

Attachment 3: Launch & Recovery

Reference: FAA AIR-160 UAPO Guidance Document 08-01

Launching of fixed wing UAV is accomplished either by manual takeoff from INL's dedicated runway, or by pneumatic launch for the Arcturus T15/T16 airframes (See Attachment 1 for an airframe discussion).

INL UA Runway

The INL has a dedicated 1000 ft by 100 ft asphalt runway for UA operations. The runway is at elevation 4891 ft, latitude 43° 35' 45.75" longitude -112° 54' 30.97", on the Idaho Falls VOR (IDA) 258° radial at 36.8 nm, and near the center of the INL reservation. The nearest inhabited structure not associated with the runway environment is several miles away. A fully equipped INL fire station is approximately five miles from the runway.

Launch

Most manual takeoff flights, but not all, begin and end at the runway. Manual takeoffs can be either rolling with a nose / landing gear or hand launched for fixed wing with no landing gear. Auto takeoff is possible for the Arcturus airframes using a pneumatic launcher, see Photos 1 and 2.



Photo 1: Pneumatic Launcher for T15/T16



Photo 2: Auto Launch

The following illustrates the safety and operational checklist for use of the auto launch and is characteristic of the checklists the INL uses for all flight procedures:

The pilot/operator will follow this checklist for all rail-launched takeoffs:

- Always wear safety glasses.
- Verify the preflight for the aircraft is complete, including aircraft; avionics, navigation, and payload are operating.
- Verify the carriage is de-energized.
- Inspect the carriage, for any damage which may have occurred from prior launches, if damage is found, replace or repair any damaged parts prior to proceeding.
- Partially open the bleed valve and the butterfly valve on the accumulator tank
- Attach gas cylinder regulator on the pressurized cylinder
- Insert carbon launch tube into cylinder
- Close bleed valve
- Close butterfly valve
- Place UAV on launch pad with wing supports just below wings
- Install alignment band between UAV tail and launch pad pin
- Clear the area forward of the main wing of the aircraft.
- Start UAV engine and complete normal pre-flight activities preparatory for take-off
- Ensure the regulator is closed and attach hose from pressure cylinder to accumulator tank
- Ensure butterfly valve is closed on accumulator tank
- Open the bleed valve on the accumulator tank
- Partially open the regulator on the pressurized cylinder
- Open the pressurized cylinder valve
- Verify pressurized air enters accumulator tank
- Adjust regulator valve as necessary to fill the accumulator tank while monitoring the pressure gage on the accumulator tank
- When the desired pressure is reached close the bleed valve on the accumulator tank. *Note: Desired pressure will vary with UAV weight and desired take-off velocity; typically 90 to 150 PSI*

- Pilot and GCS operator verify UAV ready for launch
- Upon signal from pilot, quickly open the butterfly valve on the accumulator tank to launch UAV

Recovery

Most UA recoveries occur at the INL UA runway. Both auto-land using differential GPS and manual landing are used.