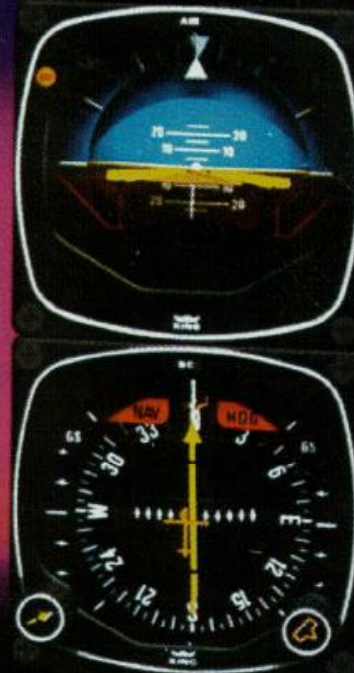


# PILOT'S GUIDE FOR THE KFC 150/KAP 150 & KAP 100 FLIGHT CONTROL SYSTEMS



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# INTRODUCTION

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The pressures of single-pilot instrument flying place critical demands on the skill and concentration of any pilot.

To help you meet the challenge, King Radio has developed three digital, panel-mounted Silver Crown flight control systems for single and twin engine aircraft.

These systems bring digital flight control technology from the flight deck of the new generation airliners to the cockpits of piston powered aircraft for the first time. The result is lightweight, compact flight control systems which incorporate the functions of computer, mode selector, and annunciator in a single, panel-mounted unit. These digital panel-mounted systems use fewer parts than previous generation flight control systems for singles and twins. And fewer parts mean potentially greater reliability.

It's also significant that these Silver Crown flight control systems have been designed from the beginning to interface with your Silver Crown package of

COMM/NAV Pulse products. Consider the advantage of having your avionics working together as an integrated system rather than as a group of unrelated components built by several manufacturers.

To fully utilize the impressive capabilities of your new digital, panel-mounted flight control system, you must understand the performance capabilities and basic operational requirements of these advanced-design Silver Crown systems. This pilot's guide is divided into three sections. The first provides a general familiarization with each flight control system including the associated panel-mounted displays. The second section describes each system, including the KCS 55A slaved compass system and its operation, as well as optional altitude preselect/alerting and vertical speed hold. The final section covers emergency procedures and optional NAV 1/NAV 2 switching.

# GENERAL DESCRIPTION: KFC 150, KAP 150 AND KAP 100

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## *KFC 150 Flight Control System*

The KFC 150 is the ultimate panel-mounted digital flight control system for singles and twins. It has the autopilot capability you need, plus a complete flight director system. The flight director provides attitude commands for the pilot to hand-fly, or displays to the pilot the commands being followed by the autopilot. The KFC 150 has capabilities similar to King's popular KFC 200 Flight Control System.

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## *KAP 100 Autopilot System*

The KAP 100 Autopilot System is a single-axis panel-mounted digital system which extends Silver Crown quality and reliability to an entirely new entry-level capability. The KAP 100 Autopilot is the most affordable option in the Silver Crown line of flight control systems and offers many substantial workload relief benefits.

The following chart highlights the major attributes of each of the three systems

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## *KAP 150 Autopilot System*

The KAP 150 Autopilot System is a two-axis, panel-mounted digital system which delivers highly sophisticated IFR capability. It has modes and functions similar to the KFC 150 but has no flight director.

# SILVER CROWN PANEL-MOUNTED FLIGHT CONTROL SYSTEM CAPABILITIES

	KFC 150	KAP 150	KAP 100
Two Axis	Yes	Yes	—
Single Axis	—	—	Yes
Flight Director	Yes	—	—
KI 525A PNI	Standard	Optional	Optional
KG 107 DG	—	Standard	Standard
KG 258 Horizon Reference Indicator	—	Standard	Standard
KI 256 Flight Command Indicator	Standard	—	—
Automatic Electric Elevator Trim	Standard	Standard	—
Manual Electric Trim	Standard	Standard	Optional
Yaw Damper	Optional for some aircraft	Optional for some aircraft	—
KA 185 Remote Mode Annunciator	Optional for some aircraft	Optional for some aircraft	Optional for some aircraft
KAS 297B Altitude Preselect/Alerting, Vertical Speed Hold	Optional for some aircraft	Optional for some aircraft	—
<b>FUNCTIONS/MODES</b>			
ALT Hold (ALT)	Yes	Yes	—
ALT Preselect	Optional	Optional	—
Heading Select (HDG)	Yes	Yes	Yes
NAV (VOR/RNAV)	Yes	Yes	Yes
Approach (APR)	Yes	Yes	Yes
Glideslope (GS)	Yes	Yes	—
Back Course (BC)	Yes	Yes	Yes
Control Wheel Steering (CWS)	Standard	Standard	Optional with King manual electric trim
Vertical Speed Hold	Optional	Optional	—
Vertical Trim	Yes	Yes	—
Auto Capture	Yes	Yes	Yes
Auto Track	Yes	Yes	Yes
All Angle Intercept	Yes	Optional (with KI 525A)	Optional (with KI 525A)
Auto 45-degree Intercept	—	Standard (with KG 107)	Standard (with KG 107)
<b>TEST</b>			
Manual and Auto Trim Monitor	Both	Both	Manual Trim Monitor (with King manual electric trim option)
Roll Rate Monitor	Yes	Yes	Yes
Pitch Rate Monitor	Yes	Yes	—

**NOTE:** The KFC 150, KAP 150 and KAP 100 are designed as independent systems to maximize their individual capabilities. Therefore they are not designed for conversion from one system to another.

**IMPORTANT:** This Pilot's guide provides a general description of various operational characteristics of the KFC 150, KAP 150 and KAP 100 Flight Control Systems. However, operation of a system should not be attempted without reviewing the specific information in the FAA approved Aircraft Flight Manual Supplement for your particular aircraft type.

## SYSTEMS INTEGRATION

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The individual systems diagrams on pages 7, 8, and 9, show the components and their relationships in typical KFC 150, KAP 150 and KAP 100 Flight Control Systems. The actual components used on individual aircraft may vary slightly in order to optimize certification and installation requirements.

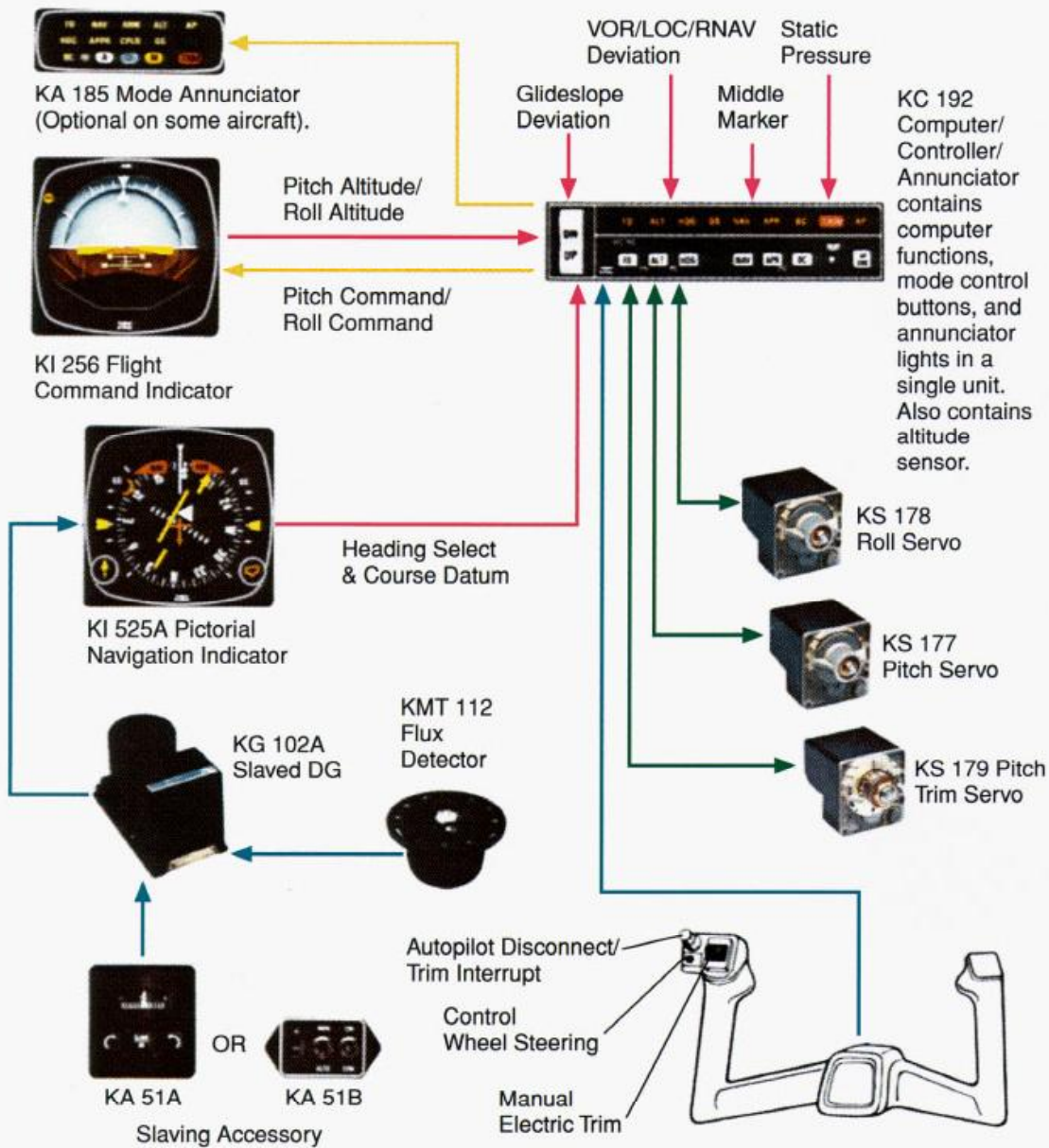
Each system has a number of inputs and outputs: sensor outputs are shown in red; computation inputs shown in blue; display outputs shown in orange; and aircraft control shown in green. The systems diagrams reflect that the KAP 150 and KFC 150 systems control both pitch and roll axes of the aircraft. The KAP 100, being a single-axis system, controls only the roll axis of the aircraft. All sensor information (pitch and roll reference, heading and course datum, RNAV/VOR/LOC/GS deviation and flags, marker receiver and static pressure [altitude] is fed into the system's flight computer).

The flight computer computes pitch and roll steering commands (or in the case of the KAP 100, roll commands only). In the KFC 150 system these commands are routed through the KI 256 Flight Command Indicator (FCI), where they are displayed on the V-Bar as visual guidance commands.

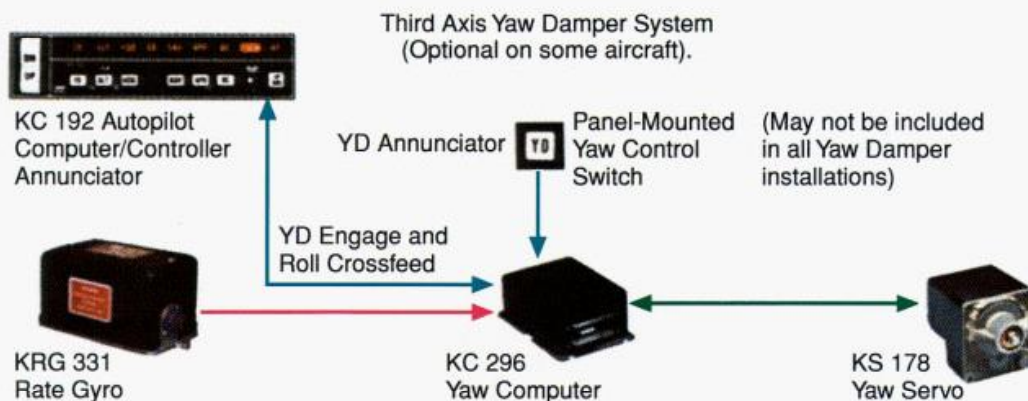
In all three systems these steering commands are fed to the autopilot computation circuits contained in the appropriate flight computer which generates the commands for the individual servos to manipulate the ailerons, elevator and elevator trim. An optional yaw channel is available for some aircraft, but is independent of pitch and roll commands.

Using the same pitch and roll commands in the KFC 150 system for flight director and autopilot provides totally consistent flight director steering command and autopilot control. There is no disagreement in computation. The autopilot simply converts the pitch and roll steering commands from the flight computer, displayed on the V-Bar in the FCI, into the required elevator and aileron position commands. Full integration of flight director and autopilot allows the pilot to delegate the manual effort of flying the aircraft to the autopilot while monitoring its activity with the flight director.

# TYPICAL KFC 150 FLIGHT CONTROL SYSTEM

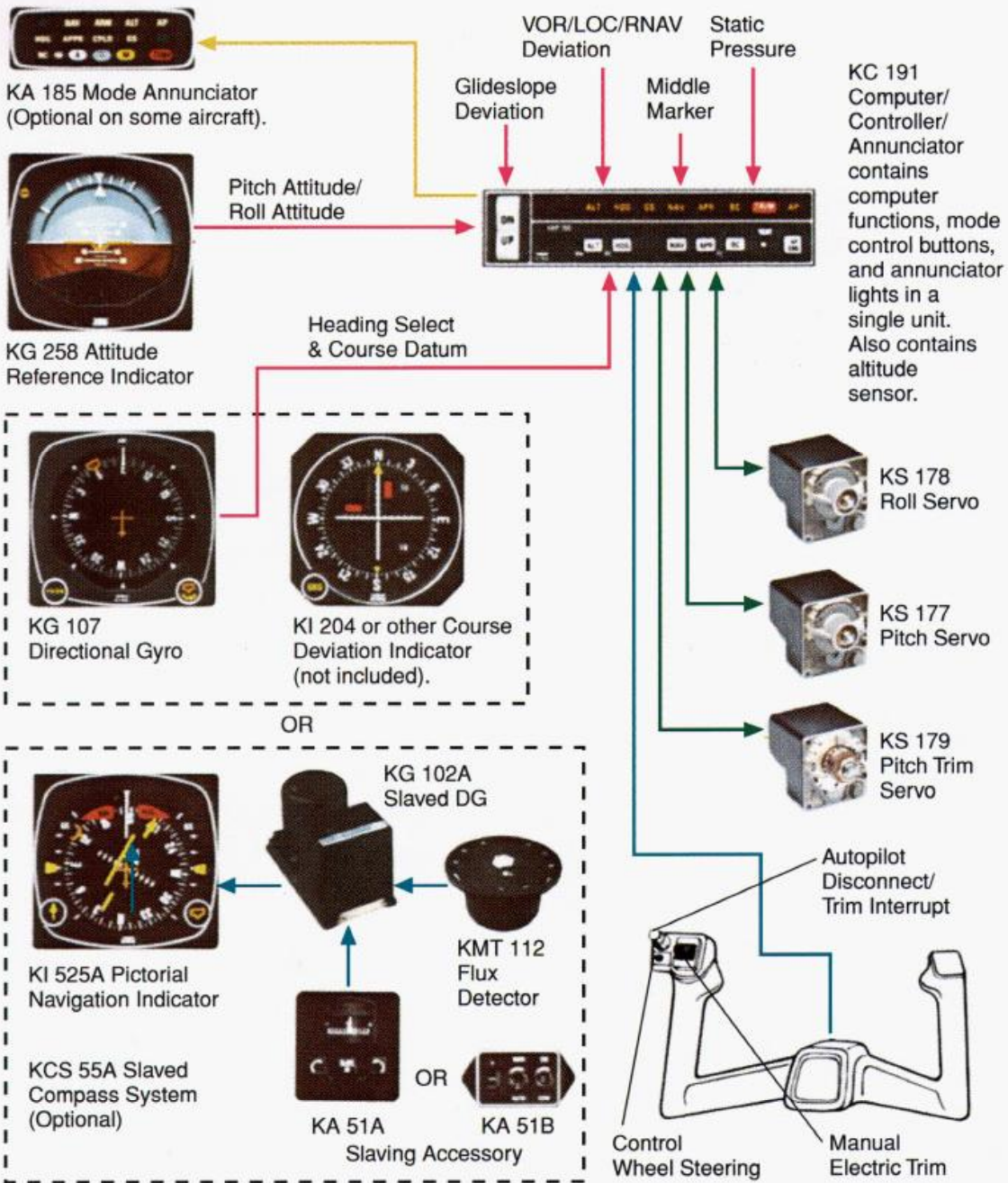


This is a 2-Axis (Pitch and Roll) System.

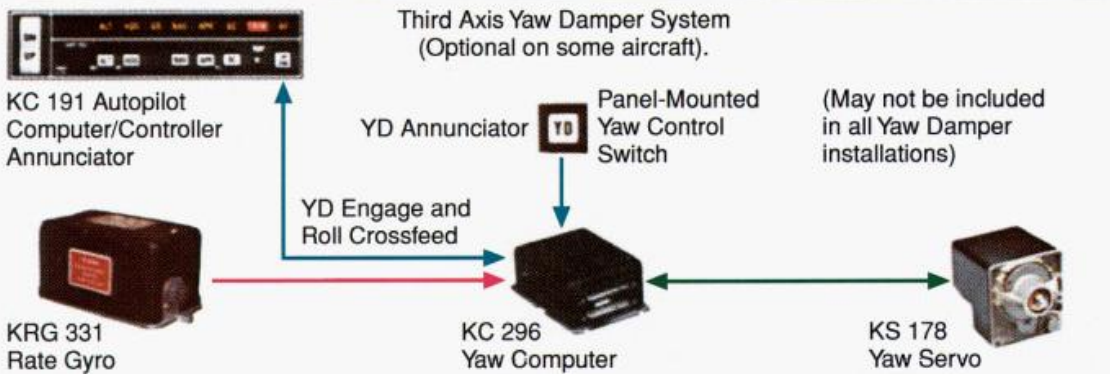




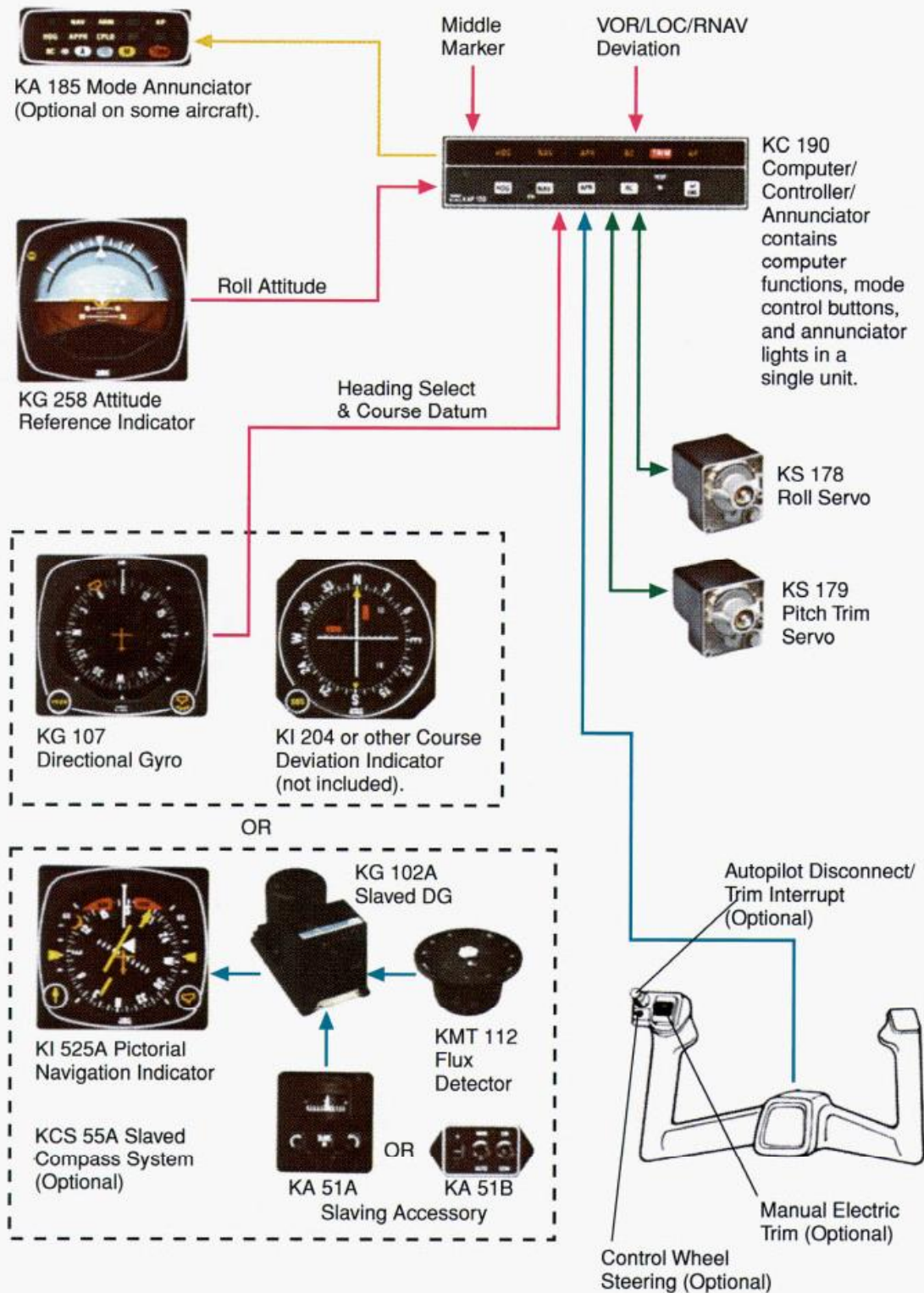
# TYPICAL KAP 150 AUTOPILOT SYSTEM



This is a 2-Axis (Pitch and Roll) System.

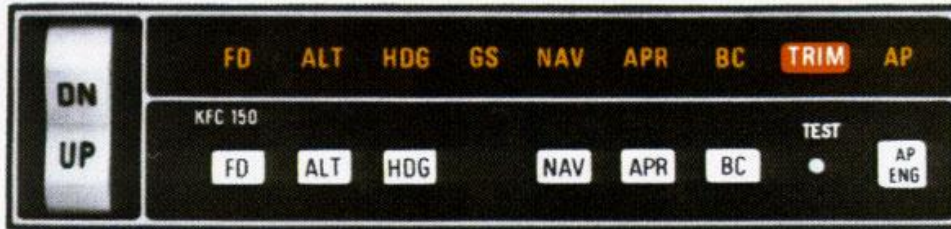


# TYPICAL KAP 100 AUTOPILOT SYSTEM



This is a Single-Axis (Roll) System.

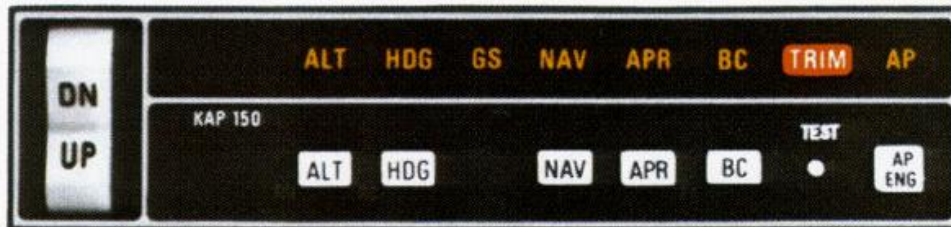
## DESCRIPTION OF PANEL UNITS



### KC 192 Mode Controller/Computer/Annunciator

The KC 192 Mode Controller/Computer/Annunciator for the KFC 150 system incorporates all computer functions, mode control buttons and annunciator lights in a single panel-mounted unit. The KC 192 annunciates all vertical and lateral flight director and autopilot system modes.

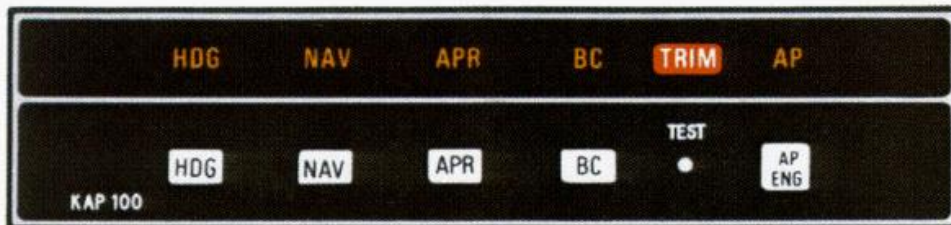
In addition, the KC 192 has seven push buttons for engaging flight director and/or autopilot modes, a push button to initiate a system self-test, and a vertical trim rocker switch to allow for changing the aircraft's pitch up or down without disconnecting the autopilot.



### KC 191 Mode Controller/Computer/Annunciator

The KC 191 Mode Controller/Computer/Annunciator for the KAP 150 incorporates the functions of a computer, mode controller and annunciator lights in a single, panel-mounted unit. The KC 191 annunciates all vertical and lateral autopilot

system modes. In addition, the KC 191 has six push buttons for engaging autopilot modes, a push button to initiate system self-test, and a vertical trim rocker switch to allow for changing the aircraft pitch up or down without disconnecting the autopilot.



### KC 190 Mode Controller/Computer/Annunciator

The KC 190 Mode Controller/Computer/Annunciator for the KAP 100 incorporates the functions of a computer, mode controller and annunciator lights in a single, panel-mounted unit. The KC 190 annunciates all lateral autopilot system

modes. In addition, the KC 190 has five buttons for engaging autopilot modes, and a push button to initiate system self-test.



### KI 256 Flight Command Indicator (FCI)

The KI 256 displays the following information:

- Pitch and roll attitude.
- Flight Director pitch and roll commands.
- DH (decision height) annunciation when used with a radar altimeter.

The KI 256 contains an air-driven vertical gyro. Engine(s) must be running, pressure or vacuum system operating and gyro up to speed before the system will operate. Allow three minutes for the gyro to come up to speed.

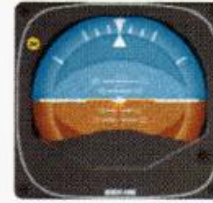


### KG 253 Electric Horizon Reference Indicator

The KG 253 displays the following information:

- Pitch and roll attitude.
- DH (decision height) annunciation when used with a radar altimeter.

The KG 253 is an electric attitude reference indicator. Electrical power (D.C.) must be applied in order for the unit to operate. Immediately following electrical power turn-on, the knob labeled "Pull to Erect" should be pulled out with a moderate, even pull and held in the out position for approximately three seconds. The knob should then be released quickly but smoothly. Erecting the unit should only be accomplished while the aircraft is relatively level on the ground or in level flight. The gyro must be up to speed before the system will operate. Allow three minutes for the gyro to come up to speed.



### KG 258 Horizon Reference Indicator

The KG 258 displays the following information:

- Pitch and roll attitude.
- DH (decision height) annunciation when used with a radar altimeter.

The KG 258 contains an air-driven attitude reference indicator. Engine(s) must be running before the system will operate. Allow three minutes for the gyro to come up to speed.



### KI 254 Electric Flight Command Indicator (FCI)

The KI 254 displays the following information:

- Pitch and roll attitude.
- Flight Director pitch and roll commands.
- DH (decision height) annunciation when used with a radar altimeter.

The KI 254 contains an electric vertical gyro. Electrical power (D.C.) must be applied in order for the unit to operate. Immediately following electrical power turn-on, the knob labeled "Pull to Erect" should be pulled out with a moderate, even pull and held in the out position for approximately three seconds. The knob should then be released quickly but smoothly. Erecting the unit should only be accomplished while the aircraft is relatively level on the ground or in level flight. The gyro must be up to speed before the system will operate. Allow three minutes for the gyro to come up to speed.



KI 204/206



KG 107



KI 525A



KA 185



KAS 297B

### KI 204/206 Course Deviation Indicator

The KI 204/206 displays the following:

- VOR/LOC/GLIDESLOPE Deviations.
- Course Select (OBS).
- TO/FROM Flag Indication.

The KI 204/206 is used with the KN 53, KX 155 or KX 175B, and the KN 75 Glideslope Receiver. The KI 206 is used with the KN 74, KNS 80, KNS 81, KX 165 or KNC 610.

### KG 107 Directional Gyro

The KG 107 Directional Gyro displays the following information:

- Unslaved gyro magnetic heading information.
- Selected heading (HDG "bug").

The KG 107 is an air-driven directional gyro indicator. Engine(s) must be running, pressure or vacuum system operating and gyro up to speed before the system will operate. Allow three minutes for the gyro to come up to speed.

### KI 525A Horizontal Situation Indicator (HSI)

The KI 525A is the display portion of the KCS 55A Slaved Compass System and displays the following:

- Slaved gyro magnetic heading information.
- Selected heading (HDG "bug").
- VOR/LOC/RNAV course deviation.
- Glideslope deviation.

### KA 185 Mode Annunciator (Optional)

The KA 185 provides a parallel annunciation display of all appropriate operating

modes and may be positioned on the panel in the pilot's normal scan.

### KAS 297B Altitude Selector (Optional)

The KAS 297B is used with a KEA 130A Altimeter to provide altitude preselect/alerting and vertical speed modes for the KFC 150 and KAP 150 systems.

### System Monitor Description

Through the use of extensive monitor circuits in the 100 series flight control systems, safer control of the aircraft is provided, since failures are predominantly "soft" (aircraft control is automatically returned to the pilot when a fault is detected). Because of this safety factor, the 100 series flight control systems are able to provide smoother control of the aircraft due to increased servo authority.

The internal monitors continuously check for the presence of operating pitch and roll microprocessors, adapter modules (used to tailor the autopilot to individual aircraft models), pitch and roll reference signals, proper internal voltages, trim power, "runaway" auto trim, wrong direction of trim, abnormal pitch attitude rates, and abnormal roll attitude rates.

The trip levels for pitch and roll attitude rates and duration are independently set on the adapter modules for each aircraft.

Digital design allows the incorporation of these monitors without the weight and space penalties associated with previous technology systems. Now these important safety features are available to the operators of piston engine aircraft at a reasonable price.

## THE KFC 150 FLIGHT CONTROL SYSTEM

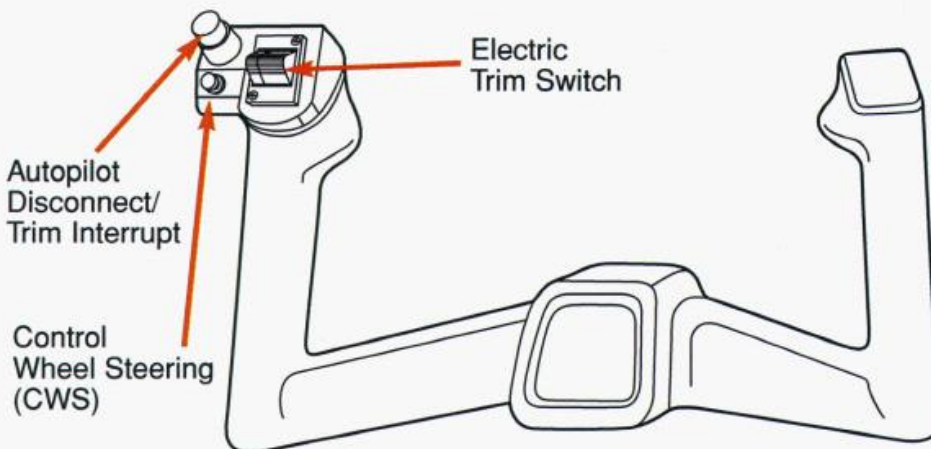
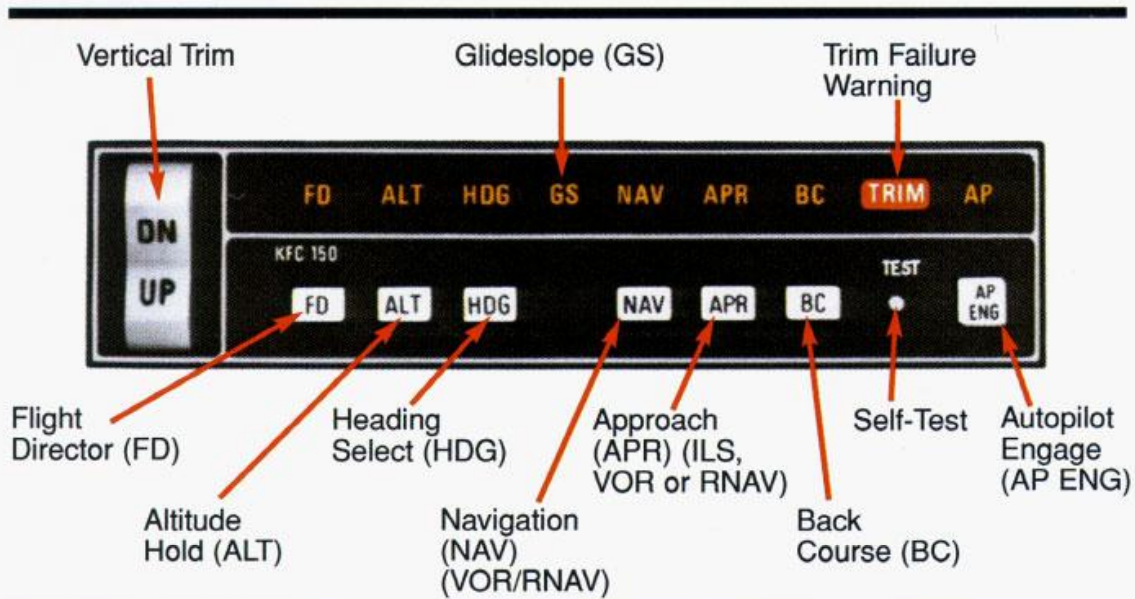


The KFC 150 is the ultimate in digital panel-mounted flight control systems for singles and twins.

The system incorporates a highly capable two-axis autopilot and a flight director system. An optional third-axis (yaw damper) system is available for some aircraft at a slightly higher cost.

The flight director system is a computer which calculates the appropriate pitch and roll attitudes required to intercept and maintain headings, courses, approach paths, pitch attitudes and altitudes. Once computed, the commands are displayed to the pilot on the single-cue steering command which is part of the KI 256 Flight Command Indicator (FCI).

The pilot can then manually fly the commands shown on the KI 256, or engage the autopilot portion of the system and have it fly the commands. Monitoring the single-cue steering command (V-bar) will tell the pilot if the commands are being satisfied. A good cross-check is to monitor the raw data (course or localizer and glideslope information) on the KI 525A PNI to see if the aircraft is intercepting or tracking course and glide-path as desired. (If you are unfamiliar with the operation of a Pictorial Navigation Indicator (PNI) you should stop here and review the section of the KCS 55A Compass System on page 95.)



Mode	Flight Director/Autopilot Action
Attitude Reference _____	Power on and no modes selected. FCI displays aircraft attitude and PNI displays aircraft heading. Command V-bar is biased out of view. Aircraft engine(s) must be running for pressure or vacuum to be applied to FCI attitude gyro.
Flight Director (FD) _____	V-bar will appear and command wings level and pitch attitude of the aircraft at the time of mode selection.
Autopilot Engage (AP ENG) _____	Aircraft control surfaces (ailerons and elevators) smoothly respond to all selected Flight Director mode commands with automatic pitch trim. Engages Yaw Damper if present.

Mode	Flight Director/Autopilot Action
Heading (HDG)	Select desired heading on PNI, then select HDG mode. The V-bar will command the necessary bank to turn to and maintain the selected heading.
Navigate (NAV) (VOR/RNAV)	The V-bar will command the bank necessary to turn to and maintain a VOR or RNAV course selected by the pilot.
Approach (APR) (ILS, VOR or RNAV)	The V-bar will command the bank and pitch necessary to capture and track localizer and glideslope for ILS approaches, or to capture and track the appropriate course for VOR or RNAV.
Back Course (BC)	The V-bar will command the bank necessary to capture and track a reverse localizer course. Glideslope is locked out.
Altitude Hold (ALT)	The V-bar will command the pitch attitude necessary to maintain the engaged altitude.
Test Button	Depressing the test button initiates a test of the KFC 150 circuitry, including operation of various modes and of the trim. The test must be performed after power is applied and before the autopilot can be engaged, but the flight director can be used without the test being performed.
Vertical Trim	This rocker switch allows you to make small corrections in selected altitude while in altitude hold, or adjust pitch attitude at a rate of approximately .9 degrees per second when not in altitude hold.
Control Wheel Steering (CWS)	This button mounted on the control wheel allows you to maneuver the aircraft in pitch and roll without disengaging the autopilot. After the CWS button is released, the autopilot resumes control of the aircraft.

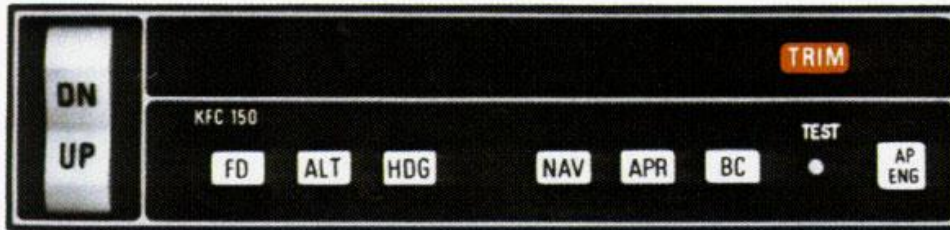


# OPERATING THE KFC 150 SYSTEM

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## Initial Power On

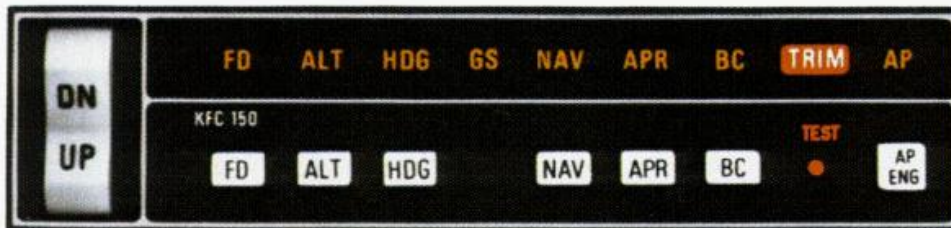
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When initially powered (no modes selected), the KFC 150 will display aircraft attitude on the FCI and aircraft heading on the PNI. The V-bar will be biased out of view. The trim light will be lit on the KC 192 as a reminder of the need to perform the system self-test.

## System Self-Test

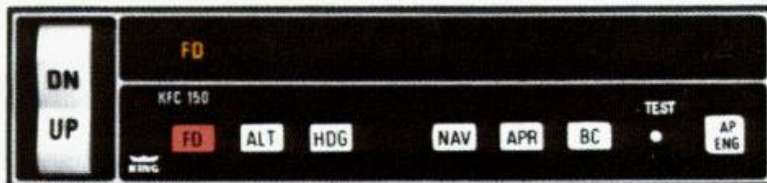
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The KFC 150 system incorporates a system self-test function which is activated by a test button on the KC 192 Mode Controller/Computer/Annunciator. The test must be performed before the autopilot portion of the system can be used, but need not be performed before using the flight director portion. This test determines, before takeoff, that the system is operating normally. To perform a test — momentarily push the test button. The following actions will occur:

1. All annunciator lights, the trim light and autopilot lights will illuminate.
2. The trim light will flash 4 times.
3. The annunciator legends will go blank, an aural tone will beep (approx. 6 times) and the "AP" light will flash (approx. 12-13 times) and go off. (If the AP light fails to flash you will be unable to engage the autopilot.)
4. The KC 192 display will go blank.

The test checks all digital computing capability, the disconnect capability of the autopilot, the auto trim drive and monitor systems, and the failure annunciator system. **CAUTION:** If the trim legend flashes or remains on at the end of the test it indicates there is a failure in the trim system and the autopilot will not engage. See a qualified King Service Agency for repair.



## Attitude Reference Mode of Operation

The system will be in the basic attitude reference or "gyro" mode with engine(s) running and aircraft power on, but no modes selected (annunciator panel blank). Aircraft heading is shown on the PNI and roll and pitch attitude on the FCI.

Attitude Gyro Operation Note: When shutting down the aircraft for short periods of time, make sure the Attitude Gyro has completely spun down before starting operations again. Gyro spin down occurs when the air supply is cut off to the gyro and usually takes about 10 minutes.

During Gyro spin down most gyros have a tendency to "tilt" (precess) to one side. If the air supply is reapplied to the gyro while in this state, slow gyro erection (leveling) will occur due to gyro inertia. If aircraft operations are initiated before the gyro is fully erected, there is a greater possibility that the gyro may tumble causing loss of primary attitude information from the Attitude Gyro.

## FLIGHT DIRECTOR (FD) MODE

The flight director mode is activated by depressing the "FD" button on the mode controller or the CWS button on the control wheel. The V-bar will appear and provide commands to maintain wings level and the pitch attitude existing at the time of engagement. To satisfy the V-bar command the pilot can manually fly the orange delta wing "aircraft" into the V-bar to align the top of the delta wing flush with the bottom edge of the V-bar. Or the pilot can engage the autopilot and let it satisfy the commands by maneuvering the aircraft in a similar manner.

---

If a change in pitch attitude is desired, the control wheel steering (CWS) button on the pilot's control wheel can be used to synchronize the V-bar (in the FD mode with autopilot disengaged) without removing your hand from the control wheel.

The vertical trim switch may be used to adjust the selected pitch attitude up or down at .9 degrees per second.

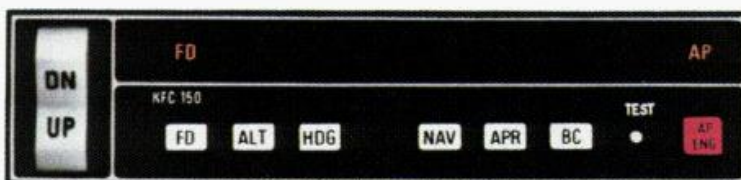
The flight director can also be activated by direct selection of any specific mode, which will activate the command V-bar. Such selection will illuminate both FD and the appropriate annunciator mode.

Selection of a mode which supersedes one already selected will cause the flight director and/or autopilot to follow the mode most recently selected by the pilot.

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## **AUTOPILOT ENGAGEMENT (AP ENG)**

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

The autopilot is engaged by depressing the "AP ENG" button on the KC 192.

**CAUTION:** Prior to autopilot engagement, the pilot should make sure the V-bar commands are satisfied. This will prevent any rapid changes in the aircraft's attitude when the autopilot is engaged.

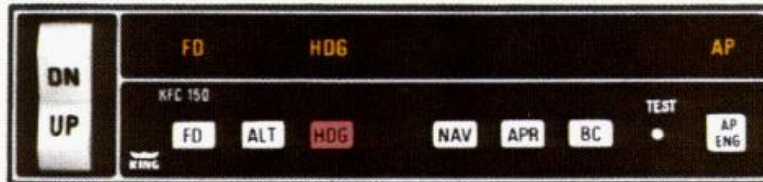
Once engaged, the autopilot will attempt to satisfy the V-bar commands generated by the selected flight director modes.

The autopilot provides two-axis (pitch and roll) stabilization and automatic elevator trim as well as automatic response to all selected flight director commands.

The addition of an optional third axis yaw damper system will significantly dampen yaw oscillations and improve turn coordination.

**WARNING:** WHENEVER THE AUTOPILOT IS DISENGAGED, THE AP LEGEND ON THE ANNUNCIATOR PANEL WILL FLASH AND AN AURAL TONE WILL SOUND TO ALERT THE PILOT.

**CAUTION:** Overpowering the Autopilot in the pitch axis in flight for periods of three seconds or more will result in the autotrim system operating in the direction to oppose the pilot and will, therefore, cause an increase in the pitch overpower forces, and if Autopilot is disengaged, will result in a pitch transient control force. Operation of the autopilot on the ground may cause the autotrim to run because of backforce generated by elevator downsprings or pilot induced forces.

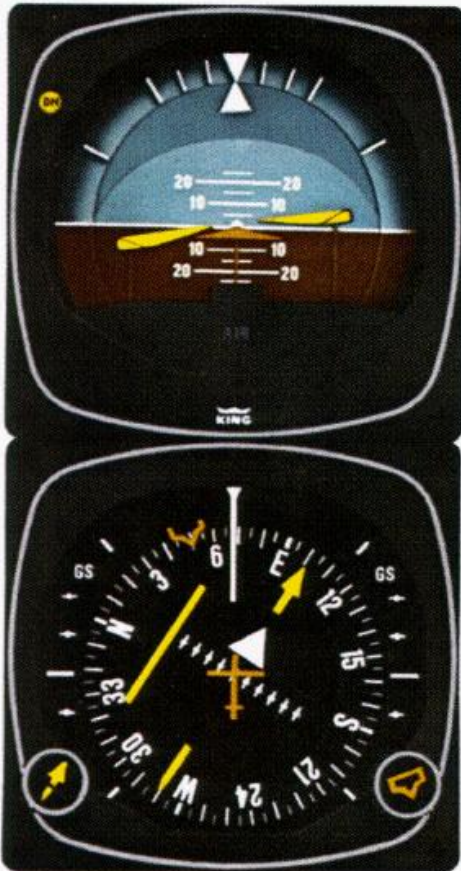
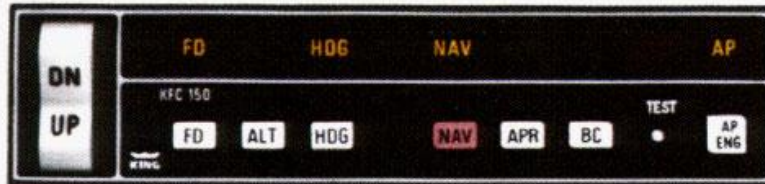


## HEADING SELECT (HDG) MODE

- To operate in heading select mode:
1. Move the heading "bug" to the desired heading on the PNI (using the HDG knob).
  2. Depress the HDG button on the KC 192 to engage the heading select mode. The V-bar on the FCI will command a bank towards the selected heading, in the direction of the shortest turn. If the autopilot is engaged it will turn the aircraft to intercept and fly the heading.
  3. The V-bar will continue to command the bank necessary to maintain the selected heading. If you move the heading "bug" again while heading select mode is engaged, the V-bar will immediately command a turn to the new heading. If the autopilot is engaged, it will immediately turn the aircraft in the direction of the new heading. The HDG mode is canceled when NAV or APR coupling occurs, or when the HDG or FD mode button is pushed again to "off".

**NOTE:** For system limitations refer to the Flight Manual Supplement for your particular aircraft.

(See page 24/25 for illustration)



**NOTE:** You should consider using HDG select mode just prior to VOR station passage. If the autopilot is engaged in NAV mode it may cause erratic maneuvers while following a rapidly changing course deviation needle as the aircraft flies in the cone of confusion.

## NAVIGATION (NAV) MODE (VOR, RNAV)

The Navigation (NAV) mode provides guidance to the pilot (or autopilot) in intercepting and tracking VOR and RNAV courses. To operate in the navigation mode:

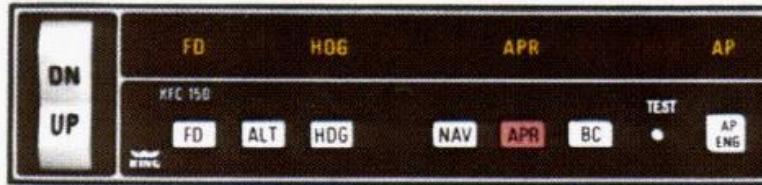
1. Tune the frequency for the selected VOR (or VORTAC) station. For RNAV, set in the waypoint distance and VORTAC radial.
2. Set the PNI course pointer to the desired course.
3. Establish the desired intercept angle by setting the heading "bug" on the intercept heading, and activate HDG mode. ("HDG" light will illuminate.)
4. Depress the "NAV" button on the KC 192. ("NAV" light will flash to signify that the NAV mode is armed.)

**NOTE:** If the NAV mode is selected with the aircraft level within  $\pm 4$  degrees of bank and within 2-3 dots of course deviation, NAV/ARM will be bypassed and the NAV mode will engage directly.

5. The V-bar will command the required bank to maintain the selected heading until the capture point\* is reached. Then the V-bar will command a turn to intercept the course. If the autopilot is engaged, it will turn to satisfy the commands. (The HDG light will go off as HDG mode is disengaged, and the "NAV" light will stop flashing and illuminate continuously as the NAV mode goes from arm to engage.)
6. The V-bar will continue to command the required bank to maintain course with automatic crosswind compensation and the autopilot (if engaged) will satisfy those commands.

\*The capture point will vary depending on the angle of intercept and the rate of change of VOR/RNAV radials.

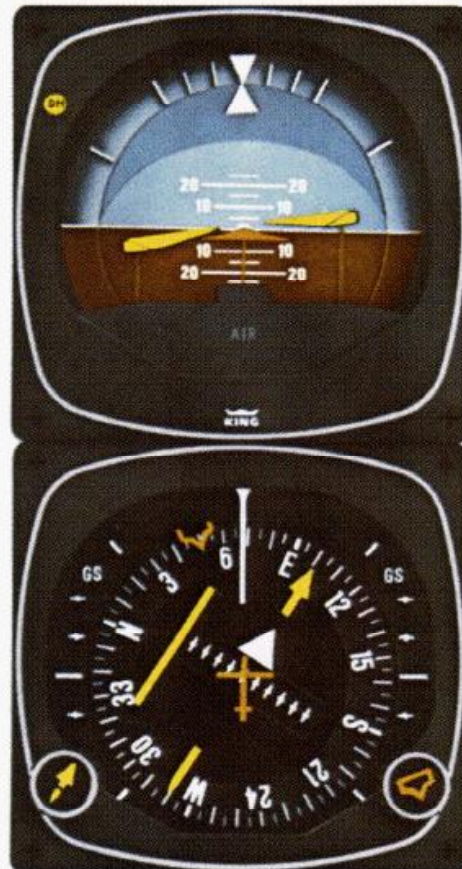
(See page 30/31 for illustration)



## APPROACH (APR) MODE

The approach (APR) mode provides guidance to the pilot (or autopilot) in intercepting and tracking ILS (both localizer and glideslope), and VOR and RNAV courses. To operate in the APR mode:

1. Tune the frequency for the selected ILS, VOR or RNAV approach.
2. Set the PNI course pointer to the final approach course (ILS front course even when flying a back course approach).
3. Set the HDG SEL "bug" on the PNI to the desired intercept angle and activate the HDG mode.
4. Depress the "APR" button. This arms the automatic capture function. (The "APR" light will flash to signify the approach mode is armed.)
5. The V-bar will command the required bank to maintain the selected heading until the capture point is reached. Then the V-bar will command a turn to intercept the course. If the autopilot is engaged it will turn to satisfy the commands. As the V-bar commands the turn to intercept the selected course, the heading mode will be canceled and the APR mode will go from arm to engage. (HDG light will go out and APR light will go from flashing to steady.)
6. The V-bar will continue to command the required bank to maintain course and the autopilot (if engaged) will satisfy those commands. (Automatic crosswind compensation will provide precise tracking. VOR/LOC deviation is shown on the PNI, and actual crab angle is shown by offset of the course arrow from the lubber line.)
7. Once localizer course capture has occurred on an ILS, the glideslope mode is armed. Automatic capture occurs as the aircraft approaches the glideslope from either above or below.

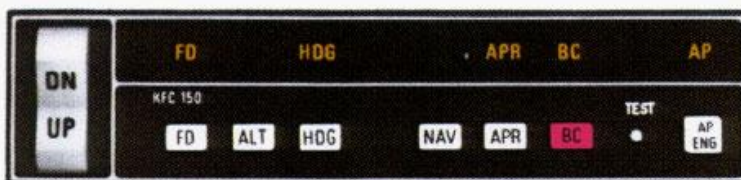


When the intercept occurs, "GS" is illuminated on the annunciator panel. The V-bar commands the pitch necessary to maintain the glideslope. If the autopilot is engaged it will satisfy these commands. If the altitude hold (ALT) mode had been engaged prior to GS capture, it will disengage at capture and the "ALT" light will go out.

**NOTE:** For system limitations refer to your Flight Manual Supplement.

(See page 28/29 for illustration)

**NOTE:** GS is locked out in VOR or RNAV APR.



## BACK COURSE (BC) MODE

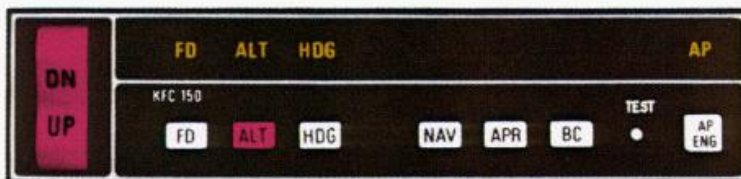
The back course (BC) mode provides guidance to the pilot (or autopilot) in intercepting and tracking a reverse course LOC.

To operate in the back course mode:

1. Tune the frequency for the selected ILS back course.
2. BE CERTAIN TO SET IN THE ILS FRONT COURSE EVEN THOUGH YOU WILL BE FLYING A RECIPROCAL HEADING ON AN ILS BACK COURSE APPROACH. FOR EXAMPLE, THE BACK COURSE APPROACH MIGHT HAVE A FRONT COURSE OF 090 DEGREES WHICH YOU WILL SET IN AS YOU FLY A BACK COURSE HEADING 270 DEGREES TO RUNWAY 27.
3. Set the heading select "bug" on the PNI to the desired intercept angle and activate the HDG mode.
4. Select the back course mode by either depressing the "APR" button and then the "BC" button or by merely depressing the BC button by itself. (BC will light and the "APR" light will flash to signify approach mode is armed.)

5. The V-Bar will command the required bank to maintain the selected heading until the capture point is reached, then it will command a turn to intercept the course. The "HDG" light will go off and the "APR" light will illuminate steadily as the BC mode goes from arm to engage. If the autopilot is engaged it will turn to satisfy the commands.
6. The V-bar will continue to command the required bank to maintain course and the autopilot (if engaged) will satisfy those commands. Automatic crosswind compensation will provide precise tracking. (The glideslope is locked out during a back course approach.)

(See page 26/27 for illustration)



## ALTITUDE HOLD (ALT) MODE

The altitude hold (ALT) mode provides guidance to the pilot (or autopilot) for maintaining the altitude at which this mode was engaged. To operate in the ALT mode:

1. Depress the "ALT" button when the aircraft has reached the altitude you wish to maintain. (For smoother operation, press the "ALT" button when the vertical velocity is no more than 500 fpm.)