Dakota UAS Communication System Description

The Dakota UAS as operated by the Space Dynamics Laboratory utilizes three separate and redundant means of communications with the air vehicle:

* The primary command and control system is the R/C link to the air vehicle. The R/C link is a standard Commercial Off The Shelf (COTS) R/C transmitter broadcasting on 72mHz, except the output boosted through 3 watt, battery-powered amplifier and external antenna to ensure control at extended ranges, and to ensure operations in the case of a power outage. The output power is verified before each flight as a check-list item. The external pilot utilizes this system for launch and recovery, as well as to take control of the aircraft in any situation where the need arises.
* Autonomous/Remote Directional commands are sent by the internal pilot via the UAS ground station procured from L3 Unmanned Systems. The ground station is connected to the air vehicle on the 900mHz Freewave frequency. The internal pilot can track the location of the vehicle on a map display and ensure the vehicle does not leave the R/C operator’s sight, as well as to report accurate airspeed and altitude to the R/C operator during launch and recovery of the air vehicle. The system procured by SDL operates Line Of Sight (LOS) only.
* In the event of an emergency, the Flight Termination System (FTS) can be used to command the air vehicle to slow to stalling speed and deploy a parachute for a semi- controlled decent. This coded command would be sent at a frequency of 440mHz. This system is redundant from either of the systems previously mentioned, and has a battery-powered back-up.