



Airman Certification Standards (ACS)

History, Development, and Prototyping

Presented to: Orlando FSDO Designated Pilot Examiner Recurrent Meeting
By: Janeen Kochan
Date: 22 January 2015



Federal Aviation
Administration



Airman Certification Standards

- **History**
- **Concept**
- **Prototyping**
- **Implementation**
- **Designated Pilot Examiner Component**
 - Transition
 - Plans of action
 - Documentation





Airman Certification Requirements

- For each airman certificate or rating, 14 CFR lists required areas of *aeronautical knowledge* and *flight proficiency*.
 - FAA developed the PTS to provide practical test performance metrics for flight proficiency in each Area of Operation and Task.
 - In addition, each PTS now includes a lengthy list of largely undefined “special emphasis” areas.
 - There has never been a corresponding set of defined “KTS” (knowledge test standards) metrics for the aeronautical knowledge elements tested via “the written” exam.



Rationale for Change

- Lack of a “KTS” has allowed the accumulation of too many FAA knowledge test questions that are:
 - Out-of-date (e.g., lots of NDB, not much RNAV)
 - Overly complex (e.g., multiple interpolations required to calculate a two-knot difference in wind speed or landing distance within three feet (?!))
 - Irrelevant (e.g., number of satellites in the GPS constellation)
 - Disconnected from “real” skills and knowledge required for safe operation in today’s NAS.



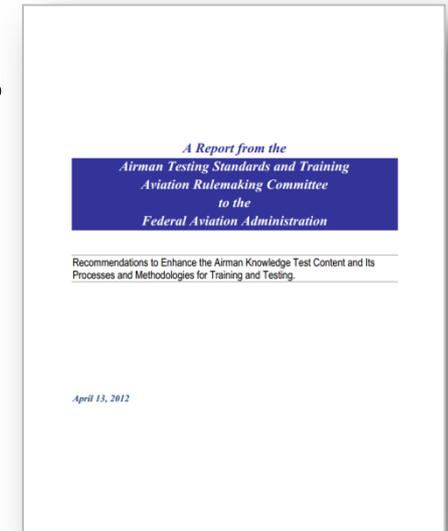
From PTS to ACS

- In 2012, an FAA-chartered Aviation Rulemaking Committee (ARC) proposed the ACS approach.
- **Airman Certification Standards**
 - “Enhanced” version of the PTS
 - Adds task-specific knowledge and risk management elements to each PTS Area of Operation and Task.
 - Result = integrated presentation of specific knowledge, skills, and risk management elements and performance metrics for each Area of Operation and Task.

From PTS to ACS

Phase I – 2011-2012:

- The ARC (Aviation Rulemaking Committee)
 - FAA chartered Airman Testing Standards and Training ARC to obtain expert industry stakeholder advice and recommendations for improving content, process, methodology, and priorities for improving airman knowledge testing.
 - The ARC developed the ACS concept and recommended that the FAA pursue it.



From PTS to ACS

Phase II – 2012-2013:

- The FAA tasked the industry Aviation Rulemaking Advisory Council (ARAC) to develop the ACS concept.
- ARAC formed the Airman Testing Standards and Training Working Group (ATST WG) to perform this work.
- The ATST WG developed ACS documents for Private, Commercial, and Instructor certificates in Instrument Rating, plus “baseline” proposal for an ATP ACS.
 - PVT, IFR, and CFI ACS submitted for public comment.
- ARAC submitted ATST WG’s report and recommendations to the FAA in September 2013.





From PTS to ACS

Phase III – 2014-2015:

- The FAA tasked the industry Aviation Rulemaking Advisory Council (ARAC) to further advance the ACS concept.
- In March 2014, ARAC formed the Airman Certification System Working Group (ACS WG) to perform this work.
- Ongoing tasks:
 - Refine and complete ACS for COM, ATP, and CFI.
 - Help FAA map standards to guidance.
 - Prototype use of PVT (PAR) ACS in Orlando area, with strong support from AFS-800 (policy memo) and ORL FSDO (assisting with ACS WG efforts).

Overview – ACS

- Airman Certification Standards
- The core of the Airman Certification System which is built around an SMS framework
- Aligns aeronautical knowledge areas with flight proficiency areas of operation
- Integrates risk management (RM) and safety risk management (SRM), note acronym
- Incorporates and supersedes the PTS



Overview – ACS

- **Airman Certification System and SMS Framework**
 - Safety Policy: Defines and describes aeronautical knowledge, flight proficiency, and risk management as integrated components
 - Safety Risk Management: Processes through which internal and external stakeholders identify and evaluate regulatory changes, safety recommendations, or other factors that require modification of airman testing and training materials
 - Safety Assurance: Processes to ensure the prompt and appropriate incorporation of changes arising from new regulations and safety recommendations
 - Safety Promotion: Ongoing engagement with both external stakeholders (e.g., the aviation training industry) and FAA policy divisions

Overview – ACS

Standards are clearer.

Practical tests are not changing.

The material is presented more coherently.

The ACS will be the only necessary reference for both knowledge and skill standards.

Flight instructors can train more effectively.

Examiners can test more effectively.

Training will tie to testing more clearly.

PTS vs. ACS

Similarities and Differences

- Areas of operations and tasks largely unchanged
- Each task has five blocks
 - Reference
 - Objective
 - Knowledge
 - Skills
 - Risk Management
- Each block has itemized standards or elements

Structure of the Documents (show)

Practical Test Standards:

- All administrative information explained up front
- Section 1 for ASEL and ASES
- Section 2 for AMEL and AMES

Airman Certification Standards:

- Basic introductory information up front
- Only one listing for each Area of Operation and Task specifying appropriate category and class (i.e., ASEL)
- All administrative information grouped into appendices at the end
- Appendix 1 explains applicable FAA knowledge tests, coding, and correlation to ACS



What is the ACS?

Private Pilot – Airplane Airman Certification Standards
Airplane—Single Engine, Multi Engine Land and Sea Areas of Operation

V. Performance Maneuvers

Task	A. Steep Turns	
Reference	FAA-H-8083-3; POH/AFM	
Objective	To determine the applicant exhibits satisfactory knowledge, skills and risk management associated with steep turns.	
Knowledge	The applicant demonstrates understanding of:	
	1. Coordinated flight.	PA.V.A.K1
	2. Attitude control at various airspeeds.	PA.V.A.K2
	3. Maneuvering speed, including changes in weight.	PA.V.A.K3
	4. Controlling rate and radius of turn.	PA.V.A.K4
	5. Accelerated stalls.	PA.V.A.K5
	6. Overbanking tendencies.	PA.V.A.K6
	7. Use of trim in a turn.	PA.V.A.K7
	8. Aerodynamics associated with steep turns.	PA.V.A.K8
Skills	The applicant demonstrates the ability to:	
	1. Establish the manufacturer's recommended airspeed or if one is not stated, a safe airspeed not to exceed V_A .	PA.V.A.S1
	2. Coordination entering, during, and exiting a 45° bank turn for 360 degrees.	PA.V.A.S2
	3. Perform the task in the opposite direction, as specified by the evaluator.	PA.V.A.S3
	4. Maintain the entry altitude, ± 100 feet, airspeed, ± 10 knots, bank, and $\pm 5^\circ$; and roll out on the entry heading, $\pm 10^\circ$.	PA.V.A.S4
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:	
	1. Dividing attention between airplane control and orientation.	PA.V.A.R1
	2. Task management.	PA.V.A.R2
	3. Energy management.	PA.V.A.R3
	4. Stall/spin awareness.	PA.V.A.R4
	5. Situational awareness.	PA.V.A.R5
	6. Rate and radius of turn with confined area operations.	PA.V.A.R6

ACS

PTS



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	4. Controlling rate and radius of turn.	PA.V.A.K4
	5. Accelerated stalls.	PA.V.A.K5
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	4. Stall/spin awareness.	PA.V.A.R4
	5. Situational awareness.	PA.V.A.R5
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Aeronautical knowledge

Flight proficiency

Aeronautical decision-making and special emphasis



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	4. Controlling rate and radius of turn.	PA.V.A.K4
	5. Accelerated stalls.	PA.V.A.K5
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	3. Energy management.	PA.V.A.R3
	4. Stall/spin awareness.	PA.V.A.R4
	5. Situational awareness.	PA.V.A.R5
	6. Rate and radius of turn with confined area operations.	PA.V.A.R6

- ACS also includes unique codes for each element of knowledge, skill, and risk management.

PA = Private Pilot Airplane (*defines applicable ACS*)

V = Performance Maneuvers (*defines Area of Operation*)

A = Steep Turns (*defines Task*)

K5 = Accelerated Stalls (*defines element*)

Code Comparison



Computer Test Report

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Airman Knowledge Test Report

NAME: John Doe
APPLICANT ID: 12345678 EXAM ID: 50010220140465201
EXAM: Private Pilot Airplane (PAR)
EXAM DATE: 01/02/2014 EXAM SITE: LAS72403
SCORE: 90 GRADE: PASS TAKE: 1

Learning statement codes listed below represent incorrectly answered questions. Learning statement codes and their associated statements can be found at www.faa.gov/training_testing/testing/airmen.

Reference material associated with the learning statement codes can be found in the appropriate knowledge test guide at www.faa.gov/training_testing/testing/airmen/test_guides.

A single code may represent more than one incorrect response.

PLT064 PLT141 PLT077 PLT161 PLT414 PKT163

Today's test report lists reference-based LSCs that are often very broad – creates an obstacle to effective remedial training and retesting.



Computer Test Report

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PA.I.D.K4 PA.III.A.K3 PA.II.D.K2 PA.I.E.K2 **PA.III.B.K4** PA.I.E.K1

PA = Private Pilot Airplane (Applicable ACS)
III = Airport & Seaplane Base (Area of Operation)
B = Traffic Patterns (Task)
K4 = Right of Way Rules (Element)

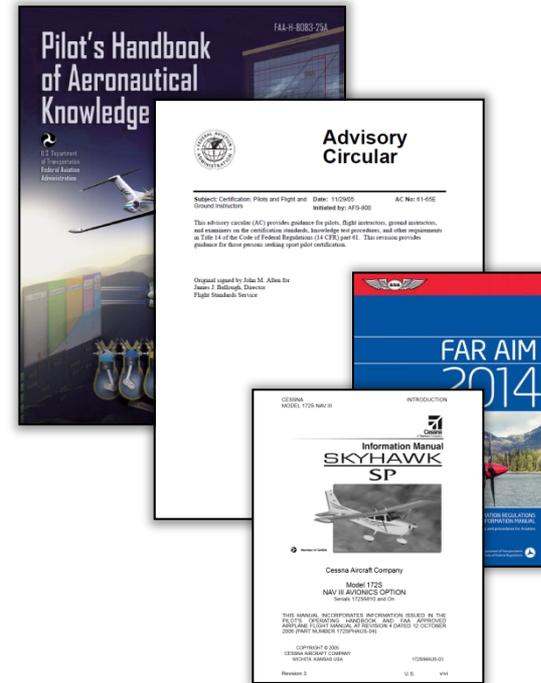
What is the ACS?

- ACS codes will replace Learning Statement Codes (LSCs).
- ACS codes are anchored in the *standard*, not in references like LSCs.
- ACS codes enable FAA to align standards to handbooks and test questions, to maintain that alignment, and to develop better test questions.
- ACS codes provide sharper, more focused feedback to applicants, instructors, and evaluators.

Private Pilot – Airplane Airman Certification Standards Airplane—Single Engine, Multi Engine Land and Sea Areas of Operation		
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	5. Situational awareness.	PA.V.A.R5
6. Rate and radius of turn with confined area operations.	PA.V.A.R6	

Reference and Objectives

- Same as PTS
- Refer to listed references
 - FAA Handbooks
 - Advisory Circulars
 - Regulations
 - POH/AFM
 - Others
- References undergoing revision



Task: Knowledge Elements

- More specific than the PTS
- Clearly itemizes the knowledge required
- Correlates directly to knowledge test
- Effective retraining and retesting for failed knowledge test questions

PTS Knowledge Elements

VII. Navigation

Task B: Navigation Systems and Radar Services (ASEL and ASES)

References: FAA-H-8083-3, FAA-H-8083-6, FAA-H-8083-25; Navigation Equipment Operation Manuals; AIM.

Objective: To determine that the applicant:

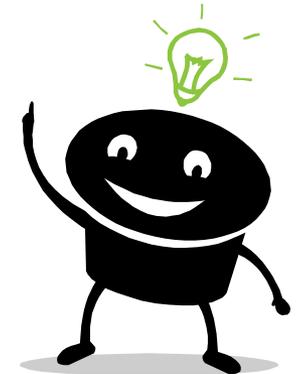
1. Exhibits satisfactory knowledge of the elements related to navigation systems and radar services.
2. Demonstrates the ability to use an airborne electronic navigation system.
3. Locates the airplane's position using the navigation system.
4. Intercepts and tracks a given course, radial, or bearing, as appropriate.
5. Recognizes and describes the indication of station passage, if appropriate.
6. Recognizes signal loss and takes appropriate action.
7. Uses proper communication procedures when utilizing radar services.
8. Maintains the appropriate altitude, ± 200 feet and headings $\pm 15^\circ$.



ACS Knowledge Elements

VI. Navigation

Task	<i>B. Navigation Systems and Radar Services</i>	
Reference	FAA-H-8083-3, FAA-H-8083-6, FAA-H-8083-25; Navigation Equipment Operation Manuals; AIM	
Objective	To determine the applicant exhibits satisfactory knowledge, skills and risk management associated with navigation systems and radar services.	
Knowledge	The applicant demonstrates understanding of:	
	1. Ground-based navigation (orientation, course determination, equipment, tests and regulations).	PA.VI.B.K1
	2. Global Positioning System (GPS) (equipment, regulations, databases authorized use, Receiver Autonomous Integrity Monitoring (RAIM)).	PA.VI.B.K2
	3. Radar assistance to VFR aircraft (operations, equipment, available services, traffic advisories).	PA.VI.B.K3
	4. Transponder (Mode A, C, and S).	PA.VI.B.K4
Skills	The applicant demonstrates the ability to:	
	1. Demonstrate the ability to use installed electronic navigation system.	PA.VI.B.S1
	2. Locate the airplane's position using the navigation system.	PA.VI.B.S2
	3. Intercept and track a given course, radial, or bearing, as appropriate.	PA.VI.B.S3
	4. Recognize and describe the indication of station passage, if appropriate.	PA.VI.B.S4
	5. Recognize signal loss and take appropriate action.	PA.VI.B.S5
	6. Use proper communication procedures when utilizing radar services.	PA.VI.B.S6
	7. Maintain the appropriate altitude, ± 200 feet and headings $\pm 15^\circ$.	PA.VI.B.S7
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:	
	1. Automation management.	PA.VI.B.R1
	2. Task management.	PA.VI.B.R2
	3. Situational awareness.	PA.VI.B.R3
	4. Limitations of the navigation system in use.	PA.VI.B.R4
	5. Planning to avoid automation distractions.	PA.VI.B.R5



Task: Skill Elements

- **Same as PTS**
- **Completion standards for flight proficiency largely unchanged**



PTS Task Skill Elements

VII. Navigation

Task B: Navigation Systems and Radar Services (ASEL and ASES)

References: FAA-H-8083-3, FAA-H-8083-6, FAA-H-8083-25; Navigation Equipment Operation Manuals; AIM.

Objective: To determine that the applicant:

1. Exhibits satisfactory knowledge of the elements related to navigation systems and radar services
2. Demonstrates the ability to use an airborne electronic navigation system.
3. Locates the airplane's position using the navigation system.
4. Intercepts and tracks a given course, radial, or bearing, as appropriate.
5. Recognizes and describes the indication of station passage, if appropriate.
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ACS Skill Elements

VI. Navigation

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	4. Limitations of the navigation system in use.	PA.VI.B.R4
	5. Planning to avoid automation distractions.	PA.VI.B.R5



Task: Risk Management Elements

- More comprehensive than the PTS
- PTS simply lists generic special emphasis areas and SRM tasks
- PTS gives no guidance for specifically how they correlate to each task
- ACS does away with generic special emphasis areas and SRM tasks
- ACS itemizes risk management elements for each task

PTS Risk Management Elements

Special Emphasis Areas

Examiners shall place special emphasis upon areas of aircraft operations considered critical to flight safety. Among these are:

1. Positive aircraft control,
2. Positive exchange of the flight controls procedure,
3. Stall/spin awareness,
4. Collision avoidance,
5. Wake turbulence avoidance,
6. LAHSO,
7. Runway incursion avoidance,
8. CFIT,
9. ADM and risk management,
10. Wire strike avoidance,
11. Checklist usage,
12. Temporary flight restrictions (TFRs),
13. Special use airspace (SUA),
14. Aviation security,
15. Single-Pilot Resource Management (SRM), and
16. Other areas deemed appropriate to any phase of the practical test.

A given special emphasis area may not be specifically addressed under a given Task. All areas are essential to flight and will be evaluated during the practice test.



ACS Risk Management Elements

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Reviewing the Knowledge Test



FA 121 Private Pilot (ASEL)
Prerequisite for Practical Tests [61.39(a)]

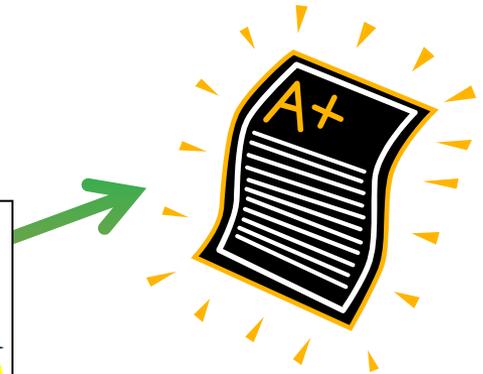
I certify that _____
(First, Middle, Last)

has received and logged 3 hours of training in preparation for the Private Pilot Airplane Single-Engine Land Practical Test within 2 calendar months preceding the month of application for the practical test, is prepared for the practical test, and **has demonstrated satisfactory knowledge of the subject area(s) in which he/she was shown to be deficient by the FAA Airman Knowledge Test Report.**

Signed: _____ Date: ____ - ____ - ____

Print: _____ FI #: _____ CFI
(First, Middle, Last)

Expires: ____ - ____ - ____



PTS – PLT Codes

 **U.S. Department of Transportation
Federal Aviation Administration**
Regulatory Support Division, AFS-600

Date Effective: February 10, 2014

Subject: Learning Statement Reference Guide for Airman Knowledge Testing

Purpose: This reference guide contains the listings of Learning Statements and Learning Statement Codes for airman knowledge testing. It includes codes for pilots, instructors, flight engineers, dispatchers, navigators, pilot examiners, inspection authorization, parachute riggers, and aircraft mechanics.

General: The expression 'learning statement,' as used in airman testing, refers to measurable statements of knowledge that a student should be able to demonstrate following a defined element of training. In order that the individual learning statements may be read as complete sentences, they should be assumed to be preceded by the words: 'Upon the successful completion of training the student should be able to'

In general, the learning statements are worded in such a way, the standard required to achieve them is self-evident. It should be noted that learning statements do not provide a ready-made ground training syllabus and should not be viewed as a substitute for thorough training course design.

When an applicant for an airman certificate takes the test required for that certificate, the applicant will receive an Airman Knowledge Test Report. The student should match the code with the learning statement in the test report to review areas of deficiency. A listing of relevant learning statements is contained in the applicable Federal Aviation Regulations. The instructor is required to provide instruction on each of the areas of deficiency and to complete an Airman Knowledge Test Report and to complete an Airman Knowledge Test Report must be presented to the test. During the oral portion of the practical test, the areas of deficiency.

Electronic Access: The learning statement codes, so knowledge test guides can be obtained from the Federal Aviation Administration at http://www.faa.gov/training_testing/.

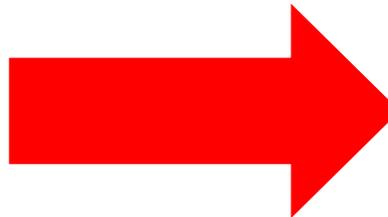
FAA-G-8082-17

**RECREATIONAL PILOT
AND
PRIVATE PILOT
KNOWLEDGE TEST GUIDE**



February 2014

 U.S. Department of Transportation
Federal Aviation Administration



 U.S. Department of Transportation
Federal Aviation Administration

FAA-S-8081-14B
(with Changes 1, 2, 3, 4, 5, & 6)

**Private Pilot
Practical Test Standards
for
Airplane
(SEL, MEL, SES, MES)**

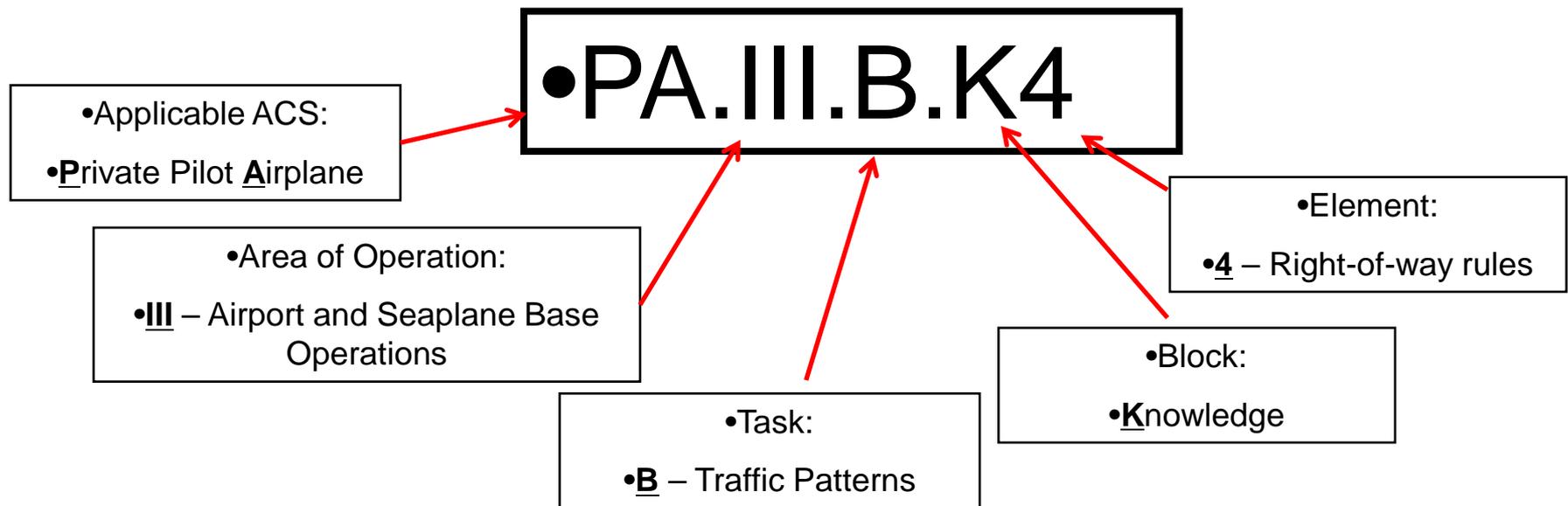
November 2011
(Effective June 1, 2012)

Flight Standards Service
Washington, DC 20581



ACS Coding

- Allows everything to be mapped and tracked to each specific element for each task and area of operation in a particular ACS



ACS Knowledge Test Mapping

- ACS codes replace PLT codes
- Every test question correlates to a knowledge element in ACS
- Instruction and retesting will be specific, targeted, and based on specified learning criteria
- Notice of Disapproval for the practical test will use the ACS codes to identify the deficient skill(s)



Computer Test Report

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Airman Knowledge Test Report

NAME: John Doe

APPLICANT ID: 12345678

EXAM ID: 50010220140465201

EXAM: Private Pilot Airplane (PAR)

EXAM DATE: 01/02/2014

EXAM SITE: LAS72403

SCORE: 90

GRADE: PASS

TAKE: 1

Airman certification codes listed below represent incorrectly answered questions. Airman certification codes and their associated statements can be found at www.faa.gov/training_testing/testing/airmen.

Reference material associated with the airman certification codes can be found in the appropriate airman certification standard at www.faa.gov/training_testing/testing/airmen/test_guides.

A single code may represent more than one incorrect response.

PA.I.D.K4 PA.III.A.K3 PA.II.D.K2 PA.I.E.K2 PA.III.B.K4 PA.I.E.K1

III. Airport and Seaplane Base Operations

Task	B. Traffic Patterns	
Reference	FAA-H-8083-3, FAA-H-8083-23, FAA-H-8083-25; AC 90-66; AIM	
Objective	To determine the applicant exhibits satisfactory knowledge, skills and risk management associated with safe operations in and around the airport traffic patterns.	
Knowledge	The applicant demonstrates understanding of:	
	1. Towered and non-towered airport operations and runway selection.	PA.III.B.K1
	2. Airport markings, lighting, wind indicators.	PA.III.B.K2
	3. Collision avoidance.	PA.III.B.K3
	4. Right-of-way rules.	PA.III.B.K4
	5. Wake turbulence recognition and resolution.	PA.III.B.K5
	6. Wind shear avoidance.	PA.III.B.K6
	7. Runway incursion avoidance.	PA.III.B.K7
	8. Use of automated weather and airport information.	PA.III.B.K8
Skills	9. Parachuting operations.	
	The applicant demonstrates the ability to:	
	1. Properly identify and interpret airport/seaplane base runways, taxiways, markings, and lighting.	PA.III.B.S1
	2. Comply with proper traffic pattern procedures.	PA.III.B.S2
	3. Maintain proper spacing from other aircraft.	PA.III.B.S3
	4. Correct for wind drift to maintain the proper ground track.	PA.III.B.S4
	5. Maintain orientation with the runway/landing area in use.	PA.III.B.S5
	6. Maintain traffic pattern altitude, ±100 feet, and the appropriate airspeed, ±10 knots.	PA.III.B.S6
7. Maintain an awareness of the position of other aircraft in the pattern.	PA.III.B.S7	
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:	
	1. Collision avoidance.	PA.III.B.R1
	2. Scanning.	PA.III.B.R2
	3. Wake turbulence.	PA.III.B.R3
	4. Lack of situational awareness.	PA.III.B.R4
	5. Aircraft separation and closure rates.	PA.III.B.R5
	6. Maintaining a sterile cockpit environment.	PA.III.B.R6

ACS Codes



Computer Test Report

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Airman Knowledge Test Report

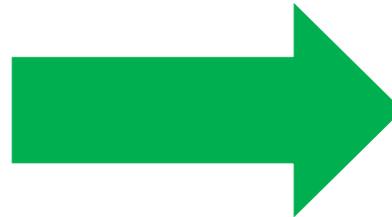
NAME: John Doe
APPLICANT ID: 12345678 EXAM ID: 50010220140465201
EXAM: Private Pilot Airplane (PAR)
EXAM DATE: 01/02/2014 EXAM SITE: LAS72403
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PA.I.D.K4 PA.III.A.K3 PA.II.D.K2 PA.I.E.K2 PA.III.B.K4 PA.I.E.K1





FAA-S-8081-ACS-PA



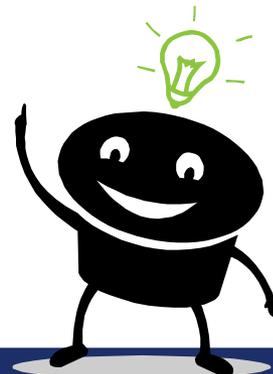
U.S. Department
of Transportation
Federal Aviation
Administration

PRIVATE PILOT – AIRPLANE

Airman Certification Standards

Date TBD

FLIGHT STANDARDS SERVICE
Washington, DC 20591



ACS Prototyping

- Purpose
 - Gather data on the usability of the ACS
 - Identify unintended consequences
 - Provide a controlled introduction to the new standard
- Participation
 - Orlando FSDO
- Protocol



ACS Prototyping

- Initial effort with ERAU Summer Academy – June 2014; positive feedback from instructors, evaluators, and Orlando FSDO inspectors. Feedback collected and analyzed.
- Orlando FSDO – October, 2014: larger prototype includes Part 141 Schools, Part 61 Instructors, Applicants, and DPEs. Goal is to develop foundation for future 8900 guidance and ACS job aids.
- Next prototypes – IRA ACS San Antonio FSDO; AI ACS in Orlando FSDO (current local AI working group)
- “Real” implementation of ACS for PVT, IRA, AI in late 2015 to early 2016.

Orlando FSDO Prototype Update

- 27 active participants from 7 providers
 - 20 in Part 141 training
 - 7 in Part 61 training
- 8 participants have taken the knowledge test
- 10-15 new participants entering this week
- Ideal completion of current group: April
- Targeted completion of current group: June
- Participant surveys completed and launched

ACS Practical Test Plan-of-Action

- ACS requires testing of a minimum of one knowledge and one risk management element for each task.
- Elements selected should be based on the knowledge test report (if applicable) and/or the scenario chosen by the examiner.
- All skill elements will be required as in the PTS.
- ACS based plan-of-action guidance forthcoming.



Key Points for DPEs

- *The ACS does not change the checkride*, but it gives the evaluator more focused information on:
 - Knowledge and risk management and special emphasis elements associated with each skill task.
 - Specific information (via ACS codes) on items the applicant missed on the knowledge test.
- Except to streamline and combine overlapping and duplicative tasks (e.g., runway safety), *the ACS does not change PTS elements or performance metrics*.
- The FAA reviews (QMS) each industry-developed ACS to validate its content and ensure that all PTS elements are included.



Key Points for DPEs

By offering an integrated and systematic approach to standards, guidance, and testing, the ACS:

- Provides better guidance to applicants, instructors, evaluators, and inspectors.
- Allows the FAA to develop better test questions that are clearly tied to standards (“need to know”) and supported by guidance (handbooks).
- Reduces subjectivity and increases system-wide standardization.
- Enhances safety by ensuring that standards, guidance and testing for airman certification all work together effectively.