

		ASN	2010-CSA-49-COA
		Case Status	APPROVED
		Date Created	10/06/2010
		Date Submitted	10/16/2010
Proponent Organization		Sponsor	NMSU-PSL
		Attn Of	Stephen B. Hottman
		Address	21st Century Aerospace
		Address2	Mail Stop 3548 NMSU
		City	Las Cruces
		State	NM
		Postal Code	88003
		Telephone	(575) 646-9202
		Email	shottman@psl.nmsu.edu
Declaration		Declaration(a)	Yes
		Declaration(b)	Yes
Point of Contact		Representative	Glen Witt
		Address	NMSU-PSL 21 Century Aerospace
		Address2	Mail Stop 3548 NMSU
		City	Las Cruces
		State	NM
		Postal Code	88003
		Telephone	(505) 975-2793
		Email	glenwitt@psl.nmsu.edu
Operational Description	Requested Effective Period	Beginning	
		End	
		Light out operation	No
		VFR operation	Yes
		IFR operation	No
		Day operation	Yes
		Night operation	No
		Program Executive Summary	Flight operations of the Aerostar UAS is for Research and Development activities, training of aircrew personnel, and to maintain aircrew flight proficiency and currency. Flight operations generally occur on a weekly basis with an average of 10 to 12 flights per month.
		Operational Summary	Takeoffs and landings for the vast majority of the Aerostar flight operations will be at the Las Cruces, NM Airport (LRU). On some very infrequent occasions, takeoffs and landings will be at the Playas, NM Airport (86E), a private airport, and the Lordsburg, NM Airport (LSB). Each of these airports are located within Class G airspace and air traffic volume is low. Except for the Lordsburg Airport, Aerostar has been flown at these airports for several years. Flight routes and altitudes within the operating airspace will vary depending on specific mission objectives and will be conducted primarily within Class E (1200 feet AGL and upto 17,500 MSL). All flight activity will only be performed over sparsely populated surface areas. In addition, no flight operation will be performed in any restricted area airspace during the time the restricted area is active, unless, prior approval is obtained from the scheduling authority for that restricted area.
	Location	State	NM
		County	Luna
		Nearest Airport	DEM NG MUNI
		AOR	New Mexico
	Class Of Airspace	Class-A	
		Class-B	
		Class-C	
		Class-D	
		Class-E	Yes
		Class-G	Yes
System Description		Aircraft Type	
		Aircraft Type And Model Description Attachment	1
		Control Station Attachment	1
		Communications System Attachment	1
		List Certified Components (TSO) Attachment	1
		Other Attachment	0
Performance Characteristics		Climb Rate (feet/Minute)	(b)(6)
		Descent Rate (feet/Minute)	(b)(6)
		Turn Rate (Degrees/Second)	(b)(6)
	Cruise Speed	Maximum	80
		Minimum	55
		Approach Speed	60
	Operating Attributes	Maximum MSL	17500
		Minimum MSL	4960
		Gross Takeoff Wt	440.0
		Launch/Recovery Attachment	1
Airworthiness		FAA Type Certificate	

		If No FAA Certificate (Public Aircraft Only) Attachment	1
Procedures		Lost Link/Mission Procedures Attachment	1
		Lost Communications Procedures Attachment	1
		Emergency Procedures Attachment	1
Avionics/Equipment		Equipment Suffix Type	U
		GPS	Yes
		Moving map indicator (Command Station)	Yes
		Tracking capability	Yes
		TCA/MCAS	No
		ELT	No
	Transponder	Transponder	Yes
		On	Yes
		Off	Yes
		Standby	Yes
		Ident	Yes
		Mode S	No
		Mode C	Yes
		Transponder Retuneable in Flight	No
Lights		Landing	No
		Position/Navigation	Yes
		Anti-collision	Yes
		Infrared (IR)	No
Spectrum Analysis Approval		Data Link	Yes
		Data Link Attachment	0
		Control Link(s)	Yes
		Control Link Attachment	0
		Operations utilizing Radio Control (R/C) frequencies as described in Title 47 CFR 95	No
		NTIA/FCC Authorization Attachment	1
ATC Communications	Transmitter VHF Band	VHF Band	No
		Quantity	
		In-Flight Retunable	No
	Transmitter UHF Band	UHF Band	No
		Quantity	
		In-Flight Retunable	No
	Transmitter HF band	HF Band	No
		Quantity	
		In-Flight Retunable	No
	Receiver VHF Band	VHF Band	No
		Quantity	
		In-Flight Retunable	No
	Receiver UHF Band	UHF Band	No
		Quantity	
		In-Flight Retunable	No
	Receiver HF band	HF Band	No
		Quantity	
		In-Flight Retunable	No
	Guard (Emergency) Frequencies VHF Band	VHF Band	No
		Quantity	
	Guard (Emergency) Frequencies UHF Band	UHF Band	No
		Quantity	
	Instantaneous Two-Way Voice	Direct to pilot	No
		SATCOM	No
		Relay via aircraft	No
Electronic Surveillance/ Detection Capability		EO/ R	Yes
		Terrain detection	No

		Weather/icing detection	No
		Radar	No
		Other Attachment	0
		Electronic detection systems	No
		Electronic detection systems attachment	0
		Radar observation	No
		NAS Operational Capability Attachment	1
Visual Surveillance/ Detection Capability	Maximum Distance from UA	Vertical	3000 Feet
		Horizontal	1.0 Nautical Miles
		Airborne based (Chase Aircraft)	Yes
		Ground based	Yes
		Visual observation from one or more ground sites	Yes
		Forward or side looking cameras	No
		Attachment for All	0
Aircraft Performance Recording		Flight data recording	Yes
		Control station recording	Yes
		Voice Recording	Yes
Flight Aircrew Qualifications	Pilots		
		Private (Written)	Yes
		Private (Certified)	Yes
		Instrument	Yes
		Commercial	Yes
		Air Transport	No
		Unique Trained Pilot	No
		Unique Trained Pilot Description	FAA pilot ground school. The internal pilots are FAA rated or have achieved an equivalent military pilot rating.
		DOD certified/trained	Yes
		Other Certified Training	Yes
		Trained on FAR Part 91 Requirement	Yes
		Medical Certification Class (FAA or DOD equivalent)	2
			External Pilot (EP) - The Aerostar EP shall maintain currency. In order to maintain currency the Aerostar pilot shall perform a minimum of three qualified proficiency events within the previous 90 days, operating the Aerostar or through the use of a compatible simulator. A single proficiency event shall include a takeoff and landing; at least one-hour of flight operation; and transfer of flight control to the Aerostar Internal Pilot (IP) and acquiring transfer of flight control from the IP.
			2. Internal Pilot (P) - The Aerostar P shall maintain currency. In order to maintain currency the Aerostar P shall perform a minimum of three qualified proficiency events within the previous 90 days through flight operation of the Aerostar or through the use of a compatible simulator. A single proficiency event shall include acquiring flight control from the EP; a minimum of one-hour of flight operation; and transfer of flight control to the EP.
		Currency Status	
			1. Aircrew Rest - Adequate aircrew rest is necessary for safe and effective operation of the Aerostar. Aircrew members that are fatigued are more likely to make mistakes and jeopardize safety and the mission. Aircrew members shall monitor their schedules and raise awareness if cannot achieve adequate aircrew rest. Aircrew rest time is 8 hours of uninterrupted time when the aircrew member does not have tasking to accomplish and is allowed to rest. Should an aircrew member change shift from one cycle to another (day or night or defined shift) to another, twelve-hours of rest shall be used instead of the normal 8 hours of rest between duty activity.
			Duty Day - The duty day is the period of time when the aircrew member is present and engaged in system wetup, planning, pre-flight briefing, mission flight, post-flight debriefing, and cleanup. Excessive time on duty leads to fatigue and decreases effectiveness. Periodic breaks, including extended breaks for extended meals, shall be afforded aircrew members to allow them to refresh their capabilities and not become task-saturated. A duty day of no more than 10 hours with periodic breaks should not overly fatigue the aircrew. Such a schedule will allow sufficient time to recover and be sustainable for a six-day work week. A duty day between ten and sixteen hours with periodic breaks should be sustainable so long as eight hours of aircrew rest is provided each day. Aircrew members should evaluate their tasking and rest schedule to determine their ability to perform their duties. Aircrew members should work a reduced week if continually tasked at this level. A duty day greater than 16 hours will be fatiguing to the the aircrew member and will also disrupt their sleep cycle, contributing to greater fatigue. Should a duty day greater than 16 hours be necessary, care shall be exercised that the aircrew member be adequately rested before the day, be afforded periodic breaks and recovery time during the day, and have a minimum of twelve hours of crew rest after the duty day to recover.
		Duty Time Restrictions	
		Single UAS Control	Yes
		UAS Description	
		Total Numbers of UAS Controlled	1
	Observers	Private (Written)	No
		Private (Certified)	No
		Instrument	No
		Commercial	No
		Air Transport	No
		Unique Trained Pilot	No

		Unique Trained Pilot Description	Visual observers shall attend a visual observer course that enhances the individuals' knowledge of air traffic rules and the ability to detect aircraft in flight.
		DOD certified/trained	No
		Other Certified Training	No
		Trained on FAR Part 91 Requirement	Yes
		DOD Certified Training Attachment	0
		Medical Certification Class (FAA or DOD equivalent)	2
		Currency Status	Visual Observer (VO) - VOs shall maintain currency. In order to maintain currency a VO must have been a VO for an Aerostar flight operation within the past 90 days or received refresher training within the past 90 days.
		Duty Time Restrictions	<p>1. Visual Observers Rest - Adequate rest is necessary for the VO to adequately provide visual observer see-and-avoid responsibilities. VOs that are fatigued are more likely to make mistakes and adversely affect flight operation safety. VOs should monitor their schedules and raise awareness if they cannot achieve adequate VO rest. VO rest time is eight-hours of uninterrupted time when the VO does not have tasking to accomplish and is allowed to rest. Should a VO change shift from one cycle (day or night or defined shift) to another, twelve-hours of rest shall be used instead of eight hours.</p> <p>2. Duty Day - The duty day is the period of time when the VO is present and engaged in system setup, planning, preflight briefing, mission flight, post flight debriefing, and cleanup. Excessive time on duty leads to fatigue and decreased effectiveness. Periodic breaks, including extended breaks for meals, shall be afforded the VO to allow time for refreshing the VO's capabilities and to ensure the effort does not become task-saturated. A duty day of less than ten-hours with periodic breaks should not overly fatigue a VO. This schedule should allow sufficient time for a VO to recover and be sustainable for a six-day work week. A duty day between ten and sixteen hours with periodic breaks should be sustainable so long as eight-hours of rest is provided each day. VOs should evaluate their tasking and rest schedule to determine their ability to perform their duties. VOs should work a reduced week if continually tasked at this level. A duty day greater than sixteen-hours will be fatiguing to the VOs and will also disrupt their sleep cycle, contributing to greater fatigue. If a duty day greater than sixteen hours is necessary, care should be exercised that the VO be adequately rested before the next duty day, be afforded periodic breaks and recovery time during the day, and have a minimum of twelve-hours of rest after the duty day to recover.</p>
		Single UAS Control	Yes
		UAS Description	
		Total Numbers of UAS Controlled	1
Special Circumstances		Special Circumstances	<p>This COA Application is for the operation of the Aerostar UAS by the New Mexico State University/Physical Science Laboratory UAS Program. It is basically a renewal request of 2009 CSA-57-COA, with some modifications. The proposed modifications are:</p> <p>1. Use of the Lordsburg, NM Airport (LSB) as an additional airport for Aerostar flight activity. Use of the Lordsburg Airport with a runway width of 75 feet will enhance NMSU/PSL's capability to support various federal agencies' activities that occur at Playas, NM. Conducting flight operations from the Playas, NM Airport (NM86) that has a runway width of 50 feet is sometimes difficult when winds conditions are not favorable. When the Aerostar has to fly from the Las Cruces Airport to support activities at Playas, NM the round-trip flight time averages 2.4 hours (84 miles each direction at 70 kts). Lordsburg Airport is only 25 miles from Playas, NM, so a round-trip flight to Playas, NM only requires 42 minutes. Another advantage of having the flexibility to use the Lordsburg Airport occurs when Aerostar flight operations are restricted at the Las Cruces, NM Airport, during runway maintenance. The Lordsburg, Airport is one of the airports that are currently authorized for use by the NMSU FTC, under the CRDA COA.</p> <p>2. Move the western boundary of current Airspace Alpha from 108-42-00 West Longitude to 108-52-00 West Longitude. The current western boundary is only one-half mile from the Lordsburg, NM Airport. This additional airspace provides 10 miles of airspace west of the Lordsburg, NM Airport in which to conduct flight operations.</p> <p>3. Extend the southeastern boundary of Airspace Alpha a few miles south so it is aligned with the western boundary of R-5107K. When the original COA was issued for the NMSU/PSL Aerostar, the airspace that is now R-5107K was a part of R-5107A. A couple of years ago the original airspace of R-5107A was split by the U.S. Army for more effective airspace utilization, resulting in two restricted areas (R-5107A and R-5107K). R-5107A is more critical to the U.S. Army's activity and is active on a CONTINUOUS basis; therefore, the ability to operate the Aerostar UAS in this airspace is very limited. The Army's activity in R-5107K is not as extensive as the activity in R-5107A, so the potential to operate in R-5107K is much greater. The realignment of Airspace Alpha will enable the Aerostar to be flown into R-5107K without having to traverse through R-5107A.</p> <p>4. Extend Airspace Echo south. With the enhanced ability to operate within the airspace of R-5107K the capability to fly to R-5103A to support U.S. Army activity is increased. Therefore, extending the southern boundary of Airspace Echo is needed for this potential to be realized.</p>

# Flight Operations Area/Plan

Type	User Defin Point	Loc ID	Degree	Distance	Latitude	Longitude	MSL Ceilin	MSL Floor
USER DEFINED ARE Alpha			1					
			2					
			3					
			4					
			5					
			6					
			7					
			8					
			9					
			10					
			11					
			12					
USER DEFINED ARE Echo			1					
			2					
			3					
			4					
			5					
			6					
			7					

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Total Map Attachment 2

Maximum	Minimum	Radius	SUA Description		
	32-50-00.00N		108-52-00.00W	17500	4960
	33-15-00.00N		108-24-32.00W	17500	4960
	32-43-00.00N		108-00-00.00W	17500	4960
	32-43-00.00N		107-13-00.00W	17500	4960
	33-13-00.00N		107-13-00.00W	17500	4960
	33-13-00.00N		106-52-02.00W	17500	4960
	32-19-30.00N		106-39-32.00W	17500	4960
	32-19-30.00N		106-34-02.00W	17500	4960
	32-06-20.00N		106-34-02.00W	17500	4960
	32-05-00.00N		106-29-02.00W	17500	4960
	31-51-00.00N		106-55-00.00W	17500	4960
	31-51-00.00N		108-52-00.00W	17500	4960
	32-36-00.00N		106-06-02.00W	17500	4960
	32-36-00.00N		106-00-02.00W	17500	4960
	32-27-40.00N		106-00-02.00W	17500	4960
	32-28-00.00N		106-02-02.00W	17500	4960
	32-06-00.00N		106-15-32.00W	17500	4960
	32-05-00.00N		106-18-22.00W	17500	4960
	32-25-00.00N		106-06-02.00W	17500	4960

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