Lost Link Procedures

Mitigation of the Risk of a Lost Link

In order to minimize the risk of a lost manual RF link or a lost autopilot link, all flight operations have been planned within 1000 ft of the pilot and ground station. The ranges of both links will be confirmed during the pre-flight procedures. In addition, the flight operations have been planned so that the helicopter will remain within the line of sight of the pilot and ground station at all times, thus minimizing the risk of a lost data link.

Lost Data Link with the JR 9303 RF Transmitter

In the event that communications fail with the JR 9303 RF transmitter, which would result in the loss of the ability to manually control the vehicle or manually over-ride the autopilot if it is engaged, the autopilot will automatically switch to autonomous hover mode. The helicopter will then hover in place while the pilot attempts to re-establish communications. If RF communications are not restored within 10 sec, the autopilot will fly the helicopter to a pre-specified home waypoint and hover in place. The home waypoint will be located 90 ft above the designated takeoff and landing point. In flying to the home waypoint, the helicopter will travel on a straight-line vector from its current position to the home waypoint. The home waypoint is positioned above the height of all obstacles in the area (i.e., 90 ft AGL), ensuring that it will have a clear path home. Figure 1 shows a chart detailing the flow of autopilot actions in the event of a lost data link with the manual RF transmitter. It should be noted that the home waypoint mode can be disabled so that, instead of returning to the home waypoint, the helicopter will continue to hover in place until the manual RF link is restored or the helicopter runs out of fuel.

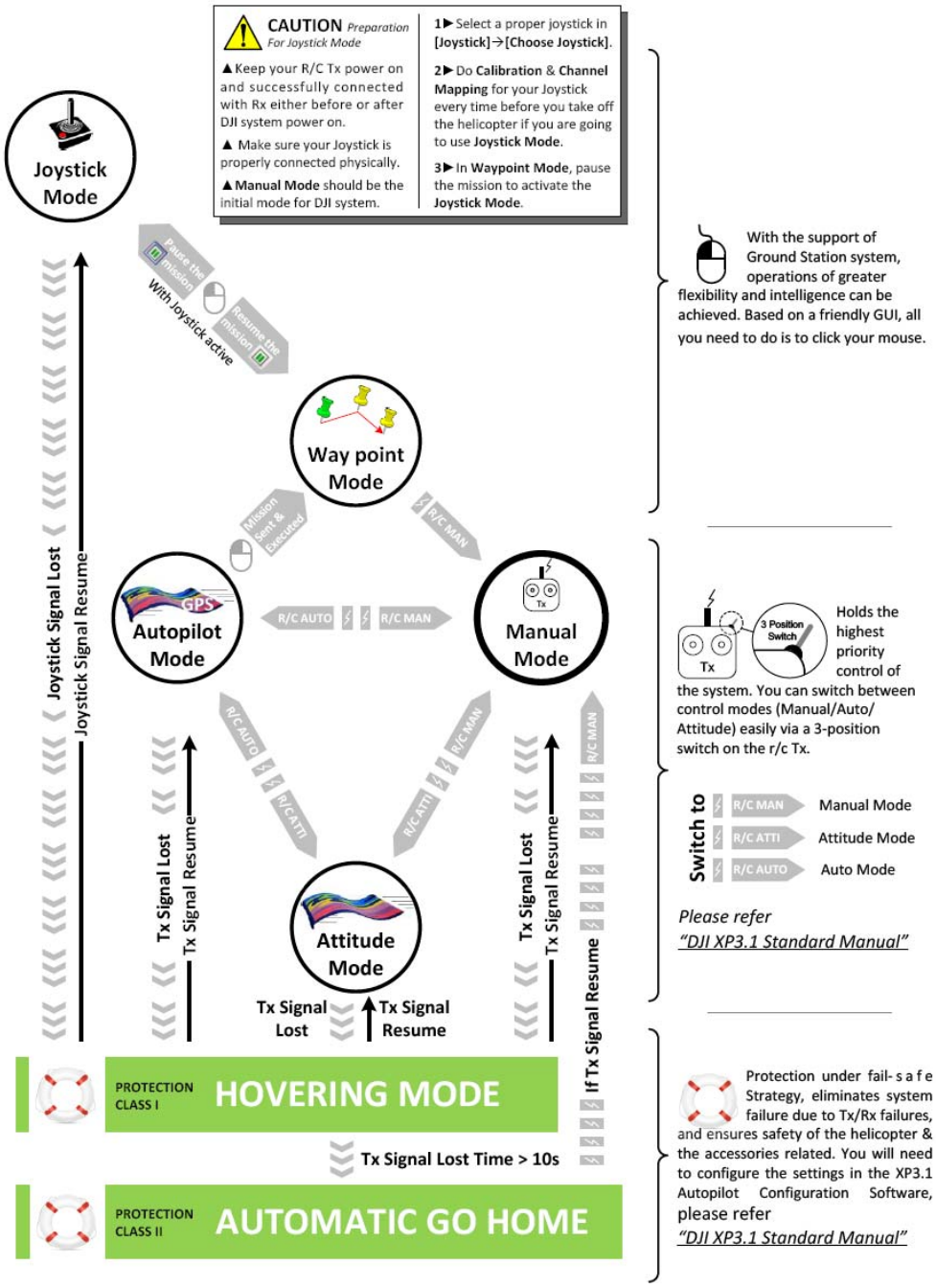

Figure 1: Flow Chart Depicting Autopilot Actions if Manual RF Control is Lost.

Lost 900 MHz Autopilot Data Link

If loss of communications with the autopilot occurs, the pilot will immediately engage the manual mode using a switch on the JR 9303 RF transmitter. The pilot can then land the helicopter or continue the mission if autopilot communications are restored. It should be noted that a lost autopilot link does not affect the ability of the onboard autopilot to perform any pre-programmed

functions, including the automatic hover fail-safe mode and the automatic go-to-home fail-safe mode. Therefore, if both the 900 MHz autopilot link and the 2.4 GHz manual link were lost, the autopilot would still be able to perform its programmed fail-safe procedures.

Lost 2.4 GHz Manual RF Link with Autopilot Malfunction

In the event that the autopilot malfunctions, the pilot has the ability to switch to manual mode and take control of the helicopter. If the autopilot were to malfunction at the same time the 2.4 GHz manual link was lost, the pilot would monitor the helicopter and attempt to re-establish communications. If the helicopter is on an apparent collision course with an obstacle (e.g., a building or power line) or if it approaches the boundaries of the operational area, the pilot will use a pulse control modulation (PCM) kill switch to shut off the engine. This switch operates on a separate transmitter and frequency. Activating the kill switch will disable the ignition control module, stopping the engine. This would force the helicopter to the ground, preventing it from leaving the operational area or colliding with an obstacle. It should be emphasized that, while there are structures within the operational area, these are farm-related structures that will be unoccupied during the flight operations.