Developing Standards for UAS Pilots

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Outline

- Why do we need standards?
- Background on standards organizations
- Background on ASTM F38
- F38 progress to date
- The Road Ahead

Standard: *"Something established and generally accepted as a model, example, or test of excellence, attainment, etc."*

-Webster's

Why do we need UAS pilot standards?

The U.S. Military Model: Non-standard

- Air Force Predator/Global Hawk Pilot
  - Junior/mid-grade officer
  - "Rated" pilot or navigator
- Army Hunter/Shadow Pilot
  - Junior/mid-grade enlisted
  - FAA ground school

Overseas Military Model: Similarly non-standard

Industry Model: Similarly non-standard

What's the driving factor: Technology or Philosophy?

Why do we need UAS pilot standards? *(cont)*

The "test of excellence" for manned aviation

- Well defined medical standards
  - Visual acuity, depth/color perception, height/weight (for ejection seat pilots), age (for commercial pilots)
  - Specific list of disqualifying conditions
- Well defined written test standards
  - FAA: Private pilot exam, Instrument exam, etc.
  - Military: Aptitude test, emergency procedures, etc.
- Well defined psychomotor standards
  - FAA: Traffic patterns, stalls, short field landing, etc.
  - Carrier Navy: "OK, 3-wire"

What's the UAV pilot "test"?

Driving Forces for Standards

"…all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments."

Section 12(d), Public Law 104-113, 1996

"All federal agencies must use voluntary consensus standards in lieu of government-unique standards in their procurement and regulatory activities, except where inconsistent with law or otherwise impractical."

OMB Circular A-119, 1998

OMB Circular A-119 Definitions

Attributes of a Voluntary, Consensus Standards Body

- Openness
- Balance of interest
- Due process
- An appeals process
- Consensus (vice unanimity)
  - Must include a method for resolving negatives

What's not:

- Company standards
- Government standards
- Standards mandated by law
- Market driven "de facto" standards
  - Examples: VHS, MS Windows

What is ASTM International

- History
  - 100+ year old organization
  - Formed to address standards for burgeoning rail industry
    - Led to first standard for railroad steel
- Legacy
  - Tens of thousands of members
  - Many hundreds of standards
    - Everyday examples:
      - Automotive and aviation fuel
      - Home and office construction materials
- ANSI Certified
  - One of only 206
- Recent relevant activity
  - Light Sport Aircraft (LSA) standards
    - Design and manufacture of manned acft <1320 lbs
    - FAA adoption

ASTM F38 Committee on UAV Standards

Scope

- ***"The development of standards and guidance materials for unmanned air vehicle systems."***

Executive Committee

- **Chairperson, Vice, Secretary, Membership**

Subcommittees

- **F38.01: Aircraft Certification**
- **F38.02: Flight Operations**
- **F38.03: Pilots and Maintainer Certification**

Name change in work to unmanned ***aircraft*** systems (UAS).

What We've Accomplished So Far

F2395-05: Standard Terminology for Unmanned Air Vehicle Systems

- Identifies and defines important concepts and terms related to unmanned air vehicle systems.
- Intended to establish boundaries and characteristics that will guide the development of other standards.

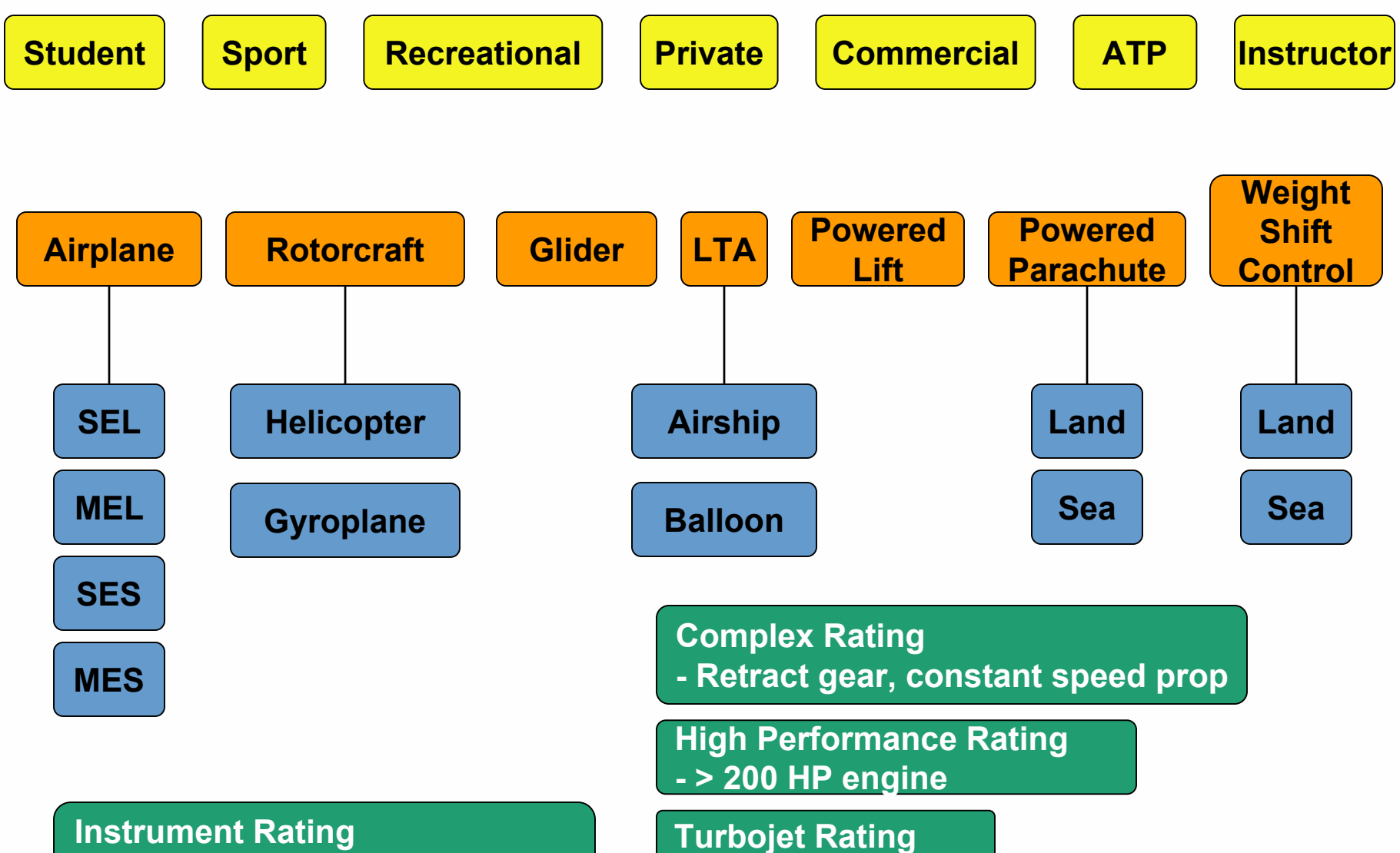
F2411-04: Standard Specification for Design and Performance of an Airborne Sense-and-Avoid System

- Applies to the design, performance and manufacturer of an appliance seeking civil aviation authority approval, in the form of flight certificates, flight permits, or other like documentation, as providing an equivalent level of safety to the see-and-avoid capability of a manned aircraft.
- Includes requirements to support detection of, and safe separation from, airborne objects such as manned or unmanned aircraft and air vehicles.

ASTM F38.03 Work in Progress

- Review of Existing Pilot Regulations
- Options for UAS Pilot Certification
- Discussion
- How can you help

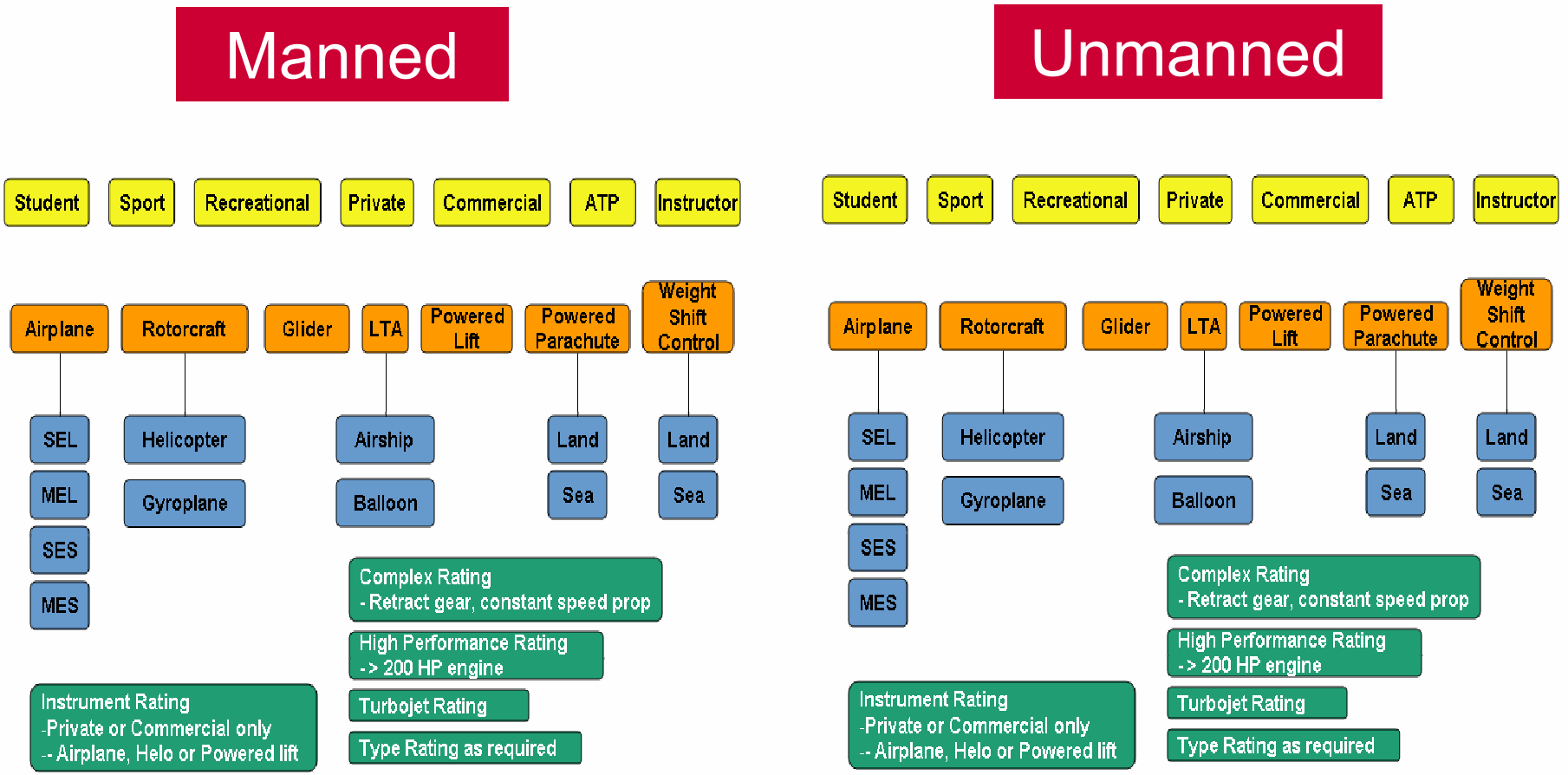
Today: 14 CFR Part 61



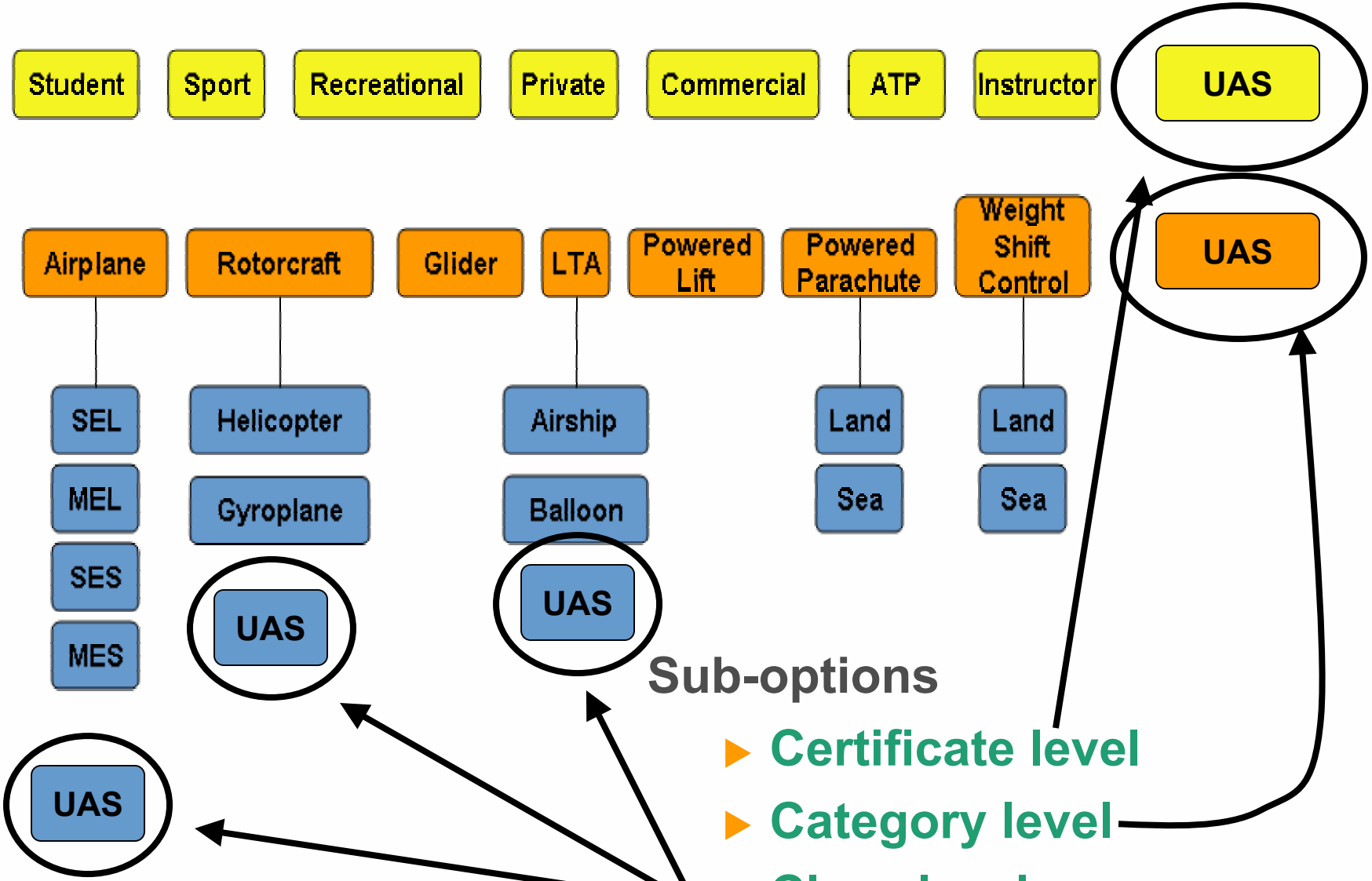
Assumptions

- Wide Open Customer Base
  - Focus on commercial applications in national airspace
  - But also consider military and international adoption
- Parallel the existing FAA system as much as possible
  - Similar words should have similar meanings
  - Don't reinvent the wheel
- Present a professional "look and feel"
  - Use terms that imply standards, rigor, safety
- Keep the administrators in mind
  - Instructors, controllers, AMEs, etc.
  - Don't make their jobs too much harder
- The word "Pilot" has beneficial implications
  - Formal training, formal testing, adherence to standards
  - A "Professional"

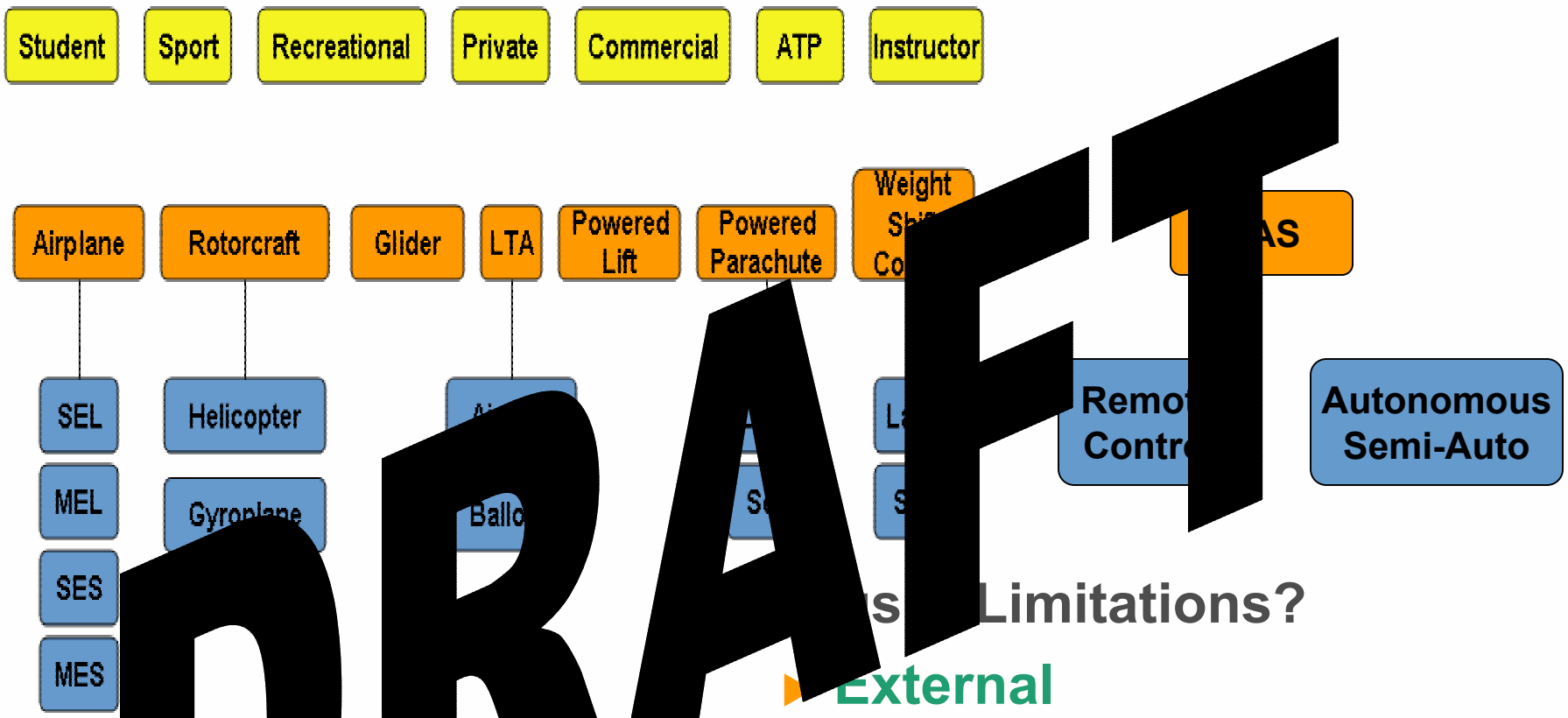
UAS Option #1 - Entirely New Structure



UAS Option #2 – Insert into Current Structure



Current Thinking: Category Level



s Limitations?

- External
- Internal
- Complex
- High Altitude
- Beyond Visual Range

Some Examples

Aircraft	Certificate	Cat	Class	Rating	Type
B-737	Commercial, ATP or Priv.	Airplane	MEL	Turbojet	737
Predator	Commercial w/Instrument	UAS	RC		RQ-1
Global Hawk	Commercial w/Instrument	UAS	Auto	Internal,	RQ-4
Pioneer Hunter	Private			Internal, Complex	N/A
Shado		UAS		Internal	N/A
Herme	Co or	UA	uto	Internal, BVR	N/A
Pointe	Li se	UAS	RC	External	N/A
RMax	ommercial or Private	UAS	Auto	External	N/A

What Else? – UAS Pilot "Test of Excellence"

Eligibility

- Examples: Age, health, eyesight, language skills, etc.

Aeronautical Knowledge

- Ground school and written exam

Flight Proficiency

- Hands on flight training

Aeronautical Experience

- Hours, landings, distances flown, handoffs, modes, etc.

What #'s for UAS Pilots?

The Road Ahead

- The ASTM Process
  - Develop additional “Work Items”
    - Formal method of tracking inputs/changes
  - Ballot the work items
    - Subcommittee and then committee level
  - Publish the Standard
- Diversify our membership
  - 209 Total Members of F38
    - Reasonably balanced
    - Need to expand
      - Internationally
      - More government participation
  - F38.03 only has 21 voting members
- For more info:
  - www.astm.org
  - Jeff Goldfinger, ASTM F38 Membership Secretary ☺
    - See me later or email jgoldfinger@brandes-assoc.com

Questions