

JAARS Aviation

FIXED WING & ROTOR WING

Technical Evaluation

KNOWLEDGE

SKILLS

ATTRIBUTES

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Background on KSAs:

KSAs have been around for a long time and have been used in a number of different ways. The US Federal Government uses the KSAs...Knowledge, Skills and **Abilities**... to define special qualifications and personal **attributes** that you need to have for a particular job in any one of a number of government agencies. These are the unique requirements that the hiring agency wants to find in the person selected to fill a particular job. A primary purpose of the KSAs, in this application, is to measure those qualities that will set one candidate apart from the others. In federal personnel guidance, KSAs are defined as the factors that identify the better candidates from a group of persons basically qualified for a position.

Glen Mast used KSAs in his management course, Training for Effectiveness. His premise was that we train people to make a change in their:

- Knowledge “Need to Know”
- Skills “Able to Do”
- **Attitudes** “Heart felt Values”

In 2007, when JAARS Aviation Training was directed to document the flight Technical Evaluation (TE) process, the frame work best suited seemed to be the KSAs. It was presented as Glen Mast used it; Knowledge, Skills and **Attitudes**. In looking back over the documentation process, even in the early stages, the term **Attitude** started to blur with **Attribute**. It was stated that we wanted a pilot to possess a certain **Attitude**, and then in summarizing that **Attitude** we wrote an **Attribute** Summary.

Over the course of the past five years, as the documentation of the TE has been refined, the training section has moved to Knowledge, Skills and **Attributes**. It just seemed that **Attribute** (see the definition on page 15) better defined the "A" than **Attitude** or **Ability**. The "A" or **Attributes** are related to the Human Factors side of flying. As we know most all of the challenges our aviation operations face, around the world, come from this area.

A Word about the Application of Attributes (Human Factors)

The Attributes that JAARS Aviation Training looks at in the process of evaluating and training pilots are generic. These Attributes can be applied to any pilot operating any aircraft type in any evaluation, training or operational setting. They are Human factors, if you will, and are common across the full spectrum of aviation, including maintenance.

Carefully crafted procedures specific to an aircraft type and/or operational environment provide the finer details of what is evaluated, technically, in a training or operational setting. Operational specifics will vary from aircraft type to aircraft type and from operation to operation, but the Attributes or Human factors, remain constant. For example, Judgment, good or poor affects fixed wing and rotor wing operations equally. Poor judgment results in unsafe operation whereas good judgment tends to enhance operational safety.

A WORD ABOUT TOLERANCES:

We want to see a pilot appropriately dissatisfied with anything other than “on specification” for airspeed, altitude and heading. This attitude should be reflected in all aspects of a pilot’s operation as an airman. If there is a departure from specification, we want to see the pilot returning to specification as soon as the excursion is noted. This is a different philosophy than allowing one’s self to roam around within a set of tolerances and calling that acceptable. On a smooth day, we want to see the pilot right on specification or always moving back to the specified altitude, airspeed and heading after small deviations. On a day when the air is unstable we want to see the pilot on specification or always moving back to the specified altitude, airspeed and heading with as little deviation as possible, taking into account the conditions. Our training aircraft are all equipped with expanded lower scale airspeed indicators and one or two knots can be easily noted.

Again, the universal problem with publishing a standard set of “numbers” is that a pilot may fly all around in the “box” and claim success for that particular maneuver. We are looking for much more than this. The numbers below are provided with the understanding they are not the only “hard and fast” criteria for evaluating flight performance.

The limit within which a deviation should be noted and a return to specification started is:

Airspeed: - zero/+ five knots

Altitude: +/- 50’

Heading: +/- 5 degrees.

The philosophy behind the numbers is the critical thing. Each Evaluator Pilot or Instructor Pilot reviews the specifications and the tolerances before each flight. Environmental factors are always considered in the evaluation of an applicant’s flying skills.

KNOWLEDGE

14 CFR Part 91: Knowledge, Application and Compliance

Aircraft POH: (Including but not limited to)

- Aircraft: Systems, Limitations and Performance
- Weight & Balance
- Aircraft Takeoff and Landing Performance
- Normal Procedures
- Emergency Procedures

Aerodynamic Theory: (Including but not limited to)

- Lift vs. Drag
- Types of Drag
- Center of Pressure
- Vx vs. Vy
- Flight on the back side of the power required curve (area of reverse command)
- Stalls
- Flap Theory
- Trim Tabs

Commercial PTS Special Emphasis Areas: Page 7, FAA-S-8081-12C

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.

Airspace

Weather Reports, Notams, TFRs

Radio Communications

SKILLS: Aircraft Handling

1. **Normal Procedures:** Preflight, Loading, Performance, Weight and Balance, Pre Start, Start, Post Start, Run-up, Taxi, Pre Takeoff, Cruise, and use of the Radio
2. **Emergency Procedures:** Done in accordance with Checklist and expanded procedures found in the aircraft POH. Being aware of where the aircraft can be landed in the event of an engine failure or other emergency situation during takeoff, initial climb as well as enroute.
3. **Use of Checklists:** Were checklists used? How was the “flip tab” checklist used? Used in accordance with the checklist use explanation in the POH, or used as a do list?
4. **Takeoff:** Procedures per the POH and/or Flight Sheet Completion Standards, Performance Quality, Command of the Aircraft
5. **Climb, Departure and Level Off:** Procedures per the POH and/or Flight Sheet Standards, Performance Quality, Command of the Aircraft
6. **Basic Configurations:** Knowledge and application of basic operational configurations. Transitioning from configuration to configuration.
7. **Positive Pitch and Power Control:** Pro-active in managing the pitch and power together, during Airwork and in the Pattern on Downwind and on Base
8. **Arrival and Pattern:** Procedures per a STD Pattern Model and/or the Flight Sheet Completion Standards, Performance Quality, Command of the Aircraft
9. **Final Approach, Agreement of Indicators:** Pitch, Power, Rate of Descent and Picture. Pro-active in managing the pitch and power to give the desired Airspeed and Rate of Descent on final approach.
10. **Landing:** Procedures per the POH and/or Flight Sheet Standards, Performance Quality, Command of the Aircraft. Transition to touchdown, use of pitch and power. Landing in a (the) predetermined Touch Down Zone
11. **Tolerances:** (A/S, ALT, Hdg.) Timely and Appropriate corrections back to the specifications spelled out in the Flight Lesson Plans, for Orientation, Recurrency and Proficiency, or as found in the Performance Standards Section of the TE handbook, for TEs.
12. **Scan inside/outside:** VFR Scan. “Methodical eye movement in search of information” The degree of consistent and appropriate scan which actively and continuously seeks to confirm and update critical information needed to operate the aircraft. Both flight and engine instruments.

- 13. Smoothness:** Control movements and power changes made in a timely manner at appropriate rates and quantities (measured/even as opposed to abrupt/segmented). It may also be used to reflect the general flow and manner of flight actions.
- 14. Coordination:** The degree to which timely and correct flight control inputs are applied, that result in the coordinated and optimum flight performance of the aircraft.
- 15. Orientation/Navigation:** The ability to maintain awareness of geographic position and the ability to hold headings and altitudes and note times and distances and relate charts information to observed features. Chart use and plan for locating one's position. Navigating TO and FROM the practice area.

SKILLS: Airmanship

- 16. Planning:** Makes and adapts plans (including for contingencies).

The degrees of ability to anticipate and plan as well as maintain priorities

The degrees of ability to maintain an ongoing assessment of the "as is" and to plan to anticipate upcoming situations in a way that leads to good situational awareness. Planning ahead includes both preflight planning as well as thinking ahead of where the plane is and where it will be or needs to be as the flight progresses.

- 17. Division of Attention/Task Management:** The degree of ability to prioritize attention and activities appropriate to the phase of flight and to **Multi-Task** without becoming overly focused on any one of the factors needing attention at the same time.

- 18. Situational Awareness** - Accurately perceives what is going on with oneself, the aircraft (flight or maintenance) and the environment, in the short-term past, the present, and in the near future.

"Condition of being aware" The degree of awareness of the ramifications of continuing any portion of the flight profile as it is currently being conducted. "Awareness" includes an awareness of his personal abilities and limits (pilot), the status, configuration and condition of the aircraft and its systems and environmental factors affecting the flight.

- 19. Resource Management** – Uses resources effectively to accomplish tasks. SRM is a way of obtaining and managing information and resources, making good decisions and good use of the resources available.

- 20. Risk Management** – Appropriately recognizes, evaluates, and mitigates risk.

- 21. Stress Management (Performance Under Pressure)** - Carries out activities appropriately when under pressure or stress

In the immediate sense it is the ability to continue to function when the workload becomes and remains higher than normal for a protracted portion of the flight. Please note, however, the trainee's general ability to maintain personal priorities, anticipate high activity loads, exercise proper relaxation, and to effectively recognize and relieve stress, throughout the flight.

22. Aeronautical Decision Making (ADM) – Makes correct decisions in an appropriate manner and in a timely fashion.

23. PIC Mentality – Is in command of all the aspects of flight.

The degree of ability to take charge and professionally manage the aircraft, passengers and all available resources.

ATTRIBUTES (Human Factors):

1. Judgment: Appropriately compares and evaluates courses of action.

The degree of ability of the pilot to recognize, analyze and evaluate information regarding oneself, the aircraft, the environment and make decisions which lead to the safe operation of the aircraft.

2. Discipline/Professionalism:

a. The degree of quality self management and self direction which results in good returns for the effort and produces highly predictable and consistent outcomes

b. Is thorough, responsible, reliable, conscientious, **Disciplined**, maintains high standards, adheres to standards, procedures and regulations, is **Self Controlled** and has **Integrity** (Does what is right even when alone)

3. Safety Conscious: Places a high value on safety, **Functions within Limitations:** Recognizes (personal and organizational) limitations, establishes appropriate margins, and consistently functions within those margins and is **Conservative**, Exercises moderation and/or caution when making decisions.

4. Hazardous Attitudes: Does/does not exhibit attitudes that lead to dangerous behavior. There are two equally undesirable extremes to Hazardous Attitudes. We are looking for balance.

MACHO:	AGGRESSIVE/FORCEFUL	5	4	3	2	1	0	1	2	3	4	5	TIMID
ANTIAUTHORITY:	DEFIANT	5	4	3	2	1	0	1	2	3	4	5	CONFORMIST
RESIGNATION:	INSISTENT	5	4	3	2	1	0	1	2	3	4	5	YIELDING
IMPULSIVITY:	SPONTANEOUS	5	4	3	2	1	0	1	2	3	4	5	PONDERING
INVULNERABILITY:	CAREFREE	5	4	3	2	1	0	1	2	3	4	5	TREPID

5. Aptitude for Learning: Has the **Ability** and **Willingness** to learn new skills and information

“Capable of being educated” Truly listens and desires to learn as evidenced by modified behavior in areas being addressed by the instruction. This is fairly close on the heels of “rate of progress”. It is the index of change which results from specific instruction and coaching. (This is not simply how amiable or willing to listen the pilot is.) **Inquisitive** – Has a desire to learn

3. Self Assessment – Assesses one’s own skills and performance accurately.

Does the pilot see what they are doing well?

Do they see where they need to improve?

Do they see where they are improving?

Overall, does their evaluation of the flight match what the IP is seeing?

4. Rate of progress: “Progression from simple to a more complex form” The rate at which training outcomes and performance demonstrate development of the needed technical knowledge, skills and attributes.

5. Consistency: Are procedures and modes of operation **Correct** and **Consistent** from operation to operation?