

Attachment 7

Lost Link Procedure

1. General Lost Link Sequence

The Lost Link Plan is a pre-programmed flight plan that is loaded onto the aircraft computer when it is first powered up before a flight. It is part of the Pre-flight Checklist.

The A160 is constantly receiving, and monitoring the health of, uplink messages from the GCS. If the A160 does not receive any uplink from the ground control station (GCS) for 15 seconds, the A160 will automatically start its autonomous "lost link" plan. The GCS will receive notice from the data link that it is not completing the UAS link. While flying the preprogrammed "lost link" trajectory, the A160 and the GCS will continue to attempt to reestablish the link.

The lost link flight plan instructs the A160 to fly a waypoint trajectory, which includes a base leg, final leg and a landing descent, to the Warrior ramp landing location (indicated "home" on the map in figure 1). The flight is at 40 kts, with a final leg 200 fpm descent approach to the Warrior ramp. 60 seconds after touchdown, the A160 will automatically shut the aircraft engine off.

ATC will be informed of the lost-link situation and that the A160 is inbound to land autonomously at the Warrior Ramp without operator input. Outside observers will continue to track and report on aircraft position until landing.

2. Flight in Class D airspace of VCV (Victorville SCLA)

When in the Class D airspace at SCLA, the A160 will follow the flight path shown in Figure 1

3. Flight in High Altitude Corridor

When the A160 is flown in the flight corridor between the Victorville Class D airspace and the restricted airspace R-2515 additional procedures are utilized in the event of a lost link. Figure 2 shows the flight path of the A160 should the aircraft lose link near edge of the restricted airspace R-2515. After 15 seconds of aircraft lost link, the A160 will initiate its autonomous lost link flight plan. The aircraft will turn toward the base, reduce airspeed to 40 knots and begin a 250 foot per minute descent to 3270 feet MSL. The aircraft will hold that altitude and airspeed until halfway through the base leg approach to final where it will begin a 200 foot per minute descent to the landing zone (marked as "home" in figure 3).

This lost link trajectory was "flown" in the Boeing flight simulator to simulate the actual response of the aircraft. The example flight path is shown in magenta in figures 2 and 3. At the starting point for the simulation, the A160 was heading North towards the restricted airspace at 80 knots and an altitude of 7,000 feet MSL. After 15 seconds of aircraft lost link, the A160 initiated its autonomous lost link flight plan, turned to the South, reduced airspeed to 40 knots and began a 250 foot per minute descent to 3270 feet MSL. The aircraft then held that final altitude and airspeed until halfway through the base leg approach to final where it conducted a 200 foot per minute descent to the landing zone.

4. Flight in Restricted Airspace R-2515

When in the restricted airspace R-2515, the A160 will remain within R-2515 until link may be re-established. If link cannot be re-established, then the lost-link procedure will terminate within R-2515.

Figure 1 Class D Airspace Operating Area, Landing Zones, and Lost Link Path

Warrior Ramp landing area is denoted as "Home"

Lost Link Final Approach to Warrior Ramp is Blue Line

Green areas are potential emergency landing sites

Red areas are no-fly zones

Yellow areas are uninhabited rough terrain

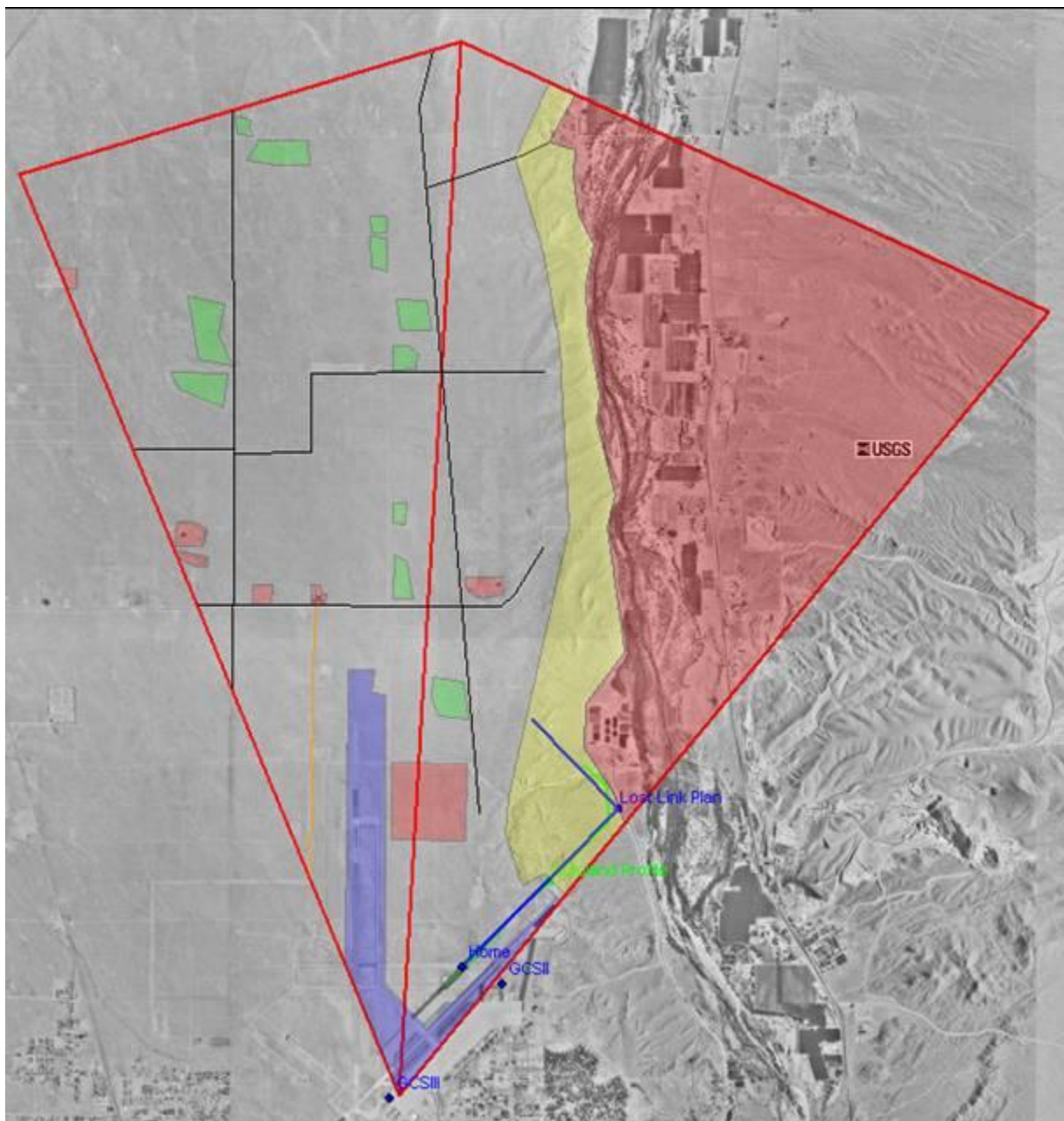


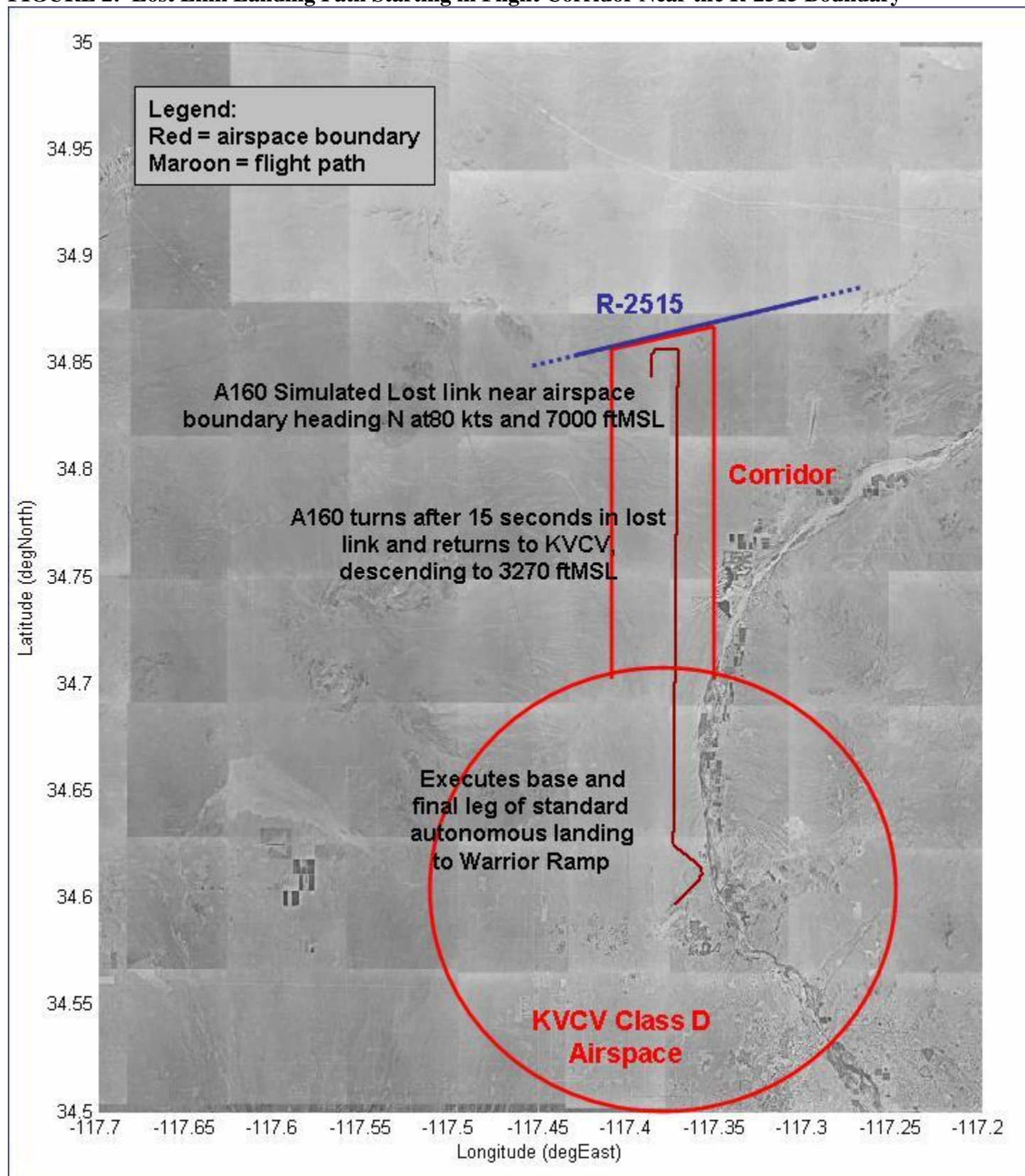
FIGURE 2: Lost Link Landing Path Starting in Flight Corridor Near the R-2515 Boundary

FIGURE3: Detail Showing Fight Inside the Class D Airspace of SLCA (KVCV)