

Aircraft Launch and Recovery Description

The Bergen RC helicopter will be launched after following a strict pre-flight routine. The key steps in the pre-flight process include:

- (1) Perform a rigorous mechanical inspection of the vehicle.
- (2) Fuel the helicopter and connect the batteries.
- (3) Turn on the manual 2.4 GHz RF transmitter and receiver.
- (4) Power on the autopilot and ground station, confirming the range of the 900 MHz autopilot link.
- (5) Confirm that the servos function correctly in response to aileron, elevator, collective, and rudder inputs from the RF transmitter.
- (6) Check the range of the RF transmitter.
- (7) Confirm the throttle setting is zero and make sure the throttle hold is engaged.

Once these steps are completed, while the Pilot holds the RF transmitter with both hands, a second person will start the engine by placing one foot on the skids and using one hand to firmly hold the top of the main rotor head. The person starting the engine will wear Kevlar gloves while gripping the rotor head. The grip on the rotor head will ensure that the rotor blades cannot unexpectedly start rotating and the helicopter cannot suddenly move when the engine is started. The engine will then be started by pulling the starter cord. Because the throttle will be set to zero and the throttle hold will be engaged, the engine should start with no blade rotation. If, for any reason, the blades do try to start rotating, the starter's grip on top of the rotor will prevent the blades from moving and the starter will immediately engage the choke, shutting down the engine. If this occurs, the pre-flight check will be repeated, including a check of all transmitter settings, and the engine will be started again. Upon successfully starting the engine, which will result in the engine running with no blade rotation, the Pilot will activate the PCM kill switch in order to confirm that it is functional. Once the proper functionality of the PCM kill switch has been confirmed, which will result in the engine being shut down, the engine will be started again in order to commence flight operations. It should be noted that the Pilot will be in direct contact with the Ground Station Operator throughout the engine start-up procedure.

After starting the engine, the pilot will move to a stand-off distance of at least 70 ft and disengage the throttle hold. The pilot will then throttle up and begin a steady climb to about 30 ft AGL at which point he will place the helicopter in a stable hover, engaging the autonomous hover autopilot mode. For flights in which the waypoint autopilot mode will be used, the autopilot waypoint mode will be engaged from the ground station. At that time, the ground station will transmit waypoints to the helicopter and the autopilot will control the helicopter so that it flies through the given waypoints. The pilot and observers will monitor the helicopter carefully, and

the pilot has a manual over-ride switch on the RF transmitter that will enable him to instantly take control at any time.

When the mission has been completed, the helicopter will return to a hover above the launch point (via manual control or through a specified waypoint command to the autopilot, depending on the mission). The pilot will then initiate a slow descent of the helicopter to the ground. Once the helicopter has landed, the pilot will throttle down and engage the throttle hold. Only after the blades have completely stopped rotating will the pilot approach the helicopter, shut off the engine, and turn off the autopilot and RF receiver. Finally, the pilot will turn off the RF transmitter.