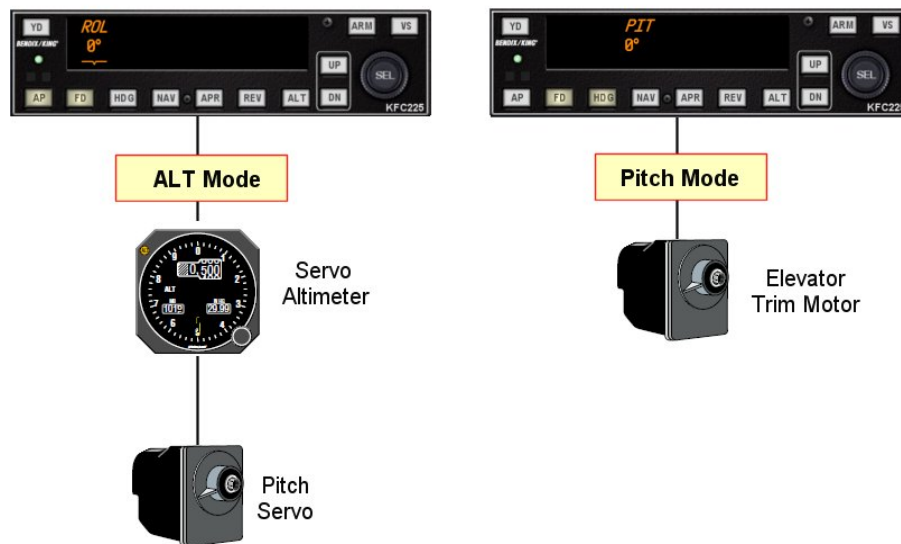


Figure 1d

ALT Mode utilizes the aircraft's servo altimeter to provide reference inputs that determine the present altitude, and its relation to the target altitude. The microprocessor in the KFC225 commands the control servos for elevator trim to maintain the selected altitude. Pitch Mode allows pilot selection of a fixed pitch value. The aircraft maintains that pitch until the setting is changed or the mode is switched OFF.

1.3.3.1 ALTITUDE ALERT



While in ALT Mode, press the ARM Key and the Altitude Alert function will be armed. The ARM key will be illuminated.



Use the Preselect Knob to select the Altitude Alert/Altitude Preselect level, in feet.





The Altitude Alert Indicator annunciates as a flashing alert for two seconds when 1000 feet from the selected altitude, and then as a solid alert to 200 feet from the target. If the airplane was previously outside of this 1,000 - 200 feet region, an aural alert with three beeps sounds.

At 200 feet from the target altitude, the alert flashes for two seconds again, and another aural annunciation with three beeps occurs.

If the airplane was previously inside of this 1,000 - 200 feet region, and strays outside, an aural alert consisting of a rising tone is associated with the visual annunciation flashing for two seconds.

When the aircraft is within 50 feet of its target altitude, the Altitude Alert Indicator will extinguish, and an aural annunciation consisting of a single beep will sound.



If the KFC225 is not already in ALT Mode, the system will automatically switch to that mode of operation once the target altitude has been reached. The ALT Key will illuminate.

The Altitude Alert will remain active as long as:

- The ARM switch is ON (illuminated)
- The AP Master Key is ON.
- A pitch axis failure has not occurred.

1.3.3.2 PITCH MODE

To engage *Pitch Mode*:



Cycle the AP Master **OFF** (Fig. 1a #2)



Check to ensure that the FD Button is **ON** (Fig. 1a #3)

All other mode keys should be **OFF**. The display will annunciate *ROL* and *PIT*, as illustrated below.



There are two functions available in Pitch Mode:

1. *Fixed Pitch Function*
2. *Fixed Vertical Speed Function*

Fixed Pitch Function



By default, *Pitch Mode* starts in Fixed Pitch Function. Use the UP/DN keys (Figure 1a, #9) to select up to +30°/-30° pitch.



The display will indicate the pitch setting.



Press the *AP Master Key* to engage *Active Mode*.

The KFC225 will send instructions to the control motor for the elevator trim to maintain this pitch as closely as possible, until the setting is changed, or the function is discontinued.



The ARM indicator will annunciate while the aircraft is seeking the selected pitch. If that pitch is maintained, the indicator will go dark.

The autopilot will control the elevator trim to maintain the selected pitch, until:

- The selection is changed to a different value.
- The VS switch is pressed, changing to Fixed Vertical Speed Function.
- The ALT switch is pressed.
- The *AP Master Key* is switched OFF.



Fixed Vertical Speed Function



While in *Pitch Mode*, press the VS Key. This will engage Fixed Vertical Speed Function. This will instruct the KFC225 to hold a selected vertical speed until directed otherwise.

Use the UP/DN keys (Figure 1a, #9) to select the desired vertical speed. The display will indicate the Vertical Speed Setting.



Press the *AP Master Key* to engage *Active Mode*.

The KFC225 will send instructions to the control motor for the elevator trim to maintain this vertical speed as closely as possible, until the setting is changed, or the function is discontinued.



The ARM indicator will annunciate while the aircraft is seeking the selected vertical speed. If that vertical speed is maintained, the indicator will go dark.

The autopilot will control the elevator trim to maintain the selected vertical speed, until:

- The selection is changed to a different value.
- The VS switch is pressed again, changing back to *Fixed Pitch Function*.
- The ALT switch is pressed.
- The *AP Master Key* is switched OFF.



1.3.3.3 ALT MODE



Press the ALT key to engage ALT Mode. When the KFC225 is in *Active Mode*, the servo controls will control the aircraft's pitch axis to maintain a preselected altitude.



Ensure that the *AP Master Key* is ON for *Active Mode*.

When the ALT Key is pressed, the KFC225 is in Altitude Hold mode. The altitude preselect will be automatically set to present altitude. If the ALT button is pressed with an established climb or descent rate present, there will be approximately a 10% (of VS rate) overshoot, with the airplane returned positively to the selected altitude. *



If pressed when ALT hold mode is engaged, ALT Mode will disengage, defaulting to *Pitch Mode*.

* *Describes the function of the unit in standard mode. If "Use FS Style Autopilot" is selected in the Control Center, the unit will not select the present altitude when the ALT button is pressed, nor will it be locked out if the aircraft is climbing or descending.*

Altitude Selection



Use the Preselector Knob for Altitude Preselect, at the desired altitude, in feet.



Vertical Speed Selection



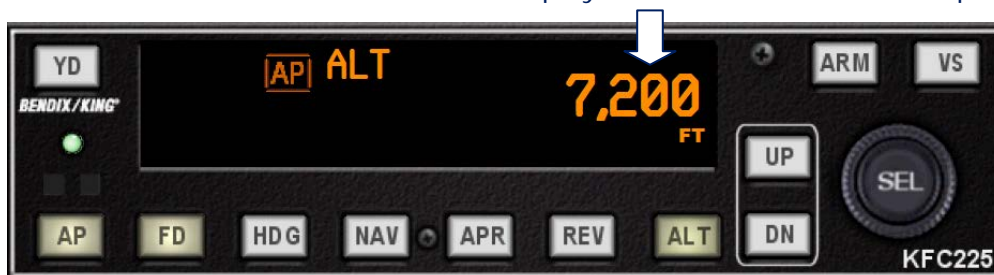
While in *Altitude Preselect Mode*, press the VS Key. This will switch the display to Vertical Speed Indication, for five seconds. This will allow you to select the climb/descent speed, in Feet Per Minute (FPM). The VS Key will be illuminated during this five second display period.



The UP/DN keys will change the vertical speed selection.



Each press of the UP or DN Keys will extend the display time for Vertical Speed Indication another five seconds. The display will then revert to ALT Display Mode.



1.3.3.4 PITCH AXIS FAILURE

Failure Annunciators



When illuminated, indicates failure of the pitch axis and will disengage the autopilot. Illuminates whenever the continuous monitoring system detects a pitch axis fault, or is not receiving information from the altimeter or vertical speed indicators.



The AP Servo Annunciator will annunciate a fault, indicating that the AP Servos are temporarily disengaged.

The ARM indicator for the roll axis will also flash red whenever a fault condition exists. The mode indicator (i.e. ALT) will also flash. This annunciates to the pilot that the autopilot will not capture the selected altitude, or maintain the selected climb/descent.



Fault Condition Display

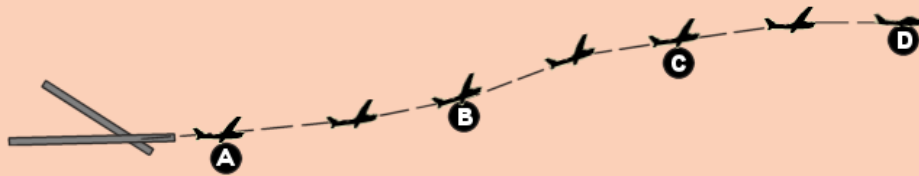
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2. Detailed System Operation

The following represents the detailed operating instructions and control sequences necessary to operate the KFC225 in all phases of flight.

2.1 BASIC PROCEDURES

Takeoff and climb to 9,200 feet.

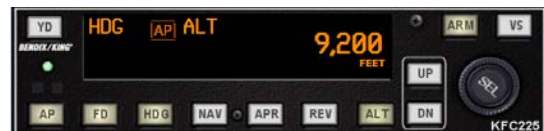


- A. Aircraft departs runway 8 and established a safe climb rate. The heading bug on the HSI is turned to 80° (runway heading).

Press the HDG Key and the AP Master key to switch the KFC225 to *Heading Hold Function* and *Active Mode*.

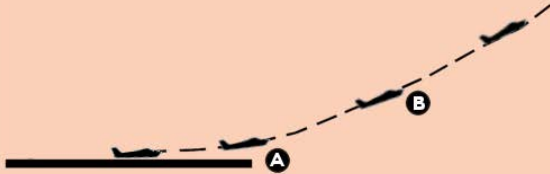
- B. Press the VS Key and use the UP Key to set the pitch axis to 700 FPM climb.

Rotate the Preselect Control to change the Altitude Preselect to 9,200'. Press the ARM key.

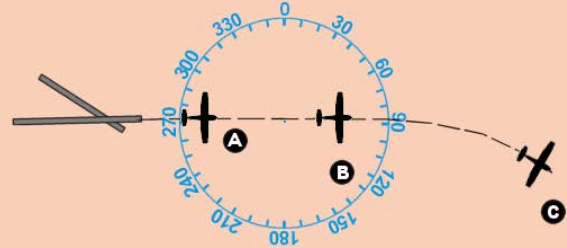


- C. When the aircraft reaches 8,200 feet indicated altitude the *Altitude Alert* will flash for two seconds, and a 3 tone aural annunciation will occur, indicating that the aircraft is approaching the preselected altitude.
At 9,000 feet indicated altitude the alert will occur again, signaling 200 feet from altitude capture.
- D. At 9,200 feet the ALT light illuminates, switching the KFC225 to *ALT Mode* and the aircraft maintains 9,200 feet.

Takeoff from Runway 8 and turn to 120°
Climb to 6,000 Feet



Takeoff from Runway 8 and Enter 20° Right
Turn - Climb at 600 Feet Per Minute



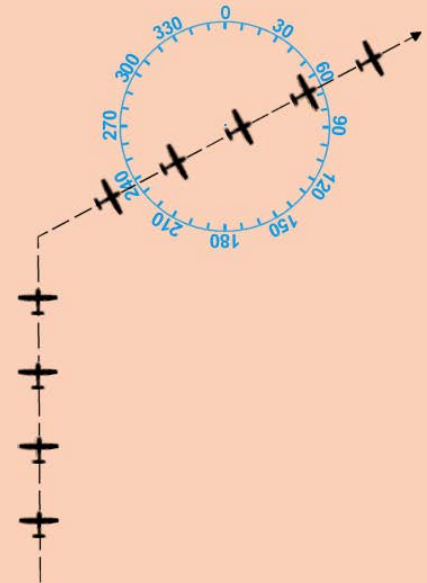
- A. Aircraft departs runway 8. Establish a safe climb rate, and then turn the heading bug on the HSI to 80° (runway heading).
Select 6,000 feet on the Preset Knob, and then press the ALT Key. This will establish the aircraft in a steady climb to 6,000 feet.
Press the HDG Key and the AP Master key to switch the KFC225 to *Heading Hold Function* and *Active Mode*.
- B. Turn the HSI heading bug to 120°
- C. The aircraft turns to the selected heading



- A. Aircraft departs runway 8. Establish a safe climb rate. Ensure that the FD Key is depressed and illuminated. *ROL* and *PIT* will be displayed.
Press the center of the Preset Knob to change the control to Roll Select. The *ROL* display will temporarily turn green. Select a 20° right turn.
- B. Press the VS Key and the PIT display will indicate FPM. Use the UP key to select 600 FPM. Then, press the AP Master Key to switch the KFC225 to *Active Mode*.
- C. The aircraft will climb at 600 FPM, and maintain a right hand turn of 20°.

GPS Capture

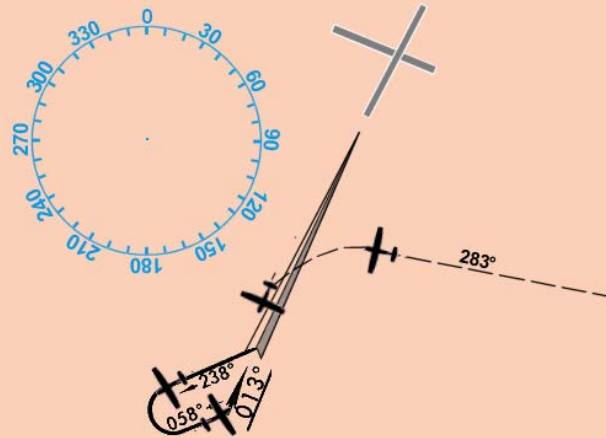
GPS data for a 62° track



- Set heading bug to 20° and select the HDG Key. The aircraft maintains a heading of 20°.
- Select 60° on the OBS control and select the NAV Key on the KFC225.

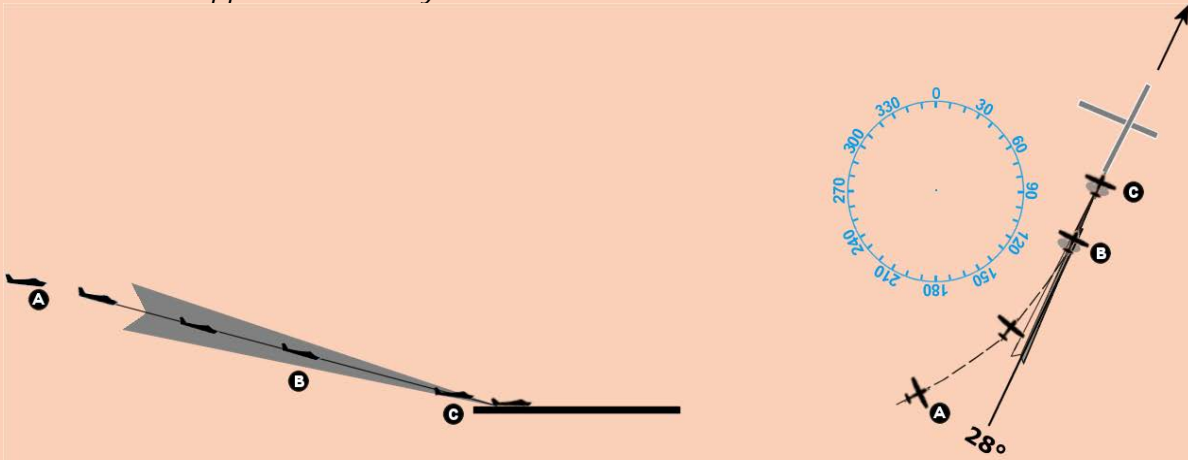


- Ensure the aircraft's NAV/GPS switch is in the GPS position. When the waypoint track is intercepted the aircraft turns to 62° and maintains course. The HDG Key is no longer illuminated and the HDG annunciation is extinguished. Display reads NAV.

Outbound On Front Course For Procedure Turn to ILS Approach

- A. The aircraft is heading north, and the NAV 1 radio is tuned to the ILS frequency. Turn the heading bug to 283° and press the HDG key on the KFC225. Ensure that the AP Master key is also ON and illuminated.
- B. Turn the OBS knob until the pointer is set to the Front Course (runway heading) of 013°. Press the REV key on the KFC225. This will engage REV standby mode.
- C. When the CDI deflection indicates that the runway radial has been reached, HDG mode is cancelled and reverse localizer mode is automatically activated, and a left turn to the outbound course (193°) will be initiated.
- D. To initiate the front course for runway approach simply press the APR Key. The aircraft will turn to the runway heading of 13° and track the ILS beam.

Front Course ILS Approach-Runway 3



- A. The NAV 1 radio is tuned to the ILS frequency, and the OBS selector is turned to runway heading (28°). Turn the heading bug to 73° and press the HDG Key on the KFC225. The aircraft will approach the Front Course at a 45° angle. Press the APR Key to arm the Approach Coupling System.

The aircraft is flying level at the runway approach altitude of 2,700 feet. In APR mode the glideslope mode is automatically armed.

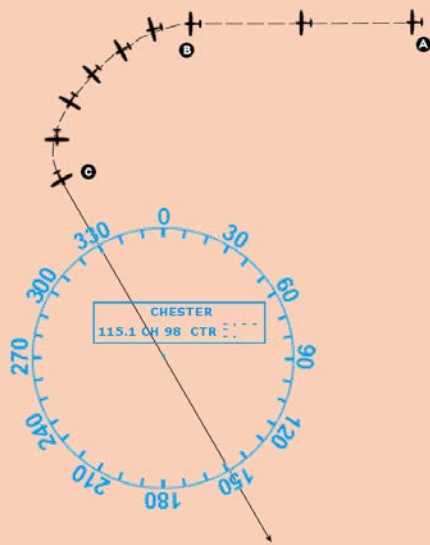


- B. With the Approach Coupling System armed, the ALT Key illumination and the ALT annunciation will extinguish and ALT Mode is disengaged when the ILS glideslope is captured.

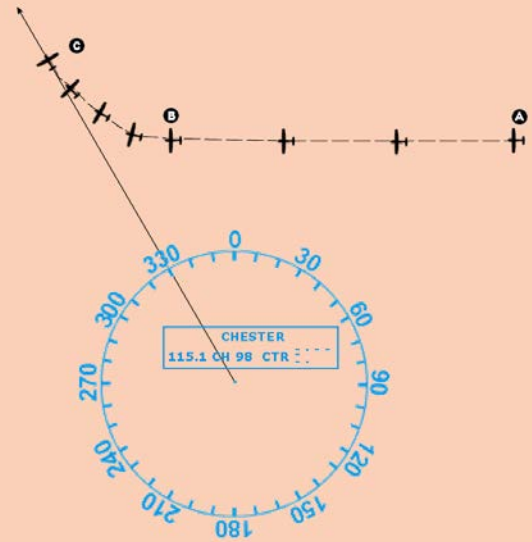
When the CDI deflection decreases, the HDG Key illumination and the HDG annunciation extinguishes as APR Mode captures the localizer. HDG Mode is disengaged automatically.

- C. Aircraft follows the localizer and glideslope to the runway threshold for landing.

NAV Turn to Inbound 150° VOR Radial



NAV Turn to Outbound 330° VOR Radial



- A. NAV 1 radio is tuned to the VOR station. The OBS selector is turned to an inbound radial of 150°. Turn the heading bug to 270° and press the HDG Key. Then press the NAV Key. The KFC225 will maintain HDG Mode.



- B. When the CDI shows less than 50% deflection HDG Mode will be automatically discontinued and the unit will switch to NAV Mode, coupling with the NAV signal and tracking the OBS selection.
- C. The aircraft turns to 150° and tracks the inbound radial.







- A. NAV 1 radio is tuned to the VOR station. The OBS selector is turned to an outbound radial of 330°. Turn the heading bug to 270° and press the HDG Key. Then press the NAV Key. The KFC225 will maintain HDG Mode.



- B. When the CDI shows less than 50% deflection HDG Mode will be automatically discontinued and the unit will switch to NAV Mode, coupling with the NAV signal and tracking the OBS selection.
- C. The aircraft turns to 330° and tracks the outbound radial.

3. Terminology

<i>AP Master Key</i>	 Fig. 1a, #2. Toggles between Active and Standby modes. Autopilot will only control the aircraft in Active Mode. Key will illuminate when in Active Mode.
<i>Active Mode</i>	Indicates that the autopilot is in control of the aircraft's control surfaces, either by control servos (Servo Control Modes) or by trim control motors (Fixed Trim Modes).
<i>Altitude Preselect Mode</i>	Aircraft is configured to seek and maintain a preselected (indicated) altitude, in feet.
<i>AP Servo Annunciator</i>	 Annunciator that illuminates when one of the Servo Control Modes is active.
<i>Back Course</i>	A runway approach where the HSI needle is set to the outbound rather than the inbound track, for the aircraft to fly in the opposite direction of the runway.
<i>CDI Indicator</i>	Course Deviation Indicator - an avionics instrument used in aircraft navigation to determine an aircraft's lateral position in relation to a track. If the location of the aircraft is to the left of course, the needle deflects to the right, and vice versa.
<i>Control Center</i>	Utility for configuring your FlightSim Developers Bendix King radios and autopilot in your specific Flight Simulator panels. You can find it within your Flight Simulator directory structure in the folder: <code>FlightSim Developers\Bendix King\Control Center.exe</code>
<i>Course Mode</i>	Servo Controlled Mode for the autopilot roll axis. Sets a microprocessor defined course heading, determined by the HSI/Gyro heading bug, in HDG Mode, or by data input from the NAV radio in NAV, APR or REV modes.
<i>Dutch Roll</i>	A type of aircraft motion, consisting of an out-of-phase combination of "tail-wagging" and rocking from side to side. This yaw-roll is an indication of poor directional stability, introducing a sideslip into the relative wind in the direction of the rolling motion. Dutch Roll can be excited by any use of aileron or rudder.
<i>Fixed Trim Modes</i>	Autopilot will configure the aircraft in a Roll Mode and/or pitch, until instructed otherwise.
<i>Front Course</i>	A runway approach where the HSI needle is set to the inbound track (runway heading) for aircraft final approach
<i>Omnibearing Selector (OBS)</i>	A device capable of being set manually to any desired omnibearing, or its reciprocal, to control a course-line deviation indicator. Also known as radial selector.
<i>Roll Axis</i>	Aileron and rudder control. Rotation along the longitudinal axis (nose to tail) of the aircraft.
<i>Roll Axis Function Keys</i>	Keys used in Course Mode:    
<i>Roll Mode</i>	Autopilot is configured to maintain a fixed roll, in degrees, until instructed otherwise.
<i>Servo Control Modes</i>	Autopilot will configure the aircraft in Course Mode and/or Altitude Preselect Mode.
<i>Standby Mode</i>	Allows change of settings and control parameters, but the autopilot will take no action until the AP Master Key is pressed ON.