

# CPL Theory Aircraft Systems (CSYA)

## CSYA 9 – Autopilot Systems



## 1. Document Identification

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## 2. Amendment Record

Amendments made to this document since the previous version are listed below. All amendments to this document have been made in accordance with CAE OAA document management procedures.

Original Author		Date of Publication (DD/MM/YY)	
Slide	Changes	Editor	Date (DD/MM/YY)
	Typos, spelling & grammar revisions to slides 4, 9	James Costa	01/07/2020

## 3. Disclaimer

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# PURPOSE OF AN AUTOPILOT

## Purpose of an Autopilot

- The purpose of an autopilot is to reduce pilot workload
- By allowing the aircraft to be flown “hands-free,” the pilot can concentrate more on other tasks, such as radio operation and approach briefs

## THE KAP140 IS NOT A FULL AUTOMATIC PILOT

- It will not control power settings and power changes for you
- It will not speak on the radio for you
- It will not conduct a LOOKOUT for you
- It will not conduct a LISTENING WATCH for you
- It will not avoid a collision for you

## TYPES OF AUTOPILOTS

## Types of Autopilots

- Light aircraft have two main types of autopilots:

### 1. Single Axis Autopilot

### 2. Two Axis Autopilot

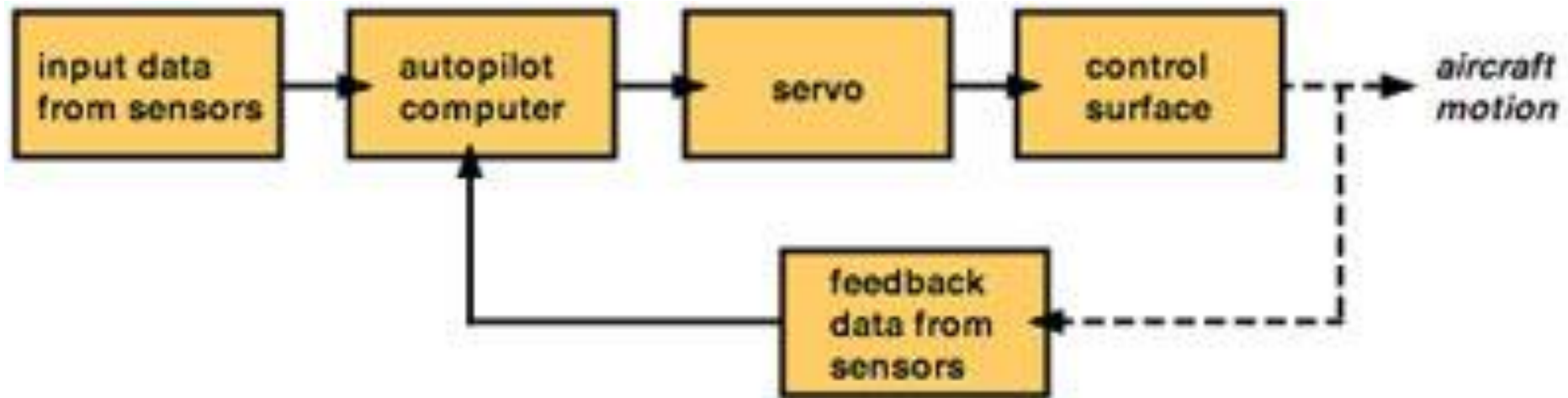
#### Single Axis Autopilot

- Controls roll only
- Sometimes known as “wing levellers”
- Powered by electricity and the system consists of:
  1. A turn coordinator,
  2. A computer amplifier
  3. An actuator that operates the ailerons in response to a deviation in roll

#### Two Axis Autopilot

- Controls roll and pitch
- This has an additional actuator connected to the elevator to provide pitch response
- Pitch deviation could be sensed by a number of instruments including additional gyros, accelerometers or barometric sensors, depending on the autopilot type!

## Types of Autopilots



# AUTOPILOT CONTROLS



## Autopilot Controls

### Autopilot Disconnect

- All autopilots must be able to be disengaged quickly in case of malfunction or other extreme circumstances/emergencies
- The disengage switch is often on the control column and its function must be checked before flight
- A warning light or alarm will sound to confirm the disengagement of the autopilot



### Control Wheel Steering (CWS)

- Used for temporary disengagement of the autopilot without having to disconnect
- Holding down the button overrides the autopilot and allows for manual control

- Once the button is released, the autopilot will resume

## KAP 140 AUTOPILOT

## KAP 140 Autopilot

- The KAP 140 is a two-axis autopilot



**AP:** Autopilot Engage/Disengage Button

**HDG:** Heading Mode – Autopilot will maintain the HDG selected on the HIS by the HDG bug

**NAV:** Navigation Mode – Autopilot will track a NAVAID or follow a GPS route

**APR:** Approach Mode – Autopilot will track an instrument approach aid e.g. ILS

**REV:** Back Course Approach Mode – Reverse sensing for localiser approaches

**ALT:** Altitude Hold Mode – Autopilot will hold a selected altitude

**UP/DN:** Vertical Speed Mode – Autopilot will climb/descend at a selected RoC/RoD

**ARM:** Altitude ARM Button – Autopilot will capture selected altitude

**BARO:** Baro Set Button – QNH may be entered in HPA for altitude hold reference