

Checklist Responses for Eight Nellis COA Requests

1. Type of application
 - a) Public – **DoD**
2. Organization/agency/department/company requesting COA – **57th Operations Group (ACC)**
3. Address – **4450 Tyndall Ave, Nellis AFB, NV 89191**
4. Point of contact
 - a) Name – [REDACTED] **Exemption 6**
 - b) Phone – [REDACTED] **Exemption 6**
 - c) FAX – [REDACTED] **Exemption 6**
 - d) E mail – [REDACTED] **Exemption 6**
5. Date application submitted – **Nov 05**
6. Requested effective period. (Not to exceed one year) – **12 Months from approval date.**
7. AVS adjudication date (if less than 60 days from application) – **N/A**
8. Aircraft system
 - a) Aircraft – **MQ-1**
 - b) Control station – **Yes, Ground Control Station (GCS)**
 - c) Communications – **One UHF & two VHF Radios**
 - d) Other – **See original renewal letter (Attachment 1)**
9. List components certified – **N/A**
10. Performance characteristics
 - a) Climb rate – **Best climb at takeoff power at max gross weight (2,250lbs) = 800 feet per minute.**
- **At nominal gross weights (2,000lbs) you can expect a climb gradient of 875 feet initially climbing from 5,000 feet to 20,000 feet MSL with the climb gradient tapering off to 600 feet per minute at 20,000 feet MSL.**
 - b) Descent rate – **At nominal gross weight you can expect a descent rate of 525-425 feet descending from 20,000 feet to 5000 feet MSL.**
 - c) Turn rate – **Autopilot turn rate at sea level is 2.6 degrees/sec decreasing to 1.7 degrees per second at 20,000 feet MSL (Lost link profile, 80 KIAS).**
- **This equates to a turn radius of .8 nm at sea level, 1 nm at 10,000 feet MSL, and 1.2 nm at 20,000 feet MSL.**
 - d) Maximum/minimum cruise speed (KIAS) – **50 to 120 KIAS**
 - e) Approach speed – **65 to 75 KIAS**
 - f) Maximum/minimum operating altitudes – **Surface to 25,000 feet MSL.**
 - g) Gross takeoff weight (GTOW) – **2,250 lbs max**
 - h) Launch/recovery (specify type/procedure) – **Self-propelled from prepared surface, Line of sight control GCS.**
11. Airworthiness
 - a) Type Certificate – **N/A**
 - b) If in possession of other than Type Certificate, specify limitations – **No limitations.**
 - c) If no Type Certificate, provide Airworthiness Statement – **Approved Airworthiness clearance (AFMC Form 273) dated, 12 Jan 06. POC: [REDACTED] **Exemption 6**, [REDACTED] **Exemption 6**, Predator Systems Squadron, Reconnaissance Wing, Wright Patterson AFB, OH. Phone: [REDACTED] **Exemption 6.****
12. Lost link/mission procedures – **Lost Link and Mission Procedures differ depending on the area the mission is flown. The only Lost Link Orbits outside of restricted airspace are in Salt Lake City ARTCC Class A Airspace on the NTTR to UTTR route (attachment 5)**

and the NTTR to Navy Fallon Ranges (attachment 6). These two routes and Lost Link Orbits were approved by Salt Lake City ARTCC Air Traffic Manager. All Lost Link procedures fly the approved routes depicted in attachments 2, 4, 5, 6, and 7 back to Creech AFB where line of sight is restored. Per the FAA, if an MQ-1 experiences Lost Link, the aircraft will automatically squawk 7700.

13. Lost communications procedures – **If radio communications is lost, the MQ-1 will continue on the pre planned mission, squawk 7600, and contact the appropriate air traffic control facility or command and control facility by land line. If the controlling agency wants the MQ-1 to return to base, the aircraft will fly the published route back to Creech AFB.**
14. Emergency procedures – **MQ-1 emergency procedures are covered in TO 1Q-1 (MB-1).**
15. Avionics
 - a) **GPS INS and internal INS**
 - i. Moving map indicator (Command station) – **YES**
 - b) Capstone Capability – **NO**
 - c) Tracking capability – **YES**
 - d) Other (list) – **See original request letter (attachment 1)**
16. Equipment
 - a) Cooperative
 - i. Transponder – **YES**
 - ii. Mode C – **YES**
 - iii. Retuneable (remote-programmed) – **YES**
 - iv. Ident capability – **YES**
 - b) Lights
 - i. Anti-collision – **YES**
 - ii. Position – **YES**
 - iii. Navigation – **YES**
 - c) Radio communications
 - i. VHF/UHF (Circle as applicable) – **YES, All**
 - ii. Retuneable (remote-programmed) – **YES**
 - iii. Spectrum analysis approval
 1. Data Link – **YES**
 2. Control link(s) – **YES**
 - iv. Instantaneous two-way voice ATC – **YES, Plus backup land line capability**
 1. Direct to pilot – **YES**
 2. Relay via aircraft – **YES**
 3. SATCOM – **YES**
 - d) Onboard surveillance/detection – **YES**
 - i. EO/IR – **YES**
 - ii. Radar – **NO**
 - iii. TCAS/MCAS – **NO**
 - iv. Other (specify) – **NO**
 - v. Terrain detection – **NO**
 - vi. Weather/icing detection – **YES**
 - e) External surveillance/detection capability – **YES**
 - i. Ground based
 1. Training – **YES, all aircrew are trained IAW USAF UAV training syllabus.**
 2. Part 91 knowledge – **YES**
 3. Distance from UA – **YES**

4. Altitude of UA – **YES**
 5. Medical certificated – **YES**
 6. Substance free – **YES**
 - ii. Airborne based – **YES, AWACS (for exercises/when available)**
 - iii. Space based – **No**
 - f) Aircraft performance recording – **YES**
 - i. Flight profile recording – **YES**
 - ii. Control station recording – **YES**
17. NAS Operational Compatibility, See-and- Avoid
- a) Radar observation – **YES, Ground based FAA ARSR, ASR, and DoD gap filler radars. Airborne based AWACS radar.**
 - b) Forward or side looking cameras – **YES, All ROAs are equipped with a fixed nose camera that has a 30-degree field of view (FOV). The following tables show performance data for the various lenses: It also has a Multi-spectral Targeting System (MTS) turret assembly on the bottom of the fuselage allows 360° hemispheric coverage following two cameras:**
 - i Day Television (DTV) – Day Only, 6-Step 155x Optical Zoom and 2x to 4x Digital Zoom.
 - ii Infra-Red (IR) – Day and Night 3 to 5 Micron (Med IR) 4-Step 56x Optical Zoom and 2x to 4x Digital Zoom.
 - c) The pilot can fly the aircraft off all of the cameras. In addition, the IR camera allows for night flight. The following tables show performance data for the various lenses:

IR Video FOVs (±10%)		
Characteristic	Vertical FOV	Horizontal FOV
IR Ultrawide (optical)	34.00°	45.00°
IR Wide (optical)	17.00°	22.50°
IR Medium (optical)	5.69°	7.64°
IR Narrow Medium (optical)	2.85°	3.82°
IR Narrow (optical)	1.21°	1.63°
IR Ultranarrow (optical)	0.60°	0.80°
IR Ultranarrow (2x electronic zoom)	0.30°	0.40°
IR Ultranarrow (4x electronic zoom)	0.15°	0.20°

DTV Video (±10%)		
Characteristic	Vertical FOV	Horizontal FOV
DTV Ultrawide (optical)	34.00°	45.00°
DTV Wide (2x electronic zoom)	17.00°	22.50°
DTV Medium (optical)	5.69°	7.64°
DTV Narrow (optical)	1.21°	1.63°
DTV Ultranarrow (optical)	0.22°	0.29°
DTV Ultranarrow (2x electronic zoom)	0.110°	0.145°
DTV Ultranarrow (4x electronic zoom)	0.055°	0.0725°

- d) Electronic detection systems – **NO**
- e) Visual observation from one or more ground sites – **YES, During UAS operations. at Creech Tower, Desert Rock Airport, there are CTO certified Air Traffic Controllers**

in the control tower.

- f) Monitored by patrol/chase aircraft – **YES, Chase planes are used from Gray Butte and El Mirage Airports to R-2515 (attachment 2) and there are communications between the two pilots. There are no chase planes used or required in the tower controlled Class D airspace at Creech AFB, Tower controlled Class E airspace at Desert Rock, or in the Tower controlled airspace at Nellis AFB. IAW HQ ACC policy, chase planes are not used in the Desert and Reveille N&S MOAs (see attachment 3 for MOA location).**
- 18. Flight operations area/flight plan – **All Flights are on IFR flight plans regardless of destination.**
 - a) Attach map depicting area of operation using current sectional chart (provide sufficient buffer around perimeter for traffic management evaluation.) – **All required maps of SUA, airport locations, and routes to/from DoD range complexes are attached (attachments 2 thru 7).**
 - b) Departure location – **Creech AFB, Desert Rock Airport, and Nellis AFB (attachment 4) Nellis AFB will only be the departure location when an MQ-1 diverts IAW the divert COA. UAS' from Creech AFB and Desert Rock Airport will depart directly into restricted airspace. Gray Butte and El Mirage Airports (attachment 2) are used for departure airports for delivery flights.**
 - c) Arrival location – **Typical arrival locations are Creech AFB, Desert Rock Airport, and Nellis AFB (attachment 4). Nellis AFB will only be the arrival location when an MQ-1 diverts IAW the divert COA. MQ-1's from Creech AFB and Desert Rock Airport will arrive from restricted airspace.**
 - d) Pre/post flight operations – **Pre and post flight operations will be conducted at Creech AFB, Desert Rock Airport, and Nellis AFB (at Nellis AFB only if UAS diverts IAW COA)**
 - e) Route of flight –
 - i **Routes of flight that depart from Creech AFB and fly directly into restricted airspace.**
 - ii **Route of flight to the restricted airspace of the Utah Test and Training Range is depicted in attachment 5.**
 - iii **Route of flight to the restricted airspace of the Navy Fallon Range is depicted in attachment 6.**
 - iv **Route of flight to the restricted airspace of the R-2508 Complex and R-2501 is depicted in attachment 7.**
 - v **Route of flight that departs the restricted airspace and diverts to Nellis AFB is depicted in attachment 4.**
 - vi **Route of flight that departs the Gray Butte or El Mirage Airport and direct to the R-2515 restricted airspace is depicted in attachment 2.**
 - f) Altitudes for each segment – **Altitudes are depicted in the various attachments.**
 - g) Class of airspace (Identify all applicable)
 - c) **Class A – Yes, Flying to and from other DoD range complexes**
 - i. **Class B – Yes, Flying to Nellis AFB IAW weather divert or practicing divert Procedures (attachment 4)**
 - ii. **Class C – NO**
 - iii. **Class D – Yes, Creech AFB, Class D Airspace (attachment 4)**
 - iv. **Class E – Yes, Desert Rock Airport Class E Airspace (attachment 4)**
 - v. **Class G – NO**
 - vi. **SUA and ASU – Yes, Restricted Airspace, Desert, Reveille North & South MOAs and ATCAAs (attachment 3)**

18. Period of operations

- a) Start/stop
- b) Number of flights/operations
- c) Duration of operations
- d) Lights out operation: attach approval – N/A

19. UAS Qualifications

a) Pilot Certification: (Circle all that apply)	<u>Pilots</u>	<u>Observers</u>
i. Private	N/A	N/A
ii. Instrument	YES	YES
iii. Air Transport	N/A	N/A
iv. Unique trained pilot	YES	YES
v. DOD certified/trained	YES	YES
vi. None	N/A	N/A
b) Medical Certification required	YES	YES
c) Currency Requirements	YES	YES
d) Duty Time Restrictions	YES	YES
e) Single UAS Control	YES	YES
f) Multiple UAS Controlled	NO	NO
If “yes” state number	N/A	
g) Trained on FAR Part 91 requirements	YES	YES

20. ATC requirements (FAA INTERNAL USE ONLY)

- a) Communications
- b) Traffic avoidance
- c) Method of navigation
- d) Departure/arrival point
- e) Airspace/route deconfliction (if needed)
- f) Scheduling
- g) Assigned transponder code
- h) NOTAM issued
- i) Call sign
- j) Flight plan information
- k) Emergency procedures
- l) Lost Link
- m) Lost communications
- n) ATC facilities involved
- o) ATC facilities point of contact.

Question to considers:

- a. What are the data recording capabilities, if any, for all components of the UAS? (UA, command station, etc.)
- b. What are the skills, knowledge and certifications of the UAS pilot to operate the UA?
- c. What knowledge does the pilot have of FAR and AT operations and procedures, if not possessing a standard FAA certification?
- d. What is the legal connection between the UA pilot and the proponent’s organization?
- e. Do the pilot/observers possess a current aviation medical?
- f. What recent experience does the pilot/observer possess to conduct UA operations? Does the proponent mandate a minimum currency requirement?
- g. What is the maximum length of duty for each UA pilot/observer for the proposed operation?