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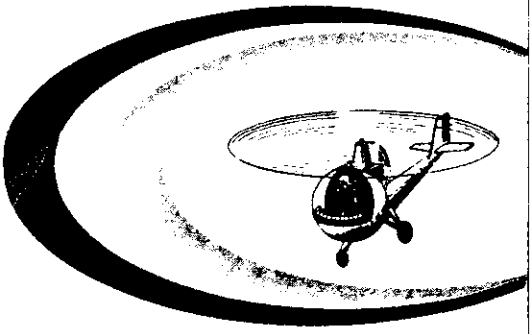
AC 61-30A

FLIGHT TEST GUIDE



PRIVATE and COMMERCIAL PILOT

Gyroplane. . .

Revised 1972

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Flight Test Guide

Private and Commercial Pilot

Gyroplane

Revised 1972

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Flight Standards Service

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Preface

This flight test guide has been prepared by the Flight Standards Service of the Federal Aviation Administration to assist the commercial and private pilot applicant in preparing for his gyroplane flight test.

It contains information and guidance concerning procedures and maneuvers relevant to the gyroplane flight test. The guide should be helpful to all pilots preparing for a gyroplane rating flight test, to flight instructors, and to pilot examiners.

This revised edition, issued as AC 61-30A, supersedes *Flight Test Guide—Gyroplane—Private Pilot*, December 1961, and AC 61-30, *Flight Test Guide—Gyroplane, Commercial Pilot*, Revised 1966. Persons using this guide to prepare for the private pilot or commercial pilot gyroplane flight test should also refer to the latest amendments to Part 61 of the Federal Aviation Regulations.

Comments regarding this publication may be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. 25083, Oklahoma City, Oklahoma 73125.

General Information

To be eligible for either a private or commercial flight test, an applicant is required by § 61.21 of the Federal Aviation Regulations (FARs) to—(1) have passed the written test (if required) within the 24 months before the date he takes the flight test; (2) have the applicable aeronautical experience appropriate to the certificate he seeks; (3) hold a medical certificate appropriate to the certificate he seeks; and (4) have a written statement, made not more than 60 days before applying for the flight test, from an appropriately rated flight instructor who certifies that the applicant has been given flight instruction in preparation for the flight test and is considered ready to take the test.

An airworthy and appropriate aircraft, which conforms to the requirements of FAR 61.33, must be provided by the applicant for the flight test. This aircraft must have functioning dual controls unless, after considering all of the factors, the examiner determines that the flight test can be conducted safely without them. This aircraft must be capable of, and its operating limitations must not prohibit, the flight maneuvers required in the test.

The procedures and flight maneuvers required for gyroplane ratings are listed in FAR 61.91 for private pilots and FAR 61.121 for commercial pilots. This flight test guide is intended only to describe the maneuvers required by regulations, and the minimum standard of performance for each which the examiner[1] will accept as evidence of pilot competence.

[1] The word "examiner" is used in this guide to denote either the Federal Aviation Administration inspector or designated pilot examiner who conducts an official pilot flight test.

The maneuvers described in this guide should not be viewed as the only way in which they may be performed but rather as the way which is acceptable to the Federal Aviation Administration.

The private pilot flight test will be given in three phases; the commercial pilot flight test will be given in four phases. The failure of any part of a phase will cause the applicant to fail that phase and the whole test. All phases of each flight test, private or commercial, must be passed before the appropriate certificate will be issued.

The flight test may be discontinued at an time by the examiner or by the applic when failure of a required item makes successful completion of the test impossi In such cases, credit will be allowed only the whole phase successfully completed.

An applicant's performance will be eva uated by the examiner on the basis of th judgment, knowledge, skill, coordination, ac curacy, and smoothness displayed. A com petent performance of a flight maneuver is demonstrated by the pilot being the obvious master of his gyroplane—with the successful outcome of the maneuver never in doubt.

The section of the guide on each flight test item is arranged in three paragraphs—Objective, Description, and Acceptable Performance.

The *Objective* states briefly the *purpose* for which the procedure or maneuver is required on the flight test.

The *Description* explains the *procedure* or *maneuver*, and details the most effective way of accomplishing it to demonstrate that the objective has been accomplished.

The *Acceptable Performance* includes the *factors* taken into account by the examiner in

PRIVATE PILOT FLIGHT TEST

Phase I. Oral Operational Test

1. Gyroplane Registration, Airworthiness, and Equipment Documents.

a. OBJECTIVE. To determine that the applicant can locate and identify the documents required in a certificated gyroplane.

b. DESCRIPTION. The applicant will be requested to present or point out in the gyroplane the required aircraft registration, airworthiness records, operating limitations, Gyroplane Flight Manual (if required), equipment list, and weight and balance documents.

c. ACCEPTABLE PERFORMANCE. The applicant should be able to locate, identify, and explain the purpose and significance of each required item.

2. Gyroplane Maintenance Records and Airworthiness Inspection Reports.

a. OBJECTIVE. To determine that the applicant knows what airworthiness inspections are required for a certificated gyroplane, and what evidence of these inspections is acceptable for flight operations.

b. DESCRIPTION. The applicant will be required to present and explain the aircraft and engine records or logbooks, or other required airworthiness inspection reports.

c. ACCEPTABLE PERFORMANCE. The applicant should be able to locate, identify, and explain the significance of the required inspection reports.

3. Gyroplane Performance, Range, and Operations.

a. OBJECTIVE. To determine that the applicant knows what performance data and operating information are important to the pilot, and can obtain them for the gyroplane to be used for the test.

b. DESCRIPTION. The applicant will be required to demonstrate a practical knowledge of the performance capabilities, approved normal and emergency operating procedures and limitations for the gyroplane furnished. This includes power settings, placard speeds, range, fuel and oil requirements, the operation of aircraft systems and special equipment, critical performance speeds, and the Height-Velocity Diagram applicable to the gyroplane to be used.

He will be required to use appropriate manuals or materials to determine the effects of temperature, density altitude, wind, surface conditions, and gross weight on flight performance. He is expected to be familiar with the general effects of power settings and altitude on the cruising range, and to know the airspeeds for the best performance in the gyroplane used.

A practical knowledge of the control systems; the fuel, lubrication, hydraulic, and electrical systems; and operation of radio, heating, and special emergency equipment will be expected.

c. ACCEPTABLE PERFORMANCE. The applicant should be able to obtain from documents, placards, approved manuals or approved manual material required in the gyroplane, the operating data and procedures essential to its proper operation. Inability to do so or faulty knowledge thereof will be disqualifying.

thoroughness of the engine, systems, and gyroplane checks. The use of a checklist is recommended, preferably one supplied by the gyroplane manufacturer.

2. Taxiing.

a. OBJECTIVE. To determine that the applicant can maneuver the gyroplane expeditiously and safely on the surface.

b. DESCRIPTION. The demonstration of taxiing will include the operation of the gyroplane on the surface, the initial and continuing determination that the taxi path is clear of obstructions, and compliance with local taxi rules and tower instructions.

c. ACCEPTABLE PERFORMANCE. Performance will be evaluated on the basis of the accuracy of taxi operations, safety, consideration for other aircraft and personnel on ramps and taxiways, and the proper use of the flight controls and brakes for steering. Attention will be given to the use of appropriate taxiing speeds, considering safety and the expeditious movement of airport traffic.

3. Takeoffs and Landings.

a. OBJECTIVE. To determine that the applicant can consistently make accurate, smooth, safe takeoffs and landings under normal and crosswind conditions.

b. DESCRIPTION. Demonstration of the following takeoff and landing operations will be required:

(1) Normal takeoffs and landings;
(2) Crosswind takeoffs and landings;
(3) Short field takeoff and power approach and landing;
(4) Soft field takeoff and landing;
(5) A high altitude takeoff and landing.

All takeoff and landing demonstrations are expected to be made in compliance with the established traffic pattern for the airport used, and in accordance with control tower instructions. Landings are demonstrated from approaches at a relatively constant normal approach airspeed from an altitude of not more than 1,000 feet above the surface through a 180° change in direction. They terminate with a touchdown in a normal landing attitude beyond and within 100 feet of a line or mark designated by the examiner. Crosswind landings must be performed with full consideration for other air traffic and for either the designed capability of the gyroplane (FAR 23.233) or for the limitations specified by the manufacturer in the owner's manual. At least one crosswind takeoff and landing subject to sufficient crosswind component to require the use of crosswind techniques will be required. The use of the sideslip, crabbing, or combined techniques for drift correction will be acceptable.

The short field takeoff procedure assumes a firm, smooth, short surface with surrounding obstructions. Rotation should be initiated sometime prior to reaching best angle-of-climb airspeed. When lift-off occurs, accelerate the aircraft until best angle-of-climb airspeed is reached. Maintain this airspeed until obstacles are cleared, then accelerate the aircraft to and maintain best rate-of-climb airspeed until reaching cruising altitude.

The short field power approach and landing procedure is that appropriate to landing over obstructions on a short field. Short field landings should be made from a stabilized final approach, with a moderately low power setting, at below normal approach speed, and with a constant rate of descent. The landing

b. DESCRIPTION. It is expected that the applicant will observe and correctly interpret any traffic flow indicators and conform with the established traffic pattern for the airport used during all maneuvers involved on the flight test. In the event control tower instructions or special traffic procedures prevent the demonstration of a normal rectangular traffic pattern, the examiner may request the applicant to fly a rectangular pattern about an area elsewhere, making the usual entries and departures.

c. ACCEPTABLE PERFORMANCE. Performance will be evaluated on the basis of planning, maintenance of altitude, airspeed control, correction for wind drift, the observance of safe clearance from other aircraft, acknowledgment of and compliance with control tower instructions, and local taxi and air traffic patterns. Applicant should be able to maintain an altitude within 100 feet of the prescribed traffic pattern altitude.

5. Climbs, Level Flight, and Descents at Normal Speeds.

a. OBJECTIVE. To determine the applicant's ability to maneuver a gyroplane safely. and to maintain flight control during climbs, level flight, and descents.

b. DESCRIPTION. Climbs, level flight, and descents on straight courses and in 20° to 30° banked turns will be required at the best rate-of-climb speed, level flight, cruising speed, or landing approach speed, as appropriate. These may be demonstrated in conjunction with other maneuvers on the flight test, or separately.

c. ACCEPTABLE PERFORMANCE. Performance will be evaluated on the basis of planning, airspeed control, smoothness, and accuracy of operations. The applicant is expected to observe the appropriate airspeed within ±5 m.p.h. of the desired speed. When assigned an altitude and heading he will be expected to climb or descend to and maintain the altitude within ±100 feet of the assigned altitude and the heading within ±10° of the assigned heading.

6. High Rate of Descent and Recoveries.

a. OBJECTIVE. To determine that the applicant can recognize high rate of descent and effect prompt, smooth, and correct recovery procedures.

b. DESCRIPTION. Demonstrations of the following high rate of descent entry and recovery operations will be required:

(1) Power-off entry, power-off recovery;
(2) Power-off entry, power-on recovery;
(3) Full power entry, power-off recovery;
(4) Full power entry, power-on recovery.

The demonstrations may be performed separately or may be combined, as feasible. Recoveries will be completed at least 1,000 feet above the surface.

The power-off entry, power-off recovery demonstration is initiated by closing the throttle and placing the aircraft in a nose-high attitude. As the applicant determines that a high rate of descent exists, he makes a power-off recovery by lowering the nose of the aircraft and establishing a normal power-off glide.

FLIGHT TEST GUIDE

GYROPLANE
Commercial Pilot

REVISED 1966

FEDERAL AVIATION AGENCY

Flight Standards Service

PREFACE

This guide has been published by the Flight Standards Service, Federal Aviation Agency, to assist the commercial pilot applicant in preparing for his certification flight test.

It is designed to give the pilot applicant information concerning applicable procedures and standards.

Both the flight instructor and the applicant should find the guide helpful in preflight test preparation.

CONTENTS

BASIC REQUIREMENTS

To qualify for issuance of a commercial pilot certificate the applicant must meet appropriate requirements prescribed in Federal Aviation Regulations, Part 61.

He shall also provide an appropriately certificated gyroplane that conforms to the requirements of Part 91. For the demonstration of the required flight test procedures the following additional equipment is necessary:

1. Two-way radio communications system and navigational equipment appropriate to the ground radio facilities to be used.
2. A needle and ball (turn and bank) indicator.
3. A sensitive altimeter.
4. Adequate functioning dual controls.
5. An appropriate checklist.

The commercial pilot flight test will be given in four phases. The failure of any part of a phase will cause the applicant to fail that phase and the whole test. All phases must be completed satisfactorily before the issuance of a commercial pilot certificate.

A commercial pilot flight test may be discontinued at any time by the examiner* or by the applicant when failure of a required item makes the successful completion of the test impossible. In such cases, credit will be allowed for whole phases successfully completed.

An applicant's performance will be evaluated by the examiner on the basis of the judgment, knowledge, skill, coordination, accuracy, and smoothness displayed. A competent performance of a flight maneuver is demonstrated by the pilot being the obvious master of his gyroplane with the successful outcome of the maneuver never in doubt.

* The word "examiner" is used in this guide to denote either the Federal Aviation Agency inspector or designated pilot examiner who conducts an official pilot flight test.

The applicant will be required to demonstrate competent performance in proced[illegible] and in flight maneuvers. These requirem[illegible] are described under Phases I, II, III, and IV.

PHASE I. ORAL OPERATIONAL EXAMINATION

1. Gyroplane documents

The applicant shall present and explain the Gyroplane Flight Manual, gyroplane registration and airworthiness certificates, and the equipment list, required to be carried in the aircraft.

2. Airworthiness records

The applicant shall present and explain the gyroplane logbooks, the powerplant logbooks, and the airworthiness inspection reports.

3. Gyroplane performance and operation

The applicant shall display a practical knowledge of the performance capabilities of and approved operating procedures for the gyroplane furnished. This should include, as appropriate, the operation of the fuel, electrical, and hydraulic systems and reference to the Gyroplane Flight Manual for performance data.

The applicant shall demonstrate thorough knowledge of the adverse effect on aircraft performance caused by high temperature, [illegible] density altitude, and operations at full gross weight, and how these and other factors such as runway gradient, sand, mud, and tall grass increase the required takeoff distance. The cumulative effect of a combination of these factors shall be discussed in a manner that demonstrates proper understanding of the problem and a proper solution.

The applicant shall demonstrate that he is thoroughly familiar with the cruising range of the aircraft at various altitudes and power set-

tings. He shall demonstrate familiarity with [redacted]per airspeeds for best performance in the [redacted]craft used. The importance of proper speed control shall be emphasized.

4. Gyroplane loading, including fuel, oil, and baggage capacities

The applicant shall demonstrate knowledge of the approved weight and balance data for the gyroplane furnished, and compute the permissible useful load distribution.

5. Gyroplane preflight check

The applicant shall use an orderly procedure in making the preflight check, preferably as recommended by the manufacturer. The applicant shall know the significance of each item checked, and shall overlook no obvious unairworthy item. He shall demonstrate knowledge of proper pilot remedial action for unairworthy conditions.

6. Two-way communications

The applicant will be required to demonstrate actual two-way radio communication. This may be in flight or simulated. Performance will be evaluated on the applicant's demonstrated ability to employ appropriate radio procedures and phraseology.

P[redacted]SE II. BASIC PILOTING TECHNIQUES

1. Preflight operations

The applicant shall perform engine starting, warmup, runup, gyroplane control, and equipment checks. Procedures must be thorough and accurate and a checklist shall be used. Runups shall be made into the wind if practicable and shall be made in a manner that will avoid hazards to persons and property and not cause any detrimental effect to the engine, propellers, or rotors.

2. Taxiing

The applicant shall maintain full control of his gyroplane on the surface, keep visual contact with his intended taxi path to avoid possible obstructions, and comply with the local taxi rules and control tower instructions. He shall taxi at a reasonable speed considering safety and expeditious movement of traffic.

3. Three takeoffs with accuracy landings

The applicant shall, during the course of the flight test, make three takeoffs and three accuracy landings, touching down in a normal landing attitude beyond and within 100 feet of an assigned line or mark. Approaches to accuracy landings from an altitude not exceeding 1,000 feet should be accomplished in a glide through 180° change in direction.

The applicant shall demonstrate knowledge of and compliance with the prescribed traffic pattern for the airport being used.

The following takeoffs and landings shall be demonstrated, either during the required accuracy landings or separately:

a. Crosswind takeoff and landing.

NOTE: If crosswind takeoff and landing operations constitute deviations from the established flow of traffic, clearance from the control tower or prior arrangement with the airport manager, as appropriate, will be necessary.

b. Short field takeoff and power approach to a landing as appropriate to a short field with surounding obstructions.

c. Soft-field takeoff and landing.

d. A wheel landing and a full flare landing.

Performance will be judged on the basis of planning, speed control, correction for wind drift, coordination, and the accuracy of landing. Violent maneuvering, or critically low airspeeds will be disqualifying.

Climbing and gliding turns

Airspeed . . . . . minimum to + 5 m.p.h.
Bank . . . . . 20° to 30°

4. High rate of descent and recoveries

An approach to landing with a high rate of descent shall be simulated from 10° to 30° bank gliding turns entered at approach speed with the engine throttled and the gyroplane in landing configuration. As the turn continues the gliding attitude should be gradually flattened until high rate of descent occurs. Recovery from all high rates of descent should be completed to straight flight with the rotors level, and with the least loss of altitude consistent with the prompt recovery of control effectiveness.

The following performance tolerances shall apply:

High rate of descent recognition:—Prompt and accurate.

Recovery:—To straight flight, immediately upon recognition of high rate of descent, using coordinated action as necessary.

Airspeed:—Not to exceed cruising speed at any time.

PHASE IV. CROSS-COUNTRY FLIGHT

1. Cross-country flight planning

Before takeoff for the flight test, the applicant shall be required to plan a cross-country flight to be flown on the test. The trip assigned will be of approximately 3 hours' duration in the gyroplane used and may include an intermediate stop for fuel.

Planning shall include the obtaining of available weather information (aviation weather reports, terminal forecasts, area forecasts, and winds aloft forecasts); plotting the course on an aeronautical chart; employing dead reckoning and air navigation radio aids; establishing checkpoints and distances; determining perti-

nent aircraft operational data; and estimating flying time, headings, and fuel requirements.

The applicant shall refer to the *Airman's Information Manual* for airport information and pertinent *NOTAMS*. The use of a computer or wind vector diagram for computing headings is desirable but not required.

Since the applicant has already demonstrated his flight planning ability on the written examination, this flight test item will require demonstration of the practical preparations for the cross-country flight to be flown during the test. Such planning should be completed in 15 minutes or less.

2. Cross-country flying

When requested by the examiner, the applicant shall set out on the cross-country flight that he planned before takeoff. The planned course shall be followed until the applicant establishes the compass heading required to stay on the track and can give a reasonable estimate of his groundspeed. At this point, the examiner may request him to head for an alternate airport of the examiner's choice or the examiner may ask the applicant to select a suitable alternate. The cross-country demonstration shall be of sufficient duration to allow the examiner to determine the applicant's ability in this phase.

The cross-country flight will be evaluated on the basis of the applicant's ability to follow the desired track, correctly identify checkpoints, maintain heading and altitude, and provide reasonable estimates of time over checkpoints. It is recommended that the cross-country flight include a landing at a strange airport, when practicable.

The applicant shall establish the compass heading necessary to hold his planned course within 10°, and thereafter he shall maintain his plotted track within one mile. He shall maintain an altitude within + 200 feet of that planned. Using his observed time over check-

points, he shall be able to compute an ETA (estimated time of arrival) for the point of first-planned landing, with an error of not more than 10 minutes. His approach to an unfamiliar airport shall be in accordance with either the published traffic pattern, reference to traffic directional markers, or control tower instructions when available.

3. Cross-country flying emergencies

During the cross-country flying portion of the flight test, the examiner will simulate at least two emergency situations, and he may ask the applicant to simulate various emergencies, such as engine overheating, partial power failure, being lost, encountering adverse or marginal weather, or imminent fuel exhaustion.

The examiner will conduct simulated emergency procedures as follows:

(a). Encountering partial power failure or imminent fuel exhaustion that would require an immediate landing. The applicant will be expected to execute appropriate emergency procedures when practicable or simulate such procedures if their actual execution cannot reasonably or safely be achieved. Performance will be evaluated on the basis of the applicant's resourcefulness, planning, and the appropriateness of the emergency action demonstrated.

(b). Encountering adverse weather conditions, light icing, or being lost that would require diverting the flight to an alternate destination or executing precautionary landing procedure will be conducted. When diverting to an alternate airport, the applicant shall establish a heading and compute an ETA within a reasonable length of time. The applicant will be judged upon his demonstrated ability to use equipment correctly, select and properly inspect a suitable landing area, set up a good approach pattern, and assume and maintain proper pattern and approach speeds.

4. Use of radio aids to VFR navigation

During this phase of the flight test, the applicant will be required to demonstrate his ability to appropriately utilize an air navigation radio aid by such means as: following an L/MF (low-frequency range course); following a VOR (omnirange radial); or using an ADF (automatic direction finder) tuned to the appropriate radio facility.

Performance will be evaluated on the basis of the applicant's ability to determine the correct frequency; to tune in and identify the desired station; and to follow a range leg, radial, or appropriate magnetic bearing. A working knowledge of the procedures for requesting radar vectors and DF (direction finding) steers is required. The *Airman's Information Manual* should be used as a reference.

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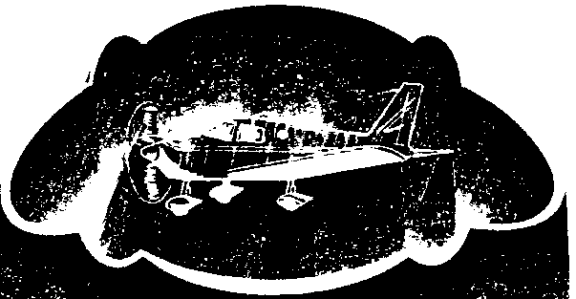
AC 61-5A

FLIGHT TEST GUIDE

[Part 61 Revised]



PRIVATE PILOT

Airplane

1973

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

FLIGHT TEST GUIDE

[Part 61 Revised]

PRIVATE PILOT

Airplane

1973

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE

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CONTENTS

PREFACE

Part 61 (revised) of Federal Aviation Regulations, effective 1 November 1973, establishes a new concept of pilot training and certification requirements. To provide a transition to these revised requirements, Part 61 (revised) permits the applicant, for a period of 1 year after the effective date, to meet either the previous requirements or those contained in the revised part. AC 61–3B, Private Pilot Test Guide, dated 1968, outlines the previous requirements.

This flight test guide, AC 61–54, has been prepared by Flight Standards Service of the Federal Aviation Administration to assist the applicant and his instructor in preparing for the flight test for the Private Pilot Certificate with Airplane Rating under Part 61 (revised). It contains information and guidance concerning the pilot operations, procedures, and maneuvers relevant to the flight test required for that certificate. A suggested flight test checklist is included for the convenience of those who may find such a checklist useful.

In addition to providing help to the applicant and his instructor, this guide will be useful to FAA Inspectors and designated pilot examiners in the conduct and standardization

of flight tests. Persons using this guide in connection with private pilot training and flight tests should also refer to the applicable *Federal Aviation Regulations; Airman's Information Manual; Flight Training Handbook,* AC 61–21; and other pertinent advisory circulars.

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

APPLICANT'S FLIGHT TEST CHECKLIST

(Suggested)

APPOINTMENT WITH INSPECTOR

OR EXAMINER: Name _____

Time/Date _____

ACCEPTABLE AIRPLANE WITH DUAL CONTROLS

- ☐ View-limiting device
- ☐ Aircraft Documents:
  - Airworthiness Certificate
  - Registration Certificate
  - Operating Limitations
- ☐ Aircraft Maintenance Records:
  - Airworthiness Inspections
- ☐ FCC Station License

PERSONAL EQUIPMENT

- ☐ Current Aeronautical Charts
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Logs
- ☐ 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)

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GENERAL INFORMATION

PILOT TRAINING AND CERTIFICATION CONCEPT

Part 61 of the Federal Aviation Regulations has been revised and upgraded to reflect the complexity of the modern aircraft as well as its operating environment. In the past, airman certification requirements could be met by training a student to pass a written test and then to demonstrate his ability to perform predetermined flight training maneuvers during a flight test. Rather than merely duplicating on the flight test the maneuvers used for training, the new training and certification concept requires that the applicant receive instruction in and demonstrate his competency in *all pilot operations* listed in pertinent sections of Part 61 (revised). A pilot operation, as used herein, is a group of related procedures and maneuvers involving skills and knowledge required to safely and efficiently function as a pilot. The specific procedures and maneuvers used to teach the pilot operations are not listed in Part 61 (revised). Instead, the instructor is permitted to select procedures and maneuvers from FAA-approved training publications pertinent to the certificate or rating sought.

The instructor indicates by logbook endorsement that the applicant has demonstrated competency in all the required pilot operations and considers him qualified to pass the flight test. On the flight test, the examiner[1] selects the procedures and maneuvers to be performed by the applicant to show competency in each required pilot operation.

The procedures and maneuvers appropriate to the Private Pilot Certificate with an airplane rating are contained in *AC 61–21, Flight Training Handbook.*

USE OF THIS GUIDE

The pilot operations in this flight test guide, indicated by Roman numerals, are required by Section 61.107 of Part 61 (revised). This guide is intended only to outline appropriate pilot operations and the minimum standards for the performance of each procedure or maneuver which will be accepted by the examiner as evidence of the pilot's competency. It is not intended that the applicant be tested on every procedure or maneuver within each pilot operation, but only those considered necessary by the examiner to determine competency in each pilot operation.

When, in the judgment of the examiner, certain demonstrations are impractical (for

[1] The word "examiner" is used hereafter in this guide to denote either the Federal Aviation Administration Inspector or designated pilot examiner who conducts an official flight test.

example, night flying), competency may be determined by oral testing.

This guide contains an ***Objective*** for each required pilot operation. Under each pilot operation, pertinent procedures or maneuvers are listed with ***Descriptions*** and ***Acceptable Performance Guidelines.***

1. The ***Objective*** states briefly the purpose of each pilot operation required on the flight test.
2. The ***Description*** provides information on what may be asked of the applicant regarding the selected procedure or maneuver. The procedures or maneuvers listed have been found most effective in demonstrating the objective of that particular pilot operation.
3. The ***Acceptable Performance Guidelines*** include the factors which will be taken into account by the examiner in deciding whether the applicant has met the objective of the pilot operation. The airspeed, altitude, and heading tolerances given represent the minimum performance expected in good flying conditions. However, consistently exceeding these tolerances before corrective action is initiated is indicative of an unsatisfactory performance. Any procedure or action, or the lack thereof, which requires the intervention of the examiner to maintain safe flight will be disqualifying. Failure to exercise proper vigilance or to take

positive action to ensure that the flight area has been adequately cleared for conflicting traffic will also be disqualifying.

Emphasis will be placed on procedures, knowledge, and maneuvers which are most critical to a safe performance as a pilot. The demonstration of prompt stall recognition, adequate control, and recovery techniques will receive special attention. Other areas of importance include spatial disorientation, collision avoidance, and wake turbulence hazards.

The applicant will be expected to know the meaning and significance of the airplane performance speeds important to the pilot, and be able to readily find these speeds for the airplane used for the flight test. These speeds include:

V_{so} – the stalling speed or minimum steady flight speed in landing configuration.

V_y – the speed for the best rate of climb.

V_x – the speed for the best angle of climb.

V_a – the design maneuvering speed.

V_{ne} – the never exceed speed.

In the event the private pilot flight test is taken in a multiengine airplane, the Description and Acceptable Performance Guidelines found in Section 1 of AC 61-57, the Multiengine Airplane Class and Type Rating Flight Test Guide, will be used for each re-

quired maneuver *which is performed differently in multiengine airplanes,* rather than those in this guide.

GENERAL PROCEDURES FOR FLIGHT TESTS

The ability of an applicant for a private or commercial pilot certificate, or for an aircraft or instrument rating on that certificate, to perform the required pilot operations is based on the following:

1. Executing procedures and maneuvers within the aircraft's performance capabilities and limitations, including use of the aircraft's systems.
2. Executing emergency procedures and maneuvers appropriate to the aircraft.
3. Piloting the aircraft with smoothness and accuracy.
4. Exercising judgment.
5. Applying his aeronautical knowledge.
6. Showing that he is the master of the aircraft, with the successful outcome of a procedure or maneuver never seriously in doubt.

If the applicant fails any of the required pilot operations he fails the flight test. The examiner or the applicant may discontinue the test at any time when the failure of a required pilot operation makes the applicant ineligible for the certificate or rating sought. If the test is discontinued the applicant is

entitled to credit for only those entire pilot operations that he has successfully performed.

FLIGHT TEST PREREQUISITES

An applicant for the private pilot flight test is required by revised Section 61.39 of the Federal Aviation Regulations to have: (1) passed the appropriate private pilot written test within 24 months before the date he takes the flight test, (2) the applicable instruction and aeronautical experience prescribed for a private pilot certificate, (3) a first, second, or third class medical certificate issued within the past 24 months, (4) reached at least 17 years of age, and (5) a written statement from an appropriately certificated flight instructor certifying that he has given the applicant flight instruction in preparation for the flight test within 60 days preceding the date of application, and finds him competent to pass the test and to have a satisfactory knowledge of the subject areas in which he is shown to be deficient by his airman written test report.

AIRPLANE AND EQUIPMENT REQUIREMENTS FOR FLIGHT TEST

The applicant is required by revised Section 61.45 to provide an airworthy airplane for the flight test. This airplane must be capable of, and its operating limitations must not prohibit, the pilot operations required in

the test. The following equipment is relevant to the pilot operations required by revised Section 61.107 for the private pilot flight test:

1. Two-way radio suitable for voice communications with aeronautical ground stations.

2. A radio receiver which can be utilized for available radio navigation facilities (may be the same radio used for communications).

3. Appropriate flight instruments for the control of the airplane during instrument conditions. Appropriate flight instruments are considered to be those required by FAR Part 91 for flight under instrument flight rules.

4. Engine and flight controls that are easily reached and operated in a normal manner by both pilots.

5. A suitable view-limiting device, easy to install and remove in flight, for simulating instrument flight conditions.

6. Operating instructions and limitations. The applicant should have an appropriate checklist, an Owner's Manual/Handbook, or, if required for the airplane used, an FAA approved Airplane Flight Manual. Any operating limitations or other published recommendations of the manufacturer that are applicable to the specific airplane will be observed.

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PILOT OPERATIONS

Procedures/Maneuvers

I. PREFLIGHT OPERATIONS

Objective

To determine that the applicant can ensure that he meets pilot requirements, that the airplane is airworthy and ready for safe flight, and that suitable weather conditions exist.

Procedures/Maneuvers

A. Certificates and Documents

1. Description The applicant may be asked to present his pilot and medical certificates and to locate and explain the airplane's registration certificate, airworthiness certificate, operating manual or FAA approved Airplane Flight Manual (if required), equipment list, and required weight and balance data. In addition, he is expected to be able to explain the airplane and engine logbooks or other maintenance records.

2. Acceptable Performance Guidelines The applicant shall be knowledgeable regarding the location, purpose, and significance of each required item.

B. Airplane Performance and Limitations

1. Description The applicant may be orally quizzed on the performance capabilities, approved operating procedures, and limitations of the airplane used. This includes power settings, placarded speeds, and fuel and oil requirements. In addition, the manufacturer's published recommendations or FAA approved Airplane Flight Manual should be used to determine the effects of temperature, pressure altitude, wind, and gross weight on performance.

2. Acceptable Performance Guidelines The applicant shall be evaluated on his ability to obtain, explain, and apply the information which is essential in determining the performance of the airplane used.

C. Weight and Balance

1. Description The applicant may be asked to demonstrate the application of the approved weight and balance data for the airplane used to determine that the gross weight and c.g. (center of gravity) location are within limits. Charts and graphs provided by the manufacturer may be used.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his ability to determine the empty weight, maximum gross weight, useful load (fuel, passengers, baggage) by reference to appropriate publications, and his ability to apply this information

to determine that the gross weight and c.g. are within approved limits.

D. Weather Information

1. Description The applicant may be asked to obtain Aviation Weather Reports, Area and Terminal Forecasts, and Winds Aloft Forecasts pertinent to the proposed flight.

2. Acceptable Performance Guidelines The applicant shall demonstrate that he knows what weather information is pertinent and how to best obtain this information, and that he can interpret and understand its significance with respect to his proposed flight.

E. Line Inspection

1. Description The applicant may be asked to demonstrate a visual check to determine the airplane's airworthiness and readiness for flight. This includes all required equipment and documents. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use an orderly procedure in conducting a preflight check of the airplane. He shall know the significance of each item checked and recognize any unsafe condition.

F. Airplane Servicing

1. Description The applicant may be asked to demonstrate a visual inspection to determine that the fuel is of the proper grade and type and the supply of fuel, oil, and other required fluids is adequate for the proposed flight. He should take appropriate action to eliminate possible fuel contamination in the airplane.

2. Acceptable Performance Guidelines The applicant shall know the grade and type of oil and fuel specified for the airplane and be able to determine the amount of fuel required to complete the flight. He shall know where to find all fuel and oil fillers, and the capacity of each tank, as well as the location of the battery, hydraulic fluid reservoirs, anti-icing fluid tanks, etc. He shall also know the proper steps for avoiding fuel contamination during and following servicing.

G. Engine and Systems Preflight Check

1. Description The applicant may be asked to demonstrate a check to determine that the engine is operating within acceptable limits and that all systems, equipment, and controls are functioning properly and adjusted for takeoff. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use proper procedures in engine starting and runup and in

stems, equipment, and
ne that the airplane is
Careless operation in close
structions, ground personnel,
ft shall be disqualifying.

ORT AND TRAFFIC PATTERN TIONS

jective

To determine that the applicant is able to safely and efficiently conform to arrival and departure procedures and established traffic patterns at controlled and noncontrolled airports during day and night VFR operations.

Procedures/Maneuvers

A. Radio Communication and ATC Light Signals

1. Description The applicant may be asked to demonstrate the use of designated frequencies and recommended voice procedures to report position and state intentions regarding the flight, and to obtain pertinent information and clearances. Where applicable, he is expected to use Airport Terminal Information Service, Airport Advisory Service, Control Tower, Approach and Departure Control, UNICOM, and ATC light signals.

2. Acceptable Performance Guidelines The applicant shall determine the type of communication facilities available, select correct frequencies, and use appropriate

communications proce
acknowledge necessary i
to comply with airport tr
instructions without permissi
be disqualifying.

**B. Airport and Runway Mar
Lighting**

1. Description Where available, applicant may be asked to demonstrate proper use of wind and traffic direction i dicators, and markings indicating closed runways, displaced thresholds, taxiways, holding lines, and basic runways. He is also expected to be familiar with taxiway and runway lighting, rotating beacons, obstruction lights, and VASI (Visual Approach Slope Indicator).

2. Acceptable Performance Guidelines The applicant shall know the meaning of standard wind and traffic indicators, markings and lighting, and how they relate to airplane operation. Failure to properly use these aids, creating an unsafe situation, shall be disqualifying.

C. Operations on the Surface

1. Description The applicant may be asked to demonstrate safe operating practices while in close proximity to other aircraft, persons, or obstructions. Emphasis should be placed on use of brakes and power to control taxi speeds, proper positioning of flight controls for existing wind conditions, awareness of possible ground hazards, and

compliance with taxi procedures and instructions. The applicant is expected to take extra precautions when taxiing behind large aircraft.

2. *Acceptable Performance Guidelines* The applicant shall maneuver the airplane on the surface without endangering persons or property or conflicting with a smooth and orderly flow of traffic.

D. Traffic Patterns

1. Description The applicant may be asked to demonstrate prescribed arrival and departure procedures. He is expected to maintain appropriate altitudes, airspeeds, and ground track consistent with instructions received or the established traffic pattern.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of his ability to maneuver the airplane relative to the runway in use. Consideration shall be given to application of wind drift corrections, adequate spacing in relation to other aircraft, and maintaining and controlling altitude and airspeed. Deviation of ± 100 ft. from prescribed traffic pattern altitudes or ± 10 knots from recommended airspeeds shall be considered disqualifying unless corrected promptly.

E. Collision Avoidance Precautions

1. Description The applicant is expected to exercise conscientious and continuous surveillance of the airspace in which

the airplane is being operated to guard against potential mid-air collisions. In addition to "see and avoid" practices, he is expected to use VFR Advisory Service at nonradar facilities, Airport Advisory Service at nontower airports or FSS locations, and Radar Traffic Information Service, where available.

2. Acceptable Performance Guidelines The applicant shall maintain continuous vigilance for other aircraft and take immediate actions necessary to avoid any situation which could result in a mid-air collision. Extra precautions shall be taken, particularly in areas of congested traffic, to ensure that his view of other aircraft is not obstructed by his airplane's structure. When traffic advisory service is used, the applicant shall understand terminology used by the radar controller in reporting positions of other aircraft. Failure to maintain proper surveillance shall be disqualifying.

F. Wake Turbulence Avoidance

1. Description The applicant may be asked to explain how, where, and when wingtip vortices are generated and their characteristics and associated hazards. He should follow recommended courses of action to remain clear of these hazards.

2. Acceptable Performance Guidelines The applicant shall identify the conditions and locations in which wingtip vortices may be encountered and adjust his flight path

so as to avoid these areas. Failure to follow recommended procedures for minimizing the likelihood of flying into wingtip vortices shall be disqualifying.

III. FLIGHT MANEUVERING BY REFERENCE TO GROUND OBJECTS

Objective

To determine that the applicant is able to maneuver the airplane at approximately traffic pattern altitude over a predetermined ground path while dividing his attention inside and outside the airplane.

Procedures/Maneuvers

A. "S" Turns Across a Road

1. Description The applicant may be asked to demonstrate a series of "S" turns across a straight ground reference line approximately perpendicular to the wind. He is expected to plan bank variations to compensate for wind so that each half circle is equal on opposite sides of the line. At each reversal of direction, he should cross the line at a 90° angle with the wings level. A constant altitude should be maintained throughout the maneuver.

2. Acceptable Performance Guidelines The applicant shall readily select ground references and maneuver the airplane in relation to these references. Properly coordinated turns, smooth control usage, and

division of attention shall be required. Deviation of ±100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below minimum safe altitudes prescribed by Regulations, or inadequate clearance of other aircraft shall be disqualifying.

B. Eights Along a Road or Eights Across a Road

1. Description The applicant may be asked to maneuver along a ground track starting above and parallel to a road, then perform a 360° turn in each direction. He is expected to vary the bank to correct for wind so as to arrive back over the road at the starting point upon completion of each 360° turn. The ground track should be in the form of a figure "8".

The applicant may be asked to perform a similar ground track maneuver starting over the intersection of two roads or some point on a road. The turns should be made so the intersection or point, which forms the center of the "8", is crossed in straight-and-level flight. A constant altitude should be maintained throughout the maneuver.

2. Acceptable Performance Guidelines The applicant shall maneuver the airplane so the loops of the "8" are symmetrical. Performance shall be evaluated on the basis of proper wind drift correction, airspeed control, coordination, altitude control, and

vigilance for other aircraft. Deviation of ±100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below minimum safe altitude prescribed by Regulations, or inadequate clearance of other aircraft shall be disqualifying.

C. Rectangular Course

1. Description The applicant may be asked to follow a rectangular or square course around and outside of a selected area. He is expected to correct for wind drift so the ground track is parallel to the sides of the selected area and equidistant from each side. A constant altitude should be maintained throughout the maneuver. This pattern should be performed both to the right and to the left.

2. Acceptable Performance Guidelines The applicant shall readily select the ground reference and maintain the desired track in relation to that reference. Properly coordinated turns, smooth control usage, and division of attention shall be required. Deviation of ±100 ft. from the selected altitude shall be considered disqualifying unless corrected primply. Also, excessive maneuvering to correct for wind drift, flight below minimum safe altitude prescribed by Regulations, or inadequate clearance from other aircraft shall be disqualifying.

D. Turns About a Point

1. Description The applicant may be asked to perform a ground track maneuver in which a constant radius of turn is maintained by varying the bank to compensate for wind drift, so as to circle and maintain a uniform distance from a prominent reference point on the ground. A constant altitude should be maintained throughout the maneuver. This maneuver should be performed both to the right and to the left.

2. Acceptable Performance Guidelines The applicant shall maneuver the airplane so that the ground track is a constant distance from the reference point. Performance shall be evaluated on the basis of proper wind drift correction, airspeed control, coordination, altitude control, and vigilance for other aircraft. Deviation of more than ± 100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below minimum safe altitude prescribed by Regulations, or inadequate clearance from other aircraft shall be disqualifying.

E. Eights Around Pylons

1. Description The applicant may be requested to perform right and left turns around two ground reference points or pylons. A turn should be made in each direction, varying bank to correct for wind drift, resulting in a constant distance from each point.

The ground track should be in the form of a figure "8".

2. *Acceptable Performance Guidelines* The applicant shall maneuver the airplane so that both loops of the "8" are of equal size. Performance shall be evaluated on proper wind drift correction, airspeed control, coordination, altitude control, and vigilance for other aircraft. Deviation of ±100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below minimum safe altitude prescribed by Regulations, or inadequate clearance from other aircraft shall be disqualifying.

IV. FLIGHT AT CRITICALLY SLOW AIRSPEEDS

Objective

To determine that the applicant understands the reason for and can recognize changes in the airplane flight characteristics at critically slow airspeeds in various attitudes and configurations. To determine that the applicant can recognize imminent and full stalls and can accomplish prompt, positive, and effective recoveries in all normally anticipated situations.

Procedures/Maneuvers

A. Maneuvering at Minimum Controllable Airspeed

1. Description The applicant may be asked to maneuver in various configurations

and at such airspeeds that controllability is minimized to the point that if the angle of attack is further increased by an increase in load factor or a decrease in airspeed, an immediate stall would result. The maneuver should be accomplished in medium-banked level, climbing and descending turns, as well as in straight-and-level flight.

2. Acceptable Performance Guidelines The applicant shall be evaluated on his ability to establish the minimum controllable airspeed, to positively control the airplane, and to recognize incipient stalls. Primary emphasis shall be placed on airspeed control. During straight-and-level flight at this speed, the applicant shall maintain altitude within ± 100 ft. and heading within $\pm 10°$ of that assigned by the examiner. Inadequate surveillance of the area prior to and during the maneuver or an unintentional stall shall be disqualifying.

B. Imminent Stalls

1. Description The applicant may be asked to demonstrate recoveries from imminent stalls entered from straight flight and from turning flight with power-on or power-off. He is expected to place the airplane in the attitude and configuration appropriate for flight situations such as takeoffs, departures, landing approaches, and accelerated maneuvers, as directed by the examiner. The applicant should apply control pressures which

result in an increase in angle of attack until the first buffeting or decay of control effectiveness is noted. The recovery should be accomplished immediately by reducing the angle of attack with coordinated use of flight and power controls.

2. Acceptable Performance Guidelines The applicant shall recognize the indications of an imminent stall and take prompt, positive control action to prevent a full stall. The applicant shall be disqualified if a full stall occurs or if it becomes necessary for the examiner to take control of the airplane to avoid excessive airspeed, excessive loss of altitude, or a spin.

C. Full Stalls

1. Description The applicant may be asked to demonstrate recoveries from full stalls entered from straight flight and from turning flight with power-on or power-off. He is expected to establish the attitude and configuration for flight situations such as takeoffs and departures, landing approaches, and accelerated maneuvers. Then he should increase the angle of attack smoothly until a stall occurs, as indicated by a sudden loss of control effectiveness or uncontrollable pitching. Recovery should be accomplished by reducing the angle of attack immediately, and positively regaining normal flight attitude with coordinated use of flight and power controls. The applicant is expected to be aware

of the loss of altitude necessary to recover from a stabilized high rate of descent with the elevator control fully back, if this condition is encountered before a stall develops.

2. Acceptable Performance Guidelines The applicant shall recognize when the stall has occurred and take prompt action to prevent a prolonged stalled condition. The applicant shall be disqualified if a secondary stall occurs or if it becomes necessary for the examiner to take control of the airplane to avoid excessive airspeed, excessive loss of altitude, or a spin.

V. TAKEOFFS AND LANDINGS

Objective

To determine that the applicant can accomplish safe takeoffs and landings under all normally anticipated conditions in a landplane or in a seaplane.

Procedures/Maneuvers

A. Normal and Crosswind Takeoffs (Landplanes)

1. Description The applicant may be asked to demonstrate normal and crosswind takeoffs by aligning the airplane with the runway or takeoff surface and applying takeoff power smoothly and positively while maintaining directional control. In crosswind takeoffs he is expected to hold aileron into the wind and maintain a straight takeoff path by use of rudder and to gradually establish

a pitch attitude which produces an angle of attack that permits normal acceleration and lift off.

The applicant may be asked to make at least one crosswind takeoff with sufficient crosswind to require the use of crosswind techniques, but not in excess of the crosswind limitations of the airplane used.

2. Acceptable Performance Guidelines The applicant's performance of normal and crosswind takeoffs shall be evaluated on the basis of power application, smoothness, wind drift correction, coordination, and directional control. The applicant shall maintain climb speed within ± 5 knots of the desired initial climb speed after liftoff.

B. Normal and Crosswind Landings (Landplanes)

1. Description The applicant may be asked to demonstrate normal and crosswind landings using a final approach speed equal to 1.3 times the stalling speed in landing configuration (1.3 V_{so}), or the final approach speed prescribed by the manufacturer. He should progressively reduce power so that the throttle is closed when the desired touchdown point is assured, or while rounding-out for touchdown. If the airplane is equipped with flaps, landings may be made with full flaps, partial flaps, or no flaps. Forward slips and a slip-to-a-landing may be performed with or

without flaps, unless prohibited by the airplane's operating limitations.

In a tailwheel type airplane, the main wheels and tailwheel should touch the runway simultaneously at or near power-off stalling speed. In a nosewheel type airplane, the touchdown should be on the main wheels with little or no weight on the nosewheel. In strong, gusty surface winds, in a tailwheel type airplane, the round-out should be made to an attitude which permits touchdown on the main wheels only. In crosswind conditions, wind drift corrections should be made throughout the final approach and touchdown. Adequate corrections and positive directional control should be maintained during the after-landing roll.

The applicant may be asked to make at least one crosswind landing with sufficient crosswind to require the use of crosswind techniques, but not to exceed the crosswind limitations of the airplane.

2. Acceptable Performance Guidelines The applicant's performance of normal and crosswind landings shall be evaluated on the basis of his landing technique, judgment, wind drift correction, coordination, power technique, and smoothness. He shall maintain the proper final approach speed within ± 5 knots and touch down in the proper landing attitude within the portion of the runway or landing area specified by the examiner.

Touching down with an excessive side load on the landing gear and poor directional control shall be disqualifying.

C. Seaplane Taxiing

1. Description The applicant may be asked to demonstrate taxiing at slow speeds and on the step, into the wind, downwind, and crosswind. Turns to downwind headings, step turns, sailing, docking, and simulated or actual approaches to a buoy should be included. The applicant should demonstrate taxiing with and without the use of a water rudder, if the seaplane is so equipped.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his proper use of flight controls, power, and water rudder to safely and effectively maneuver the seaplane. Any faulty technique which results in a hazardous situation shall be disqualifying.

D. Seaplane Takeoffs

1. Description The applicant may be requested to demonstrate takeoffs into the wind, and with light crosswind components. He may also be asked to demonstrate, when feasible, or to describe in detail any or all of the following:

a. High-density altitude takeoffs from glassy water;

b. Takeoffs from choppy water or ocean swells; and

c. Takeoffs from streams or inlets with significant current or tide and downstream wind.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of his smooth operation of the power and flight controls, directional control, and ability to achieve an efficient planing attitude promptly and to make a smooth, effective transition to flight. Misuse of the controls, consistent retarding of takeoffs by premature rotation for liftoff, or failure to take immediate corrective action to stop porpoising while on the step shall be disqualifying.

E. Seaplane Landings

1. Description The applicant may be asked to demonstrate landings into the wind, and with light crosswind components. Landing approaches should be made in accordance with the established traffic pattern for the area used, and with a final approach speed of approximately 1.3 times the power-off stalling speed in landing configuration (1.3 V_{so}), or the final approach speed recommended by the aircraft manufacturer. A straight course should be maintained during touchdown and throughout the runout on the surface. The applicant may also be asked to demonstrate, if feasible, or to describe in detail any of the following:

a. Landings on glassy water;

b. Landings on choppy water or ocean swells; and

c. Emergency landings on airports or unprepared fields.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of the accuracy of his approaches, drift correction, correct use of the controls in flight and on the surface, and landing technique. He shall maintain the desired final approach speed within ±5 knots, and touch down smoothly within the area specified by the examiner.

VI. MANEUVERING BY REFERENCE TO INSTRUMENTS

Objective

To determine that the applicant is able to control and maneuver an airplane solely by reference to flight instruments as might be experienced under emergency conditions, and to use the emergency assistance available through radio aids, radar and DF (direction finding) heading instructions.

Procedures/Maneuvers

A. Basic Maneuvers

1. Description The applicant may be asked to demonstrate his ability to control and maneuver the airplane solely by reference to flight instruments while performing straight-and-level flight, turns, climbs and

descents, and while recovering from critical flight attitudes.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of coordination, smoothness, and accuracy. He shall perform turns of at least 180° to within ±20° of a preselected heading, and climbs and descents to within ±100 ft. of a preselected altitude. If the examiner finds it necessary to take over to avoid a stall or to avoid exceeding the operating limitations of the airplane, the applicant shall be disqualified.

B. Use of Radio Aids

1. Description Under simulated instrument conditions the applicant may be asked to follow a VOR radial or "home" to a radio station using ADF (Automatic Direction Finder), as appropriate to the radio equipment in the airplane. No prescribed orientation procedure will be required.

2. *Acceptable Performance Guidelines* The applicant shall follow a radial or "home" to a station while effectively controlling altitude, heading, and airspeed.

C. Use of Radar or DF Heading Instructions

1. Description The applicant may be asked to demonstrate the proper procedures for contacting Approach Control or Flight Service Stations to request emergency assist-

ance. He should be able to follow radar or DF heading instructions while in simulated instrument conditions.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on his ability to obtain and follow radar or DF heading instructions and emergency approach assistance received by radio, while effectively controlling altitude, heading, and airspeed.

VII. CROSS-COUNTRY FLYING

Objective

To determine that the applicant can prepare for and conduct a safe, expeditious cross-country flight.

Procedures/Maneuvers

A. Flight Planning

1. Description The applicant may be asked to plan a cross-country flight to a point at least 2 hours away at the cruising speed of the airplane used. At least one intermediate stop should be included. Planning should include the obtaining of pertinent and available weather information; plotting the course on an aeronautical chart; selecting checkpoints; measuring distances; and computing flight time, headings, and fuel requirements. The Airman's Information Manual should be used as a reference for airport information, NOTAMS, and such other ap-

propriate guidance as may be extracted from its contents.

2. Acceptable Performance Guidelines All flight planning operations shall be meaningful, accurate, and applicable to the trip proposed. The applicant shall explain his plan for the flight, verify his calculations, and present his sources of information and data.

B. Conduct of Planned Flight

1. Description The applicant may be asked to perform the planned flight using pilotage, dead reckoning, and VOR or ADF radio aids as appropriate to the equipment in the airplane. He should make good the desired track, determine position by reference to landmarks, and calculate estimated times of arrival over checkpoints. He may also be asked to intercept and follow a VOR radial or "home" to a radio station using ADF, recognize station passage, and determine position by means of cross bearings.

The applicant should set out on the cross-country flight which he had planned before takeoff. The planned course should be followed at least until the applicant establishes the compass heading necessary to stay on course, and can give a reasonable estimate of his groundspeed and time of arrival at his first point of intended landing.

2. Acceptable Performance Guidelines The applicant shall: (1) establish and maintain headings required to stay on course;

(2) correctly identify position; (3) provide reasonable estimates of times of arrival over checkpoints and destination with an apparent error of not more than 10 minutes; and, (4) maintain altitude within ±200 ft. of the planned altitude.

C. Diversion to an Alternate

1. Description When requested by the examiner to divert to an alternate airport, as might be necessary to avoid adverse weather, the applicant is expected to turn to the new course promptly. This may be accomplished by means of pilotage, dead reckoning, or radio navigation aids.

2. Acceptable Performance Guidelines The applicant shall establish the appropriate heading for the course to the alternate and within a reasonable time give an acceptable estimate of the flying time and required fuel.

VIII. MAXIMUM PERFORMANCE TAKEOFFS AND LANDINGS

Objective

To determine that the applicant can use techniques appropriate to takeoffs and landings on short fields and on soft/rough fields.

Procedures/Maneuvers

A. Short-Field Takeoff and Maximum Climb

1. Description The applicant may be asked to demonstrate a takeoff from a simu-

lated short field with obstructions. He sh
apply power promptly and smoothly,
rotate to liftoff just as the best angle-of-cl
airspeed is attained. He is expected to m
tain that speed until the assumed obstruct
have been cleared. The applicant is expe
to know and understand the effectiveness
the best rate-of-climb and best angle-of-cl
airspeeds of the airplane to obtain maxi
climb performance. The flap settings
airspeeds prescribed by the airplane m
facturer should be used.

***2. Acceptable Performance Gu
lines*** The applicant's performance shal
evaluated on the basis of his plann
smoothness, directional control, and accur
In simulating a short-field takeoff, the li
and climb shall be performed within
knots of the best angle-of-climb speed.

B. Short-Field Landing

1. Description The applicant ma
asked to demonstrate a landing from ove
assumed 50-ft. obstruction using a final
proach speed which will result in little o
floating after the throttle is closed during
flare for touchdown. The airplane sh
touch down within the area designated by
examiner, at minimum controllable airsp
Upon touchdown, the applicant is expecte
properly apply brakes to minimize the a
landing roll. Power, flaps, or moderate
should be used as necessary on the last
ment of the final approach.

Procedures/Maneuvers

A. Preparation and Equipment

1. Description The applicant may be asked to demonstrate how he would prepare for a local or cross-country night flight. This requires that he be familiar with: (1) airport lighting; (2) the airplane's lighting system and its operation; (3) the need for a personal flashlight; and, (4) the weather conditions pertinent to night flight. Particular attention should be given to the temperature/dewpoint spread due to the possibility of ground fog forming during night flights.

2. Acceptable Performance Guidelines The applicant shall explain the significance of the items peculiar to the preparation for night flights.

B. Takeoffs and Landings

1. Description An actual demonstration of takeoffs and landings at night may be required. If required, the applicant is expected to explain and demonstrate: (1) proper use of power during the approach and landing phase; (2) efficient use of landing lights; (3) safe climb and approach paths; (4) safe taxi speeds; (5) recognition of position relative to other aircraft by the location and color of their lights; and, (6) the dangers of spatial disorientation. If an actual demonstration is not required, the foregoing may be satisfied by oral quizzing.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of his ability to explain or demonstrate, as required by the examiner, the various techniques and aspects of night takeoffs and landings. He shall understand the importance of constant vigilance for other aircraft on the ground and in the air, and the precautions necessary to avoid wake turbulence and spatial disorientation.

C. VFR Navigation

1. Description An actual demonstration of night navigation may be required. When required, the applicant is expected to follow procedures similar to those described in the guide under "Cross-country Flying." If an actual night demonstration is not required, the foregoing may be satisfied by a daylight demonstration or oral quizzing.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of the Acceptable Performance Guidelines under "Cross-country Flying" in this guide, with special emphasis on the pecularities of night flying.

X. EMERGENCY OPERATIONS

Objective

To determine that the applicant can react promptly and correctly to emergencies which may occur during flight.

Procedures/Maneuvers

A. Partial or Complete Power Malfunctions

1. Description The applicant may be asked to demonstrate a knowledge of corrective actions for: (1) partial loss of power; (2) complete power failure; (3) rough engine; (4) carburetor ice; (5) fuel starvation; and (6) fire in the engine compartment. The examiner may, with no advance warning, reduce power to simulate engine malfunction.

2. Acceptable Performance Guidelines Performance shall be evaluated on the applicant's prompt analysis of the situation and on his remedial course of action. He shall perform the emergency procedures in compliance with the manufacturer's published recommendations. Any action which creates unnecessary additional hazards shall be disqualifying.

B. Systems or Equipment Malfunctions

1. Description The applicant may be asked to demonstrate a knowledge of corrective actions for: (1) inoperative electrical system (generator, alternator, battery or circuit breaker); (2) electrical fire or smoke in cockpit; (3) gear or flap malfunctions; (4) door opening in flight; and (5) inoperative elevator trim tab. Where practicable, the examiner may, with no advance warning, simulate flap malfunctions, landing gear malfunctions, or an inoperative electrical system.

The applicant is expected to perform emer gency procedures for the simulated malfunc tion.

2. *Acceptable Performance Guide- lines* Performance shall be evaluated on th applicant's prompt analysis of the situatio and his remedial course of action. He shal perform the emergency procedures in com pliance with the manufacturer's publishe recommendations. Any action which create unnecessary additional hazards shall be dis qualifying.

C. Lost Procedures

1. Description The applicant may b asked to explain the proper courses of actio to be taken in the event he becomes lost, i trapped on top of an overcast, loses radi communications, or encounters unanticipate adverse weather.

2. *Acceptable Performance Guide- lines* Performance shall be evaluated on the applicant's ability to promptly and correctly analyze the situation and describe the appro- priate remedial action.

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