Objectives	▪ The student should develop knowledge of the elements related to checking the instruments prior to flight.
Key Elements	▪ Develop a pattern ▪ Stick to a pattern
Elements	▪ Communications Equipment ▪ Navigation Equipment ▪ Magnetic Compass ▪ Heading Indicator/HSI/RMI ▪ Attitude Indicator ▪ Altimeter ▪ Turn-and-Slip Indicator/Turn Coordinator ▪ VSI ▪ Airspeed Indicator ▪ Outside Air Temperature ▪ Clock ▪ Pitot Heat ▪ Electronic Flight Instrument Display ▪ Traffic & Terrain Awareness ▪ FMS & Auto Pilot
Schedule	▪ Review lesson objectives ▪ Review lesson material ▪ Conclusion & Review
Equipment	▪ White Board / Markers ▪ References
CFI Actions	▪ Present lesson ▪ Use teaching aids ▪ Ask/ answer questions
Student Actions	▪ Participate in discussion ▪ Take notes ▪ Ask / answer questions
Completion Standards	▪ The student has developed an effective preflight check for the instruments.

Additional Notes: _____
_____
_____

Introduction

Overview

Review objectives / Elements

What

This will explain how to check the communication, navigation, and other equipment prior to flight.

Why

This is important because, you don't want to discover a problem with your instruments in the clouds where you are entirely reliant on your instruments.

How

Communications Equipment

- **Loss of communications under IFR may be considered an emergency (FAR 91.185)**
  - Confirm position, stability of radio antennas
  - Use all radios prior to flight. Request "radio check" if necessary
  - Transponder on standby, reply light ON during warm-up (or per manufacturer's instructions)

Navigation Equipment

- **VORs**
  - Confirm position, stability of nav antennas
  - FAR 91.171 – VOR check within 30 days prior to IFR flight
    - Record date, error, place, and signature (DEPS)
- **DME – Note/verify distance from VOR/DME if available**
- **ILS – if loc on the field, then tune, id, and note the indication**
- **GPS – Confirm current database and follow any startup procedure**
  - Compute RAIM

Magnetic Compass

- **Fluid filled, moves freely, correctly indicates known headings (taxiways, runways)**

Heading Indicator / HSI / RMI

- **Note Correct indications on known headings such as runways or taxiways**

Attitude Indicator (AI)

- **Allow 5 minutes for gyro spin up (or as applicable), note/adjust horizon bar alignment**
- **Unreliable if more than 5° of pitch or bank during taxi**

Altimeter (ALT)

- **Check maintenance logbook for static system and altimeter check within 24 months (FAR 91.411)**
- **Check static ports open, clear**
- **Set to current altimeter setting, and check for error**
  - Record any ALT error – difference between ALT and field elevation (> 75' requires maintenance)
  - Conservative/safe practice: add any ALT error to the approach MDA or DH

Turn-and-Slip Indicator / Turn Coordinator (TC)

- **During taxi, ball should move freely to outside of turns; Miniature airplane level**

Vertical Speed Indicator (VSI)

- **Check maintenance logbook for static system (and altimeter) check within 24 months (FAR 91.411)**
- **Note/set level indication**

Airspeed Indicator (ASI)

- **Check maintenance logbook for static system (and altimeter) check within 24 months (FAR 91.411)**
- **Note airspeed alive and appropriately increasing during initial takeoff roll**

Outside Air Temperature (OAT)

- **Note correct indication on the ground**

Clock

- **Confirm operation and correct time is set**

Pitot Heat

- **Turn on the pitot heat and check to ensure it is operating per the manufacturer's instructions**

Electronic Flight Instrument Display

- **On power up ensure instruments are displayed properly and any cautions/warnings are normal**
- **Most displays are very clear when an instrument has failed (Ex. Red X across the instrument)**
- **Follow the specific manufacturer's instructions to verify proper operation**

Traffic & Terrain Awareness

- **Ensure proper operation on power up based on the manufacturer's required procedures**

FMS & Auto Pilot

FMS

- Check for proper operation of the FMS as required by the manufacturer
- Ensure proper satellite coverage (check RAIM if necessary), be alert for insufficient satellite signal

Auto Pilot

- Check based on the manufacturer's procedures and requirements
- Often includes ensuring that the auto pilot can be disconnected in order to avoid a runway

Conclusion & Review

Conclusion:

Brief review of the main points

PTS Requirements:

To determine that the applicant exhibits instructional knowledge of an instrument cockpit check by describing the reasons for the check and the detection of defects that could affect safe instrument flight. The check shall include:

1. Communications equipment.
2. Navigation equipment.
3. Magnetic compass.
4. Heading indicator/horizontal situation indicator/remote magnetic indicator.
5. Attitude indicator.
6. Altimeter.
7. Turn-and-slip indicator/turn coordinator.
8. Vertical-speed indicator.
9. Airspeed indicator.
10. Outside air temperature.
11. Clock.
12. Pitot Heat.
13. Electronic flight instrument display.
14. Traffic awareness/warning/avoidance system.
15. Terrain awareness/warning/alert system.
16. Flight management system (FMS).
17. Automatic pilot.