

# Unmanned Aircraft Systems (UAS) Human Factors (HF)

## FAA Aircraft Certification (AIR) Research Perspective

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Federal Aviation  
Administration



# First: What is Unique about UAS?

- **UAS Definition**

- Pilot and Aircraft not colocated

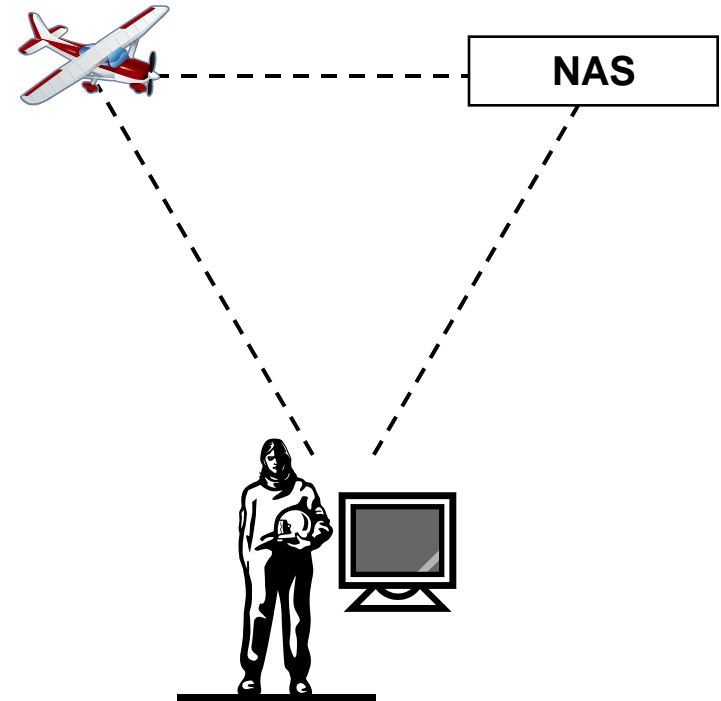


- **First Order Consequences**

- No direct pilot sensing/control
- Very small aircraft
- No shared fate

- **What's NOT unique (example)**

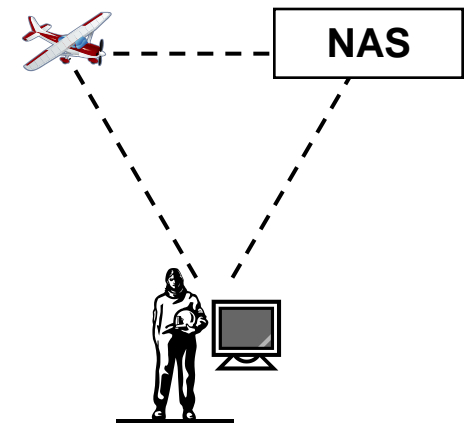
- High levels of automation (e.g., flight guidance and control)



# Unique UAS Attributes

## Guidance for HF Research Topics, FAA Aircraft Certification

- **No direct human sensing/control**
  - Link loss and limitations
    - Pilot feedback control degradation
    - Minimum levels of automation ?
  - Aircraft state & environment through artificial means
    - No window
    - Most human senses NOT used
- **Very small aircraft**
  - UA visual detectability by other NAS users
  - UA equipage (e.g., ability to carry transponder)
  - UA performance mismatch with other aircraft
- **No shared fate**
  - Pilot complacency and loss of situation awareness?
  - Survival instinct not used?
  - Flight termination options?
- **Other**



# Closing Remarks

- **Human Factors key to safe integration of UAS into National Airspace System (NAS)**
- **Human Factors in training, operations, ATC not addressed here**
- **Unique UAS attributes not function-specific**
- **“Situation Awareness” is not a function**
- **Manned aircraft: large knowledge base, so use it**
- **Special concern: unplanned events**
- **Lack of standardized UAS designs limit insight from operational data**
- **Research to support FAA regulations, policy, and guidance development**

