

B. LOST COMMUNICATION PROCEDURES

The actual procedural plan followed in a Lost Communication Emergency is covered in the Emergency Procedures document, under section A-1. This section only includes the description of the communication system and the response of the system in general.

The Uglo 7 UAS uses a single communication channel for command and control uplink as well as data downlink. The single communication link is provided by a 1-W 900 MHz spread-spectrum modem supplied with the Piccolo SL autopilot system as original equipment. The same modem is used in the autopilot and in the Ground Control System (GCS). Since there is only a single communication link between the Uglo 7 UA and the GCS, a lost link constitutes a lost communication event. Depending upon the operational mode of the UA, the Piccolo autopilot detects two types of lost communications; one is when the aircraft is under manually piloted mode and the other is when the Piccolo is operating under semi-autonomous control. In either case, in the event of a lost communication emergency, the UA is no longer under control of the PAC and collision avoidance capability has been compromised. In this situation, the first priority of the PIC is to maintain as safe an airspace surrounding the UA as possible. This is done by broadcasting a PAN-PAN message to any nearby traffic as described in the Emergency Procedures document.

When the autopilot is under manual pilot (or manual assisted) control, a lost link is determined by the UA as not receiving any decodable manual pilot control packets for two (2) seconds, referred to as the pilot timeout. Once this condition is met, the autopilot will automatically switch to autopilot mode and enter into the closest waypoint plan at the time of the pilot timeout.

If communications fail entirely for ten (10) seconds (defined as the communication timeout) either under manual or semi-autonomous modes, the autopilot will take automatic action depending upon the status of the GPS timeout. If the GPS timeout has been asserted prior to the communication timeout, then when the communication timeout occurs the autopilot will issue an aerodynamic termination. If the GPS timeout has not occurred, then the autopilot will switch from the current flight plan to the emergency waypoint plan, defined by the lost communication entry point. If communication is re-acquired during the orbiting phase of the emergency flight plan then the PAC can initiate landing procedures. If communication is not re-acquired after two minutes of orbiting at the lost communication waypoint, the autopilot will automatically switch to the autoland segment of the emergency flight plan and will begin an autonomous landing.

Finally, since the operation of the Uglo 7 UAS will be well within the communication range of the 900 MHz link, failure of the communication link will tend to be hardware based. Therefore, after a lost communication event is detected a crew member who is not currently tasked as the observer or PIC will be directed by the PIC to inspect the communication hardware in the GCS to make sure there is no visible problems with the 900 MHz antenna, its location, or in the cabling.

The PIC and observer will be co-located since the operations area is small (0.14 miles in radius). If communications with ATC at Lehigh Valley International Airport (LVI) is required this will be done via cell phone: line of site for VHF radio is not available since there is an 870' mountain range between Goodman and LVI. If communications is required and then lost the flight will be terminated by landing the aircraft.