



# **Flying Tigers Flight School**

## **Student Handbook**

Welcome to Flying Tigers! We hope you will enjoy your flight training experience with us. Flying airplanes can be extremely fun and rewarding, allowing you to experience the freedom of flight, beauty of the world below, travel with family and friends, and learn precision skills that will carry over into many other areas of life.

Flight training does require intense work in flight as well as on the ground. Dive into your training head first. Show up early for your lessons to obtain weather information and plan your flight. Talk with other pilots. Read the magazines. View the many YouTube videos that are available. Study at home on a regular basis, whether in a formal aviation course or not.

Flight training is a time to put your game face on. Be ready to give your full attention and concentration for an hour or so each flight. Take your flying seriously. Make it your passion. Flying as often as you can will result in faster progress and lower overall cost.

In the words of one of our instructors, “flying is fun, fun, fun!” Learning to fly requires a lot of work both on the ground and in the air. You’ll find that you get out of flying what you put into it.

Happy Landings,

Flying Tigers

# Index:

Safety Procedures and General Practices.....	page 3
Weather Minimums .....	page 6
Fight Risk Assessment Tool.....	page 7
Inoperative Equipment Procedures.....	page 8
Standard Operating Procedures.....	page 9

# Safety Procedures and Practices

## Flight Dispatch:

- The instructor will assign a practice area before each flight. All student solo flights require instructor approval BEFORE departure.
- Pilots will fill out a 'dispatch ticket' indicating planned practice area or airport. Pilots will utilize 123.5 in the practice areas to announce position and altitude regularly throughout flight.
- The minimum altitude to begin slow flight, stalls, steep turns, and the high altitude commercial maneuvers is 2,000 ft. AGL.
- No Passengers will be carried on any part 141 flight. Students in the same course may 'back seat' for instruction purposes only.
- Student pilots may not make over-night cross-country flights.
- Re-dispatch procedures after un-programmed landings: Students will contact Flying Tigers or their Instructor before resuming any flight that has landed at a site other than the airport proposed in the dispatch ticket.
- Students will utilize ATC Flight Following, or file and open an FAA flight plan, for all cross country flights.

## Ellington Airport Ramp:

- All persons (employees, students, renters and those directly escorted by employees, students or renters) must remain in the immediate vicinity of Flying Tigers aircraft while on the Ellington airport ramp.
- No person may start or operate an aircraft on the ramp area in any manner that will endanger persons or property.

## Engine Start and Taxi:

- Cold weather engine starting will be done in accordance with the aircraft POH.
- Pilots will insure propeller area is clear before starting.
- Pilots will visually clear area (left, right, and center) before moving aircraft. Engine run-ups shall only be conducted at the designated areas. Movement within the non-movement area of the ramp does not require a call to ground control.
- Contact ground control before entering any taxiway. Pilots will have the airport diagram visible when taxiing. Use aircraft type when making radio calls (Cessna 280JA, Grumman 26172, etc.)
- Once the airplane is moving, power should be maintained at approximately 1000RPM to maintain a safe speed (10-13 knots groundspeed). Use minimal differential braking to track the runway centerline. Anticipate the need to slow down by reducing power, and then using brakes.

- Stop aircraft before conducting any checklists. Maintain ‘eyes up’ while taxiing.

### **Fire Precautions and Procedures:**

- All pilots will remain clear of the aircraft during fueling and servicing.
- Smoking is prohibited on the ramp.
- In case of fire, pilots will execute checklist procedures and call Signature FBO before leaving airplane if possible, or call 911 after exiting. Fire extinguishers are located in most aircraft. A large portable extinguisher is located just north of the ramp access gate. All fuel service trucks have extinguishers available.
- Passengers will be briefed on proper egress and evacuation procedures in case of aircraft fire. Exit aircraft to the aft and clear the area by at least 100’.

### **Fuel Reserve Necessary for Local and Cross-country Flights:**

- A Flying Tigers fleet fuel card must be taken on all cross country flights. At least one hour of fuel reserve must be maintained throughout all local and cross-country flights.

### **Avoidance of Other Aircraft in Flight and on the Ground:**

- Each student will be briefed on procedures for avoiding other aircraft both on the ground and in the air. These will include using a systematic 10 degree scanning technique.
- Contact tower 10 to 15 miles from the airport when practical to utilize radar services.
- Use extra care while crossing runways, minimize cockpit duties and conversation while taxiing, use shallow climbs for forward visibility, etc. Read back all Hold Short instructions.
- In high wing aircraft, always raise the wing in the direction of turn and look for traffic before turning.
- **TRAFFIC PATTERN:** At uncontrolled airports, Arriving aircraft should enter the traffic pattern on the downwind leg at a 45 degree angle, abeam the midpoint of the runway, at traffic pattern altitude, allowing sufficient time to view the entire traffic pattern. The pilot may choose an alternate type of entry, especially when intending to cross over midfield, based upon the traffic and communication at the time of arrival.

### **Minimum Altitude Limitations and Simulated Emergency Landing Instructions:**

- All emergency descent or emergency landing practice will be conducted with an Instructor on board.
- No dual simulated emergency approaches will be continued below 500’ AGL unless at an approved airport. Engine out procedures will not be conducted on take-off climb-out below 500’ AGL.

### **VFR Procedures in Ellington Airspace (Local Agreement):**

- Departure: Notify the tower intended direction of flight. Under normal conditions the majority of the traffic will proceed south or east toward practice area A, B, or C, or as directed by Ellington tower. If remaining in the traffic pattern, the pattern altitude is 600' AGL. When leaving the pattern maintain 1100' while in the Class D airspace.
- Maintain sterile cockpit practices within the class D airspace.
- Cruise altitude: It is recommended to maintain highest altitude possible below class B airspace for additional emergency glide distance.
- Arrival: Enter class D airspace at 1100'. Descend to join traffic pattern at 600'.
- Landing: Ellington tower may clear a training airplane to land if another airplane is at least 3000' down the runway.
- If you execute a go-around, advise tower.
- After landing, exit the runway at the first available taxiway. Cross the hold short line far enough for another airplane to also clear behind you, but do not enter any taxiway until cleared by ground control.
- You may continue to parking before completing the after landing checklist.

### **Post-Flight**

- After completion of the engine shutdown checklist, a walk around of the aircraft must be completed to ensure no physical damage has been sustained.
- If physical damage or any other discrepancy has been observed, the pilot must notify Flying Tigers' or their instructor for proper maintenance write-up.
- Any aircraft with an open write-up will not be dispatched until that discrepancy has been addressed and signed off by proper personnel.

### **Securing of Aircraft When Not in Use:**

- All aircraft will be tied down, with the control wheel lock installed, magnetos and master switch off, and all cabin doors and windows closed at the end of each flight. Chocks must be used at outlying airports when no tie-down is available.

# Weather Minimums

## NOTE: Check Current and Forecasted Weather!

### \* Winds including Gust Factor

Gust factor is  $\frac{1}{2}$  the difference between steady + gust.

EX. Winds 12g18 =  $12 + (6 \div 2) = 15$  knot winds

#### Outside EFD

1800 FEET (T41, LVJ)  
2500 FEET (Practice Areas)  
8 STATUTE MILES

#### Local Solo

	<u>At EFD</u>
CEILING	1500 FEET
VISIBILITY	5 STATUTE MILES
SURFACE WINDS	12 KNOTS
MAXIMUM X/WIND COMPONENT	5 KNOTS

#### Solo Cross Country-Departure, En-route and Arrival

DEPARTURE CEILINGS	3000 FEET
VISIBILITY	10 STATUTE MILES
SURFACE WINDS	15 KNOTS
MAXIMUM X/WIND COMPONENT	5 KNOTS

#### IFR Departure and En-route

IN ACCORDANCE WITH FAR 91 AND PUBLISHED ARRIVAL PROCEDURES BUT NO LESS THAN:	
CEILINGS	400 FEET

#### IFR Arrival

IN ACCORDANCE WITH FAR 91 AND PUBLISHED ARRIVAL PROCEDURES BUT NO LESS THAN:	
PRECISION APPROACH CEILING and VISIBILITY	400 FEET 1 STATUTE MILE
NON-PRECISION APPROACH CEILING and VISIBILITY	800 FEET 2 STATUTE MILES

**NOTE: YOUR INSTRUCTOR MAY INCREASE THESE MINIMUMS**

# Preflight Risk Assessment Tool - VFR

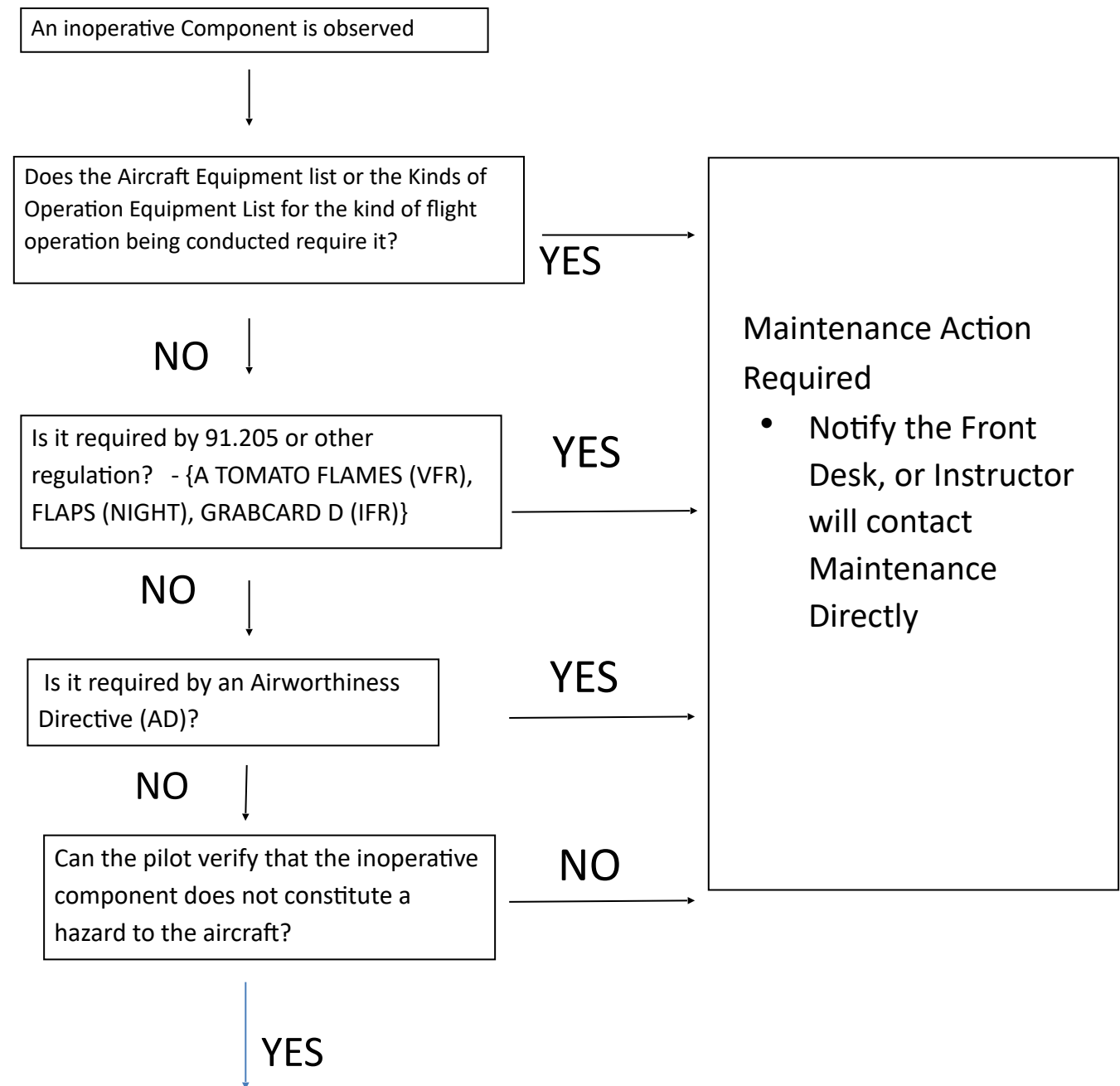
Before each flight, assess each of the following conditions and assign a numerical rating of 1 to 5 in the right-hand (Rating) column.

View overall risk estimate in lower right box, and see where it falls in the Risk Chart.

After you are done, please DISCARD changes

Risk Element	1	2	3	4	5	Rating
<b>PILOT</b>						
Rating	CFI/ATP	Comm1	Private Pilot	Student		
Crew	Pilot & Instructor	Pilot & Passenger	Solo	> 1 Passenger		
Hours in aircraft type	>50	21-50	11-20	6-10	<5	
Hours in last 90 days	>25	16-25	11-15	6-10	<5	
Days since last flight	< 5	5-10	10-15	15-25	>30	
Total Hours	>500	200-500	75-200	50-75	<50	
Illness / Medication		Allergies		Cold	Fever	
Stress	Low		Medium		High	
Alcohol		1-2 within 16 hrs		3-4 within 16 hours	> 4 within 16 hours	
Rest in last 24 hrs	> 8 hrs	7-8 hrs	6-7 hrs	4-5 hrs	<4 hrs	
Flight Time (Day)	< 2 hrs	2-4 hrs	4-6 hrs	6-8 hrs	> 8 hrs	
Eating / Emotion	Good		Fair		Poor	
<b>AIRCRAFT / AIRPORTS (departure or arrival)</b>						
Aircraft	1st Flight after Maint. Event or	> 50 hrs since inspection	Inop. radios or nav. equipment	2 inop items	> 3 inop items	
Destination airport	Very Familiar	Somewhat familiar		Not familiar		
Runway		< 3000'	Grass	< 50' wide	< 2000'	
Obstacles		Trees	Power Lines	Any at Night		
Terrain	Flat	Raising Terrain near Runway		Hilly	Mountainous	
Class	Class D	Class C	Class E or G	Class B	Busy Class B	
NOTAMS		Construction	Taxiways closed	Runway shortened	TFR	
<b>ENVIRONMENT - Worst Case - (departure or arrival)</b>						
Day/Night	Day		Night – Full Moon	Night – No Moon		
Visibility	> 9 miles	8-9 miles	5-7miles	3-5 miles	< 3 miles	
Ceiling	> 4,000'	3,000' –4,000'	2000' - 3000'	1500' - 2000'	< 1500'	
Winds	< 10 kts		15 - 20 kts or gusts 5-10 kts		< 25 kt. or gusts < 10 kts	
Crosswind	0-5 kts	6 - 7 kts	8 -11 kts	12 - 15 kts	> 15 kts	
Weather Forecast	Stable		Slow deterioration		Rapid deterioration	
Enroute Weather	> 4000' / 10 miles		2000'-3000' / 5-8 miles		<2000' / 5 miles	
Convective Activity	None	Within 200 miles	Within 100 miles	Within 50 miles	Within 20 miles	
<b>External Factors</b>						
External Factors	No Pressure to complete flight		Strong Pressure to complete today		Must complete flight as scheduled	
<b>Total Risk Score&gt;&gt;&gt;&gt;&gt;</b>						0
No unusual hazards. Use normal flight planning, established personal minimums, and operating procedures.						< 36
Somewhat riskier than usual. Conduct flight planning with extra care. Review personal minimums and operating procedures to ensure that all standards are being met. Consider consulting a flight instructor or alternatives to reduce risk.						37-45 or a 5 in any row
Conditions present much higher than normal risk. <u>Consult Flight Instructor before flight.</u> Conduct flight planning with extra care and review all elements to identify those that could be modified to reduce risk. Develop contingency plans before flight to deal with high risk items. Decide beforehand on alternates and brief passengers and other crewmembers on special precautions to be taken during the flight. Consider delaying flight until conditions improve and risk is reduced.						45-55 or a 5 in any 2 rows
Do Not Fly						> 55 or a 5 in any 3 rows

# Inoperative Equipment Procedures (91.213)



Inoperative component must be removed from aircraft OR deactivated and placarded Inoperative. The inoperative component must be logged on the aircraft squawk sheet.

Contact maintenance before squawking component. Students **MUST** contact the front desk or an instructor **before** squawking an item. All squawks **MUST** include the pilot's name.

If maintenance is not available, Instructors may deactivate and placard the inoperative component. A note that the item is deactivated and placarded inoperative will be entered in the 'worked performed' column of the aircraft squawk sheet along with pilot name and cert. #. The Squawk Alert card will remain in front of the binder until signed off by a mechanic.

The Squawk is cleared when a mechanic write off and signature is in the mechanic signature column.





# Standard Operating Procedures

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Generic for all single engine aircraft : flap setting 10 degrees = 1/3 in Grumman. Power settings in RPM and MP for Arrow are approximate and may vary based on aircraft and specific flight conditions.

## Index

All Lessons.....	10	Non Precision Approach.....	22
All Training Flights.....	10	Circling Approach.....	22
Taxi, Takeoff, Departure.....	10	Missed Approach.....	22
Passenger Briefing.....	10	Holding.....	22
Takeoff Briefing.....	10		
Traffic Pattern and Landing.....	10		
Forward Slip to Landing.....	11		
Go- Arounds.....	11		
All Training Maneuvers.....	11		
Pre-Maneuver Checklist.....	12		
Basic Attitude Flying .....	12		
Maneuvering During Slow Flight.....	12		
Power Off Stalls.....	13		
Power On Stalls.....	14		
Accelerated Stalls.....	14		
Demonstrated Stalls.....	15		
Steep Turns.....	15		
Short Field TO's and Landings.....	16		
Soft Field TO's and Landings.....	16		
Ground Reference Maneuvers.....	16		
Private Pilot Instrument Procedures....	17		
Other Training Maneuvers.....	17		
Rudder Drill.....	17		
Stability Demonstration.....	17		
Emergencies.....	18		
Engine Failure.....	18		
Emergency Descents.....	18		
Other Emergencies.....	19		
Cross Country Navigation.....	19		
Commercial Maneuvers.....	20		
Chandelles.....	20		
Lazy eights.....	20		
Eights on Pylons.....	21		
Steep Spiral.....	21		
Accuracy Landing.....	21		
Instrument Procedures.....	22		
Approach Briefing.....	22		
Precision Approach.....	22		

## All Lessons:

Review Lesson Objectives and Completion Standards during Pre and Post Flight Briefing

Review maneuvers in this Document.

## All Training Flights:

Climb at  $V_y$  (+10 to - 5 knots) unless otherwise directed.

Coordinated flight (Right rudder during climb)

Cruise at 2400 RPM (24x24 in Arrow),

Prescribed altitude +100 to - 0 feet.

Use aircraft type in all radio calls (Cessna 280JA, etc.)

- Use last 3 digits only after ATC has done so.

(Complex) When Gear Horn sounds, announce **“Gear Horn Acknowledged” (or lower gear)**.

## Traditional Best Practices

First solo flights should complete three full stop landings. All pre-solo students should be taught full stop / taxi back as well as touch and go landings.

Cross country dual and solo flights should also complete three full stop landings. At least one stop at an FBO is important. Have student take photos at each airport they go to!

### TAXI, TAKEOFF, & DEPARTURE

- Use crosswind correction throughout taxi and takeoff
- Maintain outside visual scan throughout taxi (comes to a complete stop before any checklist, etc.)
- Brief normal and emergency plan prior to takeoff
- Short and soft field – POH procedures
- Climb at  $V_y$  (-5 to +10 knots)
- Crosswind turn from upwind– begin 300’ below pattern altitude to be at TPA turning downwind.
- Out of 1000’ set climb power.

#### Common Errors:

- Not maintaining centerline and heading (Rudder)
- Excessive pitch after takeoff (maintain  $V_y$ )
- Failure to maintain cross wind correction
- Feet on brakes during takeoff

### TAKE OFF BRIEFING

- Runway departing / verify performance
- Wind
- Type of takeoff
- Rotation speed /  $V_y$  (or  $V_x$  as appropriate)
- Initial departure procedure
- Abort or engine failure plans.

#### Passenger Briefing

- Use of seatbelts
- Cockpit door/canopy
- No smoking
- Evacuation plan
- Help with visual lookout
- Sterile cockpit in class B,C,D
- Flight control freedom of movement
- airsickness

### TRAFFIC PATTERN & LANDING

- Complete approach briefing early
  - Runway / pattern entry
  - Approach type / IFR brief
  - Obstacles
  - Taxi plans
- Get ATIS and call tower at least 10 miles out.
- Before landing checklist, except final flaps, before entering traffic pattern.

- Uncontrolled field - maneuver to enter pattern at a 45 degree angle to downwind. Alternatively, cross over mid-field to enter downwind.
- Flaps 1/3 entering pattern (or entering downwind when in pattern)
- Abeam touchdown point - power to 1500 RPM /15" MP (Arrow)
- Airspeed on downwind: 90, Base 70 MINIMUM (80 is ideal).
- Base leg - - Flaps 2/3
  - Flaps settings may be modified as desired for type landing.
- Turning final - set landing flaps and slow to approach speed (65-70 knots)
- Stabilized at 300' AGL: landing speed (vref), aligned with centerline, crosswind slip established
- Short and soft field - full flaps, 61 knots (Cheetah, Cessna)
- Normal landings on **main wheels only, on and aligned with centerline**, holding nose off as long as possible.
  - Hold back pressure until taxi speed: Airspeed Standards; +10 to -0 knots on final.

#### Common Errors:

- Incorrect pattern entry altitude or position
- Failure to use radio calls throughout
- Not maintaining traffic pattern altitude
- Improper visual scanning
- Failure to set proper descent attitude

## PARKING & SECURING AIRCRAFT

- Use low power while maneuvering near other airplanes
- Clean Cabin before leaving
- Post Flight Inspection

## FORWARD SLIP TO LANDING

Purpose: To gain skills required to reduce aircraft altitude quickly during normal and emergency approaches

#### Procedure:

- Line up on runway (or road for practice)
- Determine crosswind
- Roll aileron into the wind
- Opposite rudder to maintain alignment with reference line
- Adjust pitch attitude to maintain 80 knots (safe margin above stall speed)
- On normal profile – recover to stable approach.

#### Common Errors:

- Not maintaining runway alignment
- Poor airspeed control
- Forgetting to close the throttle
- Failure to re-align with centerline

## GO-AROUND

- Make timely decision
- Apply full power and appropriate right rudder
- Carburetor heat - off
- Pitch - nose to horizon
- Retract the first notch of flaps
- Positive rate of climb – gear up (if applicable)
- Maintain heading using rudder and ailerons
- Notify tower or airport traffic
- Establish a positive rate of climb at Vy
- Retract the second and third notches of flaps in increments

#### Decision Making. Go Around if:

- Excessive sink rate close to runway
- Ballooning
- Porpoising (hitting nose wheel first, or flat)
- Drifting off center line
- Not landing in first 1/3<sup>rd</sup> of runway
- Wake turbulence or wind shear
- Another aircraft or obstruction on runway
- Instructed by ATC

#### Common Errors:

- Initiating go-around too late (or too slowly)
- Not increasing airspeed quickly
- Excessive yaw

## ALL TRAINING MANEUVERS

- Use OUTSIDE visual reference (**cowling to horizon relationship**) to maintain heading and pitch attitude (Instructors - watch their eyes!)
- Aviate, Navigate, Checklist, Communicate.
- **Practice, Practice, Practice:** In training, repeat maneuvers such as stall recovery and ground reference maneuvers over and over (even when proficient) to ensure long lasting skills.

## PRE-MANEUVER CHECKLIST

- Altitude that will insure recovery above 1500' AGL
- Suitable area – sparsely populated where a forced landing can be made if the engine fails (not over large buildings!)
- Practice area radio call **123.5**
- Lights on (NAV and/or Strobes, and LDG LGHT)
- Seat belts fastened
- Mixture – set
- Fuel pump on as applicable (not in C172S)
- Fuel selector on the fullest tank
- Engine instruments verify on the green range
- Clearing turns (Turn 90 degrees to left or right, then to the opposite direction to ensure the area is clear of other traffic)

### Common Errors:

- Improper airspace selection
- No radio calls
- Failure to perform clearing turn

## BASIC ATTITUDE FLYING (4 FUNDAMENTALS)

- Primarily use OUTSIDE visual reference (**cowling to horizon relationship**) to maintain pitch attitude and heading (Instructors - watch students eyes!)
- Integrated method: compare outside and inside visual references (horizon vs. flight instruments)
- Cruise power setting: usually 2400 RPM -Arrow: 24"/2400RPM
- Students should use and adjust trim throughout flight
- Power/performance in all phases of flight

### Common Errors:

- Insufficient scan outside and inside
- Failure to properly lead roll-out of level-off
- Difficulty maintaining descent attitude

## MANEUVERING DURING SLOW FLIGHT

Normally will be performed in the landing configuration (gear and flaps down as applicable)

- Pre-maneuver checklist
- Reduce power to 1500 RPM - carburetor heat on
- Maintain heading and altitude while slowing
- When the airspeed drops below V<sub>fe</sub>
  - flaps down (full or partially deployed as specified by the instructor)
  - Landing Gear Down (if applicable)
- As airspeed drops to 5-10 knots above the stall speed, increase Power to about 2000 RPM
- Trim as necessary
- Maintain airspeed approximately 5-10 knots above the 1G stall speed, at which the airplane is capable of maintaining controlled flight without activating the stall warning
- Control speed with pitch, altitude with power
- Perform turns to specific headings, climbs, and descents.
- PTS: Altitude  $\pm 100$ ft, Heading  $\pm 10^\circ$ , Airspeed  $+10/-0$  knots, Bank  $\pm 10^\circ$
- Commercial :  $\pm 50$  feet, Heading  $\pm 10^\circ$ , Airspeed  $+5/-0$  knots, Bank  $\pm 5^\circ$

### Common Errors:

- Gain or loss of altitude during entry
- Poor rudder control (uncoordinated flight)
- Not understanding power/performance relationship
- Not using trim
- Insufficient outside visual scan

## RECOVERY:

Once you are done with the procedure you may recover (exit the maneuver), or go directly into the power off stall recovery exercise. The recovery is done with the following procedure:

- Apply full power - and corresponding right rudder
- Carburetor heat off
- Retract the first notch of flaps
- Positive rate – gear up (if applicable)
- As airspeed increases the second and third notches of flaps in increments ( $V_x$ ,  $V_y$ )
- Maintain altitude and heading
- Resume cruise flight
- Cruise checklist

## POWER OFF STALLS IN THE **LANDING CONFIGURATION**:

This type of stall recovery practice is designed to simulate a condition in which the pilot might lose situational awareness when turning base to final or flaring too high during landing, resulting in a stall well above the runway.

### SET-UP

- Pre maneuver checklist
- Pick a heading and reference point on ground
- Reduce power to 1500 RPM
- Carburetor heat on
- When the airspeed drops below  $V_{fe}$  : flaps down (full) in increments.
- Landing gear down (if applicable)
- Establish stabilized descent at 70 knots (500 FPM, about 1500 RPM) (final approach attitude)
- At designated altitude: reduce power to idle
- Apply back pressure on the yoke to simulate a landing flare
- Increase back pressure so nose continues to raise vs. the horizon to induce a stall
- Use rudder to maintain heading (ACS:  $\pm 10^\circ$  or if in turning flight not to exceed  $20^\circ$  bank:  $\pm 10^\circ$ )
- Practice both straight ahead and in banks up to 20 degrees

#### Common Errors (setting up):

- Not maintaining altitude, heading or bank angle  
- not using outside visual references
- Uncoordinated aileron/rudder
- Insufficient outside visual scan
- “Mushing” rather than stalling  
- not enough back pressure to induce stall

### RECOVERY (Power off stalls):

Once the stall is identified by aerodynamic buffet, initiate the recovery by the following procedure:

- Reduce AOA while simultaneously applying full power and right rudder
- Carburetor heat off
- Maintain heading using coordinated rudder and aileron
- Retract the first notch of flaps
- Positive rate – gear up (if applicable)
- Establish a positive rate of climb at  $V_y$  without inducing a secondary stall
- Retract the second and third notches of flaps in increments
- Resume cruise flight – cruise checklist

#### Common Errors (recovery):

- Failure to maintain heading or bank angle
- Insufficient use of rudder in recovery
- Failure to reduce pitch to the horizon
- Excessive altitude loss

## POWER ON STALLS IN THE **TAKEOFF CONFIGURATION**: (after gear retraction if applicable)

This type of stall maneuver is designed to simulate a condition in which the pilot might pitch up excessively after takeoff, resulting in a stall a short distance above the runway.

- Pre maneuver checklist
- Reduce power to 1200 RPM
- Carburetor heat on
- When the airspeed Reaches 60 Knots ( $V_r$  - rotation airspeed):
- Apply full power, right rudder, and carburetor heat off
- Apply back pressure on the yoke to simulate an exaggerated climb out
- Use rudder to maintain heading
- Increase back pressure so that nose continues to raise vs. the horizon until a stall is induced
- **Practice both straight ahead and in banks up to 20 degrees**

### Common Errors (setting up):

- Not maintaining altitude, heading or bank angle
- Uncoordinated aileron/rudder
- “Mushing” rather than stalling
  - not enough back pressure to induce stall

## RECOVERY:

Once the stall is **identified by aerodynamic buffet** initiate the recovery by doing the following procedure:

- Lower the nose to approx. cruise attitude
- Maintain heading with coordinated use of rudder and aileron
- Establish a positive rate of climb at  $V_y$  without inducing a secondary stall
- Resume cruise flight – cruise checklist

### Common Errors (recovery):

- Not maintaining heading or bank angle
- Insufficient use of rudder in recovery
- Entering secondary stall
- Excessive altitude loss

## ACCELERATED STALLS (required for commercial)

Objective: To understand stall speed changes in relation to load factor and demonstrate the ability to recover from an accelerated stall

Procedure:

- Pre maneuver checklist
- Slow to 80 knots
- Power to idle
- Bank to 45 degrees, increase pitch to induce stall horn
- Use opposite aileron to counter over-banking tendency
- Recover: normal stall recovery, be alert for sudden wing drop if not coordinated– use rudder!

### Common Errors:

- Over banking as pitch is increased
- Failure to slow to stall speed
- Insufficient rudder on recovery

## DEMONSTRATED STALLS: Required for training, but not for Practical Test

- **Cross-Control Stall**
    - **Objective:** simulate exaggerated use of rudder on late base to final turn.
    - Set up for normal power off stall – establish glide
    - Roll into a 25° banked turn
    - Apply heavy rudder IN DIRECTION of turn
    - Apply opposite aileron to maintain bank angle
    - Increase back pressure to keep nose from lowering
    - Recovery: release all control pressure, increase power, recover to cruise flight.
  - **Secondary Stall**
    - **Objective:** simulate exaggerated pitch recovery from a stall
    - Execute a normal power on or power off stall
    - During recovery, quickly increase pitch again to enter a secondary stall
    - Recovery: lower AOA to regain airspeed, normal stall recovery
  - **Elevator Trim Stall**
    - **Objective:** simulate stall when going around with nose high pitch trim.
    - Set full flaps
    - Establish normal power off descent
    - Trim nose up to relieve control pressure
    - Add full power (right rudder) to simulate a go-around
- Recovery:
- Apply positive forward pressure on the yoke,
  - Lower nose to normal climb attitude
  - Re-trim

## STEEP TURNS

Purpose: To increase aircraft control skills and to train eyes to scan airspeed and altitude while concentrating on outside references and watching for other aircraft.

- Pre maneuver checklist
- At least 1500' AGL
- Trim for level flight, \* knots. (about 2100 RPM)
- Select heading and outside visual reference
- Smoothly roll into 45 degree bank (add back pressure going through 30 degrees) - pre-determined point on cowling is on the horizon
- Advance power 100-200 RPM
- Trim aircraft
- Maintain attitude with reference to horizon and cowling – keep eyes OUTSIDE 90% of time.
- Private pilot: One 360. Commercial: both directions
- Begin rollout 20 degrees before target heading
- Reduce back pressure and reduce power back to (about 2100 RPM)
- Re-trim
- Maintain heading, altitude, and airspeed
- Cruise Checklist

### \* Max maneuvering speed (Va)

* Cheetah/Tiger/172S	105 knots
* 172M/N	97 knots
* SR-20	131 knots

### Common Errors:

- Not maintaining proper bank angle
- Failure to maintain airspeed  $\pm 10$  knots
- Gain or loss of altitude during entry
- Loss of orientation (roll out heading)
- Gain or loss of altitude or airspeed during rollout

## GROUND REFERENCE MANEUVERS

Purpose: (traffic pattern skills)

- Learn to compensate for wind drift in the traffic pattern, orient ground path with visual references while scanning outside for other aircraft.
- Train eyes to scan airspeed and altitude while concentrating outside to complete maneuver to Airmen Certification Standards. ( $\pm 100$  ft.  $\pm 10$  knots)

Procedure:

- Pre maneuver checklist
- Identify suitable emergency landing area considering winds that is sparsely populated (no buildings).
- Enter maneuver with a tailwind
- Establish 1000' AGL Trim to \* knots (about 2100 RPM)
- Maintain appropriate bank angle and wind drift correction to complete maneuver to ACS standards
  - Rectangular course – proper use of rudder / wind correction
  - S-Turns – check wings level and parallel to reference by looking both ways on roll out.
  - Turns around a point - maintain constant radius

### Common Errors:

- Failure to perform pre-maneuver checklist
- Failure to enter at proper altitude / airspeed
- Inability to divide attention outside and inside
- Failure to scan for traffic
- Insufficient wind correction
- Poor coordination

## SHORT FIELD TAKEOFF

- Normal pre-takeoff procedures
- Set flaps per POH
- Line up at the end of the runway
- Hold brakes until full power is applied – verify engine instruments are in appropriate ranges
- Apply elevator back pressure per POH
- Lift off and climb to 200' at  $V_x$
- See ACS standards

## SHORT FIELD LANDING

- Use normal pre-landing procedures
- Use full flaps, stabilize airspeed per POH (61k in Cheetah, 62k in C172S, recommend 81mph in Arrow)
- Touch down at slowest safe airspeed
- Simulate maximum braking
- See ACS Standards

## SOFT FIELD TAKEOFF

- Normal pre-takeoff procedures
- Hold full back pressure while taxiing onto runway
- Use minimal braking
- Smoothly add full power
- Gradually release back pressure as weight comes off the nose gear
- Maintain level flight in ground effect to  $V_y$
- See ACS standards

### Common Errors: (Soft Field Takeoff)

- Allowing nose to raise too quickly, blocking view of runway and losing ground effect.

## SOFT FIELD LANDING

- Use normal pre-landing procedures
- Use full Flaps, stabilize airspeed per POH (61k in Cheetah, 62k in C172S, recommend 81 mph in Arrow)
- Touch down at slowest safe airspeed

### Common Errors: (Soft Field Landing)

- Confusing short field and soft field procedures



- Maintain back pressure on elevator throughout roll-out.
- See ACS standards

#### PRIVATE PILOT INSTRUMENT PROCEDURES

- Scan Technique
- Pitch and Power
- Training: VFR into IMC scenario: tell student they have just entered a cloud and have them get out of it.

##### Common Errors:

- Fixating on one instrument
- Over controlling
- Failure to make prompt corrections

#### UNUSUAL ATTITUDES

- Nose high and slow - increase power, decrease pitch, and then roll out
- Nose low and fast - reduce power, pitch to horizon, roll out of turn
- Recover to normal cruise

##### Common Errors:

- Failure to properly identify unusual flight attitude
- 'Pushing over' in high pitch / low bank attitude
- Failure to add or reduce power as needed

## Other Training Maneuvers

#### RUDDER DRILLS

- Turns using rudder only
- Dutch Roll – hold heading with rudder while instructor banks airplane with aileron
- Holding a slip while tracking a straight line

#### STABILITY DEMONSTRATION

- Static Stability – airplane stays in equilibrium when trimmed properly
- Dynamic Stability – airplane returns to equilibrium when disrupted

# Emergencies

## ALL EMERGENCIES / ANOMOLIES:

- Emergency Checklist
- Boxed items are to be performed by memory
- Check circuit breakers

- 1. Maintain situational awareness**
- 2. Analyze the situation**
- 3. Take appropriate action**

## SIMULATED ENGINE FAILURE

Objective: To gain skills required to manage the airplane in case of an engine failure

Procedure:

- Maintain aircraft control
- Engine failure memory items
- Maneuver as needed to set up for an upwind landing
- Forced landing memory items
- Continue maneuvering as necessary to guarantee a landing in the first 1/3 of field
- Execute checklists if time permits
- Go around at 500', or lower if at an airport
- Practice 360 degree and 180 degree (traffic pattern) approaches
- Evacuate aircraft

### Common Errors:

- Failure to maintain glide speed throughout
- Not checking GPS for available airfield
- Failure to pick landing field and keep it in sight
- Failure to modify approach as needed to get in landing position
- Failure to complete forced landing checklist

Practice: Engine failure on climb out, departure, and arrival – not to exceed 200' altitude loss below 1000' AGL (Student should at least trim for best glide speed, find a field, and turn toward it).

## EMERGENCY DESCENTS

Objective: To understand procedures needed to lose altitude quickly and land in case of fire, passenger issue, cabin depressurization, or other emergency

Procedure:

- Pre Maneuver checklist
- Power Idle
- Turn off airway – maintain steep bank (30°-45°)
- Pitch to V<sub>no</sub> or V<sub>ne</sub> as appropriate (Arrow : Gear Down, 150 MPH)
- Notify ATC
- Recover at safe altitude

### Common Errors:

- Failure to set proper configuration
- Insufficient pitch down.
- No radio call

## SYSTEMS AND EQUIPMENT MALFUNCTIONS

Objective: To become familiar with possible aircraft system failures and actions to recover from them.

- Engine fires on start and in flight,
- Partial engine failure,
- Electrical and radio failure,
- Other emergencies applicable to aircraft (landing gear, etc.),
- No flap landings
- Balked takeoff: flat tire, low engine power, and other scenarios
- Stuck Throttle / flight controls in flight

Procedure (Other Emergencies):

- Maintain Aircraft Control
- Identify Failure
- Take immediate (memory) actions
- Check Circuit Breakers / Fuses
- Consult checklist as applicable
- Evacuate Aircraft

### Common Errors:

- Failure select proper checklist
- Doesn't understand system

## CROSS COUNTRY NAVIGATION

Pilotage and Dead Reckoning

- Find position on sectional chart
- Intercept course
- Find groundspeed, ground track, and time to next station using dead reckoning
- Check correct estimated time at next checkpoint

Navigation Systems and Radar Services

- VOR and GPS navigation, Radar Vectors
- **Use OBS whenever navigating with GPS**

Diversion

- Find rough heading, time, and fuel burn to appropriate airport
- Use all available resources

### Common Errors:

- Failure to set up cockpit before departure
- Failure to start time on departure
- Failure to adequately intercept course
- Failure to adequately track course
- Selecting an inappropriate diversion airport

Lost Procedures - Five C's – Climb, Confess, Communicate, Comply, Conserve.

Flight Service Station: 122.2

**Emergency frequency: 121.5**

## Commercial Maneuvers: \* All Speeds and procedures applicable to the Grumman Cheetah

### CHANDELLES

Objective: To increase aircraft control skills and smoothness appropriate to a commercial pilot level. Perform maximum performance climbing turns while emphasizing proper coordination.

Procedure:

- Pre maneuver checklist (High RPM)
- Maintain level flight with approx. 2300 RPM
- Select cardinal entry heading and external visual checkpoint off wingtip
- Smoothly roll to 30 degree bank
- Set full throttle
- SLOWLY pitch up to about 12 degrees (should arrive at this pitch at 90 degree point)
- At 90 degree point, SLOWLY decrease bank to level with checkpoint off opposite wing (180 degree point)
- Increase back pressure as needed to maintain 12 degrees pitch
- At 180 degree point should be at minimum controllable speed (stall horn)
- Accelerate while maintaining level flight
- Cruise checklist

#### Common Errors:

- Insufficient use of outside visual reference
- Rapid pitch change during first 90°
- Failure to maintain pitch second 90°
- Failure to roll out smoothly second 90°

### LAZY EIGHTS

Objective: To increase aircraft Coordination skills and smoothness appropriate to the commercial pilot level.

- Maneuver requires constantly changing pitch, bank, and airspeed

Procedure:

- Pre maneuver checklist (high RPM)
- Maintain level flight with approx. 2300 RPM
- Select cardinal entry heading and visual checkpoint off wingtip
- SLOWLY increase pitch and bank (pitch increase slightly faster than in chandelle)
- At 45 degree point (checkpoint at 45 degree angle)
  - 15 degrees bank, 12 degrees pitch (keep eyes outside!)
  - Allow pitch to start dropping
  - Continue increasing bank to 30 degrees
- At 90 degree point (checkpoint straight ahead) - Pitch level, bank 30 degrees
  - Pitch down
  - Decrease bank
- At 135 degree point (checkpoint out other window) pitch down 12 degrees, bank 15 degrees
  - Slowly pitch up
  - Continue decreasing bank
- At 180 degree point (checkpoint off other wing) level pitch and bank - but:
  - Continue rolling bank other direction to complete the 8
  - Start pitching back up to complete the 8

#### Common Errors:

- Insufficient use of outside visual reference
- Rolling out too early
- Uncoordinated rudder/aileron
- Impatience

## EIGHTS ON PYLONS

Objective: To increase aircraft control skills and smoothness appropriate to a commercial pilot.

- Maneuver requires constantly changing pitch, bank, and airspeed

Procedure:

- Pre maneuver checklist
- Calculate pivotal altitude
- Maintain level flight at 100 KIAS (approx 2300 RPM)
- Select two pylons that will allow a turn in both directions
  - the pylons should be on a road to be easier to spot on rollout from left turn
- Set up with a tailwind, fly between the pylons at 45 degree angle to first pylon at pivotal latitude.
- Begin turn such that the pylon is directly on top of wing (or bottom – Cessna)
- Apply pitch changes to compensate for changes in GS
- Keep pylon glued to wing with bank angle:
- Pitch down if point moves forward, pitch up if point moves aft.
- Watch for other pylon during turn
- Roll out to proceed diagonally between pylons at 45 degree angle
- Continue maneuver until told to stop
- Exit maneuver on entry heading
- Cruise checklist

### Common Errors:

- Incorrect entry
- Allowing pylon to drift above or below wingtip
- Slipping or skidding to bring wing around
- Failure to pick suitable pylons
- Loss of situational awareness (unable to find second pylon)

## STEEP SPIRAL

Objective: To increase aircraft control skills and learn to descend quickly while maintaining position over a point

Procedure:

- Pre maneuver checklist
- Suitable area - sparsely populated where a safe landing can be made if the engine fails
- Start at least 5500' AGL
- Select suitable point – will appear very close to airplane at that altitude
- Set power to idle, trim for 72 KIAS
- Maintain 3 constant radius turns – bank **may not** exceed 60 degrees (start with 30 degrees)
- Clear engine every 360 degree turn (when into the wind)
- Maintain rudder coordination – ball centered
- Rollout on entry heading
- Cruise checklist

### Common Errors:

- Starting too far from the point
- Inadequate wind correction
- Failure to maintain airspeed
- Loosing count of number of turns

## 180° ACCURACY LANDING

Objective: To increase aircraft control skills and gain ability to land the aircraft in a confined space.

Procedure:

- Entering downwind leg: before landing checklist including gear down complete
- Idle power when “abeam the numbers”
- Turn toward runway
- Judge descent rate and maneuver accordingly
- Flaps and slip as necessary
- Land within -0' to +200' of target

### Common Errors:

- Late base turn
- Incorrect corrections for wind conditions
- Over flaring or bouncing.

## INSTRUMENT PROCEDURES

### Altitude awareness

- Write down cleared altitudes
- Call out 1000' above/below, 300 above/below, 100 above minimums.
- Terminology: Out of 2000 for 3000, etc. (**Better Situational Awareness!**)

Instructors: Use distractions at level off or course intercept

### Before takeoff briefing

- Route, Altitude, Frequencies. Set up for first approach if known.

All Approaches: Continue past MAP as if you will be landing unless otherwise instructed.

: If landing - remain on PAPI or VASI until runway threshold.

### APPROACH BRIEFING:

- Approach name/runway/airport
- Frequency (set)
- Approach course (set if on vectors to final)
- Notes
- Lighting
- Missed approach procedure
- Minimum safe altitude
- FAF name/altitude
- Intermediate altitudes
- GS intercept altitude (precision app.)
- MAP (timing if applicable)
- DA/MDA
- Visibility required
- Other notes / comments

### PRECISION APPROACH

- Brief procedure
- Approaching localizer: before landing Checklist, slow to 90 knots
- One dot below GS: flaps 10 (about 2200RPM)
- On GS power to about 1700 RPM
  - Pitch for Glide Slope, Throttle for Airspeed
- Stabilized approach – maintain 90 knots to DA
- At MAP continue on PAPI, or execute go around as instructed
- Flaps as desired, slow to landing speed

#### Common Errors:

- Failure to configure before FAF
- Poor situational awareness
- “Chasing” LOC/GS

### NON-PRECISION APPROACH

- Brief procedure
- Approaching final approach course : before landing checklist down to final flaps, slow to 90 knots
- Descend to FAF altitude once established on course (1700 RPM)
- 1 NM from FAF – flaps 10, about 2200RPM = 90 knots, Level
- At FAF, power to about 1700 RPM
  - Descend initially at 1000 fpm, then 500fpm within 500' of MDA or intermediate fix.
- Stabilized approach – Maintain 90 knots  $\pm 10$  to MAP
- At MAP continue on PAPI: flaps as desired, slow to landing

#### Common Errors:

- Failure to configure before FAF
- Failure to start timing at FAF
- Failure to identify FAF
- Failure to identify step-down fixes

- speed
- Go around as instructed/required

### **CIRCLING APPROACH**

- Brief procedure
- Begin circle when field is in sight or later as briefed
- Maintain 90 knots (85 in Cheetah)
- Maintain Circling Altitude until in position to make a normal descent using normal procedures
- Intercept PAPI
- Go Around if instructed/required
  - Initial turn toward runway
  - Intercept normal missed approach procedure

#### **Common Errors:**

- Failure to visualize circling pattern before MAP

### **MISSED APPROACH**

- Full power
- Carb heat off
- Flaps 20, 25, 2/3 (as appropriate)
- Positive rate: gear up
- Vy – Flaps up
- Notify ATC
- Climb at Vy
- Fly procedure

#### **Common Errors:**

- Failure to announce missed approach
- Failure to remove carburetor heat
- Insufficient or no climb

### **HOLDING**

- Brief procedure
- Determine holding entry (hand method)
- Determine initial outbound course
- Determine first turn after outbound leg
- Notify ATC of time and altitude entering hold (first passing the fix)
- Five T's (Throttle, Turn, Time, Twist, Talk, + Think)

#### **Common Errors:**

- Failure to determine proper entry procedure
- Failure to determine initial heading
- Incorrect initial turn direction
- Failure to set inbound course on CDI