



PA – 28R- 201
PRIVATE PILOT AND COMMERCIAL PILOT
MANEUVERS AND PROCEDURES

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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 Vr and T/O Distance, use the “Lift-Off Speed” (plus 5 KIAS) 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. Vx and Vy are shown in the chart below. The takeoff weight is taken directly from the weight and balance form.

<u>Configuration</u>	<u>Vx</u>	<u>Vy</u>
(Gear UP)(Flaps UP)	78 KIAS	90 KIAS
(Gear DOWN)(Flaps UP)	72 KIAS	78 KIAS

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 40: $V_{ref} = 75 \text{ KIAS} + \frac{1}{2} \text{ gust factor}$

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

TAKEOFFS, LADINGS, AND GO-AROUNDS

NORMAL TAKEOFF AND CLIMB

- 1) Flaps, set takeoff position (0 degrees)
- 2) Taxi into takeoff position.
- 3) Announce "Takeoff" and smoothly apply full throttle.
- 4) Check the engine instruments "Engine Instruments Checked."
- 5) Check RPM and M.P. "RPM Checked", "Manifold Pressure Checked"
- 6) Maintain directional control with rudders.
- 7) Passing 40 KIAS "Airspeed Alive."
- 8) At calculated airspeed (70 KIAS) "Rotate" initiate rotation.
- 9) When VSI and altimeter indicate a climb, "Positive Rate."
- 10) Adjust pitch to climb at V_x (gear down) 78 KIAS.
- 11) Positive rate of climb (with no available runway to land on) gear up "Gear UP"
- 12) Adjust pitch to climb at V_y (gear up) 90 KIAS.
- 13) Passing 500' AGL set M.P (25") & RPM (2500 RPM)
- 14) Passing 1000' AGL complete the Climb Checklist.

NORMAL APPROACH AND LANDING

- 1) Complete Before Landing Checklist.
- 2) Enter traffic pattern on a 45 degree entry to the downwind at least 2 mile from the runway at traffic pattern altitude (TPA.)
- 3) Slow to 100 KIAS (19" M.P. 2400 RPM)
- 4) Level pitch attitude
- 5) One half mile from runway, turn Downwind.
- 6) Abeam the touchdown point, gear down (Below 129 KIAS), flaps 10 degrees (Vfe 103 KIAS max)
- 7) Confirm landing gear is down and locked "Gear Down Three Green".
- 8) Reduce power (16" M.P.) Set prop full forward
- 9) Slow to 90 KIAS
- 10) Initiate a descent (~ 300 feet per min.)
- 11) When the runway is 45 degrees off the tail turn base.
- 12) Adjust power as needed.
- 13) Set Flaps to 25 degrees and slow to 80 KIAS GUMP Check
- 14) Turn final to align with runway centerline.
- 15) Set Flaps to 40 degrees and slow to 75 KIAS
- 16) Adjust pitch and power for descent.
- 17) At round out, reduce power to idle and continue to flare to touchdown on the main wheels first.
- 18) After nose wheel is down, gently apply brakes.

CROSSWIND TAKEOFF AND CLIMB

- 1) Note wind direction and speed.
- 2) Taxi into takeoff position.
- 3) Flaps, set takeoff position (0 degrees)
- 4) Apply FULL ailerons into the wind and elevator neutral.
- 5) Announce "Takeoff" and smoothly apply full throttle.
- 6) Check the engine instruments "Engine Instruments Checked."
- 7) Check RPM and M.P. "RPM Checked", "Manifold Pressure Checked"
- 8) Maintain directional control with rudders.
- 9) Passing 40 KIAS "Airspeed Alive."
- 10) Adjust ailerons to keep wings level during ground roll.
- 11) At calculated airspeed (70 KIAS) "Rotate" initiate rotation.
- 12) When VSI and altimeter indicate a climb, "Positive Rate."
- 13) Adjust pitch to climb at V_x (gear down) 78 KIAS.
- 14) Positive rate of climb (with no available runway to land on) gear up "Gear UP"
- 15) Adjust pitch to climb at V_y (gear up) 90 KIAS.
- 16) Passing 500' AGL set M.P (25") & RPM (2500 RPM)
- 17) Passing 1000' AGL complete the Climb Checklist.

CROSSWIND APPROACH AND LANDING

- 1) Complete Before Landing Checklist.
- 2) Enter traffic pattern on a 45 degree entry to the downwind at least 2 mile from the runway at traffic pattern altitude (TPA.)
- 3) Slow to 100 KIAS (19" M.P. 2400 RPM)
- 4) Level pitch attitude
- 5) One half mile from runway, turn Downwind.
- 6) Abeam the touchdown point, gear down (Below 129 KIAS), flaps 10 degrees (Vfe 103 KIAS max)
- 7) Confirm landing gear is down and locked "Gear Down Three Green".
- 8) Reduce power (16" M.P.) Set prop full forward
- 9) Slow to 90 KIAS
- 10) Initiate a descent (~ 300 feet per min.)
- 11) When the runway is 45 degrees off the tail turn base.
- 12) Adjust power as needed.
- 13) Set Flaps to 25 degrees and slow to 80 KIAS GUMP Check
- 14) Turn final to align with runway centerline.
- 15) Set Flaps to 40 degrees and slow to 75 KIAS
- 16) Adjust pitch and power for descent.
- 17) Use wing low or crab method for drift control.
- 18) At round out, reduce power to idle and continue to flare to touchdown on the upwind main wheel first.
- 19) As the airplane slows increase aileron deflection into the wind.
- 20) After nose wheel is down, gently apply brakes.

NOTE: Adjust final approach speed by half the gust factor
Adjust Flap setting as needed for directional control

SHORT FIELD TAKEOFF AND CLIMB

- 1) Set 25 degrees of flaps.
- 2) Taxi into takeoff position using all available runway.
- 3) Announce "Takeoff" hold the brakes and smoothly apply full throttle.
- 4) Check the engine instruments "Engine Instruments Checked."
- 5) Check RPM and M.P. "RPM Checked", "Manifold Pressure Checked"
- 6) Release the brakes.
- 7) Maintain directional control with rudders.
- 8) Passing 40 KIAS "Airspeed Alive."
- 9) At calculated airspeed (60 KIAS) "Rotate" initiate rotation.
- 10) Maintain 65 KIAS until obstacles are cleared.
- 11) When VSI and altimeter indicate a climb, "Positive Rate."
- 12) Positive rate of climb gear up "Gear UP"
- 13) Set flaps to 10 deg.
- 14) Accelerate to best rate of climb V_y 90 KIAS
- 15) Retract flaps
- 16) Passing 500' AGL set M.P (25") & RPM (2500 RPM)
- 17) Passing 1000' AGL complete the Climb Checklist.

SHORT FIELD APPROACH AND LANDING

- 1) Complete Before Landing Checklist.
- 2) Enter traffic pattern on a 45 degree entry to the downwind at least 2 mile from the runway at traffic pattern altitude (TPA.)
- 3) Slow to 100 KIAS (19" M.P. 2400 RPM)
- 4) Level pitch attitude
- 5) One half mile from runway, turn Downwind.
- 6) Abeam the touchdown point, gear down (Below 129 KIAS), flaps 10 degrees (Vfe 103 KIAS max)
- 7) Confirm landing gear is down and locked "Gear Down Three Green".
- 8) Reduce power (16" M.P.) Set prop full forward
- 9) Slow to 90 KIAS
- 10) Initiate a descent (~ 300 feet per min.)
- 11) When the runway is 45 degrees off the tail turn base.
- 12) Adjust power as needed.
- 13) Set Flaps to 25 degrees and slow to 80 KIAS GUMP Check
- 14) Turn final to align with runway centerline.
- 15) Set Flaps to 40 degrees and slow to 70 KIAS
- 16) Adjust pitch and power for descent.
- 17) At round out, reduce power to idle and continue to flare to touchdown on the main wheels first.
- 18) After nose wheel is down, apply braking to stop the airplane in the shortest distance consistent with safety.

SOFT FIELD TAKEOFF AND CLIMB

- 1) Set 25 degrees of flaps.
- 2) Taxi into takeoff position while holding full aft elevator.
- 3) Announce "Takeoff" and smoothly apply full throttle without stopping.
- 4) Check the engine instruments "Engine Instruments Checked."
- 5) Check RPM and M.P. "RPM Checked", "Manifold Pressure Checked"
- 6) Passing 40 KIAS "Airspeed Alive."
- 7) As the nose wheel comes off the ground, pitch to set about 3 degrees nose up
- 8) Maintain directional control with rudders.
- 9) As the main wheels liftoff, lower pitch attitude to level flight and stay in ground effect.
- 10) Accelerate to 65 KIAS until obstacles are cleared.
- 11) When VSI and altimeter indicate a climb, "Positive Rate."
- 12) Positive rate of climb gear up "Gear UP"
- 13) Set flaps to 10 deg.
- 14) Accelerate to best rate of climb V_y (gear up) 90 KIAS
- 15) Retract flaps
- 16) Passing 500' AGL set M.P (25") & RPM (2500 RPM)
- 17) Passing 1000' AGL complete the Climb Checklist.

SOFT FIELD APPROACH AND LANDING

- 1) Complete Before Landing Checklist.
- 2) Enter traffic pattern on a 45 degree entry to the downwind at least 2 mile from the runway at traffic pattern altitude (TPA.)
- 3) Slow to 100 KIAS (19" M.P. 2400 RPM)
- 4) Level pitch attitude
- 5) One half mile from runway, turn Downwind.
- 6) Abeam the touchdown point, gear down (Below 129 KIAS), flaps 10 degrees (Vfe 103 KIAS max)
- 7) Confirm landing gear is down and locked "Gear Down Three Green".
- 8) Reduce power (16" M.P.) Set prop full forward
- 9) Slow to 90 KIAS
- 10) Initiate a descent (~ 300 feet per min.)
- 11) When the runway is 45 degrees off the tail turn base.
- 12) Adjust power as needed.
- 13) Set Flaps to 25 degrees and slow to 80 KIAS GUMP Check
- 14) Turn final to align with runway centerline.
- 15) Set Flaps to 40 degrees and slow to 70 KIAS
- 16) Adjust pitch and power for descent.
- 17) At round out, reduce power to idle and continue to flare to touchdown on the main wheels first.
- 18) A slight addition of power during the round out will aid in easing the nose wheel down.
- 19) Hold the nose off with back pressure.

FORWARD SLIP TO LANDING

- 1) Power is reduced to idle
- 2) One wing is lowered using aileron. (lower wing into wind if applicable)
- 3) Simultaneously yaw the airplane in the opposite direction with the rudder.
(Longitudinal axis is now at an angle to the flight path).
- 4) The amount of yaw required is just enough to maintain the original ground track.
- 5) The pitch attitude must be adjusted to maintain airspeed.
- 6) Prior to round out, the forward slip must be discontinued.
- 7) Align the Longitudinal axis with the runway centerline for landing.

NOTE: This maneuver increases descent rate with out increasing airspeed.
This maneuver should only be performed in landing configuration and at V_{ref} .

GO-AROUND (BALKED LANDING)

- 1) Announce "Go-around".
- 2) Apply full throttle.
- 3) Reduce flaps to 25 degrees.
- 4) When VSI and altimeter indicate a climb, "Positive Rate."
- 5) Positive rate of climb gear up "Gear UP"
- 6) Accelerate to V_x (gear up) 78 KIAS, slowly retract the flaps to 10 degrees.
- 7) Above 100' AGL and airspeed V_y (90 KIAS) or greater, set flaps to 0 degrees
- 8) Passing 500' AGL set M.P (25") & RPM (2500 RPM)
- 9) Make radio calls as necessary.

CRUISE

TRAINING CRUISE

NOTE: Training cruise is used for all maneuvering flight. It is designed to keep the airplane at an appropriate airspeed and configuration in which to begin airwork.

- 1) Level off smoothly at desired altitude by slowly lowering the nose.
- 2) Allow the airplane to accelerate to 100 KIAS.
- 3) Adjust power and trim to maintain 100 KIAS for the existing conditions. Power setting should be approximately 2400 RPM and 19" M.P.
- 4) Complete the Cruise Checklist

EN ROUTE CRUISE

NOTE: En Route Cruise is used when relatively long periods of straight and level are expected.

- 1) Level off smoothly at desired altitude by slowly lowering the nose.
- 2) Allow the airplane to accelerate to the appropriate airspeed.
- 3) Set power according to the performance charts.
- 4) Set mixture just rich of peak.
- 5) Complete the Cruise Check List.

CLEARING TURNS

First 90 degree clearing turn:

- 1) Visually scan the area to the left and right of the aircraft.
- 2) Pick a visual landmark off the wing in the direction of turn to rollout on.
- 3) Enter a 30 degree bank turn.
- 4) Electric fuel pump on.
- 5) Mixture rich
- 6) Fuel selector fullest tank.
- 7) Continuously scan the area above, below and ahead of the flight path
- 8) After 90 degrees of turn is completed rollout wings level on your selected landmark.

PERFORMANCE MANEUVERS

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 (2400RPM, 19" M.P.=100 KIAS)
- 4) Smoothly roll into turn (45-50 degrees of bank).
- 5) Rolling past 30 degrees of bank.
 - a. Add power to maintain airspeed (~22" M.P.)
 - b. Increase back pressure to maintain altitude.
- 6) Trim may be used to relieve the back pressure.
- 7) Rolling out past 30 degrees of bank.
 - a. Decrease power to maintain airspeed (19" M.P.)
 - 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.

CHANDELLES

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

- 1) Establish Training Cruise and Complete the Pre-Maneuver Check.
- 2) Increase to 2500 RPM
- 3) Pick a reference point of your wing tip.
- 4) Roll into a 30 degree bank.
- 5) After the bank is established, smoothly and continuously increase the pitch and simultaneously add climb power so as to arrive at the 90 degree point with maximum pitch up.
- 6) Upon reaching the 90 degree point, begin rolling out slowly so as to arrive at the 180 degree point with maximum pitch up, wings level, and the airspeed at approximately 1.2 Vs1 (72 KIAS)
- 7) At the 180 degree point of the maneuver, resume straight and level flight. Re-establish Training Cruise and complete the Post-Maneuver Check.

LAZY EIGHTS

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

- 1) Establish Training Cruise and complete the Pre-Maneuver Check.
- 2) Select a heading that will establish the aircraft perpendicular to a well defined reference line. Select visual references at the 45 and 135 degree points relative to the direction of the maneuver.
- 3) Initiate the maneuver by slowly increasing the pitch while simultaneously rolling into a bank so as to arrive at the 45 degree point with maximum pitch up and 15 degrees of bank.
- 4) Passing the 45 degree point, increase the bank and decrease the pitch so as to arrive at the 90degree point with 30 degrees of bank and pitch attitude passing through level.
- 5) As the aircraft passes through the 90 degree point, continuously decrease the pitch and decrease the bank so as to reach maximum pitch down and 15 degrees of bank at the 135 degree point.
- 6) Passing the 135 degree point, continuously decrease the bank and increase the pitch so the aircraft is straight and level upon reaching the 180degree point.
- 7) After completion of the first 180 degree circuit, perform the maneuver in the opposite direction.
- 8) Upon completion of the maneuver, re-establish Training Cruise and complete the Post-Maneuver Check.

GROUND REFERENCE MANEUVERS

RECTANGULAR COURSE

- 1) Establish Training Cruise and complete the Pre-Maneuver Check.
- 2) Increase to 2600 RPM
- 3) Gear down below 129 KIAS
- 4) Select a ground reference that is approximately 1 square mile size.
- 5) Level off at 1000' AGL and 100 KIAS (19" M.P. 2400 RPM) The minimum altitude for this maneuver is 600' AGL, but the altitude should reflect the traffic pattern altitude most commonly used.
- 6) Enter the maneuver an appropriate distance from the selected reference area, 45 degrees to the downwind leg, using left hand turns.
- 7) Correct for wind drift by applying an appropriate wind correction angle, maintaining a track parallel to and equidistant from the rectangular leg.
- 8) Divide attention between aircraft control and maintaining ground track.
- 9) Turn onto the next leg when the airplane is approximately 45 degrees off the corner of the ground reference.
- 10) Establish a wing correction angle suitable for the next leg, making small corrections to maintain an equidistant and parallel track.
- 11) Continue flying all four rectangular legs in this fashion.
- 12) Upon completion of the maneuver, re-establish Training Cruise and complete the Post-Maneuver Check.

S-TURNS ACROSS A ROAD

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Increase to 2600 RPM
- 3) Gear down below 129 KIAS
- 4) Select a straight reference line that is at least 2-3 NM in length, such as a road.
- 5) Level off at 1000' AGL and 100 KIAS (19" M.P. 2400 RPM) The minimum altitude for this maneuver is 600' AGL, but the altitude should reflect the traffic pattern altitude most commonly used.
- 6) Enter the maneuver downwind, perpendicular to the reference line. Passing overhead the reference, immediately begin a turn to the left.
- 7) Maintain a constant radius turn on each side of the reference line by varying the angle of bank to compensate for the wind.
- 8) Divide attention between aircraft control and maintaining ground track.
- 9) Crossing back over the reference line, immediately begin a turn in the opposite direction, repeating the maneuver.
- 10) Exit maneuver on downwind.
- 11) Upon completion of the maneuver, re-establish Training Cruise and complete the Post-Maneuver Check.

URNS AROUND A POINT

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Increase RPM Full Forward
- 1) Gear down below 129 KIAS
- 2) Select a suitable ground reference point.
- 3) Level off at 1000' AGL and 100 (19" M.P. 2400 RPM) the minimum altitude for this maneuver is 600' AGL, but the altitude should reflect the traffic pattern altitude most commonly used.
- 4) Enter the maneuver downwind, approximately $\frac{1}{4}$ - $\frac{1}{2}$ NM from the selected reference. Begin a constant radius turn around the point, compensating for wind drift by continuously changing the wind correction angle (using a maximum of 45 degrees of bank).
- 5) Divide attention between aircraft control and maintaining ground track.
- 6) Exit maneuver on downwind.
- 7) Upon completion of the maneuver, re-establish Training Cruise and complete the Post-Maneuver Check.

EIGHTS ON PYLONS

NOTE: This maneuver will be performed between 600' AGL and 1000" AGL.

NOTE: The pivotal altitude can be calculated using the following formula:

$$\text{Ground speed squared} / 11.33 = \text{Pivotal Altitude}$$

(1000' AGL is the recommended entry altitude.)

- 1) Establish Training Cruise and complete the Pre-Maneuver Check.
- 2) Increase to 2600 RPM and 19" M.P.
- 3) Gear down below 129 KIAS
- 4) Select suitable reference points ("pylons") and position the aircraft so the maneuver can be entered on a heading 45 degrees to downwind.
- 5) When the pylon passes below the wing, smoothly roll into a turn using coordinated aileron and rudder so that the pylon maintains a constant position relative to the wingtip.
- 6) As the turn around the pylon progresses, make pitch changes to compensate for variations in groundspeed and maintain the pylons position relative to the wingtip.
 - a. Pylon forward- control forward- reduce bank
 - b. Pylon rearward- control rearward- increase bank.
- 7) Approximately three-quarters around the pylon, or roughly perpendicular to the original entry heading, establish straight and level flight for approximately 3 to 5 seconds and repeat the maneuver in the opposite direction around the second pylon.
- 8) Upon completion of the maneuver, re-establish Training Cruise and complete the Post-Maneuver Check.

STEEP SPIRAL

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Select an altitude that will allow for 3- 360 degree descending turns (4000' MSL)
- 3) Select a suitable ground reference point.
- 4) Enter the maneuver downwind.
- 5) Before reaching the abeam point on downwind reduce power to idle and hold altitude.
- 6) Time maneuver so as to reach the abeam point at best glide speed (79 KIAS)
- 7) Abeam the reference point roll into a bank (~45 degrees)
- 8) Begin a constant radius turn around a point, compensating for wind drift by continuously changing the wind correction angle and bank (using a maximum of 60 degrees of bank.)
- 9) Adjust pitch to maintain best glide speed.
- 10) Divide attention between aircraft control and maintaining ground track.
- 11) During descent occasionally apply power to keep engine warm.
- 12) Make 3 constant radius turns around the reference point.
- 13) Exit maneuver on downwind, no lower than 1000' AGL
- 14) Upon completion of the maneuver, re-establish training cruise and complete the post-maneuver check.

SLOW FLIGHT AND STALLS

MANEUVERING DURING SLOW FLIGHT

NOTE: Minimum safe altitude (on recovery) for this maneuver is 1500' AGL

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Gear Down below 129 KIAS
- 3) Increase to 2600 RPM
- 4) Reduce power to 15" M.P. Set flaps to 40 (if desired)
- 5) Slow the aircraft to 1.2 Vs1 (see chart below)
- 6) When aircraft is approx. 10 KIAS above target add power (see chart below)
- 7) Turns, Climbs and descents should be practiced.
- 8) Recovery:
 - a. Add climb power 2600 RPM and 26" M.P.
 - b. Slowly lower the pitch to maintain altitude.
 - c. Flaps 25, Gear UP.
 - d. Accelerate past Vx set flaps 10. Accelerate past Vy set flaps 0.
- 9) Re-establish Training Cruise and complete the Post-maneuver Check.

<u>Configuration</u>	<u>Target Airspeed</u>	<u>RPM</u>	<u>M.P.</u>
Clean	72 KIAS	2600	16"
Flaps Full	66 KIAS	2600	19"

POWER OFF STALL

NOTE: Minimum safe altitude (on recovery) for this maneuver is 1500' AGL.

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Reduce power to 15" M.P.
- 3) Increase to 2600 RPM
- 4) Gear down below 129 KIAS
- 5) Set flaps to 40.
- 6) Maintain altitude until airspeed slows to Vref. Simulate a landing approach.
- 7) Reduce power to idle.
- 8) Smoothly increase pitch to slightly above landing attitude.
- 9) Use rudders to maintain directional control
- 10) At stall warning announce "stall warning", at stall announce "stalling."
- 11) Recovery:
 - a. Reduce the angle of attack and simultaneously apply takeoff power.
 - b. If banked, roll level passing Vs and pitch to climb attitude.
 - c. Confirm positive rate of climb
 - d. Flaps 25, Gear UP.
 - e. Accelerate past Vx set flaps 10. Accelerate past Vy set flaps 0.
 - f. Level off at safe altitude or original starting point.
- 12) Re-establish Training Cruise and complete the Post-maneuver Check.

NOTE: The maneuver should be practiced wings level and from turns up to 20 degrees of bank.

POWER ON STALL

NOTE: To ensure that PTS requirements are met, three different power-on stall scenarios are presented. The student should be proficient in the performance of all three power-on stalls.

NOTE: Minimum safe altitude (on recovery) for this maneuver is 1500' AGL.

TAKEOFF CONFIGURATION: This maneuver simulates a stall during a short field takeoff as the result of over-rotation. It is practiced with flaps 25.

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Reduce power to 15" M.P.
- 3) Increase to 2600 RPM
- 4) Gear down below 129 KIAS
- 5) Add 25 degrees of flaps below Vfe (103 KIAS).
- 6) Maintain altitude until airspeed slows to Vref.
- 7) Set takeoff power and slowly increase pitch to slightly higher than normal takeoff attitude.
- 8) Use rudders to maintain directional control
- 9) At stall warning announce "stall warning", at stall announce "stalling."
- 10) Recovery:
 - a. Reduce the angle of attack.
 - b. If banked, roll level passing Vs and pitch to climb attitude.
 - c. Confirm positive rate of climb "Positive Rate"
 - d. Gear UP.
 - e. Accelerate to Vx (78 KIAS) and set flaps to 10 degrees.
 - f. Accelerate to Vy (90 KIAS) and set flaps to 0 degrees.
 - g. Level off at safe altitude or original starting point.
- 11) Re-establish Training Cruise and complete the Post-maneuver Check.
- 12) Establish Training Cruise and complete the Pre-maneuver Check.

NOTE: The maneuver should be practiced wings level and from turns up to 20 degrees of bank.

CLIMB CONFIGURATION: This maneuver simulates a stall during climb out.

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Reduce power to 15" M.P.
- 3) Increase to 2600 RPM
- 4) Gear down below 129 KIAS
- 5) Maintain altitude until airspeed slows to Vref.
- 6) Set takeoff power and slowly increase pitch to slightly higher than normal takeoff attitude.
- 7) Use rudders to maintain directional control
- 8) At stall warning announce "stall warning" at stall announce "stalling."
- 9) Recovery:
 - a. Reduce the angle of attack.
 - b. If banked, roll level passing Vs and pitch to climb attitude.
 - c. Confirm positive rate of climb "Positive Rate"
 - d. Gear UP.
 - e. Accelerate to Vy (90 KIAS)
 - f. Level off at safe altitude or original starting point.
- 10) Re-establish Training Cruise and complete the Post-maneuver Check.

NOTE: The maneuver should be practiced wings level and from turns up to 20 degrees of bank.

GO-AROUND CONFIGURATION: This maneuver simulates a stall following initiation of a go-around. It is practiced with flaps 40.

- 1) Establish Training Cruise and complete the Pre-maneuver Check.
- 2) Reduce power to 15" M.P.
- 3) Increase to 2600 RPM
- 4) Gear down below 129 KIAS
- 5) Add 40 degrees of flaps below Vfe (103 KIAS).
- 6) Maintain altitude until airspeed slows to Vref.
- 7) Set takeoff power and slowly increase pitch to slightly higher than normal takeoff attitude.
- 8) Use rudders to maintain directional control
- 9) At stall warning announce "stall warning", at stall announce "stalling."
- 10) Recovery:
 - a. Reduce the angle of attack.
 - b. Set Flaps to 25 degrees.
 - c. If banked, roll level passing Vs and pitch to climb attitude.
 - d. Confirm positive rate of climb "Positive Rate"
 - e. Gear UP.
 - f. Accelerate to Vx (78 KIAS) and set flaps to 10 degrees.
 - g. Accelerate to Vy (90 KIAS) and set flaps to 0 degrees.
 - h. Level off at safe altitude or original starting point.
- 11) Re-establish Training Cruise and complete the Post-maneuver Check.

NOTE: The maneuver should be practiced wings level and from turns up to 20 degrees of bank.

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.

EMERGENCY OPERATIONS

EMERGENCY DESCENT

- 1) Close the throttle and set prop Full Forward
- 2) Get airspeed below V_{le} (129 KIAS) and extend landing gear.
- 3) Roll into a 45 degree bank, allowing the nose to drop and initiating a descent
- 4) Allow the airspeed to stabilize at V_{le} and roll wings level after 90 degrees of turn.
- 5) Stop the emergency descent no lower than 1000' AGL and prepare for landing.

NOTE: The primary reason for making an emergency descent in a non-pressurized aircraft would be engine or cabin fire. While making the descent, the pilot should make an effort to perform the appropriate non-normal checklist.

NOTE: Due to the rapid engine cooling caused by this maneuver, practice emergency descents should not exceed 1000' of altitude loss.

EMERGENCY APPROACH AND LANDING

- 1) Pitch for best glide 79 KIAS (clean aircraft 0 flaps and gear up)
- 2) Choose the best landing area (most likely to survive)
- 3) Head to landing area
- 4) Use Restart Flow
 - a. Fuel Selector on fullest tank or one that is known to be functioning
 - b. Ignition to BOTH
 - c. Master switch ON
 - d. Fuel Pump ON
 - e. Throttle OPEN
 - f. Prop lever Full Forward
 - g. Mixture Full RICH
 - h. Alternate air Open
 - i. Squawk 7700
 - j. Communicate
- 5) Ensure landing in best area.
- 6) Utilize Checklist.
- 7) Prepare for emergency landing.

NOTE: During an emergency approach and landing, the pilot is expected to demonstrate positive control of the aircraft at all times and prioritize tasks. After determining the cause of the emergency and ensuring that the aircraft is under control, the appropriate checklist(s) should be utilized.

Power-Off 180 Accuracy Approach and Landing

- 1.) Complete Descent Checklist
- 2.) Enter traffic pattern on a 45-degree entry to the downwind at least 2 miles from the runway traffic pattern altitude.
- 3.) Slow to 100 Kts (19"/2400 RPM)
- 4.) Level Pitch Attitude
- 5.) One half mile from runway turn downwind.
- 6.) Select Desired touchdown point
- 7.) Abeam the touchdown point, gear down.
- 8.) Power to Idle.
- 9.) Adjust pitch to maintain appropriate glide speed.
- 10.) Plan and maneuver to execute a safe approach and landing.
- 11.) Use 0-40 degrees of flaps as necessary.
- 12.) By 300 feet AFE, complete GUMP check.
- 13.) Touchdown in normal landing attitude, at or within 200 feet beyond the specified landing point.
- 14.) After nose wheel is down gently apply brakes.

Note: Do Not adjust propeller in an effort to extend the glide.

Note: All Power-Off 180 Accuracy Approach and Landings will be to a full stop.

Standards:

FAA-S-8081-12B Commercial PTS