OPERATING PROCEDURES

LAUNCH

Upon completion of Preflight Check, the air vehicle is ready for launch. To obtain airspace clearance, follow the procedures outlined in " Airspace Management", which describes airspace management. To launch:

1. (VO) Determine wind direction. Always launch air vehicle into wind.

2. (MO) Point air vehicle nose in desired takeoff direction.

3. (VO) Select MAN mode (using Hot Key Button). Horizontal stabilizer will move from Autoland to flight positio VO states "Clear prop."

4. (MO) Grasp air vehicle from bottom aft of skid pad. Ensure downlink antenna is hanging free and not tangled. sume correct stance for launching air vehicle depicted in "raven_aircraft_launch_stanceFigure 1". Acknowle with "Prop clear."

Figure 1.   Raven Air Vehicle Launch Stance

LAUNCH—CONTINUED

5. (VO) Throttle up to full power (press Toggle Switch forward and hold until 100% throttle achieved (three seconds)).

CAUTION

Wait until the motor is at full throttle for three seconds before launching the air vehicle. Otherwise, a crash landing and possible damage to the air vehicle could result.

6. (MO) Wait three seconds after motor is at full power, then throw air vehicle into wind. Throw it upward at angle between 25° and 45° (see "raven_launch_diagram_figureFigure 2"). Throw it hard with complete follow-through. Maintain focus on correct stance and technique.

CAUTION

In the event of a bad launch, be prepared to command Autoland immediately to minimize damage to the air vehicle.

7. (VO) Should be prepared to provide joystick inputs to adjust for desired flight path, however, if launch appears to be unrecoverable, VO must be prepared to autoland immediately.

8. (VO) Maintain climb out into wind until approximately 200-300 feet AGL then select appropriate flight mode.
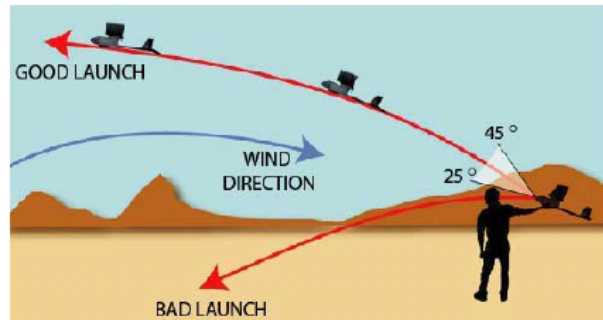

Figure 2.   Raven Launch Diagram

Recovery Procedures:

Raven B is designed with an Autoland feature that causes the air vehicle to descend in a deep stall. This enables landings in confined areas (see "raven_landing_site_figureFigure 1"). The landing is triggered by Vehicle Operator (VO) or as programmed in Loss of Link (LOL).
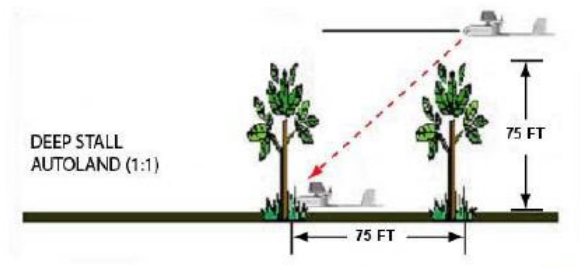

Figure 1.   Raven B Landing Site

NOTE

During MOPP operations, determination of winds is very difficult. Dropping dirt or grass will identify wind direction.

The air vehicle should always be landed into the wind. This helps to slow forward motion and stabilize the air vehicle horizontally during descent. The landing site should be surveyed before initiating a landing or from the air just prior to activating the landing.

CAUTION

During LOL mode, Air Vehicle will not automatically align to land into wind, and could cause damage to Air Vehicle.

CAUTION

Autoland can be initiated at any time and any altitude. There will be a greater chance of air vehicle damage at altitudes lower than 75 feet AGL.

Upon VO command or LOL Autoland, power is cut from the engine and the horizontal stabilizer deflects fully upward. The air vehicle pitches nose up and begins a steep descent to the ground with wings level. Impact with the ground usually causes the air vehicle components to separate. This is normal and helps dissipate the impact of landing and protect the air vehicle. A landing pad on the bottom of the fuselage also provides impact protection.

It is possible to safely abort the flight at any time. For typical landing procedures, it is recommended that Autoland be initiated above 75 feet AGL.

Autoland Landing

NOTE

Increased wind speed will decrease Air Vehicle glide distance.

The following procedure outlines a VO-initiated landing.

1. Direct air vehicle down to altitude of approximately 75 ft. AGL and orient air vehicle into wind.

2. When air vehicle is approximately 45 degrees from operator's LOS and still at approximately 75 ft. AGL, air vehicle is properly oriented into wind for Autoland.

3. Press Hot key and Enter Buttons simultaneously to manually enter Autoland. Autoland indicator on VO Controller will flash.

4. VO should continue to fly air vehicle to ground, ensuring nose of air vehicle remains directed into wind.

Autoland Options

One of three actions will be initiated upon LOL (These options are preselected during preflight procedures): the air vehicle will immediately Autoland, the air vehicle will proceed to E and then to the L Waypoint and Autoland at that location, or the air vehicle will Finish Flight. The LOL action is automatically engaged after 3 continuous seconds of loss of uplink (Loss of downlink only does not initiate LOL mode.). The link status bar on Hand Controller will appear as a red bar (indicating no signal).

Autoland

If the mission has been set to initiate Autoland upon LOL, the Autoland indicator will read "AUTOLAND" (not flashing). The air vehicle is in descent at this time. The current Air Vehicle coordinates in the controllers is the location of Autoland activation.

Land at Rally

If the mission has been set to GO TO RALLY upon LOL, the air vehicle will return to the preset L Waypoint. The Autoland indicator will read "AUTOLAND" (not blinking) once the air vehicle reaches E waypoint it will proceed to L waypoint and land.

Finish Flight

If the mission has been set to Finish Flight, the air vehicle will continue its mission until flight loop time expires then proceed to E waypoint for landing at L waypoint.

CAUTION

Do not attempt to regain control of the air vehicle after LOL if altitude is below 75 ft. AGL.

If link is suddenly regained, control of the air vehicle can be regained. To take the air vehicle out of Autoland, press the Hot Key Button by itself once. This will put the air vehicle in MAN mode at 0% throttle. Begin manually piloting the air vehicle and immediately add power.

Unintended Landing

If the GCS is still powered-up and the GPS link was good at the time of the crash, the last known coordinates will be displayed on the Hand Controller. A recovery team should record the last known coordinates or Long/Lat location and other data (altitude, range, distance, heading) that will aid in search, and then plot the location on a map and/or program it as a waypoint on a hand-held GPS before moving to the area to begin a systematic search to recover the air vehicle.

The GCS can be taken to the vicinity of the downed air vehicle and used to pick up video signal from a grounded or crashed plane, provided it is intact enough to transmit. As the nose usually separates from the air vehicle, watch for data (not video). An autolanded air vehicle may transmit for quite a long time after landing, as battery usage is significantly diminished after the motor is off.