HANDY TIPS FOR NEW JUMP PILOTS

CONTENTS

This section of the PANAM Manual of Procedures will serve as GUIDANCE for jump pilots in general; this information does **NOT** supersede the procedures as described in the Pilot's Operating Handbook or the standard operating procedures in force at the individual clubs.

1 GENERAL

The noise of a jump-airplane cockpit generally makes normal conversation difficult and communication of complex plans almost impossible. It is therefore very important that the pilot fully understands, and be in a position to anticipate the procedure required by the load/jump master under almost any set of circumstances. The load/jump master must be familiar with the performance limitations of the aircraft.

Communication between the jump pilot and the load/jump master is vital for successful and safe parachuting operations.

A jump pilot must be familiar with the various hand signals used during skydiving operations; this type of communication is only possible after you have solid knowledge of parachuting. Make a point of attending first jump courses as well as jumpmaster/instructor seminars on a regular basis. This will expand your understanding of skydiving activities and allow you to voice your opinion on any issues that you wish to raise.

2 PRE-FLIGHT INSPECTION

The commencement of daily operations is preceded by a pre-flight inspection. Always follow the procedure as prescribed by the Pilot's Operating Handbook.

The following points are generally applicable for any type of aircraft.

3 CABIN INSPECTION

Ensure that all the required paperwork is available.

Remember the letters **AROW** and you will have no problem recalling what is required.

- **A**irworthiness certificate
- **R**egistration certificate
- **O**perating handbook
- **W**eight and balance data

Remove the control wheel lock.

Check that the ignition switch is off and keys are not in the ignition

Switch on master switch.

Check fuel quantity, but be aware the gauges are only completely accurate when reading empty. Visually inspect the tanks and calculate fuel requirements

Lower the flaps

Switch the master switch off

Ensure that the fuel valve is on

4 EXTERIOR INSPECTION

During this part of the pre-flight inspection look for anything that is mechanically unsound. If in doubt do not fly!

i Inspect the empennage.

ii Remove tie downs.

iii Check for free movement and security of the elevator and rudder. Ensure balance weights are secure.

iv Check antennae.

v Inspect right flap. Check sliders and security of flap, there should be only slight movement possible.

vi Inspect the right aileron by checking the hinges and ensuring that there is freedom of movement. The control wheel should move in the correct direction when the aileron is moved.

vii Inspect the leading edge of the wing.

viii Check right main wheel. The tire should be in good condition and adequately inflated. There should be no signs of brake fluid leaks.

ix Drain a small quantity of fuel from the right fuel tank drain valve and check for water, sediments and proper fuel grade.

x Inspect upper surface of wing.

xi Visually check fuel quantity by removing fuel cap and looking in the tank.

xii Secure fuel cap.

xiii Check oil level.

xiv Pull out the fuel strainer drain knob and collect a sample of fuel to check for any sediment and/or water.

xv Look inside cowling for small animals, lost wrenches, oil leaks, etc.

xvi Inspect the nose wheel and fairing. The nose wheel strut and tire should be properly inflated. There should be about two inches of nose wheel strut exposed and no significant leakage of oil from the strut. Check the shimmy damper and the nuts and bolts for security.

While inspecting the nose of the airplane, remain clear of the arc of rotation of the propeller at all times.

xvii Check propeller and spinner for damage such as nicks or cracks and security.

xviii Check alternator belt.

xix Ensure air intake filter is unobstructed.

xx Landing light should be clean and operational.

xxi Inspect static source opening.

xxii Inspect upper surface of left wing.

xxiii Visually check fuel quantity by removing fuel cap and looking in the left tank.

xxiv Inspect the pitot tube.

xxv Inspect the leading edge of the left wing. Check stall warning device and fuel vent.

xxvi Inspect the left aileron by checking the hinges and ensuring that there is freedom of movement. The control wheel should move in the correct direction when the ailerons are moved.

xxvii Inspect left flap. Check sliders and security of flap, there should be only slight movement possible.

xxviii Check left main wheel. The tire should be in good condition and adequately inflated. There should be no signs of brake fluid leaks.

xxix Drain a small quantity of fuel from the left fuel tank drain valve and check for water, sediment and proper fuel grade.

Stand in front of the aircraft and take a minute to consider whether anything has been overlooked.

5 LOADING, START-UP AND TAXI

Always load the aircraft within the weight and balance limitations, pay specific attention to the position of the centre of gravity as this limitation is the one most likely to be exceeded.

The jump pilot is faced with a high risk of someone walking into the propeller. Jumpers and spectators may not be aware of the spinning propeller. Crouching in the propeller arc is a favourite spot for photographers, **NEVER** start the aircraft until all jumpers are aboard and the spectators are clear.

On busy days it may be necessary to leave the engine/s running while the jumpers are boarding the aircraft. **BE EXTREMELY CAUTIOUS**.

If record keeping is required, it can be done while the jumpers are boarding or before start-up, this will ensure that the jump pilot can apply his full attention the start-up and taxi.

During the taxi, re-confirm the jump run altitudes. If you know or suspect that the requested altitude may not be practicable discuss the alternatives before take-off.

6 TAKE-OFF AND CLIMB OUT

Perform complete pre-take off procedures as described in the Pilot's Operating Handbook before each flight, this will ensure that nothing is left to chance. The use of a checklist is highly recommended.

Just before take-off the jumpers will make their final adjustment in seating position. Do final cockpit checks prior to take-off. Check the **fuel selector/s, trim, flaps, primer, mixture, prop-pitch, carburettor heat, cowl flaps, fuel quantities (pumps) and magnetos** as you roll into the take-off position.

The first priority after lift-off is to accelerate to the **best rate of climb speed**, obstructions permitting. Since the aircraft is near its weight and centre of gravity limitations, the airspeed must be closely monitored. Trim the aircraft so that minimum control forces are necessary during the initial climb out.

Perform the after take-off checks as per Pilot's Operating Handbook and club standard operating procedures.

Ensure that the aircraft is operated within the operating limitations at all times, pay specific attention to engine performance indicators as the nature of the operation can lead to abuse of the engine/s.

7 CLIMBING TECHNIQUE

Efficiency in the climb is achieved not by overworking the engine, but by maintaining coordinated flight at a constant airspeed and by keeping the turns gentle and to a minimum. Be smooth and precise. Follow the standard operating procedures as set out by the Pilot's Operating Handbook.

Handy tips for piston engine aircraft.

Cylinder head temperature is controlled in the following order:

1 Cowl flaps
2 Richer mixture if smooth engine operation allows
3 Higher airspeed
4 Lower power settings

High oil temperature is quickly corrected by 1, 3 and 4.

Much of the guesswork in proper leaning can be taken care of by the exhaust gas temperature gauge. About 100 degrees to the rich side of peak is recommended.

There have been several publications discussing techniques to utilize thermals and rising air to help gain altitude. In practice, the flat-ground thermals are very difficult to utilize for lift in an aircraft moving at 85 MPH or more. Some areas may be blessed with long ridges where flying parallel to the ridge would be very beneficial when the winds are favourable. The most practical techniques are:

- When the aircraft starts to **climb** (before the VSI indicates) **slow down** by about **5 MPH**.
- When the aircraft starts to **sink, speed up** by about **10 MPH**.
- Ideally climb in areas of high lift activity and descend in high areas of sink.

The jump run should be planned to allow the load/jump master a good view of the exit point and parachute landing area.

The jump pilot and load/jump master are responsible for keeping all the occupants of the aircraft calm. **ALWAYS REMAIN CALM - NO MATTER WHAT THE SITUATION.**

8 DESCENDING TECHNIQUE

The primary consideration that an engine requires for the decent is temperature, or more specifically, **rate of temperature change**. To ensure a constant change in temperature without damaging the engine, allow the engine to cool smoothly and slowly. Once again follow the Pilot's Operating Handbook and Standard Operating Procedures to avoid abuse of the engine.

On the descent, keep well clear of the Drop Zone, and follow the applicable descend and approach patterns accurately.

9 LANDINGS

Try to land at the lowest safe airspeed. This will greatly reduce tyre and brake wear. Follow the Pilots Operating Handbook after landing procedures, as you approach the loading area, taxi past the waiting jumpers to position the aircraft so that the jumpers approach it from behind.

10 SPOTTING BASICS

Spotting skydivers is as much intuition as it is manipulation. This means that even though you know where the jumpers need to be dropped, you still need to fly the aircraft over that path. You will need enough situational awareness to time it so they climb out and leave right where you want them to. The following steps will ensure that the jump pilot will dispatch the jumpers exactly overhead the drop zone.

10.1 STEP ONE

Spotting is built from the ground up. Jump pilots need to consider the shape of the landing area, obstacles near the airport, winds aloft and the composition of the load.

10.2 STEP TWO

Ensure that the canopies will be in the best position considering the winds. Look at the surface winds up to three thousand feet. Generally, canopies are capable of forward speeds of 15-30 mph. If the winds are 15-20 kts at three thousand feet the jumper will need to open directly above or just beyond the landing area upwind.

If the winds are forecast at 0-10 knots, you can put them pretty much anywhere within a half-mile of the airfield.

10.3 STEP THREE

Figuring out what influence freefall drift has on the jump run takes some practise and needs a little precision flying to make the first part of your plan work.

Here are some interesting facts:

• When a jumper has about one minute of freefall, and the prevailing winds aloft started out at 60 knots, the jumper will drift about one mile.
• If the winds prevail at 30 knots they will drift half a mile, and if they prevail at 15 knots, they will drift a quarter mile.

Ensure that jumpers are dropped at the correct position taking into account their freefall drift, prevailing winds and the composition of the load.

10.4 STEP FOUR

Fly the plan and be precise. As you descend, watch where the canopies open. This will give you a good idea of how effective your jump run was.

Try to get someone to let you know how the spot worked out. Use someone you trust, and ask where they went out on the exit order if it's a larger aircraft. This will give you a good idea of what to do in future loads.

10.5 CROSSWIND JUMP RUN

Sometimes a crosswind jump run is beneficial if the landing area is a long, narrow rectangle and one side has a hazard.

When you do a crosswind jump run you will also give any gear that is cutaway a chance at landing on the airport. As the winds change through the day or the types of loads you are flying change then adjustments will be needed to the offset. Discuss it with your jumpers before hand.

10.6 HOOK PATTERN JUMP RUN

The hook pattern run is partly a crosswind jump run, partly into the wind and possibly, a downwind run. Try to plan your hook before you drift too far off.

Let the jumpers know that it is acceptable to exit whilst the aircraft is banked. SOME DROP ZONES TEACH PEOPLE TO STAY IN WHEN THE AIRCRAFT BANKS. Make sure you know what the jumpers expect. If you plan to use this technique then you need to tell the jumpers. Banking while large groups climb out is not very good practise, thus the hook pattern jump run is not appropriate all the time.

11 SPEED AND POWER CONTROL

The airspeed for all jump runs should be 80 – 85 MPH. Find the optimum power setting for the type of aircraft you are flying, avoid large changes in the power settings during the jump run.

Terminal velocity for the human body is approximately 125 MPH and at speeds below 80 MPH the human body is “flying” below minimum control speed. Knowledge and application of this fact to student jumpers is very important. Speeds of 65 – 70 MPH will make it slightly easier to get out on the step, but it will make it unnecessarily difficult for the static line or 5 seconds delay student to fall stable.

Set power to maintain altitude on the jump run. During the exit it is helpful to reduce power to a low thrust setting, this makes it easy for the inexperienced to exit on to the step. It is still quite common for jumpers and jumpmasters to call “THROTTLE BACK” as they or their students are preparing to exit. A“throttle back” is never more than a smooth power reduction to low thrust where the airspeed will not to have to be chased and even a slow exit will only have a 50 ft loss of altitude.