ATTACHMENT to FAA FORM 7711-1

ISSUED TO: United States Army

ADDRESS: US Army UAS Project Office
Sparkman Center 2nd Floor
Redstone Arsenal
Alabama 36898

NAME: Federal Aviation Administration (FAA) Certificate of Authorization (COA) for Raven Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) outside of restricted/warning area airspace.

ACTIVITY: Operation of the Raven UAS in Class G airspace at or below 400 feet above ground level (AGL) in the vicinity of Simi Valley and Taft, California (See Attachment 1).

PURPOSE: To prescribe operating requirements in the NAS (outside of restricted and/or warning area airspace) for the purpose of training and/or operational flights.

DATES OF USE: This COA (2007-WSA-8) is valid from December 1, 2007, through November 30, 2008. This version of the 7711-1 attachment supersedes previous versions, but all authorized operations dates remain the same. Should a renewal become necessary, the proponent shall advise the FAA, in writing, no later than 60 days prior to the requested effective date.

GENERAL PROVISIONS:

- The review of this activity is based on our current understanding of the UAS operations, and the impact of such operations in the NAS, and therefore should not be considered a precedent for future operations. As changes occur in the UAS industry, or in our understanding of it, there may be changes to the limitations and conditions for similar operations.
- All personnel connected with the UAS operation must comply with the contents of this authorization and its special provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

SAFETY PROVISIONS:

Unmanned Aircraft (UA) have no on-board pilot to perform see-and-avoid responsibilities, and therefore, when operating outside of restricted/warning/Class A airspace areas, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. In accordance with 14 CFR Part 91, General Operating and Flight Rules, Subpart J-Waivers, 91.903, Policy and Procedures,

the following provisions provide acceptable mitigation of 14 CFR Part 91.113 and must be complied with:

- Visual Observers, either ground-based or airborne, must be used.
- The applicant and/or its representatives are responsible for collision avoidance with all aircraft, other aviation operations, and the safety of persons or property on the surface.

AIRWORTHINESS CERTIFICATION PROVISIONS:

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft applications must contain one of the following:
    - A civil airworthiness certification from the FAA, or
    - A statement specifying that the Department of Defense Handbook "Airworthiness Certification Criteria" (MIL-HDBK-516), as amended, was used to certify the aircraft or equivalent method of certification.

PILOT / OBSERVER PROVISIONS:

- **Pilot Qualifications:** UA pilots interacting with Air Traffic Control (ATC) shall have sufficient expertise to perform that task readily. Pilots must have an understanding of and comply with Federal Aviation Regulations and Military Regulations applicable to the airspace where the UAS will operate. Pilots must have in their possession a current third class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA pilots.

- **Observer Qualifications:** Observers must have been provided with sufficient training to communicate clearly to the pilot any turning instructions required to stay clear of conflicting traffic. Observers will receive training on rules and responsibilities described in 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Observers must have in their possession a current third class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA observers.

- **Pilot-in-Command (PIC) – Visual Flight Rules (VFR):**
    - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
    - The PIC must pass the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105, and must keep their aeronautical knowledge up to date.

- There is no intent to suggest that there is any requirement for the UAS PIC to be qualified as a crewmember of a manned aircraft.

Pilot Proficiency – VFR:

- Pilots will not act as a PIC unless they have had three qualified proficiency events within the preceding 90 days.
  - The term "qualified proficiency event" is a UAS-specific term necessary due to the diversity of UAS types and control systems.
  - A qualified proficiency event is an event requiring the pilot to exercise the training and skills unique to the UAS in which proficiency is maintained.
- Pilots flying UA on other than instrument flight plans must pass the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105.

PIC Responsibilities:

- Pilots are responsible for a thorough preflight inspection of the UAS. Flight operations will not be undertaken unless the UAS is airworthy. The airworthiness provisions of 14 CFR 91.7, Civil Aircraft Airworthiness, or the military equivalent, apply.
- One PIC must be designated at all times and is responsible for the safety of the UA and persons and property along the UA flight path.
- The UAS pilot will be held accountable for controlling their aircraft to the same standards as the pilot of a manned aircraft. The provisions of 14 CFR 91.13, *Careless and Reckless Operation*, apply to UAS pilots.

Pilot/ATC Instructions: The PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions as applicable.

SPECIAL PROVISIONS:
Listed below are the special provisions that must be complied with. All personnel connected with this UAS operation shall comply with the contents of this authorization and its special provisions.

1. All UAS operations shall be conducted under Visual Flight Rules (VFR) in Visual Meteorological Conditions (VMC) in accordance with CFR 14 Part 91.

2. For the purpose of see-and-avoid, visual observers must be utilized at all times when operating outside of restricted airspace. The visual observers must remain within 1 nautical mile laterally and/or 400 feet vertically of the UAS during all operations. Pilot/observers must not operate Raven at a distance beyond that at which see and avoid responsibilities can be exercised.

3. Operations outside of restricted airspace may only be conducted during daylight hours.

4. The operational transponder requirement as listed in FAR Part 91.215 (5) (c) is waived, including the requirement to contact the Air Traffic Control facility.

5. All lost link procedure will be contained within the operations area depicted in "Activity" above and attachment 1 below.

6. Operations are not authorized over populated areas, open air crowds or heavily trafficked roads including orbit during lost link.

7. Operations at the Taft flight operations area need to consider parachuting activity which is charted in the local area. Vigilance for this activity needs to be exercised and the applicant should cease operations until the area is clear of any conflicting parachuting activity. The applicant should check applicable Notices to Airmen (NOTAMs) and the appropriate radio frequencies for current parachuting status.

NOTAM: A distance (D) Notice to Airman shall be issued when UA operations are being conducted. Contact the Automated Flight Service Station not more than 72 hours in advance, but not less than 48 hours prior to the operation and provide:

- Name and Address of the Using Facility
- Location, Altitude or the operating Area
- Time and nature of the activity

INCIDENT / ACCIDENT REPORTING: The following information is required to document unusual occurrences associated with UAS activities in the NAS.

- The proponent for the COA shall provide the following information to Donald.E.Grampp@faa.gov on a monthly/annual basis:

  - Number of flights conducted under this COA.
  - Pilot duty time per flight.
  - Unusual equipment malfunctions (hardware/software).
  - Deviations from ATC instructions.
  - Operational/coordination issues.
  - All periods of Loss of Communications.

- The following shall be submitted to Donald.E.Grampp@faa.gov within 24 hours:

  - Deviations from the "Special Provisions" contained in the COA.
  - All periods of Loss Link, including duration.
  - All incidents involving the UAS as defined in 49 CFR 830.
  - All accidents involving the UAS as defined in 49 CFR 830.

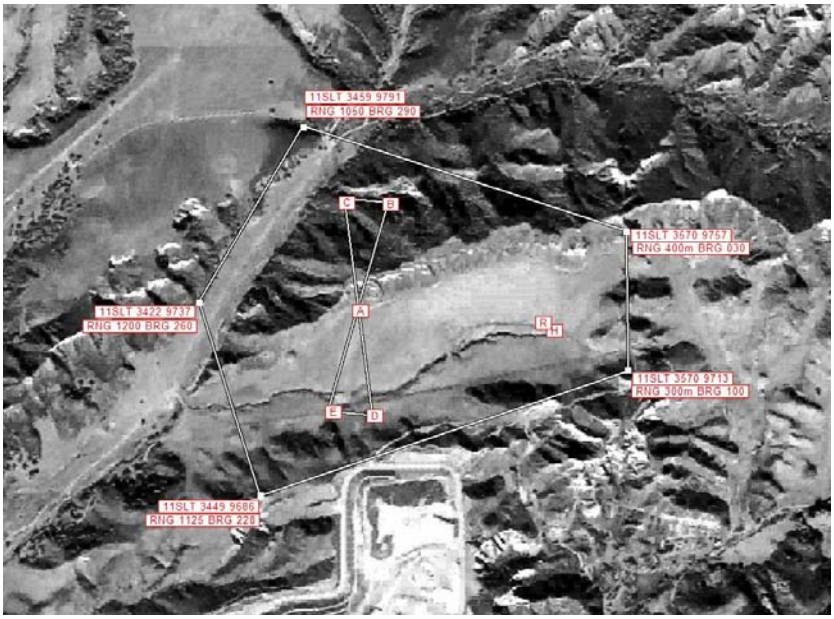
This COA does not, in itself, waive any Federal Aviation Regulation (FAR) nor any state law or local ordinance unless specifically stated. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the United States Army to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The United States Army is hereby authorized to operate the Raven UAS in the operations area depicted in “Activity” above and attachment 1 below.

Lower Waste Management Attachment 1

- HOME 11SLT 3542 9728 / N34° 18’13” W118°47’18”
  Loss of Link RALLY Point 11SLT 3542 9728 / N34° 18’13” W118°47’18”

Airspace Definition (MGRS / LAT/LONG)

1) 11SLT 3570 9757	N34° 18’22” W118°47’07”
2) 11SLT 3570 9713	N34° 18’08” W118°47’07”
3) 11SLT 3449 9686	N34° 17’59” W118°47’54”
4) 11SLT 3422 9737	N34° 18’15” W118°48’05”
5) 11SLT 3459 9791	N34° 18’33” W118°47’51”

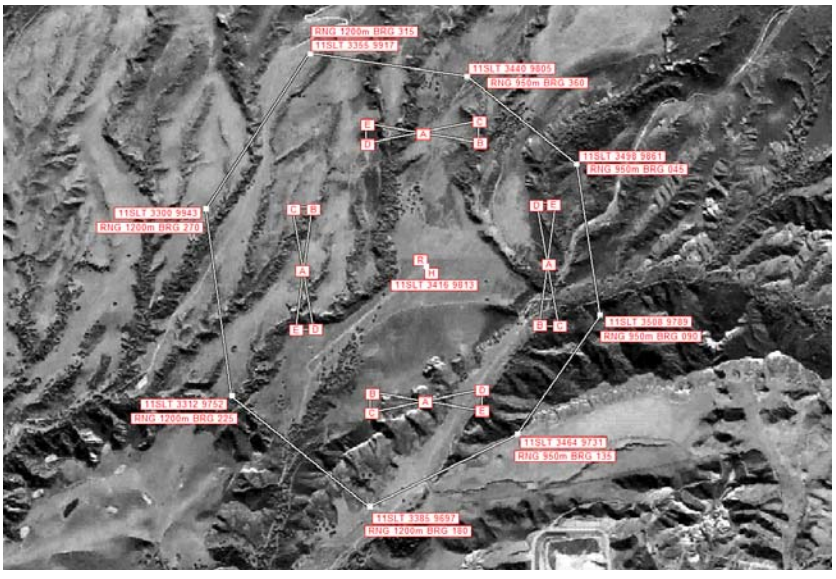


Upper Waste Management

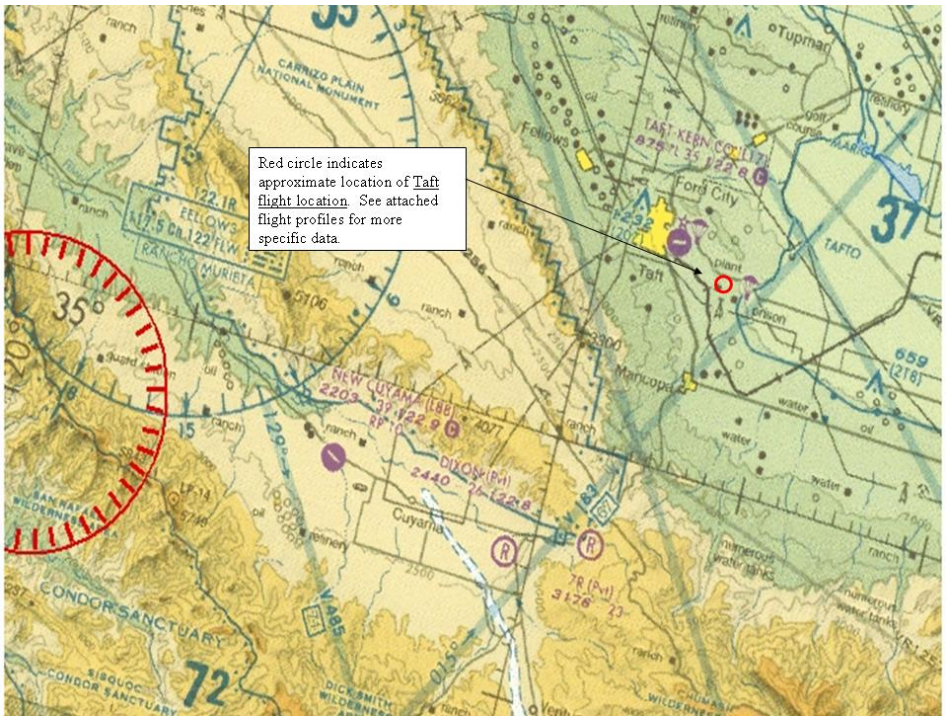
- HOME 11SLT 3416 9813 / N34° 18’40” W118°48’08”
  Loss of Link RALLY Point 11SLT 3416 9813 / N34° 18’40” W118°48’08”

Airspace Definition (MGRS / LAT/LONG)

1) 11SLT 3440 9905 N34° 19’10” W118°47’59”
2) 11SLT 3498 9861 N34° 18’56” W118°47’36”
3) 11SLT 3508 9789 N34° 18’32” W118°47’32”
4) 11SLT 3464 9731 N34° 18’13” W118°47’48”
5) 11SLT 3385 9697 N34° 18’02” W118°48’19”
6) 11SLT 3312 9752 N34° 18’19” W118°48’48”
7) 11SLT 3300 9843 N34° 18’49” W118°48’53”
8) 11SLT 3355 9917 N34° 19’13” W118°48’32”



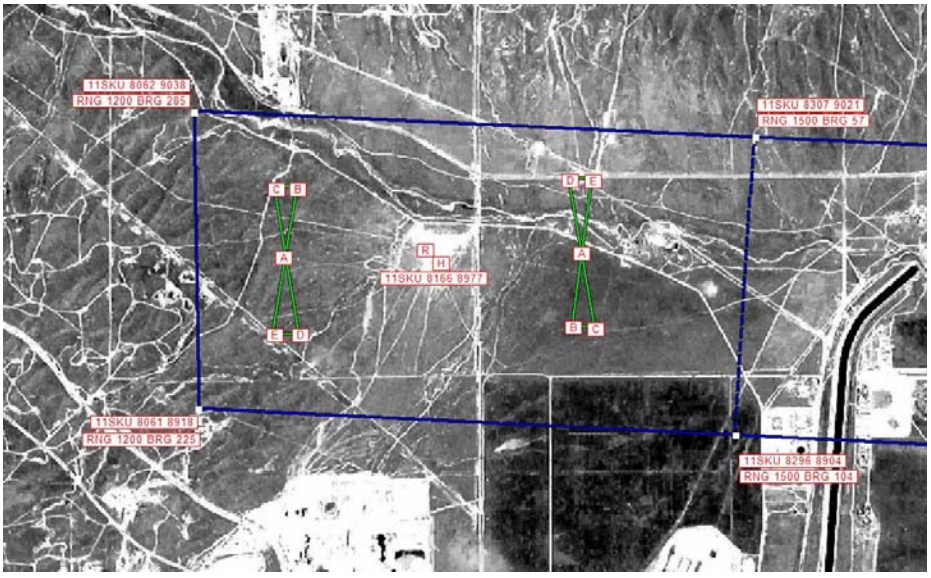
Taft



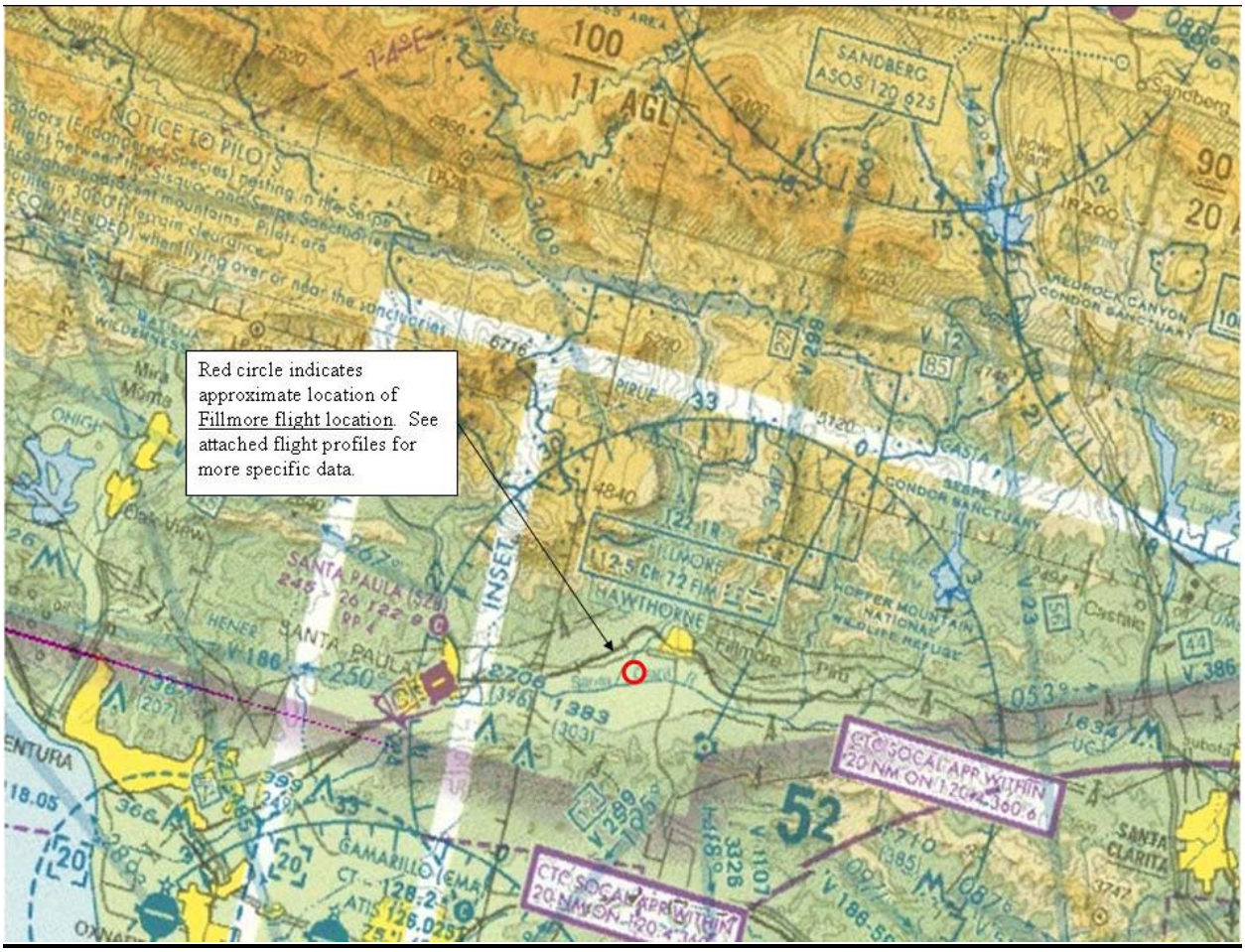
- HOME 11SKU 8166 8977 / N35° 07'37" W119°23'46"
  Loss of Link RALLY Point 11SKU 8166 8977 / N35° 07'37" W119°23'46"

Airspace Definition

1) 11SKU 8062 9038 N35° 07'56" W119°24'27"
2) 11SKU 8307 9021 N35° 07'53" W119°22'51"
3) 11SKU 8296 8904 N35° 07'15" W119°22'54"
4) 11SKU 8061 8918 N35° 07'17" W119°24'27"



Fillmore



- HOME 11SLU 2193 0676 / N34° 23’12” W118° 56’13”
- Field altitude is approximately 400 feet MSL.

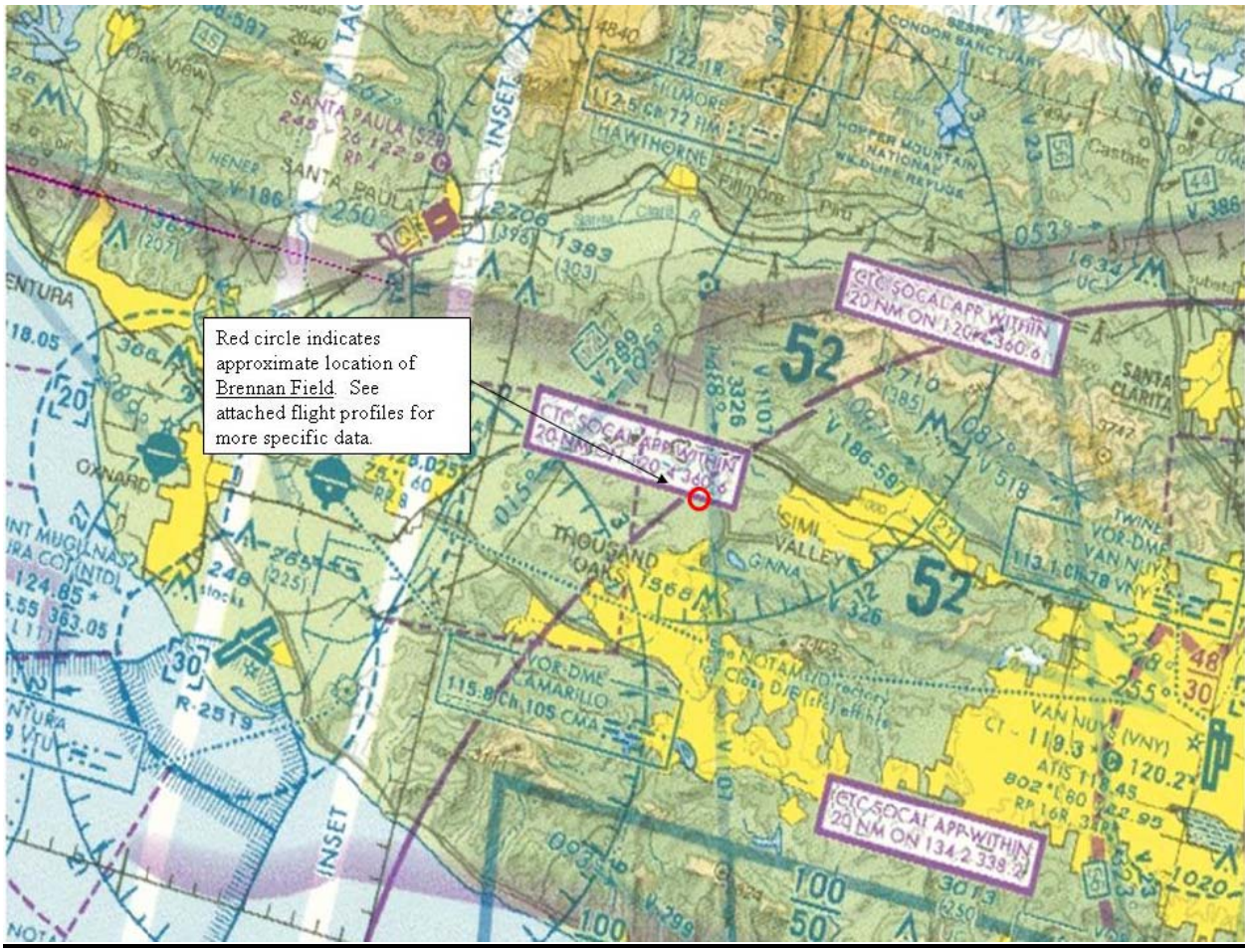
Loss of Link RALLY Point 11SLU 2193 0676 / N34° 23’12” W118° 56’13”

Airspace Definition

- 1) 11SLU 2052 0717 N34° 23’25” W118° 57’08”
- 2) 11SLU 2333 0728 N34° 23’30” W118° 55’18”
- 3) 11SLU 2295 0566 N34° 22’37” W118° 55’32”
- 4) 11SLU 2106 0555 N34° 22’33” W118° 56’46”


11SLU 2052 0717
RNG 1492 BRG 092
11SLU 2333 0728
RNG 1497 BRG 054
11SLU 2193 0676
11SLU 2106 0555
RNG 1496 BRG 020
11SLU 2295 0566
RNG 1499 BRG 122

Brennan Field

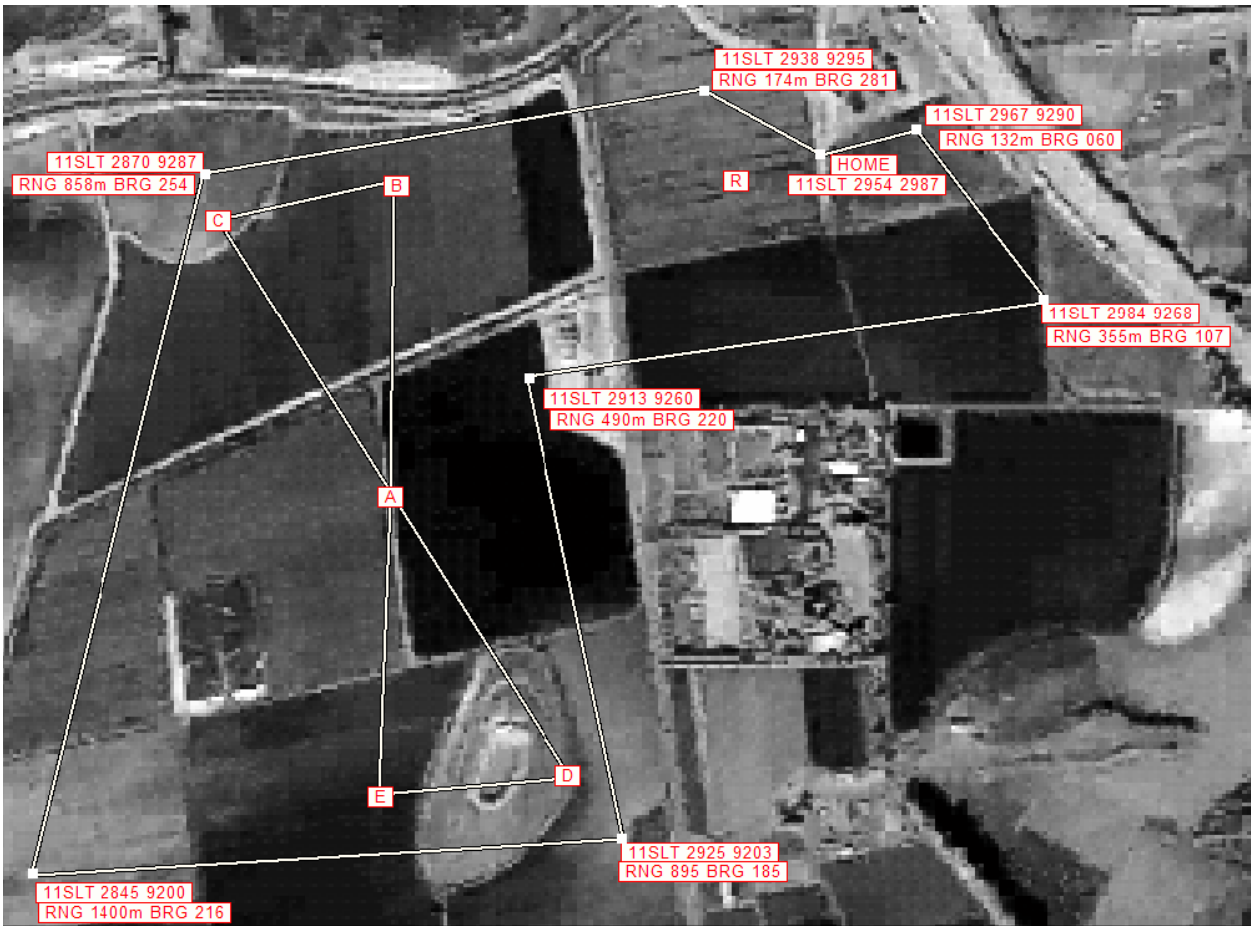


- HOME 11SLT 2954 9287 / N34° 15’ 46” W118° 51’ 05”
- Field elevation is approximately 600 ft MSL.

Loss of Link RALLY Point 11SLT 2954 9287 / N34° 15’ 46” W118° 51’ 05”

Airspace Definition (MGRS / LAT/LONG)

- 11SLT 2870 9287 N34°15’46” W118°51’38”
- 11SLT 2938 9295 N34°15’49” W118°51’11”
- 11SLT 2967 9290 N34°15’47” W118°51’00”
- 11SLT 2984 9268 N34°15’40” W118°50’53”
- 11SLT 2913 9260 N34°15’37” W118°51’21”
- 11SLT 2925 9203 N34°15’19” W118°51’15”
- 11SLT 2845 9200 N34°15’17” W118°51’47”


11SLT 2938 9295
RNG 174m BRG 281
11SLT 2967 9290
RNG 132m BRG 060
11SLT 2870 9287
RNG 858m BRG 254
B
C
R
HOME
11SLT 2954 2987
11SLT 2984 9268
RNG 355m BRG 107
11SLT 2913 9260
RNG 490m BRG 220
A
D
E
11SLT 2925 9203
RNG 895 BRG 185
11SLT 2845 9200
RNG 1400m BRG 216