V-Speed Quick Reference

V-Speed		KIAS	Description	Airspeed Indicator Marking
Vso		53	Stall speed in landing configuration	Bottom of White Arc
Vmc		62	Minimum controllable airspeed	Red Line
Vs		66	Stall speed with zero flaps	Bottom of Green Arc
Vr		65	Rotation speed (start rotation)	
Vx		72	Best angle of climb	
Vxse		83	Best angle of climb single-engine	
Vsse		70	Safe speed for intentional engine failure	
Vy		84	Best rate of climb	
Vyse		84	Best rate of climb single-engine	Blue Line
Vfe	93 Full 40°	122 at 15 °	Maximum flap extension speed	Top of White Arc
Vlo (Up)		122	Maximum gear retraction speed	
Vlo (Down)		122	Maximum gear extension speed	
Vle		122	Maximum speed with gear extended	
Vno		135	Max Structural Cruising Speed	Top of Green Arc
Vne		171	Never exceed speed	Red Line
Va		122	Maneuvering speed	

Maximum demonstrated crosswind 17

Commercial Multiengine Add-On Tasks & Procedures

In Flight Procedure Checklists

These procedures are general procedures and are used many times throughout the course of a flight. They should be memorized and used as a flow checklist, not a do list. This will allow the pilots attention to be focused on situational awareness and safety in the critical phases of flight.

Climb Configuration Flow

This flow is used to transition, and decreased stress and wear on the engines.

Procedures:

1. Power Set	27” MAP and 2250 RPM
2. Gear	UP -Once positive rate and 84 KIAS is attained
3. Flaps	UP at 400 ft AGL
4. Airspeed	84 KIAS until safe altitude then 95-115 KIAS

Cruise Configuration Flow

This flow is used to transition the aircraft from a climb/descent configuration to a cruise configuration. It is also to be used at the completion of all maneuvers. The power settings listed are a standard configuration, and can be modified according to the cruise settings listed in the POH or the desired airspeed.

Procedures:

1. Power Set	24”/1900-2200 RPM (normal) 20”/1900-2200 RPM (maneuver)
2. Engine Instruments	Check all green
3. Lights	Landing/Nav as required
4. L Fuel Pump	OFF/Check Pressure
7. R Fuel Pump	OFF/Check Pressure

Gear Down Before Landing Flow

This flow is utilized in multiple phases of flight. It is used primarily for landing as the name suggests, but it is also utilized in maneuvers that are to be completed in the landing configuration. It is also used on all approaches. The only thing that will change on this flow is the appropriate amount of flaps used and this will all be up to the pilot's discretion.

Procedures:

1. Power	As required
2. Gear	Down (3 Green, No Red, No amber) below 122 KIAS
3. Parking Brake	Off
4. Chokes	Off
5. Carb Heat	Off
6. Props	Forward to MCP
7. Electric Fuel Pumps	On
8. Flaps	T/O setting
9. All Lights	On
10. Flaps	Full down landing assured
11. Final Approach Speeds	Vref 70 KIAS full flaps Vref 80 KIAS flaps set T.O. Vref 90 KIAS zero flaps

Pre-Maneuver Checklist

The purpose of the Pre-Maneuver Checklist is to configure the aircraft for the maneuver, establish situational awareness prior to beginning the maneuver, and to ensure the maneuvers can be accomplished safely. This checklist should be completed prior to each maneuver, even if you are repeating the same maneuver. The following items will be verbally called out and visually checked even if actual manipulation of the system/switches is not required.

IP3C's

Instruments: -Check for normal operating conditions.

Position: -Identify position of aircraft in relation to nearest emergency field.

Clear: -Conduct 180 degrees of clearing turns.
-Correct heading, altitude, and airspeed prior to entry.

Call: -Report on Air to Air Frequency (122.75 MHz)

Configure: -Appropriate Flow

Takeoffs, Landings, and Go-Arounds

Normal Takeoff

A normal takeoff is the controlled movement of the aircraft from the starting point on the runway, transition down the runway, liftoff from the ground and coordinated climb away from the ground.

Procedures:

1. Complete *Before Takeoff* and *Line Up Checklist*.
2. Verify Flaps Takeoff 15° (takeoff), taxi on to the runway, hold brakes.
3. Increase throttles to 20" MP, check "*Engine in Parameters*".
4. Release brakes and increase throttles to Full power, "*Airspeed Alive*".
5. Accelerate to Vr, 65 KIAS. Announce "*Rotate*" and smoothly apply back pressure.
6. Establish a positive rate of climb and retract gear when reaching blue line 84 KIAS, "*Positive Rate, Gear UP*".
7. Climb at Vyse, 84 KIAS/Blueline until 1000 ft AGL.
8 Gear up once 84 KIAS is attained
9. Retract the flaps at 400 ft AGL.
10. At 1000 ft AGL, *After Takeoff Checklist*.

Normal Approach and Landing

A normal landing is a transition from flight to touchdown of the aircraft at the intended touchdown point on the centerline of the runway with the main landing gear followed by a controlled lowering of the nose wheel. The landing is complete when the aircraft is slowed to a safe speed and exits the runway.

Procedures:

1. Complete *In Descent/Approach Checklist*.
2. Slow to 100 KIAS before entering the traffic pattern.
3. When ready to descend out of TPA, *Gear Down Before Landing Flow Checklist*.
4. Descend out of TPA at Blueline (84 KIAS).
5. On Base, *Approach Flow Check.*
6. On final slow to 71 KIAS, Final *Check*.
7. Taxi Clear of the runway and perform, *After Landing Checklist*.

Short Field Takeoff and Climb

Short field takeoffs are often required when there is minimal runway distance or when obstacles on the departure end of the runway require minimizing takeoff roll and maximizing obstacle clearance.

Procedures:

1. Complete *Before Takeoff* and *Line Up Checklist*.
2. Verify Flaps set at T/O (takeoff), taxi on to the runway, hold brakes.
3. Increase throttles to 20" MP, check "*Engine in Parameters*".
4. Increase throttles to Full power.
5. Release brakes, "*Airspeed Alive*".
6. Rotate as per POH, approximately 65 KIAS.
7. Establish **Positive Rate of Climb** and retract the gear.
8. Maintain Vx, 72 KIAS until clear of obstacles.
9. Once clear of obstacles retract flaps and accelerate to Vyse, 84 KIAS/Blueline until 1000 ft AGL.
10. At 1000 ft AGL, *After Takeoff Checklist*.

Short Field Visual Approach and Landing

A short field landing is required when the landing area is relatively short or when obstacles on the approach end of the runway limit available landing area. The landing is complete when the aircraft is slowed to a safe speed and exits the runway.

Procedures:

1. Complete *In Range/Descent Checklist*.
2. Slow to 100 KIAS before entering the traffic pattern.
3. When ready to descend out of TPA, *Gear Down Before Landing Flow Checklist*.
4. Descend out of TPA at Blueline (84 KIAS).
5. On Base, *Approach Flow Check*
6. On Final: a) Full flaps 40° landing assured
   b) Slow aircraft to 71 KIAS and *Final Check*
7. Retract flaps after touchdown. **(Caution- Do not retract landing gear)**
9. Max breaking (Simulate for training purposes).
10. Taxi Clear of the runway and perform, *After Landing Checklist*.

Go-Around

A go-around/balked landing is used anytime the pilot deems the approach is unsafe, not stable, or is instructed to do so by the tower. The go-around procedure is complete when the aircraft has safely performed the tasks listed below.

Procedures:

1. Propellers-Full forward
2. Throttles-Max Power
3. Flaps-Retract to T/O (takeoff) setting
4. Airspeed- Vx or Vy as appropriate for terrain
5. Gear-Positive rate gear up
6. Flaps-Retract remainder of flaps, accelerate to Vyse 84 KIAS

In-Flight Maneuvers

Specific completion standards listed in the Commercial/Private/ATP PTS. All Maneuvers listed below are detailed for commercial ACS standards and procedures. Slight differences exist for the other levels of checkride, so please refer to those before commencing training.

No intentional engine shutdowns below 4000 ft AGL and no securing of engines or single engine maneuvering while secured to be completed below 4000 ft AGL. Have a suitable landing airport nearby.

Steep Turns

A Steep turn is a maneuver that tests the pilots ability to control the aircraft's altitude, airspeed through consistent high angle of bank turns, and accurate heading reversals.

Procedures:

1. *IP3C's Pre-maneuver Checklist*.
2. Verify power is set to 22" MP, 2250 RPM. About 100 KIAS
3. Set bug to entry heading, and pick visual reference point.
4. Begin a coordinated turn in the desired direction.
6. When passing through approximately 30°, adjust power/trim as necessary (generally +/- 1-2" of MP and trim).
7. Perform left 360° turn maintaining 50° +/- 5°.
8. Roll out on entry heading.
8. When transitioning, adjust power as necessary to maintain standards.
9. Perform right 360° turn maintaining 50° +/- 5°.
10. Roll out on entry heading.
11. *Cruise Flow Checklist*.

Maneuvering During Slow Flight

This maneuver establishes the aircraft at minimum controllable airspeed; or an airspeed just above the stall speed in order to allow the student to feel, understand, and recognize how the airspeed, altitude, and load factor all relate to each other. Minimum controllable airspeed is defined as the speed at which with any further increase in angle of attack, increase in load factor, or decrease in power would result in an imminent stall.

Procedures:

1. *IP3C's Pre-maneuver Checklist.*
2. *Gear Down Before Landing Flow Checklist*.
3. Flaps Down below 93 KIAS
4. Props Forward below 90 KIAS
3. Slow to just above stall (app. 70 KIAS).
4. Adjust power as necessary (app. 19" MP) to **maintain altitude and airspeed**.
5. Recover with:
    a. Power to- Max power
    b. Flaps- Reduce flaps T/O (takeoff) setting
    c. Accelerate to Vx 72
    d. Positive Rate Gear UP
    e. Accelerate to Vye 84
    f. Flaps Retract remainder of flaps
6. *Cruise Flow Checklist*.

Power-Off Stall

This procedure enables the student to recognize the characteristics of an impending stall as well as practice the recovery from a stall. The power off stall simulates a typical stall condition of an aircraft as it approaches for a landing. This may be accomplished on an established heading or in a max 20° bank turn.

Procedures:

1. *IP3C's Pre-maneuver Checklist.*
2. *Gear Down Before Landing Flow Checklist*.
3. Establish a stabilized decent at 75 KIAS.
4. Reduce Power to Idle, and transition smoothly to a normal landing attitude.
5. *Horn*, *Buffet* -Recover **promptly** at the onset of the stall by **simultaneously**:
    a. Reducing the angle of attack
    b. Set max power

c. Level wings

After these are completed, promptly:

d. Flaps	Reduce flaps to 15° takeoff setting
e. Accelerate to Vx	72 KIAS
f. Positive Rate Gear	UP
g. Accelerate to Vyse,	84
f. Positive rate	Retract remainder of flaps

9. *Cruise Flow Checklist*.

Power-On Stall

This procedures enables the student to recognize the characteristics of an impending stall as well as practice the recovery from a stall. The power-on stall simulates the typical flight conditions of an aircraft that stalls during a climb or departure from an airfield. This maneuver can be done in either the takeoff configuration, gear down and flaps up, or in the departure configuration, both gear and flaps up as specified by the instructor or examiner.

Procedures:

1. *IP3C's Pre-maneuver Checklist.*
2. Configure with the *Cruise Configuration Flow* (Maneuver):
    a. Takeoff Configuration: Gear DOWN, FLAPS 10°
    b. Departure Configuration: Gear UP.
3. Reduce power to 15" MP.
4. Slow to Liftoff Speed, app. 65 KIAS.
5. Transition smoothly into a normal takeoff attitude and increase power to 19" MP. (65 % power)
6. *Horn*, *Buffet* -Recover **promptly** at the onset of the stall by **simultaneously**:
    a. Reducing the angle of attack
    b. Set max power
    c. Level wings
7. Accelerate to Vx (72 KIAS), establish **positive** rate of climb.
8. Retract Gear (if necessary), accelerate to Vyse (84 KIAS), then retract FLAPS
9. *Cruise Flow Checklist*.

Accelerated Stall

This procedure enables the student to recognize the relationship between an increase in load factor and a proportional increase in stall speed. It also enables a student to recognize and recover from an impending stall encountered in maneuvering flight. This maneuver is performed in the clean configuration and can be performed in either a bank to the left or right.

Procedures:

1. *IP3C's Pre-maneuver Checklist*.
2. Configure with the *Cruise Configuration Flow.* (Maneuver)
3. Set bug to entry heading, pick visual reference point.
4. Begin a coordinated turn in the desired direction to a bank of 45°.
5. After passing through approximately 30°, slowly reduce throttles to idle.
6. Maintain altitude to induce the stall.
7. At the onset of the stall, simultaneously reduce angle of attack, set max power, and level the wings.
8. *Cruise Flow Checklist*

Vmc Demonstration

This maneuver is designed to teach the student how to recognize and recover from a loss of directional control with the critical engine inoperative. Vmc is defined as the minimum airspeed at which directional control can be maintained with the critical engine inoperative. It is not a fixed airspeed and is determined by many factors. The student must know and understand these factors and the procedure used to recover from a loss of directional control.

Procedures:

1. *IP3C's Pre-maneuver Checklist*.
2. Configure for FLAPS at 15° takeoff and GEAR up.
3. **Slowly** close the left throttle.
    a. Maintain heading and altitude.
3. Slow to 84 KIAS, upon reaching:
4. Slowly increase the right throttle to full power.
    a. Maintain heading and altitude.
    b. Up to 5° bank into the operative engine.
5. Increase the pitch attitude in order to lose **1 knot per second**.
    a. Increase rudder as necessary to **maintain directional control**.
6. Recover at **first** sign of:
    a. Loss of directional control. (Full rudder travel)
    b. First indication of stall (horn or buffet).
7. Recover by:
    a. Reducing power on the operative engine.
    b. Decrease angle of attack.
    c. Maintain within 20° of initial heading.
8. Once directional control has been established, increase right throttle to full.
9. Accelerate to Vye, 84 KIAS.
10. Bring throttles together slowly to 20" MP.
11. *Cruise Flow Checklist*.

*** Vmc Bible ***

“I have lost directional control when I have full rudder deflection into the operative engine and the aircraft begins to yaw into the inoperative engine. To recover, I will simultaneously reduce angle of attack and reduce power on the operative engine.”

Emergency Procedures Guide

This section goes over some of the most commonly used emergency procedures and ones specific to the testing phase of the pilot practical examinations. There are more procedures available than those listed here, for those please refer to the Piper Seminole POH.

Recovery from Unusual Attitudes

These procedures should be utilized when the aircraft enters an unusual flight attitude. The procedures have been established to quickly and safely return the aircraft to straight and level instrument flight while minimizing a potential stall or overstressing the aircraft.

Procedures:

Nose High:
1. Add full power
2. Pitch level
3. Roll wings level
4. Cruise checklist

Nose Low:
1. Reduce Power
2. Roll wings level
3. Pitch level
4. Cruise checklist

Emergency Descent

This procedure is used to show the student how to descend the aircraft to a lower altitude as quickly and as safely as possible. This can be done for a number of reasons, such as an uncontrollable fire, a sudden loss of cabin pressure, or any situation requiring an immediate and rapid descent. The descent should be made at the maximum allowable airspeed consistent with the procedure used.

Procedures:

1. *IP3C’s Pre-maneuver Checklist*.
2. Configure with the *Clean Configuration Flow.*
3. Upon commencement of the maneuver:
    a) Throttles IDLE
    b) Gear DOWN (Below 122 KIAS)
    c) Props FULL FWD
4. Maintain a max of 122 KIAS during decent.

5. Simulate declaring an emergency.
6. Recover at designated altitude.

*** A positive load factor should be maintained throughout the maneuver. Therefore, a 30°-45° angle of bank should be used to establish the decent and maintained throughout the maneuver, both for extra visual scanning and for load factor.

In-Flight Engine Failure

This procedure is used when there is a failure or partial loss of power for one of the engines in our aircraft. For a conventional twin aircraft, this situation would be the most adverse with a loss of the critical engine, normally the left engine. The maneuver shall be completed above 4000 ft AGL over an area where a landing can be made with a single engine. No engine failures may be made below 3000 ft AGL using the fuel selector or ignition switches and no engine securing is authorized below 4000 ft AGL for training purposes.

***__All Steps below need to be memorized__. They are instant action items and should be accomplished from memory with no hesitation. The troubleshoot checklist should be performed as a flow with a confirmation using the checklist. After this, proceed to the *Engine Failure Secure Checklist*.

Procedures:

1. *Maintain Directional Control/Pitch Attitude/Airspeed/ Vyse 84 KIAS*
2. Props Full FWD
4. Throttles Full FWD
5. Flaps UP
6. Gear UP
7. Identify **Dead Foot**
8. Verify Close Dead Throttle

-- *Troubleshoot Flow Checklist/Altitude Permitting*

Ignitions	ON/Check
Fuel Qty/Pressure	Check
Oil Temp/Pressure	Check
Fuel Pumps	ON
Carb Heat	ON/Check/OFF
Fuel Selectors	ON

--If Engine is still Inoperative, **proceed**:

9. Prop **Inop** Engine Feather

If altitude permits, proceed to the Engine Failure Secure checklist (next page).

Engine Failure Secure

After the failed engine has been identified, feathered, and coordinated level flight has been established, the inoperative engine can be secured according to the procedure below. For training purposes, except for the cowl flaps and fuel pumps, all of these items will be simulated so as not to increase any possible risk.

Procedures:

1. Throttle Inop Eng	IDLE
2. Inop Eng Ignition	OFF-ONE AT A TIME
3. Inop Eng Prop	FEATHERED
3. Inop Eng Fuel Selector	OFF
4. Inop Eng Fuel Pump	OFF
5. Inop Eng Field Switch	OFF

Airstart of a Failed Engine

Once an engine has been secured and any desired maneuvering is completed, the engine may be restarted. Please refer to the POH to see if your aircraft uses this procedure or not.

Procedures:

1. Inop Eng Fuel Quantity	Check
2. Inop Eng Fuel Selector	ON
3. Inop Eng Throttle Lever	Idle
4. Inop Eng Propeller	Full Forward
5. Inop Eng Fuel Pump	On
6. Inop Eng Ignition Switches	On
7. Inop Eng Start button	Push
8. Oil Pressure	Check
9. Electrical System	Restore

10. When Engine begins to run, slowly increase throttle to 15” MP until CHT is in the Green.
10. *Cruise Checklist*.