

		ASN	2010-CSA-47-COA-R
		Case Status	APPROVED
		Date Created	08/30/2010
		Date Submitted	09/18/2010
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	Yes
		Day operation	Yes
		Night operation	Yes
		Program Executive Summary	The objectives of the UAS flight operations that will be performed under the Certificate of Authorization (COA) that NNSU is seeking are defined in the Cooperative Research and Development Agreement (CRDA) between the FAA and NMSU. There are two key elements to the CRDA; (1) NMSU will perform UAS research and development activity, including test, evaluation, and validation of as many categories of UAS as possible, including a diverse variety of UAS with different operational capabilities, and (2) collect analyze, and record data related to UAS characteristics and operational capabilities and then submit the data to the FAA to facilitate the development of standards and regulations that will allow UAS flight in the NAS. UAS flight operations will normally be performed on a weekly basis. The volume and category of actual UAS flight operations each week will vary and is dependent on the availability of UAS proponents that are interested in working with NMSU in the Research and Development effort.
		Operational Summary	<p>Takeoffs and landings for the UAS flight operations that require hard or relatively smooth dirt runways will be performed from several airport that are located within the boundaries of the NMSU UFTC Operations Airspace. These airports include the Las Cruces Airport, Deming Airport, Lordsburg Airport, Socorro Airport, Playas Airport, College Ranch/Jornado Research Station, and private field north of I-10, all located within the State of New Mexico. Selection of a particular airport for takeoff and landings of each UA will be based on the maturity and proven operational capabilities of that UAS. Most small UAS (sUAS) will be flown from open desert areas east, north and west of Las Cruces, New Mexico. There will be no flight operations over other than sparsely populated surface areas.</p> <p>The NMSU UAS program as a part of its CRDA research and development and test and evaluation efforts has a need to operate sUAS during night time hours. All of the night time sUAS operations will be performed within UFTC Airspace Delta four. No flight will be higher than 2,500feet AGL. UFTC Airspace Delta Four is locate immediately adjacentto WSMR Retricted Area R-5107B (surface to unlimited) that is active continuously. The likelihood of any manned aircraft flights operations in Athe majority portion of UFTC irpace Delta is very unlikely.</p> <p>Flight routes and altitudes within all of he UFTC Airspace areas will vary depending on mission objectives. During launch (takeoff) and subsequent recovery (landing) the UAS will operate within Class G airspace when basically below 1,200 feet AGL (700 feet AGL in the vicinity of Las Cruces). During the mission phase of the flight the vast majority of flight activity will be in Class E airspace under VFR. However; when UAS proponents are developing UAS that are planned to flown under FR some IFR flight operations will be conducted, provided the UAS is capable of complying with all 14 CFR 91 Instrument Flight Rules criteria. Some IFR flight may be performed within Class A airspace, as high as FL350, as approved by and in accordance with procedures specified by Albuquerque ARTCC.</p> <p>No flight operations will be conducted within any restricted area or Military Operations Area (MOA) without the prior approval of the using or controlling authority.</p>
	Location	State	NM
		County	Luna
		Nearest Airport	LUNA LANDING
		AOR	New Mexico
	Class Of Airspace	Class-A	
		Class-B	
		Class-C	
		Class-D	
		Class-E	
		Class-G	
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)
		Descent Rate (feet/Minute)	(b)
		Turn Rate (Degrees/Second)	(b)
	Cruise Speed	Maximum	250
		Minimum	40
		Approach Speed	40
	Operating Attributes	Maximum MSL	35000
		Minimum MSL	4500
		Gross Takeoff Wt	3000.0
		Launch/Recovery Attachment	1
Airworthiness	FAA Type Certificate		
	If No FAA Certificate (Public Aircraft Only) Attachment	2	
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	The external pilot has completed the military equivalent of the FAA pilot ground school. The internal pilots are FAA rated or have achieved an equivalent military pilot rating.
		DOD certified/trained	No
		Other Certified Training	No
		Trained on FAR Part 91 Requirement	Yes
		Medical Certification Class (FAA or DOD equivalent)	3
		Currency Status	1. External Pilot (EP) - The Aerostar EP shall maintain currency. In order to maintain currency the Aerostar UA EP shall perform a minimum of three qualified proficiency events within the past 90 days operating the Aerostar or through the use of a compatible simulator. A single proficiency event will include a takeoff and landing, at least 1 hour of flight operation, and transfer of flight control to the P and reacquiring flight control from the P.  2. Internal Pilot ( P) - The Aerostar P shall maintain currency. In order to maintain currency the Aerostar UA IP shall have performed a minimum of three qualified proficiency events within the past 90 days through flight operation of the Aerostar or through use of a compatible simulator. A single proficiency event will include acquiring flight control from the EP, a minimum of 1 hour of flight operation, and transfer of flight control to the EP.

			<p>1. Crew rest: Adequate crew rest is necessary for safe and effective operation of the AeroStar UAS. Crewmembers that are fatigued are more likely to make mistakes and jeopardize safety and the mission. Crewmembers shall monitor their schedules and raise awareness if they cannot achieve adequate crew rest. Crew rest time is 8 hours of uninterrupted time where the crewmember does not have tasking to accomplish and is allowed to rest. Should a crewmember change shift from one cycle (day or night or defined shift) to another, 12 hours of rest shall be used instead of 8.</p> <p>2. Duty Day: The duty day is the period of time where the crewmember is present and engaged in system setup, 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 meals should be afforded the crewmembers to allow them to refresh their efforts and not become task-saturated. A duty day of no more than 10 hours with periodic breaks should not overly fatigue the crew. Such a schedule should allow sufficient time to recover and be sustainable for a 6 day workweek. A duty day between 10 and 16 hours with periodic breaks should be sustainable so long as 8 hours of crew rest is provided each day. Crewmembers should evaluate their tasking and rest schedule to determine their ability to perform their duties. Crewmembers should work a reduced week if continually tasked at this level. A duty day greater than 16 hours will be fatiguing to the crewmember and will also disrupt their sleep cycle, contributing to greater fatigue. Should a duty day greater than 16 hours be necessary, care should be exercised that the crewmember be adequately rested before the day, be afforded periodic breaks and recovery time during the day, and have a minimum of 12 hours of crew rest after the duty day to recover</p>
		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	
		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)	3
		Currency Status	Visual observers (VO) - All shall maintain currency. In order to maintain currency a VO must have been a VO for an AeroStar UA flight operation or participated in VO refresher training within the past 90 days
			<p>1. Visual Observers Rest: Adequate visual observer rest is necessary for the Visual observer to adequately provide visual observer see and avoid responsibilities. Visual observers that are fatigued are more likely to make mistakes and adversely affect flight operation safety. Visual observers should monitor their schedules and raise awareness if they cannot achieve adequate visual observer rest. Visual observer rest time is 8 hours of uninterrupted time where the visual observer does not have tasking to accomplish and is allowed to rest. Should a visual observer change shift from one cycle (day or night or defined shift) to another, 12 hours of rest shall be used instead of 8.</p> <p>2. Duty Day: The duty day is the period of time where the visual observer 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 should be afforded the visual observers to allow them to refresh their efforts and not become task-saturated. A duty day less than 10 hours with periodic breaks should not overly fatigue the visual observer. Such a schedule should allow sufficient time to recover and be sustainable for a 6 day work week. A duty day between 10 and 16 hours with periodic breaks should be sustainable so long as 8 hours of crew rest is provided each day. Crewmembers should evaluate their tasking and rest schedule to determine their ability to perform their duties. Visual observers should work a reduced week if continually tasked at this level. A duty day greater than 16 hours will be fatiguing to the visual observer and will also disrupt their sleep cycle, contributing to greater fatigue. Should a duty day greater than 16 hours be necessary, care should be exercised that the visual observer be adequately rested before the day, be afforded periodic breaks and recovery time during the day, and have a minimum of 12 hours of visual observer rest after the duty day to recover.</p>
		Duty Time Restrictions	
		Single UAS Control	Yes
		UAS Description	
		Total Numbers of UAS Controlled	1

Special Circumstances		Special Circumstances	<p>This COA Application is submitted as part of the Cooperative Research and Development Agreement (CRDA) that has been established between the FAA and New Mexico State University. The CRDA has created a UAS Flight Test Center (UFTC) in southwestern New Mexico. NMSU will conduct flight operations within the UFTC operations airspace. The UAS that will be operated at the UFTC will be a variety of different UAS that are in the micro, small, and medium categories of UAS. All of the UAS flight operations will be as "Public" UAS. Since the COA online system is designed for addressing one UAS it is impossible to provide data, within one COA Application, that is completely accurate for each of the numerous UAS that will be operated by NMSU in conjunction with the CRDA initiative. For example, some micro UAS do not have lights or electronic systems that exist on small and medium UAS. What is consistent with each UAS operation is the operating procedures and practices that will be applied to ensure safety. Because it is impossible to address more than one UAS in the COA online process, most of the data provided herein is consistent with the data associated with the operation of the Aerostar UAS, which NMSU has been flying for several years. UAS flights at the UFTC are restricted and operated consistent with the degree of maturity of the UAS.</p> <p>The NMSU UAS Program, as part of its continuing CRDA UAS research and development and Test and evaluation effort, has the need to operate some UAS during night time. UFTC Airspace DELTA FOUR has been developed solely for this purpose. The airspace is located immediately adjacent to R-5107B and only over very sparsely populated surface area and manned aircraft flight within this airspace during night hours is very unlikely.</p> <p>The NMSU CRDA Program is having increased potential to perform periodic research and development and test and evaluation of UASs capable of operating up to FL350. UFTC Airspace Foxtrot and Golf have been designed to provide the capability to operate within Class A airspace. All operations within UFTC Airspace Foxtrot and Golf will be under FR and after obtaining Albuquerque Center's approval. These high-altitude flights will be conducted in accordance with procedures specified by the Albuquerque ARTCC.</p>
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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					
USER DEFINED ARE BRAVO			1					
			2					
			3					
			4					
			5					
			6					
			7					
USER DEFINED ARE CHARLIE			1					
			2					
			3					
			4					
			5					
			6					
USER DEFINED ARE DELTA ONE			1					
USER DEFINED ARE DELTA TWO			1					
USER DEFINED ARE DELTA THREE			1					
USER DEFINED ARE ECHO			1					
			2					
			3					
			4					
			5					
			6					
			7					
			8					
USER DEFINED ARE FOXTROT			1					
			2					
			3					
			4					
			5					
			6					
			7					
			8					
			9					
			10					
			11					
			12					
			13					
USER DEFINED ARE GOLF			1					

2  
3  
4  
5  
6  
1  
2  
3  
4  
5

USER DEFINED ARE DELTA FOUR

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Total Map Attachment 1

Maximum	Minimum	ξ Radius	SUA Description			
			32-30-00.00N	109-00-00.00W	17999	4500
			32-30-00.00N	106-42-00.00W	17999	4500
			32-19-30.00N	106-39-32.00W	17999	4500
			32-18-00.00N	106-34-02.00W	17999	4500
			32-11-00.00N	106-34-00.00W	17999	4500
			32-04-00.00N	106-48-00.00W	17999	4500
			31-47-24.00N	107-00-00.00W	17999	4500
			31-47-24.00N	108-15-00.00W	17999	4500
			31-20-00.00N	108-15-00.00W	17999	4500
			31-20-00.00N	109-00-00.00W	17999	4500
			32-30-00.00N	109-00-00.00W	17999	4500
			33-27-00.00N	108-04-00.00W	17999	4500
			33-27-00.00N	106-49-00.00W	17999	4500
			33-13-00.00N	106-52-02.00W	17999	4500
			32-30-00.00N	106-42-00.00W	17999	4500
			32-30-00.00N	109-00-00.00W	17999	4500
			32-40-00.00N	109-00-00.00W	17999	4500
			33-27-00.00N	108-04-00.00W	17999	4500
			34-17-00.00N	107-11-00.00W	17999	4500
			34-17-00.00N	106-40-32.00W	17999	4500
			33-27-00.00N	106-49-00.00W	17999	4500
			33-27-00.00N	108-04-00.00W	17999	4500
			34-09-00.00N	107-11-00.00W	17999	4500
			34-17-00.00N	107-11-00.00W	17999	4500
			32-30-00.00N	106-41-12.00W	6000	4500
			32-26-35.00N	106-40-47.00W	6000	4500
			32-23-49.00N	106-41-29.00W	6000	4500
			32-36-00.00N	106-06-02.00W	17999	4500
			32-36-00.00N	106-00-02.00W	17999	4500
			32-27-40.00N	106-00-02.00W	17999	4500
			32-28-00.00N	106-02-02.00W	17999	4500
			32-15-00.00N	106-10-02.00W	17999	4500
			32-15-00.00N	106-12-00.00W	17999	4500
			32-24-48.00N	106-09-02.00W	17999	4500
			32-36-00.00N	106-06-02.00W	17999	4500
			33-27-00.00N	108-04-00.00W	35000	18000
			33-27-00.00N	106-49-00.00W	35000	18000
			33-13-00.00N	106-52-02.00W	35000	18000
			32-30-00.00N	106-42-00.00W	35000	18000
			32-19-30.00N	106-39-32.00W	35000	18000
			32-18-00.00N	106-34-02.00W	35000	18000
			32-11-00.00N	106-34-00.00W	35000	18000
			32-04-00.00N	106-48-00.00W	35000	18000
			31-47-24.00N	107-00-00.00W	35000	18000
			31-47-24.00N	108-15-00.00W	35000	18000
			31-20-00.00N	108-15-00.00W	35000	18000
			32-40-00.00N	109-00-00.00W	35000	18000
			33-27-00.00N	108-04-00.00W	35000	18000
			34-17-00.00N	107-11-00.00W	35000	18000

34-17-00.00N	106-40-32.00W	35000	18000
33-27-00.00N	106-49-00.00W	35000	18000
33-27-00.00N	108-04-00.00W	35000	18000
34-09-00.00N	107-11-00.00W	35000	18000
34-17-00.00N	107-11-00.00W	35000	18000
32-45-00.00N	107-00-00.00W	7000	4500
32-45-45.00N	106-57-02.00W	7000	4500
32-43-00.00N	106-43-02.00W	7000	4500
32-30-00.00N	106-43-00.00W	7000	4500
32-30-00.00N	107-00-00.00W	7000	4500





250	80
250	80
250	80
250	80
250	80
80	40
80	40
80	40
80	40
80	40