

JUAS-COE  
Training Document  
Organic/Non Organic UAS  
Creech AFB, NV



EMPLOYMENT OF GROUP 3/4/5  
ORGANIC/NON ORGANIC UAS  
TACTICAL POCKET GUIDE

# ARMY

MQ-1B PREDATOR  
MQ-1 WARRIOR A  
MQ-1C ER/MP  
MQ-9 REAPER  
MQ-5B HUNTER  
RQ-7B SHADOW

**FEBRUARY 2010**

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**Joint Unmanned Aircraft System  
Center of Excellence  
(JUAS-COE)**

**ARMY  
TACTICAL POCKET GUIDE  
Organic/Non Organic  
Group 3/4/5 UAS**

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## JUAS-COE ARMY TACTICAL GUIDE GROUP 3/4/5 UAS

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JUAS-COE ARMY TACTICAL GUIDE GROUP 3/4/5 UAS

**INTERIM CHANGE SUMMARY**

The following interim changes have been canceled or previously incorporated in this manual:

INTERIM CHANGE NUMBER(S)	REMARKS / PURPOSE

The following interim changes have been incorporated in this change/revision:

INTERIM CHANGE NUMBER	REMARKS / PURPOSE

Interim changes outstanding – to be maintained by the custodian of this manual:

INTERIM CHANGE NUMBER	ORIGINATOR/DATE (or DATE/TIME GROUP)	PAGES AFFECTED	REMARKS PURPOSE

**JUAS-COE****NON ORGANIC UAS TACTICAL POCKET GUIDE- ARMY**

THIS POCKET GUIDE PROVIDES INFORMATION USED BY BATTLE STAFFS INVOLVED IN PLANNING, COORDINATING, SYNCHRONIZING OR EXECUTING ACTIONS THAT SUPPORT THE EFFECTIVE EMPLOYMENT OF UNMANNED AIRCRAFT SYSTEMS (UAS) ON THE BATTLEFIELD. ALTHOUGH THIS POCKET GUIDE IS PRIMARILY FOCUSED ON NON-ORGANIC UAS, THOSE ASSETS CONTROLLED AT DIVISION LEVEL OR HIGHER, BOTH ORGANIC AND NON-ORGANIC UAS ARE STILL NEW TOOLS TO MOST UNITS. UNDERSTANDING THE CAPABILITIES AND LIMITATIONS OF UAS CURRENTLY USED BY U.S. FORCES WILL HELP STAFFS MORE EFFECTIVELY USE THESE KEY ASSETS TO THE FULLEST POTENTIAL IN SUPPORT OF GROUND UNIT OPERATIONS.

**UAS Planning**

UAS currently bring numerous ISR and Tactical Air Support capabilities to Army units, providing near-real-time reconnaissance, surveillance, and target acquisition (RSTA) and fires. They can be employed on the forward line of own troops (FLOT), on the flanks, or in rear areas. Employed as a team, UAS and manned systems provide excellent reconnaissance and attack resolution. Most UA can be fitted with laser designators to mark targets and others may be armed. Other key capabilities include route, area, and zone reconnaissance, Battle Damage Assessment (BDA), passing target coordinates, teaming with manned systems, and communication relay. Planning for organic and non-organic UA as an integrated element within the combined arms team can be challenging and is essential.

1

**Army Participates in Planning**

*Division* – The division commander establishes the overall scheme of maneuver, tempo, and focus by fusing employment of all available joint and organic aviation assets. The G-2 coordinates ISR requirements with G-3 to ensure balanced UAS employment. The G3 is primarily responsible for planning and employment of UAS in support of tactical operations and coordinates joint assets through higher headquarters.

*Brigade Combat Team (BCT)* – UAS provide organic and non-organic aerial reconnaissance/ surveillance, security; tactical air support and communications relay capability for the BCT.

*Combat Aviation Brigade (CAB)* – The CAB Commander is the division senior advisor for employment of aviation assets, both manned and un-

manned; UAS company typically launches UAS and turns over control to One System Ground Control Station operators in BfSB and Fires brigades; Tactical UAS platoons are now organized under the CAB.

*Battlefield Surveillance Brigade (BfSB)* – Organized to satisfy division ISR requirements and provide ISR assets to division commanders. Military Intelligence BN has tactical UAS company; BfSB is scheduled to control RQ-7B Shadow and MQ-1C ERMP assets.

*Fires Brigade* – Provides close support and precision strike capability; responsible for entire targeting process. Owns tactical UAS platoon and will possess organic RQ-7B Shadow and integrate MQ-1C assets.

*Air Defense Airspace Management/Brigade Aviation Element (ADAM/BAE)* –The aviation planning and coordination cell organic to the above organizations. Synchronizes manned and unmanned air vehicle operations into the scheme of maneuver; Implements Airspace Control Order, provides Army input to Air Tasking Order.

### **Employment Planning Considerations**

Planning considerations for employing UAS are similar to those of ground units and are nearly identical to those of manned aviation assets. The UAS LNO (or subject matter expert) facilitates the flow of information between UAS operations and the supported unit and ensures the supported unit understands UAS capabilities and limitations. UAS may perform multiple roles during their long missions as some UA have multiple sensors and weapons. The following missions may be assigned:

- *Reconnaissance* – Near Real Time combat information received.
- *Surveillance* – Area surveillance in friendly or enemy territory.
- *Situational Awareness and Situational Understanding*: Provide commanders with battlefield posture.
- *Security* – Reaction time and maneuver space for main body and area security.
- *Targeting* – Target detection and recognition, target designation and illumination and BDA.
- *Communication Support* – Voice and data com's retransmission.
- *Movement Support* – Convoy security, mine/IED detection.

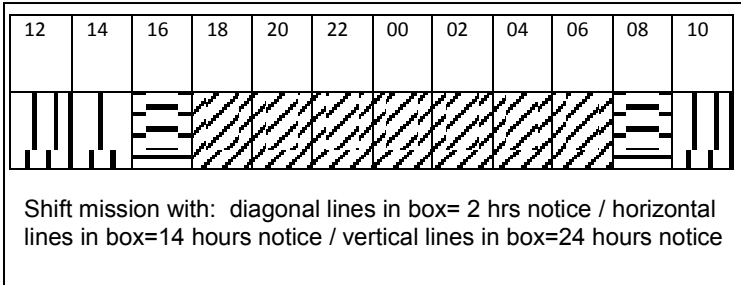
### **Location of UAS**

*Single Site* – Entire unit collocated—better for command, control, communications, and logistics at the expense of supported unit coordination.

*Split-Site Operations* – Usually two sites, 1) mission planning and control site (MPCS) usually at supported unit's TOC, and 2) Launch & Recovery (L/R).

**Sustained Operations**

Various mission sets will require various crew manning schedules. Normal operations, 12 on 12 off, surge operations- no time schedule, Commander's discretion. Figure 1 is the template for one crew.



**Figure 1. Schedule Template**

**Terrain Consideration**

Terrain plays a key role in both sensor effectiveness and C2.

*Manmade* – Cities, airfields, bridges, railroads, ports, power and telecom lines, and towers.

*Natural* – Desert terrain provides optimal conditions for UAS sensors; mountainous, heavily vegetated terrain greatly reduces sensor effectiveness. Loss of Signal is more likely in mountainous areas requiring multiple GCS sites.

**Weather**

Weather conditions must be at or above those minimums prescribed for geo specific AOR's. The appropriate authority in general can waive those requirements due to criticality of a specific combat mission. Table 1 describes typical UAS weather limitations.

**Table 1. UAS Weather Limitations**

Weather	UAS	UAS Sensors
Icing	No deicing/anti-icing capability	N/A
Crosswinds > 15 kts	Exceeds operational capabilities	N/A

Weather	UAS	UAS Sensors
High winds at altitude > 50 kts	Creates dangerous flying conditions	N/A
Light rain	UAS can operate	N/A
Heavy rain: 2 inches or more per hour	UAS cannot operate	Poor, unusable imagery
Fog and low clouds	UAS can operate, but increases the risk to the UA during takeoffs/landings	Cannot Penetrate heavy fog/clouds

*Precipitation, Wind and Temperature* – Precipitation, wind, temperature all degrade the operating parameters of UAS, but icing presents a major dilemma as there is no de-icing capability for any UAS. Consider lowering altitude in icing conditions (with 5°C of freezing and visible precipitation)

*Fog and Low Clouds* – Reduces the effectiveness of the payloads and makes landing difficult. IR camera can easily penetrate light fog, but not heavy fog or clouds. These conditions require flying lower to receive exploitable imagery.

*Sensor Considerations* – UAS sensor/operator selects the type sensor that provides the best resolution and image for the mission. Table 2 describes sensor advantages and disadvantages.

**Table 2. Sensor Matrix**

Advantages	Disadvantages
<b>Electro-Optical</b>	
Affords a familiar view of a scene.	Employment of camouflage and concealment techniques can deceive the sensor.
Offers system resolution unachievable in other optical systems or in thermal images and radars.	Restricted by weather conditions; visible light cannot penetrate clouds or fog.
Preferred for detailed analysis and measurement.	Restricted by terrain and vegetation.
Can provide 3 D imaging for better analysis	Limited to lighted areas during nighttime.



<b>Infrared</b>	
A passive sensor, impossible to jam.	Not as effective during thermal crossover (1 to 1.5 hours after sunrise or sunset).
Offers camouflage penetration.	Tactical platforms threatened by threat air defenses.
Provides good resolution. Night imaging capability.	Bad weather degrades quality.
<b>Synthetic Aperture Radar</b>	
Near continuous SA even in adverse weather	No video capability. Not supported by OSRVT.
Detailed imaging of large area	Extensive processing and distribution bandwidth
Photographic-like images	Image latency based on resolution
<b>Ground Moving Target Indicator</b>	
Provides increased UA survivability through increased stand-off ranges	Additional processing may be required. Will miss stationary targets

### **Threat Considerations**

Avoid known heavy hostile areas that have AAA or SAM capability. Although it is very difficult to shoot down a UA, route, altitude and enter/exit points should be considered in pre-mission planning.

### **Rules of Engagement (ROE)**

ROE specify the circumstances and limitations under which forces initiate and/or continue combat engagement with other forces encountered. ROE governs U.S. Forces.

### **UAS Request Procedures**

Two types of UAS means of exploitation and utilization:

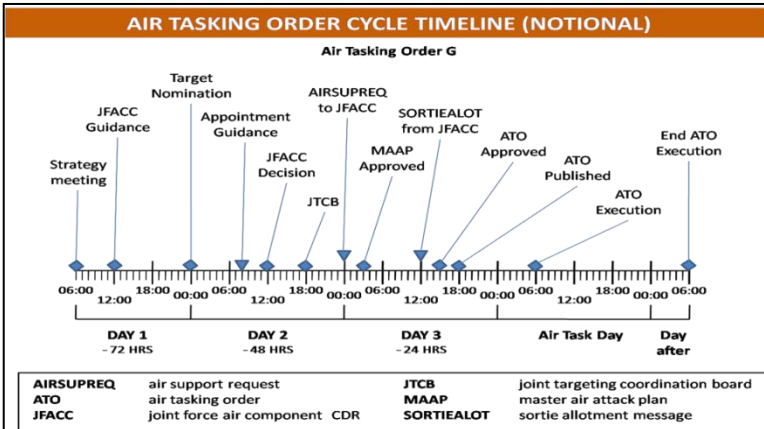
- *Request UAS support* - that is use of UAS asset for mission.
- *Request physical control* - that is, calling for C2 authority or physical management of the UA, payload and sensor.

Three categories of UAS support: Preplanned; Immediate; Dynamic Re-tasking.

*Preplanned* – For theater-level, non-organic UAS controlled by Joint Force Air Component Commander (JFACC), request for direct support of a preplanned mission must be submitted through:

- Joint Tactical Air Strike Request (DD Form 1972)
- Joint Tactical Air Reconnaissance/Surveillance Request (DD Form 1975)
- Air Support Request (AIRSUPREQ) process or other theater/platform specific process

Timeline typically 12-72 hours prior to the new ATO execution period are considered pre-planned. Notional ATO cycle timeline, see Figure 2.



**Figure 2. Air Tasking Order Cycle Timeline (Notional)**

*Immediate* – Requests are submitted outside ATO cycle and expedited through internet relay chat (mIRC), email, telephone or radio, as required. For immediate mission, requests are sent directly to Air Support Operations Center (ASOC) or Direct Air Support Center (DASC) using DD Form 1972/DD Form 1975.

*Dynamic Re-Tasking* – This is a re-tasking of UA from an existing mission to a new target based on published priorities and criteria. Reasons for re-tasking include troops in contact, high priority target opportunity. Minimum information required to begin dynamic re-tasking includes:

- Priority of use
- Call sign
- Routing
- ACM
- Required altitude
- Weapons considerations

Figure 3 depicts a battalion dynamic re-tasking request of MQ-1C UAS to support TIC.

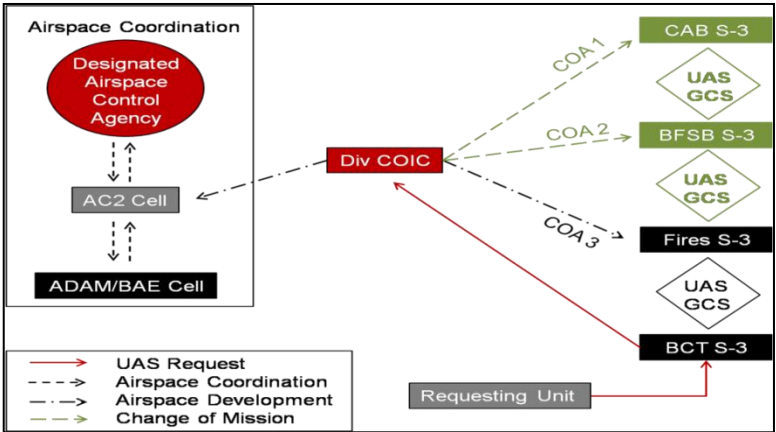


Figure 3. Dynamic Re-Tasking UAS Request



## UAS Employment

2

In general, employment of UAS support of tactical operations falls into two major categories: ISR and Tactical Air Support. Specific employment of UAS capabilities and platforms are a function of enemy, terrain, weather, troop location, support, time availability, and civil considerations (METT-TC).

*ISR Missions* – ISR is an activity that synchronizes and integrates the planning and operation of sensors, assets and processing, exploitation, dissemination systems in direct support of current and future operations. UAS ISR missions are broadly considered tactical air reconnaissance or surveillance.

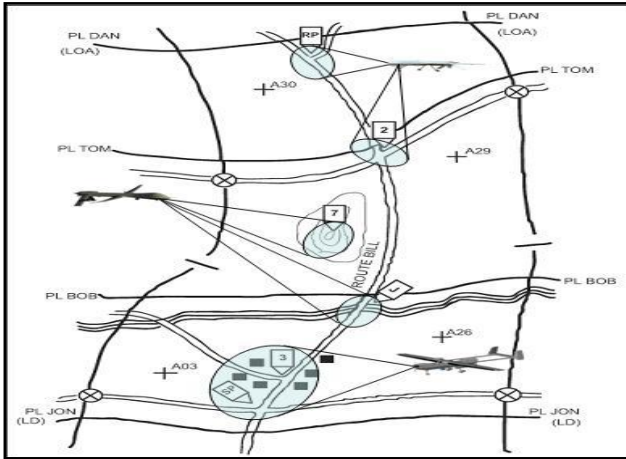
*Reconnaissance* – Reconnaissance missions obtain combat information about enemy and indigenous population activities and resources through sensor payloads.

*Route Reconnaissance* – Is the directed effort to obtain detailed information of a specified route and all terrain from which the enemy could influence movement along that route. UAS, with multi-sensor capabilities, are well-suited to reconnoiter the front, flanks and rear providing early warning, ambush detection, and over watch. Additional UAS support roles are: ground element over watch, trafficability assessment, landing site and hazard location, threat and suspicious item identification. The best results occur when synchronized and commanded by ground elements.

Critical information needed from the unit commander:

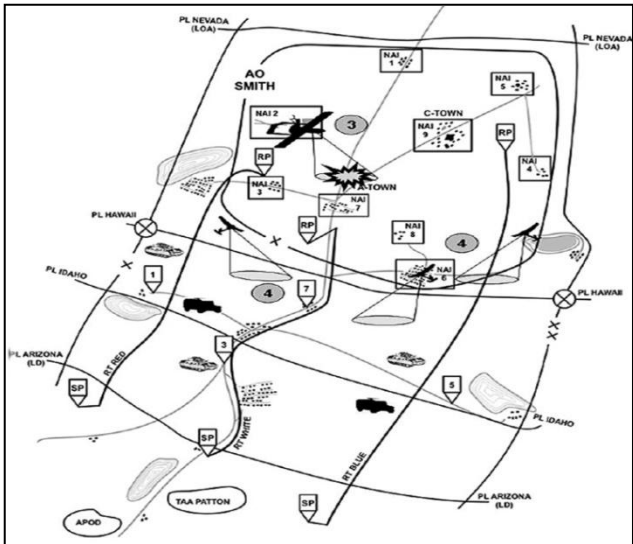
- Start Point, Release Point and designated route time of mission, start to finish
- Critical Points identified
- Intelligence Preparation
- Any constraints or restrictions
- Weather
- Type of unit or vehicles expected to use the route, specify day/night

General schematic of a route reconnaissance overlay is depicted in Figure 4.



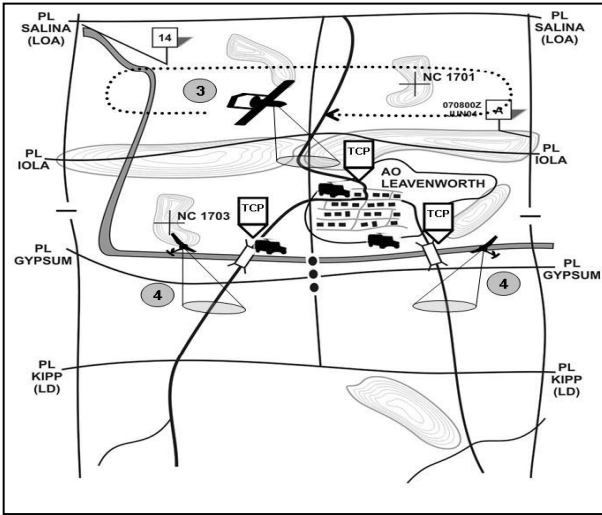
**Figure 4. Route Reconnaissance (FM 3-04.155 Jul 09)**

*Zone Reconnaissance* – Is the directed effort to obtain information concerning all routes, obstacles, terrain, enemy forces within a zone defined by boundaries. Used when existing knowledge of terrain is limited, combat operations have altered the terrain, boundaries are restricted or when the enemy situation is vague. Often time consuming, covering extensive distances ahead of ground forces in well coordinated zones which dictates special considerations for air assets. Planning considerations are similar to route reconnaissance though multiple teams (manned and unmanned) operate abreast. Figure 5 illustrates the zone reconnaissance.



**Figure 5. Zone Reconnaissance (FM 3-04.155 Jul 09)**

*Area Reconnaissance* – Primary difference between zone and area reconnaissance is the nature (restrictive versus permissive) of the boundaries. Flanks of the overall objective area are secured, then recon can be directed inward. Figure 6 Depicts a typical area reconnaissance where the UAS has conducted an initial recon over the general area of interest (AO Leavenworth) followed by a route recon of the movement corridors, finishing with recon outside the AO after friendly forces advance.

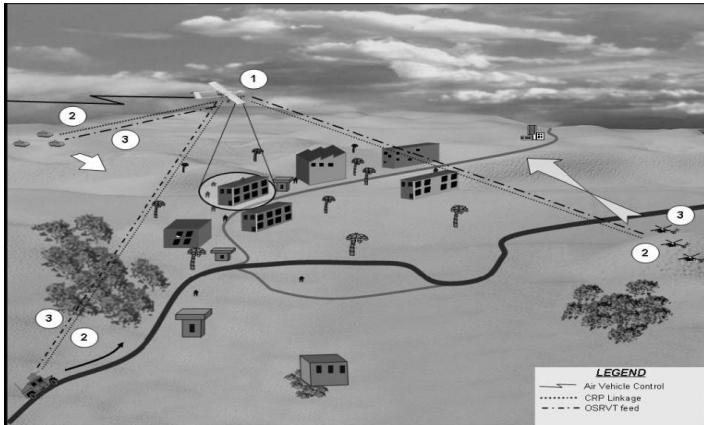


**Figure 6. Area Reconnaissance (FM 3-04.155 Jul 09)**

*Aerial Surveillance* – Is the systematic observation of aerospace, surface or subsurface areas, places, persons or things, by visual, aural, electronic, photographic or other means to collect information. UAS are ideal platforms as these missions are more passive, long duration, and persistent watch often requiring a low signature asset to avoid enemy detection.

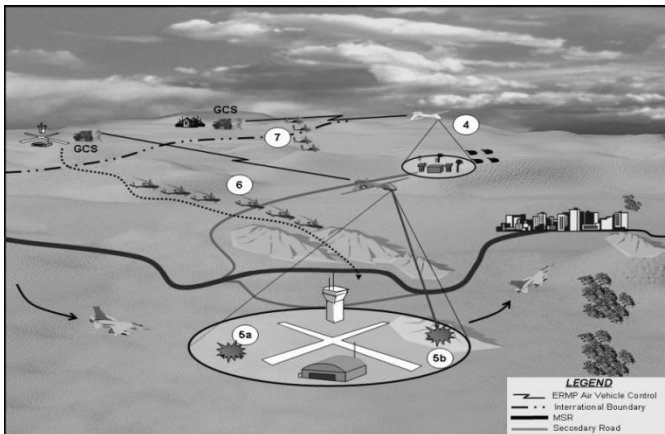
*Surveillance of a Specified Area* – usually target area or buildings which are areas of interest to operational forces. UAS can send FMV continuously to ground elements' One System Remote Video Terminal (see Figure 7).





**Figure 7. Surveillance of a Specified Area (FM 3-04.155 Jul 09)**

*Long Endurance Surveillance* – enables continuous surveillance of avenues of approach, Named Areas of Interest, Target Areas of Interest, decision point and other mission critical areas.



**Figure 8. Long endurance surveillance (FM 3-04.155 Jul 09)**

*Tactical Air Support* – UAS missions in direct support of ground forces and executed in direct assistance to land operations. Following categories support this mission: Security; Armed Reconnaissance; Strike; Strike Coordination and Reconnaissance (SCAR).

*Security Operations* – To orient on the force, area or facility being protected and included all measures taken by a command to protect itself from surprise, provocation, espionage, sabotage or observation by the threat.

## UAS Support to Security Missions

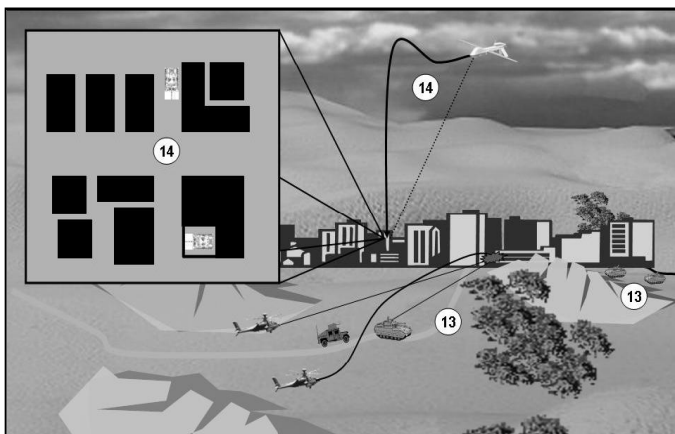
- Contribute to and share the common operational picture (COP)
- Provide early and accurate information (e.g. enemy approach) to protected force
- Maintain persistent surveillance on avenues of approach
- Gain and maintain enemy contact to ensure continuous information flow
- Report enemy activity
- Destroy, repel or suppress enemy reconnaissance units without decisive engagement
- Impede and harass the enemy with indirect fires
- Guide reaction forces

## Security Missions Definitions

- *Screen* – Primary purpose of a screen is to provide early warning to the main body; defensive in nature with observation posts (OPs) and surveillance patrols. UAS superior mobility, day and night TA capabilities, long-range digital or voice communication or RETRANS, and video sensors make them ideally suited for screen missions. UAS units may conduct screen operations independently, as part of a team, or as an integral part of a larger ground unit's task organization. UAS may be used as an extension of ground surveillance to see-over-the-next hill, or may be employed in support of a series of OPs by providing air patrols en route between Ops.
- *Guard* – Differs from screen in that a guard forces has enough combat power to defeat, cause the withdrawal of, or fix the lead elements of an enemy ground force before it can engage the main body with direct fire. UAS may perform reconnaissance, maintain continuous surveillance of threat avenues of approach, maintain contact with threat forces, maintain contact with the lead combat element, destroy/repel threat reconnaissance, security or ground forces, and locate and cause the threat main body to deploy, determining its composition and direction of travel.
- *Cover* – A covering force accomplishes all the tasks of screening and guard forces but is self-contained. UAS normally conduct screen or zone reconnaissance missions as part of a larger force.
- *Area Security* – Operations that may be offensive or defensive in nature. Recon and security for designated personnel, airfields, unit convoys, facilities, main supply routes, lines of communication, equipment and critical points. UAS may maintain surveillance of avenues of approach into AO, maintain contact with threat or belligerent forces, defend the

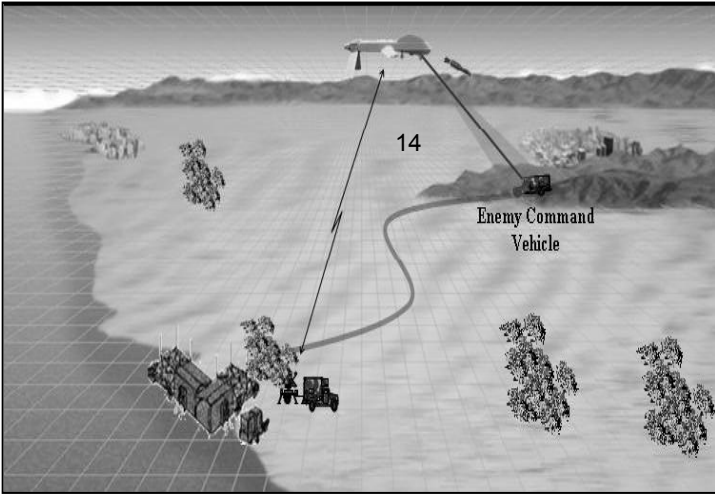
protected force or facility, deter/destroy enemy forces conducting mortar, rocket, or ambush attacks, protect MSR and convoys, prevent threat forces from acting against friendly forces in other AOs, support presence operations, and react to civil disturbances.

- *Local Security* – Includes any local measure taken by the units against enemy actions. Involves avoiding detection by the enemy or deceiving the enemy about friendly positions and intentions. UAS employed in support of local security missions would be best employed as reconnaissance and surveillance assets performing similar missions as described for area security.
- *Armed Reconnaissance* – A mission with the primary purpose of locating and attacking targets of opportunity, i.e. enemy material, personnel, facilities in assigned general areas or assigned ground communications routes, not for the purpose of attacking specific briefed targets.
- *Strike* – A mission to attack or damage or destroy an objective or a capability. Strike missions include close air support (CAS). UAS integration into a CAS is done by a JTAC. UAS video provides JTAC SA required to deploy weapons on target possibly using UAS weapons. Figure 9 depicts a strike profile.

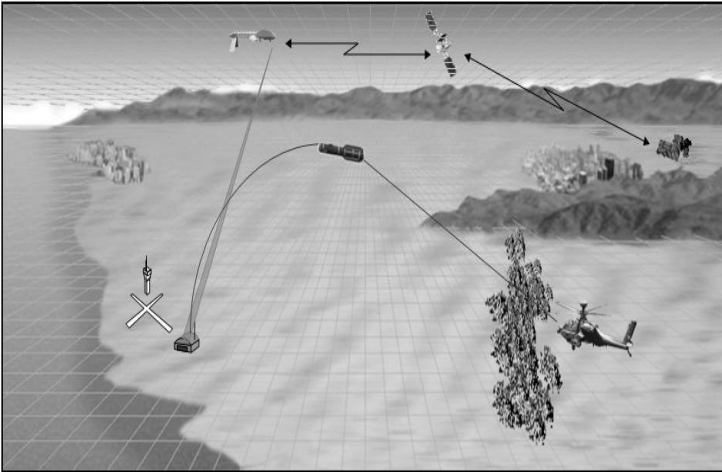


**Figure 9. Strike (FM 3-04.155 Jul 09)**

*Strike Coordination and Reconnaissance (SCAR)* – A SCAR mission is flown for the purposes of detecting targets and coordinating or performing attack or reconnaissance on those targets. UAS can provide SCAR tasks such as locating, cross cueing, identify moving targets, passing target updates, sequencing other aircraft, buddy lase for manned aircraft, kinetically engage targets with its own weapons, and conduct BDA. Two options are depicted below in Figure 10 and 11.



**Figure 10. Autonomous Engagement  
(FM 3-04.155 Jul 09)**



**Figure 11. UAS "Buddy Laze" Cooperative Engagement between  
AH-64D and an MQ-1C**

**Airspace Command and Control (AC2)**

3

Airspace C2 balances various demands competing for airspace use without unnecessarily hindering the application of combat power. Planners must emphasize flexibility and simplicity to maximize the force effectiveness using the system. The Commander's OPLAN, the airspace control plan (ACP), the airspace control order (ACO), and the air tasking order (ATO) are major elements of this process for coordinated airspace operations.

AC2 elements, within the theater air ground system (TAGS) and Army air-ground system (AAGS), form vertical and horizontal links that coordinate, disseminate and synchronize airspace control requirements. The TAGS combines each service's airspace management system but is not a complete and separate system for airspace management within a theater of operations. UAS mission planners must be familiar with each service's AC2 composition and structure to understand their relationship to the TAGS. Figure 13 depicts the Army Air Ground System.

The AAGS is the Army's control system for synchronizing, coordinating, and integrating air operations with the ground units IAW the commander's scheme of maneuver. It initiates, receives, processes, and executes requests for air support; and disseminates information and intelligence produced by aerial assets. Army components include Command Post (CP) effects coordinators, air missile defense elements, aviation elements, BCT ADAM/BAE, Division AC2 cells, Corps AC2 section and liaison elements.

*Army Airspace Command and Control (A2C2)* – Is the airspace management component of AAGS. The A2C2 system outlines the Army's integration of airspace usage and C2 within the TAGS. Users of airspace include: manned aircraft; UAS; air defense systems; fires; joint and combined air and ground forces.

*Airspace Management* – The Airspace Control Authority (ACA), appointed by the Joint Force Commander, coordinates, integrates, and regulates the use of AO airspace which increases force effectiveness and minimizes fratricide risk. Additional duties include establishing broad policies and procedures for airspace control; establishing the airspace control system and integrating host-nation and multinational forces; developing the airspace control plan; and implementing the airspace control plan through the airspace control order.

**Documents that support and are critical for executing airspace control:**

*Airspace Control Plan (ACP)* – developed by the airspace control authority and approved by the JFC.

*Airspace Control Order (ACO)* – Is developed from the airspace control plan. The ACO provides effective times, altitudes, distances and controlling agencies for airspace control measures. It directs the use of joint airspace and details the approved requests for airspace control measures.

*Air Tasking Order (ATO)* – The ATO is a detailed order developed daily by the JFACC that describes and directs the overall air operation. This order provides the details for individual sorties to include targets, mission timing, weapons loads, air refueling data, call sign's, and special instructions. The ATO directs tactical identification friend or foe (IFF) use and assignments in each theater while projecting ground combat movements.

*Air Defense Plan (ADP)* – air defense commander along with other services develops, integrates, and distributes the JFC-approved air defense plan. The air defense plan includes sensor employment, identification procedures, engagement procedures, defensive airspace control procedures, weapon control procedures, early warning dissemination, location and type of enemy/friendly air and missile forces.

*Types of AC2* – Airspace Control Procedures (ACPs) and systems need to accommodate these methods based on component, joint, and national capabilities and requirements. Positive control, conducted by elements designated by the ACA, relies on radars, other sensors, identification, friend or foe (IFF)/selective identification feature (SIF), digital data links, and other elements of the air defense system to positively identify, track, and direct air assets. Normally, the BCT does not have the capability to provide positive control unless augmented with an air traffic services (ATS) support package. Procedural control relies on previously agreed to and disseminated airspace control measures; these may include rules of engagement (ROE), restricted operating areas/zones (ROA/ROZ), standard use Army aircraft flight route (SAAFR), aircraft identification maneuvers, fire support coordinating measures (FSCM), Minimum Risk Routes (MRR), high-density airspace control zones, and coordinating altitudes.

## **Airspace Control Terms**

*Air Control Point* – is a point easily identified on the terrain or an electronic navigation aid used to provide necessary control during air movement. It is a graphic control measure used to segment an air corridor similar to checkpoints on a ground route.

*Air Corridor* – an air corridor is a restricted air route of travel at or below the coordinating altitude specified for use by friendly aircraft to avoid friendly fire and de-conflict artillery-firing positions with aviation.

*Coordinating Altitude* – is a procedural airspace control method specified in the ACP used to separate fixed and rotary-wing aircraft. This method determines an altitude below which fixed-wing normally will not fly and above which rotary-wing will normally not fly.

*Kill Boxes* – is a three-dimensional fire support coordinating measure (FSCM) used to facilitate the expeditious air-to-surface lethal attack of targets, which may be augmented by or integrated with surface-to-surface indirect fires.

*Restricted operating zones/areas (ROZ/ROA)* – is airspace of defined dimensions created in response to specific operational situations (e.g. UAS launch and recovery zone) or requirements within which the operation of one or more airspace users is restricted.

ROZ/ROA's can be established over areas where combat operations are likely to involve a mix of air vehicles are likely to be employed (e.g. over urban operations areas) and disseminated throughout theater using the ACO. Information about the ROZ includes contact frequency for the aircraft desiring to transition through the ROZ. The BCT Fires Support Element coordinates and tracks all fires and aviation activity in the ROZ/ROA. Figure 12 is a representation of a ROZ.

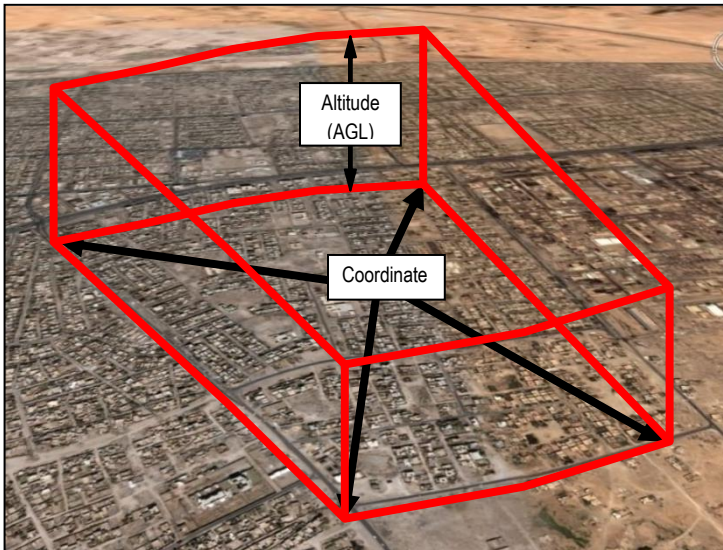


Figure 12. Example ROZ/ROA Diagram

*Zone Reference Systems* – Ground units can develop a zone reference system, using security zones based on unit boundaries, population densities, geographical areas, or any system that facilitates airspace deconfliction for maneuver elements. Example of a zone is depicted in Figure 13.



**Figure 13. Example of a Security Zones**

*Common Reference System* – provides a universal perspective with which to define specific area of the battle space, enabling commanders to efficiently coordinate, deconflict, and synchronize surface attacks. Common geographic system (CGRS) is used by the Air Force, whereas the Army has chosen to use a zone method based on the operational picture. Another system, called the Global Area Reference System (GARS) has been approved for joint use by the Department of Defense. Examples of GARS and CGRS is depicted in Figures 14 and 15 respectively.



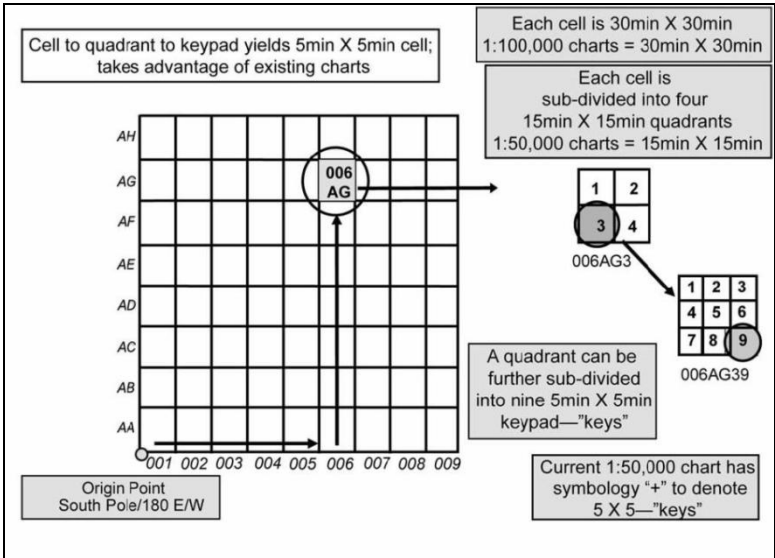


Figure 14. Global Area Reference System (GARS)

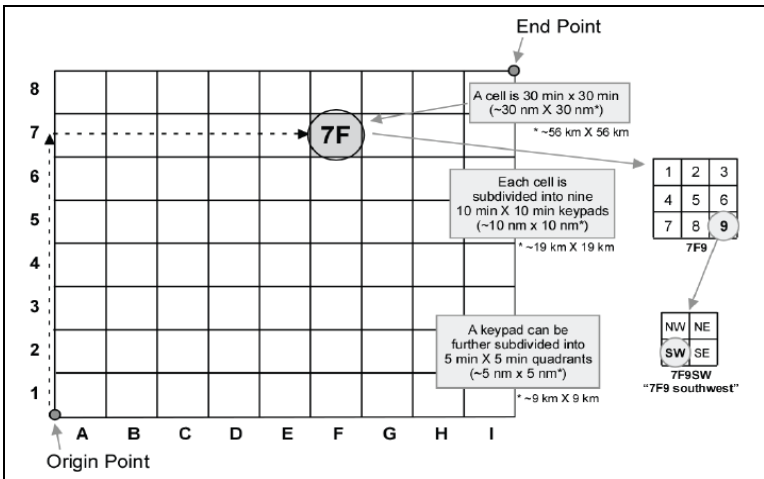


Figure 15. Common Geographic Reference System (CGRS)

*Types of Separation* – there are three common means to keep separation between manned and unmanned aircraft: Lateral, Time, and Vertical Separation. Frequency separation may also be required between airspace users and unmanned vehicles equipped with UHF/VHF radio communications.

- Lateral Separation spaces aircraft that may be operating at the same altitude by not having them operate in the same geographic space by using ROZ/ROA, flight corridors, unit boundaries, and phase lines.
- Time Separation spaces aircraft (or fires) that may be operating in the same geographical area or at the same operating altitudes by not allowing them to operate at the same time.
- Vertical Separation spaces aircraft based on operating altitude or by assigning different operating altitudes to other aircraft that may be working in the same geo area. Vertical separation is the least preferred method, since UAS and rotary-wing aircraft normally operate from the surface to 500 ft above a ground (AGL).

*Coordination Responsibilities* – At division level and above, A2C2 organizations are organized as part of the table of organization and equipment (TOE). At organization below division, informal or ad hoc cells manage A2C2 tasks.

*Battlefield Coordination Detachment (BCD)* – is the ARFOR coordination detachment located at the Joint Air Operations Center (JAOC). This detachment monitors and interprets the land battle for the JAOC and exchanges current and planned intelligence and operational information with ground units at wing operations centers, control and reporting centers, and A2C2 centers. The broad range of vertical coordination responsibilities the BCD has as the interface between the ARFOR Commander, the JAOC, and subordinate Army units appears in Table 3.

**Table 3. BCD Vertical Information Networking (FM 3-52 Aug 02)**

Information Required		Received From	Action Officer	Action/Output
OPORD or OPLAN (includes A2C2 annex)	Corps	Corps A2C2 Element Corps G3	BCD A2C2 Element	P, C
A2C2 Control Measures and Restrictions	Requests	Corps A2C2 Element	BCD A2C2 Element	C, A
	Approvals	JAOC	BCD A2C2 Element	D Corps A2C2 Element ADA Brigade

Information Required		Received From	Action Officer	Action/Output
FLOT		Corps A2C2 Element Corps G3	BCD A2C2 Element	P, C, D
A2C2 Priorities	Army	Corps A2C2 Element	BCD A2C2 Element	P, C, D JAOC Combat Ops
	Air Force	Combat Ops	BCD A2C2 Element	P, C, D Corps A2C2 Element
ATO and ACO		JAOC Combat Ops	BCD A2C2 Element	P, C
ATO Issuing Times		Corps A2C2 Element	BCD A2C2 Element	P, C, D
IFF and SIF Procedures		CRC	BCD A2C2 Element	D Corps A2C2 Element JAOC and A2C2
Unscheduled, Large Formation Missions		JAOC Combat Ops	BCD A2C2 Element	C, D Corps A2C2 Element ADA Brigade
NBC Contaminated Areas		Corps A2C2 Element	BCD A2C2 Element	P, C, D JAOC Combat Ops
Friendly ECM Activities (Affecting Avionics)		Corps A2C2 Element G2	BCD A2C2 Element	P, C, D JAOC Combat Ops and Plans
SEMA and UAVs (Above Coordinating Altitude)		Corps A2C2 Element G2 Corps FSE	BCD A2C2 Element	P, C, D JAOC Combat Ops and Plans

Information Required		Received From	Action Officer	Action/Output
SEMA and UAVs (Above Coordinating Altitude)		Corps A2C2 Element G2 Corps FSE	BCD A2C2 Element	P, C, D JAOC Combat Ops and Plans
ADA Locations and Status (HIMAD)		Corps A2C2 Element ADA BDE	BCD A2C2 Element	P, C
ADA Weapons Control Status	Requests	Corps A2C2 Element G3	BCD A2C2 Element	P, C, A
	Approvals	CRC	BCD A2C2 Element	D Corps A2C2 Element
Army ADA Priorities		Corps A2C2 Element G3	BCD A2C2 Element	C, D JAOC Combat Ops
AD Warnings		CRC Corpse A2C2 Element	BCD A2C2 Element	C, D Corps A2C2 Element ADA BDE JAOC Defensive Duty Officer
ADA Weapon Engagement Zones and Weapons Coverage		CRC JAOC Plans ADA Brigade	BCD A2C2 Element	P, C, D Corps A2C2 Element
Significant Planned Indirect Fires		Corps FSE Corps A2C2 Element	BCD A2C2 Element	P, C
Fire Support Coordinating Measures		Corps FSE Corps A2C2 Element	BCD A2C2 Element	C

Information Required		Received From	Action Officer	Action/Output
Locations and Status	Army Articles	Corps A2C2 Element Corps AVN Units	BCD A2C2 Element	P, C, D JAOC
	NAVAIDS	Corps A2C2 Element ATS Group and BN	BCD A2C2 Element	P, C, D JAOC
	AIC	Corps A2C2 Element ATS Group and BN	BCD A2C2 Element	P, C, D JAOC
SAAFRs		Corps A2C2 Element	BCD A2C2 Element	P, C, A (If above coordinating altitude)
A-Approval ATS-air Traffic Service AVN-aviation BDE-brigade BN-battalion	C-Coordination D-Distribution ECM-electronic countermeasures NAVAID-navigational aid NBC-nuclear, biological and chemical		Ops-operations P-Planning SAAFR-standard Army Aircraft flight route SEMA-special electronic mission aircraft	
*Action/output assumes each A2C2 Element section passes information it obtains to its parent unit.				

*Corps Cell* – Corps A2C2 element has a dedicated element at the corps main and tactical command posts deconflicts airspace for tactical air support, Army aviation, UAS, ADA, FA and EW assets. Corps airspace

issues are controlled by the corps G3 and managed by the G3 air. The corps air traffic service (ATS) battalion commander and the corps air defense artillery (ADA) brigade commander serve as the corps commander's airspace advisors. The corps A2C2 cell focuses on the deep battles, rear battles, and future (72+ hours) operations and coordinates A2C2 issues for deep operations through the DOCC (when established). The A2C2 Corps level cell is also the primary airspace point of contact (POC) for subordinate divisions and commands/ BCTs/brigades under corps control. Specific coordination and action requirements for the Corps A2C2 cell appear in the below tables. Table 4 delineates the lateral requirements of the cell in coordinating actions across staff sections. Table 5 delineates the responsibilities of the cell for coordinating and performing actions between higher and lower echelon units.

**Table 4. Corps A2C2 Element Lateral Information Networking (FM 3-52 Aug 02)**

Information Items	G3 Air	Corps Aviation Officer	Corps ADA Liaison Officer	Air Traffic Service Liaison Officer	Fire Support Coordinator	Air Liaison Officer
OPORD or OPLAN (Includes A2C2 Annex)	X	X	X	X	X	X
ATO and ACO	X	X	X	X	X	
Airspace Control Issuing Times	X	X	X	X	X	X
Airspace User Priorities	X	X	X	X	X	
A2C2 Restrictions and Control Measures (Current and Requested)	X	X	X	X	X	X
Army AD Priorities	X	X	X			

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Information Items	G3 Air	Corps Aviation Officer	Corps ADA Liaison Officer	Air Traffic Service Liaison Officer	Fire Support Coordinator	Air Liaison Officer
AD Warnings		X	X	X	X	X
AD Weapons Control Status (Current and Requested)	X	X	X	X		X
Friendly ADA Locations and Coverage	X	X	X	X		X
ADA Weapon Engagement Zones		X	X	X		
FARPs		X		X		X
Location and Status of Airfields (Includes FARPs)	X	X		X		
Field Artillery Locations	X	X		X	X	X
Fire Support Coordinating Measures	X	X		X	X	
Significant Planned and Ongoing Fires (Assumes no Fires in Rear Areas)	X	X		X	X	

FOUO

Information Items	G3 Air	Corps Aviation Officer	Corps ADA Liaison Officer	Air Traffic Service Liaison Officer	Fire Support Coordinator	Air Liaison Officer
Army Aviation Airspace Requirements (Includes SEMA)	X	X	X			
Army Aviation Unit Locations (Company and Larger)	X	X		X		
Aviation Battle Positions		X	X		X	X
Massed Enemy Aircraft Locations			X			
IFF and SIF Procedures		X	X	X		
SAAFRs		X	X	X	X	
UAV Flight Paths and Routes		X		X	X	
UAV Launch Sites		X		X	X	
Flight Obstructions		X		X		
Sortie Allocation	X				X	
FLOT		X	X	X	X	
Positions of Instrument Landing Systems		X		X		
Location and Status of NAVAIDs		X		X		
Intelligence Summaries	X	X	X		X	X
Air Support Requests and Requirements (Includes SEMA and UAV)		X	X	X	X	



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Information Items	G3 Air	Corps Aviation Officer	Corps ADA Liaison Officer	Air Traffic Service Liaison Officer	Fire Support Coordinator	Air Liaison Officer
Air Support Requests and Requirement (Includes Air Force Only)					X	
NBC Contaminated Areas		X		X		
Unscheduled Large Formation Missions				X		
Airborne Tactical Formations		X		X		
Friendly ECM Activities		X		X		
Location of AIC				X		X
NBC Reports		X		X	X	
Weather Reports	X	X		X		X
ECM-electronic countermeasures FARP-forward arming and refueling point NAVAID-navigational aid	NBC-nuclear, biological and chemical SAAFR-standard, Army aircraft, flight route SEMA-special electronic mission aircraft					

**Table 5. Corps A2C2 Element Vertical Information Networking (FM 3-52 Aug 02)**

Information Required		Received From	Action Officer	Action Output
OPORD or OPLAN (includes A2C2 annex)	Corps	G3	G3 Air	P, C, D BCD
	Division	G3	G3 Air	P, C, A
A2C2 Control Measures and Restrictions	Requests	Corps G3, DIV A2C2 Element	G3 Air	P, C, A, D BCD
	Approvals	BCD A2C2 Element	G3 Air	P, C, D DIV A2C2 Element
FLOT		G3	G3 Air	P, D BCD
A2C2 Priorities	Army	G3	G3 Air	P, C, D BCD DIV A2C2 Element
	Air Force	BCD A2C2 Element	G3 Air	P, C, D DIV A2C2 Element
ATO and ACO		BCD ASOC	G3 Air	D DIV A2C2 Element
ATO Issuing Times		BCD	G3 Air	P, C, D
IFF and SIF Procedures		BCD A2C2 Element	G3 Air	P, D DIV A2C2 Element
Unscheduled, Large Formation Missions		BCD ASOC	G3 Air	D DIV A2C2 Element
NBC Contaminated Areas		Corps NBC Element	G3 Air	P, C, D DIV A2C2 Element All A2C2 Element Sections

FOUO

Information Required		Received From	Action Officer	Action Output
Air Support Requirements and Requests	Army Aviation Attack	G3 Corps AVN Units DIV A2C2 Element	AVN LNO	P, C, D DIV A2C2 Element
Air Support Requirements and Requests	Airlift	G4/G3 Corps AVN Units DIV A2C2 Element	AVN LNO	P, C, D DIV A2C2 Element
Air Support Requirements and Requests	SEMA	G2/G3 Corps AVN Units DIV A2C2 Element	AVN LNO	P, C, D DIV A2C2 Element
	Air Forces CAS	G3	G3 Air	P, C
	Recon	G2/G3	G3 Air	P, C
	Airlift	G4/G3	G3 Air	P, C
ADA Locations and Coverage		Corps ADA Units DIV A2C2 Element	ADA LNO	P, C, D BCD A2C2 Element
ADA Weapons Control Status	Requests	G3 DIV A2C2 Element	ADA LNO	P, C, D DIV A2C2 Element
	Approvals & Mods	Corps A2C2 Element	ADA LNO	P, D DIV A2C2 Element
Army ADA Priorities		G3	ADA LNO	P, D DIV A2C2 Element
AD Warnings		BCD Subordinate Units DIV A2C2 Element	ADA LNO	C, D BCD DIV A2C2 Element

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Information Required		Received From	Action Officer	Action Output
ADA Weapon Engagement Zones and Weapons Coverage		BCD ATO	ADA LNO	P
Significant Planned and Ongoing Indirect Fires		Corps Arty	FSCoord	P, C
Fire Support Coordinating Measures		Corps FSE	FSCoord	P, C, D DIV A2C2 Element BCD
Field Artillery Locations		Corps Arty	FSCoord	P, C, D DIV A2C2 Element
UAV Launch Sites		DIV A2C2 Element	FSCoord	P, C, D DIV A2C2 Element
UAV Flight Routes		DIV A2C2 Element	G3 AIR	P, C, A, D DIV A2C2 Element UAV Units
SAAFRs		DIV A2C2 Element Corps AVN	G3 AIR	P, C, A, D DIV A2C2 Element BCD (if above coord altitude)
Army AVN Unit Locations		Corps AVN Units G3	AVN LNO	P, C, D DIV A2C2 Element
Airborne Tactical Formations		Corps AVN Units G3	AVN LNO	C

Information Required		Received From	Action Officer	Action Output
Locations and Status	Army Articles	Corps AVN Units G3 DIV A2C2 Element	AVN LNO G3 Air	P, C, D DIV A2C2 Element BCD
Locations and Status	FARPs	Corps AVN Units DIV A2C2 Element	AVN LNO G3 Air	P, C, D DIV A2C2 Element
	NAVAIDs	ATS BN/CO G3	ATS LNO	P, C, D DIV A2C2 Element BCD
	AIC	ATS BN/CO	ATS LNO	P, C, D DIV A2C2 Element BCD
Flight Obstructions		ATS BN/CO Corps AVN Units DIV A2C2 Element	ATS LNO	P, C, D
Intelligence Summaries		G2	G3 Air	P, C
Friendly ECM Activities		G2	G3 Air	P, C
Massed Enemy Aircraft Formations		G2 ADA Units	G3 Air	P, C, D
A-Approval ASOC-air support operations center Arty-artillery AVN-aviation BN-battalion C-Coordination CAS-close air support		CO-company, D-Distribution DIV-division, ECM-electronic countermeasures, FARP-forward arming and refueling point FSCOORD-fire support coordinator NAVAID-navigational aid, NBC-nuclear, biological and chemical P-Planning, Recon-reconnaissance		

	SAAFR-standard Army Aircraft flight route, SEMA-special electronic mission aircraft
*Action/output assumes each A2C2 Element section passes information it obtains to its parent unit.	

*Division Cell* – The division A2C2 element, located in the main CP, is the G-3's principal organization for managing airspace use and is part of the movement and maneuver cell. The A2C2 element includes representatives from the corps ATS battalion's direct support company and other elements supporting the division maneuver elements, to include ADA, FA, and intelligence. The organization of the A2C2 element at the division main CP resembles that of the corps level. However, the division focuses on conducting the battles and engagements in the forward portion of the combat zone. Therefore, airspace control tasks are primarily those required to support the close battle. The difference in geographical orientation (forward versus rear) results in minor differences in airspace control procedures and the degree of coordination required. In addition to supporting the airspace requirements of subordinate BCTs and brigades, the cell also assists the G-3 by integrating the airspace use of other division functional cells. Specific coordination and action requirements for the Division A2C2 cell appear in the below tables. Table 6 delineates the lateral requirements of the cell in coordinating actions across staff sections. Table 7 delineates the responsibilities of the cell for coordinating and performing actions between higher and lower echelons units.

**Table 6. Division A2C2 Element Lateral Information Networking (FM 3-52 Aug 02)**

Information Items	G3 Air	Aviation Officer	ADA Liaison Officer	Air Traffic Service Liaison Officer	Fire Support Coordinator	Air Liaison Officer
OPORD or OPLAN (Includes A2C2 Annex)	X	X	X	X	X	X
ATO and ACO	X	X			X	
Airspace Control Issuing Times	X	X	X	X	X	X
Airspace User Priorities	X	X	X	X	X	
A2C2 Restrictions and Control Measures (Current and Requested)	X	X	X	X	X	
Army AD Priorities	X		X			

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Information Items	G3 Air	Aviation Officer	ADA Liaison Officer	Air Traffic Service Liaison Officer	Fire Support Coordinator	Air Liaison Officer
AD Warnings	X	X	X	X	X	X
AD Weapons Control Status (Current and Requested)	X	X	X	X		X
Friendly ADA Locations and Coverage	X	X	X	X		X
ADA Weapon Engagement Zones	X			X		X
FARPs		X	X	X		X
Location and Status of Airfields (Includes FARPs)	X	X				
Field Artillery Locations	X	X		X	X	X
Fire Support Coordinating Measures	X	X		X	X	X
Aviation Battle Positions	X					
Significant Planned and Ongoing Fires (Assumes no Fires in Rear Areas)	X	X		X	X	X
Army Aviation Airspace Requirements (Includes SEMA)	X	X	X			
Army Aviation Unit Locations (Company and Larger)	X	X		X		X
Massed Enemy Aircraft Locations	X					
IFF and SIF Procedures		X	X	X		X
SAAFRs	X	X	X	X	X	X
UAV Flight Paths and Routes		X		X	X	
UAV Launch Sites		X		X	X	

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Information Items	G3 Air	Aviation Officer	ADA Liaison Officer	Air Traffic Service Liaison Officer	Fire Support Coordinator	Air Liaison Officer
Flight Obstructions		X		X		
Sortie Allocation	X				X	X
FLOT	X	X	X	X	X	X
Positions of Instrument Landing Systems		X				
Location and Status of NAVAIDs		X		X		
Intelligence Summaries	X					
Air Support Requests and Requirements (Includes SEMA and UAV)	X	X			X	
Air Support Requests and Requirements (Includes Air Force Only)	X			X		X
NBC Contaminated Areas	X	X		X		
Unscheduled, Large Formation Missions	X					
Airborne Tactical Formations		X		X		
Friendly ECM Activities		X		X		
Location of AIC Logistics Resupply Requests		X		X		
ECM-electronic countermeasures FARP-forward arming and refueling point NAVAID-navigational aid			NBC-nuclear, biological and chemical SAAFR-standard, Army aircraft, flight route SEMA-special electronic mission aircraft			



**Table 7. Division A2C2 Element Vertical Information Networking (FM 3-52 Aug 02)**

Information Required		Received From	Action Officer	Action Output
OPORD or OPLAN (includes A2C2 annex)	Corps	G3	G3 Air	P, C,
	Division	G3	G3 Air	P, C, D Corps A2C2 Element
	Brigade	GS	G3 Air	P, C, A
A2C2 Control Measures and Restrictions	Requests	G3 BDE S3	G3 Air	P, C, A, D Corps A2C2 Element
	Approvals	Corps A2C2 Element	G3 Air	P, C, D BDE S3 Air
	Directed (current)	Corps A2C2 Element	G3 Air	P, C, D BDE S3 Air
FLOT		G3	G3 Air	P, D Corps A2C2 Element
A2C2 Priorities	Army	Corps A2C2 Annex G3	G3 Air	P, C, D Corps A2C2 Element BDE S3 Air
	Air Forces	Corps A2C2 Annex	G3 Air	P, C
Sortie Allocation		ASOC G3 Air	G3 Air	P, C, D BDE S3 Air
IFF and SIF Procedures		Corps A2C2 Element	G3 Air	P, D
Unscheduled, Large Formation Missions		Corps A2C2 Element G3	G3 Air	C, D
NBC Contaminated Areas		Corps A2C2 Element DIV NBC Element	G3 Air	P, C, D BDE S3 Air
Air Support Requirements and Requests	Army Aviation Attack	G3 DIV AVN Units BDE S3 Air	AVN LNO	P, C, D S3 Air

Information Required		Received From	Action Officer	Action Output
Air Support Requirements and Requests	Airlift	G4/G3 DIV AVN Units BDE S3 Air	AVN LNO	P, C, D S3 Air
	SEMA	G2/G3 DIV AVN Units BDE S3 Air	AVN LNO	P, C, D S3 Air
	Air Forces CAS	G3 S3 Air	G3 Air	P, C, D Corps A2C2 Element
	Recon	G2/G3	G3 Air	P, C, D Corps A2C2 Element
	Airlift	G4/G3	G3 Air	P, C, D Corps A2C2 Element
ADA Locations and Coverage		DIV ADA Corps ADA Corps A2C2 Element	ADA LNO	P, C, Division Aviation Brigade
AD Warnings		Corps A2C2 Element Subordinate Units	ADA LNO	C, D Corps A2C2 Element S3 Air
ADA Weapons Control Status	Requests	G3 BDE S3 S3 Air	ADA LNO	P, C, D Corps A2C2 Element
	Approvals & Mods	Corps A2C2 Element		P, D BDE S3 Air
Army ADA Priorities		G3 Corps A2C2 Element	ADA LNO	P, C, D S3 Air

*Brigade Combat Team (BCT)* – A formal and dedicated BCT A2C2 element does not exist but an ad hoc element under the brigade S3 does resemble those at higher echelons. The BCT AC2 team, comprised of ADAM/BAE, effects cell, and ALO, provides planning and execution of brigade AC2. AC2 team elements develop and implement their portion of the plan for inclusion in the BCTs scheme of maneuver and members work as a team to deconflict and synchronize the plan for

the best use of airspace while retaining flexibility for the commander to maximize lethality.

The ADAM/BAE is designed to work with a division or corps AC2 cell. However, it is capable of independent operations when the BCT is employed independent of a higher headquarters. The ADAM/BAE is equipped to receive the joint air picture and coordinate digitally with the BCD, within the AOC. The ADAM/BAE:

- Implements and disseminates the ACO for brigade and below.
- Ensures the effects cell provides the same function for the ATO.
- Develops and disseminates the air defense plan.
- Provides the air picture and early warning functions.
- Is the principle brigade staff element planning the use of Army aviation and UAS.
- Submits Airspace Control Means Requests (ACMR) to the division AC2 element for synchronization and deconfliction, and further processing for inclusion in the ACO.

Table 8 delineates the lateral requirements of the cell in coordinating actions across staff sections. Table 9 delineates the responsibilities of the cell for coordinating and performing actions between higher and lower echelons units.

**Table 8. Brigade Staff Lateral Information Networking (FM 3-52 Aug 02)**

Information Items	ADA Liaison Officer	Army Aviation Officer	Fire Support Officer	Air Liaison Officer	S3 Air
OPORD or OPLAN (Includes A2C2 Annex)	X	X	X	X	X
ATO and ACO	X	X	X	X	X
Airspace Control Issuing Times				X	X
Airspace User Priorities					X
A2C2 Restrictions and Control Measures (Current and Requested)	X	X		X	X
Army AD Priorities	X			X	X
AD Warnings	X			X	X
AD Weapons Control Status (Current and Requested)	X	X		X	X
Friendly ADA Locations and Coverage	X	X		X	X
ADA Weapon Engagement Zones	X			X	X

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Information Items	ADA Liaison Officer	Army Aviation Officer	Fire Support Officer	Air Liaison Officer	S3 Air
FARPs		X			X
Location and Status of Airfields (Includes FARPs)	X	X		X	X
Field Artillery Locations		X	X	X	X
Fire Support Coordinating Measures	X	X	X	X	X
Significant Planned and Ongoing Fires (Assumes no Fires in Rear Areas)		X	X	X	X
Army Aviation Airspace Requirements (Includes SEMA)		X		X	
Army Aviation Unit Locations (Company and Larger)		X			X
Aviation Battle Positions		X	X		X
Massed Enemy Aircraft Locations					X
IFF and SIF Procedures	X	X		X	
SAAFRs	X	X	X		
UAV Flight Paths and Routes		X	X		
UAV Launch Sites		X	X		
Flight Obstructions		X			X
Sortie Allocation					X
FLOT	X	X	X	X	X
Positions of Instrument Landing Systems		X		X	
Location and Status of NAVAIDS		X		X	
Intelligence Summaries					X
Air Support Requests and Requirements (Includes SEMA and UAV)	X	X	X	X	X

Information Items	ADA Liaison Officer	Army Aviation Officer	Fire Support Officer	Air Liaison Officer	S3 Air
Air Support Requests and Requirements (Includes Air Force Only)	X		X		X
NBC Contaminated Areas		X			X
Unscheduled, Large Formation Missions					X
Airborne Tactical Formations	X				X
Friendly ECM Activities		X			X
Location of AIC Logistics Resupply Requests		X		X	
ECM-electronic countermeasures FARP-forward arming and refueling point NAVAID-navigational aid					NBC-nuclear, biological and chemical SAAFR-standard, Army aircraft, flight route SEMA-special electronic mission aircraft

**Table 9. Brigade Staff Vertical Information Networking (FM 3-52 Aug 02)**

Information Required		Received From	Action Officer	Action Output
OPORD or OPLAN (includes A2C2 annex)	Division	G3	S3 Air	P, C,
	Brigade	S3	S3 Air	P, C, D BN S3 DIV G3
	Battalion	S3	S3 Air	P, C, A
A2C2 Control Measures and Restrictions	Requests	S3 BN S3	S3 Air	P, C, A, D DIV A2C2 Element
	Approvals	DIV A2C2 Element	S3 Air	P, C, D BN S3
	Directed (current)	DIV A2C2 Element	S3 Air	P, C, D BN S3
FLOT		S3	S3 Air	C, D DIV A2C2 Element

FOUO

Information Required		Received From	Action Officer	Action Output
A2C2 Priorities	Army	G3 DIV A2C2 Annex	S3 Air	P, C, D BN S3 Air
	Air Forces (If affects BDE)	DIV A2C2 Annex	S3 Air	P
Sortie Allocation		G3 Air	S3 Air	P, C, D BN S3 Air
Unscheduled, Large Formation Missions		DIV A2C2 Element G3 Air	S3 Air	C, D
NBC Contaminated Areas		DIV A2C2 Element BDE NBC Officer	S3 Air	P, C, D DIV A2C2 Element
Air Support Requirements and Requests	Army Aviation Attack	S3	S3 Air AVN LNO	P, C, D BN S3 Air DIV A2C2 Element
	Airlift	S3/S4	S3 Air AVN LNO	P, C, D DIV A2C2 Element
	SEMA	S2/S3	S3 Air	P, C, D DIV A2C2 Element
	Air Forces CAS	S3	S3 Air ALO	P, C, D BN S3 Air DIV A2C2 Element
	Recon	S3/S2	S3 Air ALO	P, C, D BN S3 Air DIV A2C2 Element
	Airlift	S3/S4	S3 Air ALO	P, C, D DIV A2C2 Element
Airspace Control Issuing Times		DIV A2C2 Element	S3 Air	P
ADA Locations and Coverage		ADA BN/Battery	ADA LNO	P, C

## FOUO

Information Required		Received From	Action Officer	Action Output
ADA Weapons Control Status	Requests	S3	ADA LNO	C, D DIV A2C2 Element
	Approvals & Modifications	DIV A2C2 Element	ADA LNO	P, D BN S3 Air
AD Warnings		DIV A2C2 Element Subordinate Units	ADA LNO	C, D DIV A2C2 Element BN S3 Air
Significant Planned and Ongoing Indirect Fires		DIV Arty DS Arty	FSO	P, C, D DIV A2C2 Element
Fire Support Coordinating Measures		DIV Arty DS Arty	FSO	P, C, D S3 Air
Field Artillery Locations		DIV Arty DS Arty	FSO	P, C, D DIV A2C2 Element
UAV Launch Sites		UAV Units	FSO	P, C, D DIV A2C2 Element
UAV Flight Routes		DIV A2C2 Element	S3 AIR	P, C
Army AVN Unit Locations		DIV A2C2 Element AVN Units	S3 AIR AVN LNO	P, C, D DIV A2C2 Element
Airborne Tactical Formations		AVN Units S3	S3 AIR AVN LNO	C
FARPs		DIV A2C2 Element AVN Unit	S3 AIR AVN LNO	P, C, D DIV A2C2 Element
AVN Battle Positions		AVN Unit	S3 AIR AVN LNO	P, C, D DIV A2C2 Element
Intelligence Summaries		S2	S3 Air	P, C
Friendly ECM Activities		S2 DIV A2C2 Element	S3 Air	P, C

Information Required		Received From	Action Officer	Action Output
Massed Enemy Aircraft Formations		DIV A2C2 Element ADA Units	S3 Air	C
A-Approval Arty-artillery AVN-aviation BDE-brigade BN-battalion C-Coordination		CAS-close air support D-Distribution DIV-division DS-direct ECM-electronic countermeasures FARP-forward arming and refueling point	NBC-nuclear, biological and chemical P-Planning Recon-reconnaissance SEMA-special electronic mission aircraft	
*Action/ouput assumes each A2C2 Element section passes information it obtains to its parent unit.				

*Battalion and Below* – Extensive aviation operations at battalion and below require AC2 coordination. Formal AC2 elements do not exist at this level; therefore, the BCT ADAM/BAE absorbs many of the necessary functions to minimize the AC2 workload on battalion company/platoon UAS operators. This does require that battalions actively coordinate with the BCT ADAM/BAE to ensure mission requests are processed as efficiently and expeditiously as possible.

The battalion/company level does have some responsibilities in performing appropriate AC2 tasks to ensure successful UAS operations such as track/monitor aviation operations to determine and resolve conflicts, submit all airspace requests to the ADAM/BAE, manage separation and frequencies of battalion and below UAS operations, provide preplanned UAS flight schedules for ATO/ACO cycle, and inform airspace users at each echelon of any communication loss during operations. Specific vertical coordination tasks for battalions appear in Table 10.

**Table 10. Battalion Staff Vertical Information Networking (FM 3-52 Aug 02)**

Information Required		Received From	Action Officer	Action/Output
OPORD or OPLAN (includes A2C2 annex)	Brigade	S3	S3 Air	P, C
	Battalion	S3	S3 Air	P, C



FOUO

Information Required		Received From	Action Officer	Action/Output
A2C2 Control Measures and Restrictions	Current	S3 Air	S3 Air	P, C
	Required	N/A	S3 Air	P, C, D BDE S3 Air
FLOT		S3	S3 Air	P, C
A2C2 Priorities (Army Only)		S3 BDE S3 Air	S3 Air	P, C
AD Warnings		BDE S3 Air	S3 Air	C
Sortie Allocation		BDE S3 Air	S3 Air	P
Air Support Requirements and Requests	Army Aviation Attack	Subordinate Units S3	S3 Air	C, D BDE S3 Air
	Airlift	S4/S3	S3 Air	C, D BDE S3 Air
	SEMA	S2/S3	S3 Air	C, D BDE S3 Air
	Air Forces CAS	S3	S3 Air ALO	C, D BDE S3 Air
	Recon	S2/S3	S3 Air ALO	C, D BDE S3 Air
	Airlift	S4/S3	S3 Air	C, D BDE S3 Air
Unscheduled, Large Formation Missions		BDE S3 Air	S3 Air	C
ADA Locations		ADA Unit	S3	C
ADA Weapons Control Status		S3	S3	C, D BDE
Significant Planned and Ongoing Indirect Fires		DIV Arty	FSO	C, D BDE S3 Air
Fire Support Coordinating Measures		DIV Arty DS Arty	FSO	C
Field Artillery Locations		DS Arty	FSO	C
Army AVN Unit Locations		AVN Units	S3 AIR	C, D BDE S3 Air
AVN Battle Positions		AVN Units	S3 AIR	C, D BDE S3 Air

FOUO

Information Required		Received From	Action Officer	Action/Output
A-Approval Arty-artillery AVN-aviation BDE-brigade C-Coordination	CAS-close air support D-Distribution DIV-division DS-direct support N/A-not applicable		P-Planning Recon-reconnaissance SEMA-special electronic mission aircraft	
*Action/output assumes each A2C2 Element section passes information it obtains to its parent unit.				

**UAS Communications**

4

Communications are one of the most important aspects of the tactical employment of UAS. Communications provide both capabilities and limitations to the UAS user, whether to control the UA, or to manage sensors and information flow. Users must be aware of enemy actions and environmental factors that can limit the effectiveness of UAS communications. For example, LOS ranges advertised for various UAS may not take into account LOS restrictions, environmental attenuation, or frequency congestion. Although UAS communication is near-real time, there are several factors that can induce substantial time errors between users and operators. For instance, every relay station that a signal passes through can cause up to a 1/2 second delay in reception which across multiple nodes may result in a several-seconds delay between the actual UA sensor action and what the end user might see.

*Frequency Management* – UAS operators/pilots should ensure they receive a brief from their communications officer specific to their AO. The following should be briefed:

- Frequency management coordination and deconfliction issue-Location of active IED jammers
- Means of communications/collaboration utilized in the AO
- Methods/means to access the collaborative tool(s)
- Frequency/communications card for the AO
- Contact information for the communications section

UAS frequency requirements for some current Man-portable, Tactical and Theater systems are provided in Table 11 to support employment planning.

**Table 11. UAS Frequency Requirements**

<b>UAS Frequency Requirements</b>					
	UA Control DL (P)	UA Control DL (S)	RVT2 (Type)	TADL/ TCDL	Video
<b>Man Portable</b>					
Desert Hawk	L-band LOS	NO		NO	L-band analog 1.71 – 1.85 GHz
Dragon Eye	L-band LOS	NO	Rover	NO	L-band analog 1.71 – 1.85 GHz

UAS Frequency Requirements					
Pointer	L-band LOS	NO	Rover	NO	L-band analog 1.71 – 1.85 GHz
Raven	L-band LOS	NO	One System RVT	NO	L-band analog 1.71 – 1.85 GHz
Silver Fox		NO		NO	
Tactical					
Hunter	C-band LOS	NO	One System RVT	Mode IIIC	C-band analog 4.4 – 5.85 GHz
IGNAT	C-band LOS SATCOM	NO	One System RVT	Mode IIIC	C-band analog 4.4 – 5.85 GHz
Pioneer	C-band LOS	UHF	Rover	Mode IIIC	C-band analog 4.4 – 5.85 GHz
Scan Eagle	L-band 900 MHz	NO			2.4 GHz
Shadow	S-Band LOS	NO	One Sys RVT	Mode IIIC	C-Band analog 4.4-5.85 Ghz
Theater					
Global Hawk	UHF (LOS) Ku-band SATCOM	NO	None	Mode IIIC Mode IV	X-band Ku-band INMARSAT
Predator/Warrior A	C-band (LOS) Ku-band SATCOM	NO	Rover	Mode IIIC Mode IV	C-band digital 5.25 – 5.85 GHz
Reaper	C-band (LOS) Ku-band SATCOM	NO	Rover	Mode IIIC Mode IV	C-band digital 5.25 – 5.85 GHz
1. GPS navigation available. 2. Many UAS display UA and sensor information on the RVT. This information can be helpful in confirming sensor target location, determining TLE confidence, or developing tactics in regard to noise and visual signature of the UA.					

*UAS Operations Standards* – Multiple levels of interoperability are feasible among different UA systems. The information provided in Table 12 provides levels of control that may be exercised in the direction and control of UAS operations. What those levels mean in terms of practical use to the BCT and battalion commander and staffs appears in Table 13.

**Table 12. UAS Levels of Interoperability (FM 3-04.15 Aug 06)**

<b>UAS Levels of Interoperability</b>	
Level 1	Indirect receipt/transmission of UA related payload data (Provided by other standards in the NIIA. STANAG 4586 not required.)
Level 2	Direct receipt of ISR/other data where “direct” covers reception of the UA payload data by the RVT when it has direct communication with the UA. (Provided by other standards in the NIIA. STANAG 4586 not required.)
Level 3	Control and monitoring of the UA payload in addition to direct receipt of ISR/other data. (Handover of sensor control as defined in STANAG 4586.)
Level 4	Control and monitoring of the UA, less launch and recovery. (Handover of UA control as defined in STANAG 4586.)
Level 5	Control and monitoring of the UA (Level 4) plus launch and recovery functions
Note: Table based on OSD UAS Roadmap 2005-2030	

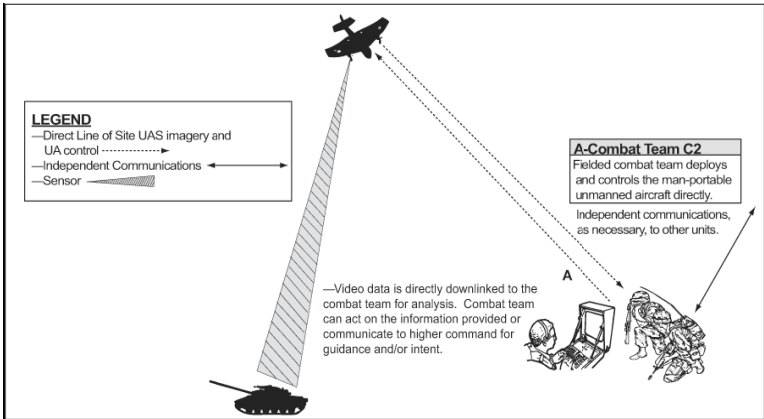
**Table 13. UAS Levels of Access and Control Attributes (FM 3-04.15 Aug 06)**

<b>UAS Levels of Access and Control Attributes</b>		
	<b>Capability of Access and Control</b>	<b>Comments</b>
Level 1	User receives UAS data from GCS or intelligence sources.	Intelligence filtering or processing may delay delivery of imagery and data.
Level 2	User receives UAS data directly or imagery data via RVT, UAS video monitor.	Level 2 interaction involves the direct receipt and display of imagery and data from the UA or its supporting satellite through a user-located data link without filtering or processing at another location.

<b>UAS Levels of Access and Control Attributes</b>		
	<b>Capability of Access and Control</b>	<b>Comments</b>
Level 3	User takes over control of UAV payload.	Level 3 interaction involves control of the UA payload separate from control of the UA. Some RVTs may permit this.
Level 4	User takes over control of UAV flight path control and payload control.	Generally not a common practice or a capability available to the end user.
Level 5	User takes over control of UAV launch/recovery, flight path control and payload control.	Generally not a common practice or a capability available to the end user. Man-portable

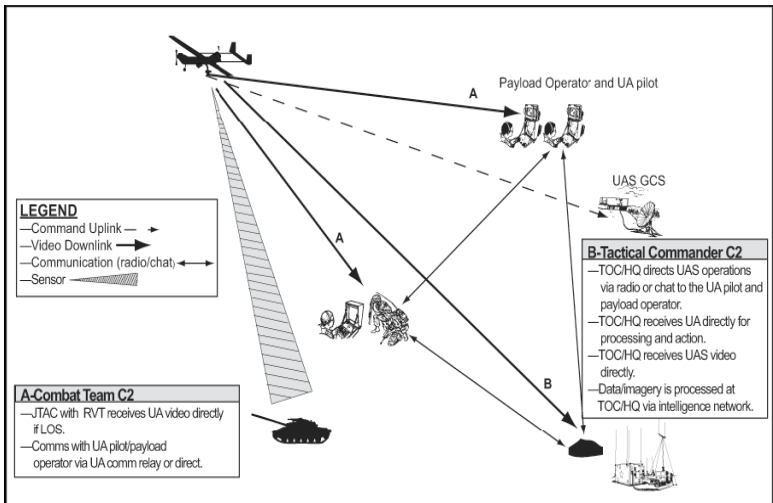
*Command and Control (C2) Options* – For the purposes of C2 issues supporting and integrating UAS, they are categorized as man-portable, tactical and theater. All participants should understand the communication, chat, video and data links and how they support or interact in the mission. The best employment is usually achieved by pushing the UAS video to lowest end user and not always via a C2/TOC/HQ. This necessitates UAS familiarity, training, and proficiency of the end user(s) and the commander's confidence in personnel proficiency and in UAS system utility.

Man-portable UAS – Small, self-contained and portable. Usually operate below the coordinating altitude. Their use supports the small ground forces and generally controlled by a single individual who also views the sensor images/FMV on a small laptop-type computer. Limited to LOS. A generalized schematic for the C2 of man-portable UAS is depicted in Figure 16.



**Figure 16. Man-portable UAS C2 (FM 3-04.15 Aug 06)**

*Tactical UAS* – are larger systems that support maneuver commanders at various tactical levels of command and can also support the small combat teams when so employed. Data products can expand beyond FMV and can be disseminated to combat teams real time via OSRVT/Rover and/or distributed among supported tactical command elements. Data processing may occur within the UAS unit or be forwarded to an intelligence support unit. Communications may be limited to LOS or via UA if communication relay capable. A generalized schematic for the C2 of tactical level UAS is depicted in Figure 17.



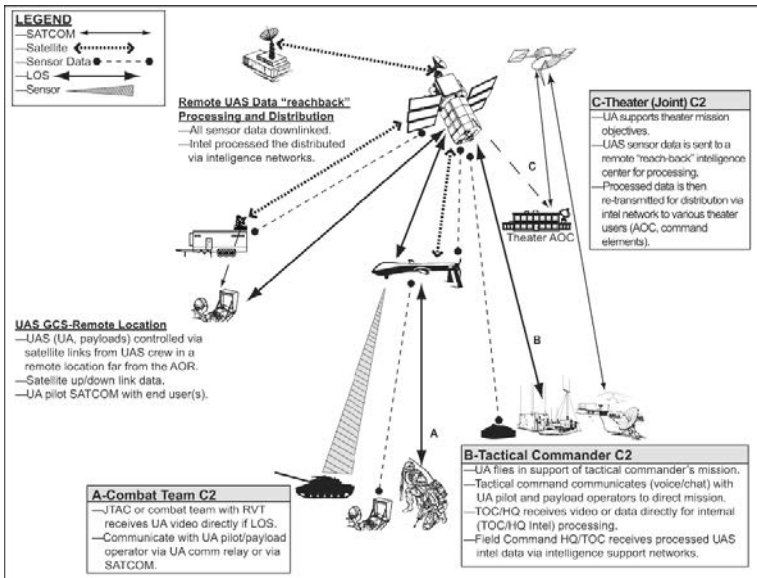
**Figure 17. Tactical UAS C2 (FM 3-04.15 Aug 06)**

*Theater UAS* – theater UAS are generally deployed to support theater-wide requirements. Theater UAS permit varied support to combat team and subordinate tactical command levels depending on the type of UAS.

Theater UAS characteristics include:

- Theater UAS design and robust C2 architecture permit split-site operations. Specifically, the UA can be deployed to theater while mission C2 and data collection, processing and dissemination is conducted outside of theater of operations under "reachback" conduits.
- More capable payloads permit more diverse data products that are generally produced in greater volume and scope.
- Data processing is supported by specialized intelligence units via "reach back" connectivity and/or locally at the theater level.
- Data products are disseminated via direct links or supporting intelligence networks.
- Communication architecture is the most robust and may include some or all of supported command elements, combat teams, UAS units, and intelligence units.

A generalized schematic for the C2 of theater level UAS is depicted in Figure 18.



**Figure 18. Theater UAS C2 (FM 3-04.15 Aug 06)**

*UAS Collaborative Environment* – The effective employment of UAS in direct response to supported unit requirements is enhanced via a well defined and constantly improving collaborative environment. The



collaborative environment tools such as info work space (IWS) and internet relay chat (mIRC) coordinate the direct tasking and distribution of information of UAS assets. The creation and restriction of access to the collaborative “group” designated for tasking the actions of the UAS asset is directed by the controlling commander to ensure the orderly execution of the mission.

### Jabber/Chat

#### NIPR/DCO CHAT

- 1) Establish a DCO account on <https://www.dco.dod.mil/>
- 2) Logon (CAC or username/password)
- 3) Select public meetings on left column
- 4) Type in JUAS Chat for search entry (upper right of web page)
- 5) Select chat room from list
- 6) Chat box located on left. (Also has the capability for voice communication and to share data/products)

### Communication Brevity Codes

Although commonly used in the coordinated employment of other assets, communications brevity codes for UAS OSRVT/Rover have not yet been completely standardized across the Services. Many current communications brevity and aviation brevity codes apply to UA operations and should be used when applicable. A few of the most commonly used and important brevity codes for employing UAS is shown in Table 14.

**Table 14. Multi-Service and Schoolhouse Brevity Codes (FM 3-04.15 Aug 06)**

Multi-Service and Schoolhouse Brevity Codes		
Multi-Service Brevity Definition		ROVER A/G School Definition
Link-16 Air Control Network Participant Group initiation between air control unit and controlled aircraft.		Indicates that video signal/data link with OSRVT/Rover and UA are established and working.
HOLLOW	Data link message not received. Lost full motion video signal or data to OSRVT/Rover.	Lost video signal/data link between UA and OSRVT/Rover.

Multi-Service and Schoolhouse Brevity Codes		
EXPECT HOLLOW	A condition will likely exist that limits OSRVT/Rover reception (maneuvers, terrain, etc.).	Preparatory call from UA pilot/sensor operator that a condition will likely exist or will happen that may disrupt the signal/data link between the OSRVT/Rover and the UA due to masking from terrain, building in an urban environment, or during maneuvering of the UA for a weapons launch or repositioning for other tasking.
SWITCH CAMERA	Switch the setting on the referenced item. Switch full motion video to EO or IR.	Request to the sensor operator from the OSRVT/Rover operator to change cameras/sensor from one type to another. Example would be going from EO to IR or SAR.
SWITCH POLARITY	Switch the setting on the referenced item. Switch IR polarity to black hot or white hot.	Request from OSRVT/Rover operator to UA pilot/sensor operator to change the IR sensor from white hot to black hot or vice versa.
ZOOM (in/out)	Increase/decrease the sensor's focal length. Note: —Zom in/out" is normally followed by —,12, 3, or 4" to indicate the number of fields of view (FOV) to change,	Request from OSRVT/Rover operator to the sensor operator to change the field of view. The ZOOM command is given with a number, attached to it. The 1, 2, 3, or 4 indicates the FOV change the OSRVT/Rover operator wants. Note: It is recommended only one change at a time in or out be used for the FMV.

<b>Multi-Service and Schoolhouse Brevity Codes</b>		
SLEW (left/right/ up/down)	N/A	Request from the OSRVT/Rover operator to the UA pilot/sensor operator to slew the sensors in a direction/ distance around the target/area of interest. The cursor or screen size can be used as a yardstick for the distance to move the sensor. Clock positions can also be used for direction.
SET	Set (or have set) a particular speed. May be in knots/indicated or in Mach.	Informative/prep call from the UA pilot/sensor operator to the OSRVT/Rover operator indicating that the sensor is no longer slewing.
STAKE	Reference point for A/S targeting operations. A full motion video system mark has been set and is used as a frame of reference.	A video system mark has been set and is used as a point of reference. Works the same as a target reference point (TRP) or anchor point.
CAPTURE(D) <sup>1</sup>	Specified surface target/object has been acquired and is being tracked with an onboard sensor.	A call from the UA sensor operator or the OSRVT/Rover operator that the target or point of interest is located and being tracked by the sensor. This is also used by manned aircraft with sensor pods such as LITENING or LANTIRN.
CHECK CAPTURE	Target appears to be no longer tracked by sensor.	Informative call from the OSRVT/Rover operator to the RPA pilot/sensor operator that the sensor is no longer on the target or point of interest.
CHECK FOCUS	Sensor image appears to be out of focus.	An informative call or a request from the OSRVT/Rover operator to the RPA pilot/sensor operator to focus the sensor.

<b>Multi-Service and Schoolhouse Brevity Codes</b>		
SHADOW	Follow indicated target.	A request from the OSRVT/Rover operator to the RPA pilot/sensor operator to maintain a track on a specific target or point of interest. These may be moving targets
CYCLOPS	Any unmanned aircraft	N/A
DEADEYE	Laser inoperative.	Information call by an airborne laser designator indicating the laser system is inoperative.
DIRTY	Link is not encrypted.	N/A
FLASHLIGHT	N/A	Directive term for helicopter to turn on IR floodlight (pointed at ground to aid visual acquisition by escort aircraft).
HANDSHAKE	Full motion video signal and data operative to ROVER.	Link 16 Air Control NPG initiation between air control unit and controlled aircraft.
LOOKING	N/A	Aircrew does not have the ground object, reference point, target in sight (opposite of CONTACT).
PLAYTIME	ONE PLUS THIRTY equals one hour and thirty minutes.	Amount of time aircraft can remain on station, given in hours plus minutes.
RIFLE	Friendly air-to-surface missile launch.	N/A
SAM	Surface-to-air missile.	N/A

<b>Multi-Service and Schoolhouse Brevity Codes</b>		
SCRAM	Danger	Friendly asset is in immediate danger; withdraw clear in the direction indicated for survival; no further mission support from the friendly asset is expected.
SHIFT	Change	Directive to shift laser/IR/radar/device energy.
SHOPPING	N/A	An aircraft request to FAC/JTAC/C2 platform for the target.
SNAKE	Directive	Directive call to oscillate an IR pointer about a target.
SPARKLE	N/A	Target marketing by IR pointer or by gunship/forward air control airborne (FAC-A) using incendiary rounds.
SPOT	N/A	Acquisition of laser designation.
STARE	Directive	Call to cue the targeting pod and enable the laser spot search (LSS) function on the specified laser code in relation to the specified reference point; reference point may include the following: INS steer point, GEOREF, bearing and range, data link point or laser mark.
TALLY	N/A	Sighting of a target, non-friendly aircraft, landmark, or enemy position; opposite of NO JOY.

**Multi-Service and Schoolhouse Brevity Codes**

<sup>1</sup> JP 1-02 cites the term "missing" which includes the definition for "captured" with the following definition: "The casualty has been seized as the result of action of an unfriendly military or paramilitary force in a foreign country." Caution: Do not confuse this term with the brevity code, captured.

<sup>2</sup> JP 1-02 cites the term "shadowing" with the following definition: "To observe and maintain contact (not necessarily continuously) with a unit or force." Caution: Do not confuse this term with the brevity code, shadow.

## UAS Characteristics



Group	MDS	Name	Mission	Speed		Altitude (ft)	
				Max	Cruise	Max (MSL)	Mission (AGL)
4	MQ-1B	Predator	Multi	118	70	25,000	15,000
4	MQ-1C	Warrior A	Multi	150	60-75	25,000	8k-20k
4	MQ-5B	Hunter	RTSA	110	70	18,000	3k-15k
4	MQ-8	Fire Scout	RTSA	117	60	20,000	TBD
5	RQ-4B	Global Hawk	Multi	340	310	65,000	30-45k
5	MQ-9	Reaper	Attack	225	200	45,000	TBD
5	RQ-4N	BAMS	Maritime ISR	TBD	TBD	TBD	TBD
3	RQ-7B	Shadow	RTSA	110	70	15,000	6k-8k

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Group	MDS	Name	Payload							
			EO Camera	IO Camera	FMV Capable	RVT Capable	LRF/ID	IR Pointer	SAR	
4	MQ-1B	Predator	X	X	X	X	X	X	X	X
4	MQ-1C	Warrior A	X	X	X	X	X	X	X	X
4	MQ-5B	Hunter	X	X	X	X	X	X		
4	MQ-8	Fire Scout	X	X				X	X	
5	RQ-4B	Global Hawk	X	X	X	X	X			X
5	MQ-9	Reaper	X	X	X	X	X	X	X	X
5	RQ-4N	BAMS	X	X						
3	RQ-7B	Shadow	X	X	X	X	X		X	



Table 15. UAS C2 System Information

 <b>ROVER – OSRVT Comparison</b> 					
<i>Dominant Air Power: Design For Tomorrow...Deliver Today</i>					
Capability	eROVER III	ROVER 4	ROVER 5	OSRVT <sup>1</sup>	ROVER 6
Autoscan RF Spectrum	C, L, Ku	C, L, Ku, S	C, L, Ku, S, UHF <sup>2</sup>	C, L, Ku, S, UHF <sup>2</sup>	C, L, Ku, S, UHF
Receives Full Motion Video in: Analog MPEG-2 H.261 MPEG-4 (Part II) H.264 DDL BE-CDL	X X X X X	X X X X X <sup>3</sup>	X X X X X	X X X X <sup>3</sup> X <sup>3</sup>	X X X X X X
Receives/Displays Metadata from Airborne Assets	KLV	KLV	KLV	KLV / Multiple Proprietary Formats	KLV
Moving Maps – FalconView	None <sup>4</sup>	None <sup>4</sup>	None <sup>4</sup>	X	None <sup>4</sup>
Incoming Metadata link directly to moving map (FalconView)	None <sup>4</sup>	None <sup>4</sup>	None <sup>4</sup>	X	None <sup>4</sup>
Extended Range Antennas	None <sup>5</sup>	None <sup>5</sup>	None <sup>5</sup>	C/L/Ku-band	None <sup>5</sup>
Encryption	Triple DES, AES <sup>3</sup>	Triple DES, AES <sup>3</sup>	NSA Type I, Triple DES, AES	Triple DES, AES <sup>3</sup>	NSA Type I, Triple DES, AES
Transmit Capability	None	None	C, L, Ku, S, UHF <sup>2</sup>	None	C, L, Ku, S, UHF <sup>2</sup>

<sup>1</sup> OSRVT path forward in FY11 will retrofit to ROVER 6, adding all listed capabilities  
<sup>2</sup> UHF capability in ROVER 5 is not same waveform as Shadow UHF on OSRVT  
<sup>3</sup> Require software upgrades – expected release to field: AES H.264 in Feb 10, DDL in 3QFY11  
<sup>4</sup> Not organic to base system. Requires user added FalconView, map link software, and connection to laptop  
<sup>5</sup> L-3 investigating extended range antenna application for use on eROVERIII/ROVER 4/ROVER 5/ROVER 6



## UAS Mission Planning Checklist

6

<b>Duty assignments:</b>	
	Authorized MOSs on-hand
	Critical MOSs identified and on-hand
	Additional personnel necessary for 24-hour operations (if commander directed)
<b>Enemy situation:</b>	
	Unit/order of battle (OB)/uniforms
	Battalion/company locations plotted on map
	Strengths/weaknesses
	Most probable COA
	Most dangerous COA
	ADA threat (for each weapon system)
	System Location plotted on map
	Maximum/minimum range (threat rings plotted on map)
	Minimum engagement altitude
	Strengths
	Weaknesses
	How to defeat
	Night vision capability
	EW threat
	Meaconing, interference, jamming, and intrusion (MIJI) of UAS uplink/downlink
	CBRN threat
	UA should avoid CBRN presence
	Place M9 paper on UA
<b>Friendly situation:</b>	
	Brigade mission/intent
	Battalion mission/intent
	Maps or imagery of operating area
	Friendly unit location (brigade headquarters plotted on map)
	Friendly graphics posted on map
	UAS readiness status
	Supported unit task/purpose
	Adjacent unit task/purpose
	Abort criteria
	Other UAS units task/purpose
	Other UAS units graphics posted on map
	Army aviation/friendly scheme of maneuver
	ROE GCS/GCU and L/R site security
	Additional UAS equipment necessary for 24-hour operations (if commander directed)
	Evaluate all specified tasks from:

	OPORD
	WARNOs
	FRAGOs
	Verify ACO, ATO, SPINS requirements
	ROZ/ROA locations/dimensions/frequency/call signs
	Artillery position area locations plotted
	Active routes/airspace control points (ACPs) plotted
	Verify method of airspace control
	Positive control measures
	Procedural control measures
	Verify H-hour time
	Spare UA procedures
	Emergency procedures
	Downed UA recovery plan
	Weather (WX) decision time
<b>Mission planning:</b>	
	Sensor selection (if not dual selectable)
	EO and IR imagery payload for day/night operations
	EO or IR (Raven only)
	Map reconnaissance of mission area
	Identify terrain that will interfere with LOS data link
	NAIs
	Grids defining NAIs
	Heading and distance to NAI from launch point
	Heading and distance between NAIs
	Identify/mark natural and manmade hazards to flight
	Local hazards
	Sectionals
	Alternate route (ingress and egress)
	Threat plotted along route
	Weather
	Clouds
	Precipitation
	Wind
	Visibility
	Temperature
	Illumination
	Flight route outside threat engagement rings
	Route time
	Loiter time
	Verify grids
	Check all altitudes, azimuths, and distances
	Times submitted to higher headquarters
	Waypoint card printed
	Air control points plotted on map
	Primary/alternate routes plotted on map

	Contingency actions	
	Fuel planning:	
	Availability and on-hand stock age of AVGAS/MOGAS	
	Availability and on-hand stock age of batteries (Raven only)	
	BB-390	
	BA-5590	
	Availability and on-hand stock age of ammunition	
	Estimated fuel burn rate	
	Estimated battery usage rate (Raven only)	
	Minimum fuel at departure	
	Bingo fuel	
	Communication plan:	
	Flight operations	
	TOCs, command nets	
	Air battle net	
	Fire support coordinator (FSCOORD) net	
	Administrative and Logistics Operations Center (ALOC) net	
	ATC (airfields, approach, and others)	
	ROZ/ROA	
	LOS characteristics of terrain (UA limits of operation based on LOS data link)	
	Hunter	125 km (200 km with second Hunter as airborne relay)
	Shadow	50 km
	Raven	10 km
	Contingency actions	
	Frequency compromise	
	COMSEC compromise	
	Emergency procedures for loss of signal	
	Communication frequency bandwidth of UAS operation	
	Frequency management	
	OPSEC requirements	
	EW considerations to include friendly communication interference	
	Packet/card/map preparation	
	Enemy graphics	
	Friendly graphics	
	ROZ graphics	
	Flight routes	
	Crew card	
	Time flow	
	Mission sequence	
	Waypoint card	
	Rehearsal setup	



## Joint Tactical Air Strike Request (DD Form 1972)

7

1. UNIT CALLED _____		REQUEST NUMBER _____		SENT	
				TIME _____	BY _____
2. PREPLANNED: _____		PRECEDENCE _____		PRIORITY _____	
IMMEDIATE: _____		PRIORITY _____		RECEIVED	
				TIME _____	BY _____
3. TARGET IS/NUMBER OF					
A PERS IN OPEN _____		B PERS DUG IN _____		C WPNS/IMG/RR/AT _____	
D MORTARS, ARTY _____		E AAA ADA _____		F RKT MISSILE _____	
G ARMOR _____		H VEHICLES _____		I BLDGS _____	
J BRIDGES _____		K PILLBOX, BUNKERS _____		L SUPPLIES, EQUIP _____	
M CENTER (CP, COM) _____		N AREA _____		O ROUTE _____	
P MOVING N E S W _____		Q REMARKS _____			
4. TARGET LOCATION IS _____					
A _____		B _____		CHECKED	
(COORDINATES)		(COORDINATES)		BY _____	
E TGT ELEV _____		F SHEET NO. _____		G SERIES _____	
				H CHART NO. _____	
5. TARGET TIME/DATE					
A ASAP _____		B NLT _____		C AT _____	
				D TO _____	
6. DESIRED ORD/RESULTS					
A ORDNANCE _____		B DESTROY _____		C NEUTRALIZE _____	
				D HARASS/INTERDICT _____	
7. FINAL CONTROL					
A FAC/RABFAC _____		B CALL SIGN _____		C FREQ _____	
D CONT PT _____					
8. REMARKS					
1. P _____			9. EGRESS _____		
2. HDNG _____ MAG _____ OFFSET: L/R _____					
3. DISTANCE _____			THE FOLLOWING MAY BE INCLUDED IN THE "REMARKS",		
4. TGT ELEVATION _____ FEET MSL			IF REQUIRED.		
5. TGT DESCRIPTION _____			BCN-TGT _____ MAG _____ BCN GRID _____		
6. TGT LOCATION _____			BCT-TGT _____ METERS _____ TGT GRID _____		
7. MARK TYPE _____ CODE _____			BCN ELEVATION _____ FEET MSL		
8. FRIENDLIES _____					
SECTION II - COORDINATION					
9. NSFS _____		10. ARTY _____		11. AIOIG-2IG-3 _____	
12. REQUEST		13. BY _____		14. REASON FOR DISAPPROVAL _____	
<input type="checkbox"/> APPROVED					
<input type="checkbox"/> DISAPPROVED					
15. RESTRICTIVE FIRE/AIR PLAN		16. IS IN EFFECT			
A IS NOT IN EFFECT _____		B NUMBER _____		A (FROM TIME) _____	
				B (TO TIME) _____	
17. LOCATION		18. WIDTH (METERS)		19. ALTITUDE/VERTEX	
A _____		B _____		A (MAX VERTEX) _____	
(FROM COORDINATES)		(TO COORDINATES)		B (MINIMUM) _____	
SECTION III - MISSION DATA					
20. MISSION NUMBER _____		21. CALL SIGN _____		22. NO. AND TYPE AIRCRAFT _____	
23. ORDNANCE _____					
24. EST/ALT TAKEOFF _____		25. EST TOT _____		26. CONT PT (COORDS) _____	
				27. INITIAL CONTACT _____	
28. FAC/FAC(A)/TAC(A) CALL SIGN/FREQ _____		29. AIRSPACE COORDINATION AREA _____		30. TGT DESCRIPTION _____	
				*31. TGT COORD/ELEV _____	
32. BATTLE DAMAGE ASSESSMENT (BDA) REPORT (USMTF INFLTREP)					
LINE 1/CALL SIGN _____		LINE 4/LOCATION _____		*TRANSMIT AS APPROPRIATE	
LINE 2/MSN NUMBER _____		LINE 5/TOT _____			
LINE 3/REQ NUMBER _____		LINE 6/RESULTS _____			
		REMARKS _____			

DD FORM 1972, JUL 2001

PREVIOUS EDITION MAY BE USED.

Reset

## Section I – Mission Request

## Line 1. (Identification)

UNIT CALLED. Identifies the unit designation/call sign/pre-assigned number.

REQUEST NUMBER. For preplanned missions, indicates the originator's request number in series. For an immediate mission, this number is assigned by the ASOC/DASC.

SENT. Indicates the time and the individual who transmitted the request.

Line 2. (Mission categories)PREPLANNED: For preplanned requests, enter precedence (block A) or priority (block B).

A. PRECEDENCE is stated numerically in descending order of importance, as determined by the requestor.

B. PRIORITY is expressed as shown below.

IMMEDIATE:

C. PRIORITY For immediate requests, enter priority (block C). A precedence entry is not required for immediate requests because, by definition, all immediate requests are precedence #1. Use the numerical designation below to determine priority (e.g., define the tactical situation) for preplanned (block B) or immediate (block C):

1. Emergency. Targets that require immediate action and supersede all other categories of mission priority.

2. Priority. Targets that require immediate action and supersede routine targets.

3. Routine. Targets of opportunity. Targets which do not demand urgency in execution.

RECEIVED, indicates the time and the individual who received the request.

Line 3. TARGET IS/NUMBER OF. Describes the type, approximate size, and mobility of the target to be attacked. It is necessary to specify, even if a rough estimate, the number of targets (e.g., 10 tanks) or the size of the target area (e.g., personnel on a 500 meter front). Otherwise planners cannot accurately determine what force is required — aircraft numbers/type and ordnance amount/type.

Line 4. TARGET LOCATION IS. Locates the target by using the military grid reference system prescribed for the area concerned.

A. COORDINATES. Locates a point target or starting point

B. COORDINATES. When used together with A, provides from A to B coordinates.

C. COORDINATES. When used together with A and B, provides a route.

D. COORDINATES. When used together with A through C, provides a route or describes a target area.

E. TARGET ELEV. Target elevation in feet above sea level.

F. SHEET NO. Self-explanatory.

G. SERIES. Self-explanatory.

H. CHART NO. Self-explanatory. CHECKED. Indicates with whom target information has been crosschecked.

Line 5. TARGET TIME/DATE. Indicates the time/date when the air strike is requested.

A. ASAP As soon as possible.

B. NLT The target is to be attacked before, but not later than the time indicated.

C. AT Indicates time at which target is to be attacked.

D. TO Denotes end of period of time in which support such as airborne alert or column cover is required. When D is used, C and B are unnecessary.



Line 6. DESIRED ORD/RESULTS. Indicates the requestor's desired air strike results. This is essential information for the planner and must be carefully considered by the requestor.

- A. ORDNANCE Desired ordnance.
- B. DESTROY Self-explanatory.
- C. NEUTRALIZE Self-explanatory.
- D. HARASS/INTERDICT Self-explanatory.

Line 7. FINAL CONTROL. Identifies the final controller (e.g., JTAC, FAC [A]) who will conduct the briefing and control the release of ordnance.

- A. FAC Transmit the type of terminal control.
- B. CALL SIGN Call sign of terminal controller.
- C. FREQ Recommended TAD frequency.
- D. FIX/CONT PT Military grid coordinates and/or navigational aid fix of a control point which is the furthest limit of an attack aircraft's route of flight prior to control by the final controller.

Line 8. REMARKS Allows incorporation of briefing information not included elsewhere in the request. Enter data of the standard 9-line CAS brief.

#### Section II – Coordination

Line 9. NSFS Naval surface fire support coordination.

Line 10. ARTY Artillery coordination.

Line 11. AIO/G-2/G-3 Air Intelligence Officer, G-2, G-3, or other Service equivalent coordination.

Line 12. REQUEST Indicates the approval or disapproval of the request.

Line 13. BY Indicates the individual who approved or disapproved the request

Line 14. REASON FOR DISAPPROVAL Self-explanatory.

Line 15. RESTRICTIVE FIRE/AIR PLAN The ACA establishes airspace that is reasonably safe from friendly surface-delivered non-nuclear fires. The ACA provides a warning to aircrew of the parameters of surface-delivered fire in a specific area. A plan number or code name is issued, as appropriate.

Line 16. IS IN EFFECT Establishes the time period that the applicable ACA plan will be in effect.

Line 17. LOCATION Grid coordinates of the start/end points of the ACA's centerline.

Line 18. WIDTH (METERS) Defines ACA from either side of the centerline.

Line 19. ALTITUDE/VERTEX ACA altitude given in feet above MSL.

#### Section III – Mission Data

NOTE: Mission data information transmitted to the requesting agency may be limited to those items not included in the request.

Line 20. MISSION NUMBER Self-explanatory.

Line 21. CALL SIGN Self-explanatory.

Line 22. NO. AND TYPE AIRCRAFT Self-explanatory.

Line 23. ORDNANCE Type of ordnance either by code number or actual nomenclature.

Line 24. EST/ACT TAKEOFF Estimated or actual time the mission aircraft will take off.

Line 25. EST TOT Estimated time on target.

Line 26. CONT PT (COORDS) The farthest limit of the attack aircraft's route of flight prior to control by the final controller. Same as Line 7, item D, when designated in the request.

Line 27. INITIAL CONTACT Indicates the initial control agency the flight is to contact.

Line 28. FAC/FAC(A)/TAC(A) CALL SIGN/FREQ Call sign and frequency of the final control agency.

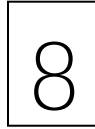
Line 29. AIRSPACE COORDINATION AREA Refer to lines 15 through 19 for this data.

Line 30. TGT DESCRIPTION Self-explanatory.

Line 31. TGT COORD/ELEV Self-explanatory.

Line 32. BATTLE DAMAGE ASSESSMENT (BDA) REPORT (USMTF INFLTREP) This optional space is used to record BDA for each mission.

## Operations Employing UAS



### Mission Category 1: Conduct Defensive Operations

Defensive operations are conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability operations. The defense alone normally cannot achieve a decision. However, it can create conditions for a counteroffensive that allows forces to regain the initiative. Defensive operations can also establish a protective barrier behind which stability operations can progress. Defensive operations counter enemy offensive operations. They defeat attacks, destroying as much of the attacking enemy force as possible. They also preserve control over land, resources, and populations. Defensive operations retain terrain, guard populations, and protect critical capabilities. They can be used to gain valuable time and economize forces to allow execution of offensive tasks elsewhere.

This section allows the Supported unit to understand how to incorporate and better use available UAS assets to accomplish operational missions. This will also allow the Supporting UAS element to understand how their tasks should properly fit into the execution of the maneuver unit's tasks. It is intended to help each unit (Supported and Supporting) better understand what information the other needs to execute their respective missions. It should also be noted that no distinction is made between organic and non-organic UAS support. Supported unit commanders should consider unique coordination and planning requirements that will have to be met, depending on UAS group type, and supporting unit or source.

This section addresses those defensive operations collective tasks most commonly associated with ground maneuver units. At the Brigade Combat Team and subordinate maneuver battalion levels, the general set of collective tasks applicable to defensive operations includes:

- Coordinate Air-Ground Integration (AGI) and Close Combat Attack (CCA)
- Conduct a Defense
- Conduct a Delay
- Conduct a Passage of Lines as a Passing Unit
- Control a Passage of Lines as a Stationary Unit
- Conduct a Deliberate Relief in Place
- Conduct Mobility, Countermobility, and Survivability Operations
- Synchronize Close Air Support (CAS)
- Implement the Intelligence, Surveillance, and Reconnaissance (ISR) Plan
- Coordinate Army Airspace Command and Control (A2C2)
- Conduct Area Security Operations

- Employ Fires and Effects
- Conduct a Guard Mission
- Conduct a Screen
- Conduct Zone / Area Reconnaissance
- Conduct Lines of Communication Security
- Conduct Convoy Security Operations

*Appendix G provides an outline of high level tasks integrated with for the planning, preparation, execution and post-mission analysis*

**General Defensive Operations Scenario** – A notional scenario is presented and decomposed to the major activities and considerations of primary interest at the BCT/BN levels of command. These are grouped into five categories roughly corresponding to the phases of a defensive operation. These phases are: Planning; Preparation; Execution; Post-mission; and Assessment. The generally sequential nature of the first four phases is supported to a great extent by the Assessment phase that is widely recognized as continuous in nature. Each phase generally describes the major activities being conducted, with emphasis on opportunities for command and staff consideration for the appropriate employment of UAS support.

**Scenario** — A Heavy Brigade Combat Team (HBCT) is directed to conduct defensive operations as part of a higher echelon area defense mission. The HBCT mission is to conduct a defense in depth, denying the enemy force access to designated terrain for a specific time rather than destroying the enemy outright. The commander's intent is to conduct the mission by establishing the defense using a combination of static defensive positions, engagement areas, and small, mobile reserves to retain ground. To support this complex mission, the commander directs his staff and subordinate commanders to ensure all plans emphasize effective and flexible control, synchronization and distribution of fires. The brigade is organized with Ravens (Group 1 UAS), a Shadow Platoon (Group 3 UAS), and has been provided an armed Predator (Group 4 UAS) for combat air patrol (CAP) support. The Shadow platoon GCSs are co-located with the HBCT TOC and their full motion video (FMV) feeds directly into the HBCT Maneuver Control Station (MCS). Each of the subordinate battalions receives the FMV feed via OSRVT and chat with the aircrews via mIRC.

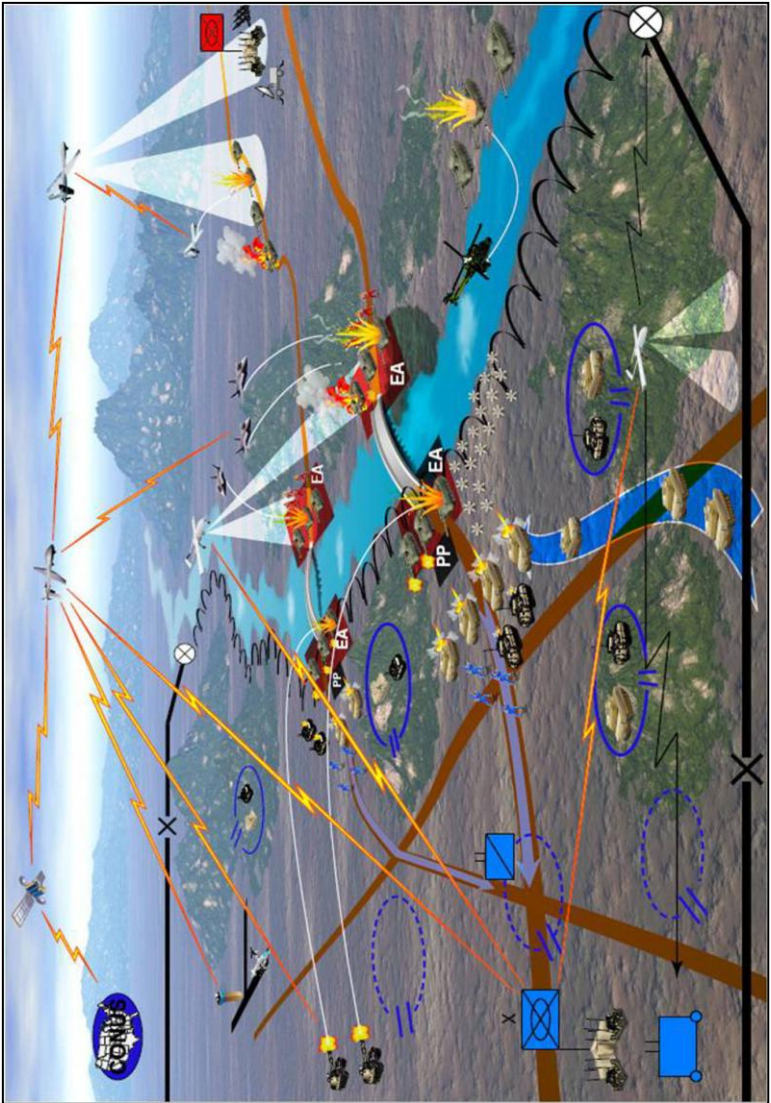


**Figure 19. Defensive Operations - Planning**

*Planning* – The critical planning piece for both maneuver and fire support during defensive operations is Engagement Area (EA) development. The BCT Commander initiates planning to determine likely enemy avenues of approach, likely enemy schemes of maneuver, where to kill the enemy, integration of obstacles, unit positioning, and integration of indirect fires, and he assigns missions to assigned, attached, and other supporting units accordingly. Defensive planning measures are taken to ensure the retention of flexibility, which also requires that the commander "see" the battlefield to detect the enemy's

scheme of maneuver early. Planning activities also include measures to ensure supporting UAS elements are integrated with ground ISR assets, and synchronized with other aviation assets to provide complementary and coordinated capability to mass fires and reduce fratricide. UAS assets are also used during the planning process to help visualize the battlespace, site obstacles, identify key terrain and deadspace, support initial security area missions forward of the Main Battle Area (MBA), and may also provide local security forward and on the flanks during preparatory activities.

*Preparation* – The BCT uses the preparation time available to build the strongest defense possible and refining counterattack plans. Commanders and staffs supervise and assess unit preparations while continuing to maintain situational awareness of developments in the AO. ISR and security operations are aggressively conducted while units occupy their assigned initial positions and rehearse their defensive actions. The first priority in the defense is to establish security. Employment of patrols, establishment of OPs, skillful use of UAS and sensors, and effective use of the terrain to conceal dispositions are essential for effective security. As units move into their assigned AOs and occupy positions as directed by the BCT's movement plan, the BCT commander and staff will monitor and deconflict any problems with ISR efforts. The BCT may also have to make minor adjustments to AOs, EAs, BPs, and other defensive coordination measures based on unanticipated METT-TC conditions the occupying units encounter as they begin preparing the defense. If METT-TC permits, the BCT should rehearse its defense, and incorporate all supporting assets to the maximum extent possible. Units should rehearse moving from hide positions to primary position, from primary to supplementary positions, and from primary to alternate positions. These rehearsals help establish the time required for movement under different environmental conditions and ensure that all combat power multipliers are completely integrated into the defensive scheme of maneuver.



**Figure 20. Defensive Operations - Attack**

*Execution* – During execution, the commander employs UAS in support of security area and main battle area missions. UAS missions and actions in the security area predominantly support the ground force focus on reconnaissance, counter-reconnaissance, target acquisition, reporting, delay of the enemy main body, and battle handover. This may include employment of UAS in close combat attack in coordination with other aviation assets or in synchronized execution with ground force

direct and indirect fires. The HBCT's security area forces must integrate their actions with any friendly forces forward of them, maintaining information flow and security. The brigade's elements may also have to execute battle handover with those forward elements and assist them in executing a rearward passage through the security and main battle area positions. During the security area fight, UAS support the commander by providing essential information necessary for him to make critical decisions: initiate and employ fires against enemy formations; modify or adjust the defensive plan; execute situational obstacles; direct withdrawal of forward security forces; and order commitment of the reserve, counterattack, or both.

During the MBA engagement, the BCT and CABs shift combat power and priority of fires to defeat the enemy's attack. All brigade efforts are applied to employ forward forces, obstacles, and fires within the MBA to break the enemy's momentum, reduce his numerical advantage, and force his troops into positions of vulnerability. The BCT accomplishes this primarily through massing of fires (direct and indirect) to destroy attacking enemy forces as they enter the EAs. UAS missions perform two unique supporting roles during this phase. The first is by conducting direct attack as part of the commander's available combat power, including the employment of UAS in support of direct and indirect fire engagements. The second role supports ISR and C2 support missions that allow the commander to take action to adjust subordinate unit boundaries and missions; reposition forces; shift the main effort; commit the reserve; or modify the original plan. Effective UAS employment is key to maintaining cohesion of the defensive effort, and can be used to support tactical crosstalk among subordinates and continual tracking and digital reporting of the enemy. This allows all staff and commanders to continually assess the enemy's options and movement while identifying means to defeat them. UAS also can support cohesive and coordinated efforts during widely dispersed defensive missions when requirements for continual assessment of time, distance, and trafficability factors are essential.

*Post-Mission* – Following a successful defense, there may be a period of confusion that the BCT commander can exploit. Given the information capabilities provided by supporting UAS, the commander could quickly execute counterattacks before the enemy can secure his gains or organize a defense. These could include UAS in a direct role, in supporting ISR requirements, or both. Whether continuing to defend or transitioning to offensive operations, the BCT must quickly reorganize. Key reorganization tasks that could be supported by UAS include: establishing and maintaining security; assisting in reestablishing C2 and communications architecture; and refining and updating the COP.

*Assessment* – Assessment is a continuous process, with the BCT employing a variety of assets to enhance situational understanding (SU) to strike the enemy at near-simultaneous, multiple, and critical points in



its depth, while also attacking its supporting and reinforcing capabilities. The systems available to the commander (UAS and other ISR assets) enable him to see what the enemy is doing before it impacts the brigade, and SU gives him the ability to assume risk in areas allowing a concentration of forces and/or fires. Skillful reconnaissance operations allow the BCT commander to more proactively shape the battlefield, ideally accepting or initiating combat at times and places of his choosing and applying combat power in a manner most likely to achieve his desired effects. UAS employment in reconnaissance operations yield an extraordinarily high payoff in the areas of threat location, disposition, and composition, early warning, protection, and battle damage assessment (BDA). This helps preserve the BCT's freedom of maneuver and initiative over the enemy.

### **Mission Category 2: Conduct Offensive Operations**

Offensive operations are operations conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. They impose the commander's will on the enemy. In combat operations, the offense is the decisive element of full spectrum operations. Against an adaptive and capable enemy, offensive operations are the most direct and sure means of seizing, retaining, and exploiting the initiative. Executing offensive operations compels the enemy to react, creating or revealing weaknesses that attacking forces can exploit. Successful offensive operations place tremendous pressure on defenders, creating a cycle of deterioration that can lead to their disintegration.

This section addresses those offensive operations collective tasks most commonly associated with ground maneuver units. At the Brigade Combat Team and subordinate maneuver battalion levels, the general set of collective tasks applicable to offensive operations includes:

- Coordinate Air-Ground Integration (AGI) and Close Combat Attack (CCA)
- Conduct a Movement to Contact
- Conduct a Passage of Lines as a Passing Unit
- Control a Passage of Lines as a Stationary Unit
- Conduct an Attack
- Conduct Mobility, Countermobility, and Survivability Operations
- Synchronize Close Air Support (CAS)
- Implement the Intelligence, Surveillance, and Reconnaissance (ISR) Plan
- Coordinate Army Airspace Command and Control (A2C2)
- Breach an Obstacle
- Conduct Areas Security Operations
- Employ Fires and Effects
- Conduct a Guard Mission
- Conduct a Screen

- Conduct Zone / Area Reconnaissance
- Conduct Lines of Communication Security
- Conduct Convoy Security Operations

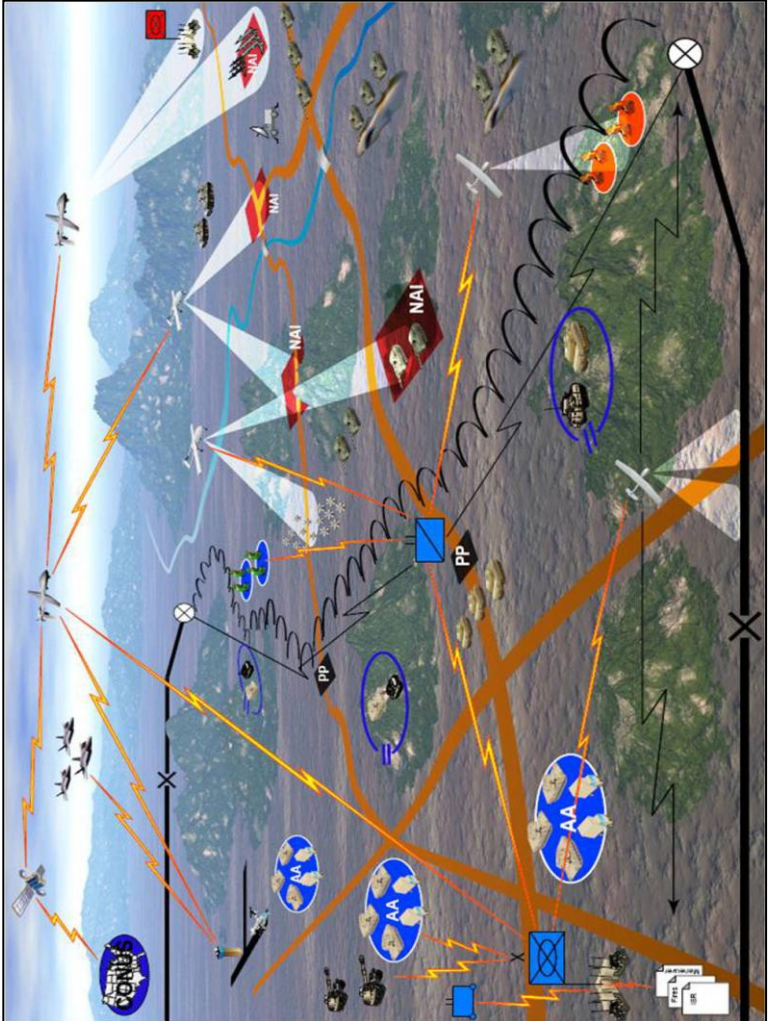
This section allows the Supported unit to understand how to incorporate and better use available UAS assets to accomplish operational missions. It also allows the Supporting UAS element to understand how their tasks should properly fit into the execution of the maneuver unit's tasks. It is intended to help each unit (Supported and Supporting) better understand what information the other needs to execute their respective missions. It should also be noted that no distinction is made between organic and non-organic UAS support. Supported unit commanders should consider unique coordination and planning requirements that will have to be met, depending on UAS group type, and supporting unit or source.

*General Offensive Operations Scenario* – A notional scenario is presented and decomposed to the major activities and considerations of primary interest at the BCT/BN levels of command. These are grouped into five categories roughly corresponding to the phases of a defensive operation. These phases are: Planning; Preparation; Execution; Post-mission; and Assessment. The generally sequential nature of the first four phases is supported to a great extent by the Assessment phase that is widely recognized as continuous in nature. Each phase generally describes the major activities being conducted, with emphasis on opportunities for command and staff consideration for the appropriate employment of UAS support.

*Scenario* – A Heavy Brigade Combat Team (HBCT) is directed to conduct offensive operations as part of a higher echelon offensive mission. The HBCT mission is to conduct a movement to contact to find and fix the enemy force. Then, in coordination with other elements, the brigade will conduct an attack to destroy the enemy. The commander's intent is to initially conduct the mission by executing a forward passage of lines, and conducting a movement to contact to find the enemy and develop the situation. As the conditions indicate, the commander will then execute an attack to destroy the enemy forces using the form of maneuver best indicated by METT-TC conditions. During the movement to contact, the commander will employ security forces as advance and flank elements, and organize the balance of the BCT as the main body and rear security. As the situation develops, the commander will use the ISR effort to maintain freedom of action and exploit enemy weaknesses, task organizing and employing the combat power of the BCT at the decisive place and time. To support this complex mission, the commander directs his staff and subordinate commanders to ensure all plans emphasize effective and flexible control, coordination, and synchronization to seize the initiative, exploit success, and maintain momentum. The brigade is organized with Ravens (Group 1 UAS), a Shadow Platoon (Group 3 UAS), and has been provided an armed

Predator (Group 4 UAS) for combat air patrol (CAP) support. The Shadow platoon GCSs are co-located with the HBCT TOC and their full motion video (FMV) feeds directly into the HBCT Maneuver Control Station (MCS). Each of the subordinate battalions receives the FMV feed via OSRVT and chat with the aircrews via mIRC.

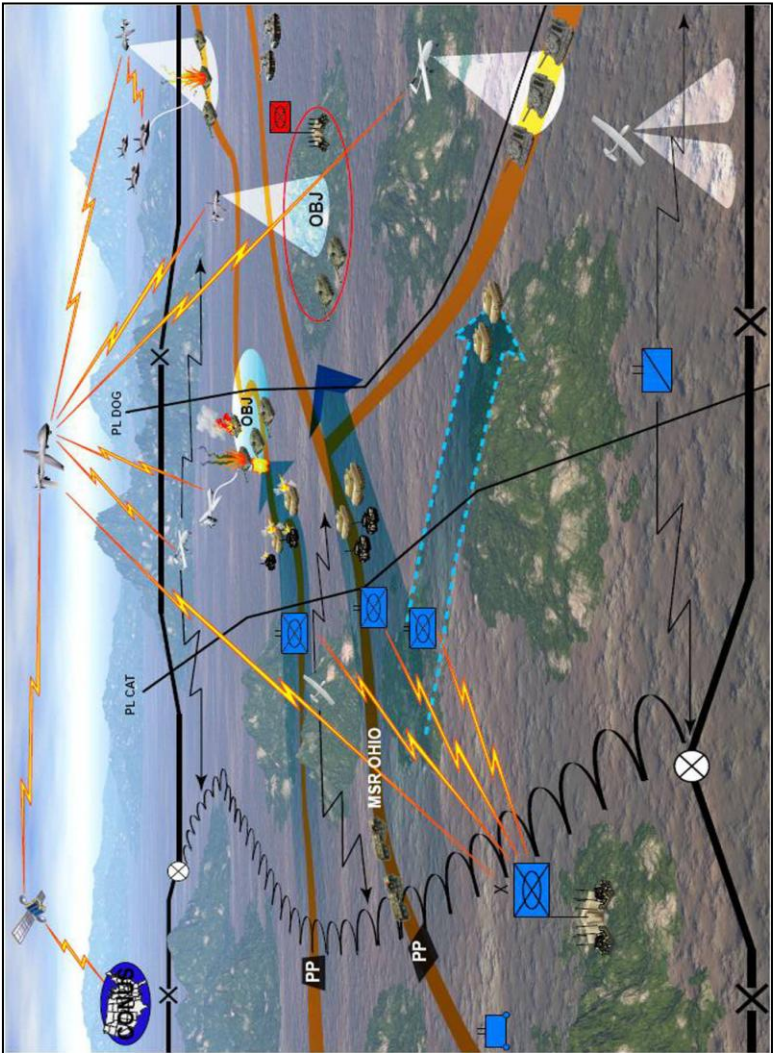
**Figure 21. Offensive Operations - Planning**



*Planning* – During offensive operations, the BCT commander develops plans that emphasize rapid and decisive maneuver, exploiting the UA's ability to move quickly through a zone and observe successive Named Areas of Interest (NAIs) in a short time. If armed UAS are available, the

commander conducts planning and coordination for the integration of those assets as part of the fires and effects process, particularly focusing on airspace deconfliction and scheduling. UAS assets are also used to support the planning process to help visualize the battlespace; identify enemy locations; determine mobility corridors, obstacles and key terrain; and identify deadspace. Commanders may typically plan to employ UAS to identify terrain that will hinder a rapid advance and help the planning staff to select avenues of approach that orient on key terrain and provide maneuver opportunities for attackers. UAS missions may also be planned to support initial security and deception missions to protect friendly force preparations for offensive action, and deceive and frustrate enemy efforts to discern friendly force dispositions and intentions. The ISR plan can use the "waves" of reconnaissance method, in which ground collection assets move forward at different times. This allows information from lead elements to cue follow-on reconnaissance forces and trailing intelligence assets. If UAs are in the first "wave" of reconnaissance in the synchronized ISR plan, follow-on manned reconnaissance and security assets know where to concentrate their efforts. This UA "recon push" expedites the BCT's movement through the zone by helping to cue ground and air scouts, and enables the brigade to identify the enemy's disposition, determine its weakness, and exploit that weakness.

*Preparation* – Preparation postures the force to begin offensive operations. It includes assembling and positioning forces and resources to allow dispersion, responsiveness, protection, and sustainment, while retaining the ability to mass effects quickly. Preparation includes reconnaissance operations conducted concurrently with planning. Conducting aggressive reconnaissance and surveillance, integrating joint collection assets, and exploiting the capabilities of information systems allows commanders to assess enemy capabilities and anticipate his reactions. These operations focus on identifying and locating enemy reserves, locating and tracking enemy fire support systems, and gathering information about enemy intelligence, air, and air defense capabilities. Skillful use of unmanned reconnaissance assets allow the commander to gather information throughout the battlespace without endangering his troops or compromising security. Should METT-TC conditions permit, the conduct of rehearsals that include all supporting assets are an important preparatory activity. Depending on the extent of the rehearsal, UAS resources may not only actively participate but could provide additional visibility of rehearsal and other preparatory activities to assist the commander in making modifications to the plan, and confirming the readiness of his forces.



**Figure 22. Offensive Operations - Execution**

*Execution* – Offensive operations require rapid shifts in the focus of combat power to take advantage of opportunities. Sustaining a tempo the enemy cannot match is vital to success. A commander's ability to continually anticipate and visualize both enemy and friendly situations is essential. Making timely decisions is likewise important. UAS missions perform two unique supporting roles during this phase. The first is by conducting direct attack as part of the commander's available combat power, including the employment of UAS in support of direct and indirect fire engagements. The second role supports ISR and C2

support missions that allow the commander to take action to adjust subordinate unit boundaries and missions; reposition forces; shift the main effort; or modify the original plan. Enroute to NAI that correspond to primary routes of advance, UA overfly and examine ground reconnaissance infiltration routes to detect any enemy forces or obstacles the ground reconnaissance assets will encounter en route to their observation point (OP). Under many conditions, UAS can remain on station for long periods of time until the first "wave" of manned reconnaissance assets arrive at their OP locations. This ensures nearly continuous surveillance of NAIs and simplifies handover of any UA-detected targets to the manned reconnaissance and security team. As the commander increases the tempo of the operation, UAS missions may transition from providing security in depth to targeting in support of decisive operations. As an example, if the HPT list identifies enemy artillery, UAS missions may dynamically re-task to counterfire and eliminate artillery systems that threaten advancing friendly elements.

As attackers near the enemy force, they overcome resistance with violent, massed firepower and rapid movement. This may occur without conducting a traditional movement to contact or meeting engagement due to the ability to develop the situation largely out of contact.

Advanced surveillance and reconnaissance assets refine the picture of the enemy, while reconnaissance and security elements maintain contact only as required to collect information that unmanned sensors cannot. Commanders maneuver forces into position to begin the attack before major forces make contact, and attacks unfold as simultaneous sets of blows that bewilder and shock enemy forces.

*Post-Mission* – As friendly forces quickly move through the objective, destroying remaining enemy resistance, they anticipate a counterattack by maneuver forces, indirect fires, or aircraft. Primary immediate post-mission efforts are taken to consolidate on the objective, reorganize to meet a counterattack, prepare for the next mission, or continue the attack. If the situation allows, commanders immediately begin an exploitation, either with the same force or by passing follow-on forces through the objective area. UAS support missions as the attack continues would include maintaining contact with fleeing enemy forces, assisting the commander in identifying opportunities to maintain the momentum and tempo, and disrupting enemy efforts to recover and organize for counterattacks. Whether continuing to attack or transitioning to other operations, the BCT must quickly reorganize. Key reorganization tasks that could be supported by UAS include: establishing and maintaining security; assisting in reestablishing C2 and communications architecture; and refining and updating the COP.

*Assessment* – Assessment is a continuous process, with the BCT employing a variety of assets to enhance situational understanding (SU) to strike the enemy at near-simultaneous, multiple, and critical points in its depth, while also attacking its supporting and reinforcing capabilities.

The systems available to the commander (UAS and other ISR assets) enable him to see what the enemy is doing before it impacts the brigade, and SU gives him the ability to assume risk in areas allowing a concentration of forces and/or fires. Skillful reconnaissance operations allow the BCT commander to more proactively shape the battlefield, ideally accepting or initiating combat at times and places of his choosing and applying combat power in a manner most likely to achieve his desired effects. UAS employment in reconnaissance operations yield an extraordinarily high payoff in the areas of threat location, disposition, and composition, early warning, protection, and battle damage assessment (BDA). This helps preserve the BCT's freedom of maneuver and initiative over the enemy.

### **Category 3: Conduct Stability Operations**

Stability operations encompass various military missions, tasks, and activities conducted outside the United States, in coordination with elements of combat, to maintain or reestablish a safe and secure environment, provide essential government services, emergency infrastructure reconstruction, and humanitarian relief. In general, military forces conduct five stability tasks: civil security, civil control, restore essential services, support to governance, and support to economic and infrastructure development. These tasks form the basis for meeting requirements that may be generated by a variety of stability mission types. These are:

- Peace Operations
- Foreign Internal Defense
- Security Assistance
- Humanitarian and Civic Assistance
- Support to Insurgencies
- Support to Counterdrug Operations
- Combatting Terrorism
- Noncombatant Evacuation Operations
- Arms Control
- Show of Force

This section addresses those stability operations collective tasks most commonly associated with ground maneuver units. At the Brigade Combat Team and subordinate maneuver battalion levels, the general set of collective tasks applicable to stability operations includes:

- Conduct a Deliberate Relief in Place
- Conduct a Civil Military Operation
- Conduct Mobility, Countermobility, and Survivability Operations
- Provide Humanitarian Support
- Synchronize Close Air Support (CAS)
- Employ a Reserve (QRF) during Stability Operations
- Conduct Mediation and Negotiation

- Implement the Intelligence, Surveillance, and Reconnaissance (ISR) Plan
- Coordinate Army Airspace Command and Control (A2C2)
- Secure Civilians during Operations
- Breach an Obstacle
- Conduct Area Security Operations
- Enforce Peace Agreements
- Employ Fire and Effects
- Conduct a Guard Mission
- Conduct a Screen
- Conduct Zone / Area Reconnaissance
- Conduct Lines of Communication Security
- Conduct Convoy Security Operations
- Plan Public Affairs Operations
- Implement Higher Headquarters Public Affairs Themes
- Coordinate between US Military and Local Authorities

This section allows the Supported unit to understand how to incorporate and better use available UAS assets to accomplish operational missions. This also allows the Supporting UAS element to understand how their tasks should properly fit into the execution of the maneuver unit's tasks. It is intended to help each unit (Supported and Supporting) better understand what information the other needs to execute their respective missions. It should also be noted that no distinction is made between organic and non-organic UAS support. Supported unit commanders should consider unique coordination and planning requirements that will have to be met, depending on UAS group type, and supporting unit or source.

*General Stability Operations Scenario* – A notional scenario is presented and decomposed to the major activities and considerations of primary interest at the BCT/BN levels of command. These are grouped into five categories roughly corresponding to the phases of a standard operation. These phases are: Planning; Preparation; Execution; Post-mission; and Assessment. The generally sequential nature of the first four phases is supported to a great extent by the Assessment phase that is widely recognized as continuous in nature. Each phase generally describes the major activities being conducted, with emphasis on opportunities for command and staff consideration for the appropriate employment of UAS support.

*Scenario* – A Heavy Brigade Combat Team (HBCT) is directed to conduct stability operations as part of a higher echelon force mission to establish a safe and secure environment immediately following combat operations. The HBCT mission is to support US and Host Nation efforts to facilitate reconciliation efforts among the local adversaries; help reestablish political, legal, social, and economic institutions within the BCT AOR; and facilitate the transition of responsibility to legitimate host



nation civilian authority. As the BCT AOR has recently been the scene of heavy fighting, the commander's intent is to conduct the mission by emphasizing activities in three major areas: initial response; transformation; fostering sustainability. The commander recognizes that these activities will occur both sequentially and concurrently, depending on how rapidly the success of some tasks can be locally achieved. In general, he has grouped task efforts for the three activities as follows:

- Initial response: The BCT will immediately stabilize the AO to provide a secure environment, protecting the populace from internal and external threats, and allowing relief forces to attend to the immediate humanitarian needs of the local population. Major efforts will support the reduction in the level of violence and human suffering while creating conditions that enable other actors (i.e., joint, interagency, intergovernmental, multinational [JIIM] agencies, nongovernmental organizations [NGOs], and contractors) to participate safely in relief efforts.
- Transformation: The BCT will conduct and support tasks that represent the broad range of post-conflict stabilization, reconstruction, and capacity-building requirements performed in a relatively secure environment. These tasks aim to build host-nation capacity across multiple sectors.
- Fostering sustainability: The BCT will conduct and support missions to improve the stability of the security environment in support of long-term capacity building and reconstruction efforts primarily led by host nation civilian agencies. As a part of these activities, transfer of responsibilities to host nation security forces will become a major task requirement.

To support this complex mission, the commander directs his staff and subordinate commanders to ensure all plans emphasize effective and flexible control, synchronization and distribution of reconnaissance and surveillance assets, and strict adherence to established Rules of Engagement (ROE) and Rules of Interaction (ROI). The brigade is organized with Ravens (Group 1 UAS), a Shadow Platoon (Group 3 UAS), and has been provided an armed Predator (Group 4 UAS) for combat air patrol (CAP) support. The Shadow platoon GCSs are co-located with the HBCT TOC and their full motion video (FMV) feeds directly into the HBCT Maneuver Control Station (MCS). Each of the subordinate battalions receives the FMV feed via OSRVT and chat with the aircrews via MIRC.



**Figure 23. Stability Operations**

*Planning* – Stability operations rely on an extensive understanding of the operational environment, to include the people, topography, economy, history, religion, and culture. Leaders must be aware of every village, road, field, population group, tribal leader, and ancient grievance. The ability of the BCT commander to identify essential stability tasks may not become clear until the BCT has occupied the area and performed intelligence, surveillance and reconnaissance (ISR) to identify local requirements. Strict Rules of Engagement (ROE) and Rules of Involvement (ROI) will direct the specific conditions and options the commander will have when planning his operations. UAS missions

may have to be planned with sensitivity to non-combat conditions, such as airspace restrictions, flight clearances, refueling procedures, civil and military laws, environmental laws and regulations, radio frequency usage, ground convoy clearances, and procedures vary from country to country. Employment of armed assets in security roles may be restricted due to proximity of non-combatants and areas where an incident of collateral damage could do irreparable harm to developing a safe and secure environment. Other considerations would include the potential security restrictions for the release of UAS generated information to host nation and other non-US government entities. This may require the extensive planning for the provision of liaison elements and the consideration of interoperability of C2 systems to ensure timely and accurate dissemination of UAS provided products. Priorities for planning the employment of UAS will normally emphasize reconnaissance and surveillance missions in support of IPB, and will necessarily involve close coordination and synchronization with ground elements. Initial phases in establishing a secure and safe AOR will probably require planning for the employment of armed UAS assets. This requirement should diminish as the BCT achieves success in improving security measures and rule of law within the AOR.

*Preparation* – The BCT uses the preparation time available to immerse itself in developing an accurate picture of the AOR, including information on potential enemy force strength, locations, and capabilities. Terrain information focuses on obstacles, avenues of approach, and key terrain features that impact movement throughout the area. Supporting UAS assets are employed to build the picture used by BCT elements to envision the operating environment and help guide the conduct of specific preparatory activities in anticipation of the series of tasks directed by the commander. As the units expect to be facing a wide range of challenges and an uncertain operating tempo, UAS assets are employed to build information to feed IPB requirements, and the intelligence running estimate. This information is used by brigade units to understand the dynamics of the operational environment, threat capabilities and vulnerabilities, threat tactics, techniques, and procedures, and possible threat courses of action. The BCT also uses available preparation time to conduct rehearsals and training to ensure all units are capable of conducting potential missions within the context of the established ROE and ROI. This includes supporting UAS assets.

*Execution* – During execution, the commander primarily employs UAS in support of security operations focused on protecting civilians, protecting the force, securing services, and safeguarding relief/recovery operations and/or national building efforts. UAS missions and actions in the security area predominantly support the ground force focus on reconnaissance and surveillance missions however, during early stabilization phases, armed UAS may be employed in support of direct action, or may be used to support integration efforts for fires and effects. As the operations in the AOR may concurrently occur in multiple

phases, the employment of UAS may involve considerable dynamic re-tasking, and involve rapid changes in mission between armed and unarmed roles. Successful stabilization efforts rely on flexibility, depth, and redundancy, so commanders conduct continuous reconnaissance with patrols, UAS surveillance, and observation posts that keep a specific location under observation for extended periods. UAS are also particularly well suited to conduct long-range, unobtrusive operations that may be of particular benefit in reconnaissance and surveillance of border areas, or in areas that may be denied due to political, cultural, or physical remoteness considerations. When used to support operations over extended distances, UAS may also support critical cross-talk between remote locations as a key part of the C2 network; provide timely and accurate information supporting responsive and collaborative decision making; and assist the commander to cue units to reposition, or commence responsive action in anticipation of critical incidents.

*Post-Mission* – Most stability operations within a BCT AOR will have no clearly defined “end of mission.” Some areas will transition to real conditions of stability and a high degree of host nation civilian control faster than other areas. As areas transition between conditions of stability, UAS support missions will also change. The role of the BCT in employing UAS as ISR or armed platforms may change from providing support to BCT direct missions, to those in direct support of host nation security forces, or civilian authorities. General BCT operations in the “post mission” phase can be characterized as Transition – Handover. Depending on how well the transition-handover process is going, UAS could be employed to “keep an eye” on things, to ensure that potential threat/destabilizing elements or actions are minimized. As an example, a high profile US presence can be scaled down as unobtrusive use of UAS provides sufficient surveillance and reconnaissance to enable host nation security forces to assume a more visible role, and help in restoring confidence of the local populace in their government. They can also be employed to track progress or improvement in the maintenance or development of long term capacity building and reconstruction efforts.

*Assessment* – Assessment is a continuous process across all operations, but is particularly important in stability operations. The idea of assessment under these missions is to keep things moving forward. UAS employed simply to identify the initiation or termination of a particular action, or the necessity to take an action will not support the commander in measuring progress. The best use of UAS and other assets used to support continuous assessment can be achieved by the development of measures of effectiveness (MOEs) concurrent with the determination of the tasks to be executed by the BCT. These MOEs are subjected to continuous refinement as operations continue through the phases of the stabilization mission. UAS missions can then be planned, scheduled, and conducted with other assets to provide the commander with information on how the operation or conditions are changing, and the rate at which those changes are occurring. Assessments conducted

with UAS under those rules allow the commander to measure progress, and task organize or prioritize missions with unprecedented responsiveness and efficiency.

#### **Mission Category 4: Conduct Civil Support Operations**

Civil support operations are generally conducted to assist civil authorities in response to emergencies (natural or manmade disasters), specified illegal activities, or to relieve or reduce suffering within the United States and its territories. Civil support operations meet the immediate needs of civil authorities or designated groups for a limited time until they can accomplish these tasks without military assistance. In extreme or exceptional cases, United States forces may provide relief or assistance directly to those in need.

This section addresses those civil support operations collective tasks most commonly associated with ground maneuver units. At the Brigade Combat Team and subordinate maneuver battalion levels, the general set of collective tasks applicable to civil support operations includes:

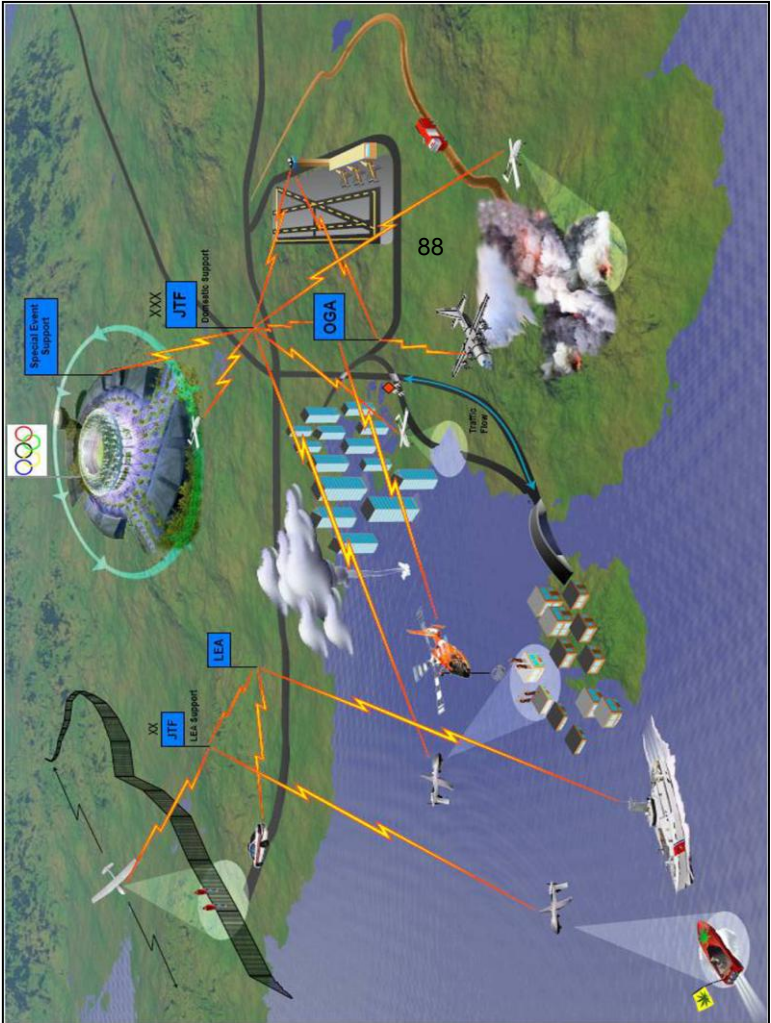
- Conduct a Civil Military Operation
- Conduct Mobility, Countermobility, and Survivability Operations
- Provide Humanitarian Support
- Implement the Intelligence, Surveillance, and Reconnaissance (ISR) Plan
- Coordinate Army Airspace Command and Control (A2C2)
- Secure Civilians during Operations
- Conduct Area Security
- Conduct Zone / Area Reconnaissance
- Conduct Lines of Communication Security
- Conduct Convoy Security Operations
- Plan Public Affairs Operations
- Implement Higher Headquarters Public Affairs Themes
- Coordinate between US Military and Local Authorities

This section allows the Supported unit to understand how to incorporate and better use available UAS assets to accomplish operational missions. This also allows the Supporting UAS element to understand how their tasks should properly fit into the execution of the maneuver unit's tasks. It is intended to help each unit (Supported and Supporting) better understand what information the other needs to execute their respective missions. Supported unit commanders should consider unique coordination and planning requirements that will have to be met, depending on UAS group type, and supporting unit or source.

*General Civil Support Operations Scenario* – A notional scenario is presented and decomposed to the major activities and considerations of primary interest at the BCT/BN levels of command. These are grouped into five categories roughly corresponding to the phases of a standard

operation. These phases are: Planning; Preparation; Execution; Post-mission; and Assessment. The generally sequential nature of the first four phases is supported to a great extent by the Assessment phase that is widely recognized as continuous in nature. Each phase generally describes the major activities being conducted, with emphasis on opportunities for command and staff consideration for the appropriate employment of UAS support.

*Scenario* – An Infantry Brigade Combat Team (IBCT) is directed to provide support to civil authorities in the wake of a serious natural disaster in the United States. The IBCT mission is to conduct missions to provide essential services, assets, and specialized resources to help civil authorities deal with situations beyond their capabilities until they can provide those resources without military assistance. This support will extend to direct tasks to support civil law enforcement, protection of military and civilian critical assets, and a wide range of response and recovery missions. The Department of Homeland Security (DHS)/ Federal Emergency Management Agency (FEMA) has requested and been given a Defense Coordinating Officer (DCO) to serve as the single DOD point of contact within the disaster area who is OPCON to the JTF commander. The BCT will report to the defense coordinating officer for missions. To support this complex mission, the commander directs his staff and subordinate commanders to ensure all plans emphasize effective and flexible control, synchronization and distribution of reconnaissance and surveillance assets, and strict adherence to the established directives of the lead federal agency (LFA), and Rules for the Use of Force (RUF) directed by the DoD. The brigade is organized with Ravens (Group 1 UAS), a Shadow Platoon (Group 3 UAS), and has been provided Predator (Group 4 UAS) for higher altitude mission support. The Shadow platoon GCSs are co-located with the IBCT TOC and their full motion video (FMV) feeds directly into the IBCT Maneuver Control Station (MCS). Each of the subordinate battalions receives the FMV feed via OSRV and chat with the aircrews via mIRC.



**Figure 24. Civil Support Operations**

*Planning* – The BCT’s roles and responsibilities to the LFA are to provide the LFA with capabilities that were lost to the local government, and/or those capabilities that the LFA requests. The loss of telecommunications, water, electricity, food, shelter, and the loss of control of the population overwhelms local support. The BCT’s ability to deploy on short notice, set up operations without external support, and create an infrastructure that would support the civilian effort is paramount to the ability of the BCT to help. The chaos surrounding most natural disasters of such magnitude as to require military support will require the BCT commander to use all available assets to develop an

accurate picture of the situation. Planning for the use of UAS to support his MDMP, and for the employment of UAS during execution, is complicated by many factors. Operation of unmanned systems in the national airspace, weather and visibility conditions, locations from which to stage UAS missions, priority of UAS mission support, movement priorities of deploying units into the devastated areas all serve to complicate BCT planning. As most natural disasters occur across widespread areas and devastate telecommunications systems, the planning for use of UAS as communications relay platforms will be a consideration that may limit availability to support more traditional ISR roles. Finally, BCT planning for UAS must consider the release of imagery and other information to non-DoD or non-USG agencies. Dissemination and interpretation of UAS provided information may not be directly accessible to participating relief activities. The BCT should therefore plan on providing liaison elements and C2 systems support as directed by the LFA through the DCO.

*Preparation* –The BCT uses the preparation time available to build the most robust assessment of the area of operations to support potential or assigned BCT missions, and those information requirements generated or directed by the LFA. UAS missions approved and executed during this phase feed the development of the COP used by the LFA to direct, coordinate, and synchronize a robust federal, state, and local response. UAS and other imagery sources are used to identify the extent of damage, assist in the identification of possible areas that may continue to be affected, and track other related issues such as traffic congestion, civil unrest, and many others. This information will assist BCT assigned and attached units to conduct immediate training, if required for non-traditional METL tasks, and prepare or acquire additional or special equipment or supplies for probable missions. UAS unit preparation may also be a consideration if unique operating restrictions or conditions affect the deployment or use of UAS in the stricken area. Some considerations could include frequency management, local interference, pilot/operator experience or certification, infrastructure support or other issues. Employment of certain types and configurations of specific UAS may also be restricted, so preparation to surge flight operations of approved systems may be required to meet mission requirements.

*Execution* – During execution, the commander employs UAS as directed or approved by the LFA. All UAS flights are conducted within defined legal and operational oversight to ensure compliance with federal and state laws. The BCT also provides advice to the LFA on the best use of UAS assets to support critical ISR and imagery requirements, potential use to support long haul communications requirements, and appropriate techniques for the synchronization and collaboration of UAS with other collection and imagery sources. The BCT also advises and supports the LFA with the production and dissemination of UAS generated information to directed recipients. UAS support to BCT missions is focused on gathering and providing



information to develop the COP, facilitate collaborative decision making by BCT elements, and supporting dynamic assessments.

*Post-Mission* – As support operations mature, and the requirement for military support ends, potential missions for UAS will primarily support redeployment activities of the BCT and the handover of responsibilities to local authorities. Possible UAS support could involve route reconnaissance missions for BCT convoy operations, providing local security for staging and support areas, and monitoring of recovery operations across large areas. A potential post mission action could involve UAS unit recovery activities if, under a DoD approval, the transfer of military equipment or supplies to Non-DoD agencies has been directed. This may involve communications and imagery processing equipment in addition to the more commonly directed Class 2 items.

*Assessment* – Assessment is a continuous process across all operations, but the employment of UAS in that role under Civil Support mission conditions is particularly valuable. Assessment actions supported by UAS provide the BCT commander and the LFA the means to measure support progress, beyond simply identifying the initiation or termination of a particular action. Under the conditions of appropriately developed Measures of Effectiveness, employment of UAS in a continuous assessment role assist the LFA to rapidly respond to changing requirements, prioritize activities, and cue supporting agency activities. Under some natural disaster conditions, UAS in the assessment role can also provide valuable information in helping to predict the extent and impacts of threats to areas not yet affected, or monitor receding threats to areas immediately affected



## Acronyms

A

<b>AA</b>	assembly area
<b>AAA</b>	anti-aircraft artillery
<b>AAGS</b>	Army air-ground system
<b>AAR</b>	after-action review
<b>ABCS</b>	Army battle command system
<b>ABC2</b>	airborne battle command capability
<b>AC2</b>	airspace command and control
<b>ACA</b>	airspace control authority
<b>ACM</b>	airspace control measures
<b>ACMR</b>	airspace control means request
<b>ACO</b>	airspace control order
<b>ACP</b>	air control point
<b>AD</b>	air defense
<b>ADA</b>	air defense artillery
<b>ADAM</b>	air defense and airspace management
<b>ADR</b>	aerial data relay
<b>ADSI</b>	air defense system integrator
<b>AFATDS</b>	advanced field artillery tactical data system
<b>AGL</b>	above ground level
<b>AIS</b>	automatic identification system
<b>ALO</b>	air liaison officer
<b>AMD</b>	air missile defense
<b>AMDWS</b>	air and missile defense workstation
<b>AMPS</b>	aviation mission planning system
<b>AO</b>	area of operations
<b>AOC</b>	air operations center
<b>APOD</b>	aerial port of debarkation
<b>AR</b>	Army regulation
<b>ARFOR</b>	Army forces
<b>ASAS</b>	all source analysis system
<b>ASB</b>	aviation support battalion
<b>ASOC</b>	air support operations center
<b>ATC</b>	air traffic control
<b>ATO</b>	air tasking order
<b>ATP</b>	aircrew training program
<b>ATS</b>	air traffic services
<b>AWT</b>	attack weapons team
<b>ACE</b>	aviation combat element
<b>BAE</b>	brigade aviation element
<b>BCD</b>	battlefield coordination detachment

<b>BCT</b>	brigade combat team
<b>BDA</b>	battle damage assessment
<b>BSB</b>	battlefield surveillance brigade
<b>BFT</b>	Blue Force Tracker
<b>BLOS</b>	beyond line of sight
<b>C2</b>	command and control
<b>CAB</b>	combat aviation brigade
<b>CAS</b>	close air support
<b>CBM</b>	condition-based maintenance
<b>CBRN</b>	chemical, biological, radiological, and nuclear
<b>CCA</b>	close combat attack
<b>CEP</b>	circular error probability
<b>COIC</b>	current operations integration cell
<b>CLS</b>	Contractor logistical support
<b>COA</b>	course of action
<b>COMSEC</b>	communications security
<b>COP</b>	common operational picture
<b>CP</b>	command post
<b>CRC</b>	control and reporting center
<b>CRP</b>	communications relay package
<b>CRP</b>	communications relay package
<b>CRP-L</b>	communications relay package-light
<b>CRP-M</b>	communication relay package-medium
<b>CTL</b>	commander's task list
<b>DA</b>	Department of the Army
<b>DA Pam</b>	Department of the Army pamphlet
<b>DART</b>	downed aircraft recovery team
<b>DIDEA</b>	detect, identify, decide, engage, and assess
<b>DOD</b>	Department of Defense
<b>DS</b>	direct support
<b>DVB/RCS</b>	Digital Video Broadcast/Return Channel System
<b>EFP</b>	egress fly point
<b>EO</b>	electro-optical
<b>EPLRS</b>	enhanced position locating and reporting system
<b>ERMP</b>	extended range multi-purpose
<b>EW</b>	electronic warfare
<b>FA</b>	field artillery
<b>FBCB2</b>	Force XXI battle command brigade and below
<b>FM</b>	field manual, frequency modulated
<b>FMV</b>	full motion video
<b>FOB</b>	forward operating base
<b>FOV</b>	field of view
<b>FRAGO</b>	fragmentary order
<b>FS</b>	fire support
<b>FSCM</b>	fire support coordinating measure

## FOUO

<b>FSE</b>	fire support element
<b>FSR</b>	field service representative
<b>FW</b>	fixed-wing
<b>FARP</b>	forward arming and refueling points
<b>G-2</b>	Assistant Chief of Staff-Intelligence
<b>G-3</b>	Assistant Chief of Staff-Operations
<b>GCE</b>	ground combat element
<b>GBS</b>	global broadcast system
<b>GCCS-A</b>	global command and control system-Army
<b>GCS</b>	ground control station
<b>GDT</b>	ground data terminal
<b>GMTI</b>	ground moving target indicator
<b>GS</b>	General support
<b>GSE</b>	ground support equipment
<b>GTL</b>	gun target line
<b>HEAT</b>	high explosive anti-tank
<b>HMMWV</b>	high mobility multipurpose wheeled vehicle
<b>HPT</b>	high payoff target
<b>HQ</b>	headquarters
<b>I2</b>	image intensified
<b>IAW</b>	in accordance with
<b>IED</b>	improvised explosive device
<b>IFF</b>	identification, friend or foe
<b>IMGCS</b>	improved modular ground control station
<b>IP</b>	ingress point
<b>IPB</b>	intelligence preparation of the battlefield
<b>IR</b>	infrared
<b>ISR</b>	intelligence, surveillance, and reconnaissance
<b>JFACC</b>	joint force air component commander
<b>JFC</b>	joint force commander
<b>JFLCC</b>	joint force land component commander
<b>JP</b>	joint publication
<b>JTAC</b>	joint terminal attack controller
<b>JTF</b>	joint task force
<b>L/R</b>	launch and recovery
<b>LAN</b>	local area network
<b>LAR</b>	launch acceptability region
<b>LD</b>	laser designator
<b>LGW</b>	laser-guided weapon
<b>LOAL</b>	lock-on after launch
<b>LOI</b>	level of inoperability
<b>LOS</b>	line of sight
<b>LRF/D</b>	laser rangefinder/designator
<b>LRU</b>	line replaceable unit
<b>LTL</b>	laser target line

<b>MACCS</b>	Marine Air Command and Control System
<b>MAE</b>	medium altitude endurance
<b>Mbps</b>	megabits-per-second
<b>MC</b>	mission commander
<b>MCG</b>	mobile command group
<b>MCS</b>	maneuver control system
<b>MDAS</b>	Mobile Directional Antenna System
<b>MEP</b>	mission equipment package
<b>METL</b>	mission essential task list
<b>METT-TC</b>	mission, enemy, terrain and weather, troops and support available, time available, and civil considerations
<b>MGRS</b>	military grid reference system
<b>MI</b>	military intelligence
<b>MMTI</b>	maritime moving target indicator
<b>MO</b>	maintenance operator
<b>MOS</b>	military occupational specialty
<b>MPCS</b>	mission planning control site
<b>MSE</b>	mobile subscriber network
<b>MSR</b>	main supply route
<b>MTOE</b>	modified table of organization and equipment
<b>NAI</b>	named area of interest
<b>NAVAID</b>	navigational aid
<b>NOTAM</b>	notice to airmen
<b>NRT</b>	near real time
<b>OPCON</b>	operational control
<b>OPORD</b>	operation order
<b>OPSEC</b>	operations security
<b>OPTEMPO</b>	operating tempo
<b>OSGCS</b>	one system ground control station
<b>OSRVT</b>	one system remote video transceiver
<b>PBL</b>	performance-based logistics
<b>PGCS</b>	portable ground control station
<b>PGDT</b>	portable ground data terminal
<b>PIR</b>	priority intelligence requirement
<b>PMCS</b>	preventive maintenance checks and services
<b>PO</b>	payload operator
<b>POC</b>	point of contact
<b>POR</b>	program of record
<b>PR</b>	personnel recovery
<b>QRC</b>	quick reaction capability
<b>RAV</b>	risk assessment value
<b>RCT</b>	Regional Combat Team
<b>ROA</b>	restricted operations area

## FOUO

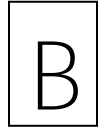
<b>ROE</b>	rules of engagement
<b>ROVER</b>	Remotely operated video enhanced receiver
<b>ROZ</b>	restricted operations zone
<b>RSTA</b>	reconnaissance, surveillance, and target acquisition
<b>RVT</b>	remote video terminal
<b>S-2</b>	intelligence staff officer
<b>S-3</b>	operations staff officer
<b>S-4</b>	logistics staff officer
<b>SA</b>	situational awareness
<b>SAAFR</b>	standard Army aircraft flight route
<b>SAL</b>	semi-active laser
<b>SAR</b>	synthetic aperture radar
<b>SATCOM</b>	satellite communications
<b>SBCT</b>	Stryker brigade combat team
<b>SINGARS</b>	single channel ground and airborne radio system
<b>SIPR</b>	secret internet protocol network
<b>SITREP</b>	situation report
<b>SO</b>	standardization instructor operator
<b>SOF</b>	special operations forces
<b>SOP</b>	standing operating procedure
<b>SPINS</b>	special instructions
<b>SSE</b>	sensitive site exploitation
<b>SUAS</b>	small unmanned aircraft system
<b>SWT</b>	scout weapon team
<b>TA</b>	target acquisition
<b>TAC CP</b>	tactical command post
<b>TACON</b>	tactical control
<b>TACP</b>	tactical air control party
<b>TACOPS</b>	tactical operations
<b>TACP</b>	tactical air control party
<b>TACSOP</b>	tactical standing operating procedure
<b>TAOC</b>	tactical air operations center
<b>TAGS</b>	theater air ground system
<b>TAI</b>	target area of interest
<b>TAIS</b>	tactical airspace integration system
<b>TALS</b>	tactical automated landing system
<b>TC</b>	training circular
<b>TCDL</b>	tactical common data link
<b>TCP</b>	traffic control point
<b>TFR</b>	temporary flight restriction
<b>TIC</b>	troops in contact
<b>TLP</b>	troop leading procedures
<b>TRADOC</b>	training and doctrine command
<b>TST</b>	time-sensitive target
<b>TTP</b>	tactics, techniques, and procedures

## FOUO

<b>TUAS</b>	tactical unmanned aircraft system
<b>TV</b>	television
<b>UA</b>	unmanned aircraft
<b>UAS</b>	unmanned aircraft system
<b>ULLS-A (E)</b>	Unit-Level Logistics System-Airborne (Enhanced)
<b>VoIP</b>	voice over internet protocol
<b>VS</b>	Viper Strike
<b>WARNO</b>	warning order



**UAS Types and Weapons**



**MQ-1B Predator**

Group 4

MISSIONS: Multi-mission capable (RSTA, ISR, Attack)

WEIGHT: 2250 lbs

WINGSPAN: 55 ft

LENGTH: 27 ft

LAUNCH METHOD: Runway

ENGINE TYPE: 115 hp Rotax

SPEED:

Cruise - 70 kts (indicated air speed)

Loiter - 70 kts (indicated air speed)

Dash - 118 kts (indicated air speed)

ENDURANCE:

Clean Configuration - 24 hrs

Max Payload - 16 hrs

ALTITUDE:

Maximum - 25,000 ft (MSL)

Normal Mission - 15,000 (AGL)

SENSORS/PAYLOADS:

EO Camera

IR Camera

FMV Capable

RVT Capable

LRF/D

Special Mission: SIGINT, LIDAR, FOPEN, AGM-144 Hellfire Missiles

PAYLOAD CAPACITY: 450 lbs



**MQ-1C ERMP**

Group 4

MISSIONS: Multi-mission capable (RSTA, ISR, Attack)

WEIGHT: 3600 lbs

WINGSPAN: 56 ft

LENGTH: 28 ft

LAUNCH METHOD: Runway

ENGINE TYPE: 135 hp Thielert

SPEED:

Cruise – 60-75 kts (indicated air speed)

Loiter – 60-75 kts (indicated air speed)

Dash – 150 kts (indicated air speed)

ENDURANCE:

Clean Configuration – 36+ hrs

Max Payload – 30+ hrs

ALTITUDE:

Maximum – 25,000 ft (MSL)

Normal Mission – 8,000-20,000 (AGL)

SENSORS/PAYLOADS:

EO Camera

IR Camera

FMV Capable

RVT Capable

LRF/D

IR Pointer

SAR

GMTI

COMM Relay

Special Mission: AGM-114 Hellfire Missiles

PAYLOAD CAPACITY: 500 lbs



**MQ-5B Hunter**

Group 4

MISSIONS: RSTA

WEIGHT: 1950 lbs

WINGSPAN: 34.25 ft

LENGTH: 23 ft

LAUNCH METHOD: Runway

ENGINE TYPE: 57 hp Mercedes

SPEED:

Cruise – 70 kts (indicated air speed)

Loiter – 70 kts (indicated air speed)

Dash – 110 kts (indicated air speed)

ENDURANCE:

Clean Configuration – 20.5 hrs

Max Payload – 16 hrs

ALTITUDE:

Maximum – 18,000 ft (MSL)

Normal Mission – 3,000-15,000 (AGL)

SENSORS/PAYLOADS:

EO Camera

IR Camera

FMV Capable

RVT Capable

LRF/D

Com Relay/CBRNE

PAYLOAD CAPACITY: 280 lbs



**RQ-7B Shadow**

Group 3

MISSIONS: Multi-mission capable (RSTA, ISR)

WEIGHT: 375 lbs

WINGSPAN: 14 ft

LENGTH: 11ft 2 inch

LAUNCH METHOD: Cat/Runway

ENGINE TYPE: Rotary 38 hp UEL AR-741

SPEED:

Cruise – 90 kts (indicated air speed)

Loiter – 60 kts (indicated air speed)

Dash – 105 kts (indicated air speed)

ENDURANCE:

Clean Configuration – 6hrs

ALTITUDE:

Maximum – 15,000 ft (MSL)

Normal Mission – 3,000-8,000 (AGL)

SENSORS/PAYLOADS:

EO Camera

IR Camera

IR Pointer

Special Mission: SIGINT

PAYLOAD CAPACITY: 60 lbs



**MQ-1 Warrior A**

Group 4

MISSIONS: Multi-mission capable (RSTA, ISR, Attack)

WEIGHT: 2550 lbs

WINGSPAN: 55 ft

LENGTH: 27 ft

LAUNCH METHOD: Runway

ENGINE TYPE: 105 hp Rotax

SPEED:

Cruise – 70 kts (indicated air speed)

Loiter – 70 kts (indicated air speed)

Dash – 118 kts (indicated air speed)

ENDURANCE:

Clean Configuration – 24 hrs

Max Payload – 16 hrs

ALTITUDE:

Maximum – 25,000 ft (MSL)

Normal Mission – 15,000 (AGL)

SENSORS/PAYLOADS:

EO Camera

IR Camera

FMV Capable

RVT Capable

LRF/D

IR Pointer

SAR/MTI/Com Relay

Special Mission: AGM-114 Hellfire Missiles

PAYLOAD CAPACITY: 500 lbs

The Army's *Warrior* UAS will normally fly autonomous missions, and will eventually use the same GCS (Ground Control Station) as the [RQ-7 Shadow 200](#) system. It will eventually replace the [MQ-5 Hunter](#)



**RQ-4B Global Hawk**

Group 5

MISSIONS: Multi-mission capable (RSTA, ISR)

WEIGHT: 32,250 lbs

WINGSPAN: 130 ft

LENGTH: 47 ft

LAUNCH METHOD: Runway

ENGINE TYPE: AE -3007H Rolls

SPEED:

Cruise – 310 kts (indicated air speed)

Loiter – 310 kts (indicated air speed)

Dash – 340 kts (indicated air speed)

ENDURANCE:

Clean Configuration – 28 hrs

Max Payload – 20 hrs

ALTITUDE:

Maximum – 65,000 ft (MSL)

Normal Mission – 30,000-45,000 ft (AGL)

SENSORS/PAYLOADS:

EO Camera

IR Camera

SAR

GMTI

PAYLOAD CAPACITY: 3000 lbs



**MQ-9 Reaper**

Group 5

MISSIONS: Hunter/Killer, ISR

WEIGHT: 10,500 lbs

WINGSPAN: 66 ft

LENGTH: 36 ft

LAUNCH METHOD: Runway

ENGINE TYPE: 900 hp Honeywell turboprop

SPEED:

Cruise - 200 kts (indicated air speed)

Loiter – 200 kts (indicated air speed)

Dash – 225 kts (indicated air speed)

ENDURANCE:

Clean Configuration – 30 hrs

Max Payload – 16-20 hrs

ALTITUDE:

Maximum – 45,000 ft (MSL)

Normal Mission – TBD

SENSORS/PAYLOADS:

EO Camera

IR Camera

FMV Capable

RVT Capable

LRF/D

Synthetic Aperture Radar (SAR)

Special Mission:

AGM-114 Hellfire missiles, GBU-12 Paveway II, and GBU-38

Joint Direct Attack Munitions

PAYLOAD CAPACITY: 3750 (3000 external, 750 internal)



**RQ-4N BAMS (Broad Area Maritime Surveillance)**

Group 5

MISSIONS: Maritime ISR

WEIGHT: 32,500 lbs

WINGSPAN: 131 ft

LENGTH: 48 ft

LAUNCH METHOD: Runway

ENGINE TYPE: TBD

SPEED:

Cruise - TBD

Loiter – 343 kts (indicated air speed)

Dash – TBD

ENDURANCE:

Clean Configuration – 36 hrs

Max Payload – TBD

ALTITUDE:

Maximum – TBD

Normal Mission – TBD

SENSORS/PAYLOADS:

EO Camera

IR Camera

AIS

SAR/MMTI

FMV

PAYLOAD CAPACITY:

3000 lbs





**UAS Weapons**

## GBU-12 Paveway II, (Reaper)

Class	500 lb. Paveway I & II Guided Weapon
Mission	Air interdiction
Targets	Mobile hard, fixed soft, fixed hard
Service	Air Force, Navy
Contractor	Texas Instruments
Program status	Operational
First capability	1976
Guidance	Semi-Active Laser (man-in-the-loop)
Control	MAU-157 Series (Paveway I) MAU-169 Series (Paveway II)
Autopilot	Bang-Bang Mode
Weight (lbs.)	800
Length (in.)	129
Diameter (in.)	11 (Warhead); 18 (Airfoil Group)
Warhead	MK-82 Blast/Fragmentation
Explosive	Tritonal, PBXN-109 (192 lbs.)
Fuze	FMU-81 Tail
Range	8 nautical miles
Circular error probable	9 meters



**AGM-114 Hellfire Missile (Reaper/Predator/ERMP/Warrior A)**

Specifications	
Weight	100–108lb (45.4–49kg)
Length	64 in (163 cm)
Diameter	7 in (17.8 cm)
Warhead	High Explosive Anti-Tank (HEAT); 20 lb (9 kg) tandem anti-armor Metal augmented charge (MAC); 18 lb (8 kg) shaped-charge Blast Fragmentation
Engine	Solid-fuel rocket
Wingspan	13 in (33 cm)
Operational range	546 yd – 5 mi (500 m – 8 km)
Speed	Mach 1.3 (950 mph; 425 m/s)
Guidance system	Semi-active laser homing millimeter wave radar seeker
Launch platform	Rotary and fixed-wing platforms, Unmanned combat air vehicles, tripods, ships, and ground vehicles



**GBU-38 Joint Direct Attack Munitions (Reaper)**

Use:	Fixed target, precision strike
Length:	9.9 feet (3.0 m) – 12.75 feet (3.89 m)
Wingspan:	19.6 inches (500 mm) –25 inches (640 mm)
Range:	Up to 15 nautical miles (28 km)
Cost:	\$35,000+ for the GBU-38



## Distributed Common Ground System (DCGS)

DCGS is a widely accessible network of existing and planned system that enables a substantial volume of information to be shared by multiple users, including raw intelligence data and simultaneous analysis by multiple participants. DCGS consists of the group of individual Service nodes connected through designated points of interoperability. The ultimate goal of DCGS is to connect all sensor and ground stations on a common network creating a shared information environment.



## One System Remote Video Terminal (OSRVT)

OSRVT is a kit integrated with the ROVER systems that provides enhanced situational awareness with near Real-time Video and Telemetry Data from multiple manned and unmanned platforms: Raven, Shadow, Pioneer, IGNAT, Hunter, Warrior A, Predator, and other UAS. Software supports decoding Telemetry and METADATA from multiple UAS, links data onto Falcon View maps and supports off target calculations.

- *Range* – 10km and ~50 km w/ extended range antenna (Mobile Directional Antenna System – MDAS)
- *Weight* - 22-60 lbs base system with case
- *RF* – C-band (4.4-4.85 GHz, 5.25-5.85 GHz)
- *L-band* – 1.71-1.859 GHz
- *KU bands* – 14.4-15.35 GHz
- *UHF* – 340-400 MHz
- *Power* - AC, DC and battery (4-12 hrs based on configuration)

### System Capability Notes

- DVR, TIVO like capability – 10 hours of recording video
- Telemetry Data Linked to FalconView with 2525 Symbology
- JPEG Files With Embedded Metadata
- Off Target Calculations
- Tri-Band (C/L/Ku) Extended Range Antenna, up to 50km (Optional)
- S-Band Planned for 2 QTR FY 08



Multi-Band RCVR (MBRX)

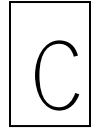


Toughbook PC



MDAS





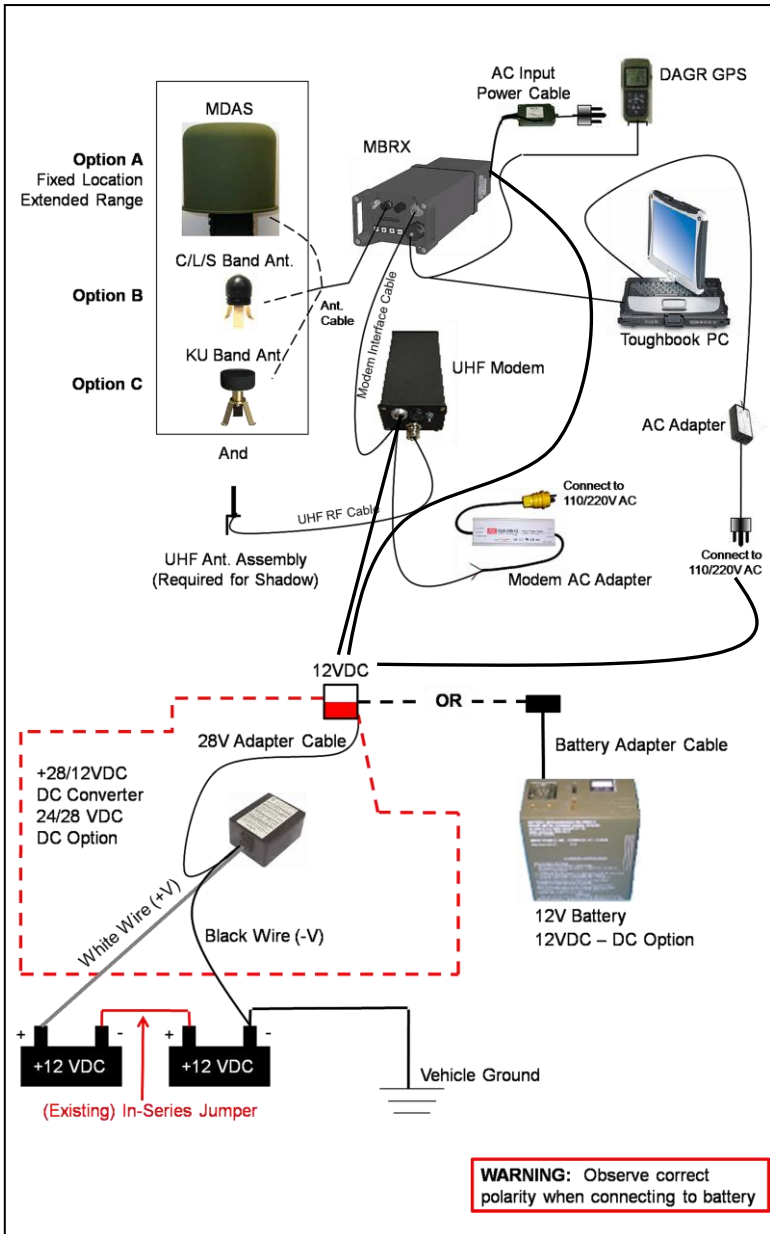
**OSRVT Block 1 System Set-Up Instructions: DC Power Option**

Determine power source that will be used and choose appropriate cable/converter and instructions. *These instructions are for the DC power option: +24/28VDC vehicle power or +120VDC battery (BB390/2590 or equivalent).*

**WARNING:** Ensure correct polarity when connecting W9 to the vehicle. Never connect EITHER the white OR black lug wires on W9 to the battery posts where the In-Series Jumper is connected. When in doubt, verify polarity with vehicle mechanic. Failure to comply may result in injury or death.

Choose appropriate antennae per mission requirement, and use antenna brackets if necessary. Antennae should be mounted as high as possible and as far away from other antennae as possible. If using the MDAS, refer to guide supplied with MDAS. Connect cables as shown below, ensuring correct power cable/converter is used. Connect DAGR GPS cable to *Com Port 1* on DAGR.

### Hardware Configuration for DC Option



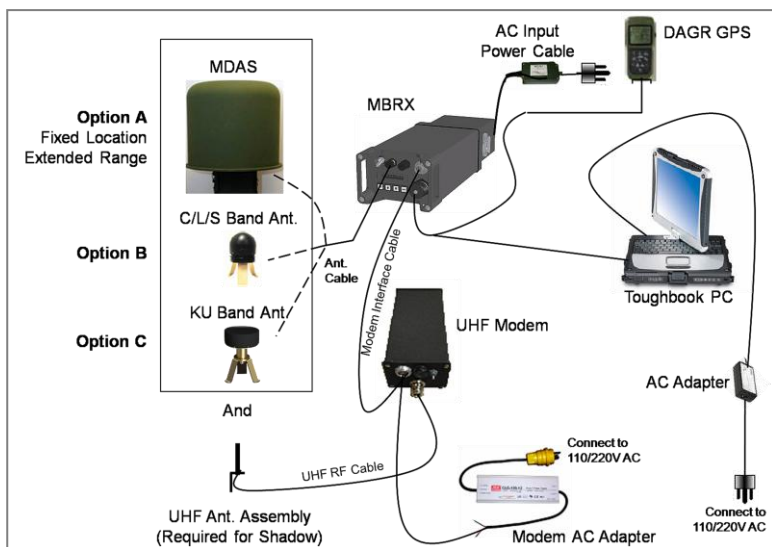


### OSRVT Block 1 System Set-Up Instructions: AC Power Option

Determine power source that will be used and choose appropriate cable/converter and instructions. Choose appropriate antennae per mission requirement, and use antenna brackets if necessary. Antennae should be mounted as high as possible and as far away from other antennae as possible. If using the MDAS, refer to guide supplied with MDAS. Connect cables as shown below, ensuring correct power cable/converter is used. When using AC power, be sure to use identified cable supplied with MBRX, AC adapter for UHF RF modem, and AC adapter for Toughbook PC. If using DAGR GPS, connect DAGR GPS cable to *Com Port 1* on DAGR.

Connect the cables as shown below for AC connection.

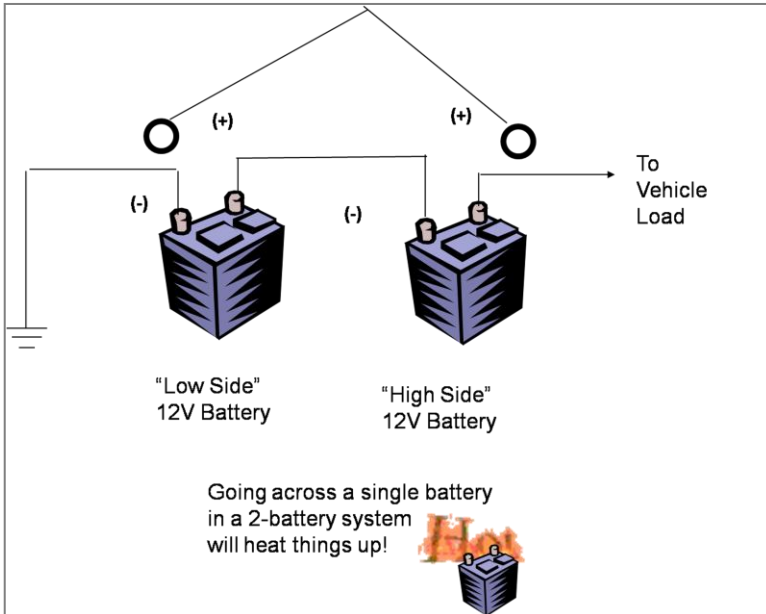
- Use the C/L Band Antenna for Shadow TUAV, Predator, Hunter, I-Gnat, Raven or Warrior.
- Use the Ku Band Antenna for ERMP or P3 Orion and other manned aircraft.



\*NOTE: The antenna cable has an L-shaped adapter positioned at the antenna base so that it can be installed without bending the cable.

## OSRVT Battery Connection 24V

- *DO NOT* connect the 24V OSRVT battery terminals to a single 12V battery!
- *NEVER* connect the 24V terminals across one battery if there are two batteries in the system!
- An improper connection to a 24V battery system can result in a direct short when components are mounted to a vehicle.



## MTS Overlay Symbols

# Predator MTS Overlay

**Aircraft Position:**

- Lat/Long: Deg (°), Min (′), Sec (″)
- Altitude: Can be displayed as MSL, AGL or HAT

**Next FOV Prediction:**

- The four corners (only 2 are highlighted) predict the FOV of the next zoom level.

**Target (Crosshair) Information:**

- Lat/Long: Deg (°), Min (′), Sec (″)
- BRG- relative bearing of target from aircraft
- RNG- ground distance from aircraft to target in meters
- RNG- ground distance to target in NM
- TWD- width of current FOV in meters, "Yard Stick"
- ELV- elevation of ground at target (crosshair) location. Can be displayed in meters or feet.

**Compass Rose:**

- Direction of North. True or Mag N can be depicted based on if Mag (M) or True (T) is set as the reference. (T or M is displayed at the top next to aircraft heading)

**Display Data:**

COOLING  
DAR  
CAREA  
41/168

1688  
267-25 C

60  
0 ← -2  
-120

A

SEL LRD  
218:08:05

**Aircraft Position Data:**

A CRT  
N 34°30'00"  
W 119°12'00"  
3,280 MSL

**Target (Crosshair) Information Data:**

N 34°29'53"  
W 119°11'10"  
BRG 102  
RNG 1,301M  
RNG 0.70NM  
TWD 22M  
ELV 3501F

## Common Issues (FAQs) with the OSRVT

The OSRVT will not receive Video, even though all equipment and SW is set up correctly:

- Check the Antenna (MDAS or Omni) has clear LOS to the Aircraft (No tents, vehicles or mountains in the way)
- Reset any Scans and/or try —Scan for Video” on the current aircraft Freq Range
- Verify TX Frequencies of the Aircraft you are attempting to receive

The OSRVT Receiver is not responding:

- Check the Receiver status and see if there are any failures
- Check the Receiver is not overheated
- Reboot all equipment and try again
- Call applicable person on Trouble Card to correct problem

I can't get the Antenna far enough away from the tent to receive UAS data/Video:

- Use the Extended Ethernet cable to extend the range of the antenna. The Receiver, Modem and power supplies must accompany the antenna outside as the cables are not long enough.
- You must cover the Components outside to prevent overheating. You must have power (DC/AC) at the Antenna site to power the Receiver and the Modem (or MDAS)

## RF Front End Troubleshooting

If the “RF Front End Check” does not automatically disappear there is no communication between the OSRVT PC and the MBRX. Steps to Resolve:

- Confirm that there is power to the Receiver.
- Confirm that there is an Ethernet connection between the OSRVT PC and the Receiver.
- Confirm that the correct ports are being used for the connections.
- Confirm that the Ethernet connection has not come unplugged or jarred loose.
- Reset the power to the MBRX.
- Reset the power to the OSRVT PC.
- Replace the cable between the OSRVT and the MBRX.
- You may want to run the OSRVT Main application in simulation mode if your receiving equipment is not connected. To do this, check the box and click on Next.



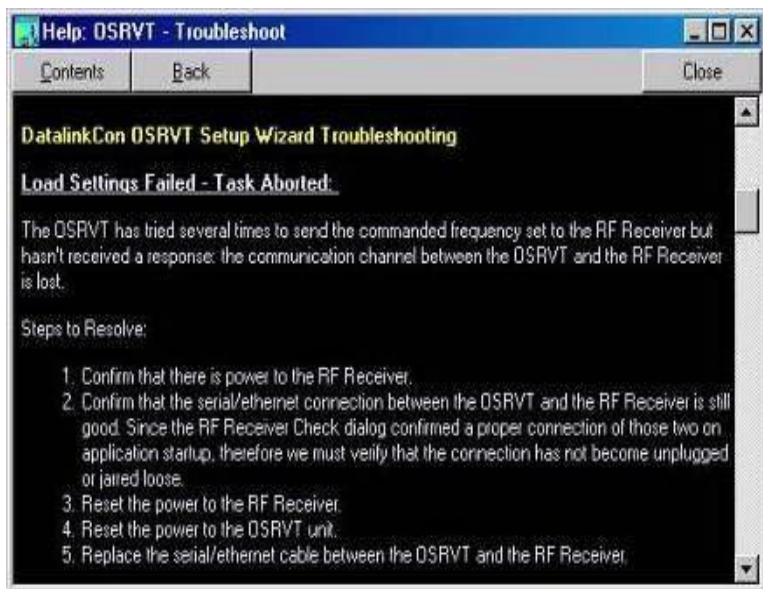
## Data link OSRVT Setup Wizard Troubleshooting

If you get a “Load Settings Failed” message:

The OSRVT has tried several times to send the commanded frequency set to the MBRX but hasn't received a response. The communication channel between the OSRVT PC and the MBRX has been lost.

Steps to Resolve:

- Confirm there is power to the Receiver.
- Confirm that there is an Ethernet connection between the OSRVT PC and the Receiver.
- Reset the power to the Receiver.
- Reset the power to the OSRVT PC.
- Replace the cable between the OSRVT and the Receiver.

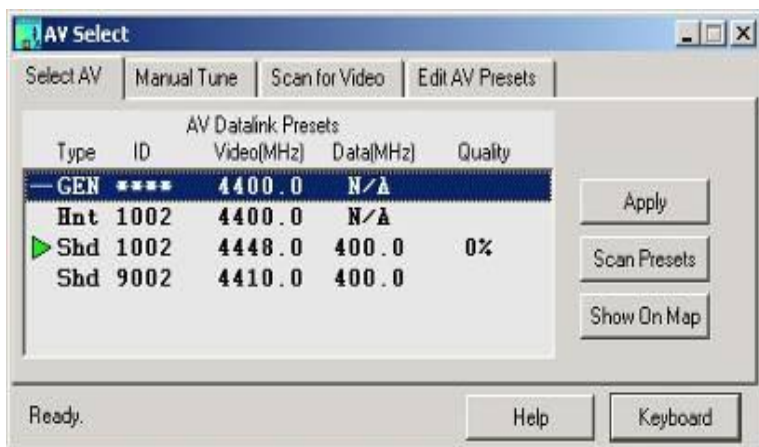


Load Settings Failed screen shot

## No Active Signals

If no Active Signals are found while scanning. While scanning the frequency list, if no sets have active signals, the OSRVT Setup Wizard will continually search the list to acquire usable signals. Steps to Resolve:

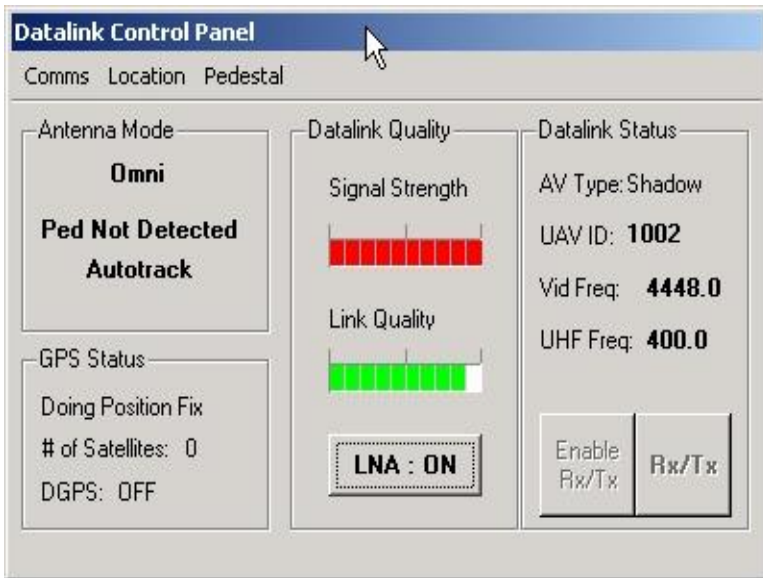
- Confirm that the frequency list has at least one useable frequency set loaded that corresponds to an air vehicle's transmitted signals.
- The C/L Band antenna is not properly setup or is not positioned properly.
- The air vehicle could be out of range of the Video receiver.



## No Video

While watching video downlink, video drops out. While watching video downlink, video drops out. Datalink Control Panel Signal Strength window is red, Link Quality window is green. Steps to Resolve:

- Confirm that cable connections are still made.
- Confirm that the selected frequencies correspond to transmitted video signals.
- The C/L Band antenna is not properly setup or is not positioned properly.
- The air vehicle could be out of range of the Video receiver but not the UHF receiver.
- Vehicles fly out of range (or directly overhead!)
- You will lose Video but may have Telemetry – look at your Map (telemetry) data.
- If Vehicles fly out of range (or directly overhead! You will lose Video but may have Telemetry – look at your Map (telemetry) data.





## Reminders

- Shadow requires 2 antennas and two frequencies.
- Boot the computer before powering up the receiver.
- If the —RF Front End Check” window stays up, the receiver isn't powered on or cables aren't connected.
- Protect the receiver from overheating.
- If you mess up the password on the laptop, you get four chances. After the fourth try it will shut down for one hour.
- Use help files and the TM to figure out problems.

## OSRVT Block 1 System Start-Up/Operating Instructions

If using DAGR GPS, set-up DAGR as follows:

1. Press <Enter> to acknowledge all warnings
2. Press <Menu> twice (main menu)
3. Select *System* <Enter>
4. Select *Function set* → advanced, <Enter>
5. Push <Menu> twice (main menu)
6. Select *Communications*, <Enter>
7. Select *Com Port Set-Up*, <Enter>
8. Scroll down, ensure *Comport 1* is selected, <Enter>
9. Scroll to *Out Protocol*, <Enter>, set to *NMEA*, <Enter>
10. Scroll to *Out Baud* <Enter>, set to 4800, <Enter>
11. Scroll to *NMEA Interval*, <Enter>
12. Set interval to —0”, <Enter>
13. Select first box under NMEA sentence, <Enter>
14. Select GGA sentence, <Enter>, <Quit>
15. Press <Menu> twice

Make sure power is disconnected from the modem and the Multi-Band Receiver (MBRX) is powered off. Boot the computer by sliding the switch on the front, then releasing it. Wait for the desktop to appear. Switch on the MBRX and wait for text to appear on the front panel to display. Connect the power cable to apply power to the UHF RF modem (if used). Double click the —OSRVT Main” icon or select —Start | All Programs | OSRVT Main.” After an introductory screen appears and communication with the MBRX is established, the PC will display a video and a map window, and will be ready for operation. *If there is no GPS data available*, the —OSRVT Set-up Wizard” window will appear. The text in the left side of the OSRVT Set-up Wizard window provides instructions for each step.

**OSRVT Setup Wizard - OSRVT Location Settings**

Enter the current location of the OSRVT.  
OR click the "Select from map..." button to select the OSRVT's location from a map.

OSRVT Coordinates

Select from Map

Latitude: N 00:00:00.0

Longitude: E 000:00:00.0

OSRVT Altitude

Altitude (feet): 0

Keyboard

Help Quit Next>

\* This window only displays if DAGR is *not connected* or *not receiving* a GPS signal.

After entering OSRVT coordinates and altitude or selecting your location from the map window, click *Next*. The *Datalink Control Panel* window will appear.

**Datalink Control Panel**

Comms Location Pedestal

Antenn OSRVT Location

Ped Not Detected  
Autotrack

Signal Strength

Link Quality

LNA : ON

Datalink Status

AV Type: Shadow

UAV ID: 1002

Vid Freq: 4448.0

UHF Freq: 400.0

Enable Rx/Tx Rx/Tx

OSRVT Location

In the list, select (click or use touch screen) the UAV whose video and telemetry is to be received and click the *Apply* button.

- (Optional) Click the *Scan Presets* button if you would like the OSRVT system to scan the list of pre-programmed AVs for any operating within range of the OSRVT system.
- Click the *Edit AV Presets* tab and enter AV information for AVs operating in the area other than those already programmed.

The live video display will appear showing live UAV payload video and telemetry.

\* For additional OSRVT help, double click the *OSRVT Help* icon on the computer desktop or click *Start | All Programs | OSRVT Help*. For a

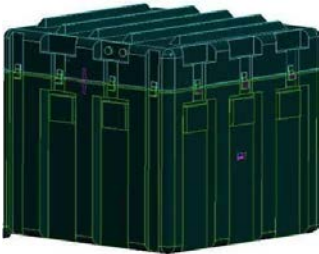
tutorial on how to set-up and operate the OSRVT, double click the *OSRVT Training* icon on the desktop.

### OSRVT Block 1 System Shut-Down Instructions

From the live video window, click *File | Exit* and click the *Yes* button when prompted to quit the OSRVT system. Click *Start | Shut-Down*, select *Shut-Down* from the drop down list in the dialog box and click the *OK* button if you want to shut-down the computer. Turn off the MBRX and disconnect the power cord to the UHF RF modem (if used).

### Mobile Directional Antenna System – MDAS

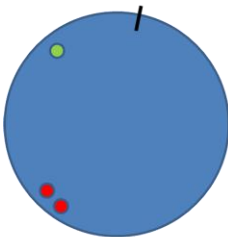
MDAS shipping container



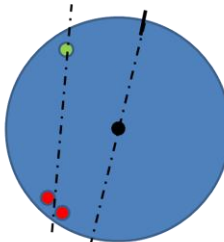
- 27" x 27" x 32"
- 4-person lift
- Approx 130 lbs. full



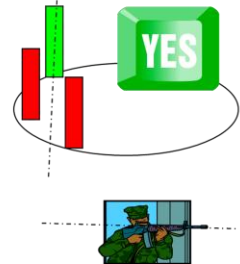
### MDAS Alignment



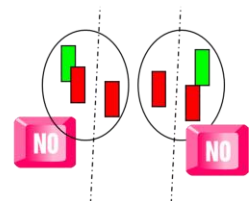
- Step 1: Notice
- Notice the 2 close pins
  - Notice the single far pin
  - Notice the indented slot



- Step 2: Notice
- Look between the two pins
  - Line up the single pin between the two pins
  - Notice the angle is the same as the indent at the center of the MDAS



- Step 3: Write it Down
- Sight your compass
  - Note the azimuth reading
  - This is the **initial pedestal magnetic heading**



**ROVER III**

ROVER III (Compatible with OSRVT and MDAS) provides real-time full motion video for situational awareness, targeting, battle damage assessment (BDA), surveillance, convoy operations and other situations where eyes on target are required. ROVER III provides enhanced air/ground coordination, which shortens talk-on-target for time-critical operations. It has proven interoperability with data links in Ku-band, C-band, and L-band with platforms such as Predator, Shadow, Dragon Eye, and other joint and coalition assets. ROVER III is small, lightweight and rugged.

**System Capability Notes**

Range: Based on environmental conditions and terrain features.

Weight: Total system weight 10.25 lbs.

RF: Ku = 14.4 GHz to 15.35 GHz, 5.0 MHz steps;  
L- 1.71 GHz to 1.85 GHz, 0.5 MHz steps;  
C Analog-4.40 GHz to 5.85 GHz, 1.0 MHz steps  
C Digital-5.25 GHz to 5.85 GHz, 1.0 MHz steps

Power:

- Single BA-5590 battery 10-12 hour operation
- Battery eliminator allows DC or AC input
- 11-36 VDC 95-270 VAC, 47-440 Hz

Video display software- MPEG-2- H.261

- Analog, Digital Video Recorder with standard wmv file format Integrated MPEG-2 / H.261 decoder, Wireless access point 802.11 b/g allows untethered operation video display, ruggedized laptop via Ethernet.
- NTSC/RS-170 Video Port -Directional C-band antenna for increased range (currently available).



**ROVER III**

**ROVER V**

ROVER V (Compatible with OSRVT and MDAS) is a small, lightweight and rugged software defined radio which provides a digital capability for full motion video, situational awareness, targeting, battle damage assessment (BDA), surveillance, convoy operations and other situations where eyes on target are required. ROVER V provides enhanced air/ground coordination which shortens talk-on-target for time-critical operations. ROVER V is designed to operation with encryption. Because ROVER V is a versatile software defined radio, it is forward compatible through easily loadable upgrades for both radio and video codecs. ROVER V is also backward compatible and interoperable with the thousands of ROVER III, eROVER and ROVER 4 units fielded to date, as well as the platforms they support, such as Predator, Shadow, Dragon Eye, Litening Pod and other joint and coalition assets.

**Transmit and Receive Bands**

- Ku-band: 14.4 -15.35 GHz, 1.0 Mhz steps
- C-band: 4.40 - 4.950 GHz, 1.0 MHz steps
- 5.25 - 5.85 GHz, 1.0 MHz steps
- S-band: 2.2-2.5 GHz, 0.5 MHz steps
- L-band: 1.71-1.85 GHz, 0.5 MHz steps
- UHF: 400 - 470 MHz

**System Capability Notes**

Range: Based on environmental conditions and terrain features.

Weight: Total system weight 3.5 lbs.

Power:

- Lithium-polymer battery
- AC/DC vehicle accessory power cable

Integrated video display

Highly compatible and Interoperable:

- Digital & Analog Waveforms
- Metadata (KLV supported)
- Video Encode/Decode
  - MPEG-2
  - MPEG-4
  - H.261 (decode only)
  - H.264
  - Analog

Intuitive Control GUI:

- Pre-mission configuration
- Waveform control
- Band and Frequency



**ROVER V**

**VIDEOSCOUT**

VideoScout offers direct “log and play” connectivity with Electro Optical (EO)- Infrared (IR) sensors, as well as fixed or mobile receivers to capture live digital or analog video and metadata. VideoScout can synchronize and archive video with UAV metadata to create “geo-location rich” video intelligence by associating time and location with both motion and still imagery. Captured metadata is stored with the video, and is extracted and displayed separate from the video for convenient search and retrieval by date, location or textual annotations.

Remote Video Exploitation Terminal (RVeT) VideoScout -MC A lightweight, portable VideoScout laptop with an integrated L and Full C (Military Spectrum), L and S, or S and Full C band receivers for mobile, forward and dismounted personnel to receive video and telemetry data directly from L, S and C-band tactical UAVs.



**VIDEOSCOUT**

Micro Exploitation System VideoScout - MXA “pocket-size” hand-held VideoScout computer with an integrated L, S or C-band receiver to easily capture and exploit real-time video and metadata directly from UAVs and other common sensors.

UAS Frequencies



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Predator (Video)	5250-5475 MHz																																										
Warrior A (Video)	5250-5475 MHz																																										
Reaper (Video)	5250-5475 MHz																																										
ER/MP (Video)	14.4 – 14.83 GHz																																										
Shadow (Video / Secondary)	5590 MHz / 370.483 MHz 5705 MHz / 367.257 MHz 5771 MHz / 361.728 MHz Primary Link 2.4 – 2.485 GHz Secondary/Telemetry Range 340 – 400 MHz Video Range (CONUS/DEPLOYED) 4.4 – 4.95 GHz Video Range (OCONUS) 5.25 – 5.85 GHz																																										
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## Close Air Support 9 Line Brief

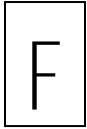
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CAS Check In	CAS Check In	Situation Update
C/S	C/S	Target/Situation
1. Msn #	Msn #	Threat Activity
2. # / Type	# / Type	Friendly Situation
3. Pos / Alt	Pos / Alt	Artillery Activity
4. Ordnance	Ordnance	Clearance Authority
5. Time On Station	Time On Station	Ordnance Requested
6. <b>*Abort Code</b>	<b>*Abort Code</b>	Remarks/Restrictions

CAS (9 Line) Briefing			
1. IP			
2. Hdg			
3. Dist			
4. <b>*Elev</b>			
5. Description			
6. <b>*Coords (TGT Location)</b>	N	N	N
	W	W	W
7. Mark			
8. Friendlies			
9. Egress			
Remarks <b>(*Restrictions)</b>			
Do not transmit line numbers. Units of measures are standard unless otherwise specified. Lines 4, 6, and any restrictions are mandatory read-back items. JTAC may request read-back of any additional items required.			



## ISR 8 Line Brief



<b>Dynamic/Immediate ISR Request (8 Line)</b>
1. Desired ISR support or effect (full motion video, positive ID, EO, IR, MIT)
2. Target Name
3. Target Location
4. Essential Elements of Information (EEI's)
5. Latest Time Information of Value (LTIOV)
6. Reporting instructions (mIRC, IPL, Classification)
7. ISR asset detection concern (low, medium or high)
8. Airspace deconfliction information if you need to stay clear of an area for deconfliction.
Remarks: Lines 1-6 are mandatory, 7 and 8 are optional.



**Mission Task List****Mission Category 1: Conduct Defensive Operations**

The Defensive Operations unit tasks were derived from an examination of the Mission Training Plans for a variety of US Army ground maneuver organizations using the general task list indicated earlier. The specific subtasks of these collective tasks were modified to indicate appropriate insertion of UAS considerations and were necessarily restricted to the most common set of defensive tasks a ground maneuver element would be expected to conduct. It is not intended to be an exhaustive set. As the user considers each task within the context of the overarching mission, the appropriate phase wherein that task would be properly performed should become clear. Some tasks will necessarily be repetitive across two or more phases. Some tasks, under very specific conditions may not be required at all, or may be situationally applied, depending on the type of UAS that would be available. UAS systems, depending on group, configuration, and ownership are flexible and adaptable combat power multipliers, and specific employment procedures and rules must be considered and planned for in advance. Those rules will vary.

<b>Mission 1 - TASKS</b>	
* 1.	Brigade Combat Team/Battalion (BCT/BN) leaders gain and or maintain situational understanding using available communications equipment, maps, intelligence summaries, situation reports (SITREPs), and other available information sources. Intelligence sources include human intelligence (HUMINT), signal intelligence (SIGINT), and imagery intelligence (IMINT) to include unmanned aircraft systems (UAS).
* 2.	Unit commander and staff receive an order or anticipate a new mission and begin the military decision-making process (MDMP) incorporating UAS capabilities for all groups.
* 3.	BCT/BN commander and staff publish the order and distribute all paragraphs, annexes, and supporting overlays throughout the BCT/BN via FBCB2. They also task-organize the BCT/BN to accomplish the mission (S3). Supporting UAS elements are included in the operational information distribution structure.
* 4.	BCT/BN conducts mission preparation.

<b>Mission 1 - TASKS</b>	
	a. Refines the plan based on continuously updated intelligence. Ensure UAS elements are used to support the rapid collection and dissemination of time sensitive information to appropriate levels.
	b. Conducts extensive ISR. Ensure UAS assets are effectively utilized to extend situational awareness.
	(1) BCT/BN issues WARNO to designated ISR assets (to include UAS), and elements start movement to designated locations.
	(2) ISR planning team develops a draft ISR plan
	(3) Staff finalizes ISR plan and briefs to BCT/BN commander for his approval.
	(4) S3 issues ISR order to subordinate units (to include UAS elements) that synchronizes higher headquarters and BCT/BN ISR operations, and supports the commander's IR.
	(5) As the operation is being executed, the staff (including the UAS element or LNO) monitors/refines ISR plan.
	c. Conducts precombat checks and inspections.
* 5.	BCT/BN occupies and improves defensive positions
	a. Initiates occupation of defensive positions.
	b. Continues to prepare and or upgrade defensive positions.
	c. Conducts reconnaissance and surveillance operations in front of defensive positions.
* 6.	BCT/BN engineer integrates obstacles into the defense and disseminates obstacle overlay(s) IAW unit SOP. UAS elements are used to provide local security, obstacle and dead space coverage, and imagery support.
* 7.	BCT/BN reports occupation of defensive positions to higher headquarters
	a. Submits the completed obstacle and fire plans.
	b. Updates the COP.
* 8.	BCT/BN executes the defense.
	a. Withdraws OPs and unit security elements.

<b>Mission 1 - TASKS</b>	
	b. Engages the enemy (in the security area or MBA) on order or when engagement criteria are met. Uses available UAS support to assist as required
	c. BCT/BN executes a delay if required.
	(1) Uses clearly defined decision points or events to trigger withdrawals. Use UAS to support initiation of withdrawal.
	(2) Ensures the security forces provide early warning on high-speed approaches and cover secondary approaches between BPs. Utilize UAS to provide early warning and/or cover secondary approaches.
	(3) Exploits and reinforces existing obstacles within the limits of available materials, time, and personnel to aid withdrawal.
	(4) Provides forces with sufficient lethality and fire support to cover the withdrawal of forward elements. UAS elements may be used to support the withdrawal of forces
	(5) Engages the enemy at the greatest range using long-range fires. Include armed UAS.
	(6) Forces the enemy to deploy into assault formations repeatedly against successive BPs.
	(7) Maintains contact with the enemy's main body. Utilize available UAS to assist in maintaining contact.
	(8) Maintains flank security. UAS elements may be used to provide flank security.
	(9) Achieves depth in the delay.
* 9.	Conduct Mobility, Countermobility, and or Survivability operations with UAS support
	a. BCT/BN executes defensive tasks.
	(1) Executes mobile defense tasks IAW the commander's intent.
	(2) Executes area defense tasks IAW the commander's intent.
	b. BCT/BN breaches obstacles.

<b>Mission 1 - TASKS</b>
c. BCT/BN conducts survivability actions whenever the unit stopped.
d. BCT/BN conducts deliberate survivability actions whenever the unit stops for longer than eight hours.
<b>* 10. Employ Fire and Effects</b>
a. Fire support coordinator (FSCOORD) or fire support officer (FSO) and fire support element (FSE) process planned fire support requests (digital or voice).
b. FSO processes combat assessment.
c. FSE monitors the current situation.
d. FSO coordinates fire support.
<b>* 11. Conduct Area Security Operations</b>
a. BCT/BN commander, with staff, coordinates with the protected area or force commander and develops the security plan.
b. BCT/BN moves to security positions along the perimeter and/or in depth throughout the area. Utilize available UAS elements to support security and reconnaissance missions during this phase.
c. BCT/BN establishes a defensive/security perimeter or security in a specified area. Utilize available UAS elements to support security and reconnaissance missions during this phase.
d. BCT/BN provides early warning to the protected area/force. Utilize available UAS elements to support security and reconnaissance missions during this phase.
e. BCT/BN maintains continuous security and defends, delays, and/or attacks as necessary. Utilize available UAS elements to support security and reconnaissance missions during this phase.
f. BCT/BN conducts liaison with civilian population, host nation (HN) agencies, or international support agencies, as required, in the AO.



<b>Mission 1 - TASKS</b>	
	g. The BCT/BN secures the specified area or terrain, and achieves the desired end state. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
* 12. Conduct Lines of Communication Security	
	a. Commander and staff plan and coordinate LOC security.
	b. BCT/BN conducts route security missions IAW area commander's guidance and mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC). Utilize available UAS elements to support a wide variety of security and reconnaissance tasks during this phase.
	c. Squadrons conduct convoy security missions IAW area commander's guidance and METT-TC.
* 13. Conduct Convoy Security Operations	
	a. The battalion commander receives the convoy security mission from higher headquarters and issues initial guidance.
	b. The battalion operations (S-3) officer issues a warning order.
	c. The battalion staff conducts a mission analysis.
	d. The battalion intelligence (S-2) section provides support to subordinate and adjacent elements. Supporting UAS elements are included for both the planning and dissemination
	e. The battalion commander approves the COA.
	f. The battalion staff completes the operation plan.
	g. The battalion S-3 section produces the operation order, including guidance on the rules of engagement, rules for the use of force, rules of interaction, and escalation of force. Supporting UAS elements receive the plan and special instructions, as necessary.

<b>Mission 1 - TASKS</b>
h. The battalion S-3 section provides support to subordinate elements. UAS elements are integrated appropriately in the support plan and are used to conduct surveillance and reconnaissance missions in support of battalion requirements.
i. The battalion staff monitors the convoy security mission and provides support to subordinate and adjacent elements. Available UAS elements are employed to provide real-time SU in support of convoy security missions.
* 14. Conduct Zone/Area Reconnaissance
a. Commander and staff plan area/zone reconnaissance.
b. BCT/BN begins movement to the zone or AO.
c. Battalions or companies conduct zone/area reconnaissance to find and report all threat forces within the zone/area; reconnoiter specific terrain within the zone/area; and report CCIR. UAS assets are employed to provide real-time surveillance and imagery in support of missions.
d. BCT/BN elements (air and/or ground) make contact with threat forces.
e. BCT/BN elements arrive at LOA or objective and prepare for subsequent missions. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
* 15. Coordinate A2C2
a. SQDN/BN commander establishes the A2C2 element
b. A2C2 element obtains necessary data
c. A2C2 element performs airspace management functions.
d. A2C2 element determines A2C2 requirements and forwards them to G3-Air for deconfliction of airspace control procedures.
e. A2C2 element receives airspace control information from higher.
f. S3-Air identifies and controls hazards IAW risk management procedures, as necessary, to allow the SQDN/BN to operate without suffering casualties or causing equipment damage as a result of fratricide.

<b>Mission 1 - TASKS</b>
*16. Synchronize Close Air Support
a. Conduct CAS planning
(1) S3 supervises close air support (CAS) planning.
(2) Air liaison officer (ALO) initiates CAS planning
(3) FECC and ALO plan for CAS.
b. FECC and ALO process preplanned CAS requests.
*17. Coordinate Air-Ground Integration and the Close Combat Attack
a. The aviation brigade commander and staff directly coordinate with the mounted BCT commander and staff, to gain knowledge of the ground tactical plan.
b. The aviation brigade commander and staff obtain the minimum planning requirements required to better integrate aviation into the BCT ground scheme of maneuver and ensure accurate and timely support.
c. The aviation brigade operations officer (S3) briefs and dispatches aviation and UAS LNOs to the BCT S3.
d. The senior aviation LNO works with the BCT S3-Air to advise and assist the BCT commander and staff.
e. The aviation and UAS LNOs and the BCT S3-Air coordinate Army aviation and non-organic UAS employment with the air defense (AD) officer.
f. During operations, the aviation and UAS LNOs and BCT S3-Air assist in the identification and resolution of airspace conflicts.
g. The aviation and UAS LNOs, BCT S3-Air, and AMC coordinate aviation mission execution actions with the BCT units in close combat with the enemy.
*18. BCT/BN leaders assess the operation.
a. Continuously monitor and update the COP and the progress of the operation.
b. Direct adjustments to ensure that operations remain aligned with the commander's intent.
c. Employ UAS to provide reconnaissance and security to support monitoring of the situation; integrate provided data into command assessments
*19. BCT/BN consolidates and reorganizes as necessary. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
*20. BCT/BN continues operations as directed.

**Mission Category 2: Conduct Offensive Operations**

*High Level BCT/BN level Offensive Operations Task List* - The Offensive Operations unit tasks were derived from an examination of the Mission Training Plans for a variety of US Army ground maneuver organizations using the general task list indicated earlier. The specific subtasks of these collective tasks were modified to indicate appropriate insertion of UAS considerations and were necessarily restricted to the most common set of offensive tasks a ground maneuver element would be expected to conduct. It is not intended to be an exhaustive set. As the user considers each task within the context of the overarching mission, the appropriate phase wherein that task would be properly performed should become clear. Some tasks will necessarily be repetitive across two or more phases. Some tasks, under very specific conditions may not be required at all, or may be situationally applied, depending on the type of UAS that would be available. UAS systems, depending on group, configuration, and ownership are flexible and adaptable combat power multipliers, and specific employment procedures and rules must be considered and planned for in advance. Those rules will vary.

<b>Mission 2 - TASKS</b>	
* 1.	Brigade Combat Team/Battalion (BCT/BN) leaders gain and or maintain situational understanding using available communications equipment, maps, intelligence summaries, situation reports (SITREPs), and other available information sources. Intelligence sources include human intelligence (HUMINT), signal intelligence (SIGINT), and imagery intelligence (IMINT) to include unmanned aircraft systems (UAS).
* 2.	Unit commander and staff receive an order or anticipate a new mission and begin the military decision-making process (MDMP) incorporating UAS capabilities.
* 3.	BCT/BN commander and staff publish the order and distribute all paragraphs, annexes, and supporting overlays throughout the BCT/BN via FCB2. They also task-organize the BCT/BN to accomplish the mission (S3). Supporting UAS elements are included in the operational information distribution structure.
* 4.	BCT/BN conducts mission preparation.
	a. Refines the plan based on continuously updated intelligence. Ensure UAS elements are used to support the rapid collection and dissemination of time sensitive information to appropriate levels.
	b. Conducts extensive ISR. Ensure UAS assets are effectively utilized to extend situational awareness.
	(1) BCT/BN issues WARNO to designated ISR assets (to include UAS), and elements start movement to designated locations.
	(2) ISR planning team develops a draft ISR plan
	(3) Staff finalizes ISR plan and briefs to BCT/BN commander for his approval.
	(4) S3 issues ISR order to subordinate units (to include UAS elements) that synchronizes higher headquarters and BCT/BN ISR operations, and supports the commander's IR.
	(5) As the operation is being executed, the staff (including the UAS element or LNO) monitors/refines ISR plan.
	c. Conducts precombat checks and inspections.
* 5.	Conduct a Passage of Lines as Passing Unit
	a. BCT/BN prepares for the passage.
	(1) Collocates command posts (CPs) for ease of coordination, making direct liaison, updating plans, and sending changes to higher headquarters. (If CPs were not collocated earlier in the planning process).
	(2) Conducts extensive ISR operations. Use available UAS elements to support real-time SU.

<b>Mission 2 - TASKS</b>	
(3)	Obtains updated ISR information from the stationary unit and higher headquarters (include UAS ISR information).
(4)	Refines the plan based on continuously updated intelligence. Integrate real-time surveillance and imagery provided by UAS.
(5)	Transmits changes in the plan to the stationary unit.
(6)	Employs operational security measures to deny the enemy information. Coordinates OPSEC with supporting UAS elements.
(7)	Verifies communications. (Internal and with the stationary unit).
(8)	Supervises subordinate troop-leading procedures to ensure planning and preparations are on track and consistent with the unit commander's intent.
(9)	Conducts rehearsals during day and limited visibility if possible. Include the use of UAS if possible.
(10)	Positions forces IAW the plan.
b. BCT/BN conducts the passage.	
(1)	Provides the element designated to coordinate and assist the passage with a list of elements to go through designated passage points.
(2)	Moves along assigned routes and or lanes. Utilize UAS to provide surveillance.
(3)	Displays correct visual signals.
(4)	Identifies and sends contaminated units to designated passage points.
(5)	Passes through the stationary unit without halting.
(6)	Maintains cover, concealment, and dispersion.
(7)	Imposes minimum radio traffic or radio listening silence for forward passage.
(8)	Orients subordinate elements and complete closure.
* 6. Conduct a Passage of Lines as Stationary Unit	
a. BCT/BN prepares for the passage.	
(1)	Clears lanes through all obstacles from the assembly area (AA) or attack position (AP) through passage lanes or routes.

<b>Mission 2 - TASKS</b>
(2) Employs reconnaissance and surveillance (R&S) assets to gather requested information for the passing unit. Utilize UAS to provide continuous updates to requested R&S information.
(3) Refines the plan based on continuously updated intelligence. Integrate real-time surveillance and imagery provided by UAS.
(4) Employs operational security measures to deny the enemy information.
(5) Verifies communications.
(6) Supervises subordinate troop-leading procedures to ensure planning and preparations are on track and consistent with the unit commander's intent.
(7) Conducts rehearsals during day and limited visibility if possible. Integrate UAS elements to the extent possible.
(8) Positions forces at established contact points.
b. BCT/BN conducts the passage.
(1) Establishes contact at contact points.
(2) Stops or delays pursuing enemy at BHL.
(3) Passes elements through unit positions with no halts.
(4) Provides security of the line of departure (LD) for the passing unit until it is able to assume that responsibility. Utilize UAS to assist in providing security.
(5) Engages all enemy elements that could fire on passing unit. Utilize UAS for strike missions.
(6) Provides emergency resupply of Class III and VIII items and care of casualties to the passing unit to allow continued movement.
(7) Closes all passage lanes when the passing unit completes passage.
(8) Reports to higher headquarters completion of passage.
c. BCT/BN supports by fire.
(1) Engages and suppresses all enemy elements in line of sight by direct or indirect fires IAW passing unit's fire plan. Utilize UAS to assist in fire support.

<b>Mission 2 - TASKS</b>
(2) Responds to requests for supporting fires from passing elements.
(3) Avoids firing on friendly elements.
* 7. Conduct a Movement to Contact
a .BCT/BN executes approach march technique.
(1) Uses movement formation(s) based on mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC).
(2) Uses designated direction of attack or axis of advance to orient movement.
(3) Selects routes based on IPB and guidance from higher headquarters.
(4) Establishes a security force, advance, flank, and rear guards to protect the main body and enable it to deploy if the enemy attacks. Coordinate for UAS to provide screen, guard, and cover support and integrate those actions with ground force security missions.
(5) Develops the situation early, but avoids decisive engagement.
(6) Establishes a defense and seeks guidance from higher headquarters if the BCT/BN reaches the objective or LOA before making contact with the enemy.
(7) Assists battalions or companies/teams (CO/TM) by ensuring adequate supporting fires, mobile transportation assets, timely and accurate intelligence, and reserve forces are available.
(8) Ensures ISR elements provide security to the front during the approach march. (ISR elements should be far enough ahead of the advanced guard to provide adequate warning and sufficient space to maneuver the main body.) Coordinate for UAS to provide continuous ISR updates.
(9) Ensures flank security elements operate far enough from the main body to prevent the enemy from placing direct or observed indirect fires on the main body. Coordinate for UAS to provide tactical air support for flank security elements.



<b>Mission 2 - TASKS</b>	
(10)	Ensures advance guard operates forward of the main body to provide security and ensure the main body's uninterrupted advance. Coordinate for UAS to provide tactical air support for the advance guard.
(11)	Ensures combat elements of the main body are prepared to rapidly deploy and attack, giving them the flexibility to maneuver rapidly to a decisive point on the battlefield in order to destroy the enemy or seize terrain.
<b>b.</b>	<b>BCT/BN conducts search and attack technique.</b>
(1)	Conducts ISR activities and collects information to develop the situational template while remaining undetected. Coordinate for UAS to provide continuous ISR updates.
(2)	Specifies where each battalion, CO/TM, and UAS asset will operate, establishes measures to consolidate units before the attack, and establishes fire control measures for each unit.
(3)	Seeks the most likely locations of enemy base camps, command and control sites, and artillery/mortars.
(4)	Designates a main effort and supporting efforts that enable the unit to maintain flexibility.
(5)	Fire support officer (FSO) uses AFATDS to plan concept of fire support and coordinate for responsive indirect fire in support of all CO/TMs.
(6)	Ensures sustainment supports the main effort while remaining responsive to the rest of the BCT/BN.
(7)	Finds the enemy using the smallest unit appropriate to the situation.
(8)	Fixes the enemy
(9)	Finishes the enemy rapidly.
<b>c.</b>	Upon making contact with the enemy, the BCT/BN commander decides on a COA.
<b>d.</b>	BCT/BN complies with rules of engagement (ROE) and rules of interaction (ROI). Appropriate ROE is determined and disseminated to supporting UAS units.
<b>* 8.</b>	<b>Conduct an Attack</b>
<b>a.</b>	<b>BCT/BN prepares for the mission.</b>
(1)	Refines the plan based on continuously updated intelligence. Ensure UAS elements are used to support the rapid collection and dissemination of time sensitive information to appropriate levels.
(2)	Conducts extensive ISR. Ensure UAS assets are effectively utilized to extend situational awareness.

<b>Mission 2 - TASKS</b>
(3) Conducts precombat checks.
(4) Supervises subordinate MDMP/troop-leading procedures to ensure planning and preparations are on track and consistent with the unit commander's intent.
(5) Conducts rehearsals during day and limited visibility, if possible. Supporting UAS elements are included in rehearsals, as appropriate.
(6) Positions forces.
b. BCT/BN conducts movement to the LD.
c. BCT/BN executes the plan.
(1) Conducts approach to the objective.
(a) Breaches or bypasses obstacles.
(b) Transitions to different formations based on the factors of METT-TC.
(c) Employs forces to screen or guard flanks that may become exposed or threatened during the approach. Assign UAS security missions and integrate with other security elements.
(d) Avoids terrain features that are likely enemy artillery reference points, locations for chemical strikes, or locations for situational obstacles.
(e) Destroys or forces the withdrawal of opposing enemy security forces.
(f) Uses available combat power to weaken enemy positions.
(g) Shifts fires and smoke to suppress enemy forces and obscure friendly forces.
(h) Minimizes the effects of enemy deception.
(2) Conducts actions on the objective.
(a) Employs firepower. Shifts fires and smoke to suppress enemy forces and obscure friendly forces as the unit approaches the enemy defense.
(b) Conducts shaping operations. Isolates the enemy force targeted for destruction by preventing him from laterally repositioning and reinforcing. Utilize UAS to provide reconnaissance and security support to identification of enemy intentions and actions.
(c) Conducts decisive operations.
(d) Pushes reconnaissance and security forces (include UAS) forward to provide critical information to the unit.

<b>Mission 2 - TASKS</b>	
(e) Calls forward sustainment assets.	
* 9.	Conduct Mobility, Countermobility, and or Survivability operations with UAS support
a.	BCT/BN executes defensive tasks.
	(1) Executes mobile defense tasks IAW the commander's intent.
	(2) Executes area defense tasks IAW the commander's intent.
b.	BCT/BN breaches obstacles.
c.	BCT/BN conducts survivability actions whenever the unit stopped.
d.	BCT/BN conducts deliberate survivability actions whenever the unit stops for longer than eight hours.
* 10.	Employ Fire and Effects
a.	Fire support coordinator (FSCoord) or fire support officer (FSO) and fire support element (FSE) process planned fire support requests (digital or voice).
b.	FSO processes combat assessment.
c.	FSE monitors the current situation.
d.	FSO coordinates fire support.
* 11.	Conduct Area Security Operations
a.	BCT/BN commander, with staff, coordinates with the protected area or force commander and develops the security plan.
b.	BCT/BN moves to security positions along the perimeter and/or in depth throughout the area. Utilize available UAS elements to support security and reconnaissance missions during this phase.
c.	BCT/BN establishes a defensive/security perimeter or security in a specified area. Utilize available UAS elements to support security and reconnaissance missions during this phase.
d.	BCT/BN provides early warning to the protected area/force. Utilize available UAS elements to support security and reconnaissance missions during this phase.
e.	BCT/BN maintains continuous security and defends, delays, and/or attacks as necessary. Utilize available UAS elements to support security and reconnaissance missions during this phase.
f.	BCT/BN conducts liaison with civilian population, host nation (HN) agencies, or international support agencies, as required, in the AO.

<b>Mission 2 - TASKS</b>	
	g. The BCT/BN secures the specified area or terrain, and achieves the desired end state. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
<b>* 12. Conduct Lines of Communication Security</b>	
	a. Commander and staff plan and coordinate LOC security.
	b. BCT/BN conducts route security missions IAW area commander's guidance and mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC). Utilize available UAS elements to support a wide variety of security and reconnaissance tasks during this phase.
	c. Squadrons conduct convoy security missions IAW area commander's guidance and METT-TC.
<b>* 13. Conduct Convoy Security Operations</b>	
	a. The battalion commander receives the convoy security mission from higher headquarters and issues initial guidance.
	b. The battalion operations (S-3) officer issues a warning order.
	c. The battalion staff conducts a mission analysis.
	d. The battalion intelligence (S-2) section provides support to subordinate and adjacent elements. Supporting UAS elements are included for both the planning and dissemination
	e. The battalion commander approves the COA.
	f. The battalion staff completes the operation plan.
	g. The battalion S-3 section produces the operation order, including guidance on the rules of engagement, rules for the use of force, rules of interaction, and escalation of force. Supporting UAS elements receive the plan and special instructions, as necessary.
	h. The battalion S-3 section provides support to subordinate elements. UAS elements are integrated appropriately in the support plan and are used to conduct surveillance and reconnaissance missions in support of battalion requirements.
	i. The battalion staff monitors the convoy security mission and provides support to subordinate and adjacent elements. Available UAS elements are employed to provide real-time SU in support of convoy security missions.
<b>* 14. Conduct Zone/Area Reconnaissance</b>	
	a. Commander and staff plan area/zone reconnaissance.
	b. BCT/BN begins movement to the zone or AO.

**Mission 2 - TASKS**

c. Battalions or companies conduct zone/area reconnaissance to find and report all threat forces within the zone/area; reconnoiter specific terrain within the zone/area; and report CCIR. UAS assets are employed to provide real-time surveillance and imagery in support of missions.
d. BCT/BN elements (air and/or ground) make contact with threat forces.
e. BCT/BN elements arrive at LOA or objective and prepare for subsequent missions. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
* 15. Coordinate A2C2
a. SQDN/BN commander establishes the A2C2 element
b. A2C2 element obtains necessary data
c. A2C2 element performs airspace management functions.
d. A2C2 element determines A2C2 requirements and forwards them to G3-Air for deconfliction of airspace control procedures.
e. A2C2 element receives airspace control information from higher.
f. S3-Air identifies and controls hazards IAW risk management procedures, as necessary, to allow the SQDN/BN to operate without suffering casualties or causing equipment damage as a result of fratricide.
*16. Synchronize Close Air Support
a. Conduct CAS planning
(1) S3 supervises close air support (CAS) planning.
(2) Air liaison officer (ALO) initiates CAS planning
(3) FECC and ALO plan for CAS.
b. FECC and ALO process preplanned CAS requests.
*17. Coordinate Air-Ground Integration and the Close Combat Attack
a. The aviation brigade commander and staff directly coordinate with the mounted BCT commander and staff, to gain knowledge of the ground tactical plan.
b. The aviation brigade commander and staff obtain the minimum planning requirements required to better integrate aviation into the BCT ground scheme of maneuver and ensure accurate and timely support.
c. The aviation brigade operations officer (S3) briefs and dispatches aviation and UAS LNOs to the BCT S3.
d. The senior aviation LNO works with the BCT S3-Air to advise and assist the BCT commander and staff.

<b>Mission 2 - TASKS</b>
e. The aviation and UAS LNOs and the BCT S3-Air coordinate Army aviation and non-organic UAS employment with the air defense (AD) officer.
f. During operations, the aviation and UAS LNOs and BCT S3-Air assist in the identification and resolution of airspace conflicts.
g. The aviation and UAS LNOs, BCT S3-Air, and AMC coordinate aviation mission execution actions with the BCT units in close combat with the enemy.
*18. BCT/BN leaders assess the operation.
a. Continuously monitor and update the COP and the progress of the operation.
b. Direct adjustments to ensure that operations remain aligned with the commander's intent.
c. Employ UAS to provide reconnaissance and security to support monitoring of the situation; integrate provided data into command assessments
*19. BCT/BN consolidates and reorganizes as necessary. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
*20. BCT/BN continues operations as directed.

### **Mission Category 3: Conduct Stability Operations**

*High Level BCT/BN level Stability Operations Task List* - The Stability Operations unit tasks were derived from an examination of the Mission Training Plans for a variety of US Army ground maneuver organizations using the general task list indicated earlier. The specific subtasks of these collective tasks were modified to indicate appropriate insertion of UAS considerations and were necessarily restricted to the most common set of tasks a ground maneuver element would be expected to conduct. It is not intended to be an exhaustive set. As the user considers each task within the context of the overarching mission, the appropriate phase wherein that task would be properly performed should become clear. Some tasks will necessarily be repetitive across two or more phases. Some tasks, under very specific conditions may not be required at all, or may be situationally applied, depending on the type of UAS that would be available. UAS systems, depending on group, configuration, and ownership are flexible and adaptable combat power multipliers, and specific employment procedures and rules must be considered and planned for in advance. Those rules will vary

### Mission 3 - TASKS

- \* 1. Brigade Combat Team/Battalion (BCT/BN) leaders gain and or maintain situational understanding using available communications equipment, maps, intelligence summaries, situation reports (SITREPs), and other available information sources. Intelligence sources include human intelligence (HUMINT), signal intelligence (SIGINT), and imagery intelligence (IMINT) to include unmanned aircraft systems (UAS).
- \* 2. Unit commander and staff receive an order or anticipate a new mission and begin the military decision-making process (MDMP) integrating all UAS capabilities.
- \* 3. BCT/BN commander and staff publish the order and distribute all paragraphs, annexes, and supporting overlays throughout the BCT/BN via FBCB2. They also task-organize the BCT/BN to accomplish the mission (S3). Supporting UAS elements are included in the operational information distribution structure.
- \* 4. Conduct extensive ISR. Ensure UAS assets are effectively utilized to extend situational awareness.
  - a. BCT/BN issues WARNO to designated ISR assets (to include UAS), and elements start movement to designated locations.
  - b. ISR planning team develops a draft ISR plan
  - c. Staff finalizes ISR plan and briefs to BCT/BN commander for his approval.
  - d. S3 issues ISR order to subordinate units (to include UAS elements) that synchronizes higher headquarters and BCT/BN ISR operations, and supports the commander's IR.
  - e. As the operation is being executed, the staff (including the UAS element or LNO) monitors/refines ISR plan.
- \* 5. Conduct a Civil Military Operation
  - a. Civil affairs officer and CA team prepares CA annex and portions of the operation plan (OPLAN) for the unit.
  - b. CA team and or staff judge advocate (SJA) advises the commander of legal obligations and moral considerations to include civilian casualty figures, property destruction, and infrastructure dislocation.

**Mission 3 - TASKS**

c. BN/BCT commander and staff conduct confirmation briefing with subordinates immediately after OPORD is issued to ensure subordinates understand commander's intent and concept. Supporting UAS units are included in briefings.

d. BN/BCT prepares for the mission.

(1) Establishes liaison with local officials.

(2) Establishes and maintain close and continuing relations with other US government agencies with a responsibility toward the civilian community in the AO.

(3) Refines the plan based on continuously updated intelligence. Ensure UAS elements are used to support the rapid collection and dissemination of time sensitive information to appropriate levels.

(4) Conducts extensive reconnaissance and surveillance (R&S). Ensure UAS assets are effectively utilized to extend situational awareness.

(5) Conducts precombat checks as necessary.

(6) Supervises subordinate troop-leading procedures to ensure planning and preparations were on track and consistent with the unit commander's intent.

(7) Conducts rehearsals during day and limited visibility if possible. Supporting UAS units are included in mission rehearsals as appropriate.

(8) Establishes medical civic action programs (MEDCAPs) to provide health care to noncombatants, incorporating US doctors and local host nation medical personnel.

(9) Brief subordinates on the danger of unmapped mine fields or unexploded ordinance in the AO.

(10) Positions forces.

(11) Completes host-nation resource estimate.

e. BN/BCT executes the Civil Military Operation (CMO).

(1) Conducts CA activities within offense, defense, stability, and civil support operations as directed.



<b>Mission 3 - TASKS</b>	
(2)	Concentrates engineers on both battle-damage repair and the upgrading of utilities to improve local infrastructure.
(3)	Maintains an information field. (CMO database). Information available from supporting UAS elements is included in the database.
(4)	Maintains liaison with local civil authorities and nongovernmental organizations.
f.	BN/BCT public affairs office (PAO) and or personnel officer (S1) supervises media support, control, and briefing.
* 6.	Conduct Mobility, Countermobility, and or Survivability operations with UAS support
a.	BCT/BN executes defensive tasks.
(1)	Executes mobile defense tasks IAW the commander's intent.
(2)	Executes area defense tasks IAW the commander's intent.
b.	BCT/BN breaches obstacles.
c.	BCT/BN conducts survivability actions whenever the unit stopped.
d.	BCT/BN conducts deliberate survivability actions whenever the unit stops for longer than eight hours.
* 7.	Provide Humanitarian Support
a.	S2, in coordination with the staff, continues IPB. Utilize UAS support to provide real time ISR support to maintain a timely situational understanding. Include supporting UAS units conducting security missions.
b.	S5 coordinates with the S2 and reports information gained through civil affairs and civilian-military operations (CMO) activities.
c.	S4 advises the commander and staff on the availability of logistical support for humanitarian assistance operations.

**Mission 3 - TASKS**

d. Commander and staff analyze the nature of the conflict or natural disaster and the environment in which it is occurring (permissive, semi-permissive, or hostile), conduct the military decision-making process (MDMP), and develops an OPORD. Includes ISR support from supporting UAS units.
e. XO continues the staff planning process. Includes UAS units providing support for ISR and security missions.
f. Unit headquarters and major subordinate elements establish a HACC or use the TOC elements as a coordinating center in accordance with OPORD. Consider using UAS for security and surveillance support.
g. Commander and staff maintain command and control (C2) and reports humanitarian activities to higher headquarters. UAS elements are employed to support C2 missions as available and are included in the dissemination of activity reports from the headquarters.
* 8. Synchronize Close Air Support
a. Conduct CAS planning
(1) S3 supervises close air support (CAS) planning.
(2) Air liaison officer (ALO) initiates CAS planning
(3) FECC and ALO plan for CAS.
b. FECC and ALO process preplanned CAS requests.
* 9. Employ a Reserve During Stability Operations
a. BCT/BN has a designated QRF.
b. Commander and staff conduct military decision-making process (MDMP) to produce FRAGO within time constraints dictated by mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC), and higher headquarters' orders. Integrate UAS assets to support ISR requirements and other collection efforts to support staff planning and situational awareness during the MDMP process. Ensure supporting UAS elements are included for intelligence dissemination.

<b>Mission 3 - TASKS</b>	
c.	S2, in coordination with staff, continues intelligence preparation of the battlefield (IPB). Utilize supporting UAS assets to conduct surveillance and reconnaissance missions for IPB.
d.	S5 and BCT/BN effects coordinator (ECOORD) update commander and staff on civil-military operations (CMO) and information operations (IO) assets and activities.
e.	ECOORD refines fire and effects plan to ensure immediate responsive fires and effects to the QRF.
f.	Executive officer (XO) and staff analyze impact on combat support (CS)/combat service support (CSS) plans.
g.	QRF begins movement at time specified in FRAGO.
h.	Commander and staff maintain command and control (C2) of developing situation.
<b>* 10. Coordinate A2C2</b>	
a.	BCT/BN commander establishes the A2C2 element
b.	A2C2 element obtains necessary data
c.	A2C2 element performs airspace management functions.
d.	A2C2 element determines A2C2 requirements and forwards them to G3-Air for deconfliction of airspace control procedures.
e.	A2C2 element receives airspace control information from higher.
f.	S3-Air identifies and controls hazards IAW risk management procedures, as necessary, to allow the BCT/BN to operate without suffering casualties or causing equipment damage as a result of fratricide.
<b>* 11. Secure Civilians During Operations</b>	
a.	BCT/BN prepares for mission. Supporting UAS elements are involved in mission rehearsals and provide real-time SA to the commander and staff, as available, to support continuous planning.
	(1) Refines the plan based on continuously updated intelligence.
	(2) Conducts rehearsals if possible.

**Mission 3 - TASKS**

(3) Positions forces IAW the plan.

b. BCT/BN executes the mission. Supporting UAS units provide situational awareness, ISR support, and security support as required.

(1) Establishes and maintains 360-degree and three-dimensional security in the AO in which civilians are gathered.

(2) Segregates civilians identified as being combatants or suspected war criminals and treats them as enemy prisoners of war (EPW).

(3) Searches civilians.

(4) Restrains and detains noncombatants who do not follow instructions.

(5) Provides food, water, and medical attention based upon the medical ROE for civilian medical treatment.

(6) Assigns guards to escort civilians out of the immediate AO to a processing and reception station or to an intermediate collection point.

(7) Reports situation and status in a timely manner to higher headquarters.

(8) Responds to the press and local officials IAW media plan, unit SOP, or ROE/ROI.

c. BCT/BN leaders assess the operation.

d. BCT/BNS2 section processes combatants and/or suspected war criminals as EPWs IAW the OPORD, FRAGO, tactical SOP (TACSOP), or other command guidance.

\* 12. Conduct Area Security Operations

a. BCT/BN commander, with staff, coordinates with the protected area or force commander and develops the security plan.

b. BCT/BN moves to security positions along the perimeter and/or in depth throughout the area. Utilize available UAS elements to support security and reconnaissance missions during this phase.

<b>Mission 3 - TASKS</b>
c. BCT/BN establishes a defensive/security perimeter or security in a specified area. Utilize available UAS elements to support security and reconnaissance missions during this phase.
d. BCT/BN provides early warning to the protected area/force. Utilize available UAS elements to support security and reconnaissance missions during this phase.
e. BCT/BN maintains continuous security and defends, delays, and/or attacks as necessary. Utilize available UAS elements to support security and reconnaissance missions during this phase.
f. BCT/BN conducts liaison with civilian population, host nation (HN) agencies, or international support agencies, as required, in the AO.
g. The BCT/BN secures the specified area or terrain, and achieves the desired end state. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
* 13. Enforce Peace Agreements
a. The commander, in conjunction with battle staff, plans enforcement operations. Coordinate with UAS to obtain real time information from UAS reconnaissance and surveillance missions and integrate into intelligence products.
b. S3 section publishes an order using Force XXI Battle Command Brigade and Below (FBCB2)/maneuver control system (MCS) field orders and overlay messages, or free text and overlay messages, or other electronic means to higher headquarters, subordinate units, and supporting (including UAS) elements.
c. The BCT/BN conducts rehearsals.
d. The BCT/BN conducts ISR operations to assess the area and reports results to the S2. Available UAS elements are integrated into ISR operations and are included in the exchange and dissemination of intelligence.

**Mission 3 - TASKS**

- e. The BCT/BN executes peace enforcement operations. Available UAS assets are employed to provide and complement monitoring, situational understanding, and security missions.

## \* 14. Employ Fire and Effects

- a. Fire support coordinator (FSCOORD) or fire support officer (FSO) and fire support element (FSE) process planned fire support requests (digital or voice).
- b. FSO processes combat assessment.
- c. FSE monitors the current situation.
- d. FSO coordinates fire support.

## \* 15. Conduct Lines of Communication Security

- a. Commander and staff plan and coordinate LOC security.
- b. BCT/BN conducts route security missions IAW area commander's guidance and mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC). Utilize available UAS elements to support a wide variety of security and reconnaissance tasks during this phase.
- c. Units conduct convoy security missions IAW area commander's guidance and METT-TC.

## \* 16. Conduct Convoy Security Operations

- a. The battalion commander receives the convoy security mission from higher headquarters and issues initial guidance.
- b. The battalion operations (S-3) officer issues a warning order.
- c. The battalion staff conducts a mission analysis.
- d. The battalion intelligence (S-2) section provides support to subordinate and adjacent elements. Supporting UAS elements are included for both the planning and dissemination
- e. The battalion commander approves the COA.
- f. The battalion staff completes the operation plan.
- g. The battalion S-3 section produces the operation order, including guidance on the rules of engagement, rules for the use of force, rules of interaction, and escalation of force.

<b>Mission 3 - TASKS</b>
Supporting UAS elements receive the plan and special instructions, as necessary.
h. The battalion S-3 section provides support to subordinate elements. UAS elements are integrated appropriately in the support plan and are used to conduct surveillance and reconnaissance missions in support of battalion requirements.
i. The battalion staff monitors the convoy security mission and provides support to subordinate and adjacent elements. Available UAS elements are employed to provide real-time SU in support of convoy security missions.
* 17. Conduct Zone/Area Reconnaissance
a. Commander and staff plan area/zone reconnaissance.
b. BCT/BN begins movement to the zone or AO.
c. Battalions or companies conduct zone/area reconnaissance to find and report all threat forces within the zone/area; reconnoiter specific terrain within the zone/area; and report CCIR. UAS assets are employed to provide real-time surveillance and imagery in support of missions.
d. BCT/BN elements (air and/or ground) make contact with threat forces.
e. BCT/BN elements arrive at LOA or objective and prepare for subsequent missions. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
* 18. Plan Public Affairs Operations
* 19. Implement Higher HQ Public Affairs Themes
* 20. Provide Interface or Liaison among Military and Civilian Organizations
* 21. BCT/BN leaders assess the operation.
a. Continuously monitor and update the COP and the progress of the operation.
b. Direct adjustments to ensure that operations remain aligned with the commander's intent.
c. Employ UAS to provide reconnaissance and security to support monitoring of the situation; integrate provided data into command assessments
* 22. BCT/BN consolidates and reorganizes as necessary. Available UAS elements are used to support updates to SU requirements in

<b>Mission 3 - TASKS</b>
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preparation for follow-on missions.
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* 23. BCT/BN continues operations as directed.
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**Mission Category 4: Conduct Civil Support Operations**

*High Level BCT/BN level Civil Support Operations Task List* - The Civil Support Operations unit tasks were derived from an examination of the Mission Training Plans for a variety of US Army ground maneuver organizations using the general task list indicated earlier. The specific subtasks of these collective tasks were modified to indicate appropriate insertion of UAS considerations and were necessarily restricted to the most common set of tasks a ground maneuver element would be expected to conduct. It is not intended to be an exhaustive set. As the user considers each task within the context of the overarching mission, the appropriate phase wherein that task would be properly performed should become clear. Some tasks will necessarily be repetitive across two or more phases. Some tasks, under very specific conditions may not be required at all, or may be situationally applied, depending on the type of UAS that would be available. UAS systems, depending on group, configuration, and ownership are flexible and adaptable combat power multipliers, and specific employment procedures and rules must be considered and planned for in advance. Those rules will vary.

<b>Mission 4 - TASKS</b>
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| * 1. Brigade Combat Team/Battalion (BCT/BN) leaders gain and or maintain situational understanding using available communications equipment, maps, intelligence summaries, situation reports (SITREPs), and other available information sources. Intelligence sources include human intelligence (HUMINT), signal intelligence (SIGINT), and imagery intelligence (IMINT) to include unmanned aircraft systems (UAS). |
| * 2. Unit commander and staff receive an order or anticipate a new mission and begin the military decision-making process (MDMP) integrating Group 1 through Group 4 UAS capabilities.  |
| * 3. BCT/BN commander and staff publish the order and distribute all paragraphs, annexes, and supporting overlays throughout the BCT/BN via FBCB2. They also task-organize the BCT/BN to accomplish the mission (S3). Supporting UAS elements are included in the operational information distribution structure.   |
| * 4. Conduct extensive ISR. Ensure UAS assets are effectively utilized to extend situational awareness.   |



<b>Mission 4 - TASKS</b>	
	a. BCT/BN issues WARNO to designated ISR assets (to include UAS), and elements start movement to designated locations.
	b. ISR planning team develops a draft ISR plan
	c. Staff finalizes ISR plan and briefs to BCT/BN commander for his approval.
	d. S3 issues ISR order to subordinate units (to include UAS elements) that synchronizes higher headquarters and BCT/BN ISR operations, and supports the commander's IR.
	e. As the operation is being executed, the staff (including the UAS element or LNO) monitors/refines ISR plan.
* 5.	Conduct a Civil Military Operation
	a. Civil affairs officer and CA team prepares CA annex and portions of the operation plan (OPLAN) for the unit.
	b. CA team and or staff judge advocate (SJA) advises the commander of legal obligations and moral considerations to include civilian casualty figures, property destruction, and infrastructure dislocation.
	c. BN/BCT commander and staff conduct confirmation briefing with subordinates immediately after OPORD is issued to ensure subordinates understand commander's intent and concept. Supporting UAS units are included in briefings.
	d. BN/BCT prepares for the mission.
	(1) Establishes liaison with local officials.
	(2) Establishes and maintain close and continuing relations with other US government agencies with a responsibility toward the civilian community in the AO.
	(3) Refines the plan based on continuously updated intelligence. Ensure UAS elements are used to support the rapid collection and dissemination of time sensitive information to appropriate levels.
	(4) Conducts extensive reconnaissance and surveillance (R&S). Ensure UAS assets are effectively utilized to extend situational awareness.
	(5) Conducts precombat checks as necessary.

<b>Mission 4 - TASKS</b>	
(6)	Supervises subordinate troop-leading procedures to ensure planning and preparations were on track and consistent with the unit commander's intent.
(7)	Conducts rehearsals during day and limited visibility if possible. Supporting UAS units are included in mission rehearsals as appropriate.
(8)	Establishes medical civic action programs (MEDCAPs) to provide health care to noncombatants, incorporating US doctors and local host nation medical personnel.
(9)	Brief subordinates on the danger of unmapped mine fields or unexploded ordinance in the AO.
(10)	Positions forces.
(11)	Completes host-nation resource estimate.
e. BN/BCT executes the CMO.	
(1)	Conducts CA activities within offense, defense, stability, and civil support operations as directed.
(2)	Concentrates engineers on both battle-damage repair and the upgrading of utilities to improve local infrastructure.
(3)	Maintains an information field. (CMO database). Information available from supporting UAS elements is included in the database.
(4)	Maintains liaison with local civil authorities and nongovernmental organizations.
f. BN/BCT public affairs office (PAO) and or personnel officer (S1) supervises media support, control, and briefing.	
* 6. Conduct Mobility, Countermobility, and or Survivability operations with UAS support	
a. BCT/BN executes defensive tasks.	
(1)	Executes mobile defense tasks IAW the commander's intent.
(2)	Executes area defense tasks IAW the commander's intent.

<b>Mission 4 - TASKS</b>
b. BCT/BN breaches obstacles.
c. BCT/BN conducts survivability actions whenever the unit stopped.
d. BCT/BN conducts deliberate survivability actions whenever the unit stops for longer than eight hours.
<b>* 7. Provide Humanitarian Support</b>
a. S2, in coordination with the staff, continues IPB. Utilize UAS support to provide real time ISR support to maintain a timely situational understanding. Include supporting UAS units conducting security missions.
b. S5 coordinates with the S2 and reports information gained through civil affairs and civilian-military operations (CMO) activities.
c. S4 advises the commander and staff on the availability of logistical support for humanitarian assistance operations.
d. Commander and staff analyze the nature of the conflict or natural disaster and the environment in which it is occurring (permissive, semi-permissive, or hostile), conduct the military decision-making process (MDMP), and develops an OPORD. Includes ISR support from supporting UAS units.
e. XO continues the staff planning process. Includes UAS units providing support for ISR and security missions.
f. Unit headquarters and major subordinate elements establish a HACC or use the TOC elements as a coordinating center in accordance with OPORD. Consider using UAS for security and surveillance support.
g. Commander and staff maintain command and control (C2) and reports humanitarian activities to higher headquarters. UAS elements are employed to support C2 missions as available and are included in the dissemination of activity reports from the headquarters.
<b>* 8. Coordinate A2C2</b>

<b>Mission 4 - TASKS</b>
a. BCT/BN commander establishes the A2C2 element
b. A2C2 element obtains necessary data
c. A2C2 element performs airspace management functions.
d. A2C2 element determines A2C2 requirements and forwards them to G3-Air for deconfliction of airspace control procedures.
e. A2C2 element receives airspace control information from higher.
f. S3-Air identifies and controls hazards IAW risk management procedures, as necessary, to allow the BCT/BN to operate without suffering casualties or causing equipment damage as a result of fratricide.
<b>* 9. Secure Civilians During Operations</b>
a. BCT/BN prepares for mission. Supporting UAS elements are involved in mission rehearsals and provide real-time SA to the commander and staff, as available, to support continuous planning.
(1) Refines the plan based on continuously updated intelligence.
(2) Conducts rehearsals if possible.
(3) Positions forces IAW the plan.
b. BCT/BN executes the mission. Supporting UAS units provide situational awareness, ISR support, and security support as required.
(1) Establishes and maintains 360-degree and three-dimensional security in the AO in which civilians are gathered.
(2) Segregates civilians identified as being combatants or suspected war criminals and treats them as enemy prisoners of war (EPW).
(3) Searches civilians.
(4) Restrains and detains noncombatants who do not follow instructions.
(5) Provides food, water, and medical attention based upon the medical ROE for civilian medical treatment.

<b>Mission 4 - TASKS</b>	
(6)	Assigns guards to escort civilians out of the immediate AO to a processing and reception station or to an intermediate collection point.
(7)	Reports situation and status in a timely manner to higher headquarters.
(8)	Responds to the press and local officials IAW media plan, unit SOP, or ROE/ROI.
c.	BCT/BN leaders assess the operation.
d.	BCT/BNS2 section processes combatants and/or suspected war criminals as EPWs IAW the OPORD, FRAGO, tactical SOP (TACSOP), or other command guidance.
<b>* 10. Conduct Area Security Operations</b>	
a.	BCT/BN commander, with staff, coordinates with the protected area or force commander and develops the security plan.
b.	BCT/BN moves to security positions along the perimeter and/or in depth throughout the area. Utilize available UAS elements to support security and reconnaissance missions during this phase.
c.	BCT/BN establishes a defensive/security perimeter or security in a specified area. Utilize available UAS elements to support security and reconnaissance missions during this phase.
d.	BCT/BN provides early warning to the protected area/force. Utilize available UAS elements to support security and reconnaissance missions during this phase.
e.	BCT/BN maintains continuous security and defends, delays, and/or attacks as necessary. Utilize available UAS elements to support security and reconnaissance missions during this phase.
f.	BCT/BN conducts liaison with civilian population, host nation (HN) agencies, or international support agencies, as required, in the AO.

<b>Mission 4 - TASKS</b>	
	g. The BCT/BN secures the specified area or terrain, and achieves the desired end state. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
* 11. Conduct Lines of Communication Security	
	a. Commander and staff plan and coordinate LOC security.
	b. BCT/BN conducts route security missions IAW area commander's guidance and mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC). Utilize available UAS elements to support a wide variety of security and reconnaissance tasks during this phase.
	c. Squadrons conduct convoy security missions IAW area commander's guidance and METT-TC.
* 12. Conduct Convoy Security Operations	
	a. The battalion commander receives the convoy security mission from higher headquarters and issues initial guidance.
	b. The battalion operations (S-3) officer issues a warning order.
	c. The battalion staff conducts a mission analysis.
	d. The battalion intelligence (S-2) section provides support to subordinate and adjacent elements. Supporting UAS elements are included for both the planning and dissemination
	e. The battalion commander approves the COA.
	f. The battalion staff completes the operation plan.
	g. The battalion S-3 section produces the operation order, including guidance on the rules of engagement, rules for the use of force, rules of interaction, and escalation of force. Supporting UAS elements receive the plan and special instructions, as necessary.

<b>Mission 4 - TASKS</b>	
h.	The battalion S-3 section provides support to subordinate elements. UAS elements are integrated appropriately in the support plan and are used to conduct surveillance and reconnaissance missions in support of battalion requirements.
i.	The battalion staff monitors the convoy security mission and provides support to subordinate and adjacent elements. Available UAS elements are employed to provide real-time SU in support of convoy security missions.
* 13. Conduct Zone/Area Reconnaissance	
a.	Commander and staff plan area/zone reconnaissance.
b.	BCT/BN begins movement to the zone or AO.
c.	Battalions or companies conduct zone/area reconnaissance to find and report all threat forces within the zone/area; reconnoiter specific terrain within the zone/area; and report CCIR. UAS assets are employed to provide real-time surveillance and imagery in support of missions.
d.	BCT/BN elements (air and/or ground) make contact with threat forces.
e.	BCT/BN elements arrive at LOA or objective and prepare for subsequent missions. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions.
* 14. Plan Public Affairs Operations	
* 15. Implement Higher HQ Public Affairs Themes	
* 16. Provide Interface or Liaison among Military and Civilian Organizations	
* 17. BCT/BN leaders assess the operation	
a.	Continuously monitor and update the COP and the progress of the operation.
b.	Direct adjustments to ensure that operations remain aligned with the commander's intent.
c.	Employ UAS to provide reconnaissance and security to support monitoring of the situation; integrate provided data

<b>Mission 4 - TASKS</b>
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| * 18. BCT/BN consolidates and reorganizes as necessary. Available UAS elements are used to support updates to SU requirements in preparation for follow-on missions. |
| * 19. BCT/BN continues operations as directed.   |



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