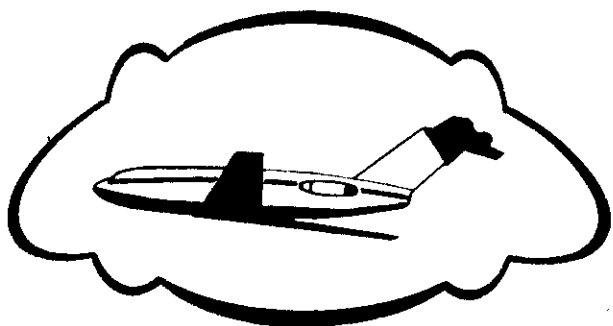


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AC 61-77

PRACTICAL TEST GUIDE

(Part 61 Revised)



**AIRLINE TRANSPORT
PILOT
Airplane**



1974

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

AC 61-77

**PRACTICAL TEST GUIDE
[Part 61 Revised]**

**AIRLINE TRANSPORT PILOT
AIRPLANE**

1974

**U.S. DEPARTMENT OF
TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE**

PREFACE

This guide, AC 61-77, has been prepared by the Flight Standards Service of the Federal Aviation Administration to assist the applicant and his instructor in preparing for the Airline Transport Pilot Certificate with an Airplane Rating under Part 61 (revised) of the Federal Aviation Regulations, which became effective November 1, 1973. For a period of 1 year after the effective date, the applicant may meet either the previous requirements or those of the revised Part. AC 61-49, the Airline Transport Pilot Airplane Practical Test Guide, dated 1972, outlines the previous requirements.

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 practical tests. This guide describes the maneuvers and procedures required by Appendix A of Part 61 (revised); stipulates the conditions and limitations under which they are to be performed; prescribes the required level of competence; and expresses the factors which are to be taken into account by the Inspector or examiner in deciding whether the applicant has satisfactorily

accomplished those maneuvers and procedures. A suggested test checklist is included for the use of those who may find it to be helpful.

Since this is a test guide and *not* a training handbook, the descriptions of maneuvers and procedures contained herein are not of a "how-to-accomplish" nature. Detailed explanations and descriptions of how the maneuvers and procedures should be performed are contained in training publications such as the operating instructions of the airplane being used, the FAA *Flight Training Handbook*, the FAA *Instrument Flying Handbook*, and in commercial publications generally accepted by recognized authorities on airline transport operations.

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

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APPLICANT'S TEST CHECKLIST
(Suggested)

APPOINTMENT WITH INSPECTOR

OR EXAMINER: Name _____

Time/Date _____

ACCEPTABLE AIRPLANE

- View-limiting device
- Aircraft Documents:
 - Airworthiness Certificate
 - Registration Certificate
 - FAA Approved Airplane Flight Manual (if applicable)
 - Operating Limitations
 - Weight and Balance Records
- Aircraft Maintenance Records:
 - Airworthiness Inspections
- FCC Station License

PERSONAL EQUIPMENT

- Current Aeronautical Charts
- Computer
- Flight Plan Form
- Current AIM

PERSONAL RECORDS

- Pilot Certificate
- Medical Certificate
- Logbook
- Notice of Disapproval (if applicable)
- FCC Radiotelephone Operator Permit
- Examiner's Fee (if applicable)

GENERAL INFORMATION

AIRLINE TRANSPORT PILOT AIRPLANE PRACTICAL TEST

This guide describes the practical test requirements for the Airline Transport Pilot Airplane Certificate and associated Class and Type ratings. All references to Part 61 of the Federal Aviation Regulations pertain to Part 61 (revised) which became effective November 1, 1973.

An applicant for an Airline Transport Pilot Certificate with an Airplane Rating must meet the requirements prescribed in FAR §§ 61.151, 61.153, 61.155, and 61.157. The holder of an Airline Transport Pilot Certificate with a Rotorcraft Rating who applies for an Airplane Rating must comply with §§ 61.153, 61.157, and 61.165(c). An applicant who does not already have an Instrument Pilot Rating must, in addition to the maneuvers and procedures prescribed in this guide, comply with § 61.65(g), as appropriate to the airplane type.

Throughout the performance of maneuvers and procedures described in this guide, and

those selected by the examiner¹ in compliance with § 61.65(g), if appropriate, the applicant must demonstrate good judgment commensurate with a high level of safety. In determining whether such judgment is shown, the examiner will consider the applicant's adherence to approved procedures, his actions based on his analysis of situations for which there is no prescribed procedure or recommended practice, and his prudence and care in selecting a course of action. When the applicant's final performance of *any* required maneuver or procedure is unsatisfactory, the practical test is unsatisfactory. A practical test may be discontinued at any time by the examiner or the applicant; however, once started, every effort should be made to complete it. If the test is discontinued and the applicant is later retested, he is entitled to credit for those items he has performed successfully.

Each maneuver or procedure must be performed in flight except to the extent that certain maneuvers or procedures may be performed in an airplane simulator with a visual system (visual simulator), or an airplane simulator without a visual system (non-visual simulator), or a training device, or may be waived. The current Appendix A

¹The word "examiner" is used hereafter in this guide to denote either the Federal Aviation Administration Inspector or FAA designated pilot examiner who conducts official flight tests for Airline Transport Pilot Certificates or Type Ratings.

of Part 61 should be consulted to identify the maneuvers or procedures which are affected by these provisions.

USE OF THIS GUIDE

The practical test outlined in this guide contains seven sections. Each section provides the **Objective, Description, and Acceptable Performance Guidelines** for pertinent maneuvers and procedures.

1. The **Objective** states briefly the purpose of each maneuver or procedure required on the practical test.
2. The **Description** explains the maneuver or procedure and stipulates the conditions and limitations under which it is to be performed.
3. The **Acceptable Performance Guidelines** state the factors which will be taken into account by the examiner in deciding whether the applicant has met the objective of the maneuver or procedure at the required level of competence. The airspeed, altitude, and heading tolerances given represent the minimum performance expected in good flying conditions. Consistently exceeding those tolerances before corrective action is initiated is indicative of an unsatisfactory performance.

In addition to the specific factors considered for a particular maneuver or procedure, the examiner will evaluate the

applicant's performance on the basis of the judgment, knowledge, accuracy, and smoothness he displays. Any procedure or action, or lack thereof, which requires the intervention of the examiner to maintain safe flight will be disqualifying. Failure of the applicant to take positive action to ensure that the flight area is clear of conflicting traffic will also be disqualifying. A competent performance, therefore, is one in which the applicant is obviously the master of the airplane and the successful and safe completion of the maneuver or procedure is never seriously in doubt.

The maneuvers and procedures set forth in this guide must be performed in a manner that satisfactorily demonstrates the applicant's knowledge and skill with respect to—

- a. the airplane, its systems and components; and
- b. proper control of airspeed, configuration, direction, altitude, and attitude in accordance with procedures and limitations contained in the manufacturer's published recommendations,² and

²The phrase "manufacturer's published recommendations" is used hereafter in this guide to denote FAA approved Airplane Flight Manual material when such material has been approved for the airplane type or other manufacturer's published recommendations such as "Owner's Manual," "Owner's Handbook," "Bulletins," and "Letters" for the safe operation of the airplane model or series, in the absence of an approved Airplane Flight Manual.

c. compliance with approved enroute, instrument approach, missed approach, ATC, or other applicable procedures.

Throughout the practical test, emphasis will be placed on the hazards of spatial disorientation, mid-air collision, and wake turbulence. The applicant is expected to know the meaning and significance of the airplane performance speeds important to an airline transport pilot, and be able to readily find the speeds appropriate to the airplane being used. These speeds include at least:

- V_a —design maneuvering speed.
- V_{fe} —maximum flap extended speed.
- V_{le} —maximum landing gear extended speed.
- V_{lo} —maximum landing gear operating speed.
- V_{lof} —lift-off speed.
- V_{mc} —minimum control speed with critical engine inoperative.
- V_{mo}/M_{mo} —maximum operating limit speed.
- V_{ne} —never exceed speed.
- V_r —rotation speed.
- V_{so} —stalling speed or minimum steady flight speed in landing configuration.
- V_{st} —stalling speed or minimum steady flight speed obtained in a specified configuration.
- V_x —speed for the best angle-of-climb with all engines operating.

V_y —speed for the best rate-of-climb with all engines operating.

V_1 —critical engine failure speed.

V_2 —takeoff safety speed.

AIRPLANE AND EQUIPMENT REQUIREMENTS FOR PRACTICAL TEST

The applicant is required by § 61.45 to provide an airworthy airplane for the practical test. This airplane must be capable of, and its operating limitations must not prohibit its use in, any maneuver or procedure required on the test.

PRACTICAL TEST PREREQUISITES

An applicant for the airline transport pilot airplane practical test is required by § 61.39 to have: (1) passed the Airline Transport Pilot Airplane written test within 24 months before the date he takes the practical test,³ (2) the applicable instruction and aeronautical experience prescribed in Part 61, and (3) at least a first-class medical certificate issued within the past 6 months.

³The 24-month limitation does not apply to an applicant for an airline transport pilot certificate or an additional aircraft rating on that certificate who has been, since passing the written test, continuously employed as a pilot, or as a pilot assigned to flight engineer duties by, and is participating in an approved pilot training program of a U.S. air carrier or commercial operator, or who is rated as a pilot by, and is participating in, a pilot training program of a U.S. scheduled military air transportation service.

PROCEDURES/MANEUVERS

I. PREFLIGHT

A. Equipment Examination (Oral)

1. **Objective.** To determine that the applicant has a practical knowledge of the airplane, its operation and limitations.

2. **Description.** As part of the practical test, the equipment examination must be closely coordinated with, and related to, the flight maneuvers portion, but may not be given during the flight maneuvers portion. Notwithstanding § 61.39, the equipment examination may be given to an applicant who has completed a ground school that is part of an approved training program under the Federal Aviation Regulations Part 121 for the airplane type involved and who is recommended by his instructor. The equipment examination must be repeated if the flight maneuvers portion is not satisfactorily completed within 60 days. The equipment examination must cover—

- a. subjects requiring a practical knowledge of the airplane, its powerplants, systems, components, and

operational and performance factors;

- b. normal, abnormal, and emergency procedures and the operations and limitations related thereto; and
- c. the appropriate provisions of the manufacturer's published recommendations.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's knowledge of the appropriate manufacturer's published recommendations, his understanding of the airplane, its systems and components, and his knowledge of its weight and balance limitations.

B. Preflight Inspection

1. Objective. To determine that the applicant possesses the necessary knowledge and ability to ascertain that the airplane is safe for flight.

2. Description. The applicant will be required to—

- a. conduct an actual visual inspection of the exterior and interior of the airplane, locating each item, and explaining briefly the purpose of inspecting it; and
- b. demonstrate the use of the prestart checklist, appropriate control system checks, starting procedures, radio and electronic equipment

checks, and the selection of proper navigation and communications radio facilities and frequencies prior to flight.

If a flight engineer is a required crewmember for the particular type airplane, the actual visual inspection may either be waived or it may be replaced by using an approved pictorial means that realistically portrays the location and detail of inspection items.

3. Acceptable Performance Guidelines. The applicant's performance shall be evaluated on the accuracy of his explanation of the operational purpose of each item and the thoroughness of his inspection.

C. Taxiing

1. Objective. To determine that the applicant is competent in maneuvering the airplane expeditiously and safely on the surface.

2. Description. The applicant will be required to demonstrate taxiing or sailing and docking procedures in compliance with instructions issued by the appropriate traffic control authority or by the examiner.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's attention to safety; proficiency in handling the airplane; consideration for other aircraft and personnel on ramps, taxiways, or water areas; the use of power, brakes, and

flight controls for directional control; and the proper use of nosewheel steering, tailwheel lock, or water rudder as applicable.

D. Powerplant Checks

1. Objective. To determine that the applicant can make the necessary powerplant and associated systems' checks to assure the airplane's immediate readiness for flight.

2. Description. As appropriate to the airplane type, the applicant will be required, through the use of a suitable checklist, to perform checks to determine that the performance of the powerplants is within acceptable limits, to check the operation of associated systems, and to properly set powerplant controls.

3. Acceptable Performance Guidelines. The applicant shall be evaluated on the proficiency and thoroughness with which he accomplishes the powerplant checks and the knowledge he displays regarding the airplane engines, systems, and related operational checks.

II. TAKEOFFS

A. Normal

B. Instrument

C. Crosswind

D. Powerplant Failure

E. Rejected

1. Objective. To determine that the applicant is competent in performing takeoffs under normal and emergency conditions, and under various meteorological conditions; and that he can safely reject a takeoff when appropriate.

2. Description. The applicant will be required to perform the following types of takeoffs:

- a. *Normal.* One normal takeoff which, for the purpose of this maneuver, begins when the airplane is taxied into position on the runway to be used.
- b. *Instrument.* One takeoff with simulated entry into instrument conditions at or before reaching an altitude of 100 feet above the airport elevation.
- c. *Crosswind.* One crosswind takeoff, if practicable under the existing meteorological, airport, and traffic conditions.
- d. *Powerplant Failure.* One takeoff with a simulated failure of the most critical powerplant either—
 - (i) at a point after V_1 and before V_2 that, in the judgment of the examiner, is appropriate to the airplane type under the prevailing conditions; or

(ii) at a point as close as possible after V_1 when V_1 and V_2 (or V_1 and V_r) are identical; or

(iii) at the appropriate speed for nontransport category airplanes.

- e. *Rejected.* A normal takeoff which is rejected after reaching a reasonable speed, determined by giving due consideration to the airplane's characteristics, runway length, surface conditions, wind direction and speed, brake heat energy, and any other pertinent factors that may adversely affect safety or the airplane.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's takeoff and reject technique, judgment, and observance of traffic patterns and control tower instructions, coordination, and smoothness. Airplane configuration, airspeed, and operational procedures shall be in accordance with those recommended in the applicable operating instructions for the airplane being used.

III. INSTRUMENT PROCEDURES

A. Area Departure and Area Arrival

1. Objective. To determine that the applicant can adhere to ATC departure and arrival clearances, including assigned radials and the proper use of navigation facilities.

2. Description. Upon acceptance of departure and arrival clearances, the applicant will be required to—

- a. adhere to actual or simulated ATC clearances (including assigned radials); and
- b. properly use available navigation facilities as appropriate to the airplane's equipment. Either area departure or area arrival, but not both, may be waived under § 61.157(c).

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's acceptance of and adherence to ATC clearances and his knowledge of, and use of, available navigation facilities; also his knowledge of, and adherence to, airspeed limits relative to altitude and distance from the airport.

B. Holding

1. Objective. To determine that the applicant can enter and fly a holding pattern properly.

2. Description. This maneuver includes entering, maintaining, and leaving holding patterns. The applicant will be required to perform the maneuver under either area departure or area arrival.

3. Acceptable Performance Guidelines. Evaluation shall be based on the ap-

plicant's entry procedure, compliance with the holding direction/radial, timing, and staying within the holding airspace. The applicant shall maintain altitude within ± 100 feet of the assigned altitude. Holding airspeed shall be maintained within ± 10 knots of the holding airspeed recommended for the airplane being used.

C. ILS and Other Instrument Approaches

1. Objective. To determine that the applicant can make safe and accurate instrument approaches under normal conditions and with a powerplant failure.

2. Description. The applicant will be required to perform the following:

- a. At least one normal ILS approach with all engines operating.
- b. At least one manually controlled ILS approach with a simulated failure of one powerplant. The simulated failure should occur before initiating the final approach course and continue to touchdown or through the missed approach procedure.
- c. At least one nonprecision approach procedure that is representative of the nonprecision approach procedures the applicant is likely to use.
- d. At least one nonprecision approach procedure, other than the approach

procedure performed under subparagraph (c) of this paragraph, that the applicant is likely to use. If performed in a synthetic instrument trainer, the procedures must be observed by the examiner, or, if the applicant has completed an approved training course under Part 121 of the Federal Aviation Regulations for the airplane type involved, the procedures may be observed by a person qualified to act as an instructor or check airman under the approved training program.

Each instrument approach must be performed according to any procedures and limitations approved for the approach facility used. The instrument approach begins when the airplane is over the initial approach fix for the approach procedure being used (or handed-off to the final approach controller in the case of a PAR approach) and ends when the airplane touches down on the runway or when transition to a missed approach configuration is completed. Instrument conditions need not be simulated below 100 feet above touchdown zone elevation.

3. Acceptable Performance Guidelines. Airplane configuration and airspeeds shall be in accordance with those recommended in the applicable operating instructions for the airplane being used. Arrival at

the authorized minimum in position for a straight-in landing is an acceptable performance for nonprecision instrument approaches. The ILS approach, to be considered acceptable, shall be conducted so that glide slope and localizer indications do not exceed one dot deviation.

Altitude shall be maintained within ± 100 feet of prescribed altitude during initial approach, and within -0 to $+50$ feet of minimum descent altitude or decision height, as appropriate. Airspeed shall be controlled within ± 10 knots of the recommended airspeed for the airplane configuration from the initial approach fix to the final fix inbound and within -0 to $+10$ knots of reference airspeed with appropriate wind/gust factor adjustment from the final fix to minimum descent altitude or decision height, as appropriate.

D. Circling Approaches

1. Objective. To determine that the applicant can maneuver the airplane safely under conditions of low visibility to align with and land on a more favorable runway when a straight-in approach is not practicable.

2. Description. The applicant will be required to perform at least one circling approach under the following conditions:

- a. The portion of the circling approach to the authorized minimum circling approach altitude should be made

under simulated instrument conditions.

- b. The approach should be made to the authorized minimum circling approach altitude followed by a change in heading and the necessary maneuvering (by visual reference) to maintain a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach.
- c. The circling approach should be performed without excessive maneuvering and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30°.

When the maneuver is performed in an airplane, it may be waived as provided in § 61.157(c) if local conditions beyond the control of the pilot prohibit the maneuver or prevent it from being performed as required.

The circling approach maneuver is not required for a pilot employed by a certificate holder subject to the operating rules of Part 121, if the certificate holder's manual prohibits a circling approach in weather conditions below 1,000 and 3 (ceiling and visibility).

3. Acceptable Performance Guidelines. During the circling approach, the ap-

plicant shall not bank the airplane more than 30°. He shall maintain altitude within -0 to +100 feet of the minimum descent altitude until the airplane is in a position from which a normal approach to a landing can be accomplished, and preferably until turning final. Airspeed shall be controlled within -0 to +10 knots of the recommended airspeed for the airplane configuration from the final fix inbound to the point where the transition is made from the approach configuration to the landing configuration, and within -0 to +10 knots of reference airspeed with appropriate wind/gust factor adjustment after the landing configuration is established.

E. Missed Approaches

1. Objective. To determine that the applicant can accurately and safely transition from approach and landing configuration to climb configuration, and can fly the airplane throughout the missed approach procedure from minimum approach altitude to the missed approach altitude under normal conditions *and* with a simulated powerplant failure.

2. Description. The applicant will be required to perform at least two missed approaches, with at least one from an ILS approach. The accomplishment of a complete approved missed approach procedure will be required at least once and, at the discretion of the examiner, a simulated powerplant

failure may be required during any of the missed approaches. These maneuvers may be performed either independently or in conjunction with maneuvers required under Sections III or V of this guide. At least one must be performed in flight.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's judgment in deciding to execute the missed approach, the appropriateness of his communications and navigation procedures, his ability to maintain positive airplane control, and to operate all airplane systems in accordance with applicable operating instructions for the airplane being used. Descent below the MDA or DH, as appropriate, prior to initiation of the missed approach procedure shall be disqualifying except in those instances where the runway environment was in sight at the MDA or DH.

IV. IN-FLIGHT MANEUVERS

A. Steep Turns

1. Objective. To determine that the applicant can control an airplane in a steep bank under maneuvering load factors, and can maintain altitude and orientation.

2. Description. The applicant will be required to perform at least one steep turn in each direction. Each steep turn should involve a bank angle of 45° with a heading change of at least 180° but not more than 360° .

3. Acceptable Performance Guidelines. The applicant shall maintain altitude within ± 100 feet of the entry altitude, and a bank angle of 45° , $\pm 5^\circ$, after the turn is established, and recover within $\pm 10^\circ$ of the assigned headings. Airspeed shall be controlled within ± 10 knots of that recommended for the airplane being used. Special attention will be directed to the applicant's smoothness, coordination, and orientation.

B. Approaches to Stalls

1. Objective. To determine that the applicant can recognize approaches to stalls in various airplane configurations, and can make prompt and effective recoveries.

2. Description. For the purpose of this maneuver, the required approach to a stall is reached when there is a perceptible buffet or other response to the initial stall entry. Except as provided below, at least three approaches to stalls will be required, as follows:

- a. One in the takeoff configuration (except where the airplane uses only a zero-flap takeoff configuration).
- b. One in a clean configuration.
- c. One in a landing configuration.

At the examiner's discretion, the performance of one approach to a stall may be required in one of the above configurations while in a turn with a bank angle between

15° and 30°. Two of the three approaches to stalls required by this paragraph may be waived as provided in § 61.157(c).

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's ability to recognize an approach to a stall as indicated by perceptible buffet or from the activation of stall warning devices, and on his ability to initiate a recovery at the first indication of an approaching stall. He shall accomplish recoveries positively and smoothly, using appropriate and coordinated flight and power controls and with the least loss of altitude consistent with the recovery of full control effectiveness. After recovery, the applicant shall make an expeditious return to the original altitude. Additional evaluation shall be based on his prompt, smooth, and positive control application.

C. Specific Flight Characteristics

1. Objective. To determine that the applicant can control and recover from specific flight characteristics that are peculiar to the airplane type.

2. Description. The applicant will be required to recover from specific flight characteristics that are peculiar to the airplane type.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's demonstration of smooth, prompt,

and positive recovery to normal flight, stressing minimum loss of altitude commensurate with safety. He shall maintain positive control without exceeding the limitations of the airplane being used.

D. Powerplant Failures

1. Objective. To determine that the applicant can use the correct procedures for feathering or shutting down an engine, or engines in flight, and that he can maneuver an airplane effectively and safely with an engine, or engines, inoperative.

2. Description. In addition to the specific requirements for maneuvers with simulated powerplant failures, the examiner may require a simulated powerplant failure at any time during the test.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's ability to maintain heading within $\pm 20^\circ$ of the original heading during the engine shutdown and restart procedures, and to maintain his altitude within ± 100 feet of the original altitude if it is within the capability of the airplane used. The applicant shall promptly identify the inoperative engine after a simulated power failure and use accurate shutdown and restart procedures as prescribed in the manufacturer's published recommendations. In an airplane not capable of maintaining altitude with an engine inoperative under existing conditions, the applicant shall

maintain an airspeed within ± 5 knots of the engine-out best rate-of-climb speed and shall use prescribed operating procedures and proper trim settings.

V. LANDINGS AND APPROACHES TO LANDINGS

A. Normal Landing

B. Landing in Sequence from an ILS Approach

C. Crosswind Landing

D. Landing with Simulated Failure of 50% of Available Powerplants

E. Landing from Circling Approach

F. Rejected Landing

G. No Flap Visual Approach to Landing

H. Accuracy Approaches and Spot Landings (For Single Powerplant Rating Only)

1. Objective. To determine that the applicant can consistently make safe landings under normal, abnormal, and emergency conditions, and can safely reject a landing when required.

2. Description. Notwithstanding the authorizations for the combining of maneuvers and for waiver of maneuvers, the applicant will be required to make at least three actual landings (one to a full stop). These landings must include the types listed below

but more than one type may be combined where appropriate:

- a. Normal landing.
- b. Landing in sequence from an ILS instrument approach except that, if circumstances beyond the control of the pilot prevent an actual landing, the examiner may accept an approach to a point where in his judgment a landing to a full stop could have been made. In addition, where a simulator approved for the landing maneuver out of an ILS approach is used, the approach may be continued through the landing and credit given for one of the three landings required by this section.
- c. Crosswind landing, if practicable under existing meteorological, airport, and traffic conditions.
- d. Maneuvering to a landing with simulated powerplant failure, as follows:
 - (i) In the case of three-engine airplanes, maneuvering to a landing with an approved procedure that approximates the loss of two powerplants (center and one outboard engine), or
 - (ii) In the case of other multien-gine airplanes, maneuvering to a

landing with a simulated failure of 50 percent of available powerplants, with the simulated loss of power on one side of the airplane. However, before January 1, 1975, in the case of a four-engine turbojet powered airplane, maneuvering to a landing with a simulated failure of the most critical powerplant may be substituted therefor, if a flight instructor in an approved training program under Part 121 certifies to the Administrator that he has observed the applicant satisfactorily perform a landing in that type airplane with a simulated failure of 50 percent of the available powerplants. However, the substitute maneuvers may *not* be used if the Administrator determines that training in the two-engine-out landing maneuvers provided in the training program is unsatisfactory.

- e. Landing under simulated circling approach conditions except that if circumstances beyond the control of the pilot prevent a landing, the examiner may accept an approach to a point where in his judgment a landing to a full stop could have been made.

The circling approach maneuver is not required for a pilot employed

by a certificate holder subject to the operating rules of Part 121, if the certificate holder's manual prohibits a circling approach in weather conditions below 1,000 and 3 (ceiling and visibility).

- f. A rejected landing (including a normal missed approach procedure) that is rejected approximately 50 feet over the runway and approximately over the runway threshold. This maneuver may be combined with instrument, circling, or missed approach procedures; but instrument conditions need not be simulated below 100 feet above the runway.
- g. A zero-flap visual approach to a point where, in the judgment of the examiner, a landing to a full stop on the appropriate runway could be made.

This maneuver is not required for a particular airplane type if the Administrator has determined that the probability of flap extension failure on that type is extremely remote due to system design. In making this determination, the Administrator determines whether checking on slats only and partial flap approaches is necessary.

- h. For a single powerplant rating only, unless the applicant holds a commercial pilot certificate, he must accomplish accuracy approaches and spot landings that include a series of three landings from an altitude of 1,000 feet or less, with the engine throttled and 180° of change in direction. The airplane must touch the ground in a normal landing attitude beyond and within 200 feet of a designated line. At least one landing must be from a forward slip. Although circular approaches are acceptable, 180° approaches using two 90° turns with a straight base leg are preferred.

3. Acceptable Performance Guidelines. The applicant shall control traffic pattern airspeeds within -0 to +10 knots of that recommended for that type airplane and the appropriate airplane configuration until reaching final approach. He shall control airspeed on the final approach within -0 to +10 knots of reference speed with appropriate wind/gust factor adjustment as recommended by the operating instructions for the airplane being used. He shall also control threshold airspeeds as recommended by those instructions with appropriate wind/gust factor adjustment.

VI. NORMAL AND ABNORMAL PROCEDURES

A. Anti-icing and Deicing Systems

B. Autopilot Systems

C. Automatic or Other Approach Aid Systems

D. Stall Warning Devices, Stall Avoidance Devices, Stability Augmentation Devices

E. Airborne Radar Devices

F. Any Other Systems, Devices, or Aids Available

G. Hydraulic and Electrical System Failures and Malfunctions

H. Landing Gear and Flap System Failures or Malfunctions

I. Failure of Navigation or Communications Equipment

1. Objective. To determine that the applicant has a practical knowledge of the systems and devices appropriate to the airplane type.

2. Description. The applicant will be required to demonstrate the proper use of as many of the systems and devices listed in test items A. through I. above as the examiner finds are necessary to determine that the applicant has a practical knowledge of the use of the systems and devices appropriate to the airplane type.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's judgment and his demonstration of knowledge of the procedures for the airplane used.

VII. EMERGENCY PROCEDURES

A. Fire In Flight

B. Smoke Control

C. Rapid Decompression

D. Emergency Descent

E. Any Other Emergency Procedure Outlined in the Appropriate Manufacturer's Published Recommendations

1. Objective. To determine that the applicant has an adequate knowledge of, and the ability to perform, emergency procedures appropriate to the airplane in use.

2. Description. The applicant will be required to demonstrate the proper emergency procedures for as many of the emergency situations listed in test items A. through E. above, as the examiner finds are necessary to determine that he has an adequate knowledge of, and ability to perform, such procedures.

3. Acceptable Performance Guidelines. Evaluation shall be based on the applicant's demonstration of knowledge of the

emergency procedures listed above for the airplane used, the judgment displayed, and the accuracy of his operations.