

# TOW PILOT SOPs

Ref: RGS(A) CQ3 Local Flying Orders

Amended: 17 Jan 10

## Taxi

- Start-up and Taxi prohibited in tie-down areas.
- As soon as possible after start-up, L-19 pilots should carefully move to a location away from the area directly in front of the Glider Maintenance hangar and then perform the Before Taxi Checklist.
- Exercise caution when turning downwind in strong winds with high power settings to prevent possible nose-over.
- When two or more tow planes are taxiing together, the minimum following distance shall be 200 feet - the length of one aero tow rope.
- Both the left and right cabin windows shall be closed and locked prior to the run-up procedure to prevent flex damage to the window frames and hinges. The right cabin window only may be removed by Glider Maintenance if requested by the pilot during periods of high temperature/humidity.
- For subsequent flights after the first flight of the day, a limited pre-flight inspection of the following minimum items shall be carried out prior to flight unless they have been checked and confirmed serviceable by a qualified servicing crew: A visual check of the fuel in both wing tanks, secure fuel caps, a visual check of the oil, secure oil cap and pin, secure cowl latches and pins.

### RWY 05 Ops

TAXI: \_RAMP \_BRAVO \_RWY 05

(Run-up on ramp short of BRAVO)

FUEL: \_RWY 05\_Parallel TXY 34 \_ALPHA \_RAMP

(Drop rope on Runway 05 in front of LCO)

### RWY 09 Ops

TAXI: \_RAMP \_BRAVO \_RWY 23 \_Right Grass RWY 09 \_RWY 09

(Run-up on ramp short of BRAVO)

FUEL: \_RWY 09 \_RWY 34 \_ALPHA \_RAMP

(Drop rope on RWY 09 in front of LCO)

### RWY 16 Ops

TAXI: \_RAMP \_ALPHA \_Parallel TXY 05 \_RWY 16

(Run-up south of ALPHA on parallel TXY 05, west of parallel TWY 16)

FUEL: RWY 16 \_ALPHA \_RAMP

(Drop rope on RWY 16 in front of LCO)

### RWY 23 Ops

TAXI: \_RAMP \_ALPHA \_RWY 23

(Run-up north of compass rose)

FUEL: Parallel TXY 34 \_ALPHA \_RAMP

(Drop rope on RWY 23 in front of LCO)

### RWY 27 Ops

TAXI: \_RAMP \_ALPHA \_RWY 16 \_RWY 27

(Run-up short of parallel TXY 27)

FUEL: \_RWY 34 \_ALPHA \_RAMP

(Drop rope on RWY 27 in front of LCO)

### **IMPORTANT**

Always clear visually and by radio with LCO before crossing any glider landing areas.



## **RWY 34 Ops**

TAXI: \_RAMP \_BRAVO \_RWY09 \_RWY 34

(Run-up short of Parallel TXY 34)

FUEL: \_RWY 27 \_RWY 05 \_BRAVO \_RAMP

(Drop rope on RWY 34 in front of LCO)

## **Takeoff**

- Prior to takeoff note glider tail number and altitude.
- **Takeoff abort** - if glider releases or towrope breaks with full power on and tail up, continue takeoff unless the abort is for conflicting traffic or aircraft malfunction.

## **Climb**

- When towing, climb at 2500 RPM to run engine cooler and help prevent shock cooling. 65-70 mph; 15<sup>o</sup> bank in turns.

### **Do Not Lean Mixture!**

- The first turn is normally at 300-400' AGL. If poor climb performance is encountered a turn at 100-200' AGL may be required to stay close to airport.
- On the downwind leg of the tow pattern, make turn toward RWY at an altitude that will not be in conflict with other tow traffic or civilian traffic manoeuvring to land, and will allow delivery of the glider under tow to the proper release area at the prescribed altitude.

**Always keep glider within gliding distance to airport**

## **Tow Patterns**

- Racetrack patterns are used. Vary the size of the pattern depending on the wind, altitude requested, and climb performance of the L-19.

### **Tow Pattern Guidelines**

1500' AGL – approx. 1400' AGL over the departure end of the runway

2000' AGL – approx. 1800' AGL over the departure end of the runway

2500' AGL – approx. 2100' AGL over the departure end of the runway

3000' AGL – approx. 2200' AGL over the departure end of the runway

- If unable to achieve the requested release altitude at the release point advise the glider (optional) and then turn 360<sup>o</sup> in the direction of the tow pattern being flown.

### **Tow Pattern Directions**

**RWYs** 16, 23, 27 - Left Hand

**RWYs** 05, 09, 34 - Right Hand

### **Release Points**

Tows to 1500' AGL –just past the departure end of runway.

Tows to 2000' AGL –½ mile past the departure end of runway.

Tows to 2500' AGL –1 mile past the departure end of runway.

Tows to 3000' AGL –2 miles past the departure end of runway.



## Premature Release Procedures

Actual or simulated tow rope breaks occurring at the following altitudes require the associated procedures.

- **Between 200'-300' AGL** – Glider normally turns 180° and lands downwind. Tow plane levels wings, & continues normal climb for 10 seconds, while glider decelerates and descends. Tow plane joins downwind at 1000' AGL when clear.
- **Between 400' and 600' AGL** – Glider normally lands on a crosswind runway. Tow plane levels wings, and continues normal climb for 10 seconds, while glider decelerates and descends. Tow plane continues climbing and flies to join downwind leg at 1000' AGL.
- **Above 600' AGL** – Glider normally flies modified circuit. Tow plane levels wings, and continues normal climb for 10 seconds, while glider decelerates and descends. Tow plane may be required to extend its downwind leg before turning base leg if the gliders modified circuit is on the tow plane side of the landing pattern. If the tow plane is in the final turn to the upwind leg overhead the runway, it continues the climbing turn and rejoins the circuit in an approved manner.

**Note 1:** Tow pilots shall broadcast on the operational frequency that a premature glider release has taken place, giving the Altitude, Position, and Tow Plane Number. (ex. Debert Traffic - Premature Glider Release at 750' on the Downwind for Runway 27 - Tow 4)

**Note 2:** Tow planes are **never** to penetrate the glider operating area. The tow plane shall at all time yield the right of way to any glider, and the tow pilot should never attempt to “**increase**” climb or slow down immediately following a release.

## Descent Profile

- Upon glider release, reduce power to 2000 RPM, lower flaps as required to a maximum of 30° and turn left 30-45°, up to 90°, depending on wind & traffic.
- Do not exceed airspeed of 80 MPH until the CHT has dropped at least 20° from release point temp and is below 200°.

**RWYs 16, 23, & 27** - Verify traffic, start descent, and turn left to rejoin downwind leg.

**NOTE:** on Runway 16 the tow plane must be a minimum of 200' AGL (**350' ASL**) over the highway on short final

**RWYs 05, 09, & 34** - Visually confirm that the glider is in a 270° turn towards the glider ops area, turn right, descend while verifying traffic and intercept the downwind leg.

- Reduce RPM in increments of 200 RPM as required to complete the circuit.

### **DO NOT EXCEED 90 MPH IN THE DESCENT**

- Downwind legs should be ½ to ¾ mile from RWY center line, and never more than 1 mile.

**Flap settings greater than 30° are PROHIBITED until established on the base leg with airspeed stabilized at 80 MPH to avoid undue stress on the flap assembly.**



## Delayed Approach

- Should there be a lengthy delay in the approach to the designated landing area due to an interruption in operations, civilian traffic, etc, the tow pilot should depart the circuit on the tow plane side, hold at a safe altitude and position, and then rejoin the circuit in the approved manner when appropriate.
- Brief delays should be accommodated by widening the circuit, or, if on final, by executing an overshoot.

**Orbiting in the immediate vicinity of the circuit (ex. Water Tower, MacElmon's Pond, Final Approach) is PROHIBITED.**

## Overshoots

- L-19's will overshoot on the tow plane side of the runway away from the Glider Launch Site.
- If an overshoot is required below 200' AGL, the L-19 will release the towrope **prior** to the glider launch site and rejoin the circuit in the approved manner.
- Tow plane Pilots are expected to be aware of potentially conflicting ground traffic in the overrun area of the active L-19 landing area. Conflicting traffic may include glider recovery ground towing operations, landing glider traffic, or authorized/unauthorized ground vehicles.
- In the event of such potentially conflicting ground traffic in the overrun area, L-19 pilots are expected to initiate an overshoot at such an altitude as to prevent those on the ground being struck by the towrope ring. The towrope should be released if there is any possibility of hitting the ground traffic with the towrope ring.

## Refuelling

- Tow Pilots shall discontinue ops and refuel the aircraft as soon as both fuel gauges reach the "NO TAKE-OFF" range. Under no circumstances shall a tow pilot continue flying with both tanks in this range.
- A normal tow shift is 2hrs. Do not exceed 2½ hrs towing without refuelling.
- Do not refuel during periods of precipitation or when thunderstorms are present.
- L-19's will normally taxi into position beside the pumps facing toward ramp.
- Do not use unnecessary high RPMs at the pumps.
- All personnel waiting at the pumps are to remain vigilant and clear of the a/c until A/C fully shuts down and pilot indicates "MAGS OFF".
- The pilot coming "off shift" shall exit the a/c immediately and assist with re-fuelling so that the pilot going "on-shift" can get in the a/c and prepare for an immediate departure after servicing is complete.
- L-19's shall be refuelled at the completion of any mission, (i.e.: tow shift, weather check, training flight) regardless of duration, unless otherwise requested by maintenance.
- During flight ops (if required) and after the last flight of the day, clean windshield with the approved plastic cleaner.



## Refuelling (Continued)

- Add oil to engine when level shows 7 litres or below for local gliding ops, and 8 litres or below for cross country ops.
- Do not leave L-19's in front of the fuel pumps after refuelling.
- Aircraft shall be taxied straight out from the pumps until adjacent with the entrance to Taxiway Alpha to avoid directing prop wash at personnel at the pumps.
- Tow planes not being used are to be tied down in windy conditions.
- L-19 canopy covers are to be installed when flying ops are finished at the end of the day if rain is forecast **or** at the direction of the Maintenance Section.

## Cross-Country Towing Procedure

- Retract flaps at pilot's discretion above 1000' AGL at 70 MPH.
- Maximum continuous RPM 2300
- Slow to 70 MPH in rough air
- Normal descent 200 f/m, Max descent 500 f/m
- Normal angle of bank 15°, Max angle of bank 30°
- Flight path should be near off-field landing sites

Note - Glider not to release until tow aircraft pilot instructs glider to do so

## Fouled Plug Procedure

- Set 2000 RPM
- Min 30 sec - Max 60 sec, then 1700 RPM
- Complete a magneto check
- Do only two times. If not cleared then return to maintenance

## TOW PILOT PROFICIENCY/CURRENCY FLIGHT TEST MISSION SEQUENCE/PROFILE

### Pre-Flight (PL4)

- Check weather/NOTAMS
- Check journey log for time remaining till next inspection
- Check journey log part 2 for defects/defect history/rectification
- Calculate weight and balance using the W&B Graph located in the map case.
- Carry out DI IAW L-19 checklist and sign DI sheet

### Pre-Takeoff (PL4)

- Complete pre-start / start / taxi / run-up & pre-T/O checks IAW L-19 checklist  
(**Call out checks so Check/Std's pilot can monitor**)



## Takeoff (PL4)

Demonstrate proper technique for:

### Normal T/O

Flaps 0°, let A/C fly off at 55-60 mph. Best rate of climb (65-70 MPH) to 650' ASL then transition to normal climb of 80 MPH.

### Crosswind T/O

Flaps 0° or minimum setting necessary for field length, hold A/C on RWY until 60 MPH, then positive lift off to prevent skipping.

### Short Field T/O (with obstacle)

30° flaps, brakes on, full power, brakes release, let A/C fly off – NOT BELOW 45-50 MPH; climb best angle 55-60 MPH until 200' AGL or obstacle is cleared. Resume normal climb. Above 200' AGL & 65 MPH retract flaps in stages.

## Climb (PL3)

**Normal** - 80 mph / flaps up / 2300-2500 RPM

**Towing** - 65-70 mph / flaps 15° / 2500 RPM

- Trim to maintain proper speed
- Clearing turns as appropriate & climb to safe altitude for manoeuvres

## Straight and Level Flight

Trim to maintain altitude / heading / speed.

**(Max Continuous RPM 2300)**

## Turns (PL3)

Maintain bank angle / speed / altitude for following turns:

**Gentle 15°**

**Medium 30°**

**Steep 45°**

- Start and end turns on a ground feature or a compass heading
- Add power to maintain speed & altitude in steep turns

**NOTE: *Prior to slow flight/steep turns/stalls/spiral dives complete pre-stall check. (HASEL)***



## Slow Flight (PL3)

### Entry:

- 1500 RPM / flaps 15° (when airspeed is 80 mph or below)
- Trim to maintain altitude/heading/speed.
- Speed 55 MPH (50 MPH for Check/Standards Pilot)
- Set power to 1800 - 2000 RPM / turns to 15° of bank max

### Recovery:

- Full power, maintain altitude/heading
- 65 MPH flaps up, 80 MPH level flight 2200-2300 RPM

### Confirm:

- Flaps UP, Carb Heat Cold, T&Ps Green

## Stalls (PL3)

**Do at a safe altitude to ensure recovery by 1500' AGL.**

### Entry:

- Clean stall - Pwr off, maintain alt., wings level. Stall 47-59 mph
- 60° flap stall - Pwr off, maintain alt., wings level. Stall 41-54 mph
- Departure stall - 65mph / flaps 15° / 2300-2500 RPM / 15° bank / 40° pitch up

**NOTE:** Hold back-stick pressure in coordinated flight until stall.

**Stall Recovery: at first indication of a stall (horn) unless check/stds pilot requests a full stall - Release back pressure**

- Prevent wing drop with opposite rudder
- Full power
- Ease out of the dive into climb attitude
- Flaps up to 30° immediately (when set to more than 30°)
- 65 mph, flaps up in stages
- Level off at safe altitude

### Confirm:

- Flaps UP, Carb Heat Cold, T&Ps Green

**NOTE:** In all stalls release backpressure to un-stall wings as opposed to pushing control column too far forward.



## Spiral Dive (PL3)

**Do at a safe altitude to ensure recovery by 1500' AGL.**

### Entry:

- 80 mph / 60° bank (no back pressure in order to allow nose to drop) when nose is well below the horizon try to pick it up with back pressure.

### Recovery:

- Throttle idle, roll wings level, ease out of the dive into climb attitude, full throttle when nose above horizon (watch RPM), level off at safe altitude.

### Confirm:

- Flaps UP, Carb Heat Cold, T&Ps Green

## Unusual Attitude Recovery (PL3)

**Do at a safe altitude to ensure recovery by 1500' AGL.**

**(Max pitch +/- 45 degrees, max bank +/- 90 degrees)**

- Check/Standards Pilot will enter either a nose high or nose low flight attitude.
- Upon command, the pilot undergoing Currency/Proficiency will take control and recover to normal flight.

### Nose high:

- Full Power
- Roll aggressively to nearest horizon (80°-90°)
- Coordinate roll with appropriate bottom rudder
- As nose approaches the horizon, unloaded roll to wings level and as speed allows assume normal climb attitude
- Monitor RPM

### Nose low:

- Power to Idle
- Unloaded roll to wings level
- Recover from ensuing dive to normal climb attitude
- When nose is above the horizon, advance throttle
- Monitor RPM

## Forward Slip (PL3)

- Simulate final approach with flap failure.
- Power off / trim for 70 mph / flaps up
- Full rudder, aileron to hold track, pitch to hold speed



## Forced Approach (PL3)

The preferred method is to fly overhead 360<sup>0</sup> procedure as per Air Cadet Manual of Flying Training. Vary angle of bank to compensate for the effects of the wind.

**Hi-Key = 1000' AGL / Low-Key = 600' AGL / Final-Key = 400' AGL**

## Circuit (PL4)

- Entry and downwind: 80-100 mph, 1000' AGL (*2000 RPM flaps up yields app 80 MPH*)
- Abeam landing point: 80 mph, flaps 30<sup>0</sup> (unless less flap required due to X-wind or planned 0<sup>0</sup> flap landing)
- Base leg: maintain 80 mph, flaps as required
- Final approach: 70 mph, flaps as required

## Landing (PL4)

**Normal (3 point) Landing:** Rotate through the flare to the 3-point attitude. Hold off and touch down at the point of stall.

**Crosswind Landing:** Use crab or wing down method or a combination of both. A three-point, flap landing is used at RGS(A). In high crosswinds reduce flap settings to the minimum required.

**Short field Landing:** Use normal approach procedure to the 3-point attitude. Apply brake immediately after touch down.

## Touch and Go's

We do “**stop and go's**” in the L-19. This is due to the high risk of a ground loop during touch and go's.

## Overshoots (PL4)

- Full power, carb heat off, raise flaps to 30<sup>0</sup> immediately (if applicable).
- At a safe altitude (200' AGL), 65 mph and a positive rate of climb raise the flaps in increments.

### Confirm:

- Flaps UP, Carb Heat Cold, T&Ps Green

**Note:** During Gliding Ops: overshoot on L-19 side of RWY away from the glider launch site as per standard overshoot procedures to rejoin the circuit. If overshoot is required below 200' AGL, release the towrope prior to the glider launch site.



## Glider Towing (PL4)

- Glider towing sequences to be flown after completion of the Aircraft Handling sequences.

## Airmanship (PL4)

- Evaluated throughout all sequences.

## Evaluation Criteria

### Proficiency Level Descriptions:

**PL 3** - Pilot completed the task, making minor errors. Pilot required minimal assistance to analyze and/or correct errors.

**PL 4** - Pilot completed the task without assistance, making only minor errors. Pilot was able to self analyze and correct errors.

**PL 5** - Pilot completed the task without assistance and without error.

### Supplementary Criteria:

Provided the pilot being evaluated has demonstrated a thorough knowledge and understanding of the manoeuvre to be performed.

5 = +/- 5mph & +/- 50' altitude

4 = +/- 10mph & +/- 100' altitude

3 / 2 / 1 as per 242.

