



DEPARTMENT OF THE ARMY
US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND
AVIATION AND MISSILE RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER
5400 FOWLER RD
REDSTONE ARSENAL, AL 35898-5000

RDMR-AEV

AWR MQ-1C20110216R5

07 October 2011

17 June 2011

16 February 2011

R5

R4

MEMORANDUM FOR Project Manager, Unmanned Aircraft Systems (SFAE-AV-UAS),
Redstone Arsenal, AL 35898-5000

SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle
Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5)
(TN 93556E)

1. Scope: This memorandum constitutes Airworthiness Release Qualification Level 3 authorizing operation of the MQ-1C Gray Eagle UAS within the Federal Aviation Administration (FAA) approved Certificate of Authorization (COA) area at Ft. Huachuca, AZ, Libby Army Airfield (AAF), and in restricted area R-2303.
2. Validity: This AWR supersedes AWR MQ-1C20110216R4 dated 17 June 2011, and terminates 16 June 2013, upon changes in configuration of the subject equipment, or upon issuance of a later AWR, whichever occurs first. This AWR is valid only for operations within the FAA approved COA area near Ft. Huachuca, AZ and in restricted area R-2303 for operations authorized in Appendix A. Use of weapons or laser designation is not authorized.
3. Appendices: This memorandum and its appendices shall be carried in the logbook, controlling Ground Control Station (GCS), and aircraft historical record file.

Appendix A - Restrictions and Operating Information
Appendix B - Configuration and Installation Detail
Appendix C - Inspections, Maintenance, and Logbook Instructions
Appendix D - Reference List

4. The point of contact (POC) is (b) (6) commercial
(256) 955-6194, email: (b) (6) DSN 897-5375,
commercial (256) 313-5375, email: (b) (6)

(b) (6)

Aviation Engineering

Appendix A - Restrictions and Operating Information:

WARNING

The MQ-1C Gray Eagle UAS has not completed full airworthiness qualification. All flight operations shall be conducted in a manner to minimize exposure to manned aircraft and populated ground areas.

WARNING

Any operation of the MQ-1C Gray Eagle Aircraft UAS outside of active restricted airspace and/or the FAA approved COA shall be immediately reported to Air Traffic Control (ATC). The operator shall take immediate actions to correct the flight path and/or follow ATC direction.

WARNING

The MQ-1C Gray Eagle UAS software has not undergone formal airworthiness qualification testing. Software performance cannot be guaranteed to conform to the operator's manual in all operational environments. All flight operations shall be conducted in a manner to minimize exposure to manned aircraft and populated ground areas.

WARNING

The MQ-1C Gray Eagle UAS does not have a sense and avoid system. Mid-air collision is a risk. All flight operations shall be conducted to ensure that minimum separation standards are maintained.

WARNING

When MQ-1C Gray Eagle operations rely on ground observers/chase aircraft to provide airspace de-confliction, radio contact between the ground observer/chase aircraft and the aircraft operator must be maintained. If radio contact between the ground observers/chase aircraft and the aircraft operator (AO) is lost, the aircraft shall Return to Base (RTB).

RDMR-AEV

AWR MQ-1C20110216R5

07 October 2011

R5

17 June 2011

R4

16 February 2011

SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5) (TN 93556E)

WARNING

The MQ-1C Gray Eagle UAS has not undergone complete Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) testing. Flight into high intensity EMI areas may result in erroneous data reports and/or loss of control of aircraft. Operators shall avoid known high intensity EMI areas as much as possible.

WARNING

The MQ-1C Gray Eagle UAS Ground Control Station (GCS) has undergone neither formal Human Factors review or evaluation nor formal airworthiness qualification testing. The performance of the GCS cannot be guaranteed to be accurate, and the workload in the GCS may not be acceptable for the various mission scenarios. During mission planning, operators shall give consideration to in-mission workload requirements.

WARNING

The C-Band data link emits radio frequency (RF) radiation that exceeds the permissible exposure limit to personnel within 1 foot of the aircraft and Ground Data Terminal (GDT). Remain at least 1 foot from the MQ-1C aircraft and GDT whenever the aircraft is in operation.

WARNING

At altitudes below 2,000 feet above ground level (AGL) and airspeeds below Automatic Takeoff and Landing System (ATLS) approach airspeeds, there may not be enough time to attempt an in-flight engine restart in the event of an engine failure. Operation at altitudes below 2,000 feet AGL at airspeeds near stall speed (V_S) should be avoided.

WARNING

The MQ-1C Gray Eagle UAS has not completed full environmental qualification and has been partially tested from -40°C (-40°F) to +49°C (120°F). Equipment failures or faults may occur when the system is operated outside these limits. Operate the MQ-1C Gray Eagle UAS between -40°C (-40°F) to +49°C (120°F).

RDMR-AEV

AWR MQ-1C20110216R5

07 October 2011

R5

17 June 2011

R4

16 February 2011

SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle
Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5)
(TN 93556E)

WARNING

In the event of any control surface failures (either hardover conditions or stuck position), aircraft control may be lost during One System Ground Control Station (OSGCS) landings if the control surfaces are in extreme positions. The following defines deflection limits for the gross weights and Density Altitudes (DAs) shown.

Gross Weight		2600 pounds		3200 pounds	
Control Surface	Surface Position (deg)	3K feet DA	9K feet DA	3K feet DA	9K feet DA
Rudder-vator	-25				
	-8				
	-5				
	0	STD	STD	STD	STD
	1				
	2				
	3		5 KIAS		5 KIAS
	4	5 KIAS		5 KIAS	
	5				
	10				
Flap	-10				
	15	STD	STD	STD	STD
	20				
	30				
	40				
Ailerons, rudder	All	STD	STD	STD	STD

No margin; aircraft control will probably be lost if surface fails in that position	
OSGCS ATLS Crosswind Limit is 5 KIAS	5 KIAS
OSGCS Standard ATLS Crosswind Limit	STD

WARNING

Uploading or downloading mission files larger than 40 waypoints can cause a Digital Flight Control System (DFCS) Software Fault. Do not upload or download mission files larger than 40 waypoints in flight.

RDMR-AEV

AWR MQ-1C20110216R5

07 October 2011

R5

17 June 2011

R4

16 February 2011

SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5) (TN 93556E)

CAUTION

The MQ-1C Gray Eagle UAS has not been tested for the effects of lightning (to include GCS, OSGCS and supporting subsystems). Flight operations shall be restricted to no less than 25 nautical miles from lightning activity.

CAUTION

When the Laser Range Finder (LRF) is fired for target marking purposes, the time that the GCS may indicate that the LRF is firing can range from 5 seconds to 28 seconds instead of the normal 5 seconds. It is unknown if the LRF is actually firing for the extended period of time or if there was an error in the GCS reporting, but while the GCS indicates LRF is firing it shall be presumed that it is firing.

NOTE

Upon rebooting the EO/IR payload, video pixilation may occur. This is an indication that both video encoders are enabled. Shutting down of one of the video encoders should alleviate this problem.

NOTE

Payload Operators (PO) must understand track suspend behavior for each auto track mode. Each mode has unique reacquisition time and logic. When using the centroid track mode there will be a lower probability of autonomous reacquisition of targets when compared to the feature track mode.

1. The aircraft operating instructions, procedures, and limitations shall be in accordance with (IAW) operator's manuals (D-1, D-2), checklists (D-3, D-4), maintenance manual (D-5) and this AWR. In the event of conflict between these documents, the information in this AWR shall prevail.
2. Flight is restricted to Visual Meteorological Conditions (VMC).
3. Flight is permitted into known or forecast moderate turbulence. During such flight, changes in altitude, attitude and indicated airspeed may occur but the aircraft should remain in positive control at all times.

CAUTION

Operation of the MQ-1C Gray Eagle aircraft at altitudes above 13,000 feet Density Altitude (DA) may result in a surge condition of the turbocharger compressor. Operation in surge conditions can eventually lead to failure of the turbocharger resulting in a loss of power or an in flight shut down of the engine. The precautions in the following paragraph shall be observed for flight operations.

4. Aircraft shall be limited to no more than 13,000 feet Mean Sea Level (MSL) unless a turbocharger kit UWA45009-1 with turbocharger UWA45008-1, turbocharger kit UWA45009-2 with turbocharger UWA45008-2, turbocharger kit UWA45009-3 with turbocharger UWA45008-3, or turbocharger kit UWA45009-4 with turbocharger SCD01095-1 is installed. If one of the aforementioned turbochargers is installed, the service ceiling shall be IAW operator's manuals (D-1, D-2).
5. Airspeed shall be limited to 130 Knots Indicated Airspeed (KIAS).
6. Intentional sideslip maneuvers are prohibited except during approach to landing at approach speeds.
7. Maximum gross weight shall be limited to 3,200 pounds.
8. The aircraft Laser System Override switch shall be kept in the "Safe" position at all times.
9. Handling, installation and removal of HELLFIRE missile simulants shall be in accordance with checklist (D-4).
10. For operations in approved COA airspace, ground observers/chase aircraft shall be used as follows.
 - (1) Ground observers/chase aircraft shall maintain positive contact with the aircraft at all times in accordance with the approved COA.
 - (2) Radio contact between the ground observer/chase aircraft and the MQ-1C Gray Eagle aircraft operator must be maintained. If radio contact between the ground observers/chase aircraft and the MQ-1C aircraft operator is lost, the MQ-1C Gray Eagle shall return to base.
 - (3) If a non-cooperative aircraft enters the COA airspace while occupied by the MQ-1C Gray Eagle aircraft, ground observers, the chase plane or ATC will direct the MQ-1C Gray Eagle aircraft to a safe area away from the non-cooperative aircraft.

11. For takeoff and landing the following restrictions shall be observed.

NOTE

Use of the Meteorological Sensor (METS) for flight planning is not authorized.

a. All OSGCS takeoffs and landings shall have operational ground METS data displayed in the OSGCS, and automatic aborts shall be enabled except for emergencies.

CAUTION

Flight testing to establish the ability of the MQ-1C to take off and land in winds has not been completed. High winds may degrade the aircraft's ability to maintain the intended takeoff or landing profile, increasing the risk of an accident. Automatic aborts shall be enabled except as required for emergencies.

b. Normal ATLS operations wind limits shall be:

Maximum Headwind Component:	26 knots
Maximum Crosswind Component:	18 knots
Maximum Tailwind Component:	8 knots
Maximum allowable gusts are 10 knots	

c. If METS data is unavailable for automatic abort limits, current local aviation weather data may be used with a reduction of 2 knots to each of the above limits.

d. When using METS, the above limits are to be based on the previous 10 minutes of METS data measured at the active runway.

WARNING

The MQ-1C UAS has not undergone Explosive Atmosphere testing. A serious fire or explosion may result if the aircraft is powered while flammable vapors are present during ground or flight operations. The precautions in the following paragraph shall be observed in order to ensure safe operations.

12. Due to the lack of Safety of Flight (SOF) explosive atmosphere testing, the following precautions shall be observed:

a. The MQ-1C shall be grounded at all times during refueling operations in accordance with reference D-4. The MQ-1C shall be un-powered during normal refueling operations.

b. While on the ground, the MQ-1C shall maintain the greatest distance practical from all other aircraft and fuel depots, while achieving mission objectives.

13. Deleted.

CAUTION

When the GPS signal is lost, the Air Data Terminal (ADT) will drift away from pointing towards the GDT. This could result in a lost link condition.

14. The following restrictions regarding the data links shall be observed in order to ensure safe operations.

a. Use of data links is limited to approved frequencies for all ground and flight operations. Data link frequencies shall be de-conflicted through the local frequency manager/coordinator prior to conducting operations.

b. Any flight critical anomalies during TCDL Level of Interoperability 2 (LOI 2) through LOI 5 operations in the OSGCS require handover of aircraft control to the Legacy GCS for return to base (RTB).

c. If the downlink from the aircraft to the OSGCS is lost, the operator shall turn off the uplink command. Termination of the uplink command will send the aircraft into a lost link profile. The uplink shall be terminated by turning the controlling GDT switch OFF before the legacy GCS takes control to allow the aircraft to stabilize. Stabilization of the aircraft in the lost link profile may take up to 51 seconds.

d. In the event of a loss of data link, the AO shall immediately notify the appropriate Air Traffic Control (ATC) authority. The MQ-1C will fly its pre-programmed lost link emergency mission. Once the command link is restored, continue the mission or recovery of the aircraft.

e. Deleted.

15. Mission profiles should be planned to minimize flight operations outside of the 13:1 glide ratio to the airfield. If mission planning identifies operations outside the 13:1 glide slope to the airfield, additional ditch points shall be identified, planned and briefed during the Mission Briefing.

16. Flight over congested/populated areas outside of active restricted airspace is prohibited.

WARNING

In the event of a loss of link, the aircraft may experience a significant increase in altitude while trying to achieve the lost link airspeed and altitude, which could result in breach of COA/restricted airspace containment region. The precaution in the following paragraph shall be observed in order to ensure safe operations.

17. During mission planning, consideration shall be given to the aircraft's lost link behavior to ensure the aircraft does not breach the containment airspace if a lost link occurs at every point in the mission profile. The lost link emergency mission shall not be planned over populated areas.

18. During preflight, the AO shall load, send, and confirm both an operational mission and emergency mission. No flight operations shall commence without each mission loaded, sent, and confirmed by the AO. During preflight, a second person shall verify that emergency mission is entered correctly.

19. In the event of an engine failure or other catastrophic failure, local ATC authority shall be notified immediately. If the aircraft is capable of unpowered controlled flight and is within glide range of the airfield, the operator may return to the airfield and recover the aircraft. If the aircraft is outside the range of the airfield or unable to maintain controlled flight, the operator shall ditch the aircraft in an unpopulated area. Every effort shall be made to visually inspect the ditching area with the assistance of the chase aircraft and with onboard cameras prior to ditching the aircraft.

20. Verified loss of any aircraft flight critical subsystem or Legacy GCS flight critical subsystem shall require RTB.

21. Any unexplained anomaly on a flight critical system shall require RTB.

22. There shall be a minimum of one controlling GCS (both pilot stations must be fully functional) and when possible a back-up GCS or Portable GCS (PGCS) available to power up and take control and recover the aircraft in case of catastrophic failure of primary GCS. Emergency procedures shall be in accordance with the MQ-1C operator's manual (D-1) and checklist (D-3).

23. Flight operations with two simultaneous OSGCSs and two MQ-1C aircraft are authorized with a single Legacy GCS backup. Each OSGCS shall control one MQ-1C aircraft. To the greatest extent possible, the Legacy GCS shall monitor downlink from the closest flying aircraft. Planning for flights in this configuration should consider that the minimum time for switching control of the Legacy GCS between two aircraft is 15 minutes.

24. Any procedural deficiencies or flight anomalies detected during operations shall be corrected, annotated, and reported to the POC listed in paragraph 4 of this AWR.

25. Commander's Corner:

The MQ-1C UAS is an unproven system and has not completed the airworthiness qualification process. An AWR has been granted through a Level 3 Airworthiness evaluation. A Level 3 AWR establishes a minimum level of safety for UAS operations. Strict adherence to the Operator's Manual and this AWR is required to reduce the risk of loss of the aircraft, property damage and personal injury.

On 27 March 2008 and again on 19 June 2009, the Program Executive Office, Aviation (PEO AVN) accepted initial and additional interim risks identified for this program during System Demonstration and Development (SDD) testing in a System Safety Risk Acceptance, reference D-6 and D-7, respectively. Additionally, as a result of a 04 November 2008 System Safety Working Group (SSWG) meeting, PEO AVN has accepted the risks associated with operation of the nose gear retract servo and Full Authority Digital Engine Control (FADEC) system in the reference D-8 and D-9 System Safety Risk Assessments (SSRAs).

On 2 July 2009, the PEO AVN accepted, as part of reference D-10 memorandum, the mitigated risks identified during Customer Test and included in the Safety Confirmation issued by Developmental Test Command.

The initial Airworthiness Impact Statement (AWIS) produced by the Aviation Engineering Directorate (AED) identified thirteen (13) hazards not documented in any SSRA which could result in a loss of an aircraft or death on the ground. One involved a software process problem (still unresolved) which resulted in the loss of an aircraft. The other twelve (12) involved propulsion or drive system failures which have occurred in operational use and could result in loss of an aircraft or death of personnel. A revision to the AWIS has identified seventeen (17) other hazards which could result in loss of aircraft or laser designation and missile impact in unintended areas. These hazards have been processed through the PEO AVN System Safety Working Group (SSWG) in support of the reference D-10 Urgent Material Release (UMR).

A limited evaluation of the cooperative engagement capabilities of the MQ-1C has been completed. Due to unresolved communication issues with the Enhanced Position Location and Reporting System (EPLRS), there is no capability to provide digital call-for-fire or remote engagement at this time.

		07 October 2011	R5
		17 June 2011	R4
RDMR-AEV	AWR MQ-1C20110216R5	16 February 2011	
SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5) (TN 93556E)			

No High Intensity Radio Transmission Area (HIRTA) messages exist for this aircraft, payload, or GCS. Exercise extreme caution when operating in the vicinity of high intensity electronic emitters.

The EO/IR LRF and LD have not been tested for the effects of EMI. As such, flight into high intensity EMI areas could result in the inadvertent activation of the laser, or, more likely, in the slewing of an already active laser. Ground personnel should exercise extreme caution at all times when the aircraft is powered on. Specific procedures and necessary controls are specified in the Warnings section of Appendix A of this AWR. Additionally, when the LRF or LD or ELRF is to be fired, coordinate with any and all manned aircraft in the area to ensure that they are aware of this firing and have instituted the warnings and procedural controls as well. Deactivate the LRF or LD if there are any detected anomalies.

RDMR-AEV

AWR MQ-1C20110216R5

07 October 2011

R5

17 June 2011

R4

16 February 2011

SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5) (TN 93556E)

Appendix B - Configuration and Installation Detail:

1. Configuration:

a. This aircraft is a new configuration as identified in the operator's manuals, Appendix D reference manuals (D-1, D-3) and this appendix. Any deviation to this configuration shall be approved in writing by the Aviation Engineering Directorate (AED).

b. The MQ-1C UAS software release 4.0.9 revision K or 4.0.9 revision N is authorized for flight operations within the restrictions and limitations listed in the associated flight release.

c. Only the SCD00632-5 or SCD00632-6 versions of Embedded Global Positioning Service / Inertial Navigation System (GPS/INS) (EGI) software are authorized for flight operations.

2. The following hardware configuration table defines the configuration authorized for the UWA 97000-10 flight operations and identifies hardware items of interest. The notes referenced in the table and listed at the bottom allow some variations.

Description	MQ-1C, Block 1	
	UWA97000-10	Qty
Air Data Installation		
Sensor, Airspeed	UHK13170-2	3
Sensor, Altitude	UWA13148-1	3
Wing Installation, Warrior		
Wing, Assembly, Left	UWA22300-1	1
ACM, Wing (I/O Expander)	UWA13130-2	1
Smart Servo, Micromo 6.4:1, 2.4 Stroke (Aileron)	UWA51000-1	1
Smart Servo, Micromo 31.1:1, 4.0 Stroke (Flap)	UWA51130-1	1
Pitot Assy	UPA12062	2
De-Ice Power Distributor*	0201-10-016-1	1
TALS Airborne Subsystem (Transponder & Antenna)	00424000-02	1
TALS Airborne Transponder	00424100-01	1
TALS Airborne Antenna	00424400-01	1
Wing Extension Assy, Left	UWA22305-1	1
Smart Servo, Micromo 6.4:1, 2.4 Stroke (Aileron)	UWA51000-1	1
Light Assy, Red Wing Tip	UPA76507	1
Wing, Assembly, Right	UWA22302-1	1
ACM, Wing (I/O Expander)	UWA13130-2	1
Smart Servo, Micromo 6.4:1, 2.4 Stroke (Aileron)	UWA51000-1	1
Smart Servo, Micromo 31.1:1, 4.0 Stroke (Flap)	UWA51130-1	1
Pitot Assy	UPA12062	1

07 October 2011
17 June 2011
16 February 2011

R5
R4

RDMR-AEV

AWR MQ-1C20110216R5

SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle
Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5)
(TN 93556E)

Description	MQ-1C, Block 1	
	UWA97000-10	Qty
De-Ice Power Distributor*	0201-10-016-1	1
Wing Extension Assy, Right	UWA22305-2	1
Smart Servo, Micromo 6.4:1, 2.4 Stroke (Aileron)	UWA51000-1	1
Light Assy, Green Wing Tip	UPA76508	1
Cooling System Installation		
Radiator Assy, 1.7l, HFE	90-0020-02463	1
Servo Assy, Micromo, 31.1:1, 4.0 Stroke (Radiator)	UWA51300-1	1
Intercooler, 1.7l, HFE Assy	SCD00721-1	1
Servo Assy (Intercooler)	UWA51249-1	1
Surge Tank Assy	UWA44019-1	1
Overflow Tank Assy	UWA44022-1	1
Tail Installation, Warrior		
Tail Servo Assy	UWA51165-1	3
Tail Assembly, Left, Warrior	UWA23260-1	1
Tail Assembly, Right, Warrior	UWA23260-2	1
Tail Assembly, Vertical, Warrior	UWA23400-2	1
Landing Gear Installation, Warrior		
Retract Servo (LH & RH Landing Gear)	UWA51030-1	2
Nose Landing Gear Assembly, Warrior	UWA31100-1	1
Servo Assy, Micromo 6.1:1, 2.4 Stroke (Steering)	UWA51200-1	1
Retract Servo, Warrior	UWA51030-1	1
Main Landing Gear, LH	UWA31400-1	1
Hub Assembly, MLG, Left, Warrior	UWA32047-1	1
Brake, Servo, Left Warrior	UWA51175-1	1
Main Landing Gear, RH	UWA31400-2	1
Hub Assembly, MLG, Right, Warrior	UWA32047-2	1
Brake, Servo, Right Warrior	UWA51175-2	1
FWD Payload Bay Installation		
LNXX II SAR REA (Radar Electronics Assy)*	LNXD51364-01-JP03	1
LNXX II SAR Gimble*	LNXD51074-01	1
AN/DAS-2 EO/IR/LD Multi-Spectral Targeting System*	4990500-0001	1
Turret Unit, AN/DAS-2 EO/IR/LD*	4990501-0001	1
Electronics Unit, AN/DAS-2 EO/IR/LD*	4990502-0001	1
Common Sensor Payload (CSP)		1
Turret Unit, CSP	4978001-0001	1
Electronics Unit, CSP	4978002-0001	1
*Flights are authorized with or without the payload, deice distributors and controllers, or with the aero-simulant installed. If installed, flights are authorized with either the AN/DAS-2 or CSP payloads.		
Aft Avionics Bay Installation		
ARM (Alternator Regulator Module)	UWA13050-1	2
SCM (Secondary Control Module)	UWA13000-1 or -2 or -3	1

07 October 2011

R5

17 June 2011

R4

16 February 2011

RDMR-AEV

AWR MQ-1C20110216R5

SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle
Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5)
(TN 93556E)

Description	MQ-1C, Block 1	
	UWA97000-10	Qty
Network Junction Assembly	UWA13360-1	2
FADEC, HFE	90-0020-E2006	1
EKIM (Engine Kill Interface Module)	UWA13578-1	1
Thermocouple Reference Junction Assy	UWA13395-1	2
ELT (Emergency Locator Transmitter)	453-6603	1
Upper IR Beacon	UER76118-1	1
Lower IR Beacon	UER76119-1	1
Laser Altimeter Assy	UWA13650-1	3
De-Ice Distributor*	0201-10-016-1	1
De-Ice Controller*	0201-10-017-1	1
Stormscope, Processor WX-500*****	805-11500-001	1
Forward Avionics Bay Installation		
Alpha Probe Assy	UER71000-1	1
RCM (Redundant Control Module)	UWA13310-2	1
C-Band,Receiver,NTSC	P00096	2
C-Band,Transmitter,NTSC	P00098	2
MCM	UWA13120-1	1
SSIU (Stores System Interface Unit)	UWA13380-1	1
ACM, Forward Bay (Auxilliary Control Module)	UWA13140-2	1
Front Bay Power Junction Assy	UPA14068-1	2
GS-511 GPS/INS, Athena	GS-511-300-000 or GS-511-301-000	2
H-764 Ace Embedded GPS/INS (Inertial Navigation System)	SCD00632-5	1
BCCU (Battery Charger/Contactor Unit)	UWA13370-2	2
Battery Unit Assy	UWA13280-1	2
Key Hold Battery Controller Assy	UWA13505-1	1
PPDM, Heatsink Assy (Payload Power Distribution Module)	UWA14020-1	2
AN/APX-118 IFF Transponder	1008939G-5	1
Ice Detector Assembly	P01190	1
Lens Heater Assy, IR Camera	UER14100-1	1
Heated Camera Lens Assy	UPA76526-1	1
Nose Camera Assy, EO/IR	UHK75010-1	1
Germanium Window Assy	UHK75007-1	1
Data Bus Coupler, 5-Stub	P01809	4
Data Bus Coupler, 8-Stub	DB80091	4
SMA Bias Tee	P00142	2
Splitter, SMA, 6-way, passive, 600-1700 MHZ	P05289	1
Cable Assy, Nose Gear Retract Switch (W183)	UWA76147-1	1
Airborne 9.5" Ku Dish Assy**	8164078	1
Airborne 30" SATCOM Antenna Assy**	UWA 16101-1	1
MA (Modem Assy)	60053131	1
AN/ARC-201D SINCGARS Radio	RT-1478D(C)/ARC-201D	2

RDMR-AEV AWR MQ-1C20110216R5
SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle
Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5)
(TN 93556E)

Description	MQ-1C, Block 1	
	UWA97000-10	Qty
AN/ARC-231 Radio	902219-804	1
Forward Avionics Bay Installation		
Keep Alive Battery, ARC-231	UWA13283-1	1
RFE (Radio Frequency Electronics)	60053014	2
Airborne Video Encoder Assy (6020R Encoder)	SCD00584-2	2
SMA (SATCOM Modem Assy)	60053121	1
Airborne Audio Mixer	UWA13180-1	1
EPLRS (Enhanced Position Locating Reporting System) *****	RT-1720G	1
** Flights are authorized with either 511 part number and either the 9.5" antenna, 30" antenna, or ballast installed. *****Flights are authorized with or without the Stormscope, or EPLRS		
Power Plant Installation		
Engine Assembly, TAE 1.7 Liter	90-0020-02003	1
Balanced Spinner Assy	UWA42050-1	1
Fuel System Installation		
Fuel Tray	UWA43400-1	1
Antenna Installation		
GPS Antenna, L1/L2, 36dB, Active	P06787	2
GPS Antenna, 13dB Gain	S67-1575-76	1
UHF/VHF Antenna (for ARC-231)	P04589	1
IFF Blade	P04610	2
ELT Whip Antenna	110-773	1
Ant, C-Band Omni, +3 dBi High Gain	SCD00044-5	2
Ant, C-Band Omni, +3 dBi Low Gain		
Omni Antenna, Ku***	60053385	2
Directional Antenna, Ku-band****	UWA79008-1	1
Stormscope Antenna		
FM/VHF/UHF Antenna (for SINCGARS)	P06399	2
UHF Antenna, JDAM EPRLS, 420-450 Mhz	P06400	1
*** Flights are authorized with either the Ku Omni antenna or the bi-conical antenna installed.		
**** Flights are authorized with either the standard or extended Ku directional antenna installed.		
Mission Kit, AGM-114 (Hellfire)		
ELECTRONICS ASSY AGM-114	UWA 14200-1	1
PYLON/RAIL ASSY AGM-114		
PYLON ASSEMBLY*****	UWA 14021-1	4
RAIL ASSY AGM-114 (300-340 LBS)*****	UWA 14201-1	4
***** Flights are authorized with either pylons/rails installed or not installed.		

		07 October 2011	R5
		17 June 2011	R4
RDMR-AEV	AWR MQ-1C20110216R5	16 February 2011	
SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5) (TN 93556E)			

3. Handling, installation, and flight with a HELLFIRE missile simulant (“house mouse”) on one or more of the weapon stations is authorized. The house mouse is an inert AGM-114P+ missile that was created in-house by the Project Management Office Joint Attack Missile System (PM JAMS) and is documented in a memorandum (D-14) dated April 6, 2010.

4. Any one of the following turbocharger kits and turbocharger part numbers; turbocharger kit UWA45009-1 with turbocharger UWA45008-1, turbocharger kit UWA45009-2 with turbocharger UWA45008-2, turbocharger kit UWA45009-3 with turbocharger UWA45008-3, or turbocharger kit UWA45009-4 with turbocharger SCD01095-1, are authorized for installation IAW with existing turbocharger replacement procedures.

		07 October 2011	R5
		17 June 2011	R4
RDMR-AEV	AWR MQ-1C20110216R5	16 February 2011	
SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5) (TN 93556E)			

Appendix C - Inspections, Maintenance, and Logbook Instructions:

1. In the event any operating limit, or limits established by this release, is exceeded in addition to the normal entry on DA Form 2408-13, appropriate inspections shall be performed prior to next flight.

2. Aircraft Logbook Entries:

a. In accordance with Department of the Army (DA) Pamphlet X-Draft-C2, Functional Users Manual for the Army Maintenance Management System – Unmanned Aircraft Systems (TAMMS-UAS), the following entries shall be made on the DA Form 2408-13-1 and shall be perpetuated on each form during the period of installation until superseded by another AWR or until reason for limitation is removed.

(1) Place a circled "X" on the form IAW TAMMS-UAS. In the Fault Information Block, make the entry: "Operate within limitations and restrictions specified in the enclosed airworthiness release dated **07 October 2011.**"

(2) A weight and balance form DD365, or an Aviation Engineering Directorate approved contractor equivalent, shall be maintained on file in each aircraft's log book and weight and balance book maintained by the operational unit.

3. Maintenance: Turbocharger UWA45008-1, UWA45008-2, UWA45008-3, and SCD01095-1 have a Time Between Overhaul (TBO) period of 800 hrs.

		07 October 2011	R5
		17 June 2011	R4
RDMR-AEV	AWR MQ-1C20110216R5	16 February 2011	
SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5) (TN 93556E)			

Appendix D - Reference List:

1. Manual, DTM 1-1550-696-10, HQ DA, latest revision, 9 April 2010, subject: Technical Manual Operator's and Crewmember's Checklist MQ-1C QRC Unmanned Aircraft System Block 1.
2. Manual, FOA-071024-1, HQ DA, latest revision, 18 January 2008, subject: Operator's Manual for AAI One System Ground Control System (OSGCS) Supplement.
3. Manual, DTM 1-1550-696-CL, HQ DA, latest revision, 28 April 2010, subject: Technical Manual Operator's and Crewmembers Checklist MQ-1C QRC Unmanned Aircraft System Block 1.
4. Checklist, ASI-02041, GA-ASI, latest revision, 21 February 2008, subject: Checklist AGM-114 Missile Loading Procedures US Army Warrior Alpha Unmanned Aircraft System.
5. Manual, DTM 1-1550-696-23-P, HQ DA, latest revision, 18 December 2009, subject: Field Maintenance Manual for Extended Range Multi-Purpose (ER/MP) Unmanned Aircraft System (UAS) Block 1.
6. Memorandum, HQ OASA (ALT) SFAE-AV, 27 March 2008, subject: System Safety Risk Assessment of Interim Medium Risks in Support of Extended Range Multi-Purpose (ER/MP) Unmanned Aircraft System (UAS), System Demonstration and Development (SDD) Testing.
7. Memorandum, SFAE-AV, 19 June 2009, subject: System Safety Risk Acceptance (SSRA) of Interim Medium Risks in Support of Extended Range Multi-Purpose (ER/MP) Unmanned Aircraft System (UAS) Urgent Material Release (UMR).
8. Memorandum, HQ OASA (ALT) SFAE-AV-UAS-MAE/TC, undated, subject: System Safety Risk Assessment (SSRA) Nose Gear Retract Servo Extended Range Multi-Purpose (ER/MP) Unmanned Aircraft System (UAS).
9. Memorandum, HQ OASA (ALT) SFAE-AV-UAS-MAE/TC, undated, subject: System Safety Risk Assessment (SSRA) Full Authority Digital Engine Control: FADEC Extended Range Multi-Purpose (ER/MP) Unmanned Aircraft System (UAS).
10. Memorandum, HQ OASA (ALT) SFAE-AV, 02 July 2009, subject: Risk Acceptance Memorandum in Support of Extended Range/Multi-Purpose (ER/MP), Unmanned Aircraft System (UAS) Urgent Material Release (UMR).
11. Deleted.

		07 October 2011	R5
		17 June 2011	R4
RDMR-AEV	AWR MQ-1C20110216R5	16 February 2011	
SUBJECT: Airworthiness Release (AWR) for Operation of MQ-1C Block 1 Gray Eagle			
Unmanned Aircraft System (UAS) at Fort Huachuca, Arizona (AWR MQ-1C20110216R5)			
(TN 93556E)			

12. Deleted.

13. Deleted.

14. Memorandum, Joint Attack Munition Systems Project Office, 06 April 2010, subject: Inert HELLFIRE Missiles.