CHAPTER 2

OPERATIONS

UAVs are capable of locating and identifying major enemy forces, moving vehicles, weapons systems which are firing, and other targets which contrast with their surroundings. Conversely, it is difficult to locate enemy forces which blend in with their surroundings. The UAV is not well-suited to wide area searches. Rather, its capabilities are enhanced when it is employed as part of an overall collection plan, integrated with, and cued by other intelligence systems in a synchronized effort to support the warfighters needs.

FUNCTIONS OF UAV OPERATIONS

UAV operations are broken down into seven key functions; **command and control**, **emplacement, communications, tasking, airspace coordination, execution**, and **reporting**.

Command and Control:
UAV units are tactically tailored by the UAV company commander based on the maneuver commander's requirements. The doctrinal principles for the command and control (C^2) and employment of UAV units are similar to those used by all other units, and discussed in FM 100-5. This section briefly discusses the C^2 and employment considerations specific to UAV units.

The UAV commander exercises C^2 over his assets. Like other intelligence and electronic warfare (IEW) assets, UAV units are task organized, tactically tailored, and deployed to perform specific missions. These missions will dictate the support responsibilities for the UAV element. They also establish the UAV's relationship to a supported unit. There are two types of relationships—command relationship and support relationship.

- Command relationship provides assigned, attached, or operational control (OPCON).

- Support relationship provides direct support (DS), general support (GS), reinforcing, and GS-reinforcing (GS-R) (see Table 2-1).

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The following JT-UAV C^2 will help to illustrate UAV C^2 procedures.

Corps C^2. The corps commander exercises C^2 over his JT-UAVs through his staff and subordinate units (see Figure 2-1). With the corps' UAVs in GS to the corps, UAV collected products will be provided to both higher and lower echelons in NRT through reporting and the use of the corps' remote video terminal (RVT), or Joint Surveillance and Target Attack Radar System (JSTARS) ground station module (GSM) and GCS. In addition, any unit within range of the UAV and in possession of a RVT, GCS, or launch and recovery station (LRS), could receive the video of any of the corps' UAVs. Coordination for frequency, communications security (COMSEC) key, and flight time are all that is required.

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If the mission dictates, the JT-UAV is capable of performing DS to division or brigade operations. In this case, the corps' air reconnaissance company or a portion of the company is tasked and reports directly to the supported unit. When divisions (or brigades supported by the division) possess either a JT-UAV or M-UAV GCS, the corps could reinforce their UAV capability by passing control of airborne UAVs down to that division or brigade.

Division C^2. The division commander exercises C^2 over his UAV assets through his staff and subordinate units (see Figure 2-2).

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The division's GS company will provide JT-UAV and M-UAV collection products to both higher and lower echelons NRT through reporting and using the division's RVT. In addition, any unit within range of the UAVs and in

possession of a RVT, GCS, or LRS could receive the video of any of the GS company's UAVs. Coordination for frequency, COMSEC key, and flight time are all that is required.

The division's DS companies will be tasked by, and report directly to, their supported maneuver brigade.

The division's GS company could reinforce any of the DS companies by passing control of airborne UAVs down since the DS companies will (upon fielding) possess a M-UAV GCS.

Brigade C^2. In the future, DS companies from the division MI battalion will provide organic M-UAV support to their respective brigades. The DS companies will have an organic M-UAV GCS which is capable of assuming control of any reinforcing UAVs from the GS company or the corps' air reconnaissance company.

Emplacement:

While many variations are possible, the normal configurations for UAV emplacement are single site operations and split site operations. The mission, enemy, troops, terrain and weather, and time available (METT-T) will determine the emplacement strategy to use.

- **Single Site Operations**. In single site operations, the entire UAV unit is collocated, usually in the division, corps, or theater area. Single site operations allow for easier unit command, control, and communications (C^3) and logistics, but make coordination with the supported unit more difficult. In addition, single site operations emit a greater electronic and physical signature.

- **Split Site Operations.** In split site operations, the UAV unit is split into two distinct sites—the mission planning and control station (MPCS) site, and the launch and recovery (L/R) site.

  — The MPCS site consists of the mission planning station (MPS), GCS personnel and supporting equipment. It is normally collocated with the supported unit. The MPCS receives the taskings, plans the missions, takes over control of the airborne UAVs for the actual conduct of the mission, and reports the information.

  — The L/R site consists of the UAVs, L/R systems, maintenance equipment, ground support equipment (GSE) and supporting personnel. After L/R site personnel receive their flight schedule and mission plan from the MPCS, they prepare and preflight the UAV for the mission and launch, and recover it as scheduled.

Site requirements depend on many factors; for example, METT-T, logistics support, the environment, and equipment. When selecting a L/R site, consider the following:

- Distance from the target.

- An adequate amount of space either for system L/R, or adequate space and engineer support for construction and expansion of the site.

- The L/R area should afford sufficient clearance to conduct operations.

- Areas with high population densities and an excess of high power lines should be avoided, when possible.

- The L/R site should be close enough to MPCS to effectively communicate, hand off, and receive control of the UAVs.

- The UAV L/R should allow for safe manned aircraft operations.

Another major factor in site selection is to have line of sight (LOS) between the ground terminals and the UAVs. If there is an onboard record capability, LOS would not require portions of the mission flown in a programmed mode. Site selection should incorporate operations security (OPSEC) considerations to reduce the possibility of detection and destruction by enemy forces.

Once the site is selected, the distance between the control station and its support equipment; for example, ground data terminal (GDT) and generators, must be considered. This is critical due to lengths of cabling used.

Communications:

UAV systems use fiber-optic cabling for internal system ground communications, Single Channel Ground Airborne Radio System (SINCGARS), and mobile subscriber equipment (MSE) for external communications on the battlefield. However, satellite relay and other DOD communications links may be used as they become available.

UAV communications nets depend on the UAV system being used, the echelon of deployment, and the operation being supported. They use standard DOD COMSEC equipment and procedures.

Tasking:

As the tasking authority, the division, corps, or theater collection manager will receive all requests for imagery support. When appropriate, a UAV will be selected to fulfill the requirement. For some operations, the G3 will specify UAV support, but this should be the exception and not the rule.
Because UAV requests, tasking, and reporting procedures vary (depending upon the type of system, echelon of deployment, command relationship,

and support relationship), some standard tasking and reporting procedures have been established.

Whenever possible, a mission request should be received by the appropriate echelon collection manager (a minimum of 24 hours prior to the mission) so that it can be included in the airspace control order (ACO). The asset manager can task an immediate mission or in-flight modification to an ongoing mission. This requires timely, detailed coordination between the asset manager and the Army airspace command and control (A^2C^2) cell to ensure successful mission execution. Some UAV elements require a minimum of three hours notice for internal mission planning and flight preparation.

The request and tasking channels for UAV support depends on echelon,

command, and support relationship. The following paragraphs are not intended to cover all of the possibilities, but lay down guiding principles.

- **Theater Army Request and Tasking Channels**. Requests for support are forwarded to the theater collection manager who will prioritize requirements and determine the best supporting asset. If the UAV is selected, airspace will be coordinated through the theater A^2C^2 element. The theater analysis and control element (ACE) will transmit the tasking directly to the UAV company and provide an information copy to the MI battalion light. All final reports from the UAV company are sent directly to the ACE for distribution to the requestor with an information copy to the MI battalion light.

- **Corps and Division Request for Intelligence Information and Tasking Channels**. Requests for support are forwarded to the collection manager who will prioritize requirements and determine the best supporting asset. If the UAV is selected, airspace will be coordinated through the A^2C^2 element. The corps will transmit the tasking directly to the air reconnaissance company and provide information copies to the aerial exploitation battalion (AEB) (see Figure 2-3).

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Figure 2-3. (3.50)

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The following request and tasking channels at division are slightly different for the GS and DS companies:

- **GS Company Request and Tasking Channels.** The division ACE will task the air reconnaissance platoon directly. Platoon taskings will include the same minimum guidance as above. In addition, requests for intelligence information (RIIs) from higher and lower can be filled. Once a brigade has determined that they cannot fulfill an information requirement (IR) with organic assets, they will send a request to division for additional support. After prioritizing requirements, the collection manager determines the best supporting asset. If the UAV is chosen, airspace is coordinated through the division's A^2C^2 element. The UAV platoon is then tasked by the asset manager.

- **DS Company Request and Tasking Channels.** When a UAV company is in direct support of a maneuver brigade, the controlling GCS can be collocated with the supported brigade's tactical operations center (TOC), allowing direct tasking by the brigade S2 and real-time down link of raw intelligence data. The brigade S3 Air is responsible for interfacing with the A^2C^2 cell to coordinate and deconflict airspace. If there are no RVT down links, then the brigade S2 has the responsibility to report UAV collection results to division and higher. The UAV platoon will provide a liaison to support brigade S2 UAV operations.

Airspace Coordination:

Airspace coordination is a vital facet of UAV operations. Allocating airspace for UAV operations, while sister services are operating within that

same airspace, requires extensive preplanning and coordination. These functions are addressed in Chapter 3 and in FM 100-103-1, Annex B to Appendix F.

Execution:

Upon receipt of a tasking or warning order, a mission planning process is initiated and the air vehicles (AVs) are readied to accomplish the mission. The following planning considerations are necessary to develop the final mission plan:

- AV availability.

- Compliance with airspace control measures.

- Weather.

- Target location.

- Collection requirements.

- Threat.

- Type of AV required (single UAV or relay).

- Payload.

- Fuel requirements.

- Altitude and speed.

- Loiter times.

- Crew manning.

- AV return home locations.

- Emergency recovery options.

All phases of mission planning are the responsibility of the UAV team performing the mission.

Reporting:

Reporting procedures depend upon the UAV system used and the echelon of deployment. The reporting medium will also depend on the system in use. A direct down link to the commander's RVT, allowing him access to NRT video, will be the normal mode of operation. In some cases, however, due to range, a hard copy photo or recorded video tape may be provided to the requestor, or if equipped, NRT video via the TROJAN SPIRIT video teleconferencing system. See Figure 2-4 for the reporting flow.

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2-4 (3.50")

For a complete list of possible reports and detailed instruction to fill them out, see UAV operations technical manuals (TMs). The two normal types of reports disseminated by UAV units are the In-flight Report (INFLTREP) shown in Figure 2-5, and the Reconnaissance Exploitation Report (RECCEXREP) shown in Figure 2-6.

- **In-flight Report**. UAV operators will report targets and information as they see them. All reports are sent as directed by the major command exercising tasking authority. All targets reported are transcribed on a multipurpose message form at the MPS, or the GCS if operating independently of the MPS. All targets are numbered and referenced in the log for cross-referencing to video tape and subsequent detailed analysis. The results portion of the INFLTREP should be given in size, activity, location, unit, time, and equipment (SALUTE) format minus the location and time since they are already included in the INFLTREP.

- **Reconnaissance Exploitation Report**. When a MPS is supporting a GCS, a RECCEXREP will be done in NRT. When operating independently of a GCS, a MPS may require approximately 45 minutes after mission completion to examine the mission tape and confirm initial reports. A RECCEXREP is then prepared and forwarded. Additional processing time may be required; for example, a UAV has performed an autonomous mission, and two or more hours of video have been recorded and not down linked. The report may be sent via tactical telephone, radio, automatic digital network (AUTODIN), TROJAN SPIRIT, facsimile, or supported unit messenger.

LAUNCH AND RECOVERY

The launch and recovery method will depend on the area available, site set-up, and land type of UAV system being used.

- **Launch**. UAVs are launched by rolling takeoff, rocket-assisted takeoff (RATO), hand launch, rail launch, or pneumatic launch.

- **Recovery**. The types of recovery operations selected depend on the UAV system. They include: arresting gear or nets; rolling landings; skid stops; parafoil; or autoload stall.

- **Emergency Recovery**. The senior UAV operator will identify

emergency recovery locations during mission planning. These locations are identified by their proximity to the launch recovery site and with minimum risk of injury or damage to property. Normally, return home points are associated with these emergency recovery areas. A return home point is a preprogrammed set of coordinates of a point on the ground. In case of lost communications between the AV and the GCS, the AV will return directly to this point and will circle. It will continue to circle this point until communications are reestablished or it runs out of fuel.