



**PA - 28 - 161 / 181
INSTRUMENT RATING
OPERATIONS AND MANEUVERS**

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INTRODUCTION

Tech Aviation's flight training program is designed to train pilots to the highest possible standards, preparing students for entry into the exciting and demanding world of aviation. Our goal is to not only give the students the academic and flight training required by the Federal Aviation Regulations (FARs), but to go beyond the regulatory requirements and instill an "aeronautical mindset" that encompasses the traits commonly associated with the professional aviator. Some of these traits include leadership, judgment, communication skills, decision making, and cockpit discipline.

It is commonly accepted fact that anyone can be trained to physically handle and aircraft; the skills required are really not that difficult. It is an entirely different matter to develop the maturity and discipline required of a pilot who takes the lives of passengers into his or her hands. The time to develop that maturity and discipline is not sitting in the cockpit of an aircraft loaded with passengers / friends / family. It is NOW!

Two of the most important attributes of a competent pilot are consistency and flexibility. The competent pilot knows when to be rigidly consistent (follow procedures) and when it is acceptable to deviate from procedures to accomplish a task (such as during an emergency situation). The competent pilot also has the ability to integrate his or her own techniques (developed through training, practice, and experience) without deviating from procedures.

The Operations and Maneuvers Manual is designed to be used in conjunction with the appropriate flight training syllabus and Practical Test Standards (PTS). The lesson elements of the syllabus will be looked over first, followed by review of the pertinent areas in the Operations and Maneuvers manual. Finally, the PTS should be consulted to determine the completion objectives required by the FAA. Note that many of the PTS tasks do not have a specific procedure. In Such cases it is left to the instructor and student to determine the best method of meeting the PTS objectives.

To further enhance standardization, it is important that some key concepts be understood so terminology among instructors and students does not cause confusion.

POWER CONDITIONS

In order to fly an airplane in the safest and most efficient manner possible, it is important to understand the relationship of pitch and power and how they relate to controlling aircraft performance. The standard convention for explaining this relationship is to use two power conditions:

POWER CONDITION ONE: *IF POWER IS AVAILABLE AND VARIABLE, THEN POWER CONTROLS AIRSPEED AND PITCH CONTROLS VERTICAL RATE.*

Power Conditions One is used throughout normal traffic patterns, instrument approaches and maneuvers. This does not mean that the power is changed constantly, but rather set until it is determined that another setting is more appropriate. It is important to remember that neither airspeed nor vertical rate change instantaneously, but must be allowed to stabilize before adjusting the pitch and / or power setting.

POWER CONDITION TWO: *IF POWER IS FIXED EITHER MECHANICALLY OR PROCEDURALLY, THEN PITCH CONTROLS BOTH AIRSPEED AND VERTICAL RATE.*

Power Condition Two is used when either very high on the glide path and the power is reduced to idle, when practicing power off and reduced power landings, and during normal climbs and descents.

CREW COORDINATION

Although the student and instructor are not acting as a crew in the traditional sense, they are nonetheless both sitting at the controls and each is responsible for certain aspects of aircraft operations. In order to prevent misunderstandings, the following rules will be followed on all dual instructional flights:

- 1) Neither pilot will activate any system with out first stating their intention. For instance, if the instructor decides that the fuel pressure is reading slightly low and wishes to turn on the fuel pump, he/she will announce "Fuel pump on," and then turn it on. These call-outs include flap usage. Before moving the flaps, the pilot will announce, for example, "Flaps 25" or "Flaps zero." Ambiguous statements such as "Flaps down" or "I'm dumping the flaps" should be avoided.
- 2) When exchanging control of the airplane, the pilot flying will say "You have the controls." The pilot taking the control of the aircraft will respond "I have the controls" and place their hands on the wheel. **THESE ARE THE EXACT WORDS TO BE USED.** Saying "You've got it" or vaguely waving in the direction of the controls in unacceptable.
- 3) Radio communications should be carried out by one person, not interchanged between the pilots indiscriminately. If the person handling the radio misses a call, and the other person hears it, the person hearing it should say, for example, "The

tower just called and cleared us to land,” whereupon the pilot handling the radios will transmit the appropriate response.

IN ALL TECH AVIAITON DUAL OPERATIONS THE FLIGHT INSTRUCTOR IS THE PILOT IN COMMAND OF RECORD AND HAS FINAL AUTHORITY AND RESPONSIBILITY FOR THE FLIGHT.

BRIEFINGS

During each dual flight, the student is responsible for conducting three briefings: a Passenger Briefing, a Takeoff Briefing, and an Approach Briefing.

Passenger Briefing

The passenger briefing should be conducted once everyone is seated, prior to the Before Start Checklist. It must include at a minimum:

- 1) Fastening and unfastening seat belts and shoulder harnesses
- 2) The location and method of opening doors and emergency exits
- 3) The location of fire extinguishers and other emergency equipment
- 4) Smoking rules (NO SMOKING!!)
- 5) Any other information the pilot deems necessary or interesting (such as the type of weather expected)

Example:

“Your seat is equipped with a seat belt and shoulder harness. To fasten seat belt, insert the flat portion of the belt into the open end of the buckle and pull the belt snugly. To release the seat belt and shoulder harness, pull up on the tab located on top of the buckle (demonstrate). This airplane has one door. To open the door, (demonstrate). In addition to the door, the airplane has an emergency exit... (point out and describe, if applicable). There is a fire extinguisher located under the pilot’s seat. This is a non-smoking flight. The weather is forecast to be nice along our route, although we may hit some light turbulence. Any questions??”

Takeoff Briefing

The takeoff briefing should be based on actual conditions and the performance data on the takeoff data card. The briefing may be conducted any time prior to the completion of the Before Takeoff Checklist (if workload permits, it may be done while taxiing from the ramp to the run up area). The takeoff briefing must include the following information:

- 1) Type of takeoff (normal, soft field, short field)
- 2) Runway in use
- 3) Takeoff weight
- 4) Applicable V Speeds
- 5) Departure route and altitude
- 6) Nav radio set up
- 7) Emergency procedures

Example:

“This will be a normal takeoff, runway 22. Takeoff weight is ____ pounds. Vr is ____, Vy is _____. We’ll be departing to the northwest, climbing initially to 3000 feet. Nav 1 and Nav 2 are set to LVZ. If the engine fails during takeoff we’ll land on the remaining runway. If the runway is insufficient, we’ll select a suitable landing site and proceed according to the Engine Failure Checklist. If there are any other malfunctions we’ll remain in the traffic pattern and land as soon as possible. Any Questions?”

Approach Briefing

The approach briefing must be completed prior to finishing the Approach Checklist (normally, about 10 NM from the landing airport). Prior to doing the briefing, the pilot must obtain weather information for the destination (ATIS or airport advisory). The VFR approach briefing must contain the following information:

- 1) The type of pattern entry
- 2) The runway in use
- 3) Traffic pattern altitude
- 4) The type of landing planned
- 5) Vref
- 6) Safety consideration

Example:

“This will be a left downwind entry for runway 22 at Wilkes-Barre, traffic pattern altitude 2000 feet, no flap landing. Vref is _____. The runway is wet, so I’ll minimize braking to reduce the chance of hydroplaning. Any questions?”

The IFR approach briefing must include the following information:

- 1) The name of the approach
- 2) MSA for the applicable sector
- 3) Initial of vectoring altitude
- 4) Altitude at the final approach fix, final approach point, or glide slope intercept (“Final” altitude)
- 5) MDA of DA (rounded up to the nearest 10 feet)
- 6) Missed approach procedure
- 7) Approach speed and Vref
- 8) Avionics set up
- 9) Safety considerations

Example:

“This will be the ILS runway 22 to AVP. MSA is 4000 feet. Initial altitude is 3800, final altitude is 2800, and minimums are 1560. Missed approach procedure is to climb to 4000 direct CYE NDB and hold. Approach speed will be ____, Vref is _____. Nav 1 is set to AVP ILS, Nav 2 is set to LHY VOR, the ADF is set to Crystal Lake, and DME is on hold. Both NAVs will be set to the AVP ILS during the approach. Several aircraft in front of us have reported windshear, so I’ll pay extra attention to airspeed and vertical rate.”

WEIGHT AND BALANCE CALCULATIONS

Students will perform a weight and balance calculation before every flight, using the standard weight and balance data form. There are two methods of calculating the weight and balance: 1) The moment of each station may be mathematically computed using the supplied arms, or 2) The loading graph may be used to determine the moments. Although each method is equally accepted, students are expected to be able to perform the calculations both ways.

NOTE: On local flights, the taxi/trip fuel will be calculated at 10 GPH. On cross country flights, use the data in the aircraft POH/AFM.

TAKEOFF AND LANDING DATA (TOLD) CARD

In addition to the weight and balance data, a TOLD card must be completed prior to every flight.

SINGLE ENGINE TAKEOFF DATA:

1) Weather (Wx):

Copy the weather at the departure airport, or, if it is unavailable, estimate the wind, temperature and altimeter setting.

2) Heading and Crosswind Component (HW COMP and XW COMP):

To calculate the headwind and crosswind component, use the wind components chart in the POH/AFM. The student should also be able to estimate the wind components based on wind sock indications.

3) Pressure Altitude and Density (PA and DA):

Pressure altitude is calculated by adding the difference between the barometric pressure and standard pressure to the airport elevation. Density altitude can be determined using a density altitude chart or flight computer.

4) V speed , Takeoff Distance and Takeoff Weight:

To determine V_r and T/O Distance, use the “Lift-Off Speed” (plus 5 kts) computed on the 0 Degree Flaps Takeoff Performance (normal takeoff) or the 25 Degree Flaps Takeoff Performance (short field and soft field takeoff) chart in the POH/AFM. Do not use the Ground Roll charts. V_x and V_y are 63 KIAS and 79 KIAS, respectively. The takeoff weight is taken directly from the weight and balance form.

SINGLE ENGINE LANDING DATA:

1) Landing Distance, No Wind:

The no wind landing distance is calculated using the Landing Distance (over a 50' barrier) performance chart in the POH/AFM prior to the flight (It would be very difficult to use the chart in flight). The pressure altitude and temperature of the arrival airport should be estimated conservatively.

2) Weather (Wx):

The arrival airport weather should be written in the space provided. If no weather information is available, estimate the weather based on the best available information.

3) Headwind and Crosswind Components (HW COMP and XW COMP):

Although the POH wind components chart may be consulted, this could prove difficult in the airplane, so estimate the wind components based on the arrival airport weather, or if the weather is not available, from the best available information.

4) Airport Info:

Information for the airport of intended landing should be placed in this space (com/nav frequencies, airport diagram, runway lengths, etc.).

5) Vref:

Vref (reference speed) is the final approach speed of the aircraft. The aircraft should be established in its final landing configuration at Vref no later than 400' AGL. Vref is determined as follows:

Flaps 0-10: $V_{ref} = 68 \text{ KIAS} + \frac{1}{2} \text{ gust factor}$

Flaps 25-40: $V_{ref} = 70 \text{ KIAS} + \frac{1}{2} \text{ gust factor}$

NOTE: The TOLD card is completed for the first takeoff and landing only.

CHECKLIST PROCEDURES

Checklists are designed to aid the pilot in remembering flight critical and /or easily forgotten items, and to ensure that those items are performed in a systematic and timely manner. The check list is neither an operating manual nor a panacea for poor airmanship! In order to be useful, however, the checklist must be used properly and in conscientious manner. Checklist use is Mandatory for all Tech Aviation flight operations, and its use will be graded accordingly.

The Normal Checklist uses a standard challenge and response format.

Although in-flight problems that result in immediate danger to the crew and aircraft are rare, it is imperative to study and practice emergency procedures on a regular basis. More specifically, since emergencies result in increased pilot stress, these procedures must be overlearned. Overlearning has been accomplished when the pilot can immediately perform the procedures without hesitation, cues or guidance. This does not mean that non-normal procedures should be done at a frenzied speed, since trying to perform them too quickly could result in making the situation worse. Non-normal procedures should be carried out at the same smooth, steady pace as normal procedures.

The Non-Normal Checklist uses both memorizations backed up by the challenge and response format.

PREFLIGHT PREPARATION

INITIAL AIRCRAFT ACCEPTANCE: (CANISTER CHECK)

- 1) Verify that the aircraft Hobbs time and Tachometer are completed and correct
- 2) Review past discrepancies, deferred items and assure that no open discrepancies exist
- 3) Verify all aircraft and equipment inspections are current including:
 - a. 50 hour events
 - b. 100 hour events
 - c. Annual events
 - d. Transponder Certification
 - e. Altimeter Certification
 - f. Altitude Encoder
 - g. ELT Battery
 - h. VOR receiver check (if IFR)
- 4) Check oil and fuel first to avoid any delays on departure

CROSS COUNTRY FLIGHT PLANNING

*Instrument Rating Practical Test Standards, Area of Operation 1, Task B
Instrument Pilot Manual*

WEATHER INFORMATION

*Instrument Rating Practical Test Standards, Area of Operation 1, Task A
Instrument Pilot Manual*

PREFLIGHT PROCEDURES

AIRCRAFT SYSTEMS RELATED TO IFR OPERATIONS

*Instrument Rating Practical Test Standards, Area of Operation 2, Task A
Instrument Pilot Manual*

AIRCRAFT FLIGHT INSTRUMENTS AND NAVIGATION EQUIPMENT

*Instrument Rating Practical Test Standards, Area of Operation 2, Task B
Instrument Pilot Manual*

INSTRUMENT COCKPIT CHECK

*Instrument Rating Practical Test Standards, Area of Operation 2, Task B
Instrument Pilot Manual*

AIR TRAFFIC CONTROL CLEARANCES & PROCEDURES

AIR TRAFFIC CONTROL CLEARANCES

*Instrument Rating Practical Test Standards, Area of Operation 3, Task A
Instrument Pilot Manual*

COMPLIANCES WITH DEPARTURE, ENROUTE, AND ARRIVAL PROCEDURES
AND CLEARANCES

*Instrument Rating Practical Test Standards, Area of Operation 3, Task B
Instrument Pilot Manual*

HOLDING PROCEDURES

- 1) Tune and identify the navigation facility.
- 2) Reset heading indicator to magnetic compass.
- 3) 3 minutes or 5 NM from holding fix slow to 90 KIAS (2000 RPM)
- 4) Carburetor heat on.
- 5) Over the fix enter the hold using proper entry
- 6) Do 5 T's
 - a. Time – Take the time
 - b. Turn – To entry heading
 - c. Twist – Verify OBS is set to inbound course.
 - d. Throttle – Verify power is set for 90 KIAS
 - e. Talk – Report time and altitude entering the hold.
- 7) After on minute outbound, or as necessary based on ground speed , turn to intercept inbound course
- 8) Over the fix turn to outbound heading.
- 9) Abeam the fix or wings level, whichever is last, start the outbound time.
- 10) After on minute outbound, or as necessary based on ground speed , turn to intercept inbound course
- 11) Start the inbound time – wings level or intercepting the inbound course, whichever happens first.
- 12) Adjust out bound time to achieve one minute inbound leg.
- 13) Adjust outbound heading so that course intercept occurs at the completion of the inbound turn.
- 14) Departing Hold, Report leaving use appropriate speed.

*Instrument Rating Practical Test Standards, Area of Operation 4, Task C
Instrument Pilot Manual*

FLIGHT BY REFERENCE TO INSTRUMENTS

STRAIGHT AND LEVEL FLIGHT

*Instrument Rating Practical Test Standards, Area of Operation 4, Task A
Instrument Pilot Manual*

CHANGE OF AIRSPEED

*Instrument Rating Practical Test Standards, Area of Operation 4, Task B
Instrument Pilot Manual*

CONSTANT AIRSPEED CLIMBS AND DESCENTS

*Instrument Rating Practical Test Standards, Area of Operation 4, Task C
Instrument Pilot Manual*

RATE CLIMBS AND DESCENTS

*Instrument Rating Practical Test Standards, Area of Operation 4, Task D
Instrument Pilot Manual*

TIMED TURNS TO MAGNETIC COMPASS HEADINGS

*Instrument Rating Practical Test Standards, Area of Operation 4, Task E
Instrument Pilot Manual*

STEEP TURNS

NOTE: Minimum safe altitude for this maneuver is 1500' AGL.

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Pick a visual reference point.
- 3) Note pitch attitude for level flight (2100RPM=95KIAS)
- 4) Smoothly roll into a 45 degrees bank.
- 5) Rolling past 30 degrees of bank.
 - a. Add power to maintain airspeed (2200 RPM)
 - b. Increase back pressure to maintain altitude.
- 6) Trim may be used to relieve the back pressure.
- 7) Rolling past 30 degrees of bank.
 - a. Decrease power to maintain airspeed (2100 RPM)
 - b. Decrease back pressure to maintain altitude.
- 8) Roll out on desired heading while maintaining altitude and airspeed, and immediately repeat the maneuver in the opposite direction.
- 9) Re-establish Training Cruise and complete the Post maneuver Check.

*Instrument Rating Practical Test Standards, Area of Operation 4, Task F
Instrument Pilot Manual*

RECOVERY FROM UNUSUAL FLIGHT ATTITUDES

Initiating the recovery from an unusual attitude, check the airspeed indicator first and use the following procedures:

AIRSPEED INCREASING:

- 1) Close the throttle.
- 2) Check the turn coordinator to determine if the airplane is in a bank. Roll the wings level using a combination of the turn coordinator, heading indicator, and attitude indicator. (The gyro instruments may tumble and become unreliable), so verify their operation by cross checking against the other instruments.
- 3) Slowly increase the pitch and bring the airplane back to level flight using the VSI, altimeter, airspeed indicator and attitude indicator.

AIRSPEED DECREASING:

- 1) Apply takeoff power.
- 2) Decrease the pitch and bring the airplane back to level flight using the VSI, altimeter, airspeed indicator and attitude indicator.
- 3) Check the turn coordinator to determine if the airplane is in a bank. Roll the wings level using a combination of the turn coordinator, heading indicator, and attitude indicator. (The gyro instruments may tumble and become unreliable), so verify their operation by cross checking against the other instruments.
- 4) After recovering from the unusual attitude, resume straight and level flight. Complete the Post-Maneuver Check.

Private Pilot Practical Test Standards, Area of Operation 4, Task G

TAKEOFFS

INSTRUMENT TAKEOFF (ITO)

- 1) Taxi into takeoff position.
- 2) Set the attitude indicator.
- 3) Set the heading indicator to the runway magnetic heading.
- 4) Announce "Takeoff" and smoothly apply full throttle.
- 5) Check the engine instruments "Engine Instruments Checked."
- 6) Check RPM "RPM Checked."
- 7) Maintain precise heading control with rudders.
- 8) Passing 40 KIAS "Airspeed Alive."
- 9) At calculated airspeed (55-60 KIAS) "Rotate" initiate rotation.
- 10) Set pitch to 5 degrees nose up using attitude indicator.
- 11) When VSI and altimeter indicate a climb, "Positive Rate."
- 12) Adjust pitch to climb at 79 KIAS.
- 13) Passing 1000' AGL complete the Climb Checklist.

*There are no specific standards for this maneuver
Instrument Pilot Manual*

NAVIGATION AIDS

INTERCEPTING AND TRACKING VOR/VORTAC RADIALS

- 1) Tune and identify the facility.
- 2) Reset the heading indicator to the magnetic compass
- 3) Determine what radial the aircraft is currently on.
- 4) Set the OBI to the desired course.
- 5) If the course is 30 degrees or less from the present course turn up to 60 degrees in the direction of the CDI deflection. (use twice the difference)
- 6) If the course is more than 30 degrees from the present course, turn up to 90 degrees in the direction of the CDI deflection.
- 7) Maintain the intercept heading until the CDI starts to center.
- 8) As the CDI centers, turn on course.

EXAMPLE: The pilot centers the course deviation indicator with a “FROM” indication and determines that the airplane is presently on the 250 radial. The desired radial is 270 outbound. Twice the difference between the present radial and the desired radial is 40 degrees ($270-250=20 * 2 = 40$). To intercept the 270 radial outbound, an intercept heading of 310 would be used.

*Instrument Rating Practical Test Standards, Area of Operation 4, Task F
Instrument Pilot Manual*

INTERCEPTING AND TRACKING A DME ARC

- 1) Tune and identify the navaid and DME
- 2) Reset heading indicator to magnetic compass.
- 3) Tracking the course to the DME fix.
- 4) Calculate when to start turn (take 5% of ground speed 100 kts = .5 NM)
- 5) Determine whether the ARC will be to left or right
- 6) Start the turn to intercept the arc by distance calculation
- 7) Turn to a heading that is 90 from the radial you are tracking.
- 8) Not DME distance after turn is complete
- 9) Adjust heading in 10 degree increments to maintain assigned DME distance
 - a. Every 10 degree Radial change should be a 10 heading Change
- 10) To help maintain situational awareness, use the #2 OBS to determine your position along the arc.
- 11) At the lead radial, turn to an appropriate intercept heading.

Private Pilot Practical Test Standards, Area of Operation 7, Task A
Commercial Pilot Practical Test Standards, Area of Operation 7, Task A
Private & Commercial Pilots Manual

INTERCEPTING AND TRACKING NDB BEARINGS

- 1) Tune and identify.
- 2) Reset heading indicator to magnetic compass
- 3) Turn the airplane parallel to the desired course.
- 4) Note the relative bearing in relation to the nose or the tail.
- 5) If the difference is 30 degrees or less, turn up to 45 degrees in the direction of the needle.
- 6) If the difference is more than 30 degrees or less, turn up to 90 degrees in the direction of the needle.
- 7) Maintain the intercept heading until the angle between the needle and the “nose” or “tail” is equal to the intercept angle. (correction = deflection)
- 8) Lead needle to roll out on course.
- 9) When course has been intercepted, maintain a heading which corresponds to the Course TO of Bearing From.
- 10) When a five degree off course deviation is indicated, turn 20 degrees toward the head of the needle.
- 11) Maintain the new heading until the angle of deflection from “nose” or “tail” is 20 degrees then take out half of the intercept angle (correction = deflection)
- 12) Continue to make small correction angle changes as needed.

NOTE: Magnet Heading (MH) + Relative Bearing (RB) = Magnetic Bearing (MB)

*Instrument Rating Practical Test Standards, Area of Operation 5, Task B
Instrument Pilot Manual*

INSTRUMENT APPROACH PROCEDURES

APPROACHES WITH COURSE REVERSAL

- 1) Review the approach plate and check frequencies, course, altitude and missed approach procedures.
- 2) Prior to reaching the initial approach fix (IAF), tune and identify the navaid.
- 3) Reset the heading indicator to magnetic compass.
- 4) Prior to IAF slow to 100 KIAS. Complete the Approach Checklist
- 5) At IAF, do the 5 T's:
 - a. Time – Start timer
 - b. Turn – To track outbound course
 - c. Twist – Set OBS to outbound course
 - d. Throttle – Slow to 90 kts (2000 RPM)
 - i. When cleared, begin descent to initial approach altitude
 - e. Talk – Make requested reports
- 6) Set Flaps to 10 degrees
- 7) Complete the descent checklist.
- 8) Complete course reversal within published limit.
- 9) Set OBI to inbound course
- 10) Intercept final approach course inbound.
- 11) Fly published altitude(s)

*Instrument Rating Practical Test Standards, Area of Operation 6
Instrument Pilot Manual*

RADAR VECTORS FOR APPROACH

- 1) Review the approach plate and check frequencies, course, altitude and missed approach procedures.
- 2) Prior to reaching the initial approach fix (IAF), tune and identify the navaid.
- 4) Set the heading indicator to magnetic compass.
- 5) When within 30 degrees of final approach course, or 5 miles of the final approach fix (FAF).
 - a. Slow to 90 KIAS (2000 RPM)
 - b. Complete Before Landing / Approach Checklist
- 6) When cleared for the approach, intercept the final approach course inbound.
- 7) Fly published altitude(s)

*Instrument Rating Practical Test Standards, Area of Operation 6
Instrument Pilot Manual*

PRECISION APPROACH (ILS)

- 1) Prior to reaching the initial approach fix (IAF), tune and identify the navaid.
- 5) Reset the heading indicator to magnetic compass.
- 6) Prior to IAF slow to 100 KIAS. Complete the Approach Checklist
- 7) Intercepting the localizer announce “Localizer alive.” flaps 10 and slow to 90 KIAS
- 8) At FAF, do the 5 T’s:
 - a. Time – Start timer
 - b. Turn – To track outbound course
 - c. Twist – Set OBS to outbound course
 - d. Throttle – Set to (1700 RPM)
 - e. Talk– Make requested reports
- 9) Begin a descent at ~ 500 FPM, following the glide slope.
- 10) 1000’ above DA announce “One thousand to minimums.”
- 11) 500’ above DA announce “Five hundred to minimums.”
- 12) 100’ above DA announce “One hundred to minimums.”
- 13) If the runway environment becomes visible at or before reaching the DA and a normal descent can be commenced, or a circling maneuver can be safely started, announce “Runway in sight, continue.” Slow to Vref (flaps may be set as desired above 400’ AGL).
- 14) If the Runway environment is not in sight upon reaching the DA, announce “Go-around.” Complete the go-around procedure. Passing 400’ AGL begin the missed approach procedure.

*Instrument Rating Practical Test Standards, Area of Operation 6, Task C
Instrument Pilot Manual*

NON-PRECISION APPROACH (LOC, VOR, NDB OR GPS)

- 1) Prior to reaching the initial approach fix (IAF), tune and identify the navaid.
- 2) Reset the heading indicator to magnetic compass.
- 3) Prior to IAF slow to 100 KIAS. Complete the Approach Checklist
- 4) Intercepting the inbound course announce "Course alive." flaps 10 and slow to 90 KIAS
- 5) At FAF, do the 5 T's:
 - a. Time – Start timer
 - b. Turn – To track outbound course
 - c. Twist – Set OBS to outbound course
 - d. Throttle – Set to (1300 RPM)
 - e. Talk– Make requested reports
- 6) Begin a descent at 700'/minute (minimum).
- 7) Make sure to comply with all step down fixes.
- 8) 1000' above MDA announce "One thousand to minimums."
- 9) 500' above MDA announce "Five hundred to minimums."
- 10) 100' above MDA announce "One hundred to minimums."
- 11) Level off at the appropriate MDA.
- 12) If the runway environment is not in sight upon reaching the MDA:
 - a. If using DME, announce "one DME to go" when 1 DME from MAP
 - b. If using time, announce "one minute to go" when 1 minute from MAP
- 13) If the runway environment becomes visible at or before reaching the MDA and a normal descent can be commenced, or a circling maneuver can be safely started, announce "Runway in sight, continue." Slow to Vref (flaps may be set as desired above 400' AGL).
- 14) If the Runway environment is not in sight upon reaching the MAP, announce "Go-around." Complete the go-around procedure. Passing 400' AGL begin the missed approach procedure.

*Instrument Rating Practical Test Standards, Area of Operation 6, Task A
Instrument Pilot Manual*

ASR APPROACH

- 1) Follow heading and altitude instructions as given by ATC.
- 2) Reset the heading indicator to magnetic compass.
- 3) Complete the Approach Checklist within five miles of the descent point as indicated by ATC.
- 4) Course guidance is provided by ATC.
- 5) Begin a descent at 700'/minute (minimum) when instructed by ATC.
- 6) Make sure to comply with all directions.
- 7) 1000' above MDA announce "One thousand to minimums."
- 8) 500' above MDA announce "Five hundred to minimums."
- 9) 100' above MDA announce "One hundred to minimums."
- 10) Level off at the appropriate MDA.
- 11) If the runway environment is not in sight upon reaching the MDA:
 - a. If using DME, announce "one DME to go" when 1 DME from MAP
 - b. If using time, announce "one minute to go" when 1 minute from MAP
- 12) If the runway environment becomes visible at or before reaching the MDA and a normal descent can be commenced, or a circling maneuver can be safely started, announce "Runway in sight, continue." Slow to Vref (flaps may be set as desired above 400' AGL).
- 13) If the Runway environment is not in sight upon reaching the MAP, announce "Go-around." Complete the go-around procedure. Passing 400' AGL begin the missed approach procedure.

*Instrument Rating Practical Test Standards, Area of Operation 6, Task
Instrument Pilot Manual*

MISSED APPROACH PROCEDURE

NOTE: The term “go-around” must be differentiated from “missed approach.” A go-around is the procedure used during a rejected landing, and is performed the same in IMC as it is VMC. A missed approach is a navigational procedure designed to keep the airplane clear of obstacles and put it in position to attempt another approach or divert to an alternate.

- 1) If the runway environment is not in sight at the MDA or DA, announce “Go-around” while simultaneously applying takeoff power and pitching to normal climb attitude.
- 2) At Vy set flaps to 0 degrees.
- 3) Report missed approach and intentions to ATC or area traffic.
- 4) Unless otherwise instructed by ATC, begin the missed approach procedure passing 400’ AGL.
- 5) Passing 1000’ AGL complete the After Takeoff Checklist.

*Instrument Rating Practical Test Standards, Area of Operation 6, Task D
Instrument Pilot Manual*

CIRCLING APPROACH PROCEDURE

- 1) If the runway environment becomes visible at or before the MDA or DA, and a circling maneuver can safely be commenced, announce “Runway in sight, continue.”
- 2) Establish the aircraft on downwind approximately ½ NM from the runway at or slightly above the MDA.
- 3) When in a position from which a normal 500 FPM descent can be made to the runway, reduce the power to approximately 1700 RPM and start the descent.

NOTE: If visual contact with the runway environment is lost at any time during the circling maneuver, immediately execute a go-around. Passing 400’ AGL, turn in the shortest direction toward the missed approach course and perform the missed approach procedure.

*Instrument Rating Practical Test Standards, Area of Operation 6, Task F
Instrument Pilot Manual*

LANDING FROM A STRAIGHT-IN OR CIRCLING APPROACH PROCEDURE

*Instrument Rating Practical Test Standards, Area of Operation 6, Task F
Instrument Pilot Manual*

EMERGENCY OPERATIONS

LOSS OF COMMUNICATIONS

*Instrument Rating Practical Test Standards, Area of Operation 7, Task A
Instrument Pilot Manual*

LOSS OF GYRO ATTITUDE AND/OR HEADING INDICATORS

*Instrument Rating Practical Test Standards, Area of Operation 7, Task B
Instrument Pilot Manual*

POSTFLIGHT PROCEDURES

CHECKING INSTRUMENTS AND EQUIPMENT

*Instrument Rating Practical Test Standards, Area of Operation 8
Instrument Pilot Manual*