STANDARDIZED

FLIGHT MANEUVERS GUIDE

(C – 172)

May 2007

TABLE OF CONTENTS

PURPOSE

The purpose of this guide is to establish a standard for specific flight maneuvers. Applicable maneuvers from this guide will be used for all Initial/Annual Flight Evaluations, as well as students seeking a Private Pilot Certificate.

Standardizing the way maneuvers are performed establishes a solid foundation of basic procedural skills and knowledge. This, coupled with experience gained over time, will enable any pilot to handle most unusual situations and emergencies in a more predictable fashion with a greater chance of a successful outcome.

Flight instructors and students should find these standards helpful in preparation for any flight evaluation. Pilots with less than 200 flight hours are expected to be able to perform these maneuvers at the Private Pilot level. Pilots with 200 flight hours or more should be able to perform these maneuvers at the Commercial Pilot level.

Chandelles, lazy eights, steep spirals, eights-on-pylons, and power-off 180 degree accuracy approach and landings are commercial maneuvers and will only be required for pilots with over 200 hours.

This guide does not replace the practical test requirements for pilot certification or flight reviews. The specific airspeeds, power settings, and flap settings used in this guide are for a C172, with either 160 or 180 hp, carbureted or fuel injected. Reference to using carb heat has been placed in all maneuvers. It is assumed that if the engine is fuel injected, this does not apply. Stalls, slow flight, chandelles, lazy 8's, steep turns, and unusual attitudes) shall be performed at an altitude which allows for recovery no lower than 1500 feet AGL. Steep spirals and emergency procedures will be terminated at 500 feet AGL unless the aircraft is in a position to land.

BACK TO BASICS

1. Every maneuver begins and ends the same way: **SLUF** (Strait and Level Unaccelerated Flight – i.e.; cruise power, trimmed, on altitude and heading, and stabilized). That way, you know exactly when you are beginning the maneuver, and exactly when you are done.

2. The recovery altitude is the altitude you are at when you are finished with the maneuver (i.e.; SLUF). It will probably be different than the altitude from which you started the maneuver. That being said, your instructor may want you to return to your original altitude after recovering from a power off stall.

3. There is no requirement to establish a positive rate of climb when recovering from a stall in a fixed gear aircraft. (The PTS only requires a positive rate of climb prior to retracting the landing gear.) However, the aircraft should be in a pitch attitude that will result in a positive rate of climb at the end of the maneuver.

4. To consistently raise or lower the flaps "incrementally," use airspeeds that equate to something useful. Pattern airspeeds work well for extending the flaps and V-speeds work well for retracting them during a stall recovery or a go-around.

5. Clearing turns will be accomplished by turning 90 degrees in each direction.

6. The importance of proper trim techniques cannot be over emphasized. Trim constantly changes throughout the flight. Any change in power, pitch, bank, airspeed or weight/CG (fuel burn) requires a corresponding trim change. You should constantly strive to keep the aircraft trimmed "hands off." A properly trimmed aircraft will allow you to do other things with your eyes and hands (e.g. surveillance, taking notes, inserting coordinates in the

GPS) without having to constantly monitor altitude, airspeed and heading.

7. The following maneuver descriptions are designed to produce standardized performance by each Pilot. Therefore, they should be considered procedural in nature. By performing each maneuver as described, you will consistently fly the aircraft (and think through the maneuver) the same way every time. This will develop a sound knowledge and flying skills base and allow you to handle any emergency or unusual flight situation in a predictable fashion based on a solid foundation of the basics.

SLOW FLIGHT

1. Clear the area using clearing turns.

2. Fuel: BOTH - Mixture: FULL RICH - Carb Heat: ON

3. Establish and announce altitude and heading.

4. Power, approximately 1500 RPM

5. Airspeed in flap operating range, extend flaps in 10-degree increments to desired setting. (85 KIAS – flaps 10; 75 KIAS – flaps 20; 65 KIAS – flaps 30)

6. As airspeed diminishes, adjust power and pitch attitude to maintain level flight.

7. Establish and maintain an airspeed at which any further increase in pitch, load factor, and/or reduction in power would result in an immediate stall.

8. Recognize and announce the first aerodynamic indications of an oncoming stall (e.g., stall warning, mushy flight controls, buffeting).

9. Perform coordinated turns, climbs, and descents as directed by the instructor.

10. Recover to cruise flight by simultaneously applying maximum power, carburetor heat cold, flaps 20. Adjust pitch attitude to maintain altitude. Retract flaps to 10 degrees at Vx, and full up at Vy. (The recovery is analogous to a Go-Around procedure.)

POWER-OFF STALL

1. Clear the area using clearing turns.

2. Fuel: BOTH - Mixture: FULL RICH - Carb Heat: ON

3. Power, approximately 1500 RPM

4. Establish and announce altitude and heading.

5. Airspeed in flap operating range, extend flaps in 10-degree increments to desired setting. (85 KIAS – flaps 10; 75 KIAS – flaps 20; 65 KIAS – flaps 30)

6. When airspeed reaches approach speed of 60-65 KIAS, reduce power to idle. Establish a glide and trim at that speed while continuing to maintain heading unless instructor directs a turn.

7. After establishing a stabilized descent, call out the altitude you have picked for the “simulated ground” and transition smoothly to a pitch attitude that will hold that altitude.

8. Recognize and announce the first aerodynamic indications of an oncoming stall (e.g., stall warning horn, mushy controls, buffeting).

9. Recognize and announce the stall, then promptly recover by simultaneously:

   A. Decreasing angle of attack (relaxing backpressure)
   B. Maintaining wings level using primarily rudder inputs.
   C. Applying full power, carburetor heat cold, flaps 20.

10. Adjust pitch to maintain attitude.

11. Retract flaps to 10 degrees at Vx, and full up at Vy. Return to initial altitude at Vy. Return to cruise flight by setting cruise power, and trimming the aircraft to maintain altitude and heading.

POWER-ON STALL

1. Clear the area using clearing turns.

2. Fuel: BOTH - Mixture: FULL RICH - Carb Heat: ON

3. Power, approximately 1500 RPM

4. Establish and announce altitude and heading.

5. Slow to lift-off speed (60-65 KIAS), then simultaneously apply full power, carburetor heat cold, and establish a takeoff attitude.

6. Transition smoothly from the takeoff attitude to the pitch attitude that will induce a stall. (Feet on the horizon or approximately 20 degrees nose high). (Max allowable pitch is 30 degrees).

7. Establish desired bank angle (as directed by instructor). If a turn is used, 20-degree max bank angle.

8. Recognize and announce the first aerodynamic indications of the oncoming stall (e.g., stall warning horn, mushy aileron control, buffeting).

9. Announce the stall (at the buffet); then promptly recover by simultaneously:

   A. Decreasing angle of attack (relaxing backpressure).
   B. Maintaining wings level using primarily rudder inputs.

10. Maintain present altitude and accelerate to Vy.

11. Return to cruise flight by setting cruise power and maintaining altitude, heading, and airspeed.

STEEP TURNS

1. Clear the area using clearing turns.
2. Establish cruise flight (Power approximately 2200 RPM, Airspeed at or below $V_{A,}$ Trim for level hands-off flight.)
3. Establish and announce altitude and heading. Determine a visual reference point (if practical).
4. Smoothly roll into a 45 degree banked turn using coordinated ailerons and rudder. (50 degrees for pilots over 200 hours)
5. Maintain a level turn by looking outside and “dragging the nose across the horizon.”
6. Vary backpressure to maintain altitude, ailerons to maintain bank angle, rudder to maintain coordinated flight, and power to maintain airspeed.
7. Approaching the visual reference point (within approximately 5-10 degrees of initial heading) transition smoothly back to straight and level flight using coordinated ailerons and rudder. Reduce backpressure to maintain altitude and power to maintain airspeed.
8. Smoothly transition into a step turn in the opposite direction.
9. After completion of the second 360 degree turn, return to cruise flight by setting cruise power and maintaining altitude, heading, and airspeed.

CHANDELLES

1. Clear the area using clearing turns.
2. Establish cruise flight (Power approximately 2200 RPM, Airspeed at or below $V_{A,}$ Trim for level hands-off flight.)
3. Establish and announce altitude and heading. Determine visual reference points and wind direction.
4. Smoothly roll into the wind and establish a 30 degree bank.
5. Apply full power while increasing backpressure to increase pitch to approximately 5-10 degrees nose high.
6. Maintain 30 degrees bank and continue to increase pitch until the 90 degree point (altitude is increasing, airspeed is decreasing).
7. Gradually start rolling out bank at the 90 degree point while maintaining pitch.
8. Complete the rollout to wings level at the 180 degree point. Airspeed should be approximately 1.2 $V_{S.}$
9. Momentarily hold airspeed without stalling.
10. Resume straight and level flight while letting airspeed increase to cruise.
11. Reduce power to cruise setting and maintain altitude, heading, and airspeed.

LAZY EIGHTS

1. Clear the area using clearing turns.

2. Establish cruise flight (Power approximately 2200 RPM, Airspeed at or below $V_{A,}$ Trim for level hands-off flight.)

3. Establish and announce altitude and heading. Determine visual reference points and wind direction. (Select a reference point abeam the wingtip.)

4. Raise the nose above the horizon and begin a climb (approximately 5-10 degrees nose high).

5. Slowly roll in bank and enter a coordinated climbing turn.

6. Pass the 45 degree point with maximum nose-up for the maneuver. (Bank is increasing through 15 degrees; speed is decreasing; pitch begins decreasing; bank angle continues to increase).

7. Arrive at the 90 degree reference point with a maximum bank angle of 30 degrees. (Pitch is momentarily level, then descending through the horizon; bank begins to decrease; speed begins to increase).

8. Take note of the altitude and airspeed at the 90 degree point.

9. Pass the 135 degree point with the lowest pitch attitude for the maneuver. (Bank is reducing through 15 degrees; speed continues to increase; pitch begins increasing; bank angle continues to decrease).

10. At the 180 degree point the aircraft is momentarily level at the same altitude and airspeed as at entry.

11. Smoothly roll bank in the opposite direction and reaccomplish the maneuver.

12. Complete the rollout to wings level at the 180 degree point. Airspeed, altitude, and heading should be the same as at entry.

13. Resume cruise flight after completing the maneuver.

EIGHTS-ON-PYLONS

1. Clear the area using clearing turns.

2. Establish cruise flight at 800 feet AGL. (Power approximately 2200 RPM, Airspeed at or below V_A, Trim for level hands-off flight.)

3. Calculate pivotal altitude (ground speed in knots squared divided by 11.3).

4. Select 2 pylons approximately ½ nm apart, perpendicular to the wind.

   NOTE: Fly over one of the 2 pylons, put the wingtip on the other pylon and note the bank angle on the attitude indicator. 20 degrees bank angle means the pylons are approximately ½ nm apart. If the bank angle is more than 20 degrees, the pylons are less than ½ nm apart. If the bank angle is less than 20 degrees, the pylons are more than ½ nm apart.

5. Enter the maneuver by approaching the midpoint between the pylons diagonally, with the wind to your back.

6. Just past the intended pylon, roll into a turn around that pylon (approximately 30 to 40 degrees of bank) and place the wingtip on that pylon.

7. Use ailerons to correct up and down movement and elevator (pivotal altitude) to correct fore and aft movement of the pylon on the wingtip.

   NOTE: If the pylon moves forward of the wingtip, apply forward elevator (i.e. descend to increase ground speed). If the pylon moves aft of the wingtip, apply aft elevator pressure (i.e. climb to decrease ground speed). Do not use rudder to maintain wingtip position on the pylon.

8. Crossing the midpoint between the pylons, roll back to wings level.

9. Just past the opposite pylon, roll into a turn around that pylon (approximately 30 to 40 degrees of bank) and place the wingtip on that pylon.

10. Use ailerons to correct up and down movement and elevator to correct fore and aft movement of the pylon on the wingtip.

11. Complete the maneuver by crossing the midpoint between the pylons wings level, at the same altitude and airspeed at which the maneuver was entered.

STEEP SPIRAL

1. Clear the area using clearing turns.

2. Establish cruise flight (Power approximately 2200 RPM, Airspeed at or below $V_{A,}$ Trim for level hands-off flight), at an altitude that will allow at least 3 descending 360 degree turns.

3. Select an appropriate landing area.

4. While maneuvering to the intended landing area, slow the aircraft to best glide speed and configure for landing (up to full flaps may be used).

5. Maintain altitude and trim for hands-off at best glide speed.

6. Abeam the intended landing area, reduce power to idle, allow the nose to drop, and retrim for hands-off at best glide speed.

7. Maintain a constant radius turn around the intended landing area by varying bank angle to correct for wind. (Normal 20-30 degrees of bank; Max 60 degrees).

8. After the 3rd 360 degree turn, execute a power off landing or go around, as applicable.

   NOTE: Clear the engine at least once during the maneuver.

NORMAL / CROSSWIND TAKEOFF AND CLIMB

1. Accomplish the before takeoff checklist.

2. Align aircraft with runway centerline with ailerons fully deflected into the wind if crosswind is present.

3. Smoothly apply full power and check instruments. Announce, “Engine instruments in the green, Airspeed alive.”

4. As the aircraft accelerates, reduce aileron deflection as necessary and maintain runway alignment with rudder.

5. At 55 KIAS, apply backpressure to establish Vy climb attitude.

   NOTE: If a significant crosswind exists, increase the rotation speed by one half the gust factor, not to exceed 10 knots. This holds the aircraft on the ground a little longer so that a smooth and definite liftoff can be made.

6. As the aircraft lifts off, establish a crab into the wind; then level the wings.

7. Maintain takeoff power, Vy, and a ground track along the extended runway centerline during climb out.

8. Once clear of the pattern, establish a cruise climb speed of 80-90 KIAS.

NORMAL / CROSSWIND APPROACH AND LANDING

1. Accomplish the before landing checklist

2. While flying the appropriate traffic pattern, assess the wind by the required wind correction angles and by the surface wind indicators. (Consider the use of reduced flap settings for landing, depending on the crosswind conditions.)

3. Prior to 300 feet AGL on final approach, stabilize the aircraft with the final flap setting and crab angle. Maintain final approach airspeed of 65 KIAS with approximately 500 feet per minute rate of descent and 1500 RPM.

   ***NOTE: If gusty conditions are present, increase final approach speed by one half the gust factor, not to exceed 10 knots*.**

4. Prior to the flare, establish and maintain a drift correction using the wing low (side-slip) method: opposite rudder to keep the aircraft's longitudinal axis aligned with the runway centerline, aileron into the wind to control drift.

   NOTE: When to transition to the sideslip depends on pilot proficiency. Establishing the sideslip earlier on final (for low time pilots) allows for a more stabilized approach with maximum exposure to the control inputs needed for the touchdown.

5. At the appropriate flare altitude, reduce power to idle and slow the descent by increasing pitch attitude. As the aircraft decelerates, increase aileron and rudder deflection to maintain the necessary sideslip. Allow the aircraft to touch down on the upwind main wheel first, followed by the downwind main wheel, then the nose wheel.

6. Maintain backpressure on the yoke throughout the landing roll and continue to increase aileron deflection fully into the wind as the aircraft slows to taxi speed.

SOFTFIELD TAKEOFF AND CLIMB

1. Accomplish the before takeoff checklist.

2. Prior to taxiing onto the takeoff surface, set the flaps to 10 degrees and apply full elevator backpressure.

3. Taxi onto the takeoff surface at a speed consistent with safety. Avoid stopping on a soft surface.

4. Smoothly apply full power and check instruments while adjusting the elevator to maintain minimum nose wheel pressure on takeoff surface. Announce ”Engine instruments in the green, Airspeed alive”.

5. Lift off at the lowest possible airspeed, then reduce back pressure to lower the pitch attitude to remain in ground effect (one wingspan length) while the aircraft accelerates.

6. Establish Vx or Vy pitch attitude as appropriate.

7. Maintain takeoff power and a ground track along the extended runway centerline during climb out.

8. Retract flaps when clear of any obstacles and continue climbing at Vy.

NOTE: If a crosswind exists, apply the appropriate crosswind procedures as described in crosswind takeoff procedures and raise the flaps.

SOFTFIELD APPROACH AND LANDING

1. Accomplish the before landing checklist.

2. Select the desired touchdown point and complete the appropriate traffic pattern. Extend downwind to allow sufficient time on final for establishing the desired descent profile.

3. Stabilize the airplane on final approach at 55 KIAS (1.3 Vso). Descent rate should be approximately 500 feet per minute, flaps full down, and power approximately 1500 RPM.

4. When the intended landing area is assured, reduce power toward idle. As you initiate the flare, increase power to break the descent rate of the aircraft just above the landing surface. Maintain pitch with elevator and control descent rate with power.

5. Hold this power setting all the way through the flare and touchdown. As the main wheels touch, hold backpressure to prevent the nose wheel from touching. Once the aircraft is stabilized with the main wheels on the ground, smoothly reduce power as required while maintaining sufficient backpressure to hold the nose off the runway as long as possible. Adjust power according to the surface conditions.

6. When the nose wheel settles to runway, maintain full elevator back pressure to minimize the weight on the nose wheel.

NOTE: If a crosswind exists, apply the appropriate crosswind procedures as described in crosswind takeoff procedures.

MAXIMUM PERFORMANCE TAKEOFF AND CLIMB (SHORT FIELD)

1. Accomplish the before takeoff checklist.

2. Set flaps as recommended by POH.

3. Taxi into position at the end of the runway so that maximum runway is available for takeoff.

4. Smoothly advance the throttle to full power. Check engine instruments and announce “Engine instruments in the green, Airspeed alive.”

5. Rotate at 55 KIAS and establish Vx pitch attitude. After liftoff, establish and maintain Vx until well clear of real or simulated obstacles.

6. Once all obstacles are cleared, lower the nose and accelerate to Vy. Raise the flaps upon reaching Vy then continue the climb to cruise altitude.

NOTE: **If crosswind exists, apply the appropriate crosswind procedures as described in crosswind takeoff procedures.**

MAXIMUM PERFORMANCE APPROACH AND LANDING (SHORT FIELD)

1. Accomplish the before landing checklist.

2. Select the desired touchdown point and complete the appropriate traffic pattern. Extend downwind to allow sufficient time on final for establishing the desired descent profile.

3. Stabilize the airplane on final approach at 60 KIAS (1.3 Vso). Descent rate should be approximately 500 feet per minute, flaps full down, and power approximately 1500 RPM.

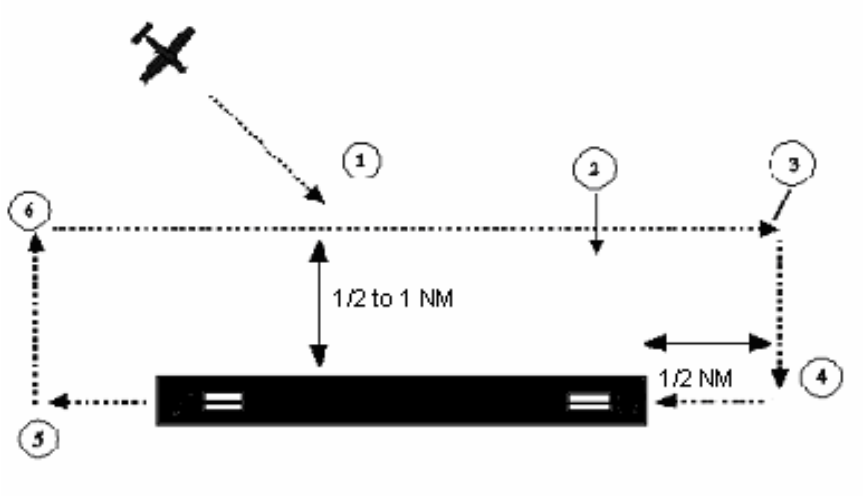
4. Select an appropriate aim point situated approximately 100-200 feet short of the specified touchdown point and adjust power as necessary to avoid over- or undershooting that aim point. Precise airspeed control is essential for judging the descent profile.

5. In the flare, reduce power to idle to land on (or slightly beyond) the specified touchdown point. Touch down at minimum control airspeed with no side drift, minimum float, and with the airplane’s longitudinal axis aligned with and over the runway center/landing path.

6. Begin smoothly applying brakes immediately after touchdown. Retract the flaps while holding positive backpressure on the elevator. Continue applying full elevator backpressure and maximum braking (without skidding the tires) until the aircraft has slowed to normal taxi speed.

NOTE: If crosswind exists, apply the appropriate crosswind procedures as described in crosswind takeoff procedures.

NORMAL TRAFFIC PATTERN



Accomplish the before landing checklist prior to entering the pattern.

1. **Entry:** Enter traffic pattern from a 45 to downwind, at pattern altitude (1000 feet AGL), Carb Heat on, approximately 1900 RPM, and 85-95 KIAS.

2. **Abeam Touchdown Point:** Pwr to 1500 RPM, Flaps to 10 degrees, Trim for 500 feet per minute rate of descent (Approximately 85 KIAS).

3. **Turn to Base:** 45 degrees to touchdown point (700 feet AGL), Flaps 20 degrees (Flaps, Turn, Talk), Retrim for 500 feet per minute rate of descent (Approximately 75 KIAS).

4. **Turn to Final:** 20 degrees to touchdown point (500 feet AGL), Flaps 30 degrees (Flaps, Turn, Talk). Roll out on final approximately ½ NM from touchdown, 300-400 feet AGL. Adjust pitch and power to maintain a stabilized approach at 65 KIAS and 500 feet per minute rate of descent.

5. **Turn to Crosswind:** Maintain climb at Vy with max continuous power until within 300 feet below pattern altitude.

6. **Turn to Downwind:** level off at pattern altitude, reduce power to approximately 1900 RPM, Carb Heat on.

POWER-OFF 180 DEGREE ACCURACY APPROACH AND LANDING

1. Position the aircraft on a normal downwind and complete the before landing checklist.

2. Determine projected ground track for a continuous turn to final (based on wind).

3. Determine desired reference altitudes around the turn to final (based on field elevation).

   NOTE: As a general rule of thumb, divide the final turn into thirds. If the pattern altitude is 1000 feet AGL, plan on being approximately 700 feet AGL at the first 3rd of the turn, 500 feet AGL at the second 3rd of the turn, and rolling out on final at approximately 300 feet AGL and ¼ nm from the intended touchdown point. If you are above these projected altitudes, add more flaps or extend the ground track. If you are below these projected altitudes, shorten the ground track.

4. Close the throttle abeam the intended touchdown point.

5. Establish glide speed based on wind and projected ground track.

6. Evaluate aircraft performance based on determined ground track and reference altitudes.

7. Lower flaps as desired. (Consider delaying the last 10 degrees of flaps until landing is assured).

8. Touchdown at or within 200 feet beyond the intended touchdown point, on centerline, with the aircraft aligned parallel to the runway.

BALKED LANDING (GO-AROUND)

1. Smoothly apply full power, retract the flaps to 20 degrees and push Carb Heat in. Establish a pitch attitude equivalent to Vy.

   (Warning: Jamming the throttle forward can cause the engine to falter or quit.)

2. If obstacles are present, establish a Vx pitch attitude and maintain Vx until clear of obstacles (400' AGL minimum).

3. As the aircraft accelerates, retract flaps to 10 degrees at Vx and flaps up at Vy. Continue climb to pattern altitude.

4. Side step to the right to keep conflicting runway traffic in sight.

5. Announce the go-around on CTAF or to the Tower

NOTE: The decision to execute a go around is no reason for embarrassment, but rather the manifestation of sound judgment. Welcome any opportunity to practice this vital maneuver!

KEY FIGURES FOR C-172

GENERAL:

MAX GROSS WEIGHT	- 2550
ENGINE	- 4 CYL; 180 HP; LYCOMING
PROPELLER	- FIXED PITCH; 76” DIAMETER; Mc CAULEY
FUEL	- 54 GAL MAX; 50 GAL USABLE; 100LL (BLUE); 110/130 (GREEN)
OIL	- 7 QT MAX; 5 QT MIN; SAE 50 (SUMMER); SAE 30 (WINTER)
WING SPAN	- 36’
MIN TURN RADIUS	- 27’ 5.5”

ENGINE:

MAX RPM	- 2700
NORMAL RANGE	- 2100-2700
WARM-UP	- 800-1000

OIL:

MAX TEMP	- 245F
NORMAL RANGE	- 100-245F
MIN PRESSURE	- 25 PSI
MAX PRESSURE	- 115 PSI
NORMAL POWER	- 60-90 PSI

ACCELERATION:

FLAPS UP	- +3.8 TO -1.52G
FLAPS DOWN	- +3.0 TO 0G

MAG CHECK (1700 RPM):

MAX DROP	- 125 RPM (FOR EITHER MAG)
COMPARISON	- +/- 50 RPM (BETWEEN MAGS)

VACUUM CHECK (1700 RPM):

ALLOWABLE RANGE - 4.5 TO 5.4 PSI

ELECTRICAL SYSTEM:

ALTERNATOR	- 60 AMP
BATTERY	- 24V
OVER VOLTAGE LIMIT	- 31.5 VOLTS

ELECTRICAL INSTRUMENTS:

FUEL QUANTITY INDICATORS
OIL TEMP
COURSE DIRECTION INDICATOR (CDI)
RADIO MAGNETIC INDICATOR (RMI)
TURN COORDINATOR
AMMETER

ENGINE DRIVEN INSTRUMENTS

ENGINE TACHOMETER (RPM)
OIL PRESSURE

VACUUM DRIVEN INSTRUMENTS:

DIRECTION GYRO (DG)
ATTITUDE SITUATION INDICATOR (ASI)

PITOT STATIC DRIVEN INSTRUMENTS:

AIRSPEED INDICATOR (AI)
VERTICAL SPEED INDICATOR (VSI)
ALTIMETER (ALT)

INSTRUMENT GROUP CATEGORIES:

POWER - RPM; OIL TEMP; OIL PRESS

PERFORMANCE	- AI; VSI; TURN COORDINATOR
FLIGHT	- ASI; ALT; DG; CDI; RMI
WARNING	- AMMETER; VACUUM GAGE; LOW VOLTAGE LIGHT; LOW VACUUM LIGHT

KEY SPEEDS:

VA	- 105	BEST GLIDE	- 68
VNE	- 158	FINAL APPROACH	- 65 (FULL FLAPS)
VNO	- 127	MAX CROSS WIND	- 15
VFE	- 85	HYDROPLANE	- 55
VS	- 50	STALL WARNING	- 5-10 KNOTS ABOVE THE STALL
VSO	- 40		
VX	- 59		
VY	- 73		
VR	- 55		

CRUISE POWER SETTINGS (4000'; +18C [STD DAY])

2300 RPM (55%); 102 KIAS; 7.6 GPH

NORMAL PATTERN: (NO WIND, STANDARD DAY)

PATTERN ENTRY	- 1000 AGL; 1900 RPM; CARB HEAT; APPR0X 95 KIAS; TRIM
ABEAM TOUCHDOWN	- 1500 RPM; FLAPS 10; TRIM FOR 500 FPM DESC
TURN TO BASE	- 700 AGL; 45 DEGREE ANGLE-OFF; FLAPS 20; 500 FPM DESC
TURN TO FINAL	- ½ NM FROM TOUCHDOWN; 300-400 AGL; FLAPS 30
DESCENT ON FINAL	- 500 FPM (4.5 DEGREE G/S) @ 65 KIAS (NORM; N/F); 55 KIAS (SHORT/SOFT)