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FLIGHT TEST GUIDE

# INSTRUMENT
# PILOT
# Airplane . . .

Revised

1972

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Flight Standards Service

## APPLICANT'S CHECKLIST FOR FLIGHT TEST

Appointment With Examiner

_____

time/date/place

ACCEPTABLE AIRPLANE

- View limiting device ☐
- Aircraft Documents:
  - Airworthiness Certificate ☐
  - Registration Certificate ☐
  - Operating Limitations ☐
- Aircraft Maintenance Records:
  - Airworthiness Inspections ☐
  - Static system and Altimeter check ☐
- FCC Station License ☐

PERSONAL EQUIPMENT

- Current Charts ☐
- Computer and Plotter ☐
- Flight Plan Form ☐
- Flight Logs, etc. ☐
- Current AIM ☐

PERSONAL RECORDS

- Pilot Certificate ☐
- Medical Certificate ☐
- Signed Recommendation ☐
- Written Test Results ☐
- Logbook ☐
- Notice of Disapproval (if applicable) ☐
- Approved School Graduation Certificate (if applicable) ☐
- FCC Radiotelephone Operator Permit ☐
- Examiner's Fee (if applicable) ☐

## CONTENTS

## PREFACE

This guide has been published by the Flight Standards Service of the Federal Aviation Administration, to assist the applicant in preparing for the instrument rating flight test.

It contains information concerning maneuvers, procedures, and standards which apply to the instrument rating flight test outlined in Part 61 of the Federal Aviation Regulations.

Both the applicant and the flight instructor should find the guide helpful in preparing for the instrument rating flight test.

This revised edition supersedes the *Flight Test Guide-Instrument Pilot Airplane . . .* AC 61-17A, dated April 1967, and all other instructions pertinent to instrument pilot tests in airplanes.

Comments regarding this publication should be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

## GENERAL INFORMATION

An applicant for an instrument rating is required to meet the aeronautical knowledge, flight experience, and skill standards prescribed in sections 61.35 and 61.37 of the Federal Aviation Regulations. For his demonstration of aeronautical skill, he is required to furnish a currently certificated airplane which is equipped in accordance with the Regulations for instrument flight operations. Fully functioning dual flight controls are required.

The airplane used should have an effective means for excluding outside visual references from the pilot being tested, such as a view limiting visor, hood, slats, light-polarizing material, or other effective arrangement. The examiner may seat himself in the applicant's seat to determine the effectiveness of the means for simulation of instrument conditions.

The applicant should furnish current charts or publications which contain all necessary data and procedures for departure, enroute, and approach operations in the National Airspace System. Any system of aeronautical charts that accurately depicts the approved instrument procedures is acceptable.

The applicant will be asked to demonstrate the competent performance of prescribed flight test maneuvers and procedures solely by reference to the flight instruments. The Regulations require performance of straight-and-level flight; climbs, turns, and descents;

and recovery from unusual attitudes by reference to needle, ball, and airspeed instruments only. This is to demonstrate the ability to control the airplane when the attitude indicator and heading indicator are not available due to aircraft system failure.

The Regulations provide that if an applicant fails any required item in a phase of the flight test he fails that phase and the entire test, and must pass that phase (as well as any other phases that he has not passed) in any later retesting.

Other persons having a legitimate interest in the flight test may accompany the applicant and examiner on the flight, subject to the approval of both examiner and applicant. Such persons may be asked to assist the examiner in the surveillance of other air traffic in the interest of safety.

Each required procedure or maneuver section of this guide contains three paragraphs, *Objective, Description, and Acceptable Performance Guidelines:*

The *Objective* states briefly the purpose for which the maneuver or procedure is required on the flight test. It specifies the flight principles involved, and the type of piloting operations which the applicant must demonstrate that he has mastered in order to perform in the test item correctly.

The *Description* explains the procedure or maneuver, and the methods and techniques of performance which demonstrate the objective. These descriptions must not be confused with the objectives.

The *Acceptable Performance Guidelines* detail the procedures and standards of performance which will be accepted by the examiner as evidence of the competence required by the Regulations. It includes the factors which are considered by the examiner in deciding whether the applicant has met the objective of the test item. The tolerances are not hard and fast, but represent the performance expected in good flying conditions. The practice of exceeding these tolerances before corrective action is initiated, however, will be considered evidence of an unsatisfactory performance.

Consideration will be given to the overall judgment, knowledge, precision, and smoothness displayed on the flight test. A competent performance is one during which the successful completion of the procedure or maneuver is never seriously in doubt.

The examiner will carefully consider the applicant's performance in the subject areas coded as unsatisfactory on the Airman Written Test Report submitted with his application.

## PHASE 1. ORAL OPERATIONAL TEST

### 1. Instrument flight planning

(a) *Objective.* To determine that the applicant can develop a functional plan of action for an IFR flight in the IFR navigation system.

(b) *Description.* The applicant will be requested to develop a written flight log for an instrument flight to a point at least 2 hours' cruising distance from the point of departure, involving at least two published IFR routes. The flight planning should include the procurement of available weather reports and forecasts, selection and confirmation of the availability of appropriate radio facilities, and the provisions of appropriate enroute, area, and approach charts. Questions will be asked on the use and interpretation of the various charts to be used, but this item is intended as a demonstration of the practical preparation of an actual flight plan rather than a quiz or training exercise.

(c) *Acceptable performance guidelines.* Performance will be evaluated on the basis of the accuracy, adequacy, and efficiency of the planning displayed for the proposed flight. The flight log should be completed in approximately 30 minutes.

### 2. Preparing and filing an instrument flight plan

(a) *Objective.* To demonstrate that the applicant can prepare, file, acknowledge, and amend in flight an instrument flight plan.

(b) *Description.* The applicant will be required to prepare and file an instrument flight plan. He will be required to accept

(b) *Description.* Straight and level flight may be demonstrated separately, or evaluated during the performance of other normal and emergency instrument maneuvers in cruising and instrument approach airspeeds and configurations.

(c) *Acceptable performance guidelines.* Evaluation will be based on the ability to maintain a prescribed heading and altitude within 10° and 100 feet, respectively. Consideration will be given to smoothness, coordination, and accuracy. The stability of the aircraft used and the existing turbulence will be taken into consideration in the evaluation.

### 2. Turns, climbs, and descents using needle, ball, and airspeed only

(a) *Objective.* To determine that the applicant can make accurate turns, climbs, and descents, both in normal operation and under emergency conditions.

(b) *Description.* The applicant will be requested to perform timed turns of 180° and 360° duration in level flight, and make constant-rate climbs and descents, using the needle, ball, and airspeed instruments only. This demonstration may be conducted separately, or combined with other maneuvers demonstrated during the flight check.

(c) *Acceptable performance guidelines.* Evaluation of the applicant's performance will be based on accuracy, smoothness, and coordination. Compliance with the following tolerances will be accepted as a competent performance:

Climb or descent to assigned altitude—within 10 seconds of estimate;

Heading on recovery from timed turn—within 20° for each 360° of turn;
Airspeed—within 10 knots of assigned speed.

Any disorientation or loss of flight control will be disqualifying.

### 3. Stalls and maneuvering at approach speeds

(a) *Objective.* To determine the applicant's ability to recognize and recover from stalls under instrument flight conditions, and to maneuver an airplane accurately and safely at normal instrument approach speeds.

(b) *Description.* Stalls will be requested from climbs and descents in climbout and approach configurations. Recovery should be effected to straight flight with coordinated control usage and the least loss of altitude consistent with safety. Straight flight and turns will be performed in climbing, descending, and level flight, with approach configuration of gear and flaps at the airspeed used for instrument approaches in the airplane concerned. There should be smooth transition from cruising flight to instrument approach speed.

(c) *Acceptable performance guidelines.* The applicant's performance will be evaluated on the basis of prompt recognition of a stall under instrument conditions, and prompt, correct recovery action. Maneuvering at approach speed should be accurate and smooth, and the transition from cruising speed and configuration to approach speed accomplished promptly without excessive variation in altitude or heading. Observance of the following tolerances will be considered a competent performance:

Heading on stall recovery—within 20° of entry heading;

Altitude during level flight at maneuvering speed—within 100 feet;

Airspeed at approach speed—within 10 knots of predetermined speed;

Altitude and heading during transition to approach speed—within 100 feet and 10° of cruising altitude and heading.

**4. Steep turns**

(a) *Objective.* To determine that the applicant can exercise precise, accurate control of his airplane in turns of extended duration at steeper than normal angles of bank.

(b) *Description.* The applicant will be requested to maintain a stable rate of turn and degree of bank throughout left and right turns of at least 360°. The angle of bank should be at least 45° at not more than maneuvering airspeed.

(c) *Acceptable performance guidelines.* Evaluation will be based on the promptness and smoothness with which turns are entered and stopped, and attention to the avoidance of excessive maneuvering loads during the turns. Failure to maintain an altitude within 100 feet of the entering altitude, or to recover within 10° of the assigned recovery heading will be disqualifying.

**5. Recovery from unusual attitudes using needle, ball, and airspeed only**

(a) *Objective.* To determine that the applicant can effect prompt, smooth recoveries from unusual attitudes of flight under emergency conditions.

(b) *Description.* The examiner will place the airplane in flight attitudes and trim conditions which are typical of the results of vertigo, turbulence, and lapse of attention to the instruments and ask the applicant to return to normal flight promptly using the needle, ball, and airspeed instruments only. The applicant should resume flight in the configuration assigned using the proper power and trim settings.

(c) *Acceptable performance guidelines.* Evaluation will be based on the promptness, smoothness, and accuracy demonstrated. All maneuvering should be conducted within the operating limitations for the airplane used. Any loss of control which makes it necessary for the examiner to take over to avoid a spin or exceeding the airspeed limitations of the airplane will be disqualifying.

### 6. Engine-out procedures, if test is in a multiengine airplane

(a) *Objective.* To determine that the applicant can control the airplane safely in the event of an engine failure under instrument flight conditions.

(b) *Description.* The applicant will be asked to trim and maneuver the airplane after one engine has been throttled to simulate the drag of a feathered propeller, or with one propeller feathered, as agreed upon by the applicant and examiner. Feathering of a propeller for flight test purposes will be performed only under such conditions and at such altitudes and positions that safe landings can be readily accomplished in the event difficulty is encountered in unfeathering.

(c) *Acceptable performance guidelines.* Evaluation of the applicant's performance will be based on the accuracy, smoothness, and promptness of his action. The applicant will be asked to maintain his heading within 20° and his altitude within 100 feet during his retrimming operation. Any loss of control which makes it necessary for the examiner to take over, or any attempt at prolonged flight contrary to the single engine operating limitations in the Airplane Flight Manual or Owner's Handbook will be disqualifying. If the aircraft is incapable of maintaining altitude with an engine inoperative under existing circumstances, the applicant will be expected to maintain an airspeed within 5 knots of the engine-out best rate of climb speed.

## PHASE III. RADIO NAVIGATION AND APPROACH PROCEDURES TEST

### 1. Radio navigation including orientation using LF, OMNI, or ADF

(a) *Objective.* To determine that the applicant can use radio aids for safe navigation of the airspace under instrument flight conditions.

(b) *Description.* The applicant will be asked to demonstrate the use of radio navigation aids for a simulated instrument flight, using at least two different navigational facilities. The use of VOR, VORTAC, low frequency facilities, or a combination of these will be accepted. The applicant will also be asked to demonstrate an orientation procedure under simulated instrument flight conditions, using such facilities. In the event the applicant uses a VOR, VORTAC,

or low frequency facility, he will be asked to pinpoint his position by cross bearings, bearing and DME distance, or a time and distance computation based on the change in relative bearings.

(c) *Acceptable performance guidelines.* Performance will be based on compliance with his clearance and prescribed procedures, and the accuracy of the applicant's maintenance of the desired track. The use of any planned course of action which results in the positive identification of position is acceptable for the required orientation procedure. During cruising flight operations on his radio navigation demonstration, the applicant should maintain his altitude within 100 feet of his assigned altitude.

**2. Using radio for voice communication**

(a) *Objective.* To determine that the applicant can use two-way radio effectively for communications with aeronautical ground stations.

(b) *Description.* The applicant will be asked to use two-way radio for voice communications which include all contacts involved in normal IFR operations. Radio communications will be simulated by the examiner only when it is not practicable to use regular aeronautical ground stations for all pertinent information, clearances, and reports.

(c) *Acceptable performance guidelines.* Performance will be evaluated on the basis of the use of correct radio phraseology, selection of the appropriate frequencies, accuracy, and clarity of transmissions, and the timing of communications.

### 3. Standard instrument approach to authorized IFR weather minimums, including holding procedures

(a) *Objective.* To determine that the applicant can make accurate, safe instrument landing approaches under instrument flight conditions.

(b) *Description.* The applicant will be asked to demonstrate a standard instrument approach to the minimum authorized altitude for the airport involved and the approach facilities used. The use of any approach chart which accurately depicts the approved approach procedure involved is permissible. In the event the minimums authorized for the airport used are greater than 500 feet and 1 mile, these minimums will be applied if they can be used safely under simulated instrument flight conditions. Otherwise, the instrument approach will be demonstrated at another airport where approaches to 500 feet and 1 mile are authorized or may be safely performed under simulated conditions. Holding procedures and other associated IFR operations will be demonstrated as requested by Air Traffic Control or the examiner. Special attention will be given to the applicant's ability to orient himself by outside references and maintain a smooth visual approach after the examiner has advised him he has the field in sight and removes his hood or visor.

(c) *Acceptable performance guidelines.* The accurate performance of a VOR, VOR/DME, NDB, ILS, or LOC approach to authorized (or simulated) minimums will be acceptable. Arrival at minimum descent altitude (MDA) within the visibility minimum distance of the runway threshold, or

airport boundary for circling approaches, is an acceptable performance for VOR, VOR/DME, NDB, or LOC approaches. Arrival at decision height (DH) in position for a straight-in landing is an acceptable performance for ILS approaches. Standard holding patterns should conform with standard procedures and specific clearances or instructions. Errors in altitude of more than 100 feet below prescribed altitudes during initial approach, full scale deflection of the glide slope indicator after glide slope interception, or descent below DH or MDA without the runway environment in sight will be disqualifying.

**4. Missed approach procedures**

(a) *Objective.* To determine that the applicant can accurately and safely execute a missed approach procedure in the event he does not sight the airport at the specified missed approach point.

(b) *Description.* At least once during the flight, the applicant will be requested to execute the prescribed missed approach procedure for the airport involved. His demonstration will include all radio reports, contacts, and clearances as well as the appropriate maneuvering.

(c) *Acceptable performance guidelines* will be based on the accuracy of the procedure demonstrated, timing of the decision to execute a missed approach, and the appropriateness of communications. Any continued descent below the authorized MDA or DH, prior to initiation of missed approach unless the examiner advises him that the field is in sight, will be disqualifying.

### 5. Emergencies such as radio or instrument malfunctions

(a) *Objective.* To determine that the applicant can promptly recognize and cope with typical equipment failures and malfunctions.

(b) *Description.* The examiner will induce simulated malfunctions of radio, instruments, and other equipment at unannounced times during the flight test. The applicant should notice promptly, identify the malfunction, and take appropriate corrective action for the simulated emergency. The applicant should obtain any necessary amended clearances from ATC to continue the planned simulated IFR flight. Emergency actions available to the pilot, such as switching to alternate equipment, resetting circuit breakers or fuses, and changing the types of ground facilities, should be demonstrated.

(c) *Acceptable performance guidelines.* Evaluation of performance will be based on the applicant's promptness in recognizing that a malfunction has occurred, analyzing the failure, and in taking appropriate corrective action. Failure to observe a critical malfunction, or the inability to take appropriate action will be disqualifying.

### 6. Compliance with air traffic control instructions and procedures

(a) *Objective.* To determine that the applicant can accept ATC clearances correctly and that he can comply accurately with ATC instructions and procedures.

(b) *Description.* Phase III of the flight test will be conducted in accordance with an IFR flight clearance. In the event ATC is

unable to provide an actual IFR clearance and enroute instructions, this function may be simulated by the examiner. All clearances, instructions, and amended clearances will be acknowledged and complied with exactly as on an actual instrument flight. Clearances based on facilities or frequencies not available to the applicant should be refused. In the event the use of departure and approach control facilities are not practicable where the test is conducted, they may be simulated by the examiner.

(c) *Acceptable performance guidelines.* Evaluation of the applicant's performance will be based on the accuracy of his compliance with ATC clearances and instructions, his acceptance and acknowledgement of instructions received by radio, and his familiarity and compliance with standard ATC procedures.

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