Honeywell

KAP 140

Pilot's Guide

Bendix/King®
Autopilot System

Rev. 2 May 02

006-18034-0000

Single Axis

Two Axis

Two Axis w/Alt Preselect

KCS 55A Compass System

Abnormal Procedures

Revision History and Instructions

Manual KAP 140 Pilot's Guide

Revision 2, May 2002

Part Number 006-18034-0000

This revision makes some of the changes for software version 03/01 more consistent throughout the Pilot's Guide. The affected pages are 9, 12, 13, 55, 58, 83, 86 and 109.

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Introduction

The KAP 140 Autopilot System is a rate based digital autopilot system offering smooth performance and enhanced features found only in more expensive autopilots. The first of its type developed by Honeywell, this system brings digital technology and reliability into the light aircraft cockpit.

It is also significant that the KAP 140 series autopilots have been designed from their inception to interface with the Silver Crown package of products. Consider the advantage of having your avionics working together as an integrated system rather than as a group of components built by several manufactures.

Your new KAP 140 roll axis features include wing leveler, heading select, and VOR/LOC intercept and tracking. The KAP 140 can also be coupled to GPS and RNAV receivers as well. Roll rate information is derived from the turn coordinator. Pitch axis features include vertical speed, glideslope and altitude hold along with the optional altitude preselect. Pitch information is derived from a pressure sensor and accelerometer. The KAP 140 Autopilot System operates independent of the aircraft's artificial horizon. Therefore, the autopilot retains roll stabilization and all vertical modes in the event of vacuum system failure.

Internal monitors keep constant track of the KAP 140's status and provide for automatic shutdown of the autopilot or trim system in the event of a malfunction. In addition to reliability, the KAP 140 is designed to be easily maintained in the field. Qualified Honeywell Service Centers are located around the world to provide assistance whenever necessary.

To fully realize the capability of your new panel mount digital autopilot system, you must understand the performance capabilities and basic operational requirements of the system. This pilot's guide provides information to aid in this and is divided up into six sections. The first section provides general familiarization of each autopilot system including the associated panel mounted displays. The second section describes the KAP 140 Single Axis Autopilot System. The third section describes the KAP 140 Two Axis Autopilot System. The fourth section describes the KAP 140 Two Axis/Altitude Preselect Autopilot System. The fifth section describes the optional KCS 55A slaved compass system. The Sixth section describes abnormal procedures.

General Description

KAP 140 Single Axis Autopilot System

The KAP 140 Single Axis system is an entry level digital panel-mount autopilot, offering lateral modes only with an electric trim option.

KAP 140 Two Axis/Altitude Preselect Autopilot System

The KAP 140 Two Axis system provides both lateral and vertical modes with altitude preselect.

KAP 140 Two Axis Autopilot System

The KAP 140 Two Axis system provides both lateral and vertical modes.

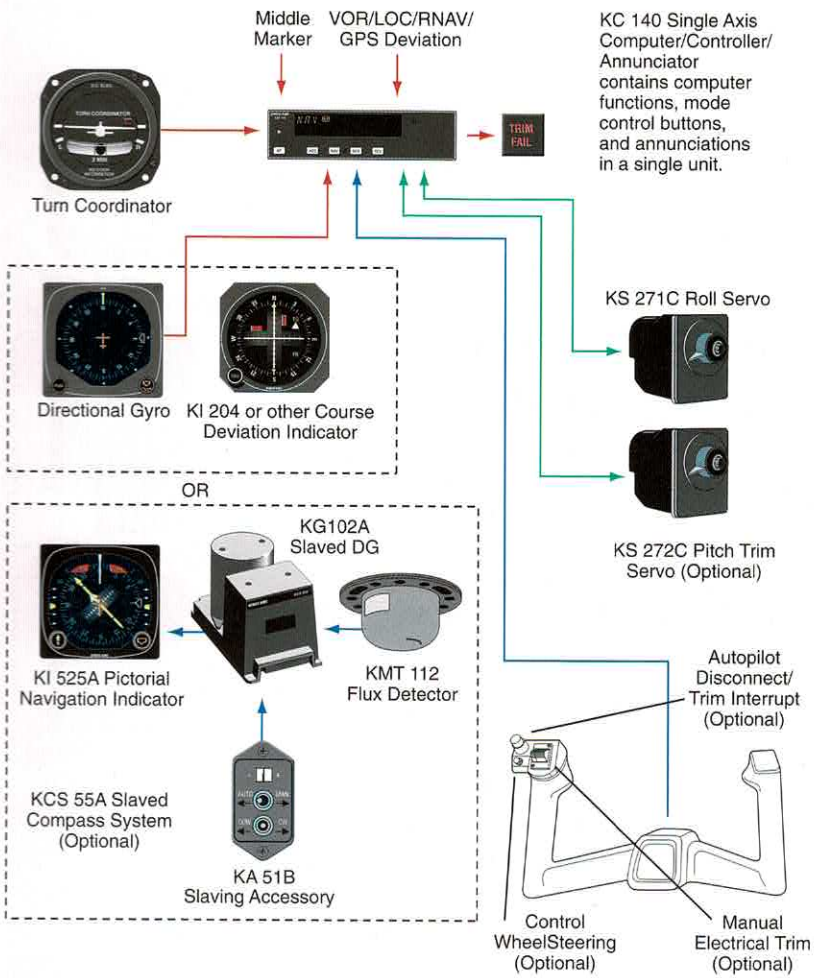
	KAP 140 Two Axis Alt. Preselect	KAP 140 Two Axis	KAP 140 Single Axis
HSI	Optional	Optional	Optional
DG	Standard	Standard	Standard
Turn Coordinator	Standard	Standard	Standard
Automatic Electric Elevator Trim	Optional	Optional	
Manual Electric Trim	Optional	Optional	
FUNCTIONS/MODES			
ALT Hold (ALT)	Yes	Yes	
ALT Preselect/ALERT	Yes		
Heading Select (HDG)	Yes	Yes	Yes
NAV (VOR/RNAV/GPS)	Yes	Yes	Yes
Approach (APR)	Yes	Yes	Yes
Glideslope (GS)	Yes	Yes	
Back Course (REV)	Yes	Yes	Yes
Control Wheel Steering (CWS)	Optional	Optional	Optional
Vertical Speed Hld	Yes	Yes	
Auto Capture	Yes	Yes	Yes
Auto Track	Yes	Yes	Yes
All Angle Intercept	Standard (with DG or optional HSI)	Standard (with DG or optional HSI)	Standard (with DG or optional HSI)
Auto 45-degree Intercept	Standard (with DG only)	Standard (with DG only)	Standard (with DG only)
TEST			
Manual and Auto Trim Monitor	Both	Both	Both
Acceleration Monitor	Yes	Yes	

KAP 140 System Capabilities

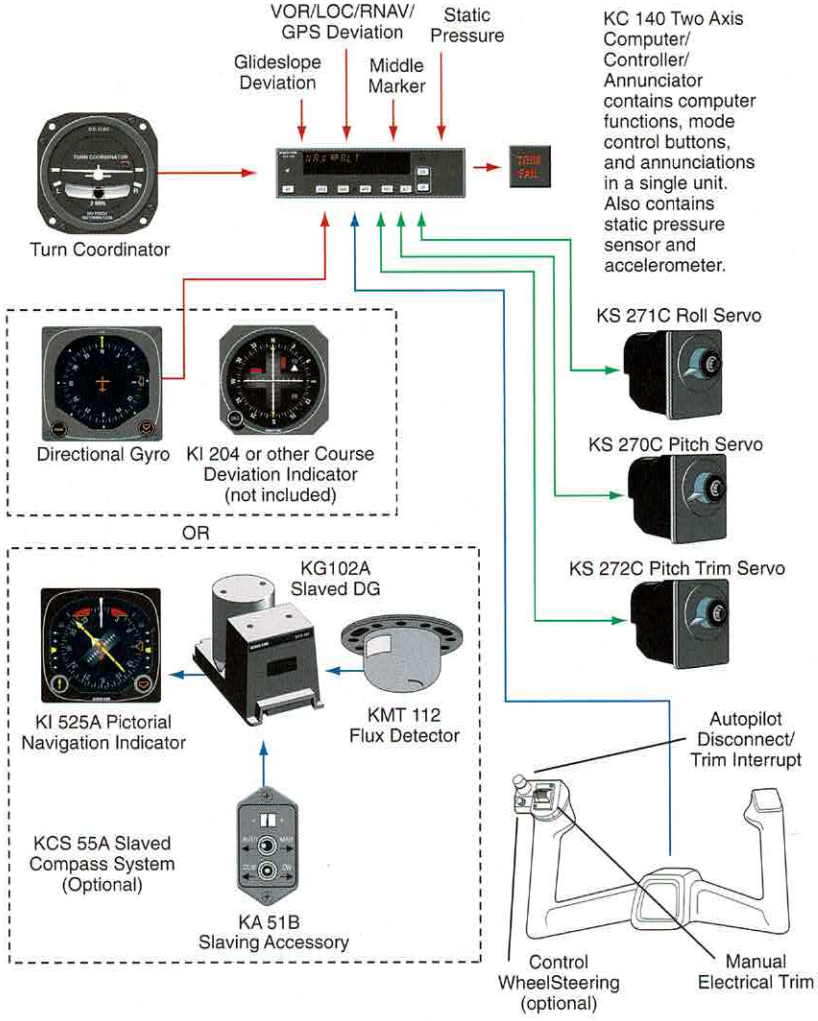
System Integration

The individual system diagrams on pages 5, 6, and 7 show the components and their relationship in typical KAP 140 Single Axis, KAP 140 Two Axis, and KAP 140 Two Axis/Altitude Preselect systems. The actual components on individual systems may vary slightly in order to optimize certification and installation requirements.

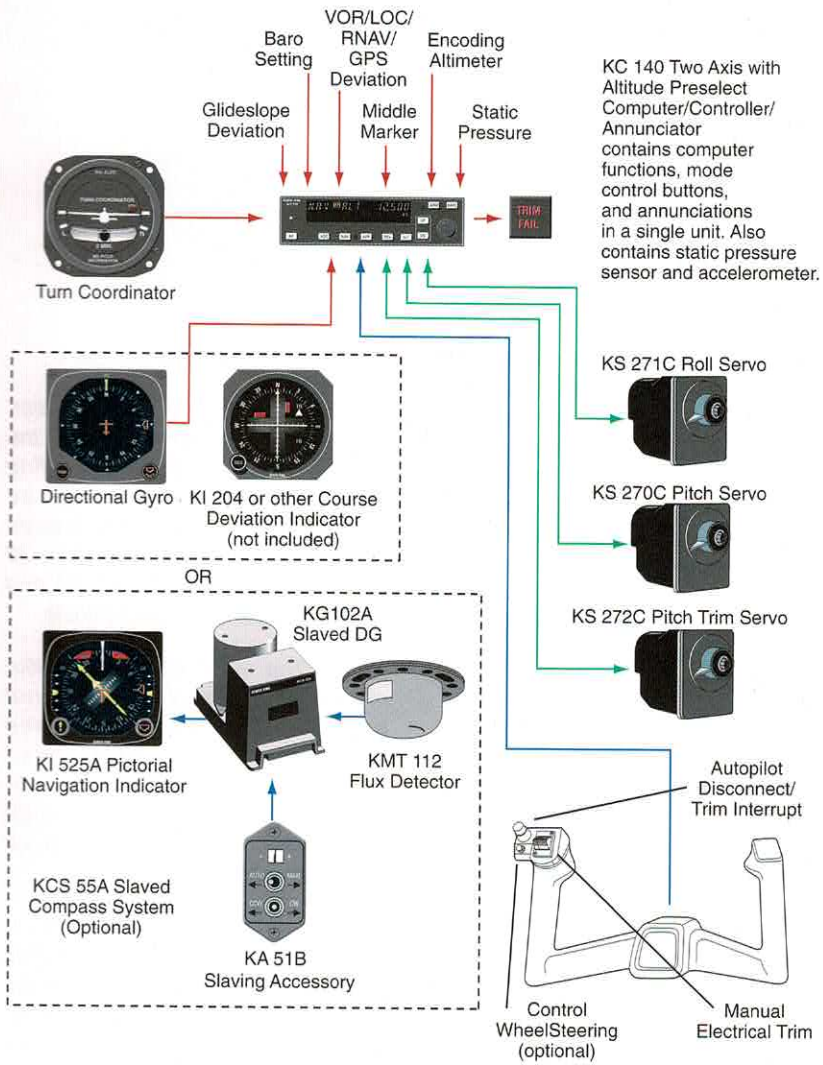
Each system has a number of inputs: sensor outputs are shown in red; combination inputs are shown in blue; display outputs are shown in orange; and aircraft control shown in green. The systems diagrams reflect that the KAP 140 systems control both pitch and roll axes of the aircraft.



KAP 140 Single Axis System Diagram



KAP 140 Two Axis System Diagram



KAP 140 Two Axis/Altitude Preselect System Diagram

Power Application and Preflight Tests

KAP 140 Preflight Test

KAP 140 Preflight Test Complete

A preflight test is performed upon power application to the computer. 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 (Display Test) and the disconnect tone sounding.

For two-axis units only:

NOTE: Following the preflight test, the red P warning on the face of the autopilot may illuminate indicating that the pitch axis cannot be engaged. This condition should be temporary, lasting no more than 30 seconds. The P will extinguish and normal operation will be available.

NOTE: The red P warning may illuminate when the autopilot is not engaged. This can occur when autopilot G limits have been exceeded during turbulence or aircraft maneuvering. Autopilot engagement is locked out during red P illumination.

If power to the autopilot is cycled in flight (i.e. through the autopilot circuit breaker for instance) it is possible that a 5 minute delay may be necessary prior to autopilot engagement to allow the pitch axis accelerometer circuit to stabilize. Engagement prior to stabilization may result in mildly erratic pitch axis behavior.