FM 30-20

FIELD MANUAL

AERIAL SURVEILLANCE–RECONNAISSANCE, FIELD ARMY

HEADQUARTERS, DEPARTMENT OF THE ARMY
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CHAPTER 1

INTRODUCTION

1–1. Purpose

The purpose of this manual is to provide guidance to commanders, staffs, and intelligence personnel concerned with the collection, processing, and use of intelligence information gained by aerial means. It sets forth doctrine, tactics, and techniques for the planning, coordination, and employment of aerial surveillance and reconnaissance resources.

1–2. Scope

a. This manual outlines the procedures used to determine aerial surveillance and reconnaissance requirements, to plan and request aerial reconnaissance and surveillance support, and to plan and coordinate activities incidental to aerial reconnaissance and surveillance. It also discusses organizational and operational aspects of the Army's and other services' aerial surveillance and reconnaissance activity. This manual includes only those details and techniques described in other manuals which are necessary for complete understanding and continuity.

b. Mechanical aspects of processing and disseminating the information obtained by aerial means are discussed in this manual. The evaluation, interpretation, and use of the product resulting from the employment of aerial surveillance and reconnaissance collection means are discussed in FM 30–5.

c. The technical aspects of the equipment used in aerial surveillance and reconnaissance and the procedures utilized by aerial surveillance and reconnaissance specialists in the performance of their duties are not discussed in detail in this manual. This information is contained in appropriate technical manuals and other published media available to specialists and technicians responsible for the employment of the equipment and procedures used in aerial surveillance and reconnaissance.

d. The material in this manual is applicable to general, limited, and cold war situations.

e. Within this manual, all discussion pertaining to the duties, functions, and responsibilities of the G2 or G2 Air will apply equally to the S2 or S2 Air in organizations below division level, unless otherwise stated.

f. Within this manual, the terms aerial surveillance and aerial reconnaissance are not treated as mutually exclusive intelligence gathering activities. Separate use of one of the terms denotes whether the surveillance activity or the reconnaissance activity will be given major emphasis in a given operation. Operational instructions will indicate whether the activity not referred to will be given secondary emphasis or excluded.

g. Surveillance of air-space involves the detection of electromagnetic radiations, principally those emanating from hostile radio transmitters and radar, with the purpose of intelligence collection; confirming, supplementing, or refuting information obtained from other reconnaissance, surveillance and intelligence sources; and target acquisition. Surveillance missions of this nature come under the operational control of the ASA unit in support of the field army and are under the staff supervision of the Field Army G2. For additional information on this subject refer to the FM 32–series.

h. This manual is in consonance with the international agreements listed below. Applicable agreements are listed by type of agreement and number at the beginning of each chapter.

i. Users of this manual are encouraged to submit recommendations to improve its clarity and/or accuracy. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommend Changes to Publications) and forwarded

TITLE	NATO STANAG	CENTO STANAG	SEATO SEASTAG	ABCA SOLOG	ASCC AIR STDS
Air Reconnaissance Intelligence Report Forms	3377	3377	3377		101/1A
Air Reconnaissance Target Reporting Guide	3596				101/5
Titling of Air Reconnaissance and Air Survey and Mapping Photography	3189	3189	3189		101/2B
Air Reconnaissance Request Form	3277	3277	3277		101/3
Reporting—Nomenclature of Equipment and Installation—ATP–26	3483				
Method of Describing Ground Locations and Areas and Boundaries	2029	2029	2029		
Place Name Spelling on Maps and Charts	2208	2208	2208		
Titling and Exchange of Hand-Held Photography					101/4
Standardization of Policies and Procedures Governing and Regulation/Control and Identification of Army Traffic in the Combat Zone				118	
Offensive Air Support Operations—ATP–27	2134	21344			
Point Designation Template for Air Photographs	3205		3205		

direct to the Commanding Officer, US Army Combat Developments Command Intelligence Agency, Fort Huachuca, Arizona 85613. Originators of proposed changes which would constitute a significant modification of approved Army doctrine may send an information copy, through command channels to the Commanding General, United States Army Combat Developments Command, Fort Belvoir, Virginia to facilitate review and followup action.

1–3. Responsibilities

Each commander is responsible for the intelligence activities of his command as defined in FM 100–5. To accomplish these activities he delegates the functions of intelligence planning, coordination, collection, production and dissemination to his principal staff assistant for intelligence—his G2 or S2.

1–4. Means of Collection and Processing

a. Collection Means.

(1) Army aerial collection capability is provided by aviators, aerial observers, sensors, and sensor equipment operators using organic airplanes and helicopter platforms. Present collection capabilities include visual observation, photography, radar and infrared imagery, and electronic surveillance.

(2) For joint operations, other services provide the aerial collection means required to increase the area of coverage capabilities of the Army and extend that coverage beyond the limits of organic Army aerial collection means. Present collection capabilities include visual observation, photography, radar and infrared imagery, electronic reconnaissance, image intensification, and weather reconnaissance.

b. Collection and Processing Agencies.

(1) The Military Intelligence (MI) Companies (Aerial Surveillance) (OV–1B/C) and (OV–1D) are two of the organizations containing Army aircraft, sensors, and necessary personnel. These companies provide the Army with an organic means procuring intelligence information in immediate response to the commander's needs. A detailed discussion of these organizations is contained in chapter 8.

(2) The Military Intelligence Battalion, Aerial Reconnaissance Support (MIBARS), Field Army, is a specialized organization which provides the Army an organic means of interpreting, processing, and disseminating intelligence information from aerial reconnaissance missions flown by the Air Force, Navy, Marine Corps, or Allied Forces in support of the Army requirements. It also provides liaison officers to the reconnaissance elements of the supporting tactical Air Force. A detailed discussion of this organization is contained in chapter 7.

(3) Army aviation units of the division are all capable of performing visual aerial surveillance missions. In addition, helicopters of the division are also capable of performing airborne personnel detector and other sensory missions when provided the necessary equipment and personnel.

(4) Contained within the military intelligence organization supporting the field army, corps, division, separate brigade, and armored cavalry regiment are imagery interpretation (II) sections that directly support their respective headquarters G2 or S2 staff section. This II sup-

port is immediately responsive to the commander's needs and can provide all II functions. A detailed discussion of II functions is contained in chapter 9.

(5) The US Army Security Agency (USASA) provides tactical units the capability to conduct the electronic warfare (EW) portion of aerial surveillance and reconnaissance in support of Army field commands. Electronic warfare operations are a staff responsibility of the operations officer G3/S3. A detailed discussion of other USASA functions, tactical organization, employment, control, and command relationships is contained in FM 32–10.

CHAPTER 2

G2 AIR ORGANIZATION AND FUNCTIONS

Section I. ORGANIZATION

2-1. General

a. The ACofS, G2 (S2 below division level), has staff responsibility for planning and coordination of aerial surveillance and reconnaissance missions.

b. At division and higher echelons, the G2 Air advises the G2 on all matters pertaining to the employment of aerial surveillance and reconnaissance resources. He is responsible to the G2 for supervising the collection, and dissemination of information concerning the enemy, weather, and terrain in the area of operations obtained from aerial surveillance and reconnaissance. To accomplish these responsibilities, he makes recommendations concerning policies and procedures for use in selecting missions; exercises staff supervision over organic Army aerial surveillance and reconnaissance agencies; requests aerial surveillance and reconnaissance support from other services; receives, consolidates, and assigns priorities to aerial surveillance and reconnaissance requests; disseminates intelligence reports resulting from aerial surveillance and reconnaissance missions; and performs necessary staff coordination.

c. The G2 Air is required to advise the G2 on the available aerial surveillance assets, their status, capabilities, and limitations, and to prepare the proposed aerial surveillance plan for the echelon.

d. The G2 Air must know the status, capabilities, limitations, and workloads of each of the elements in the aerial surveillance system; he must know the operational plan; he must remain informed of the friendly and enemy situation; he must know the impact of weather on aerial surveillance, aircraft, sensors, and telemetry operations. He must know the variables of weather, light visibility, precipitation, haze and other natural phenomena which influence sensor and aircraft operations, and be aware that these can vary greatly in very short distances and in relatively short periods of time. He must know the impact of each of these variables on each sensor and the aircraft and be able to determine which sensor is to be used, its specific configuration, and the time of accomplishment in order to assure an acceptable degree of successful accomplishment.

2-2. Location and Organization

a. General. G2 Air personnel are located at all echelons from field army through division. At echelons below division, G2 Air functions are performed by the S2 or his assistant. As an exception, separate armored, infantry, and mechanized brigades have organic S2 Air personnel.

b. Location. The tactical air support element (TASE) of the tactical operations center (TOC) at field army, corps, and division levels consists of collocated G2 Air duty teams and G3 Air representatives. The TASE normally is located with the fire support element (FSE) and airspace control element (ACE) which are also part of the TOC. Though collocated, the G2 Air, G3 Air, FSE, and ACE elements are not combined, but each remains under the direct control and authority of its own team chief and its respective general or special staff officer.

c. Organization. The G2 Air sections at field army, corps, and division are organized into duty teams to provide 24-hour operation. Actual composition of each duty team is at the discretion of the G2 Air; however, at field army level it is desirable that a long-range planning section and a duty team for the alternate field army tactical operations center (FATOC) be organized.

d. Independent Operations. When divisional brigades are assigned to independent operations for prolonged periods of time, provision should be made for inclusion of an S2 Air to augment the brigade S2 staff.

Section II. FUNCTIONS

2–3. General Functions

General functions of the G2/S2 Air at all echelons include the following:

a. Advises the G2/S2 on matters pertaining to aerial surveillance and reconnaissance.

b. Recommends policies and procedures for the conduct of aerial surveillance and reconnaissance.

c. Prepares the aerial surveillance and reconnaissance SOP.

d. Prepares the aerial surveillance and reconnaissance plan in coordination with the ACE.

e. Assists in determination of information needs and development of the collection plan.

f. Assists other staff sections in establishing aerial surveillance and reconnaissance requirements to include special studies.

g. Processes aerial surveillance and reconnaissance requests; coordinates requests with the ACE; approves or disapproves requests from subordinate elements and the staff at his own echelon.

h. Establishes a priority system for aerial surveillance and reconnaissance requests and monitors all priorities assigned to requests submitted within the command.

i. Maintains and disseminates information on the capabilities and allocations of the aerial surveillance and reconnaissance support.

j. Disseminates information resulting from aerial surveillance and reconnaissance operations.

k Develops and recommends cover and deception measures pertaining to aerial surveillance and reconnaissance operations to the G2 for subsequent recommendation to the G3.

l. Exercises staff supervision over Army aerial surveillance and reconnaissance elements organic to, or in direct support of, his command.

m. Coordinates with G3/S3 Air, ACE, and FSE in the planning of close air support and interdiction and aerial surveillance and reconnaissance missions. Keeps ACE informed of mission progress; e.g., passes frag order and on-the-way information, etc.

n. Coordinates with the G3/S3 Air, ACE, and FSE for necessary planning and execution of an aerial surveillance or reconnaissance mission to minimize interference with the accomplishment of required supporting fires.

o. Coordinates with the appropriate Air Force elements those requests for aerial surveillance and reconnaissance missions to be accomplished by the Air Force.

p. Provide briefing and debriefing for personnel directly engaged in aerial surveillance and reconnaissance operations.

q. Supervises the imagery interpretation effort at his echelon.

2–4. Specific Functions

The G2/S2 Air accomplishes specific functions relating to his level of assignment as follows:

a. Field Army/Independent Corps G2 Air.

(1) Coordinates the scheduling of available aerial surveillance and reconnaissance support with the tactical air control center (TACC) and with Navy, Marine, and organic Army aerial surveillance and reconnaissance units.

(2) Conducts appropriate portions of the daily planning conference with TACC and with representatives for Navy, Marine, and organic Army support.

(3) Supervises the employment of the MIBARS.

(4) Disseminates intelligence concerning the enemy air defense capability to the TACC and aerial surveillance and reconnaissance units, and intelligence concerning enemy air operations capabilities to the TOC.

(5) Insures the availability of current initial record imagery (basic cover) (para 4–12) of the field army area of interest and dissemination of appropriate portions of the initial record coverage to subordinate units.

(6) Disseminates intelligence reports on enemy ground activities to the TACC, supporting flying units, the MIBARS, and the field army G2 element at the TASE.

b. Corps G2 Air.

(1) Integrates corps and divisional preplanned missions into the corps G2 Air plan and then coordinates with field army G2 Air for the aerial support required. After receipt of the allocated sorties from the field army G2 Air, the corps G2 Air makes the allocations according to the priority system between corps and the divisions.

(2) Approves or disapproves immediate aerial surveillance and reconnaissance requests and coordinates those approved requests with the direct air support center (DASC) or the MI Company (Aerial Surveillance).

(3) Insures that the MIBARS detachment, collocated with the Air Force reconnaissance squadron scheduled for the mission, receives the information required for briefing and debriefing the flying crew on Air Force flown immediate requests. This information will also assist the detachment's interpretation effort by alerting them of the impending mission requirements and allowing them to plan accordingly.

(4) Exercises staff supervision over the MI Company, (Aerial Surveillance), for the corps G2.

c. Division G2 Air.

(1) Prepares the command's aerial and ground surveillance and reconnaissance plans.

(2) Approves or disapproves aerial surveillance and reconnaissance requests of subordinate elements and coordinates with the division tactical air control party (TACP).

(3) Coordinates the employment of the ground sensor terminals, located within the division area, with the operations of the imagery interpretation support available to the division.

(4) Coordinates with the G3 on the utilization of organic or direct support nonreconnaissance aircraft of the division for visual missions of high priority that are within the capability of the aircraft to accomplish.

(5) Exercises staff supervision over organic or attached aerial surveillance and reconnaissance units, when provided.

d. Separate Armored, Mechanized, and Infantry Brigades. The functions of the S2 Air for these commands are comparable to those accomplished by the division G2 Air.

CHAPTER 3

CONCEPT OF AERIAL SURVEILLANCE AND RECONNAISSANCE EMPLOYMENT

3–1. General

Aerial surveillance and reconnaissance missions are performed in support of the field army and its subordinate units by organic Army aviation units, the Tactical Air Force (TAF), or other supporting services. The TAF or air arm of other supporting services provides a portion of the total aerial surveillance and reconnaissance effort required by the field army; however, whenever organic Army aviation means can more effectively or more responsively meet the requester's needs, they should be used within the limitations of the aircraft and sensors. As specific surveillance or reconnaissance requirements are developed at any echelon, they are either accomplished with the means organic to that echelon or submitted to a higher or subordinate headquarters for accomplishment.

3–2. Support by Tactical Air Force

Tactical air reconnaissance is one of the primary sources of intelligence information available to the Army commander for planning purposes and for support of operational requirements. Tactical air reconnaissance units are capable of performing missions within the entire spectrum of air reconnaissance, both day and night, and under most weather conditions. The Air Force provides tactical air reconnaissance support to the ground force. This support will vary and the capability will be tailored to meet the specific tactical situation. Normally, the reconnaissance wing will support a field army and contain a reconnaissance technical squadron that has photo processing and imagery capability. Usually, this capability is concentrated at the reconnaissance wing level; when required, however, personnel and equipment from this squadron may be collocated with one or more of the reconnaissance squadrons to provide direct support. The reconnaissance squadrons must operate from improved airfields dispersed throughout the theater of operations. Each squadron may be equipped to provide only a portion of the total reconnaissance capability; i.e., one may be a day squadron for visual and photographic reconnaissance, one a night squadron for infrared and radar reconnaissance, and one a weather-electronic reconnaissance squadron for the collection of weather data and enemy electronic order of battle. Conversely, each squadron may be equipped to perform all of these functions on a continuous basis or to provide a major capability in one area and a limited capability in another area. The composition and mix of reconnaissance squadrons are the responsibility of the senior TAF commander.

3–3. Navy and Marine Corps Support

a. When Navy or Marine Corps air units provide the preponderance of air support to Army operations, operational procedures will be established by the joint force commander, but these procedures should conform as closely as possible to the general doctrine presented in this manual.

b. Navy and Marine Corps air reconnaissance units possess the necessary aircraft and imagery producing sensors to accomplish the same types of missions as those performed by the TAF. These units also have an organic capability for processing and interpreting imagery.

c. Depending upon operational requirements and the volume of support being provided, Navy and Marine Corps imagery may be delivered to the land airbases at which the MIBARS detachments are located. A portion of the MIBARS, to include entire detachments, may be located aboard ship or at a Marine airbase to aid in processing and interpreting imagery. If necessary, the MIBARS headquarters has the capability of creating a fifth MI detachment (air reconnaissance support (ARS)) for special operations as discussed in chapter 7. In addition, a separate MI detachment (ARS), not organically part of an existing MIBARS organization, can be created to fill a special requirement to operate with a Navy or Marine air reconnaissance unit at the same time that the existing MIBARS organization continues to

function in cooperation with a TAF reconnaissance wing.

d. Navy and Marine Corps air reconnaissance units may require Army liaison officer support to be located with their flying elements. When required, liaison officers can be provided by using officers from the imagery interpretation sections within MIBARS or from the imagery interpretation section organic to the military intelligence organizations in support of the Army combat units.

3–4. Allied Support

When supported by aerial reconnaissance elements of allied nations, commanders concerned will use mutually acceptable procedures and techniques.

3–5. Army Aviation Support

Army aviation units of the armored cavalry regiment, missile command, division, corps, and field army are all capable of performing visual aerial surveillance missions. The armored cavalry and the corps MI company (Aerial Surveillance), can provide permanent record imagery from photographic, radar, and infrared sensors. Helicopters of Army aviation units at division and brigade levels are capable of performing airborne personnel detector (APD) and other type sensor missions when provided the necessary equipment and personnel.

3–6. Aerial Surveillance Operations

a. General. Aerial surveillance operations (fig 3–1) are based on the determination of a specific requirement for information and the action necessary to fulfill the requirement at any echelon of command. The G2 Air may initiate a requirement, or he may receive it from another staff section or from a subordinate unit. As the G2 Air, he is the staff supervisor of the request until action upon it has been completed and the originator has been so advised. At each echelon the G2 Air action sequency follows a similar pattern. Variations at each echelon involve personnel, equipment, and administrative detail, but the same thought process and sequence of action are used throughout. Close staff coordination with supporting units must be effected by the G2 Air to obtain maximum return for the effort expended. Development of a specific unit SOP will facilitate and expedite the performance of these functions.

b. Field Army and Independent Corps Aerial Surveillance Operations. The G2 Air at field army level normally will perform as a staff supervisor and coordinator of the aerial surveillance and reconnaissance effort of the field army. Normally, he will process only those requests which originate at field army level or those which cannot be accomplished at corps level and below by local assets.

(1) *Air request control.* Requests received or originated at field army are approved by the G2 Air. Upon approval of each request, a priority is established. An approved request may be accomplished by organic means or forwarded to TAF (TACC). Close coordination between the G2 Air and TACC is necessary to determine the priority in which requests are accomplished by the Air Force. When the TACC designates a unit to fly the mission, the G2 Air is notified. The G2 Air then furnishes the MIBARS with the detailed mission information, and assigns a priority for interpretation of the imagery.

(2) *Mission accomplishment.* Once the requirement is furnished the MIBARS, the actions to coordinate, receive, and interpret the resultant imagery are the responsibilities of the Army element even though the mission is flown by an Air Force element. The procedures employed by the MIBARS to complete requirements for intelligence information are covered in chapter 7.

(3) *Intelligence production and dissemination.* The field army G2 Air directs and supervises the production and dissemination of intelligence information resulting from aerial reconnaissance or surveillance missions. He insures that the information is forwarded to the requesting unit, other appropriate activities, and to the field army G2 to permit its integration with other intelligence information available to the G2.

c. Corps Aerial Surveillance Operations. Aerial surveillance operations (fig 3–1) at corps are comparable to those of the field army. The corps normally has Air Force reconnaissance missions allocated to accomplish immediate aerial surveillance and reconnaissance missions only. The G2 Air at corps develops his aerial collection plan based on the corps commander's requirements and the integration of approved requests received from subordinate elements. The G2 Air determines which missions can be accomplished by organic Army aircraft and assigns them to the corps MI Company (Aerial Surveillance), for accomplishment. Preplanned missions requiring Air Force support are forwarded to the G2 Air at field army for

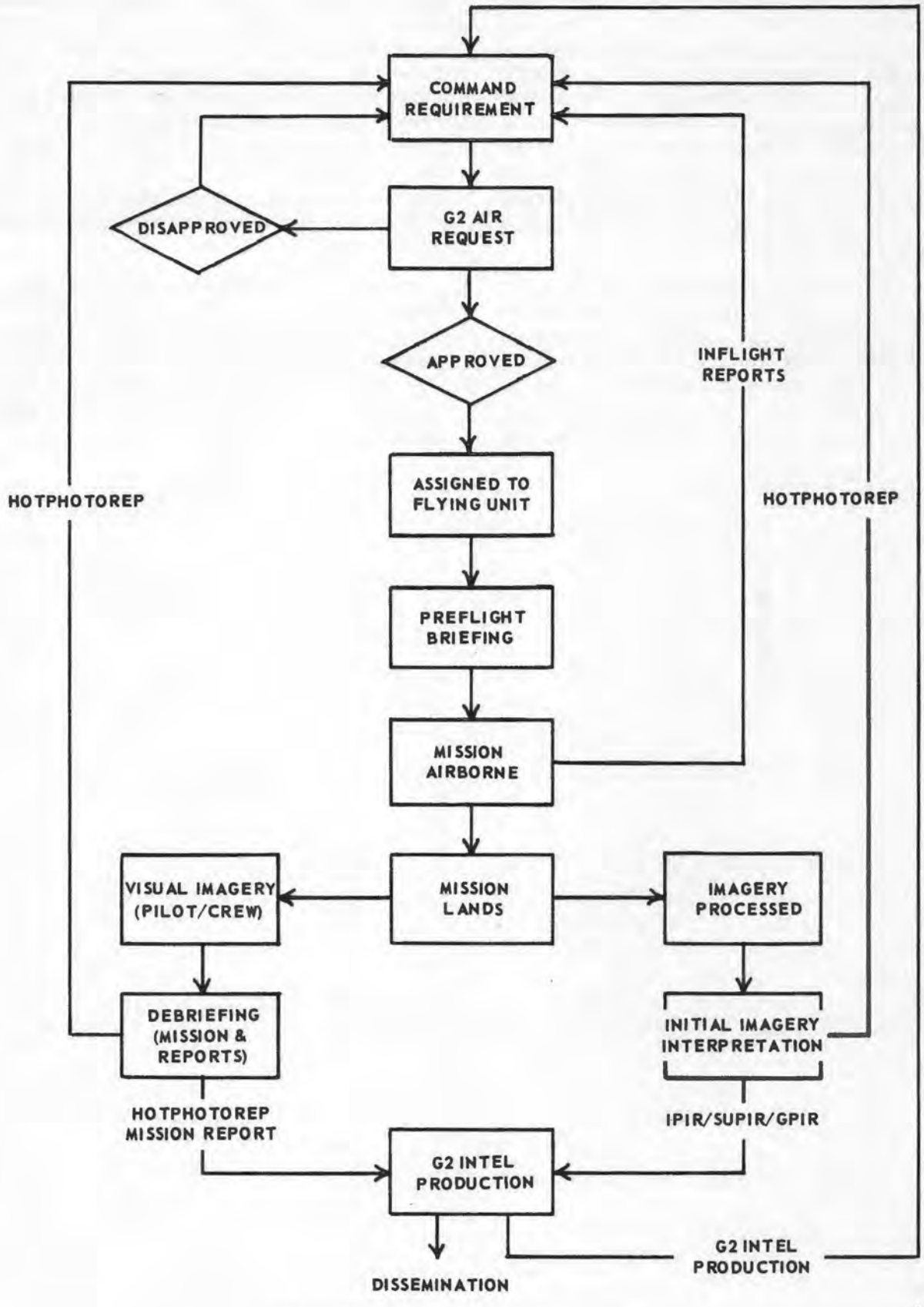


Figure 3–1. Aerial surveillance operations.

approval and incorporation into the field army surveillance plan. Immediate missions requiring Air Force support are coordinated with the DASC at corps and accomplished as part of the immediate missions allocated to the corps. The production and dissemination of the resultant intelligence are similar to those procedures used in field army aerial surveillance operations. The actions taken by the corps MI Company (Aerial Surveillance), to coordinate and receive the imagery it collects are discussed in chapter 8.

d. Division Aerial Surveillance Operations. Aerial surveillance operations at division are similar to those at corps. To the maximum extent possible, the division G2 Air attempts to accomplish requests from subordinate elements using his organic capabilities; e.g., visual aerial surveillance. When this is not possible, he incorporates approved requests into the division surveillance plan which is forwarded to corps for approval and accomplishment within the resources of higher headquarters. Division missions flown by organic corps aircraft are coordinated beforehand so that ground sensor terminals (organic to the corps MI Company (Aerial Surveillance) and imagery interpretation support of the MI Company, Division may be alerted to receive the results of the mission as it is flown and the results processed and interpreted.

e. Aerial Surveillance Operations for Other Units. The pattern for obtaining information through the use of aerial vehicles is similar at all echelons having organic aerial surveillance vehicles. Units without aerial surveillance means submit requests to the next higher echelon for appropriate action.

CHAPTER 4

AERIAL SURVEILLANCE AND RECONNAISSANCE MISSIONS

Section I. TYPE MISSIONS

4–1. General

There are two broad categories of missions—aerial surveillance missions and aerial reconnaissance missions. Both types of missions are performed for a similar purpose; however, planning and implementation differ.

4–2. Aerial Surveillance Missions

Aerial surveillance is the systemic observation from the air of air, surface, or subsurface areas by visual, electronic, photographic, or other means for intelligence purposes. A surveillance mission is characterized by the greater expanse of terrain that it covers and the repetitiveness with which it is flown. Aerial surveillance under optimum conditions is continuous over the entire battlefield or area of interest. Generally it is conducted without regard to specific targets though major areas of interest may be emphasized. A surveillance mission normally is performed with a large area coverage sensor such as radar or by visual observation from higher altitudes so that a large ground area can be observed at all times. The majority of aerial surveillance missions will be flown on a repetitive basis, with individual flights overlapping to insure complete coverage of the area. Both radar and visual surveillance flights can be flown along or behind the forward edge of the battle area (FEBA) parallel to the line of contact. Surveillance overflights of enemy occupied areas are also employed using visual observation or radar coverage to both sides of the aircraft's line of flight. The major advantages of surveillance missions are their ability to—

a. Cover large areas rapidly and continuously, with the minimum expenditure of aircraft and sensor capabilities.

b. Maintain continuous surveillance over a large area while flying over friendly positions which reduces aircraft vulnerability to hostile air defense measures.

c. Observe movement or changes in the environment as they take place on the enemy side of the FEBA to provide the commander information regarding the enemy's adoption or rejection of a particular course of action and to identify specific target areas for further observation by either aerial or ground reconnaissance measures.

4–3. Aerial Reconnaissance Missions

An aerial reconnaissance mission is undertaken to obtain information by visual or other detection means from the air and is characterized by its direction toward one or more specific target areas without the requirement for continuous coverage. A reconnaissance mission may be developed because of specific information indicating that an area possesses possible intelligence value or because current or planned operations indicate a specific area is of significant importance and warrants detailed coverage. Reconnaissance missions may be on one-time basis, or periodic, but generally they are more restrictive than surveillance missions in their size and scope of coverage. A reconnaissance mission is ordinarily flown by penetrating the enemy airspace; however, some target areas can be adequately covered while flying behind the FEBA. The air mobility of the air cavalry squadron makes it ideally suited for reconnaissance missions to great depths and in areas inaccessible to ground units. The aerial reconnaissance missions, capabilities, and its organization are discussed in detail in FM 17–37. Because of the type target involved, the need for greater detail, and the characteristics of the different sensors employed to obtain the intelligence information desired, reconnaissance missions generally are flown at low altitudes. The major advantage of a reconnaissance mission is the added detail it provides for comprehensive intelligence study gained by concentrating the aerial sensor capabilities over a specific target.

4–4. Mission Requests

Aerial surveillance and reconnaissance missions are classified as either preplanned or immediate, the majority of which are preplanned. Immediate mission requests will usually be for either reconnaissance type missions and/or increased intensity of surveillance in a specific area of interest as dictated by the prevailing situation.

4–5. Preplanned Missions

Anticipated requirements for aerial surveillance or reconnaissance missions to collect needed intelligence information are met by preplanning their scheduling and accomplishment. A preplanned mission is the most efficient and economical type of mission since it allows sufficient time for thorough coordination, planning, briefing, and consolidation of requirements. It also permits proper selection and allocation of aircraft and sensors and eliminates the wasting of capabilities by insuring that all available airborne platforms are programmed for specific mission accomplishment. The proper interpretation, integration, and dissemination of the information gathered can also be better programmed into the total work effort.

4–6. Immediate Missions

Immediate missions are characterized by the urgency of time involved between request for and receipt of information. Unforeseen requirements for intelligence of immediate tactical value triggers the need for immediate missions. A portion of the overall aerial surveillance and reconnaissance effort normally is held on a standby basis to meet such contingencies. The percentage of the total effort reserved to accomplish immediate missions varies with the tactical situation. For the Air Force, the percentage is determined by coordination between the G2 Air and the tactical air control center (TACC). For Army resources, the determination is made as part of the daily air planning conference conducted by the G2 Air. In addition to the use of specifically designated aircraft to accomplish immediate missions, aircraft that are airborne on missions of lesser impact may be diverted and given an immediate mission for accomplishment.

Section II. COLLECTION MEANS

4–7. General

Aerial reconnaissance-surveillance missions are classified according to the type of mission and/or sensor used: visual, permanent record imagery, electronic reconnaissance, airborne personnel detectors, and weather. Any or all of these types may be necessary to support an area of operations. Aerial surveillance missions generally are interrelated and of complementary significance in terms of the information produced. Much of the intelligence information gained through aerial surveillance accrues to the benefit of all services, regardless of the purpose or unit for which it was obtained.

4–8. Visual Aerial Surveillance and Reconnaissance

a. General. Visual aerial surveillance and reconnaissance provides a rapid means of collecting intelligence information of the area of operations through observation by aircraft crews. The value of visual aerial surveillance lies in the speed with which information on fleeting targets can be relayed to friendly units capable of attacking those targets. Visual observations may be augmented by the use of photographic equipment and in-flight voice recordings to provide a permanent record of the sightings and to increase accuracy and detail. For a detailed discussion on aerial observation techniques and procedures, see FM 1–80. There are four general types of visual aerial surveillance and/or reconnaissance.

(1) *Area search.* An area search normally is conducted for the purpose of covering a general area, monitoring any movement within an area, detecting military activities, or monitoring movement of civilian populations. The limits of the area to be searched are designated in the mission request; however, the aircraft crew must plan the actual flight pattern to be flown to insure complete target coverage and successful mission accomplishment.

(2) *Specific search.* A specific search normally is conducted to detect military, paramilitary, or significant civilian activity within suspected, probable, or known locations. A specific search usually is employed for point targets and for specific information. A special form of specific search is contact reconnaissance in which an aerial observation mission is undertaken to locate friendly units that are isolated or cut off from the main force; e.g., a long-range reconnaissance patrol out of contact with higher headquarters.

(3) *Route reconnaissance.* Observation of roads, railroads, waterways, and coastal and international borders may be conducted to determine enemy usage and traffic patterns. Route reconnaissance may also be conducted to determine the adequacy of roadways, bridges, and other installations for our own use. Usually it is performed on a point-to-point or town-to-town basis over a selected route which passes through several search areas.

(4) *Artillery adjustment.* Aircraft employed for surveillance and reconnaissance missions can be used to conduct indirect fire adjustment missions when the requirements exist and the priority of employment permits. Normally fire adjustment missions for artillery or naval gunfire will result from inflight reports rendered by the aircrew or from an immediate request by a supported unit.

b. Limitations of Visual Aerial Surveillance. Although much information can be collected by a trained and experienced observer, the observer is limited by the speed and vibration of the aircraft, visibility conditions, enemy concealment measures, and the distance from which he must observe as a result of the influence that terrain and enemy air defense may have on the surveillance aircraft. Many limitations of visual aerial surveillance may be overcome by using sensory and light intensification devices and binoculars to replace, verify, or supplement visual sightings.

4–9. Types of Permanent Record Imagery

a. General. Permanent record imagery is essential before, during, and after an operation. All commanders require information concerning the strength, location, and disposition of the enemy and the terrain not under friendly control. Aerial imagery normally can meet this requirement by providing recorded images which are studied, analyzed, and interpreted. Such analyses provides more detail and accuracy than that derived from visual observation. The use of permanent record imagery requires sensory and recording equipment of various degrees of complexity. A limitation of imagey is that the time lag between acquisition, interpretation, and dissemination may reduce or negate the value of information collected on transient and fleeting targets. The employment of Army SLAR aircraft using either the in-flight processor or the ground data link can reduce some of this time lag. Permanent record imagery may be obtained through the use of—

(1) Aerial photographic devices.

(2) Infrared sensor devices.

(3) Radar sensor devices.

b. Conventional Photography. Conventional photography is classified according to the camera position and the area of coverage.

(1) Classification according to camera position is as follows:

(*a*) *Vertical.* Vertical coverage of a target is achieved by photography taken from directly overhead. It provides photography of relatively constant scale and allows the interpreter to achieve optimum results from stereovision and accomplish the most accurate measurements.

(*b*) *Oblique.* Oblique coverage of a target area is achieved by photography taken at an angle from the vertical. Oblique photography presents a view of the target while flying toward or parallel to it. Oblique photography closely resembles the normal eye view and allows an interpreter to "see" into an area in a normal fashion instead of seeing the target as it appears from directly overhead. High oblique photography includes a portion of the skyline behind the target area; low oblique photography taken with an 80 percent overlap between frames will allow some stereoviewing.

(*c*) *Panoramic photography.* Panoramic photography is taken with a special camera that scans across a wide area of the terrain, usually from horizon to horizon. It provides rapid photographic coverage of large areas of the terrain on both sides of an aircraft's line of flight in only one pass over the target area.

(2) Classification according to area of coverage is as follows:

(*a*) *Pinpoint.* Pinpoint photography is that taken of a single point, feature, target, or small area of terrain which can be covered with a very small number of photographs. A minimum of 60 percent overlap between individual photoframes is necessary to assure complete stereoviewing.

(*b*) *Strip photography.* Strip photography consists of a continuous series of overlapping photos taken in a single flight line which covers a lengthy target or large area of terrain.

(*c*) *Continuous strip photography.* Continuous strip photography contains an unbroken image throughout the length of the flight line. This type of photography requires a special camera and eliminates individual photoframes with overlap throughout the length of the strip.

(*d*) *Area photography.* Area photography usually consists of two or more strips of vertical

photography which overlap to the side. Area cover requires a minimum of 30-percent sidelap between strips in addition to the 60-percent overlap between frames in order to provide effective stereoviewing throughout the area of coverage. The main use of area cover is in planning or for comparison of coverage by inspection with other imagery available. Area cover with the proper overlap and sidelap can be used to make photomosaics.

(*e*) *Mapping photography.* Mapping photography is that aerial photography obtained by precisely calibrated mapping cameras and conforming to mapping specifications, as distinguished from aerial photography for other purposes. It is taken for the purpose of preparing or revising maps and charts. Usually it is taken at much smaller scales than intelligence photography and should be used for intelligence purposes only when no intelligence photography is available. This photography is taken with specially stabilized cameras and other equipment, and the flight pattern and operation of the aircraft are carefully controlled.

(3) *Stereo Coverage.* A minimum of 60 percent overlap between individual photograph frames is necessary to assure complete stereoviewing. Stereo coverage is essential if there is a requirement to make determination of the height dimension of objects recorded on the photography; however, for routine detection and identification of tactical and strategic targets, non-stereo photos are as useful as the over-lapping imagery required for stereo viewing. Obtaining and interpreting stereo imagery is more costly in terms of the direct costs of processing time and interpretation time. The resultant delay in dissemination of valuable intelligence information may cause unacceptable costs to the tactical unit commander. Therefore, the G2 Air must evaluate each planned photo mission to determine the need for stereo coverage and then request overlapping or contiguous exposures based upon the decision reached for that mission.

c. Infrared (IR) Imagery.

(1) An IR system is a passive sensor which detects emitted and reflected thermal radiation coming from the terrain and objects on the terrain. Current IR systems filter out reflected radiation and only record that radiation emitted by the target area and objects. The total emitted radiation is a function of an object's temperature and its emissivity. Emitted radiation will differ between objects and the resultant differences will be sensed and recorded by the IR system. The IR sensor can detect minute thermal differentials and, therefore, distinguish objects located in close proximity to each other. To achieve the maximum capability, the IR system must operate at low altitudes. Its scan coverage is limited to the area directly below and immediately adjacent to the flight path of the aircraft; therefore, it is used normally only for point, linear, or small area targets.

(2) IR aircraft are equipped for both a real-time pictorial display of the IR returns as the aircraft is passing over the terrain and the recording of the sensor acquired information on strips of film for later development and interpretation. Army IR aircraft can also transmit their imagery to a ground sensor terminal (GST), thereby providing a real-time presentation of the target area to personnel on the ground. The GST also records these presentations on film. Film from the aircraft must be processed by an imagery processing facility before it becomes permanent record imagery and can be interpreted. Film from the GST is processed as it is received by a recorder-processor-viewer and can be interpreted immediately by trained imagery interpreters.

d. Side-Looking Airborne Radar (SLAR).

(1) SLAR is an active electronic device which emits energy and senses that portion of the emitted energy which is returned by reflection from the terrain and objects thereon. The radar's energy may be directed at terrain to the left, right, or both sides simultaneously along the flight path of the aircraft. The energy that is reflected from objects on the ground, both fixed and moving, is recorded on strips of film. It should be noted that since the radar pulse is line-of-sight, any high ground or tall objects in the path of the radar pulse will block out radar returns from any objects which they mask. This causes SLAR returns to leave blank spots, called radar shadow, or nonsensed areas, wherever these hidden areas occur.

(2) The SLAR produces two images simultaneously. One depicts fixed target information (FTI), such as terrain features and buildings, and the other depicts moving target information (MTI). However, for the SLAR to acquire MTI, radial movement of the object must be greater than 2½ mph. Army SLAR aircraft are equipped to continuously process exposed film and provide an airborne operator a pictorial display of the returns while the aircraft are still in flight. The SLAR system is a long-range, low-resolution radar. The airborne operator can select a range of

25, 50 or 90 km of imagery on either or both sides of the aircraft. The range resolution is a constant 80 meters and azimuth resolution is 80 meters for each 10 km distance from the flight path. The operator also has the option of selecting a delay from 0–60 km in 10-kilometer increments. Time delay from the time of film exposure until it is developed and ready for viewing varies from approximately 42 seconds to 2 minutes. Army SLAR aircraft, like the Army IR aircraft, have the capabilities for instantaneous transmission of imagery data to a GST. The company organized under TOE 30–79 is equipped with the OV–1D aircraft employing new sensor systems which are not compatible with existing GST's. A GST for the OV–1D is currently under development. At the GST these sensings are recorded on film, developed, and ready for viewing by image interpreters in approximately 42 seconds to 2 minutes. The GST operator may select a mapping range of 25 or 50 km. Range delays of 0, 20, or 40 km may be set in the GST without affecting the airborne transmitter and GST delay controls must be set at the same range delay.

4–10. Airborne Personnel Detector (APD)

The aircraft-mounted airborne concealed personnel detector—commonly called the airborne personnel detector (APD)—is an aerial reconnaissance device employed to provide a tactical commander with information indicating whether or not an area is or has been recently occupied. The APD is not capable of detecting humans but it is capable of indirectly detecting certain human-related activities which indicate the presence or recent presence of personnel in the area. These activities include but are not limited to camp fires and internal combustion engine operation. They are sources of submicroscopic airborne particles (condensation nuclei particles) which are detected when air containing the particles is drawn into the APD. When an aircraft carrying an APD is in flight, air is drawn into the APD and simultaneously processed by two identical particle detectors at the rate of five samples per second. The relative concentration of particles in an air sample is indicated by readings on two meters for constant observation by the APD operator and permanently recorded on a dual channel continuous strip chart recorder for use in post mission analysis. Detailed information pertaining to the employment of the APD is contained in chapter 12.

4–11. Weather Reconnaissance

Weather reconnaissance is conducted to obtain weather data over areas where weather reports are not available. The two basic methods of accomplishing weather reconnaissance are by taking instrumented atmospheric measurements and by making visual observations. Normally weather reconnaissance is performed by Air Force weather reconnaissance elements; however, Army aircraft can perform limited visual weather observation for the command. Weather reconnaissance is accomplished to obtain—

a. Weather data for use in preparing weather analyses and forecasts. Missions which obtain such data fall into two general classes. Scheduled missions make weather observations, to include atmospheric surroundings, at predetermined locations and at scheduled times. Unscheduled missions investigate doubtful weather conditions which may affect the battle area.

b. Special reports of weather conditions along the routes to, and in the vicinity of, targets for proposed air operations. These reports are required to permit immediate operational decisions such as diversion of aircraft, changes of flight tracks, or cancellations of missions.

c. Special reports of weather conditions that might have a significant influence on enemy or friendly capabilities.

4–12. Categories of Permanent Record Imagery

The three categories of permanent record imagery commonly used by the imagery interpreter are initial record, general intelligence record, and detailed intelligence record. The availability of improved imagery interpretation equipment in the tactical imagery interpretation facility (TIIF) has allowed the usable scales of photography to be increased in each category as *a* through *c* below.

a. Initial Record. Initial record is complete, permanent imagery coverage—usually flown seasonally—of a projected or actual area of operations generally extending from the line of contact with enemy ground forces to deep within the enemy territory. Photographic coverage normally will be of small scale (1:20,000 to 1:60,000) and suitable for stereoscopic study. Initial record provides basic information about enemy installations and defenses, cultural features, trafficability, soil, and vegetation. Its principal purpose is to provide a basis for evaluating changes in enemy-occupied

territory. Areas subject to seasonal changes are recorded under conditions characteristic of each season to eliminate the observed differences caused by seasonal variations. Vertical initial record may serve as a map substitute or supplement. The field army normally supervises the automatic initial distribution to subordinate units according to areas of interest; supplementary issues are made as necessary. Typical allowances are shown in FM 101–10.

b. General Intelligence Record. General intelligence record imagery is vertical medium scale (1:10,000 to 1:20,000) imagery coverage within the field army area of interest. It provides current intelligence information and is compared with initial record imagery to determine current location and disposition of enemy installations, troop concentrations, troop movements, equipment, and supplies. Normally this type of imagery is requested by division and higher headquarters.

c. Detailed Intelligence Record. In order to supplement the general intelligence record by providing large scale imagery of areas of specific interest, detailed intelligence record is obtained. It provides the imagery for detailed analysis of specific enemy activity, selected terrain features, installations, or equipment. It is frequently necessary to use more than one sensing or recording system over the target. Shown in (1) through (4), below, are types of detailed analyses.

(1) *Vertical analysis.* The study of large scale (1:10,000 and larger, e.g., 1:6,000) vertical photography reveals the plans and heights of installations not shown in general intelligence record.

(2) *Oblique analysis.* The study of air photographs taken at an angle from the vertical will reveal installations from the elevation viewpoint. This type of imagery is particularly important in the analysis of features not suitable for vertical analysis such as concealed or well-camouflaged installations.

(3) *Concealment analysis.* Installations and equipment hidden from observation may be detected and subjected to study by special recording techniques; e.g., a camouflage net located through general intelligence record imagery may be identified as a covering for mechanical equipment when the area is subjected to infrared search.

(4) *Deception analysis.* Enemy measures designed to deceive and confuse friendly intelligence collection agencies may be detected through analysis and comparison of photographic and electronic presentations such as radar, infrared, and electronic intelligence collected at or near the same time.

CHAPTER 5

AERIAL SURVEILLANCE AND RECONNAISSANCE PLANNING OPERATIONS AND COORDINATION STANAG 2134, 3277 SEASTAG 3277

Section I. GENERAL PLANNING

5–1. General

Aerial surveillance and reconnaissance is conducted to provide assistance to the commander in the accomplishment of the unit mission. In preparing his aerial surveillance and reconnaissance plan, the G2 Air must work in close coordination with the other members of the intelligence staff. He must consider all requests received from subordinate units as well as those requests generated by his own headquarters. He must integrate those approved requests from subordinate units with his own requirements to produce the total aerial surveillance and reconnaissance plan for the commander.

5–2. Planning Principles

Principles considered in planning are—

a. Essential Elements of Information (EEI). Generally, the EEI will serve to indicate aerial surveillance requirements. Based upon a thorough knowledge of the commander's plan, enemy tactical doctrine, and the current enemy situation, the G2 Air develops the plan for the command and establishes priorities in accordance with the EEI and other guidance furnished by the G2. He insures that the plan will yield the information required to support tactical planning.

b. Economy of Effort. Economy of effort is the planned use of equipment to obtain a maximum return from available resources. It is attained through the consolidation and integration of requests and tasks, the denial of requests which would duplicate information currently available, and the allocation of the available effort in relation to the requirements and priorities established.

c. Flexibility. Maximum flexibility is gained by the selection of alternate objectives and/or sensor means. This is especially true during periods of marginal visibility; e.g., during a photographic mission unexpected cloud cover may occur over the primary area of interest. The aircraft may be diverted to a secondary target or an alternate sensor may be used which can acquire some useful imagery when the preselected sensor would have been nonproductive.

d. Priorities. All aerial surveillance requests are assigned a priority. The basis for determination of priorities is the urgency and importance of the requested information to support the operations of the requester. This is influenced by the unit mission, tactical situation, and the purpose for which the surveillance is intended. Normally, only a Roman numeral is used to indicate to the higher G2 Air the priority based on the importance of the requirement to the unit submitting the request; however, these priorities may change at higher echelons when considered in the overall tactical situation. Priorities, with their identifying Roman numerals are—

(1) *Priority I.* Surveillance of enemy units or activities, to include nuclear delivery means, that could prevent, or are preventing, the accomplishment of the friendly force mission.

(2) *Priority II.* Surveillance of enemy units or activities capable of immediate serious interference with the friendly force mission. Surveillance required in the conduct of current tactical operations.

(3) *Priority III.* Surveillance of conditions, enemy units or activities capable of ultimate serious interference with the mission. Surveillance required to support planned future operations.

(4) *Priority IV.* Surveillance of conditions, enemy units or activities capable of limited interference with the mission. Surveillance required for administrative and logistical purposes.

e. Cover and Deception. The implementation of cover and deception measures must be considered when scheduled aerial surveillance missions over the combat area could compromise the operation by indicating unusual interest in that area (FM 31–40). The G2 Air must expect to divert a part of the surveillance capability to implement cover and deception activities. Some cover and deception measures available are—

(1) Reducing the number of missions over the area of interest.

(2) Simulating interest elsewhere.

(3) Controlling flight lines within the area of interest to obtain a random appearance.

(4) Integrating reconnaissance missions with offensive missions.

5–3. Planning Factors

The major factors considered in planning aerial reconnaissance and surveillance missions are—

a. Friendly and Enemy Situation. The G2 Air considers the type and extent of planned operations, enemy tactical doctrine, and current deployment in developing aerial surveillance plans (fig 5–1).

b. Capabilities. The G2 Air considers the favorable and limiting characteristics of the sensors and platforms available and the capabilities of the reproduction, interpretation, and dissemination agencies and their facilities.

c. Terrain. A study of the terrain is made in terms of environmental impact to the acquisition of usable imagery for the satisfaction of EEI requirements. The G2 Air uses this information to plan missions and select appropriate sensor(s). Care is exercised to eliminate preconceived or fixed ideas regarding the enemy's use of terrain and associated counterreconnaissance measures. Maps, charts, and data concerning tidal areas, channels, and rivers must be kept current for use in the imagery exploitation processes. Seasonal tidal fluctuations have a direct impact on tactical operations.

d. Weather. Aerial surveillance plans are based upon predicted weather to exploit the proper sensor in the environment best suited to its operating characteristics. Planning is flexible to allow for variations between predicted and actual weather conditions.

5–4. Planning Phases

Aerial surveillance and reconnaissance planning is divided into two phases—long-range planning and day-to-day planning. The preponderance of effort in long-range planning is accomplished at field army level while the major effort at subordinate levels is in day-to-day planning.

5–5. Planning Sequence

a. The general sequence of planning is essentially the same for both the long-range and day-to-day phases of planning. Ths broad steps in the preparation of the plan by the G2 Air are accomplished in the following sequence:

(1) Determination of the aerial surveillance and reconnaissance requirements.

(2) Assignment of priorities to each requirement.

(3) Satisfaction of the requirements with the surveillance capabilities available.

b. General considerations of the G2 Air are as follows:

(1) The unit mission as amplified by—

(*a*) Commander's concept.

(*b*) Unit's operational plans.

(*c*) EEI.

(*d*) Intelligence annexes.

(2) Enemy antiaircraft environment.

(3) Weather, light conditions and terrain.

(4) Surveillance coverage of the entire zone of responsibility.

(*a*) Preparation of the aerial surveillance and reconnaissance plans and collection activities by other means in development of a mutually supporting collection effort.

(*b*) Integration of the aerial plan with ground reconnaissance and observation plans.

(5) Coordination with higher, adjacent, and subordinate units.

(6) Selection of areas for continuing priority emphasis.

(7) Continuous planning.

Section II. SPECIFIC PLANNING

5–6. Long-Range Planning

a. Long-range aerial surveillance planning, prior to tactical engagement or the conduct of operations, begins with the receipt of a directive from higher headquarters or the decision of the local commander. The planning establishes those

Tactical Action	Situation and General Considerations	Area Reconnaissance Emphasis	Specific Information Sought
Withdrawal	1. G2 Air can expect: a. Enemy air superiority. b. Limited TAF support. c. Fast moving fluid situation. d. Possible non-availability of initial record and general intelligence record imagery. 2. The G2 Air should plan to: a. Use organic aircraft for primary support. b. Use immediate missions to meet the requirements developed by the fluid situation. c. Use visual air reconnaissance to meet the requirements for timely reporting of information. 3. If friendly air superiority is obtained, G2 Air should: a. Plan full use of available TAF visual reconnaissance. b. Coordinate with G3 Air for use of armed aerial reconnaissance.	1. Areas in which enemy is applying or has capability of applying most pressure. 2. Areas most likely to be occupied by enemy as indicated by knowledge of his tactics, deployment and reserves.	1. Enemy avenues of approach. 2. Troop movement (type and size). 3. Displacement of weapons. 4. Movement of reserve units. 5. Location and condition of obstacles including choke points. 6. Location of command posts, supply and evacuation establishments.
Defense	1. Since defense is normally a prelude to the offense, G2 Air must: a. Detect enemy buildup for defense or attack. b. Assist in planning for friendly attack. 2. The G2 Air at corps and division should determine enemy buildup by: a. Employing organic aviation to keep enemy under surveillance. b. Employing non-organic aerial reconnaissance to extend depth of coverage. 3. The G2 Air should assist in planning for friendly attack by: a. Continuing surveillance along entire front, concentrating along planned axis of advance. b. Determining areas to be reconnoitered.	Even distribution of reconnaissance across entire front with emphasis on: a. Areas of greater enemy activity. b. Areas in which friendly activity is contemplated.	1. Detection of enemy buildup. a. Location and estimated strength of enemy units along FEBA. b. Location, type and estimated strength of enemy reserve. c. Location enemy supporting weapons. d. Location enemy observation posts. e. Location enemy avenues of approach. f. Location command posts and supply points. g. Location enemy armor. h. Enemy troop movement. i. Location of obstacles. 2. Preparation for attack. a. Continuous study of comparative cover vs initial record imagery. b. Special imagery cover and studies: (1) Trafficability. (2) Enemy strong points. (3) Condition of railways and marshalling yards. (4) Condition of enemy airstrips to determine feasibility of friendly use. (5) Friendly avenues of approach. c. Continuous location of enemy reserves with emphasis on armor.
Attack	The G2 Air can expect a fluid situation in which maximum support by air reconnaissance of the TAF is available. The G2 Air should: a. Use direct observation to meet requirements for timely exploitation and reporting of information. b. Adjust depth and size of area to be reconnoitered based on rate of advance. c. Make maximum use of night visual, photographic and electronic surveillance.	1. Concentrated in front of main attack. 2. Areas occupied by enemy reserve forces (especially armor).	1. Movement enemy units (to and from FEBA). a. Actual movement (type, size, direction). b. Location of vacated areas. c. Location newly occupied areas. 2. Movement enemy reserve. 3. Displacement enemy supporting weapons (type, number and direction of movement). 4. Enemy resupply activities. 5. Location and condition of obstacles.

Figure 5–1. Planning for aerial surveillance and reconnaissance.

requirements which must be satisfied to obtain the information essential to the commander. Planning is accomplished in the greatest amount of detail possible within the time available to the echelon at which the planning is done and the capabilities of the supporting forces.

b. In those cases where the opposing forces have not yet engaged in combat, as in a landing by amphibious forces, the G2 Air bears an especially heavy portion of the responsibility for obtaining intelligence information. Little or no intelligence data will come from subordinate units before contact with the enemy, because there will be no prisoners of war, patrols, observation posts, deserters, or line crossers to provide it. It is during this phase of operations that aerial surveillance and reconnaissance becomes the prime and/or sole source of information acquisition.

c. The first step which the G2 Air takes is to develop a collection plan for his branch. Current procedures are outlined in FM 30–5.

d. The G2 Air develops the reconnaissance and surveillance missions necessary to acquire the raw data. He coordinates with the supporting tactical air elements of other US or allied services designated to operate with the Army. In addition, when organic aviation elements can accomplish aerial surveillance, he plans for, coordinates, and integrates the aerial surveillance and reconnaissance missions of these elements into his plan.

e. The processing of the incoming imagery and visual observation reports into a usable form is the next step in the G2 Air effort. This necessitates having trained image interpreters properly briefed on the operation and directing them in the production of intelligence.

f. The next step in the G2 Air's plan is to prepare his output in formats most useful to the troops, agencies, and staffs who will become involved in executing the planned operation. Special maps, defense overlays, annotated imagery, terrain and defense analyses, and up-to-date tactical maps are examples of the results of well-planned and thoroughly coordinated G2 Air operations in the planning phase.

g. The final step in the G2 Air's work is timely dissemination. The dissemination tasks must be coordinated in unit SOP and instructions which minimize bottle necks and attain maximum timeliness.

5–7. Planning Considerations

a. Day-to-Day Planning and Operations. The same procedures discussed in paragraph 5–6 are used in day-to-day planning and operations. The commander's EEI and other intelligence requirements (OIR) developed by the G2 provide the G2 Air with the current priority tasks which must be accomplished. To provide for the orderly scheduling and accomplishment of these requirements, the G2 Air should utilize a collection plan (app F). The EEI and OIR are listed on the plan and the indicators are developed for each task. From the listed indicators, the broad requirements are developed as the basis for the aerial surveillance and reconnaissance plan, and the specific requirements for all collection agencies are developed. Because of the timelag inherent in aerial surveillance operations, specific requests should be prepared as far in advance as possible.

b. Specific Planning Considerations of the G2 Air.

(1) Process and consolidate all requests.

(2) Review available imagery (current master cover traces) for adequacy to fulfill requirements before requesting new or additional imagery.

(3) Review requests for consolidation relative to: priorities, target locations, times over targets, categories (surveillance, reconnaissance, visual/Photo, IR, SLAR), time when the information is no longer of value, and initiation or formulation of sortie (mission) requirements to satisfy the EEI.

(4) Determine enemy and friendly situations after review of the following:

(*a*) Known or suspected enemy countermeasures, to include electronic jamming and deception, air-to-air and ground-to-air defensive activities and capabilities, and determine their impact on the acquisition process as well as aircraft survivability.

(*b*) Known or suspected enemy ground unit dispositions, operations and/or maneuvers in progress, and their impact on the acquisition process and the satisfaction of both EEI and OIR (mission requirements).

(*c*) Compatibility of planned missions with the friendly scheme of maneuver relative to established and assigned priorities to insure timely fulfillment of information needs. Also, begin formulation of coordination to be effected.

(5) Determine the impact of terrain on surveillance and reconnaissance sorties in terms of:

(*a*) Environmental accommodation afforded to enemy activity/target area that will degrade or enhance sensors' capabilities.

(*b*) Terrain effects on missions (aircraft/sensors) such as:

1. Obstacles to low altitude acquisition (terrain avoidance),

2. The acquisition of needed target area coverage vs required sensor—target attitudes (vertical vs standoff),

3. Terrain obstacle impact on needed coverage (such as radar shadow).

(6) Review current and predicted weather for area of operations and specifics for critical target areas to determine:

(*a*) Impact on sensor capabilities vs satisfaction of EEI and OIR (mission) requirements.

(*b*) Target and environmental changes, natural and man induced, which will enhance or obscure detection.

(7) Determine available operational sensor systems with subsequent processes as follows:

(*a*) Apply sensors' capabilities vs the target, environmental and weather factors and prediction of degrees of satisfaction of specific mission EEI and OIR requirements.

(*b*) Select sensors for exploitation for each mission and list accordingly as primary and secondary sensors, (i.e., best, next best). Coupled with this selection is the planning for commitment of ground sensor terminals as appropriate or when dictated by those priority missions requiring near real-time readout to fulfill stated requirements.

(*c*) In planning for photo missions determine the need for stereo or mono coverage.

(8) Assess available operational aircraft/sensors for the daily 24-hour time frame by category, photographic, IR and SLAR, and by day and night. Plan assignment of available aircraft/sensor system sorties for fulfillment of requirements. Assignment of tasks (missions) are made accordingly.

(9) Determine for each request desired time over target (TOT) coupled with mission flight time average processing, readout, and dissemination times vs the latest acceptable time of readout addressed concurrently with priorities. Urgency of requirements may dictate employment of ground sensor terminals as appropriate for priority IR and SLAR missions.

(10) Coordinate with ground and air operational and intelligence elements to obtain mutual support where possible.

(11) Insure that all requirements levied on the G2 Air are provided or accounted for in planning.

(12) Insure that plans are commensurate with the capabilities of available aircraft, sensory equipment, observers, ground sensor terminal teams, reproduction facilities, image interpreters, and dissemination resources.

(13) Review air request forms for accuracy, completeness, and elimination of duplication of effort before transmitting to the supporting or tasked aviation elements.

(14) Prepare final aerial surveillance and reconnaissance plans including assignment of tasks to subordinate units.

(15) Insure that signal security (SIGSEC) considerations have been included in the aerial surveillance and reconnaissance plans.

(16) Continue planning for daily operations.

Section III. REQUEST PROCEDURES

5–8. Preplanned Requests

a. The initiation, receipt, processing, and implementation of preplanned requests are basically the same at all levels. They are developed through prior planning and careful consideration and deliberation at all echelons before being submitted to the next higher headquarters. These requests represent the total known needs of the command as of the time of submission.

b. At each level, a request is entered in an aerial surveillance log when it is received. A type format is shown in figure 5–2. The G2 Air duty team chief integrates all approved requests received into his own plan, coordinates with the ACE to insure that there are no apparent airspace user conflicts at the time, prepares a draft of the overall plan for the command, and submits it to the G2 Air for concurrence. In formulating the plan, organic Army aircraft are considered for all missions which fall within their capabilities. Consideration is also given to the capabilities of aircraft from supporting field artillery and combat support elements, when they are available, to furnish a portion of the visual surveillance re-

PERIOD _____

	VISUAL/PHOTO			
	DAY	NIGHT	INFRARED	RADAR
AVAILABLE				
PREPLANNED				
IMMEDIATE				

LOG NO	UNIT REQUEST			ARMY NO		PRIORITY	TIME NO LONGER OF VALUE	DAY			NIGHT			INFRARED			RADAR			TOT		MISSION #	DISAPPROVED	FWD TO		ABORT	DIVERTED	COMPLETED	DISSEMINATED	REMARKS
	TYPE	MONTH	REQ NO	PREPLANNED	IMMEDIATE			REQUIRED	ALLOCATED	BALANCE	REQUIRED	ALLOCATED	BALANCE	REQUIRED	ALLOCATED	BALANCE	REQUIRED	ALLOCATED	BALANCE	REQUESTED	ASSIGNED			HIGHER HQ	AVN O					

Figure 5–2. Type aerial surveillance log.

quirements of the combat zone. Missions which cannot be accomplished by organic means will be tentatively identified for accomplishment by the Air Force. Below field army level, the approved plan is submitted to the next higher headquarters for consideration and inclusion into its plan.

c. At field army level the plans from lower echelons are integrated by the G2 Air into the total field army plan. This is submitted to the G2 for approval. After approval, the plan is coordinated for execution. All other missions are coordinated by the G2 Air or his representative with the TACC at a daily planning conference. Requests are scheduled according to their priority against the total number of Air Force sorties allocated to support the field army, minus the number of sorties which the G2 Air indicates will be suballocated to subordinate corps to support their immediate operational needs. After agreement between the G2 Air and TACC has been reached, subordinate corps are notified of the final plan and the immediate sorties are allocated.

d. All mission numbers, call signs, and other data for approved Air Force and Army missions are posted on the mission status board. Air Force flown missions are received from the TACC while Army missions are received from the flying unit. A type mission status board is shown in figure 5–3. Pertinent information on all missions is disseminated to the MIBARS by the G2 Air while each requester is given information pertinent to his request.

e. During daily operations, changes in preplanned missions may be required due to changes in unit mission, shifts in priority, enemy situation, weather, or aircraft availability. The G2 Air, or his representative, coordinates, on a continuous basis, with the TACC on necessary adjustments in Air Force preplanned missions and with the organic Army flying units, if provided to the command, on adjustments in Army preplanned missions.

5–9. Immediate Requests

a. Immediate requests that originate at field army are submitted directly to the G2 Air duty team in the FATOC. The request is processed in a manner similar to a preplanned request. The duty team chief will—

(1) Analyze the requirement against the current and programmed missions.

(2) Determine if requested information is currently available, duplicates another mission, can be accomplished by organic Army means at a lower echelon, or must be accomplished by Air Force means.

(3) Review preplanned missions to see if a mission already airborne could assume the immediate requirement.

(4) Determine if information required can be obtained in time to be of value.

(5) Establish the mission priority.

(6) Notify the requester immediately of the reason for disapproval, if the request is disapproved.

(7) Pass the request, if approved, to a subordinate G2 Air for accomplishment by Army means, or to the TACC for accomplishment by Air Force means.

(8) Provide the MIBARS with data and special instructions on approved Air Force missions.

(9) Post the mission on the mission status board.

(10) Notify the requester of the scheduled aircraft time over target, the radio call sign, and the frequency assigned to the aircraft.

(11) Coordinate with the ACE to check for airspace user conflicts.

b. Immediate requests originating at corps are submitted directly to the corps G2 Air or his representative in the corps TOC. The immediate requests are processed in the same manner as those that originate at field army with the following exceptions:

(1) Requests which are approved but not within Army aviation capabilities are submitted directly to the Direct Air Support Center (DASC) at corps level rather than to the TACC.

(2) Information required to properly brief the flying crew and assist in the interpretation and dissemination of the resultant intelligence information collected is furnished directly to the organic Army aviation unit, or to the MIBARS detachment, and to the ARLO collocated with the TAF reconnaissance squadron which has been scheduled to perform the mission.

(3) The field army G2 Air will be notified of approved requests and of that information that was furnished directly to the MIBARS detachment.

c. For immediate requests from echelons below corps the following applies:

MISSION NUMBER	ARMY/ AF	NR OF ACFT	COMMUNICATIONS		OPERATIONAL TIME			TYPE MISSION	TARGET AREA, ROUTE, POINT, OTHER	REMARKS
			CALL SIGN	FREQUENCY	TAKE OFF	TOT	LAND			
10 TRS 121	AF	1	SNOOPER 1		0005	0110	0235	IR	R 1–6	COMPLETED:
10 TRS 122	AF	2	SNOOPER 4		0555	0630	0715	V/P	R 3–5	ABORTED WX AT TGT
10 TRS 126	AF	1	BLUE JAY 5		0620	0700		V/P	A 8	IN AIR
45 – 1 – 7	A	1	HAMMER 4	27.8/26.4	0610	0630	0700	V/P	R 6–Ž50–R3	COMPLETED
45 – 2 – 7	A	1	HAMMER 11	27.8/26.4	0645	0645	0730	IR	A3(SOUTH ½ B3)	FOG FCST IN AREA
45 – 3 – 7	A	2	HAMMER 3	27.8/26.4	1200	1300		SLAR	DIV FRONT	

Figure 5–3. Type mission status board.

(1) Maneuver battalions, brigades, divisions, corps, field army headquarters, or separate units that have a TACP attached to their headquarters submit immediate requests directly to their attached TACP. Units which do not have a TACP submit immediate requests through command channels to that first higher headquarters having a TACP. At the TACP, the request is transmitted over the Air Force air request net directly to the DASC at corps. All intermediate TACP between the requester and the DASC monitor and acknowledge the request and notify the S2/G2 Air. If the intermediate S2/G2 Air does not object to the request, he has his TACP signify approval by remaining silent on the net. If, however, the S2/G2 Air disapproves the request, or must impose airspace restrictions recommended by the ACE, he passes his disapproval or restrictions to both the corps G2 Air and the originator of the request over the TACP communication facilities. In arriving at a decision to approve or disapprove the request, each S2/G2 Air, from maneuver battalion to corps, evaluates the request to insure that it is valid, whether it can or cannot be met from intelligence information already at hand, whether it can or cannot be accomplished by Army means, or whether it is not part of a surveillance and reconnaissance mission already in progress.

(2) At the DASC, the Air Force reconnaissance officer will coordinate the request with the corps G2 Air. If the G2 Air dispaproves the request, the DASC will notify the requester of the disapproval through the TACP. If the G2 Air approves the request, and determines that organic army aircraft cannot be used to accomplish the mission, the DASC will then direct one of the TAF reconnaissance squadrons to accomplish the mission. Once approved by the G2 Air, the request and the mission flight information are furnished to the appropriate MIBARS detachment and ARLO and the field army G2 Air as discussed in *b* above.

5–10. Requests for Other Type Missions

a. Field Artillery Adjustment. Requests for adjustment of artillery fire that cannot be accomplished by army aircraft are processed the same way as other aerial surveillance requests. Requests are coordinated with the G3 Air at all levels prior to submission to higher headquarters. This is done in order to use Air Force close air support or interdiction aircraft already operating in the area or to control the adjustment of fire using a field artillery forward observer in coordination with an Air Force forward air controller.

b. Electronic Reconnaissance. Requests for electronic reconnaissance are processed and forwarded in the same manner as other aerial surveillance requests; however, requests are closely coordinated with the Army Security Agency element at each level of command in order to accomplish the mission at the lowest possible level. When a mission is beyond organic capabilities, it is coordinated by the G2 Air at field army with the TACC for accomplishment with Air Force electronic reconnaissance resources.

c. Weather Reconnaissance. Requests for weather reconnaissance missions are processed in the same manner as other aerial surveillance requests.

Section IV. AIRCRAFT AND SENSOR CAPABILITIES

5–11. Platforms

a. Army aircraft are designed to perform visual aerial surveillance, or reconnaissance, aerial photo reconnaissance, infrared reconnaissance, or surveillance, radar surveillance, and electronic reconnaissance. The advantages of organic aircraft are in their quicker responsiveness to the commander's needs, their capability of realtime transmission of imagery to ground sensor terminals, their slower flying speeds, their ability to fly at very low altitudes which enhances visual observation, and their ability to operate from short, semi-improved runways or areas in close proximity to the supported forces. The disadvantages of organic aircraft are limited variety of camera systems, short operational range, limited all-weather capability and vulnerability to ground fire.

b. Air Force aircraft are designed to perform the same type of missions as Army aircraft with the addition of weather reconnaissance operations. The advantages of Air Force aircraft are in their ability to photograph large areas, their greater variety of camera systems that can be carried by a single aircraft, their high speed, their long operational ranges which allow deep penetration and rapid return, and their lower vulnerability to loss by ground fire since they can operate at extremely high altitudes and speeds. Their disadvantages are that they operate at speeds too high for detailed visual observation,

require improved airfields, and that response time is slower than with organic Army aircraft.

5–12. Sensors

All sensors operate according to specific natural laws regarding a particular portion of the electromagnetic spectrum. Each portion of the spectrum provides a different and unique capability as affected by natural phenomena. Visible light photography has the highest object resolution but is hampered during periods of reduced visibility such as rain, heavy clouds, and darkness. Infrared imagery is next in object resolution; however, emitted IR energy is rapidly reduced by the heat absorbing characteristics of rain, snow, fog, clouds, foliage, and hail. Radar can operate at reduced capability through clouds and precipitation and other conditions of poor visibility. SLAR is capable of limited target acquisition. The capabilities of sensors become an important consideration in their selection (fig 5–4). Each sensor is complementary to the others; i.e., optical imagery may find the object, radar may indicate its movement, and infrared may detect its heat emissions. All sensors, whether active or passive in nature, are susceptible to enemy countermeasures in the form of either jamming or deception.

a. Photographic Imagery. Two major factors must be considered in planning photographic imagery missions; the desired scale of the imagery and the maximum utilization of the photographic capability.

(1) Suggested minimum scales for detailed photo imagery interpretation have been extracted from TM 30–245 and are contained in appendix D. Factors influencing the choice of scale may include the type of information desired, cloud cover, light conditions, the type of platform, camera, lens, film used, and the air defense capabilities of the enemy.

(2) Many requests for photographic imagery will be of small areas or pinpoint targets. In order to use the effort most economically, photographic requests are consolidated whenever possible. A mission is planned so that processing, reproduction, interpretation, and dissemination can be accomplished within the time required. Careful selection of the route to and from the primary target may allow inclusion of other surveillance requirements to be accomplished during a single mission.

b. Airborne Radar. Flight planning for the use of radar sensors considers the characteristics of radar waves. Radar waves of current sets do not penetrate heavy foliage or intervening terrain; therefore, the flight lines are planned to provide maximum coverage. Depending on aircraft altitude, SLAR will not record targets in an area up to approximately 3 km to either side of the flight path. Therefore, flights should not be planned directly over areas of interest. Airborne radar, principally SLAR, produces general intelligence record imagery with the primary emphasis on indications of moving objects. A primary advantage of SLAR is that imagery can be obtained without having to penetrate into enemy territory. The airborne radar system has a day/night, near all-weather capability which can be employed during periods of low visibility when visual, photographic, or infrared surveillance/reconnaissance measures are curtailed. Only conditions of extreme weather and turbulence will adversely affect the radar results. Since radar is an active sensor, its energy output can be detected by the enemy and electronic counter-measures (ECM) may be employed to jam the signal or degrade the radar returns.

c. Infrared. Airborne infrared detectors produce detailed or general intelligence record imagery by sensing radiated temperature variations between the terrain and objects on the terrain. By varying the type of detector and filter combinations used in the set, either an infrared image of the area being covered or a presentation of points of significant temperature variations may be obtained. This type of sensor is passive in that it does not depend upon detecting the reflection of transmitted energy as does radar. It is impossible to jam, but it may be deceived by the enemy's deliberate use of heat-producing devices. Infrared imagery, like radar, may be used for comparison or it may be used to locate areas of activity determined by the number and type of heat-producing objects detected. Rain, snow, hail, smoke, dust, foliage, and fog will reduce the sensor's ability to detect heat/IR emissions. The sensor is also subject to deliberate deception by the enemy. The IR aircraft must overfly the target area to obtain its imagery.

ITEM	DAY						NIGHT					
	CLEAR	MOISTURE			DUST		CLEAR	MOISTURE			DUST	
		Haze	Cloud	Rain	Haze	Concentrated		Haze	Cloud	Rain	Haze	Concentrated
VISUAL	E	S-U	U	S-U	S-U	U	V (Artificial light augment or light search)	S-U	U	S-U	S-U	U
PHOTOGRAPHY (Film):												
PANCHROMATIC	E	V	U	V	V	U	E-S (Flash or flare)	U	U	U	U	U
AEROGRAPHIC	E	V	U	V	V	U	U	U	U	U	U	U
CAMOUFLAGE DETECTION	E	V	U	V	V	U	U	U	U	U	U	U
COLOR	E	V	U	V	V	U	U	U	U	U	U	U
HIGH SPEED	NA	NA	NA	NA	NA	NA	E-U (Flash)	U	U	U	U	U
HIGH RESOLUTION RADAR	E	S	S	V	S	U	E	S	S	V	S	U
SLAR/MOVING TARGET INDICATOR	E	E	S	V	E	P	E	E	S	V	E	P
INFRARED	S	S	U	V	S	P	E	S	U	V	S	P

LEGEND: E - Excellent
S - Satisfactory
P - Marginal use
V - Variable (Effectiveness dependent upon density of haze or rain)
U - Unusable
NA- Not applicable

Figure 5-4. Sensor selection guide.

Section V. OPERATIONAL AIDS

5–13. General

The techniques used in planning and controlling aerial surveillance and reconnaissance require the development of operational aids. These vary in scope and complexity depending upon the requirements of the preparing echelons. A complete listing of operational aids, except for the G2 Air collection plan and aerial surveillance log which have been covered in paragraphs 5–7 and 5–8, is shown in figure 5–5 and discussed below.

5–14. Section SOP

The section SOP establishes necessary administrative procedures to insure the proper functioning of the G2 Air section. It includes the organization, responsibilities and duties of personnel.

5–15. Aerial Surveillance Annex to the Unit Intelligence SOP

The aerial surveillance annex to the unit intelligence SOP establishes the administrative procedures for the command G2 Air system. It is initially prepared at field army. Corps, division, and lower units prepare their SOP in consonance with guidance furnished by the next higher echelon. There is no prescribed format for this annex.

5–16. G2 Air Situation Map

The G2 Air situation map covers the command area of interest. It is similar in scope to the G2 situation map and is kept current by plotting key observations significant to current G2 Air operations such as hostile air defense artillery locations. It is a major planning aid used in processing specific requirements of subordinate commands. Requests, plotted on an overlay, are used to evaluate and integrate the specific requirements by consolidating requests when feasible, and by eliminating duplicatory requirements. The G2 Air situation map is used as a guide to determine the advisability and feasibility of approving immediate missions.

5–17. Aerial Surveillance and Reconnaissance Appendix to Intelligence Annex of Unit Operation Order

The surveillance and reconnaissance appendix to the intelligence annex of the operation order is used to disseminate orders to subordinate commands. Orders are either general or specific, dependent upon time and availability of information for planning, and are prepared in either written or overlay from (app C).

5–18. Daily Aerial Surveillance Plan

The daily aerial surveillance plan is a listing with overlay of approved preplanned missions. It serves as a statement of requirements for information and the means selected to satisfy them. The plan is disseminated to subordinate units to provide them with information on the time, type, frequency, and purpose of missions.

5–19. Aerial Surveillance Route, Area, and Point Overlays

a. General. Aerial surveillance route, area, and point overlays are prepared and used to rapidly designate preselected routes, areas, and points in aerial surveillance planning and operations. This system is applicable at all echelons.

b. Concept. The aerial surveillance and reconnaissance appendix to the intelligence annex of an operation order is supported by appropriate route, area, and point overlays which are identified as Tabs A, B, and C respectively. Route (Tab A) (fig 5–6 and 5–7) and area (Tab B) (fig 5–8) overlays are always prepared in planning for aerial surveillance. A point overlay (Tab C) (fig 5–9) is prepared when necessary for locating points of primary interest.

c. Responsibility. The field army G2 is responsible for the preparation of route, area, and point overlays. These overlays are coordinated with the TACC and incorporated into the aerial surveillance appendix. The actual coordination, preparation, and dissemination of the overlays are functions of the field army G2 Air.

d. Route Overlays. In the preparation of route overlays, selected primary lateral and axial (pertaining to the axis of advance) routes which have been determined to be of greatest tactical significance to the commander are drawn. Selected routes are identified by the letter R prefix (R–1 to R–50) for the numerical designation of axial routes, and a block of numbers with a Z prefix (Z–51 to Z–100) designates lateral routes (fig 5–6 and 5–7). A selected route may or may not traverse the entire length or width of the area and, therefore, is terminated unless it can be tied to anothr route within 16 km (fig 5–6 shows route R–1 terminated because of this distance factor). Termination of an R-route, for example, can be

CLASSIFICATION	TITLE	PURPOSE	PREPARING ECHELON			
			Field Army	Corps	Division	Other
ADMINISTRATIVE PROCEDURES	Section SOP	To establish section administrative procedures	X	X	X	Optional
	Aerial surveillance annex to unit intelligence SOP	To establish pertinent administrative procedures within command	X	X	X	Optional
	G2 air situation map	To determine friendly and enemy situation in area of interest	X	X	X	X
	G2 air collection plan	To determine broad and specific requirements	X	X	X	Optional
	Aerial recannaissance and survl appendix to intelligence annex of operations orders.	To prepare directions for subordinate units	X	X	X	Optional
	Aerial surveillance plan	To provide information to subordinate units	X	X	X	Optional
	Route overlay (Tab A)	To prearrange route identification code	X			
	Area overlay (Tab B)	To establish area identification code	X			
	Point overlay (Tab C)	To establish point identification code	X			
	Master cover trace	To provide overlay indicating imagery available	X	X	Optional	
SPECIFIC PLANNING AND CONTROL AIDS	Air reconnaissance request form	To identify and request a specific requirement	X	X	X	X
	Request overlay (Flight plot)	To support graphic supplement for special imagery	Optional	Optional	Optional	Optional
	Aerial surveillance log	To prepare a listing of requests received and the actions taken	X	X	X	Optional
	Mission status board	To establish current reference of approved missions	X	X	X	
	Mission folders	To segregate requests by status of action	X	X	X	
REPORTS	Mission report	To inform the requester of the mission results (Field Army - by MIBARS and Corps through G2 air rep)	X	X		
	Pilot trace	Pilot route overlay by mission (Field Army - by Air Force through MIBARS and Corps by ASC thru G2 air rep	X	X		
	Imagery interpretation report (IPIR/ SUPIR/GPIR/HOTPHOTOREP)	To prepare intelligence reports from imagery interpreters. (Field Army - thru MIBARS and Corps thru MIBARS Det, MI Co, and Division thru MI Co)	X	X	X	

Figure 5–5. Aerial surveillance/reconnaissance operational aids.

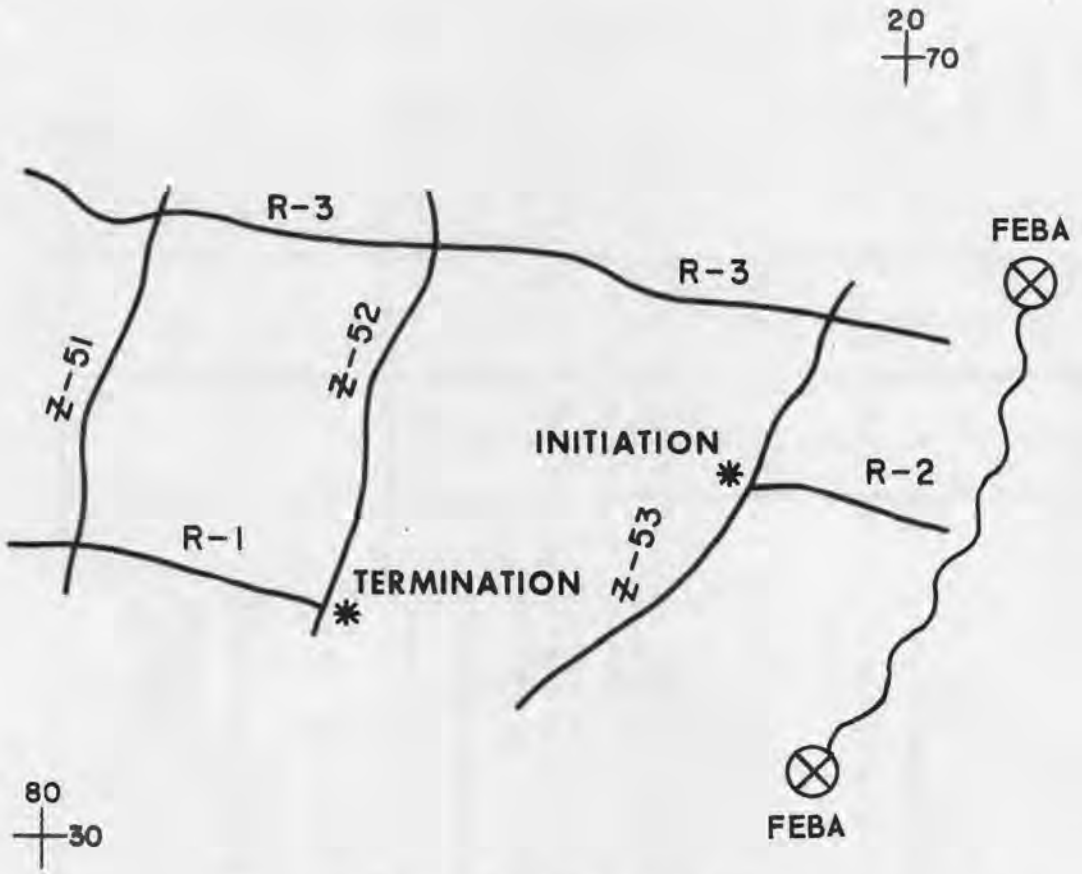
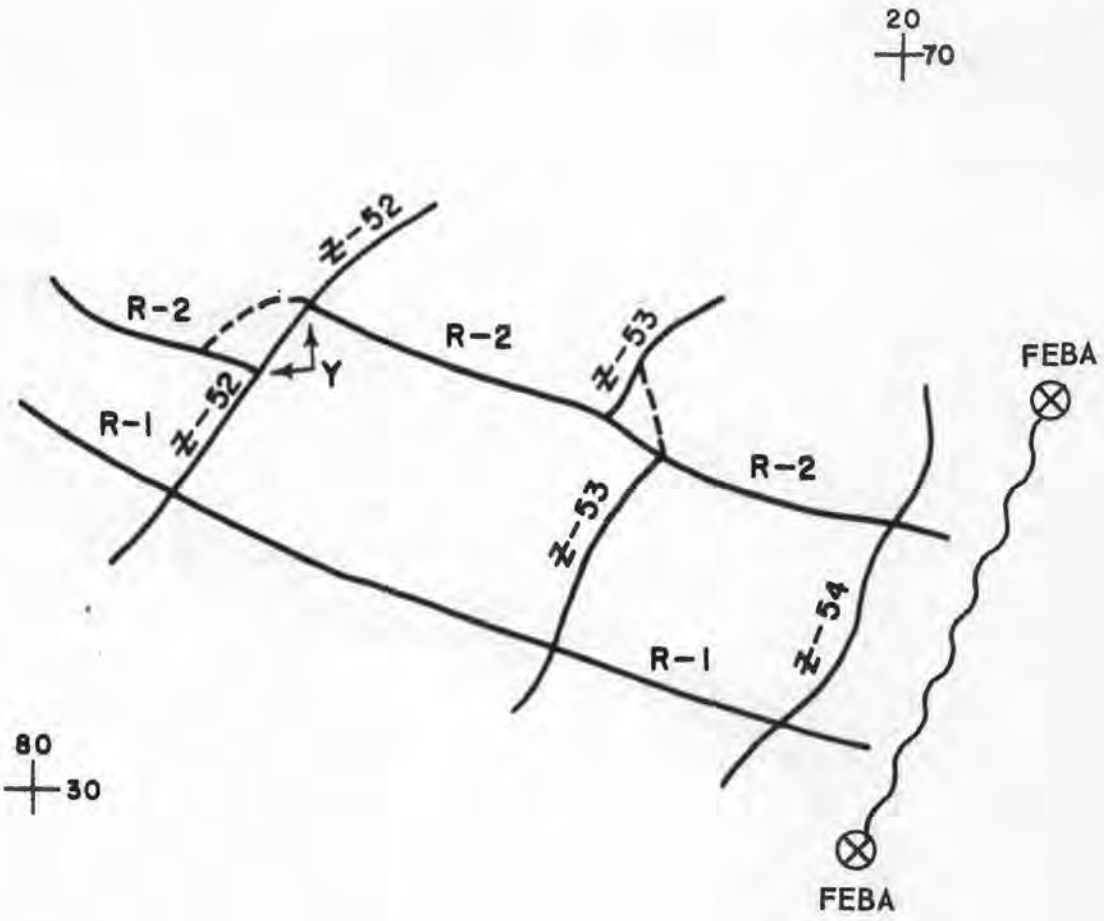


Figure 5–6. Route overlay (Tab A)—route continuation, axial and lateral route identification.

avoided by traveling a Z-route for less than 16 km (fig 5–7, point Y). When preparing route overlays, road nets, rail nets, waterway systems, and prominent trails, other features are selected that are recognizable from the air. When route planning is not adaptable to the particular terrain (jungle, arctic, etc.), reliance must be placed solely on search areas.

e. Area Overlays. Area overlays are prepared to indicate the overall area of interest to the command that will require detailed aerial search. Normally the area of interest is divided into small, specific areas that can be searched with a single visual mission. The size of an area which can be searched by one aircraft on one mission depends upon the aircraft used, type of sensor, type of terrain to be covered, enemy defenses in the area, intensity of the search, information being sought, and the capability of an aerial observer to visually search the area. Planning figures for area search operations must be developed by flying units through actual conduct of visual area search missions within the area of operations. Terrain features easily recognized from the air are used in defining the limits of the search area. For economy of time and aircraft, search areas should be oblong in shape to allow a minimum number of passes to obtain complete coverage (fig 5–8). In planning area overlays, the G2 Air places emphasis for surveillance on secondary routes and those primary routes not used in preparation of route overlays. The letters of the alphabet, with the exception of I, O, R, and Z, are used as prefixes to the numerical designations applied to search areas. When the area of interest has been subdivided into search areas, those nearest the line of contact are given the prefix A followed by a number; the areas in the next row are given the prefix B followed by a number; etc. This system is continued until all the selected areas have been identified with letters and numbers.

f. Point Overlay. The point overlay is prepared by the field army G2 Air in response to requirements to collect intelligence information and support the development of specific targets. These key points are usually readily identifiable from the air, visually or by instruments, and will facilitate in-flight target location and reporting. A pinpoint representing a coordinate, surrounded by a



* Reference paragraph 5.19d

Figure 5–7. Route overlay (Tab A)—route initiation and termination.

circle with a numerical identification, is plotted on the point overlay (fig 5–9).

g. Base Plans. All three overlays (Tabs A, B, and C) are prepared prior to operations and are referred to as the base plan. The route, area, and point numerical designations are referred to as base plan index numbers. The base plan normally is given a security classification commensurate with the classification of the plan which it supports. In anticipation of compromise of any portion of the base plan, an alternate alphabetical and numerical designation for each overlay should be established in advance. When a change of designators is required due to compromise, the necessary changes are announced by utilizing one or more of the cryptographic systems established in the command signal operation instructions (SOI) in use by all elements of the command. Examples of cryptosystems which may be used are SOI operations codes or prearranged message codes.

5–20. Master Cover Trace

A master cover trace is an overlay showing the ground area covered by all imagery available at an echelon of command or imagery interpretation element. It is used to indicate the status of current imagery available for a given area or target, thus preventing unnecessary waste of mission aircraft or duplication of effort. The master cover trace normally is maintained by the unit providing the imagery interpretation support to the command.

5–21. Air Reconnaissance Request

a. Section I of the air reconnaissance request form (fig 5–10) is applicable for use by both the US Armed Forces and all member nations of NATO. The format of section I complies with

NATO Standardization Agreements (STANAG) Number 2134, Offensive Air Support Operations, and Number 3277, Air Reconnaissance Request Form. The information requested by section I is furnished by the requester for each specific aerial surveillance or aerial reconnaissance mission submitted. Normally, requests are transmitted by electrical means and the actual form is completed at the headquarters where the request is received. The format of the request provides a means of

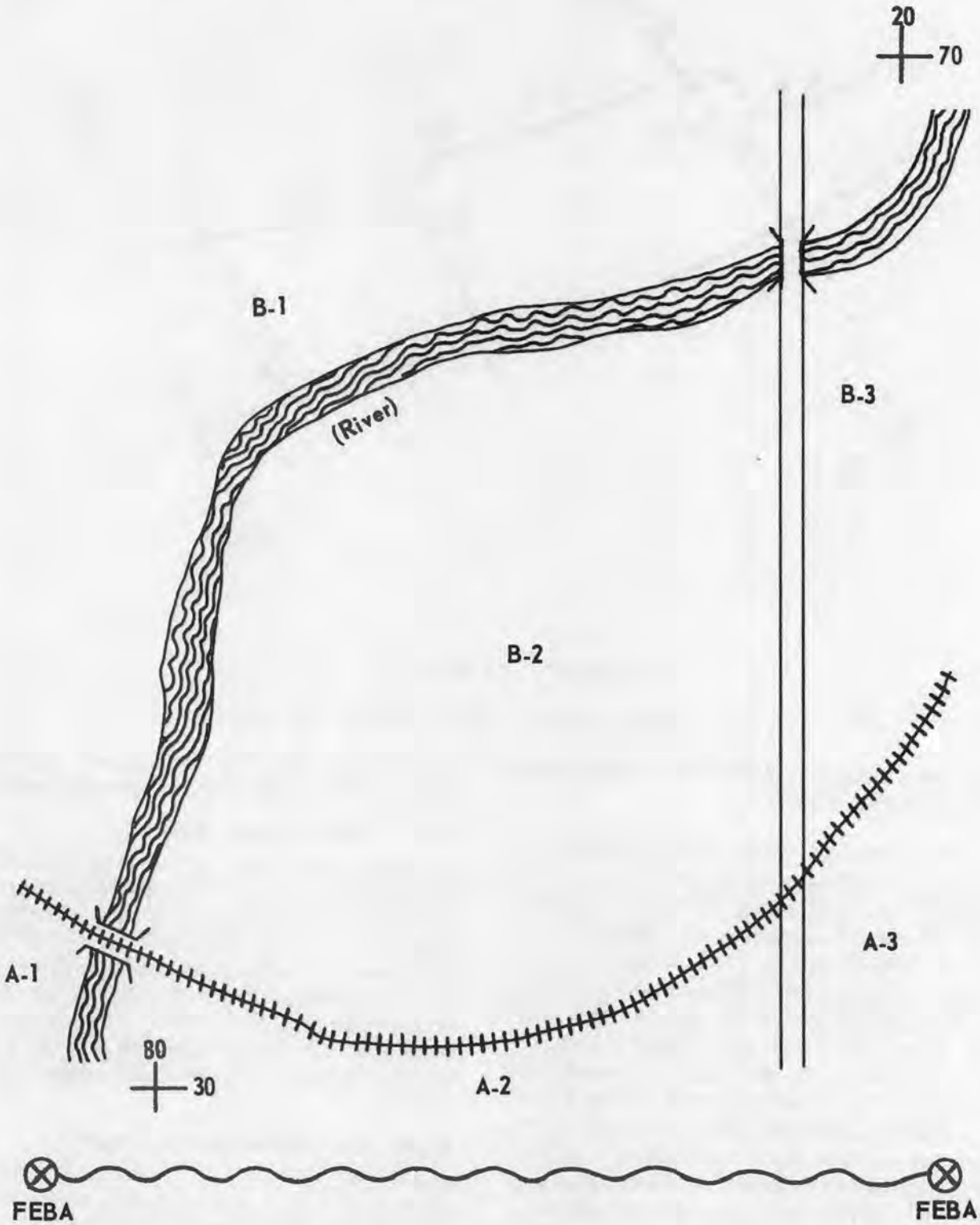
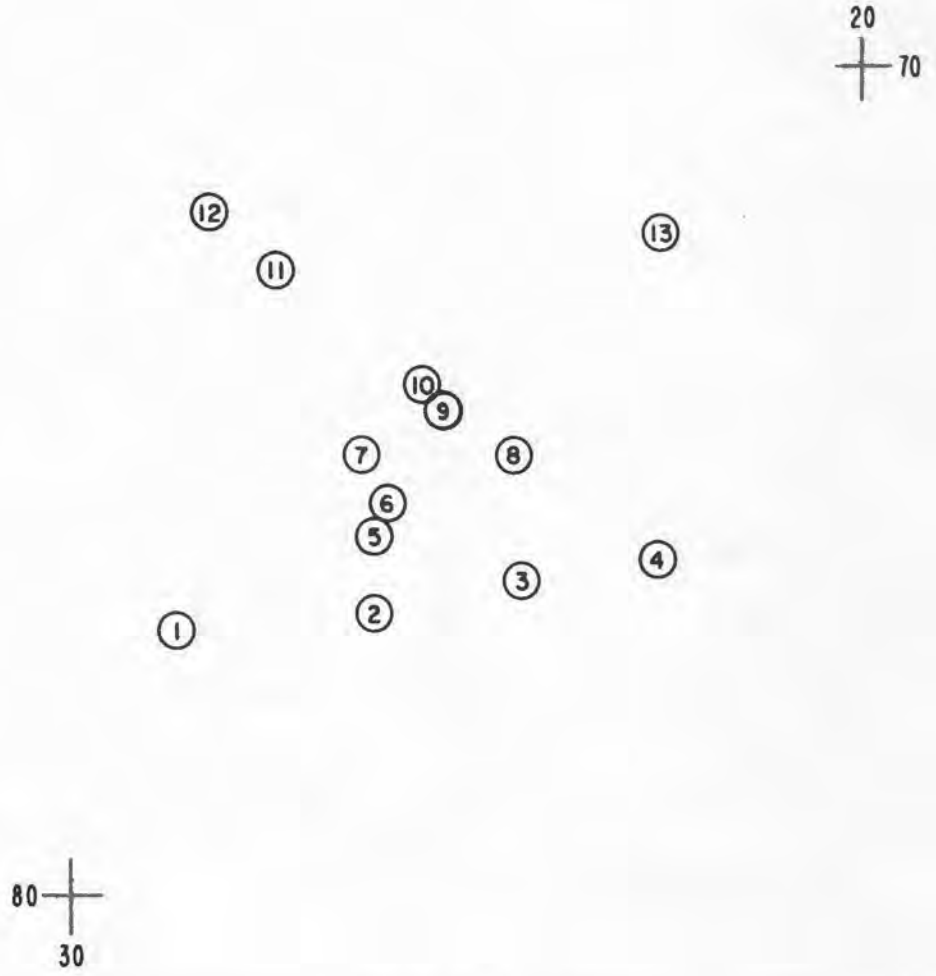


Figure 5–8. Area overlay (Tab B).

reporting and recording sufficient information to locate and identify the area of interest and the specific information desired from the mission. The request may be initiated at any echelon and is used for both immediate and preplanned missions. The G2 Air, or appropriate intelligence staff office below division level, is charged with the responsibility for initiating the request in the proper format and integrating the requirement into the aerial surveillance operations for appropriate action.



CONCENTRATION LIST

Conc. No.	Coordinates	Description	Remarks
1	43 09	Power Station & Distr Pt	Reservoir to N.
2	65 10	RR & Highway Bridges	RR Steel 100' Highway concrete 75'
3	81 13	RR & Highway Bridge	RR Steel 100' Highway concrete 90'
4	97 16	RR & Highway Bridges	RR Steel 200' Highway Steel 200'
5	66 19	Warehousing	9 ea 200' x 400'
6	67 22	6 Barracks 25' x 200'	
7	64 28	Chemical Plant - Coal Tar	
8	81 28	Mil Ord Storage Yard	
9	73 32	Tank Assembly Plant	80% Damaged
10	72 34	12 Barracks & Parade Ground	
11	55 48	Highway Bridge, 2 lane, Concrete	150' long
12	48 54	Lumber Mill	
13	98 52	Military - Maint Shops	

Figure 5–9. Point overlay (Tab C).

FROM	TO	IMMED	PR PLAN	AIR RECONNAISSANCE REQUEST

SECTION I - AIR RECONNAISSANCE REQUEST

L. ORIGINATORS REQUEST NUMBER _____

M TYPE OF RECONNAISSANCE _____

N. NATIONAL MAP SERIES AND SHEET NUMBER _____

O. DESCRIPTION OF TARGET AND LOCATION _____

P. OBJECTS OF REQUEST AND RESULTS DESIRED _____

Q. PHOTO SCALE OR LIMITS ACCEPTABLE _____

R. NUMBER OF PRINTS, PLOTS OR REPORTS REQUIRED _____

S. DELIVERY ADDRESS _____ DATE _____ TIME _____

T. LATEST ACCEPTABLE _____ DATE _____ TIME _____

U. SPECIAL INSTRUCTIONS _____

NAME/RANK/POSITION OF REQUESTER	NAME/RANK/POSITION OF APPROVING OFFICER

SECTION II - FOR ADMINISTRATIVE PURPOSES ONLY

1. RECEIVED AT DTG _____Z	2. BY LOCATION CHECKED DTG _____Z	3. COORDINATED: ARTY: AIR DEF: AVN
4. ☐ APPROVED ☐ DISAPPROVED	5. REASON FOR DISAPPROVAL	
6. FORWARD TO BY DTG _____Z	7. REQUESTING UNIT NOTIFIED DTG _____Z	8. MIBN (ARS) NOTIFIED DTG _____Z

SECTION III - AF ACTION

1. RECEIVED AT DTG _____Z	2. BY LOCATION CHECKED DTG _____Z
3. ☐ APPROVED ☐ DISAPPROVED	4. REASON FOR DISAPPROVAL
5. FORWARD TO BY DTG _____Z	6. RETURNED TO ARMY BY

SECTION IV - AIR MISSION DATA

1. MISSION NR ARMY MISSION REQ NR	2. ACCOMPLISHING ORGANIZATION NOTIFIED DTG _____Z	
3. UNIT CALL SIGN	4. NUMBER AND TYPE AIRCRAFT PRIORITY	
5. TOT	6. CONTROL INFORMATION	
7. ARMY MISSION DATA	8. CRC NOTIFIED DTG _____Z	DASC/TACC NOTIFIED DTG _____Z
9. OTHER COORDINATION		

Figure 5–10. Air reconnaissance request form.

EXPLANATORY NOTES

SECTION I. TO BE USED BY ANY ARMY/AIR FORCE UNIT REQUESTING AIR RECONNAISSANCE.

L. ORIGINATOR'S SERIAL NUMBER: EACH REQUEST WILL BE GIVEN A SERIAL NUMBER CONSISTING OF A PREFIX FOLLOWED BY A NUMBER COMMENCING WITH NUMBER 1 AT THE BEGINNING OF THE YEAR. FURTHER REQUESTS WILL BE NUMBERED CONSECUTIVELY THROUGHOUT THE YEAR. PREFIXES WILL BE THE HEADQUARTERS DEMANDING e.g. LANDCENT, AFCENT, AFNORTH, 4ATAF.

M. TYPE OF RECONNAISSANCE: FOR EXAMPLE: VISUAL, ELECTRONIC, WEATHER, FIRE CONTROL OR PHOTOGRAPHIC RECONNAISSANCE (VERTICAL, OBLIQUE, IR, SLAR OR REPRINT PHOTOGRAPHY). THIS PARAGRAPH SHOULD BE LEFT BLANK UNLESS IT IS UNDERSTOOD FULLY WHAT THE SELECTED TYPE OF RECONNAISSANCE CAN ACCOMPLISH.

N. NATIONAL MAP SERIES AND SHEET NUMBER: OWING TO THE LARGE VARIETY OF MAPS USED, BOTH IN TRAINING AND OPERATION BY NATIONS, THESE DETAILS MUST BE GIVEN IN FULL.

O. DESCRIPTION OF TARGET AND LOCATION: TO INSURE THAT THE RECIPIENT OF THE REQUEST UNDERSTANDS THE REQUIREMENTS, IT IS NECESSARY TO GIVE AN EXACT LOCATION, E.G., RAILWAY BRIDGE 775386. IN THE CASE OF OBLIQUE, THE NEAR BOUNDRY OF THE AREA TO BE PHOTOGRAPHED WILL BE GIVEN. ROUTE AND AREA BOUNDRIES WILL BE GIVEN FOR ROUTE OR AREA RECONNAISSANCE.

P. OBJECT OF THE REQUEST AND RESULTS DESIRED: IT IS IMPORTANT THAT THE EXACT PURPOSE OF THE REQUEST IS STATED IN ORDER THAT THE MOST SATISFACTORY RESULTS MAY BE OBTAINED.

Q. PHOTO SCALE OR LIMITS ACCEPTABLE: WHENEVER POSSIBLE, THIS HEADING SHOULD BE FILLED IN ON THE ADVICE OF AN IMAGERY INTERPRETER. THE SCALE SHOULD BE QUOTED IN FIGURES, E.G., 1 10000.

R. NUMBER OF PRINTS, PLOTS, OR REPORTS REQUIRED: THIS SHOULD NEVER EXCEED THE NUMBER ACTUALLY REQUIRED. IF AN IMAGERY INTERPRETATION REPORT WILL SUFFICE, PRINTS SHOULD NOT BE ORDERED.

S. DELIVERY ADDRESS, DATE, TIME: STATE CLEARLY WHERE THE PRINTS, PLOTS, OR REPORTS ARE TO BE DELIVERED AND THE TIME AND DATE ON WHICH THEY ARE REQUIRED. IF THERE IS NO HASTE, AS MUCH TIME AS POSSIBLE SHOULD BE GIVEN FOR FINAL DELIVERY SO AS TO ALLOW REQUESTS OF A MORE URGENT NATURE TO BE GIVEN PRIORITY.

T. LATEST ACCEPTABLE TIME AND DATE: THE DATE OR TIME AFTER WHICH THE PRINTS, PLOTS, OR REPORTS ARE NOT LONGER REQUIRED. IF DELIVERY CANNOT BE MADE BY THE DATE STATED, THE REQUEST WILL BE CANCELED

U. SPECIAL INSTRUCTION: THE DEGREE OF URGENCY, OR WHEN MAKING MORE THAN ONE REQUEST, THE DEGREE OF PRIORITY, AND THE SECURITY CLASSIFICATION OF THE MATERIAL REQUESTED. GIVE ANY INSTRUCTIONS OR INFORMATION NOT ALREADY PROVIDED THAT WILL AID THE PLANNING, OR SUCCESSFUL ACCOMPLISHMENT OF THE MISSION, NAME AND TELEPHONE NUMBER OF CONTACT OFFICER AND DESIRED TIME OVER TARGET IF APPLICABLE. IF IPIR/SUPIR ARE REQUIRED, THIS MUST BE CLEARLY STATED.

SECTION II. COMPLETED BY ARMY ACTION AGENCY AT ECHELON OF COMMAND ABOVE REQUESTING AGENCY.
ITEM 1: INDICATE UNIT, DATE, TIME.
ITEM 2, 4, 6, 7, 8: INDICATE INITIAL, DATE, TIME.

SECTION III. COMPLETED BY AIR FORCE ACTION RECONNAISSANCE SECTION.
ITEM 1: INDICATE UNIT, DATE, TIME. ITEM 2, 3, 5: INDICATE INITIALS, DATE, AND TIME.

SECTION IV. ITEM 3: AIRCRAFT CALL SIGN OR NUMBER. ITEM 6: AGENCY CONTROLLING MISSION.
ITEM 7: TO INDICATE METHOD WHICH MISSION DATA (SECTION I) WILL BE TRANSMITTED TO THE ACCOMPLISHING UNIT, I.E., FRAG ORDER OR "IMMEDIATE REQUEST".
ITEM 8: SHOW INITIAL DATE AND TIME.

Figure 5–10. (Continued).

The back of the request form provides instructions for completing the request. Requirements for stereo or mono photo coverage should be identified on the Air Reconnaissance Request Form under paragraph U, Special Instructions.

b. As a suggested guide for administrative control and processing of requests, sections II, III, and IV of the air reconnaissance request form are provided. These sections allow the recording of all actions taken on a request to be shown on the request form itself. Instructions for completing sections II, III, and IV are contained on the back of the form.

5–22. Request Overlay

A request overlay is an optional graphic supplement to the aerial surveillance request. Normally prepared by image interpreters, it indicates the image taking technique required to satisfy a special requirement to be accomplished by a particular photographic, infrared, or radar mission. Examples of a special requirement include numerous changes in flight paths or specific attitudes, angle and/or direction of flight, lengths of flight lines, and approach direction to a target area. A request overlay is only required if the mission must satisfy unusual interpretative requirements which cannot be presented adequately in the context of the actual air reconnaissance request format. This overlay is prepared jointly by the interpreter and the flying unit when circumstances permit.

5–23. Mission Status Board

A mission status board reflects the status of approved immediate and preplanned missions. Information about each mission is filled in as it becomes available. It assists the G2 Air in following the conduct of each mission and is a base from which to initiate changes in plans caused by changing situations. Each echelon maintaining a mission status board uses the format that best suits its operational needs. An example of a mission status board is shown in figure 5–3.

5–24. Missions Folders

Mission folders assist the G2 Air by segregating requests according to status of action. The following folders are maintained:

a. Approved requests.

b. Disapproved requests.

c. Completed missions.

d. Aborted missions. (Missions not completed due to weather, enemy air defenses, equipment malfunction, or rerouting of mission aircraft to a higher priority mission while en route.)

5–25. Pilot Trace

A pilot trace is an overlay showing the pilot's concept of the course flown and the points at which imagery was exposed. It is used to assist interpreters in correlating the resultant imagery to the terrain.

5–26. Imagery Interpretation (II) Reports

Imagery interpretation reports and mission reports are discussed in chapters 9 and 10.

Section VI. COORDINATION

5–27. General

The G2 Air coordinates the aerial surveillance effort with those agencies and elements having an effect on, or affected by, the collection of information, through aerial means. This coordination is necessary for the efficient accomplishment of the intelligence cycle from the development of requirements to the dissemination of the intelligence produced. Coordination with the general and special staff sections of the command and with the G2 Air sections at higher, lower, and adjacent headquarters as well as with operational elements is essential.

5–28. The Field Army

The field army G2 Air works closely with the staff officers and sections within the headquarters such as engineer, artillery, aviation, chemical, signal, air defense, maintenance, and transportation. Close coordination for both long-range and day-to-day planning is conducted with the G3 Air FSE, the TACC, subordinate G2 Air personnel, theater G2 Air, the MIBARS, the Military Intelligence Battalion, Field Army, and attached Army Security Agency personnel.

5–29. Corps and Divisions

Both the corps and the division G2 Air coordinate in a manner similar to the field army G2 Air; however, such coordination is reduced in scope. Examples of corps coordination are with the corps engineer for mapping photography require-

ments or photomap reproduction, with the corps artillery section on target and damage assessment information, and with the corps communications-electronics officer on communications matters. The corps G2 Air also coordinates tasking of the aerial surveillance company for mission support. At division, coordination is conducted with the G3 for planned operations, with the division aviation officer regarding the availability of visual aerial surveillance means, with the division communications-electronics officer regarding communications and signal photographic reproduction support, with the FSE regarding damage assessment mission operations and with the ACE regarding use of airspace.

5–30. Army Security Agency

a. Integration of signal intelligence (SIGINT) and imagery, SLAR, and infrared intelligence at the earliest practical moment in the intelligence production effort is a clearly defined requirement to assure the most effective target acquisition, surveillance, and reconnaissance support to the tactical commander. SIGINT information can complete, confirm, or refute, previously reported information/intelligence, and, in many instances, serve as the basis for initiating these reconnaissance and surveillance missions.

b. To facilitate timely integration, prevent handling delays often incurred when dealing with special intelligence, and assist the tactical commander in the effective employment of SIGINT resources, EW/cryptologic officers are assigned to the staffs at army, corps, and divisions. Also, the US Army Security Agency places an ASA Group, Battalion, Division Support Company and detachment in support of a field army, corps, division, and separate brigade. These units provide personnel for the EWE of the TOC to assist in integrating SIGINT results into electronic warfare and other tactical operations.

c. In order to effect proper coordination, the operations center of the supporting ASA unit will be located as close to the CP or TOC as feasible, in accordance with the supported commander's desire. It is located to provide optimum command and control over ASA deployed elements and at the same time be responsive to the requirements of the supported command. Secure communications between the ASA operations center and the CP or TOC will play a critical role in these operations.

CHAPTER 6

COMMUNICATIONS

6–1. General

a. Communication means for aerial surveillance and reconnaissance activities consists of single-sideband (SSB) radio, both voice and RATT, and sole-user telephone and teletype circuits using the Army and Army area communications systems in addition to facilities organic to TOE units. These means provide communications facilities for both the transmission of requests for aerial surveillance and reconnaissance missions and the rapid dissemination of the intelligence information produced from aerial missions. The radio nets and equipment utilized within the air-ground operations system are provided by the Air Force. Army telephone and teletypewriter equipment is either provided for in unit TOE or by organic or supporting signal units at each command level; Army communications are coordinated through or provided by the command C-E staff officer.

b. The introduction of the MI Company (Aerial Surveillance), and the tactical imagery interpretation facility (TIIF) (with organic SSB-Voice-RATT communications equipment available in the MI detachment) has necessitated the development of nets and other means of communications between G2/S2 air elements and the aerial surveillance and reconnaissance community. There are no special communications requirements for handling preplanned air requests among battalions, brigade and division. Organic communications means are—command, operations and common-user nets. Type Army aerial surveillance and reconnaissance communication nets and Air Force tactical air reconnaissance communication nets that are available for aerial surveillance and reconnaissance are depicted in figure 6–1 and are discussed below. Details of armored cavalry communications and radio nets are fully discussed in FM 17–36.

6–2. Current Aerial Surveillance and Reconnaissance Communications Nets

a. Command Operations and Common User Net. No special communications are required for handling preplanned air requests between battalion, brigade, and division. Organic communications means are: command, operations, and common user nets.

b. Immediate Air Request Net. Air Force communications means are provided for the submission of immediate requests for close air support and aerial surveillance and reconnaissance requests from lower to higher headquarters. Stations in this net are provided by the TACP attached to the battalion, brigade, division, and corps. (The TACP at corps is collocated with the CTOC and the DASC.) The NCS for the net is at the DASC. A detailed discussion on the operations of this net is contained in paragraph 5–9*c*.

c. Air Force In-Flight Report Net. This net is used by tactical air support pilots for airborne transmission of visual observations of immediate interest such as air strike results and intelligence information.

d. Air Force Communications System. The Air Force communications system provides Air Force commanders with the communications necessary for command and control of tactical air operations and for coordination of these operations with those of surface forces. Communications means are provided among the TACC, DASC, Tactical Air Force headquarters and the Air Force flying units. The system also provides communications means for the TACC. The Spot Report Receiver System is used for the rapid dissemination of important visual observation made by Air Force crews in-flight. UHF radios are located at the field army (in the TACC), at corps and division (in the TACP), and at each brigade, maneuver battalion, and cavalry squadron (in the TACP). These radios are used to monitor the Air Force in-flight report net for in-flight transmissions. Army organic aircraft employ an air-to-ground in-flight report technique to keep ground commanders informed on significant sightings. This is discussed in paragraph 6–4*d*.

e. Submission of Immediate and Preplanned Requests. Command SOP should establish normal traffic procedures for submission of immediate and preplanned requests. At division level and below, the primary means consist of the brigade operations/intelligence net (between battalions and brigades) and the division operations/intelligence net (between brigades and the division headquarters). Alternate additional means at these levels include the brigade command nets, the division general purpose net and the division command net. Above division level, the corps and

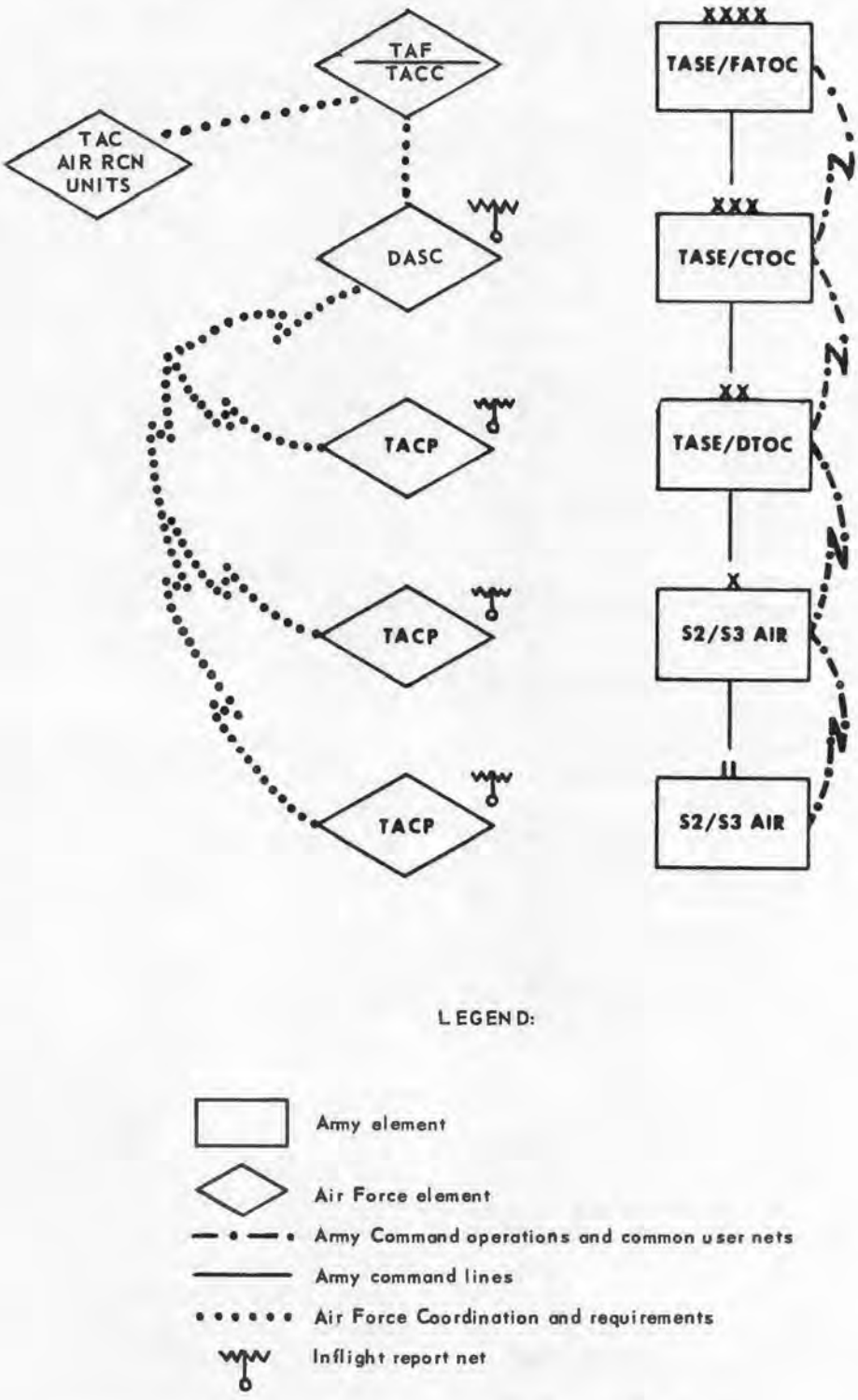


Figure 6–1. Type Army and Air Force Tactical Air Reconnaissance communications nets.

army multichannel systems provide sole-user teletypewriter and telephone circuits as primary and alternate communications means. In addition to the Army multichannel system, Air Force air request nets used for submission of immediate air requests also may be used for preplanned requests by establishing local Army-Air Force agreements. When Air Force channels are used, preplanned requests must also be transmitted through all intermediate Army headquarters for necessary staff action. The radio nets used by the Army are discussed below.

f. Air Force Tactical Air Direction Net. This net is used by the tactical air control party, combat control team, direct air support center, control and reporting center, and reporting post and the forward air control post (FACP) to direct and control tactical air support aircraft. Each tactical air control post and each combat control team acts as net control for a tactical air direction net. The direct air support center can enter any of these nets as required. The control and reporting center, control and reporting post, and forward air control post are also provided air-ground radios that can enter any net for direction purposes.

6–3. Aerial Surveillance and Reconnaissance Communications Nets

a. Military Intelligence Battalion, Aerial Reconnaissance Support, (MIBARS) Field Army Operations Net (fig 6–2). The MIBARS operations net (RATT) functions among MIBARS detachments, located with the AF reconnaissance squadrons, MIBARS battalion operations and intelligence section (NCS) and the G2/G3 air sections located in the FATOC and CTOC. (This net replaces the former air reconnaissance liaison officer (ARLO) net and portions of the old Army information net.) This net can carry imagery interpretation and ARLO reports and allows the field army and corps G2 Air to pass information on immediate and preplanned missions directly to the MIBARS headquarters and its detachment.

b. Corps G2 Air MI Company (Aerial Surveillance) Operations Net. This net (SSB-RATT-voice) provides communications between the corps G2 Air at the TASE of the CTOC and the corps MI Company (Aerial Surveillance). One imagery interpretation team with TIIF from the corps military intelligence unit, collocated with the G2 Air at the TASE, provides the communications for the G2 Air section. The communications for the MI Company (Aerial Surveillance), are authorized by TOE. When designated as the parent headquarters, the military intelligence unit at corps will be added to this net. Other TIIF organic to the corps military intelligence unit are also added to this net when required. This net can carry debriefing reports from the MI Company (Aerial Surveillance), and other corps TIIF to the G2 Air. It also allows the G2 Air to pass requirements and information on immediate and preplanned missions directly to the MI Comapny (Aerial Surveillance).

c. Ground Liaison Officer Operations Net. This net provides communications between liaison officers located with the tactical air force fighter units and the field army G3 Air in the tactical operations center. This net is used to transmit debrief reports and other information from the liaison officers to the G3 Air, to pass information or immediate and preplanned requests directly to the liaison officers.

d. Division Imagery Interpretation Team Communications Equipment. The division G2 Air is supported by one imagery interpretation team with TIIF at the TASE of the DTOC. This team has communications equipment that will net with the radio sets in the MIBARS and corps G2 Air-MI Company (Aerial Surveillance), operations nets.

e. Alternate G2 Air Means of Communications.

(1) Communications equipment in the MIBARS operations net, the corps G2 Air-MI Company (Aerial Surveillance), operations net, and the division imagery interpretation team TIIF are identical. They allow the establishment of communications between G2 Air sections at each level when required and authorized.

(2) Executing instructions for immediate air requests approved by corps G2 Air, are passed directly from the corps DASC to the AF reconnaissance squadron if not being flown by organic army aircraft. To match this responsiveness and insure that the Army ARLO and MIBARS detachment collocated with the AF reconnaissance squadron are also alerted and furnished with full information on the mission. At the same time, the corps G2 Air must insure that an information copy of the mission requirements is also furnished the G2 Air at field army and the MIBARS operations and intelligence section. This can be accomplished by including the field army G2 as an information addressee when transmitting the original message over the MIBARS net.

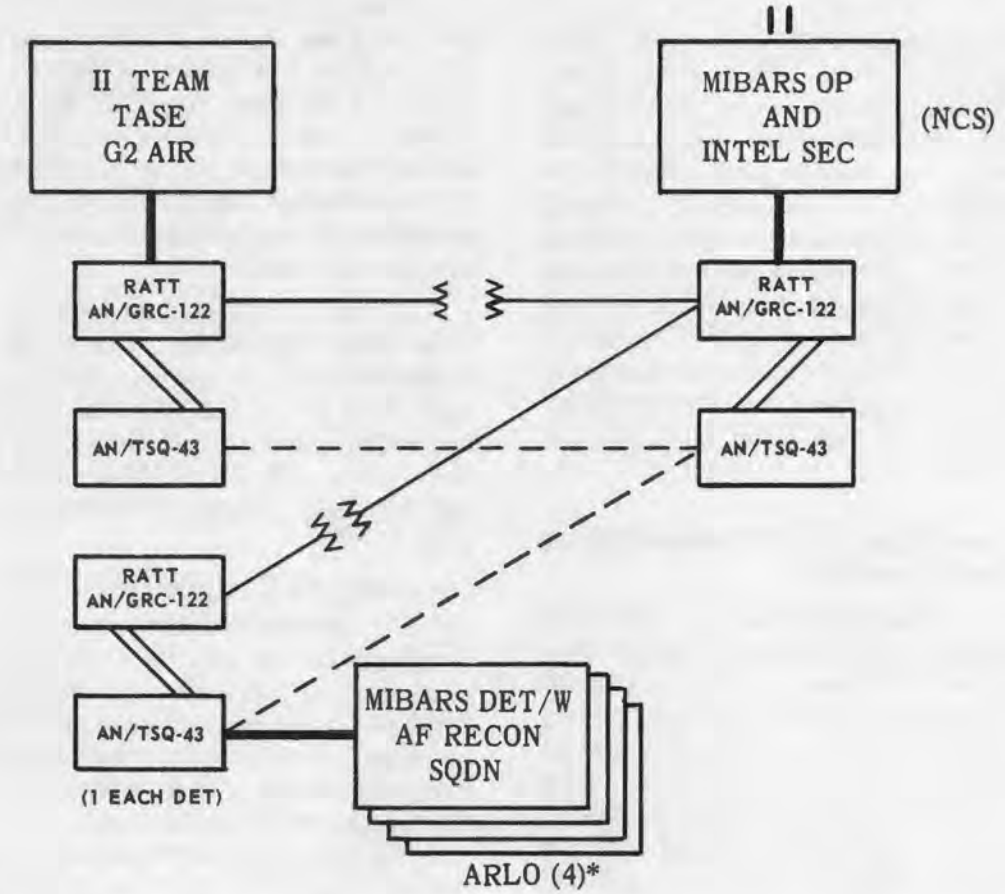
(3) When missions flown by either the Air Force or the corps MI Company, (Aerial Surveil-

lance), result in information of significant tactical value, the appropriate MIBARS detachment, MI Company imagery interpretation section, or ARLO having the information transmits the report directly to the requester utilizing the common facilities at each echelon. However, information transmitted must also be reported to the respective G2 Air as expeditiously as possible.

6–4. Other Communications Systems

a. The field army area communications system may be used for routine aerial surveillance and reconnaissance operational traffic when other communications systems require supplementation.

b. Normal communications means used for aerial surveillance and reconnaissance operations, as



* Senior ARLO with Air Force reconnaissance wing normally collocated at same airfield with one MIBARS detachment and utilizes organic detachment communications equipment. One RATT and one AN/TSQ-43 per each element as depicted above.

═══ AN/GRC-122 may be operated via remote control from the TSQ-43.

– – – – Alternate TT link, if authorized

—≷≷— Radio link

Figure 6–2. MIBARS operations net.

discussed in paragraph 6–2, may become overloaded or reduced because of displacement of a headquarters. Provisions must be made at the alternate TOC to share other nets to insure that adequate means of submitting requests and receiving information continue to exist. When possible, Air Force nets may be utilized to carry priority operational traffic for the period of the move.

c. When missile commands support allied units, provisions must be made to augment their communications capabilities to provide a rapid means of requesting and disseminating aerial reconnaissance and surveillance information.

d. Army aircraft are equipped with radios capable of netting with the tactical radios of the ground elements. This provides a means of disseminating information of immediate tactical significance. Procedures, frequencies, and call signs to be used must be coordinated between the G2 Air and the ground units prior to the flight or established in command SOP and SOI.

6–5. Signal Security and Electronic Warfare Support Measures

The mission of aerial surveillance units makes them especially lucrative targets for signal intelligence (SIGINT) and electronic countermeasures exploitation. The units must utilize all available signal security (SIGSEC) and electronic countermeasure (ECM) means to reduce the effectiveness of such exploitation and its impact on surveillance and reconnaissance operations.

a. Signal Security. Special attention is given to SIGSEC measures designed to minimize enemy SIGINT or electronic warfare support measures which might exploit friendly communications, radars, and infrared surveillance devices. For additional details, see FM 32–5.

b. Electronic Warfare. SLAR and infrared (IR) devices are particularly vulnerable to countermeasures, such as deception. For general guidance on countermeasures employed against SLAR and IR systems, see FM 32–20.

CHAPTER 7

MILITARY INTELLIGENCE BATTALION AERIAL RECONNAISSANCE SUPPORT, FIELD ARMY

Section I. MISSION, ORGANIZATION, AND FUNCTIONS

7–1. Introduction

This chapter furnishes guidance pertaining to the operations and employment of the Military Intelligence Battalion, Aerial Reconnaissance Support, (MIBARS) Field Army and its organic elements.

7–2. Mission

The overall mission of the MIBARS is to produce and disseminate intelligence information obtained or developed from Tactical Air Force reconnaissance elements operating in support of the field army and to provide liaison between the field army and the reconnaissance elements of the supporting Tactical Air Force.

7–3. Organization and Functions

a. General. A MIBARS is organized as depicted in figure 7–1. One battalion normally is assigned to each field army or independent corps. The functions of the MIBARS are to—

(1) Process, interpret, annotate, reproduce, and deliver imagery obtained from the Tactical Air Force elements operating in support of the field army or independent corps.

(2) Coordinate imagery interpretation and reproduction functions from widely separated reconnaissance airfields and from the vicinity of the supported field army headquarters or independent corps.

(3) Disseminate all intelligence information obtained through imagery interpretation and visual aerial reconnaissance sightings by the supporting Tactical Air Force reconnaissance elements.

(4) Provide air reconnaissance liaison officers (ARLO) to Tactical Air Force reconnaissance elements operating in support of the field army or independent corps.

(5) Brief and debrief tactical air reconnaissance aircraft crews.

(6) Provide deployed operations parallel to any dispersion of Tactical Air Force Reconnaissance Wing.

b. Headquarters and Headquarters Company. The mission of the headquarters and headquarters company, MIBARS, is to provide command, control, administration, and logistical support for the battalion; to provide the means for immediate dissemination of information and imagery to using units on a 24-hour basis; and to provide liaison and coordination with the tactical air reconnaissance units supporting the field army. The functions of the headquarters and headquarters company, MIBARS, are to—

(1) Provide command, control, and staff supervision for the battalion.

(2) Coordinate operations with the Tactical Air Force reconnaissance elements in support of the field army.

(3) Provide a senior ARLO to the major Tactical Air Force reconnaissance unit.

(4) Provide administrative and logistical support for battalion (with the exception of medical and religious facilities which must be furnished by other units).

(5) Perform detailed interpretation of aerial imagery as required.

(6) Reproduce, identify, and package aerial imagery.

(7) Deliver aerial imagery, as required, from each reconnaissance airfield to the field army headquarters, and to each corps.

(8) Provide imagery interpretation support to the field army headquarters and supporting units as required.

(9) Maintains the field army library for aerial imagery.

c. Military Intelligence Detachment, MIBARS. The mission of the military intelligence detach-

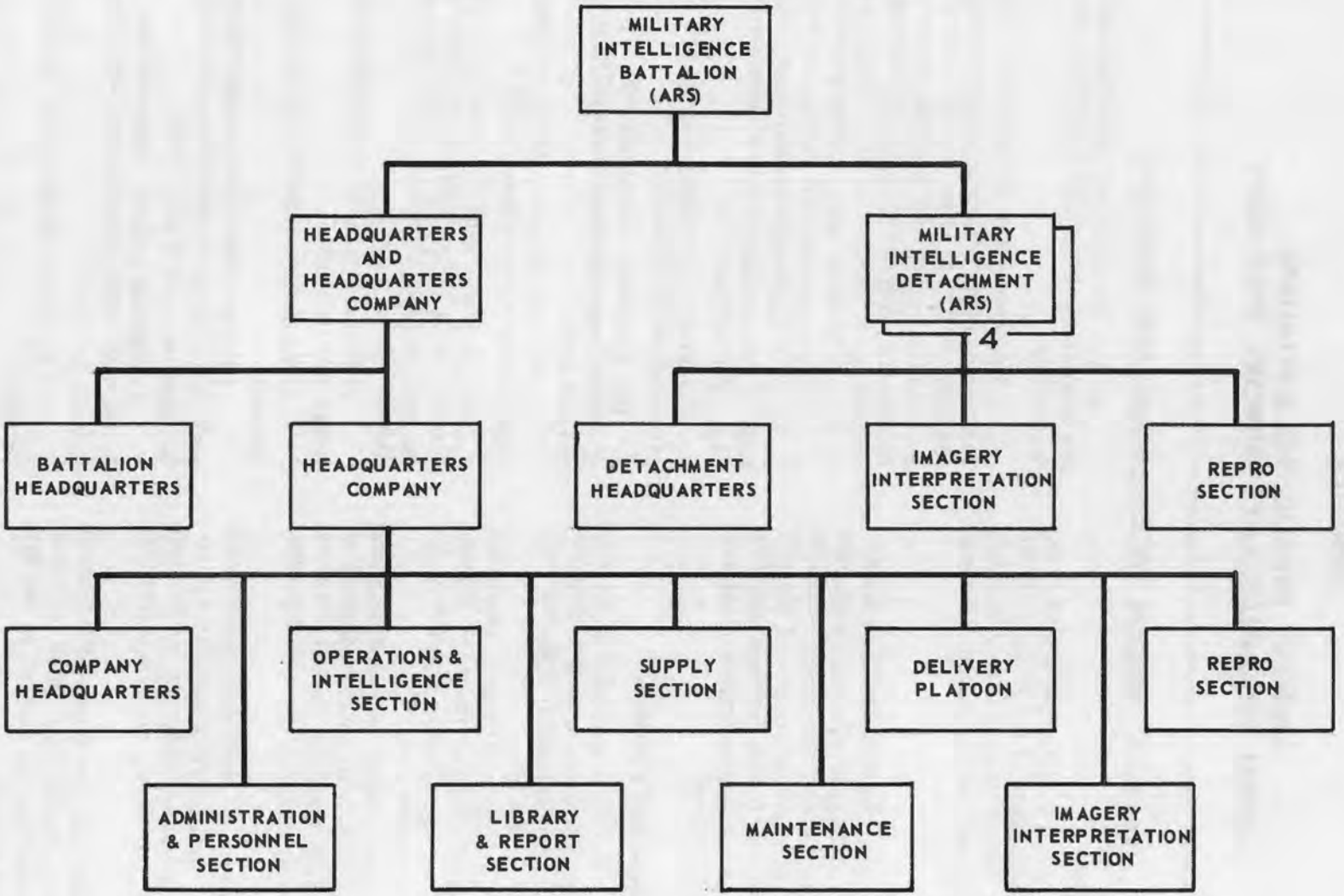


Figure 7–1. Military intelligence battalion, aerial reconnaissance support, field army.

ment, MIBARS, is to interpret and reproduce aerial imagery obtained by the Tactical Air Force, and to provide liaison between field army and the Tactical Air Force reconnaissance squadrons. The functions of the military intelligence detachment, MIBARS, are to—

(1) Accomplish immediate imagery interpretation and prepare and disseminate priority imagery interpretation reports on a 24-hour basis.

(2) Reproduce, identify, package and deliver aerial imagery.

(3) Provide liaison with reconnaissance elements of the Tactical Air Force.

(4) Brief and debrief Air Force reconnaissance aircrews.

Section II. CONCEPT OF EMPLOYMENT

7–4. General

The responsibility for staff supervision of the MIBARS lies with the field army G2. He exercises this supervision through his G2 Air. The MIBARS Commander retains command and operational control over the battalion.

7–5. Location

The headquarters and headquarters company, MIBARS, usually is located in the vicinity of the field army headquarters. The four military intelligence detachments are dispersed with Tactical Air Force reconnaissance elements, normally squadrons, of the supporting Tactical Air Force Reconnaissance Wing.

7–6. Battalion Headquarters and Headquarters Company

a. Functions. The battalion headquarters and headquarters company is composed of elements that provide three separate functions—operations, administration, and logistics. In most instances, the battalion headquarters and headquarters company will be located together, either in the vicinity of the instrumented field army airstrip, field army main CP, or the FATOC. The operations and intelligence section is located with the battalion headquarters and acts as the focal point for all battalion operations. The imagery interpretation section, reproduction section, and library and reports section are under the staff supervision of the operations and intelligence section and generally will be located within the battalion headquarters complex. The delivery platoon is also under the staff supervision of the operations and intelligence section, but normally it is located at the instrumented field army airstrip. One TIIF from the imagery interpretation section is located adjacent to the TASE of the FATOC and provides the G2 Air element with imagery interpretation facilities and communications means into the MIBARS operations net. The remaining battalion staff and headquarters company elements are located with the battalion headquarters.

b. Peculiarities of MIBARS Battalion Staff.

(1) The MIBARS S2 is also designated as the S3 operations officer as there is no S3 authorized by TOE.

(2) The assistant S2 is also designated as an assistant S3 operations officer. He usually will perform duties with the operations and intelligence section.

(3) The senior air reconnaissance liaison officer (ARLO) normally is located with the Tactical Air Force Reconnaissance Wing headquarters.

c. Operations and Intelligence Section. The operations and intelligence section is under the direct supervision of the battalion S2. It performs the functions of planning, coordinating, and supervising the battalion's operations and intelligence activities. This section maintains the battalion switchboard and teletypewriter terminals. One image interpreter from this section normally is attached to the senior ARLO as an enlisted assistant. This section provides staff supervision over the following sections of headquarters company:

(1) *Imagery interpretation section.* The imagery interpretation section normally is utilized to prepare general photographic (imagery) interpretation reports, mosaics, and other long-range planning functions. One TIIF from this section is located adjacent to the operations and intelligence section to provide communications between MIBARS detachments and the G2 Air element at the TASE of the FATOC. The second TIIF in the section is located at the TASE of the FATOC to support the G2 Air element. Both TIIF perform imagery interpretation as directed by the G2 Air or the battalion S2.

(2) *Delivery platoon.* The delivery platoon delivers reports and imagery and provides courier service for the MIBARS. It is capable of provid-

ing daily delivery of imagery and reports from each reconnaissance airfield to the field army headquarters and corps, as required. Normally it is located at the field army airfield. If this proves to be impractical or there are no Army airfields in the vicinity of either the MIBARS or FATOC, then the platoon can be located at the most convenient Tactical Air Force reconnaissance airfield.

(3) *Reproduction section.* The reproduction section receives negatives from the MIBARS detachments for the bulk reproduction of photography. Reproduced copies are delivered to the requester by the delivery platoon aircraft or by Armed Forces courier. The negatives are then stored by the library and reports section in order to satisfy future requirements.

(4) *Library and reports section.* The library and reports section maintains a library of reference materials, negatives, and publications. This section maintains files of reports for use by the MIBARS and other elements of the field army. The length of time imagery is retained will be established by the field army G2.

d. Administrative and Personnel Section. The administrative and personnel section accomplishes all administrative and personnel actions for the battalion, to include handling administrative messages and correspondence.

e. Supply Section. The supply section provides general supply and logistical support to the battalion, headquarters and headquarters company, and the detachments.

f. Maintenance Section. The maintenance section performs organizational maintenance on the battalion's wheeled vehicles. This includes detachment wheeled vehicles and electric power generator equipment within the travel limitations caused by dispersion of the detachments to the separate AF reconnaissance airbases.

g. Company Headquarters Section. The company headquarters section performs the command, administrative, supply, and mess functions for the headquarters company.

h. Additional Reproduction Section. An additional reproduction section may be assigned to the battalion based upon an unusual requirement for photography. If the necessity arises, this augmentation could be provided to a separate task force or subordinate headquarters to support a specific operation or long-range requirement.

7–7. Military Intelligance Detachment, Air Reconnaissance Support

a. The military intelligence detachments usually are deployed with the squadrons of the supporting Tactical Air Force Reconnaissance Wing. There are four of these detachments in each MIBARS.

b. Occasions will arise when the Tactical Air Force Reconnaissance Wing will be augmented by an additional reconnaissance squadron. When this occurs, MIBARS will have to be augmented with a MI Detachment (ARS), TOE 30–7, which will join the additional reconnaissance squadron.

c. The MIBARS detachment commander performs normal command functions to include providing close supervision over the preparation of imagery interpretation reports and the dissemination of these reports and their accompanying photography.

d. The detachment's ARLO normally is collocated with the Tactical Air Force reconnaissance squadron.

e. Personnel of the imagery interpretation section normally work in close coordination with the imagery interpreters organic to the Tactical Air Force. When available, common work facilities may be utilized to facilitate handling and interpreting incoming imagery.

f. The detachment normally will receive one set of titled duplicate negatives and two sets of imagery, as requested, for each mission from the supporting reconnaissance squadron. To facilitate rapid interpretation, interpretation can be performed from the initial negative before the imagery has actually been made. One of the two sets of imagery is used for plotting while the other set of imagery is being interpreted. The imagery interpretation section normally confines its efforts to preparing hot and initial imagery interpretation reports.

g. The reproduction section receives the negatives from the imagery interpretation section. Reproduction usually is limited to processing current missions. Prints are packaged and made ready for pickup by the battalion's delivery platoon.

h. The detachment is attached for quarters and messing facilities to the Tactical Air Force unit with which it is collocated; however, command, and operational control always remains with the battalion headquarters.

7–8. Communications

The current MIBARS operations net is discussed in chapter 6. The battalion headquarters also operates an internal wire net as shown in figure 7–2. Because of the wide dispersal required for individual MIBARS detachments, telephone communications between the detachments and battalion headquarters normally are not possible except through the field army area communication system. A typical MIBARS detachment wire net is shown in figure 7–3.

Section III. PLANNING AND OPERATIONS

7–9. Planning

The planning effort of the MIBARS involves a number of considerations.

a. The priority of assignments and the overall workload of the MIBARS are directed by the field army G2 Air.

b. The speed and quality of work accomplished by image interpreters are directly related to the training, specialized area knowledge, and practical experience of the interpreters. Image interpreters require constant training and practice. Therefore, planning of the imagery interpretation effort must take cognizance of the skill and experience of the interpreters and include appropriate area training for these personnel, when possible.

c. Although the photo reproduction equipment is built to function under field conditions, the equipment can break down during prolonged operations or improper handling. Consideration must be given for alternate plans in the event of equipment breakdown. The reproduction personnel are trained specialists, but, as with image interpreters, their skill level is commensurate with training, practice, and experience.

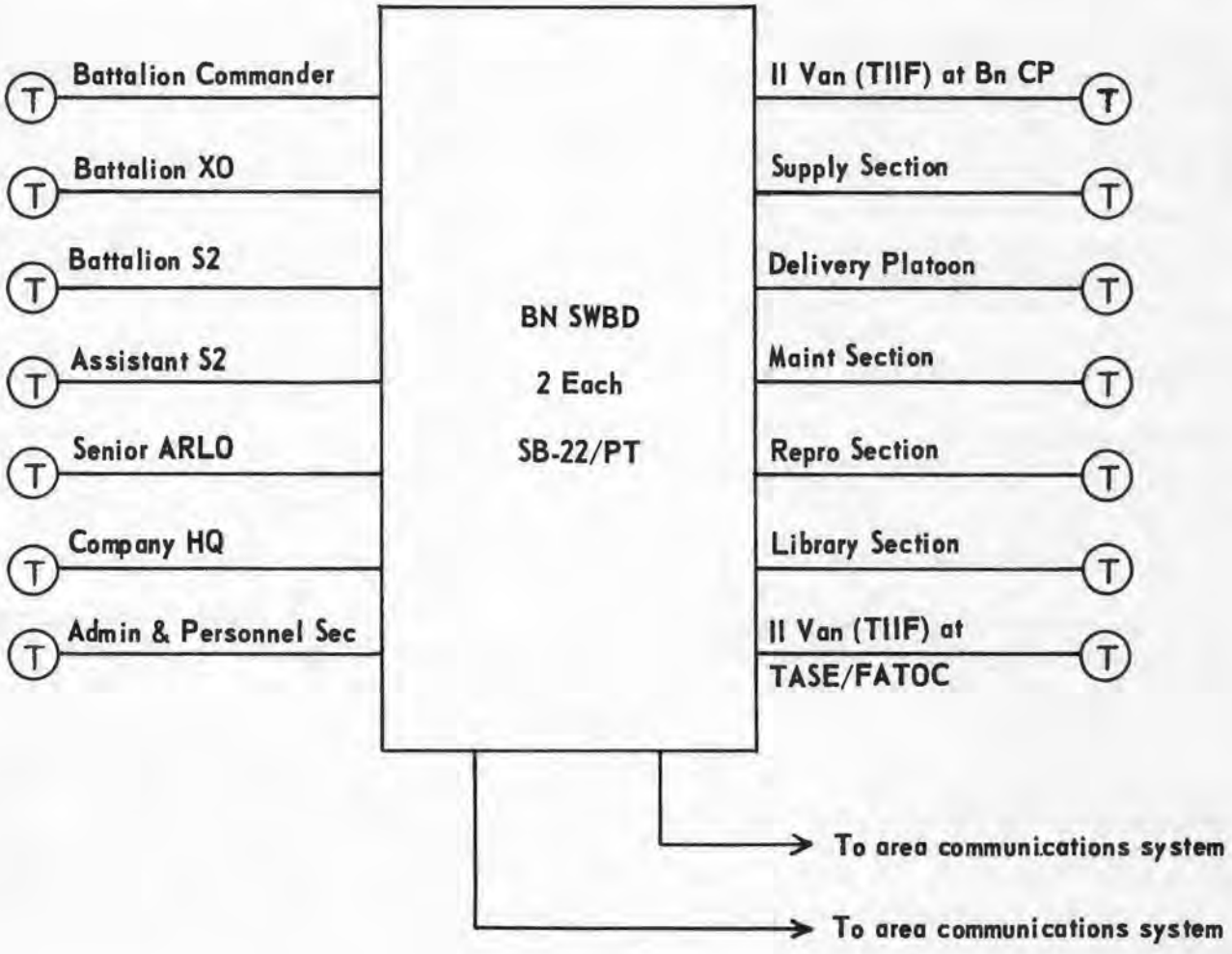


Figure 7–2. Battalion wire net.

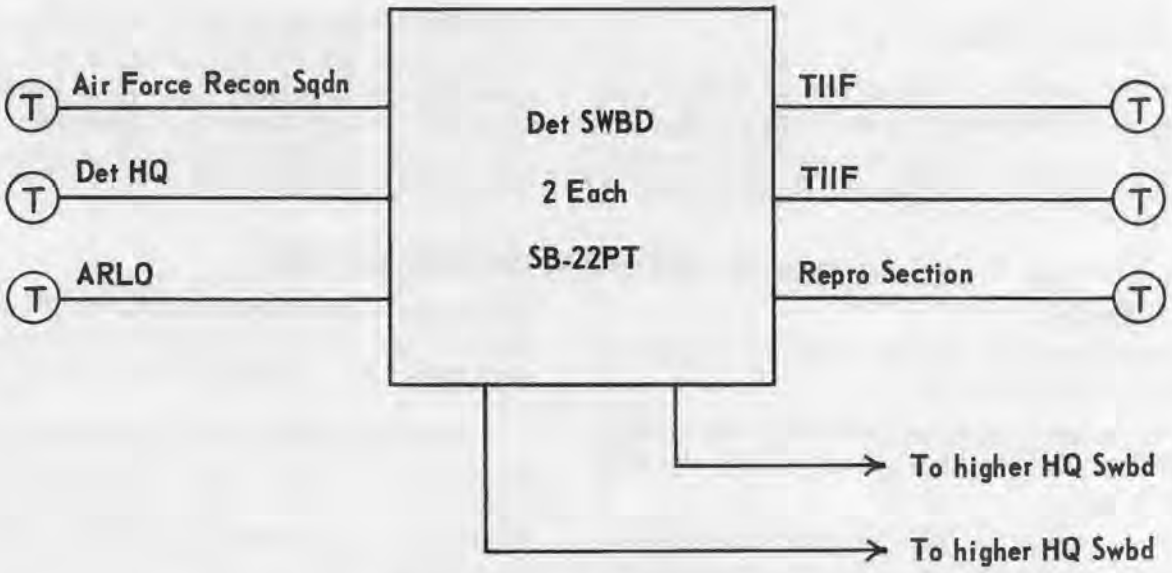


Figure 7–3. Detachment wire net.

d. The deployment of the detachments normally is dictated by the dispersal of the supporting Tactical Air Force reconnaissance elements which may be located anywhere within the theater of operations. The operation of the delivery platoon is affected by detachment dispersal. In some instances, it may be necessary to place aircraft in direct support to a particular detachment due to the time and/or distance factors involved.

e. Weather conditions influence the planning and operations of the distribution effort. Because aerial distribution is largely dependent upon favorable weather conditions, alternate methods of distribution must be planned in event of adverse flying conditions.

7–10. Operations

The MIBARS operational cycle normally is accomplished in the following steps:

a. An aerial reconnaissance requirement in the form of an air reconnaissance request is forwarded to the MIBARS operations and intelligence section from the field army or corps G2 Air. On preplanned requests the full flying data may not be included because it may not always be available when the TACC accepts the mission requirement. On immediate requests, all flying data normally will be included. Upon receipt of either type request, assuming air mission data is available, events will occur in the following sequence:

(1) The duty team in the operations and intelligence section makes the appropriate entries on its mission status board (fig 7–4). At the detachment, the commander alerts his ARLO of the pending missions. The ARLO posts his own mission status board, prepares the master briefing status board, and prepares his briefing notes for the mission. After coordinating the briefing schedule with the reconnaissance squadron, the ARLO instructs the flying crew on the mission requirements. Simultaneously, the delivery platoon is alerted to the requirement in order that proper flight planning can be accomplished.

(2) The MIBARS detachment commander issues a "be prepared order" to his imagery interpretation and reproduction sections in anticipation of the return of the mission aircraft.

(3) The imagery interpretation section posts requirements on the section's mission status board (fig 7–5).

(4) The reproduction section prepares the aerial photography reproduction request work order (fig 7–6).

b. Upon completion of the mission—

(1) The ARLO accomplishes the debriefing of the Air Force flying crew and gives the mission report to the battalion operations and intelligence section.

(2) The Air Force photo processing unit develops the raw film imagery. As soon as an initial negative is prepared, it will be given a simultaneous rapid inspection by interpreters from both the Air Force and the MIBARS detachment. This initial check will be only for items to answer the specific EEI of the requester or to identify an item of clearly significant intelligence value. Upon

ARMY REQUEST NUMBER	TAF MISSION NUMBER	TYPE MISSION	TARGET DESCRIPTION	TOT	EST RTN TIME	MSN FORWARDED TO DET [1]		MISSION REPORT [1]		HOT PHOTO REP [1]		IPIR [1]		OTHERS [1]		PRIORITY	TIME NO LONGER OF VALUE	REMARKS
						DET#	TIME	REC	FWD	REC	FWD	REC	FWD	PHOTO	NEG			

[1] COLUMN HEADINGS MAY BE CHANGED TO SATISFY REQUIREMENTS.

Figure 7–4. Mission status board.

ARMY REQUEST NUMBER	TAF MISSION NUMBER	TYPE MISSION	TARGET DESCRIPTION	TOT	TIME NEG REC	RESULTS DESIRED	REPORTS REQUIRED	TIME RPT FWD		TIME NEGS TO REPRO	INTRP BY	PLOTTED BY	DIST INST	REMARKS
								HOTPHOTO-REP	IPIR					

Figure 7–5. Imagery interpretation section mission status board.

completion of the initial check, the Air Force will produce additional copies of the imagery for the MIBARS detachment.

(3) Dependent upon the urgency and priority of the request, the imagery interpretation section may render a hot imagery interpretation report from the initial negatives which normally will be received before the prints. If this is not required, the imagery interpretation section will perform its immediate interpretation from the negatives or reproductions therefrom.

(4) The imagery interpretation section prepares the necessary interpretation reports and furnishes the negatives of the mission to the reproduction section, if the request includes a requirement to furnish prints. All reports and prints are dispatched as expeditiously as possible to the battalion operations and intelligence section. Reports normally are transmitted by radio while prints are picked up and delivered by the battalion delivery platoon.

c. The detachment commander coordinates the entire sequence of events in his detachment to insure proper responsiveness, continuity, and completion of assigned missions.

d. Mission reports and imagery interpretation reports are received by the battalion operations and intelligence section, the field army and corps G2 Air, who immediately disseminate them to the requester and to other interested agencies, as required.

e. Detailed imagery interpretation reports normally are made by the battalion imagery interpretation section while bulk reproduction requirements usually are accomplished by the battalion reproduction sections. Detachments furnish mission negatives to the battalion operations and intelligence section which coordinates the completion of special interpretation and reproduction requirements.

f. Initial record and general intelligence record imagery normally are furnished to all tactical Army units having imagery interpretation support that can properly utilize the imagery. Coverage furnished is limited to a unit's area of interest with necessary overlap to insure complete coverage of the area between adjacent units. Reproduction of initial record and general intelligence record imagery is accomplished by the MIBARS headquarters which also stores the negatives for future requirements.

g. Cover traces are prepared by the detachments and are forwarded to the battalion where they are consolidated by the library and reports section. This becomes the master cover trace which is furnished to the G2 Air at field army, corps, and division. The master cover trace is kept current on a daily basis.

h. Operational requirements may require augmentation of the G2 Air duty teams with the TASE of the FATOC. Should it be necessary to eliminate the G2 Air duty team at the alternate FATOC in order to acquire additional duty personnel, the duties of the G2 Air team at the alternate FATOC can be assumed by the MIBARS operations and intelligence section as an additional duty. Communications equipment required by a G2 Air duty team at an alternate TASE already exists in the operations and intelligence section.

i. The names and type of reports will change if MIBARS is in support of or operating with joint US or Australian, British, Canadian and American (ABCA) Armed Forces. If these conditions exist, see paragraphs 9–7 through 9–10.

AERIAL IMAGERY REPRODUCTION REQUEST WORK ORDER

CLASSIFICATION OF PHOTOGRAPHY _____ REQUESTING UNIT _____

WORK ORDER NUMBER _____ MISSION NUMBER _____

PRIORITY AND SUSPENSE _____ FRAMES _____ PRINTS _____

DEL INSTRUCTION _____

FOR USE OF IMAGERY INTERPRETATION SECTION

NEGATIVES RECEIVED, (TIME) _____ NEGATIVES CHECKED AND TITLED BY _____ (Init)

NEGATIVES TO REPRO, (TIME) _____

FOR USE OF REPRODUCTION SECTION

DEVELOPER (GALLONS) _____ TOTAL PRINT (9x9) _____ (9x18) _____

SHORT STOP (GALLONS) _____ TOTAL PAPER USED (FT) _____

STABILIZER (GALLONS) _____ TOTAL PACKAGES _____

PLOTS RECEIVED FROM II _____ TOTAL WEIGHT (LBS) _____

TIME SENT TO ARLO _____

_____

SIGNATURE

Figure 7–6. Aerial photography reproduction request work order.

CHAPTER 8

MILITARY INTELLIGENCE COMPANIES (AERIAL SURVEILLANCE) (OV–1B/C) AND (OV–1D)

Section I. MISSION, ORGANIZATION, CAPABILITIES, AND LIMITATIONS, MILITARY INTELLIGENCE COMPANY (AERIAL SURVEILLANCE) (OV–1B/C)

8–1. General

This section provides general guidance on the employment and capabilities of the Military Intelligence Company (Aerial Surveillance) (OV–1B/C). It may be used as a reference for guidance on the employment of the surveillance airplane company to include the mission, organization, equipment, capabilities, limitations, command and control, communications, and planning.

8–2. Mission

The Military Intelligence Company (Aerial Surveillance) (OV–1B/C) provides combat surveillance, reconnaissance, and limited target acquisition capabilities to corps, field army or separate task force units through the use of organic aircraft and sensor equipment.

8–3. Organization and Operation

a. General. The Military Intelligence Company (Aerial Surveillance) (OV–1B/C) is assigned to a corps, field army, or separate task force, as required. The company, organized under TOE 1–128G (fig 8–1), is a semi-independent unit capable of performing sustained aerial reconnaissance and surveillance in an assigned area when flown from an instrumented airfield. The corps commander has command and control over the company and exercises this control through the corps ACofS, G2, who delegates this control to the G2 Air. The company is capable of performing aerial surveillance and reconnaissance of routes, zones, and areas of the Army area of influence for which the Army has primary aerial surveillance/reconnaissance responsibility. Additional capabilities include collecting data in support of post-strike analyses radiological surveys, and target acquisition procedures. The information gathering modes include photographic, infrared (IR), and side looking airborne radar (SLAR); visual surveillance is a vital adjunct to these modes. To establish a complete system of battlefield surveillance, assets of this company must be employed in conjunction with sensor data processing and interpreting facilities which are found in division and corps military intelligence support units. Organizational and direct support maintenance of avionics equipment, surveillance systems, and aircraft are provided for in the appropriate platoons and sections, similar to the organizational maintenance capability for organic automotive vehicles and generators. The MI Company (Aerial Surveillance) (OV–1B/C) is organized into a company headquarters, communications platoon, aerial infrared platoon, aerial radar platoon and a service platoon. The organization provides these functionalized sections with efficiency and flexibility of command and employment. While the organization is tailored to allow the detachment of separate elements, these elements can only be detached for short periods of time.

b. Company Headquarters. The company headquarters performs company administration, mess, supply, and operations. The MI Company (Aerial Surveillance) (OV–1B/C) is staffed for 24-hour operations and is unique in that the majority of the missions are accomplished during the hours of darkness. For this reason, company headquarters is staffed with sufficient flight operations and mess personnel for continuous day and night operations. Flight operations personnel are responsible for scheduling of aircraft, assembling of preflight planning material, processing of flight plans and insuring that appropriate security measures are applied in the missions assigned.

c. Communications Platoon. The communications platoon consists of a platoon headquarters, communications section, avionics repair section

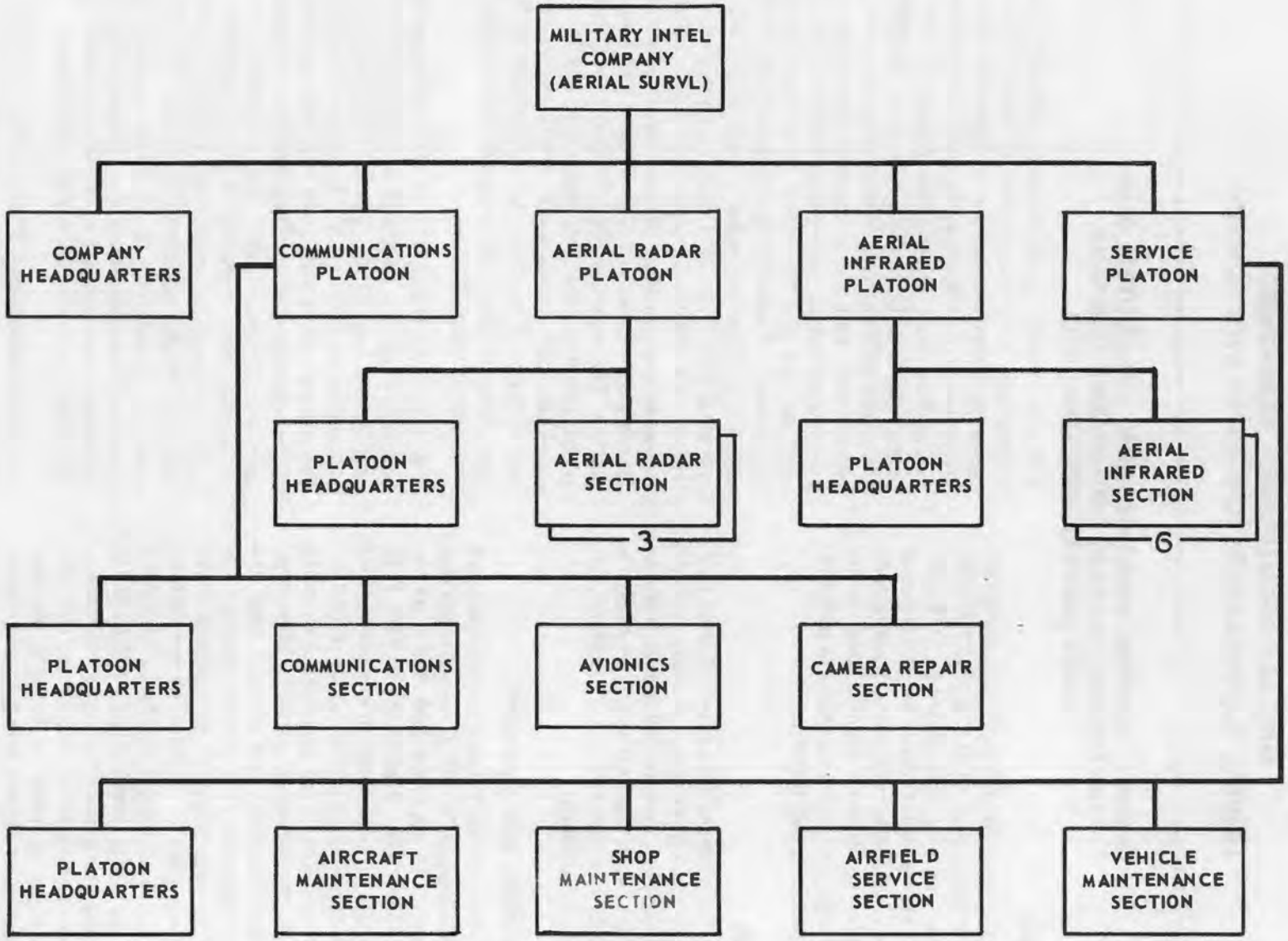


Figure 8–1. Military intelligence company (Aerial Surveillance) (OV–1B/C).

and a camera repair section. The communications platoon is responsible for communications, organizational and direct support maintenance of the avionics equipment, and the aerial sensor systems.

(1) *Communications platoon headquarters.* The communications platoon headquarters exercises supervisory control over the personnel and functions of the platoon.

(2) *Communications section.* The communications section is responsible for the ground radios and wire communications within the company for insuring that the appropriate landlines, teletypewriter and radio nets are established and maintained.

(3) *Avionics section.* The avionics section is charged with the mission of providing organizational and direct support maintenance of all avionics, SLAR, and IR equipment installed in and/or component to the surveillance aircraft.

(4) *Camera repair section.* The camera repair section performs all organizational maintenance on the airborne photographic surveillance systems installed in the aircraft. The camera repair section also has a direct support capability.

d. Aerial Radar Platoon. The aerial radar platoon consists of a platoon headquarters and three aerial radar sections. The OV–1B aircraft of the aerial radar platoon is used to conduct general search operations across the corps front. Some situations may require one aircraft on station at all times. However, the company does not have sufficient SLAR assets for continuous surveillance for an extended period of time. Assignment of continuous SLAR missions for over a few days at a time would require augmentation of the company with additional SLAR aircraft. The SLAR feature permits search of enemy terrain from aircraft flying over friendly territory operating at distances behind the forward edge of the battle area (FEBA) which are compatible with the capabilities of the aircraft to survive. SLAR imagery may be transmitted directly from the search aircraft to the appropriate ground sensor terminal by data link. Information gained through cockpit readouts of imagery, as well as significant visual sightings, can be transmitted by voice radio to the supported unit TOC and to the ground sensor terminals (fig 8–2). The aerial radar platoon consists

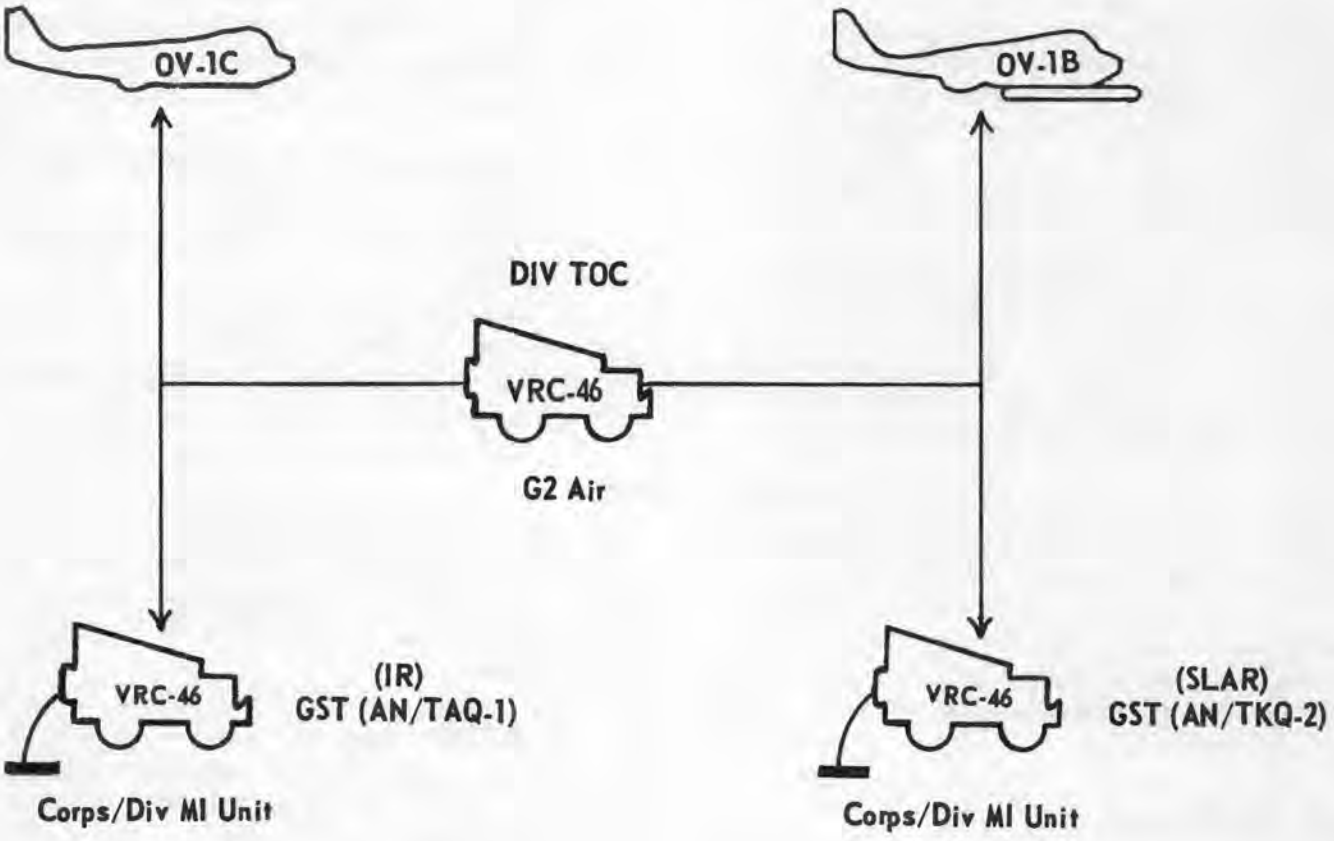


Figure 8–2. Coordination FM operational net from GST to sensor aircraft.

of a total of six OV–1B aircraft, divided into three sections of two aircraft each.

e. Aerial Infrared Platoon. The aerial infrared platoon consists of a platoon headquarters and six aerial infrared sections. The OV–1C aircraft of the aerial infrared platoon normally operate in direct support of corps elements. IR imagery may be transmitted from the aircraft to the appropriate ground sensor terminal by a data link, where it is processed by a recorder-processor-viewer for immediate interpretation. Voice spot reports can be transmitted by FM radio directly to an element of the supported unit provided a dedicated radio set is available to receive the spot report transmission. There is a total of 12 OV–1C aircraft in this platoon with two aircraft assigned to each of the six sections.

f. Service Platoon. The service platoon consists of a headquarters, an aircraft maintenance section, a vehicle maintenance section, a direct support maintenance section, and an airfield service section. The service platoon performs normal organizational and direct support maintenance, to include fueling and defueling of organic aircraft, and forced entry and rescue from crashed aircraft.

(1) *Service platoon headquarters.* The service platoon headquarters is responsible for the employment of aircraft maintenance, direct support maintenance, vehicle maintenance, and airfield service sections. Key functions of the platoon headquarters personnel include supply management, inspections and reporting, and the application of quality control measures.

(2) *Aircraft maintenance section.* The aircraft maintenance section performs organizational maintenance on the organic aircraft.

(3) *Direct support maintenance section.* The direct support maintenance section performs direct support maintenance on the organic aircraft.

(4) *Vehicle maintenance section.* The vehicle maintenance section is responsible for the maintenance of company vehicles and generators.

(5) *Airfield service section.* The airfield service section is responsible for the fueling and defueling of assigned aircraft and effecting forced entry and rescue from crashed aircraft on or near the base airfield.

8–4. Employment

The Military Intelligence Company (Aerial Surveillance) (OV–1B/C) normally will be assigned to and employed in general support of a corps. Direct support to subordinate units will be performed on a mission basis. The company performs combat surveillance, reconnaissance, and target acquisition missions for the supported unit. It is normally employed as an integral unit at an instrumented airfield within the supported unit area of operations. To fully utilize the surveillance system, the employment of this company must be fully coordinated with the ACofS, G2, of the supported unit, the military intelligence company in support of corps (TOE 30–18G), and the military intelligence companies in support of divisions (TOE 30–17G), which have the complementary equipment (photographic laboratories, tactical imagery interpretation facilities) and personnel (imagery interpreters) to convert collected sensor data into meaningful intelligence reports (chap 9). These assets must be habitually collocated with the surveillance company through attachment or direct support to establish a complete system of battlefield surveillance.

8–5. Unit Capabilities

a. The MI Company (Aerial Surveillance) (OV–1B/C) has the following capabilities:

(1) Provides sustained near all-weather, day or night, surveillance of that portion of the army area of influence for which the Army has primary aerial surveillance responsibility.

(2) Conducts reconnaissance of routes, zones, and areas.

(3) Acquires imagery by aerial means utilizing a combination of aerial sensors.

(4) Acquires target acquisition information by aerial means.

(5) Acquires information for post-strike analysis of nuclear weapons effects.

(6) Acquires information for damage assessment of conventional fire support systems.

(7) Acquires information for radiological survey.

b. Individuals of this organization can engage in effective, coordinated defense of the unit's installation if required. For the purpose of tactical movement, the unit is 90-percent mobile in organic vehicles.

8–6. Unit Limitations

a. The MI Company must be deployed at an airfield which has instrument approach facilities or must be augmented with personnel and equipment to provide this capability.

b. The company is dependent upon an AG personnel service unit for personnel and administrative services.

c. Truck tractors are required from other units to move organic semitrailers needed for tactical operations.

d. Defense of the unit's area or installation against hostile attack will require support from other forces or reinforcement by additional personnel if continuous operations are required.

Section II. GROUND DATA TERMINALS

8–7. General

In order to provide near real time (20-seconds to 3-minute delay) readout of side looking airborne radar (SLAR) and real time for infrared (IR) imagery at subordinate headquarters data terminal teams are provided to support the airborne data capability of the OV–1B/C Mohawks.

8–8. Ground Data Terminal Teams

These teams cannot produce photographic prints. Each team consists of three enlisted airborne sensor specialists. Equipment in the team includes one AN/TKQ–2 radar data receiving set and one TAQ–1 infrared surveillance information center. Each of these ground sensor terminals is mounted on a ¾-ton truck and each has a generator mounted on a ¾-ton trailer. Each vehicle is provided with an AN/VRC–46 radio to operate in the military intelligence company command net or with the aircraft.

a. The ground data stations receive electronic data from the aircraft and convert it into imagery while the aircraft is in flight. These stations must have radio line-of-sight to the aircraft while they are receiving data from the aircraft.

b. The AN/TKQ–2 receives data from the OV–1B/D SLAR aircraft. The data is transferred to film and then the film is developed using the RO–166 rapid film processor. The film is ready for viewing in about 3 minutes by the operator and imagery interpreter.

c. The TAQ–1 provides a real-time visual presentation on a small cathode-ray tube and exposes a film in the ground sensor terminal simultaneously as the aircraft flies over the terrain. The film is developed by a recorder-processor-viewer and is available for viewing and interpretation in approximately 20 to 60 seconds.

d. Twelve teams are provided to support tactical units within the corps. Four teams are organic to the Military Intelligence Company, Corps, as centralized assets; one team will be collocated with the MI Company (Aerial Surveillance) (OV–1B/C) at the corps instrumented airfield, one team in support of the Corps TOC and the corps artillery, one team available to the armored cavalry regiment and one to the corps separate brigade as required for tactical operations. One team is organic to the Military Intelligence Company, Division, to support the division headquarters. All of these teams work in conjunction with the tactical imagery interpretation facility (TIIF) when that facility is provided to the units listed above.

e. The ground data stations should be placed on high ground in order to obtain radio line-of-sight with low-flying aircraft. They should also be as close as possible to the supporting TIIF and photo lab. Teams that are to receive a mission must be alerted and provided the following items of information: time and type of the mission, aircraft radio frequency and call sign, and the frequency to be used in data transmission. They can be alerted either through the company command net via their AN/VRC–46 radio or through the supporting headquarters.

f. These teams will require support in the form of rations, POL and maintenance support. The critical necessity required for these teams is that they have radio line of sight to the aircraft during a mission. Close coordination with the supporting unit must be maintained to support proper location of facilities and the provision of adequate security for these data stations in the vicinity of the headquarters.

Section III. MISSION, ORGANIZATION, CAPABILITIES, AND LIMITATIONS, MILITARY INTELLIGENCE COMPANY (AERIAL SURVEILLANCE) (OV–1D)

8–9. General

This section provides general guidance on the employment and capabilities of the Military Intelligence Company (Aerial Surveillance (OV–ID) (TOE 30–79T), to include the mission, organization, equipment, capabilities, limitations, command and control, communications, and planning.

8–10. Mission

To provide continuous combat surveillance and in-

direct target acquisition capabilities to field army, corps, division, and separate task force units through the use of organic aircraft, and modular sensory equipment interchange.

8–11. Organization

The Military Intelligence Company (Aerial Surveillance) (OV–1D) (fig 8–3) is organized into a company headquarters, communications platoon, three aerial platoons and a service platoon. While the organization is tailored to allow the detachment of separate elements, these elements can only be detached for short periods of time.

a. Company Headquarters. The company headquarters performs company administration, mess, supply and operations. The Military Intelligence Company (Aerial Surveillance) (OV–1D) is staffed for 24-hour operations and is unique in that the majority of the missions are accomplished during the hours of darkness. For this reason, company headquarters is staffed with sufficient flight operations and mess personnel for continuous day and night operations. Flight operations personnel are responsible for the overall scheduling of aircraft, filing of preflight planning material, processing of flight plans, and insuring that appropriate security measures are applied in the missions assigned.

b. Communications Platoon. The communications platoon consists of a platoon headquarters, communications section, avionics repair and equipment section and a camera repair section. The communications platoon is responsible for communications, organizational and direct support maintenance of the avionics equipment, and the aerial sensor systems.

(1) *Communications platoon headquarters.* The communications platoon headquarters exer-

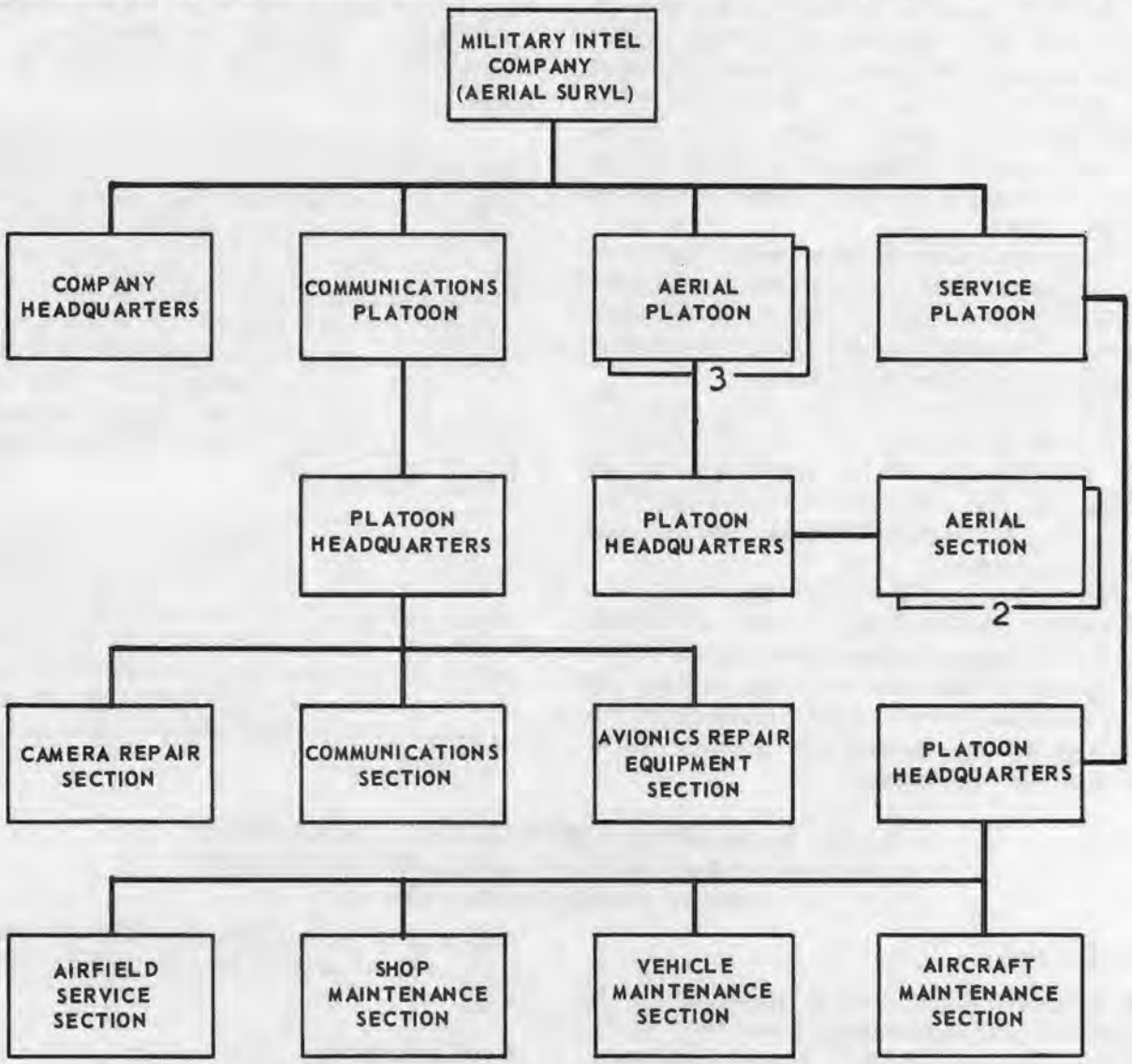


Figure 8–3. MI Company (Aerial Surveillance) (OV–1D).

cises supervisory control over the personnel and functions of the platoon.

(2) *Communications section.* The communications section is responsible for providing the teletypewriters, ground radios, and wire communications within the company and to insure that the appropriate landlines and radio nets are established and maintained.

(3) *Avionics repair and equipment section.* The avionics repair and equipment section is charged with the mission of providing organizational and direct support maintenance of all avionics equipment, the AN/APS–94D SLAR system, and the AN/AAS–24 infrared surveillance system. In addition, the OV–1D Mohawk system requires a ground handling capability for the interchange of sensors. This section contains the necessary special tools and test equipment which enable the repairman to perform authorized maintenance. The six AN/ASM–189, semitrailer mounted, electronic shops in this section are to be utilized for the repair of radar equipment, infrared equipment, antenna equipment, avionics equipment, and the AN/ALQ–80. The two AN/ASM–190, semitrailer mounted, electronic shops are utilized for the storage of prescribed load list and authorized stockage list items and other equipment, as required. The four trucks, platform utility, commonly known as the mechanical mule, have been incorporated to provide the maintenance section with an economical, easy-to-operate, and convenient-to-load/unload vehicle to assist in the accomplishment of the maintenance mission.

(4) *Camera repair section.* The camera repair section performs all organizational and direct support maintenance on the airborne photographic surveillance systems.

c. Aerial Platoons. The aerial platoon (three per company) consists of a platoon headquarters and two aerial sections. The personnel and equipment authorized are the minimum required to perform the mission.

(1) *Aerial platoon headquarters.* The aerial platoon headquarters is comprised of a platoon commander and a platoon sergeant. The platoon commander is not part of a flight crew. This enables him to properly supervise the training and performance of his aviators and sensor operators and to insure that proper maintenance procedures are adhered to throughout the platoon. The platoon sergeant is responsible for the proper operation and organizational maintenance of the sensor equipment.

(2) *Aerial sections.* Each of the six aerial sections (two per platoon) is composed of a section commander, section chief, and the requisite number of aviators, aerial sensor operators, and crew chiefs to properly man and maintain the aircraft. All of the personnel in these sections are flight crewmembers except the crew chiefs. There is a total of 18 OV–1D aircraft, organizd into six sections of three aircraft each.

d. Service Platoon. The service platoon consists of a headquarters, an aircraft maintenance section, a shop maintenance section, a vehicle maintenance section, and an airfield service section.

(1) *Service platoon headquarters.* The service platoon headquarters provides a platoon leader, an aircraft repair technician, a platoon sergeant, and additional personnel to provide the proper supply, inspection, reporting, quality control techniques, and supervision to insure effective operation of the platoon.

(2) *Aircraft maintenance section.* The aircraft maintenance section is organized into three subsections and is responsible for performing organizational maintenance on organic aircraft.

(3) *Shop maintenance section.* The shop maintenance section performs direct support maintenance on organic aircraft. The equipment provided represents the latest concept in consolidated direct support maintenance by providing a complex of three semitrailers as maintenance shops for the OV–1D direct support capability.

(4) *Vehicle maintenance section.* The vehicle maintenance section is under the direct supervision of the motor maintenance sergeant and is responsible for the maintenance of the company vehicles and generators.

(5) *Airfield service section.* The airfield service section consists of a section chief, crash rescue chief, aircraft fuel handling specialists, and crash rescue specialists. They operate a firefighting truck, one 5-ton tractor which tows a 5,000 gallon semitrailer fuel tanker, a ¾-ton truck, and four 2½ ton 1,200 gallon tankers.

8–12. Employment

The Military Intelligence Company (Aerial Surveillance) (OV–1D) normally will be assigned to and employed in general support of a corps. Direct support to subordinate units will be performed on a mission basis. The company performs combat surveillance, reconnaissance, and target acquisition missions for the supported unit. It is normally employed as an integral unit at an instrumented airfield within the supported unit area

of operations. To complete the surveillance system the employment of this company must be fully coordinated with the ACofS, G2, of the supported unit, the military intelligence company in support of corps (TOE 30–18H), and the military intelligence companies in support of divisions (TOE 30–17H), which have complementary equipment (ground sensor terminals, photographic laboratories, tactical imagery interpretation facilities) and personnel (imagery interpreters) to convert collection sensor data into meaningful intelligence reports (chap 9). These assets must be habitually collocated with the surveillance company through attachment or direct support to establish a complete system of battlefield surveillance.

a. The company can be assigned to field army, corps, or separate task force, as required. The company, organized under TOE 30–79T, is a semi-independent unit capable of performing sustained aerial surveillance and reconnaissance in an assigned area when flown from an instrumented airfield. The corps commander has operational control over the company and exercises this control through corps ACofS, G2, who delegates this control to the G2 Air. In joint service operations, the company may share in coverage of specific targets. The sensor gathering modes include photographic, infrared (IR), and side looking airborne radar (SLAR); visual surveillance is a vital adjunct to these modes. To establish a complete system of battlefield surveillance, assets of this company must be employed in conjunction with sensor data processing and interpreting facilities which are found in division and corps military intelligence support units. The imagery acquired by aerial means is interpreted by the collocated military intelligence imagery interpretation element and resultant information/intelligence is disseminated by the most expeditious means to the requesters (chap 9). Organizational and direct support maintenance of avionics equipment, surveillance systems, and aircraft is provided for in the appropriate platoons and sections, similarly to the organizational maintenance capability for organic wheeled vehicles and generators. This is necessary to enable aviation companies to perform their mission in a combat situation. "On-site" repair of engine/transmission, propeller/rotor, instruments, hydraulics, airframe, avionics, and aerial sensors is necessary to avoid excessive downtime of the aircraft.

b. The OV–1D airframe provides an inherent flexibility not available in previous Army surveillance systems. This flexibility is realized primarily from the ability to interchange modular sensor devices with a minimum of difficulty. In order to capitalize on this characteristic, maximum use of the photographic/infrared or photographic/side looking airborne radar sensors must be achieved through effective, coordinated planning by the corps and division G2 Air.

c. The normal "on station" mission time of the OV–1D is considered to be 3 hours. Take-off, in-transit time to and from the area of interest, air traffic control routing, and landing are expected to consume an additional 20 minutes of nonproductive flying time which makes a total of 3 hours and 20 minutes per normal mission time. Also consideration must be given to the monthly flying rate of 75 hours per OV–1 aircraft (AR 310–32) in planning and coordinating aerial surveillance requirements.

d. The company's surveillance system, with its new and improved sensors, is optimized for night operations. To achieve the maximum efficiency with the aircraft and its associated sensors, the technical characteristics and capability of the sensors must be considered in mission planning. Based on the slowest cyclic rate of one exposure per second, the KA–76 camera will provide 10 minutes of running time and each of the KA–60 cameras will provide 6 minutes of running time. The KA–76 camera used in conjunction with the LS–59 Photographic Flasher System is the only camera that can provide a night photographic capability. The side looking airborne radar (SLAR) utilizing a 250-foot film cassette can operate beyond the normal mission time of the aircraft. The infrared (IR) set, utilizing a 350-foot roll of film can operate for approximately 2 hours, depending on altitude and velocity of the aircraft and sensor format selected by the operator. The running time of the IR sensor is considered adequate as the sensor is not normally operated continuously. The IR sensor normally will be used in a selective manner on small areas to fill gaps in surveillance or to confirm or deny the existence of information/intelligence on targets received from other information/intelligence sources.

e. The operational concept for mid-high intensity conflict is considered to be more rigid than envisioned for stability operations. SLAR missions will be performed in the standoff mode behind the FEBA. The IR sensor missions can utilize all camera systems during daylight but during the hours of darkness the KA–76 camera system must be used in conjunction with the LS–59 Photographic Flasher System.

8–13. Unit Capabilities

a. The Military Intelligence Company (Aerial Surveillance) (OV–1D) has the following capabilities:

(1) Provides sustained, near all-weather, day or night surveillance of that portion of the Army area of influence for which the Army has primary aerial surveillance responsibility.

(2) Conducts aerial reconnaissance of routes, zones, and areas using photographic radar and infrared systems, and visual sightings.

(3) Acquires information/intelligence by aerial means utilizing an appropriate sensor mix of cameras, cameras and SLAR, or cameras and IR.

(4) Acquires target acquisition information by aerial means.

(5) Acquires information for post-strike analysis of nuclear weapons effects.

(6) Acquires information for damage assessment of conventional fire support systems.

(7) Acquires information for radiological survey.

(8) Provides reports of essential information required in support of operations.

(9) Acquires information for traffic analysis.

b. Individuals of this organization can engage in effective, coordinated defense of the unit's installation. For the purpose of tactical movement, this unit is 85-percent mobile in organic vehicles and aircraft.

8–14. Unit Limitations

a. The Military Intelligence Company (Aerial Surveillance) (OV–1D) must be deployed at an airfield which has instrument approach facilities or must be augmented with personnel and equipment to provide this capability.

b. Defense of the unit's area or installation against hostile attack will require support from other forces or reinforcement by additional US military personnel if continued operations are required.

c. The company is dependent upon an AG personnel service unit for personnel services.

d. The company will not be capable of relaying data received by the OV–1D SLAR and IR sensors by data link to a ground sensor terminal in near real time until data link equipment is made available and incorporated into the aircraft and the supporting MI unit.

e. Voice spot reports can be transmitted by FM radio from the mission aircraft directly to an element of the supported unit provided a dedicated radio set is available to receive the spot report transmissions.

f. Imagery acquired by sensor aircraft must be processed and interpreted by the collocated military intelligence reproduction and imagery interpretation facility after completion of the aircraft mission and the information/intelligence disseminated to the requester by the most expeditious means available.

g. Additional tractors must be furnished the unit during displacement to move organic semitrailers.

Section IV. COMMAND, CONTROL, AND COMMUNICATIONS

8–15. General

To prevent dissipation of the company's capabilities, definite lines of command and control must be established and maintained.

8–16. Command

a. Command channels for normal unit administrative, logistical, and maintenance requirements are through the company's parent organization. Training is the responsibility of the company commander with general guidance provided by both the parent organization and the G2 through his principal assistant, the G2 Air.

b. The company can perform organizational and DS maintenance on sensor systems and aircraft. Direct support and general support maintenance for other authorized equipment will be provided.

8–17. Control

The Military Intelligence Company (Aerial Surveillance) (OV–1B/C) or (OV–1D) is under the staff supervision of the corps G2 Air. The G2 Air coordinates and integrates the activities of the company with other means of accomplishing aerial surveillance and reconnaissance available to, or in support of, the corps. He directs the company's surveillance effort through the assignment of specific missions and priorities for accomplishment. A G2 Air representative is provided to the company to conduct briefings of the aircrews on mission requirements and debriefings of the crews

upon their return. The information obtained is passed to the G2 Air and to requesting headquarters.

8–18. Communications

a. General. The telephone is the normal means of communication within the company area. FM voice radio provides communications among company elements when moving, higher or supported headquarters, and mission aircraft for control and coordination of data transmission. UHF voice radio is used for air traffic control (fig 8–4 and 8–5). Radio teletypewriter is used to communicate among the company, the parent headquarters, and the corps G2. When possible, the company enters the corps command or Army area multichannel communications systems.

b. Wire. Telephones are provided to each platoon and subordinate section or element requiring communications in the company wire net (fig 8–6). The company headquarters has been provided an additional telephone for direct communi-

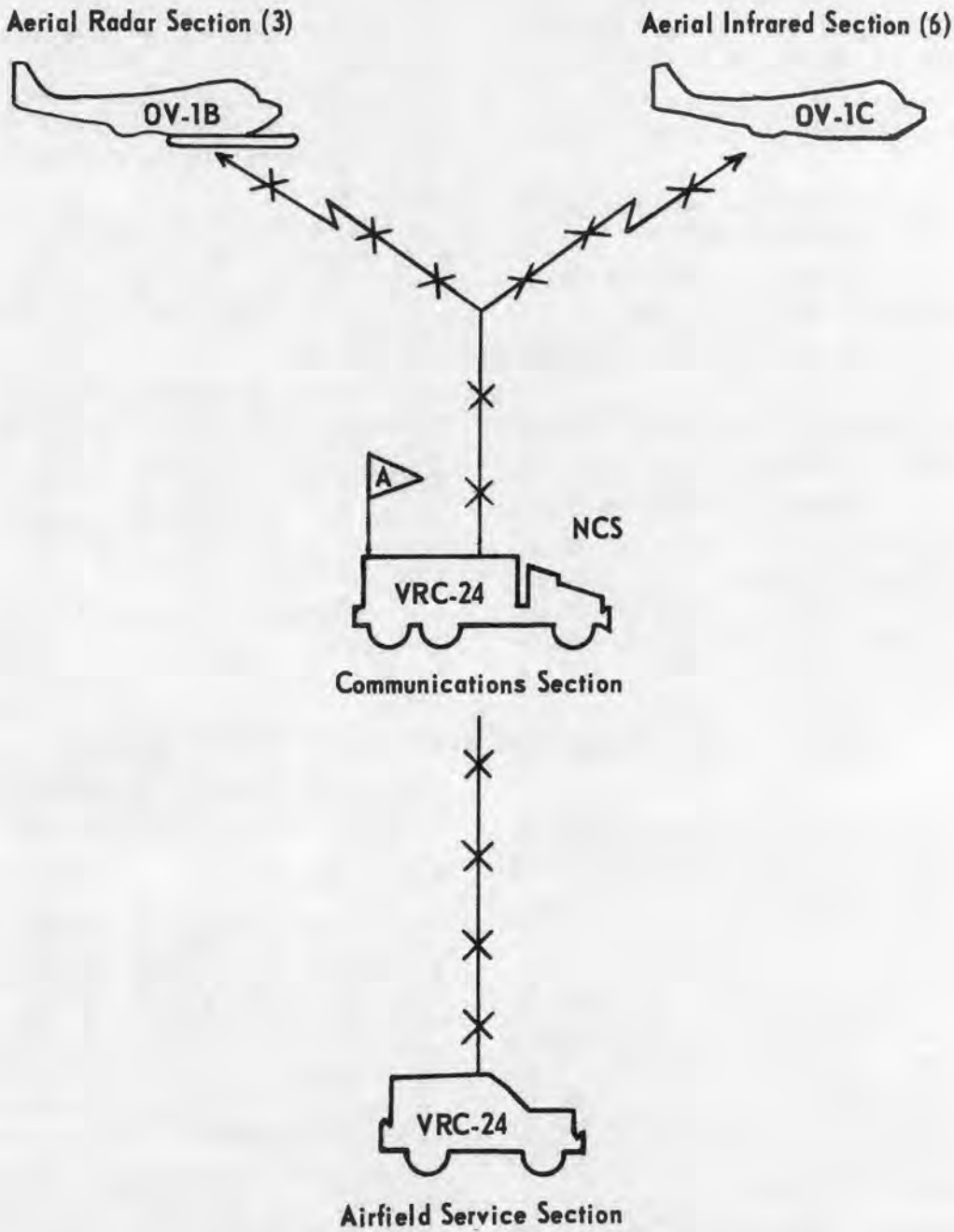


Figure 8–4. Air traffic control net AM/SSB Voice.

cations with the air traffic control element. One teletypewriter and necessary associated terminal equipment are mounted in the company operations van for teletypewriter communications. Company personnel will install the company wire net and signal personnel of the nearest area signal center will construct the circuit(s) connecting the company switchboard to the signal center switchboard.

c. Radio. Radio equipment is provided to meet the minimum requirements of the company. Equipment for remote control operations of radio sets has been included where required. Radio equipment in the company is indicated in the radio diagram (fig 8–7).

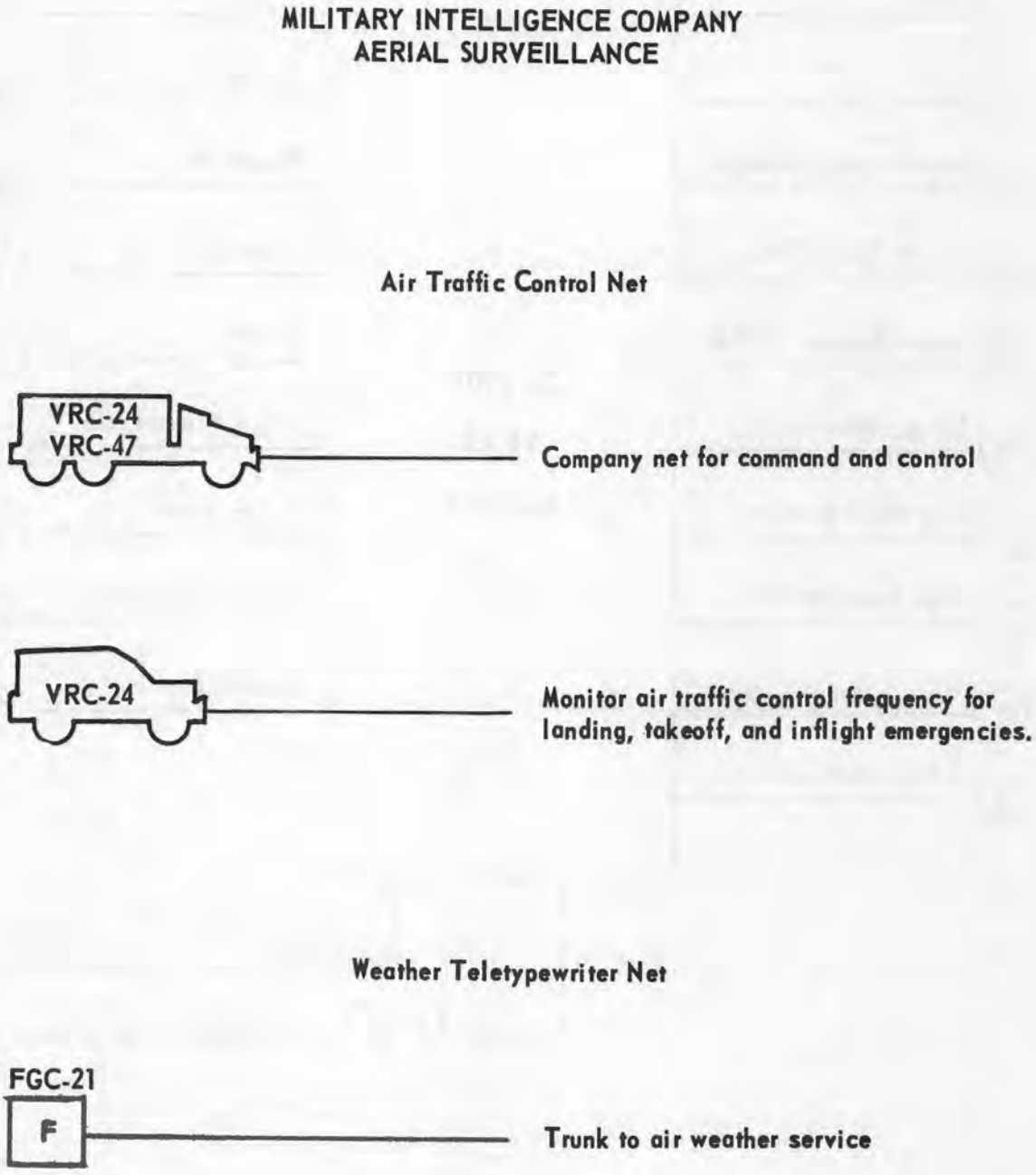


Figure 8–5. Air traffic control net and weather teletypewriter.

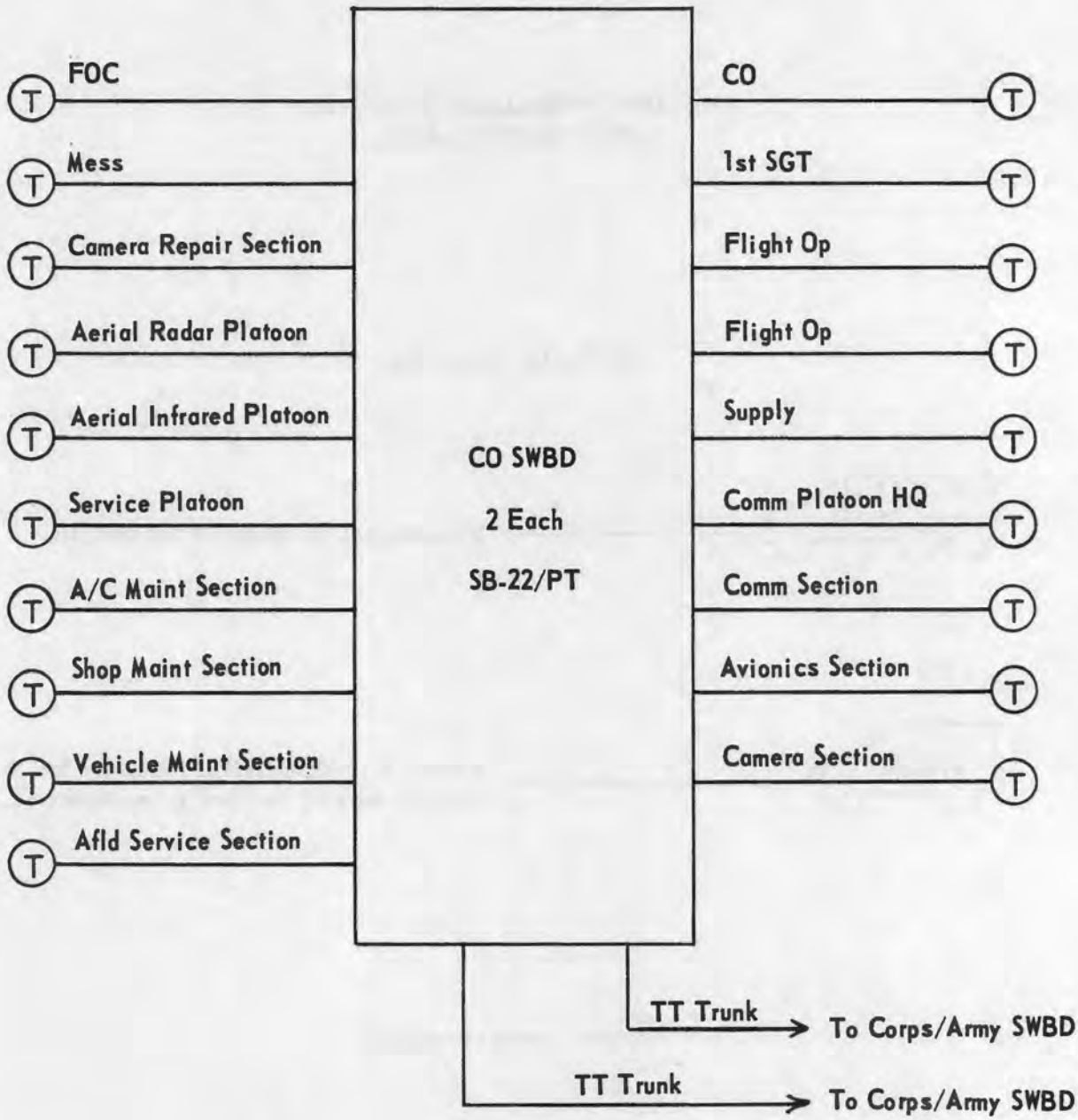


Figure 8–6. Type telephone wire/swbd net diagram.

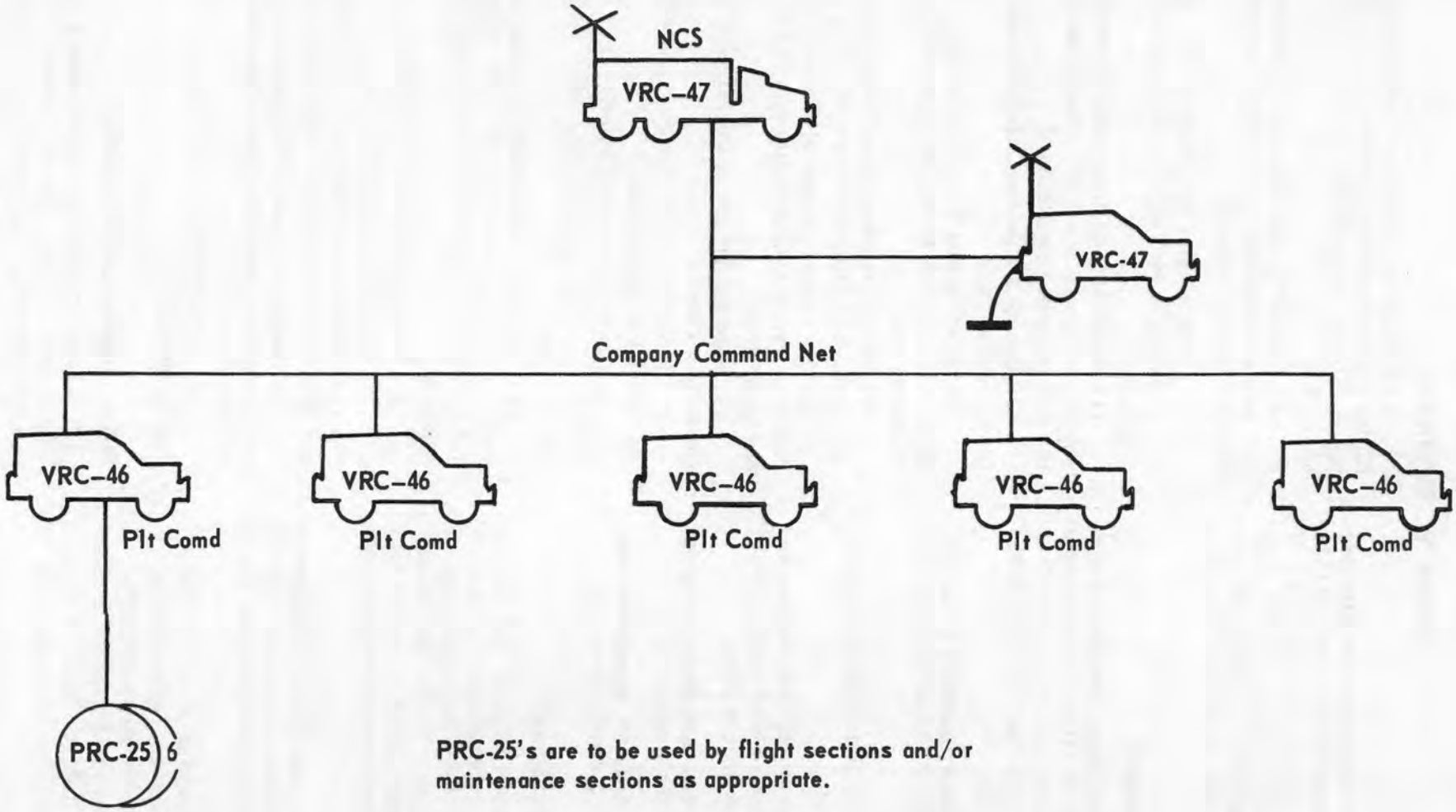


Figure 8–7. Type company command net FM voice.

Section V. PLANNING

8-19. General

Aerial surveillance and reconnaissance planning is accomplished as discussed in chapter 5. At the corps, planning will integrate the capabilities of the Military Intelligence Company (Aerial Surveillance) with the capabilities of the aerial surveillance and reconnaissance elements of the other services.

8-20. Mission Assignment

The corps G2 Air determination of whether a mission will be assigned to the Military Intelligence Company (Aerial Surveillance), accomplished by other army aircraft, or other service support will depend on the following factors:

a. The current operational capability of the Military Intelligence Company (Aerial Surveillance) to perform the mission.

b. The time when the requested information will no longer be of value.

c. The capability of enemy air, air defense, and other countermeasures to prevent organic Army aircraft from completing their missions.

d. The distance, weather, and terrain between the flying elements and the target area.

e. Considerations of the most appropriate sensor system to obtain the desired information.

8-21. Concept of Employment

Specific company missions normally are categorized as surveillance or reconnaissance. A mission may employ more than one of the sensors organic to the surveillance aircraft. During the mission, the aircraft may change in flight to another type mission or it may perform a multiple-type mission concurrently.

a. The operations of the Military Intelligence Company (Aerial Surveillance) are characterized by rapid response to mission requirements. This is accomplished by—

(1) Mission type tasking of the unit to permit maximum flexibility and utilization of resources in obtaining the desired information.

(2) A capability for rapid response by diversion to other missions in flight, based on changes in the tactical situation, the units supported, or the mission obectives.

(3) Reliable and secure communications with the G2 Air.

(4) Flexibility of mission performance afforded by multiplicity of performance capabilities inherent in the aircraft and in the surveillance systems.

(5) Acquisition of knowledge of the enemy situation and capabilities by frequent coverage of the same operational areas.

b. In planning the employment of the company's surveillance aircraft, the following must be considered:

(1) Availability of flying crews, aircraft, and sensors, to include previously established priorities and equipment maintenance.

(2) Enemy air defense capability and locations of enemy units.

(3) Existing and forecasted weather conditions at the airfield, as well as en route to, and at the target area.

(4) Specific results desired, i.e., the type of information the requester wishes to obtain.

(5) Operational altitude of the equipment in regard to terrain configurations en route to, or in the target area.

(6) Aircraft density in the target area and control of air traffic.

(7) Friendly tactical situation and supporting fires in the target area.

(8) Tactical air support plan.

(9) Existing authentication and identification systems.

(10) Selection of designated landing fields to facilitate direct coordination with supported units. This will include alternate airfields, when required.

(11) Evasion and escape information.

(12) Aircraft abandonment area.

(13) Technical proficiency of pilot, observer, and ground sensor terminal equipment operators.

(14) Imagery processing, interpretation, reporting, and print delivery requirements and capabilities.

(15) Coordination with Army Security Agency operations.

8-22. Briefing and Debriefing

a. General. The Military Intelligence Company (Aerial Surveillance) may be tasked to execute missions involving flight over any or all portions of a corps area of influence. The aircraft crews and company support personnel must be com-

pletely familiar with the mission to be flown, must adequately plan and prepare for the mission, and must use prescribed methods of reporting mission data.

b. Briefing and Debriefing of Aircraft Crews. This subject is discussed in detail in chapter 10.

c. Mission Support Personnel Briefing. The company support personnel who will be involved in the conduct of a mission also require briefing. The personnel, attached from MI Company, Corps, should be made aware of the mission (chap 9). Imagery interpretation personnel normally will assist the flying crew in planning the mission and thus are briefed during the planning stage on the information they will need to accomplish the necessary interpretation. The photo reproduction personnel must be briefed on the requirements of each mission, the anticipated processing requirements, and the deadline for completion of the processing. The ground sensor terminal teams supporting OV–1B/D and OV–1C/D must be alerted to the mission through company communications or by the G2 Air of the headquarters to which they are attached. They will require information on the mission in order to monitor the flight and produce imagery at their stations.

d. Sensor Data Log and Flight Log. A sensor data log and flight log (pilot's trace) are maintained for each sensor mission flown. These are reviewed for completeness during debriefing. It is desirable that the aircrew be present with the image interpreters during the initial readout of the imagery obtained on the mission.

8–23. In-Flight Reports

To provide commanders and staffs with critical information during the conduct of the mission, the aircrew must be able to make in-flight reports to the requesting unit and other interested elements by means of radio, message drop, or prearranged signals. In-flight reports usually will be rendered during each mission, unless the tactical situation warrants radio silence. Composition and format for in-flight reports are discussed in chapter 10.

Section VI. TECHNIQUES OF AERIAL SURVEILLANCE AND RECONNAISSANCE OPERATIONS

8–24. Visual/Photographic Missions

Aerial visual/photographic missions are discussed jointly as aerial camera systems are organic to all surveillance aircraft in both aerial surveillance companies. Significant visual sightings normally will be confirmed by photography.

a. The purpose of visual/photographic and surveillance reconnaissance is to obtain information of the enemy and the terrain and to detect targets. Some of the factors influencing these missions are weather, visibility, altitude, speed of observation, type of aircraft, terrain conditions, type of camera employed, hostile ground fire, and proficiency of the pilot-observer team.

b. Visual and surveillance reconnaissance missions are conducted at an appropriate altitude to permit accurate observation of the area of interest. Usually the aircraft will fly at an altitude of 1,000 to 1,500 feet above the ground (enemy use of surface-to-air missiles permitting); however, the specific area of interest may require low-level observation at nap-of-the-earth altitudes. If low-level observation is required, the aircraft should make one pass over the area utilizing any natural terrain features to conceal the approach of the aircraft. If additional passes over the target area are required, they should be made from random directions.

c. Visual/photographic surveillance missions may be accomplished by employing flight teams of two aircraft. This method of employment permits the two aircraft to mutually support each other in their visual observation techniques. One aircraft can perform a photographic mission while the other aircraft maintains visual observation over the area of interest. In case an aircraft is downed by ground fire, the flight team method of employment facilitates rapid recovery of the aircrew. Care should be exercised in any decision to use this technique to insure the necessity to do so. Employing this technique doubles the expenditure of aircraft, crews and flying time for a single mission and may reduce the number of missions which can be flown.

d. The surveillance aircraft are equipped with a photographic surveillance system employing aerial cameras that can be positioned in flight to provide vertical (with 20% to 80% forward overlap) or side oblique (15° to 30° depression angle) photographs of the terrain. Some surveillance aircraft are equipped with a fixed-mounted nose camera that provides forward panoramic, horizon-to-horizon photography specifically designed

to be taken from low-flying aircraft. This camera takes forward oblique photographs of the ground from forward of the aircraft position out to the apparent horizon with a 180° coverage forward.

e. Visual aerial surveillance with confirmatory photography becomes especially valuable when the aircrew is familiar with the terrain in the target area. Whenever possible, crews should operate over the same general area repeatedly to allow them to become completely familiar with the area so they can recognize and identify changes that take place. In the conduct of repetitive aerial surveillance over specific areas of interest, however, care must be taken to insure that such flights do not compromise future tactical operations.

f. Techniques used in the accomplishment of visual/photographic missions vary with the tactical situation, enemy strength and disposition, weather and terrain, and are limited only by the imagination of the pilot-observer team. Techniques considered appropriate for the accomplishment of visual/photographic missions are described in (1) through (4) below.

(1) Reconnaissance of a point target may be accomplished by a flight team of two aircraft. The aircraft approach the target area in a loose echelon formation so positioned that the target area is on the observer's side of the aircraft. Altitude usually will be 1,000 to 1,500 feet above the terrain during the initial observation; if a close reconnaissance of the target is required, the aircraft will fly past the target and then make a descending turn and execute a low-level, high-speed pass over the target area from a different direction (fig 8–8). If photographs are required, one aircraft will overfly the target at the appropriate photo altitude.

(2) The offset technique can be employed frequently when a single low pass over a target can accomplish the mission (fig 8–9). The aircraft approach the target at an altitude of 1,000 to 1,500 feet, and as soon as the target is located in the distance, the aircraft turn away from the target and descend toward a readily identifiable initial point (IP). The route from the IP to the target will be made at nap-of-the-earth altitudes, virtually insuring surprise in the target area.

(3) Route reconnaissance of a railroad, highway, or waterway can best be accomplished by a flight team of two aircraft. The aircraft fly in a loose echelon formation at an altitude sufficient to clear terrain obstacles, each aircraft positioning itself over opposite sides of the route to be surveyed (fig 8–10). This permits observation across the route and under any foliage that might conceal targets in the area contiguous to the route.

(4) Aerial cameras organic to the surveillance aircraft have a limited area coverage capability and should be employed only for small area coverage. The requesting unit should furnish the G2 Air accurate six-digit coordinates of the four corner points of the area from a 1:50,000 tactical map. Upon receipt of these coordinates, the tasked unit can plot the flight traces considering all the factors affecting the mission. Using the onboard navigational system and the aircraft's autopilot, accurate parallel flight paths can be flown to produce the required imagery.

8–25. Airborne Radar Missions

a. Some surveillance aircraft of the MI Companies (Aerial Surveillance) are also equipped with a side looking airborne radar (SLAR) system. A detailed discussion of SLAR sensor capabilities is contained in paragraph 4–9*d*.

b. Generally SLAR is employed for a large area coverage as in an area search mission or in surveillance of linear distances such as traffic arteries, coastlines, and international boundaries. During the conduct of SLAR missions, it is essential that the aircraft be flown in a straight and level altitude. Air turbulence will degrade the quality of the imagery produced. All missions should be flown at the optimum flight altitude for the recording of SLAR imagery.

c. The following are examples of typical SLAR missions:

(1) *Area search.* Flight paths are planned to insure that the target area is continuously mapped by the SLAR. This can be accomplished by using either a triangular or rectangular pattern as illustrated in figure 8–11.

(2) *Coastal or border surveillance.* This mission is executed by flying a course parallel to, and at a standoff distance from, the area of interest. Standoff distances can be varied up to 60 kilometers from the flight path in increments of 10 kilometers. Throughout the conduct of these missions, inflight spot reports can be based on target readout from the in-flight processor in the aircraft. Examples of typical SLAR missions are shown in figure 8–12.

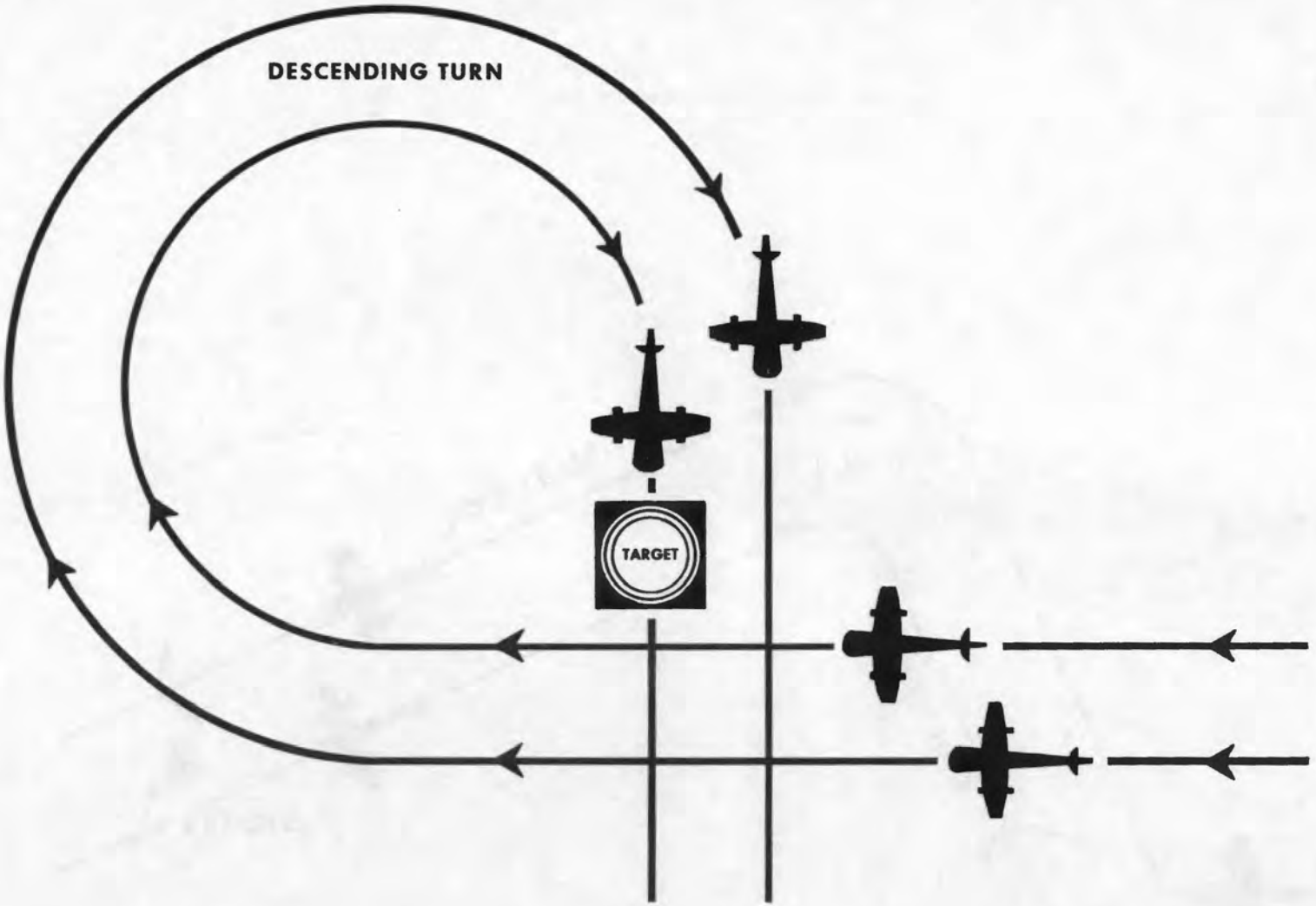


Figure 8–8. Visual/photo point target reconnaissance.

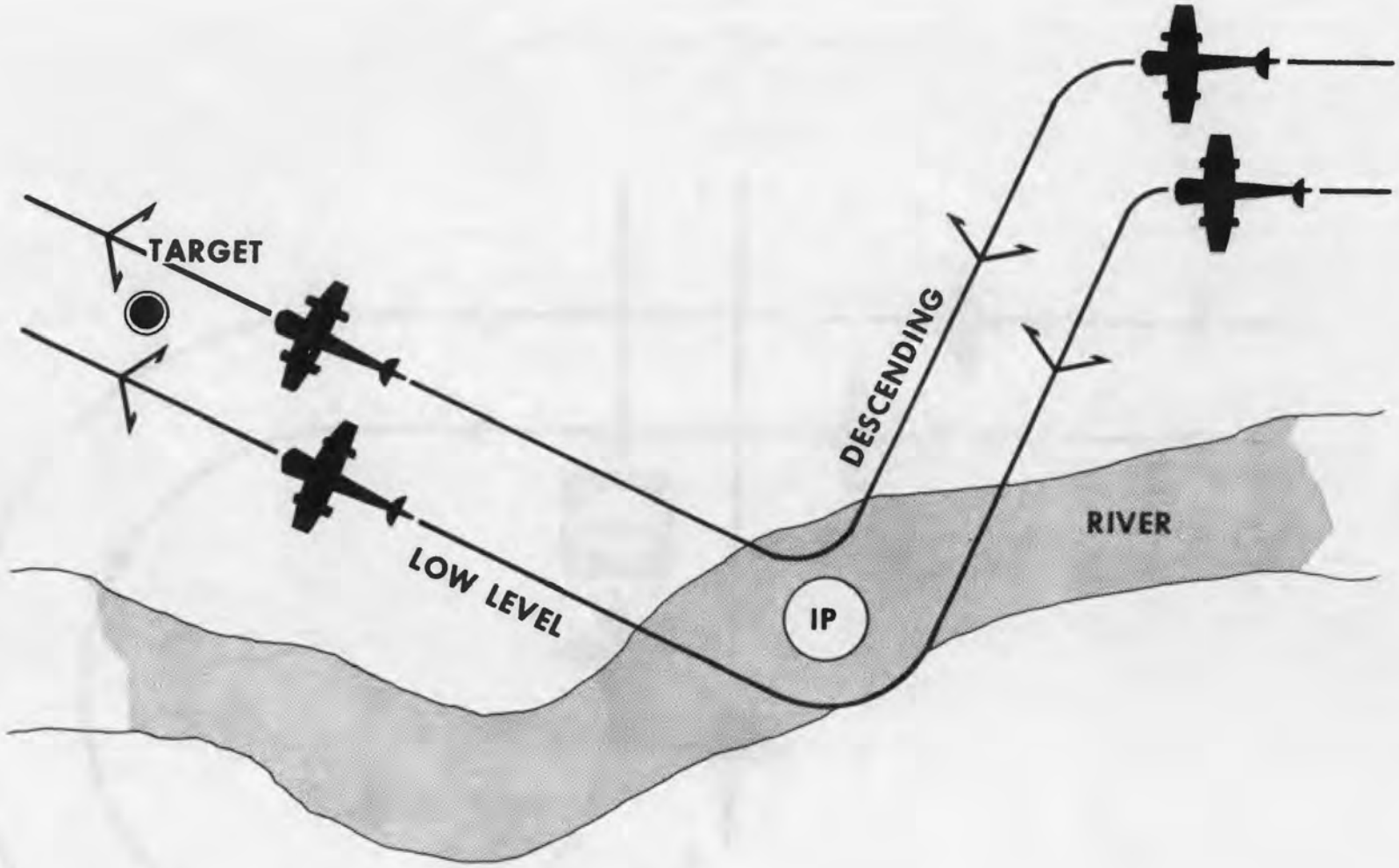


Figure 8-9. Visual/photo offset technique.

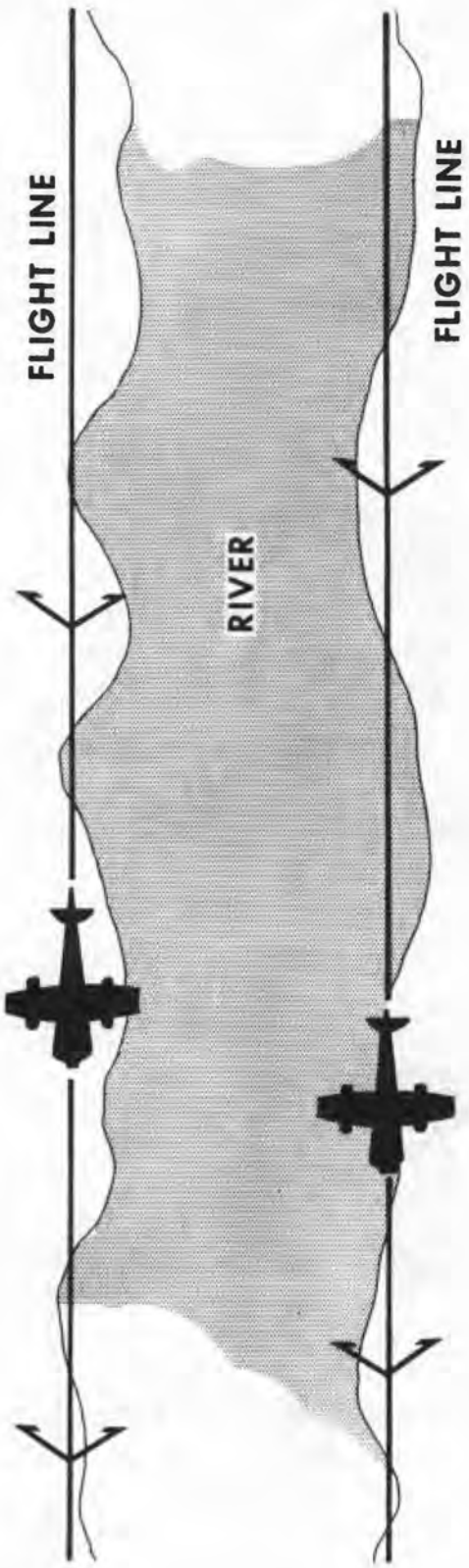


Figure 8–10. Visual/photo route reconnaissance.

8–26. Airborne Infrared Missions

a. Additional surveillance aircraft of the MI Company (Aerial Surveillance) are equipped with the infrared (IR) set. A detailed discussion of IR sensors is contained in paragraph 4–9*c*.

b. The aerial infrared sensor generally is employed to provide air-to-ground infrared coverage of routes, small areas, and suspected enemy locations or installations. The IR system has a day and night as well as a limited poor weather capa

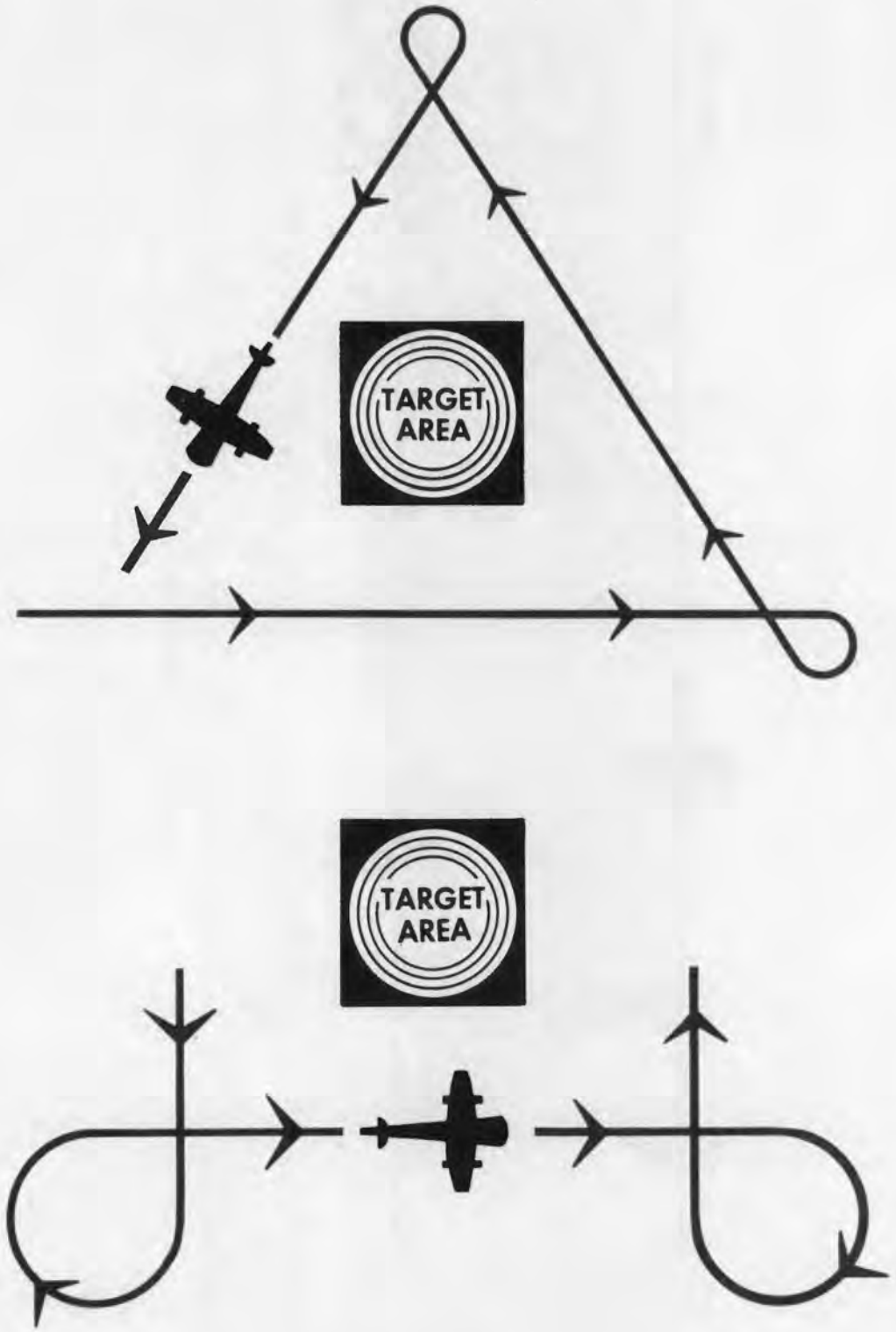


Figure 8–11. SLAR area search.

bility, but will not record heat emissions through thick cloud layers, dense jungle canopies, or other similar heat absorbing environments. IR missions usually are executed during the hours of darkness as the natural cooling of the ground permits a larger heat emission differential between "hot" objects on the ground and the surrounding terrain.

c. The success of night infrared missions is contingent upon accurate navigation to the target area. Consequently, flight planning prior to an infrared mission must be accurate, detailed, and complete. Optimum results from night infrared missions can be achieved by using the onboard navigational system. Utilizing the onboard navigational system, the pilot can execute the infrared mission by employing parallel passes over an area or random passes to minimize his exposure to ground fire.

8–27. Multiple Sensor Operations

The surveillance and reconnaissance resources within the aerial surveillance companies can be most efficiently employed if the unit is multisensor tasked. This permits primary and secondary sensors to be incorporated into the mission requirements, where feasible, to permit target coverage by the secondary sensors should target conditions preclude use of the selected primary sensors. Thus the G2 Air representative at the company and the operations officer of the company will be able to plan jointly the exploitation of the most efficient combination of sensors to accomplish the mission within the required time frame.

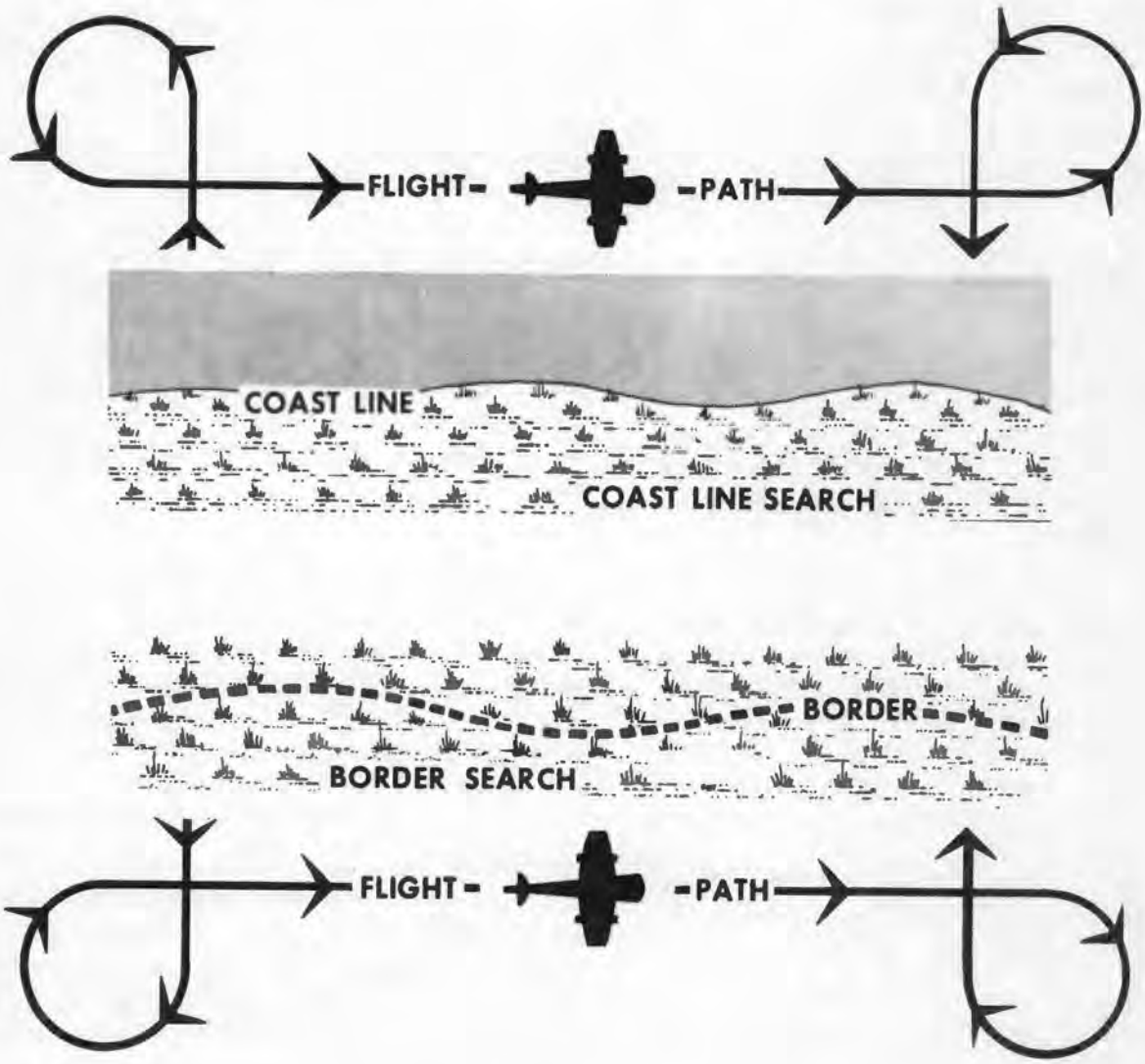


Figure 8–12. SLAR linear coverage.

8–28. Method of Describing Ground Locations, Areas, and Boundaries

It is essential that all imagery be correctly referenced. In order to negate errors and confusion, a standard method of describing ground locations, areas and boundaries has been established. This standard method has been agreed to by all NATO nations.

a. Use of Maps. In order to avoid confusion in the designation of place names when there are various editions of a map relating to the same area, the following will be shown at the top of the document:

(1) Map Series Number (and country or geographic area, if required).

(2) Sheet Number (and name, if required).

(3) Edition.

(4) Scale (if required).

Example: This information can be shown as follows:

Map Series	M 501 EUROPE
Sheet Number	NM 32–1 (ESSEN)
Edition	1–DMG
Scale	1:250,000

b. Security. The location of headquarters, units, depots, and other installations will only be mentioned in a communication or document if this communication or document can be transmitted to the addressee by a method insuring the appropriate security precautions. Location of headquarters, units, depots, and other installations will not be included in addresses unless necessary to insure correct delivery.

c. Names of Places.

(1) Names of places will be written in block capitals exactly as spelled on the maps in use. The addition of a grid reference normally will be necessary. In this case, six-figure grid references must not be used when four figures are sufficient. In areas where mapping material does not allow the use of coordinates, latitude designations will be used instead.

(2) When a grid reference code is used, the names of places which it indicates must not be shown (uncoded) in the same message.

d. Locations and Points on the Ground.

(1) Locations and points on the ground may be described either:

(*a*) By grid coordinates, or,

(*b*) By giving the distance and direction from a simple reference point, e.g., "Cross-roads 1000 yards (or 1000 meters) Southwest of church tower of NAPERVILLE (Square 6235)."

(2) In written orders and reports, grid coordinates will always be used the first time the designation of a point or location is given. Thereafter, coordinates will be given only when such repetition insures greater clarity.

e. Directions. A direction can be indicated either by two points or by angular measurement reading clockwise from a reference direction. In the latter case, directions will be given as from true, magnetic, or grid north and the type used will always be specified. The unit of angular measurement used, i.e., mils or degrees, normally are specified, but may be omitted when there is no probability of misunderstanding.

f. Roads, Tracks, and Railways.

(1) Roads, tracks, and railways will be described by the names of places to make sure that the right road can be identified. The word "road," "track," or "railway" will precede, not follow, the place names, e.g., "road LAPRAIRIE-DELSON," not "LAPRAIRIE-DELSON road."

(2) When movement is involved, the route will be designated by a sequence of points on the route named in the direction of movement. When no movement is involved, the sequence of points named will be from left to right or rear to front, assuming that the person designating the route is facing the enemy. Cardinal points (the four principal points of the compass) may be added, if required.

g. Boundaries.

(1) Boundaries will be designated by easily distinguishable terrain features in the sequence in which they occur on the ground. They will be described from rear to front during an advance, and from front to rear in defense and withdrawal. If generally parallel to the front, e.g., rear boundaries, they will be described from left to right, facing the enemy. Cardinal points may be added, if required.

(2) When describing boundaries between units and formations, the words "inclusive" or "exclusive" will be used. These words should be used before the place to which they refer. The description of a boundary will state specifically to which unit or formation an area or a point is inclusive or exclusive.

h. River Bank. River banks are described as right or left from the point of view of an observer facing downstream, or if this cannot be done, by using cardinal points.

i. Areas. An area normally will be described by starting with the northernmost point first and identifying the remaining points in clockwise order.

j. Positions. Positions will be described from left to right and front to rear facing the enemy. To avoid confusion, cardinal points may be used to describe flanks, rather than "right" or "left."

CHAPTER 9

IMAGERY INTERPRETATION
STANAG 2134, 3205, 3377

Section I. GENERAL

9–1. Image Interpreters

Image interpreters are intelligence specialists trained in the techniques of extracting information from imagery produced by airborne sensors. The image interpreter must know the intelligence requirements of the command in order to quickly recognize, identify, locate, describe and report information concerning objects, activities, and terrain represented on the imagery. Interpreters generally are employed as a group. Normally they are located so as to have immediate access to the film processing facilities serving the various units employing airborne sensors. This assures the availability of adequate interpretation effort at all times, the elimination of administrative dead time in transmitting imagery, and the economical use of processing and interpretation equipment.

9–2. Duties

The specific duties of image interpreters include the following:

a. Interpreting imagery and reporting intelligence information regarding the enemy—his operations and activities, disposition, supplies, communications, and installations—and civilian activity related to military operations such as population concentrations, industrial production concentrations, industrial production facilities, and traffic networks.

b. Analyzing terrain.

c. Evaluating targets for attack by all available weapons systems; preparing target folders and performing damage assessments.

d. Updating maps from current imagery; preparing map supplements from photography.

e. Preparing mosaics, panoramics, and terrain models for operations.

f. Assisting the G2 Air in planning aerial reconnaissance and surveillance missions.

9–3. Effectiveness

The effectiveness of an image interpreter is increased by his experience and the amount of background knowledge he possesses about the enemy and the area of operations. The interpreter's time and effort are also more effectively expended when he is made aware of exactly what information is requested or desired. Effectiveness is enhanced when the interpreter has available to him—

a. Area studies, other background material, and selected intelligence reports that deal with the enemy and the area of operations.

b. Operation orders, commander's EEI, and OIR that identify intelligence requirements and the area of interest.

c. Knowledge of the capabilities and limitations of the supporting aircraft and sensors, and the interpretation equipment available to him.

d. Knowledge of current enemy tactics, equipment, and order of battle.

e. Prior imagery of the area of interest for comparative analysis.

f. Intelligence information received from other sources that will assist in confirming or denying his suspicions.

g. Imagery interpretation keys.

9–4. Imagery Interpretation Support

a. Field Army. In addition to the imagery interpretation support furnished by the Military Intelligence Battalion, Air Reconnaissance Support, Field Army, the Military Intelligence Battalion, Field Army (TOE 30–25) provides an imagery interpretation team to the field army G2 Air. The primary mission of this section is to support field army operational planning and targeting.

b. Corps. The Corps Military Intelligence Company (TOE 30–18H) provides an imagery interpretation platoon to the corps G2 Air. Its major mission is similar to that of the imagery interpretation section supporting the field army G2 Air.

c. Division. Each division has an imagery interpretation section which is part of the MI Company, Division, (TOE 30–17H). This section supports the division G2 Air. Its major mission is immediate interpretation of imagery received from the surveillance aircraft of the corps Aerial Surveillance Company as well as GST imagery produced in support of their headquarters. It also assists in operational planning and targeting for division weapon systems.

d. Other Units. Other units having an aerial surveillance or target acquisition capability are provided imagery interpretation support.

(1) Armored cavalry regiments and separate brigades are provided imagery interpretation support from their attached MI detachments (TOE 30–14H).

(2) Missile commands contain organic image interpreters.

(3) The field artillery target acquisition battalion is provided imagery interpretation support from within the resources of the MI Company at corps.

Section II. TACTICAL USES OF IMAGERY

9–5. General

a. The value of imagery is largely dependent upon the timeliness of the information extracted from it. Items of immediate tactical value can be extracted and furnished to the requester in a relatively short period of time since only a minimum of detailed interpretation and analysis is usually required. Specialized intelligence studies require a great deal of preparation, research, and detailed interpretation. While the tactical application of imagery is similar at all echelons of the field army, emphasis on its tactical usage will vary with the echelon at which it is used, the tactical situation, and the speed with which the information is required.

b. The primary use of imagery is to provide intelligence information to the commander. Normally this information is provided by the reports furnished by imagery interpretation personnel from the imagery at hand. Because the imagery itself is bulky, requires special storage and protection, and does not lend itself to proper interpretation by untrained personnel, it is not normally furnished to the requesting agency unless there is a particular purpose to be served by doing so. Instead, imagery normally is kept for a specified period of time by the imagery interpretation section at the echelon where the imagery interpretation report was rendered and then evacuated or destroyed.

9–6. Specific Tactical Uses of Imagery

a. Imagery is used to—

(1) Provide information in response to the commander's EEI and OIR.

(2) Identify items of immediate tactical significance.

(3) Assist in operational planning.

(4) Provide a current, accurate display of an area of interest to the commander to assist him in the tactical employment of his combat troops and his tactical weapons.

b. In providing this assistance, the imagery interpreter utilizes imagery to provide the following types of information:

(1) *The locations of enemy installations.* These include such installations as missile, artillery, mortar, and automatic weapons emplacements; minefields, barbed wire, obstacles, and strong points.

(2) *Enemy supply installations.* These include the locations of enemy supply installations and lines of communication, to include forward area supply depots, rear area supply depots, railheads, transshipment points, and main supply routes.

(3) *Enemy personnel.* This includes the location of enemy personnel and equipment concentrations.

(4) *The analyses of terrain.* These include trafficability analyses of terrain for all types of military units and operations to include road and bridge studies. This use of imagery should not be confused with the detailed terrain studies prepared by Army engineer units.

(5) *Intelligence information.* This includes the confirmation or denial of intelligence information from other sources or agencies such as order of battle personnel, interrogation of prisoner of

war personnel, technical intelligence teams, and clandestine sources.

(6) *Target folders.* Target folders may be supplemented by detailed and special imagery intelligence reports or by selected imagery.

(7) *Damage assessment.* The type and extent of damage to critical items in an area of interest, such as installations, roads, and equipment, can be at least partially determined from the interpretation of aerial photography.

(8) *Mosaics and panoramas.* Mosaics and panoramas may be used for planning and briefing purposes and for locating and designating targets. Preparation of mosaics and panoramas is time-consuming and should be resorted to only when imagery interpretation reports or current map coverage will not suffice.

(9) *Map correction and supplement.* Discrepancies occur between what is shown on maps and what actually exists as shown by aerial imagery. These discrepancies are noted and reported.

Section III. AERIAL SURVEILLANCE/RECONNAISSANCE REPORTS

9–7. General

a. The aerial surveillance/reconnaissance report formats contained in this manual are compatible with those established in international agreements. NATO titles often contain the word "photo" but these formats are to be used with SLAR and IR in addition to photo. The other formats listed in the table in figure 9–1 are to be used in joint US or ABCA operations, when applicable.

b. The basic types of aerial surveillance/reconnaissance reports are the mission report, hot photo report, initial photo interpretation report, and the general photographic imagery interpretation report. Imagery interpretation reports serve two parallel objectives; they insure the maximum exploitation of information and its timely dissemination to the user. The requirements, preparation, and dissemination of these reports are discussed below and shown in figure 9–2.

c. Mission reports are normally transmitted by the ARLO or G2 Air representatives after debriefing the flying crews upon completion of their missions. Mission reports are further discussed in chapter 10.

d. All of these reports except the general imagery interpretation report follow a prescribed format as to content and organization. This facilitates electronic transmission and insures that the information transmitted is complete and understandable to the recipient. The general photographic (imagery) interpretation report normally is too voluminous to permit radio transmission and is submitted only on request. All other imagery interpretation reports normally are transmitted by electrical means. This requires the use of the standard joint message form heading as prescribed in AR 105–31. Following this prescribed heading is the standardized body of the report as shown in figure 9–3.

9–8. Hot Photo Report (HOTPHOTOREP)

A HOTPHOTOREP is rendered at the earliest possible time after imagery has been received for interpretation. A HOTPHOTOREP is rendered when the MISREP must be supplemented by vital information, or amended by contradictory information or when directed. It is confined to a short, concise report of vital information. It also can report a sighting of significant intelligence value. The report is rendered as soon as the imagery has been inspected the first time or immediately upon discovery of a significant item. The report is disseminated to the requester and other interested agencies by the most rapid means available. The initial HOTPHOTOREP should be submitted within one hour after the mission aircraft has landed. If during subsequent interpretation a significant finding is made, an additional HOTPHOTOREP may be forwarded on an immediate basis. Format for a HOTPHOTOREP is shown in figure 9–4.

9–9. Initial Photographic Interpretation Report (IPIR)

The IPIR is furnished only when specifically asked for by the mission requester or when the full interpretation of the imagery reveals additional intelligence information not previously reported on the HOTPHOTOREP or the mission report. The IPIR normally is completed within four to eight hours after mission aircraft have returned and provides much more detail than the MISREP and HOTPHOTOREP. An IPIR deals with only one imagery mission and includes an evaluation of the quality of the imagery and area coverage accomplished. Format for an IPIR is

shown in figure 9–5. This same format will be used when Supplemental Photo Interpretation Reports (SUPIR) are submitted. This same format will be used when supplemental photo interpretation reports (SUPIR) are submitted.

9–10. General Photographic Interpretation Report (GPIR)

The GPIR is designed to provide detailed intelligence information in response to a specific request, primarily to assist in planning future oper-

TYPE OF REPORTS	ABCA (ASCC 101/1A)	NATO (STANAG 3377)	JOINT US SVCS (JCS Pub 12)
Inflight Report (FLIGHTREP)	Yes	Yes	Yes
Mission Report (MISREP)	No	Yes	Yes
Hot Photo Report (HOTPHOTOREP)	Yes	Yes	No
Immediate Request Briefing (IRB)	No	No	Yes
Inflight Report (ELINT)	No	No	Yes
ELINT Report	No	No	Yes
Initial Photo Interpretation Report (IPIR)	No	Yes	Yes
General Photographic Interpretation Report (GPIR)	No	Yes	No
Initial Photo Interpretation Report/Supplemental Photo Interpretation Report (IPIR/SUPIR)	Yes	No	No

Note: ABCA refers to Australian, British, Canadian, and American Armies.

Figure 9–1. TYPE—Aerial Surveillance/Reconnaissance Reports.

TYPES OF AERIAL SURVEILLANCE AND RECONNAISSANCE REPORTS					
TYPE OF REPORT	PURPOSE OF THE REPORT	WHEN PREPARED	PREPARED BY	TRANSMITTED BY	TRANSMITTED TO
IN-FLIGHT	To send the mission results from the aircraft while in flight	As ordered or at the discretion of the pilot	Pilot	Radio	Requester
MISREP	To inform the requester of the mission results	Within 30 minutes after the aircraft lands	Debriefer (based on pilot statement and possible sensor readout)	Radio, Telephone, and Teletypewriter	Requester and other interested agencies
HOTPHOTO-REP	To inform the requester of results of quick sensor readout if info has not been reported in MISREP (used to supplement or amend MISREP)	Within 1 hour after the aircraft lands; however, if later study reveals that additional info is present, another HOTPHOTOREP may be submitted.	Imagery Interpreter and debriefer	Radio, Telephone, and Teletypewriter	Requester and other interested agencies (include all MISREP addressees)
IPIR/SUPIR	To acquire more detailed info than received from the MISREP or HOT-PHOTOREP. Report the answers of the requester in positive terms.	Only when requested (due out within 4-8 hours	Imagery Interpreter	Radio, Telephone, and Teletypewriter	Requester and other interested agencies
GPIR/GIIR	To provide more detailed info (primarily for planning future operations).	As requested	Imagery Interpreter	Teletypewriter (courier or facsimile)	Requester

Figure 9-2. Aerial Surveillance/Reconnaissance Reports.

ations. It may be made from a new mission specifically flown for the requirement or from existing coverage. No specific format is used; the content will vary according to the requirements of the information being reported. Reports are submitted to meet the time limitations imposed by the requester.

HEADING

(All reports use standard message form headings for electrical transmissions)

TYPE OF REPORT

(The type of report is always the first item in the message, followed by the mission number.)

INTERNAL ORGANIZATION

(Name of the intemal organization)

PARA	TYPE OF REPORT				
	IN-FLIGHT REPT	MISREP	HOTPHOTOREP	IPIR/ SUPIR	GPIR
A.	Location identifier	Same	Same	Same	GPIR has no prescribed format.
B.	Time over target/ Time of sighting	Same	Time sensors are activated	Same	
C.	Results	Same	Same	Same	
D.	Not used	Photo confirmation	Type of photo and exposure number	Same	
E.	Not used	Other information	Quality and scale of imagery	Same	
F.	Not used	Not used	Percent of target coverage	Same	

Note: Titles may differ when US or STANAG 2134 formats are used.

Figure 9-3. Format for aerial surveillance/reconnaissance reports.

(Classification)

USE STANDARD MESSAGE FORM HEADING

FORMAT

HOTPHOTOREP (Always start of message)

AIR TASK/MISSION NUMBER

A. Location identifier such as: target number, coordinates, line search number, etc.

B. Time photos taken (date-time group)

C. Results

D. Type of photography exposure number

E. Quality of photography/sensor image/approximate scale

F. Percentage of photo/sensor coverage

(Classification)

(Classification)

USE STANDARD MESSAGE FORM HEADING

EXAMPLE MESSAGE

HOTPHOTOREP

2/A255

A. LC 725355

B. 231150Z

C. Frogmen identified in target vicinity

D. P0001-0003

E. Good, large

F. 100 percent

(Classification)

Figure 9–4. Hot photo report.

(Classification)

USE STANDARD MESSAGE FORM HEADING

FORMAT

IPIR (Always start of message)

AIR TASK/MISSION NUMBER

A. Location identifier, such as: target number/ grid reference, etc.

B. Time photos taken (date-time group)

C. Results

D. Type of photography/exposure numbers

E. Quality of photography/sensor image/ approximate scale

F. Percentage of photo/sensor coverage.

(Classification)

(Classification)

USE STANDARD MESSAGE FORM HEADING

EXAMPLE MESSAGE

IPIR

2/A603

A. Hwy bridge at NA418384

B. 121050Z Aug

C. This bridge is a six span masonry arch structure, length 200 meters, width 10 meters. It is based on 5 concrete piers and two concrete abutments. At time of photography the bridge was fully usable.

D. 0 0012-0014

E. Good, large

F. 100 percent

(Classification)

Figure 9–5. Initial photographic interpretation report.

Section IV. TEMPLATE FOR AERIAL PHOTOGRAPHS

9–11. General

a. Templates for point designations on aerial photographs have been designed by the NATO nations and by DIA. The NATO template is discussed in this section but the DIA template, which is not discussed below, is covered in DIA manuals. The DIA template will be used when US Forces are engaged in joint operations not involving the NATO nations.

b. Templates are used to identify points on aerial photographs. The template is a transparent square measuring 25 cm square on which is etched a centimeter grid in black as shown in figure 9–6. Every fifth horizontal and vertical line is thickened which creates 25 five-cm squares. Each square on the template is identified by letters from A to Z, excluding I, in order from left to right and from the top down. The lines which form the small one-cm squares within the larger squares are numbered with single digits. Vertical lines are numbered Ø, 1, 2, 3 and 4 and the horizontal lines are numbered 5, 6, 7, 8 and 9 in order to avoid confusion in the designation of horizontal and vertical axes. The one-cm template squares are not further divided but may be divided and accurately measured using additional scales (e.g., millimeter scale). Vertical lines one mm apart are numbered ØØ thru 49, and horizontal lines 5Ø thru 99. As figures 9–7 and 9–8 show, Point A, at the position indicated in square G, is designated G37–77; similarly, Point B is identified as G33–74. A perforation indicates the center of the template at position N25–75. Two perpendicular axes pass through the center of the template with the horizontal axis marked by arrows while the vertical axis is unmarked.

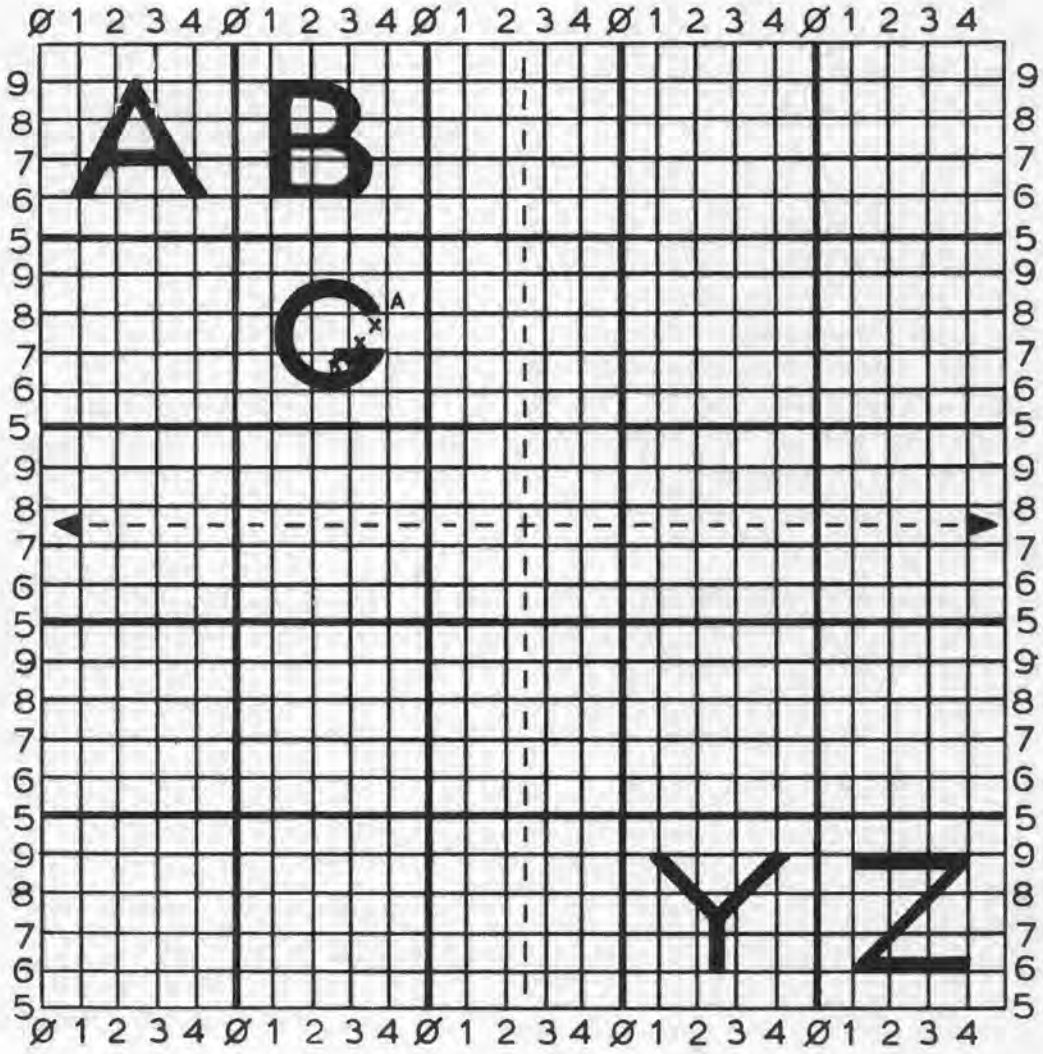


Figure 9–6. NATO template.

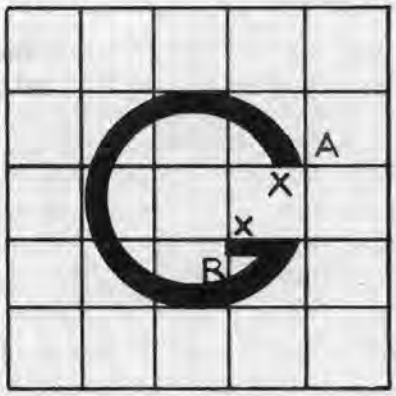


Figure 9–7. Square G enlarged.

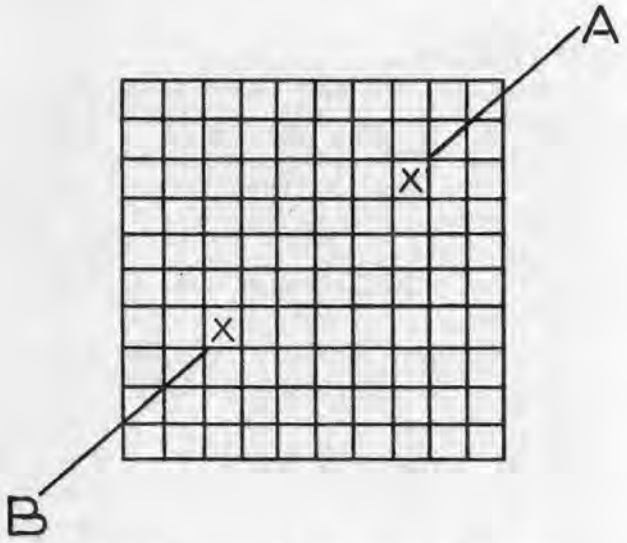


Figure 9–8. Square 7–8, of square G, enlarged.

9–12. Positioning Methods

There are two methods of positioning the template on aerial photographs: one for use with aerial photographs 24 cm square or smaller, and the other for larger scale photographs. In all cases, the template is to be so oriented on the photograph that both the letters on the template and the titling strip are upright and read from left to right.

a. Photographs 24 cm Square or Smaller. The center of the template must coincide with the center of the photograph. This is accomplished by using half-way (fiducial) marks provided along the edges of most photographs. When the horizontal and vertical axes on the template are laid on top of the half-way marks, the center perforation is directly over the center of the photograph. Half-way marks should be drawn when no marks are printed. Template orientation procedure is the same using printed or drawn marks.

b. Photographs Larger than 24 cm Square. Point L, 00–75 of the template should be superimposed on the center of the photograph for readings with the right-hand part of the photograph, and Point P, 50–75, for readings within the left-hand part.

9–13. Titling

To designate a particular point, the following information must be given in format order:

a. STANAG 3189 (Titling of Air Reconnaissance, Air Survey and Mapping Photographs), format:

(1) negative number
(2) camera position
(3) taking unit
(4) service
(5) sortie/mission number
(6) date

b. The template coordinates of a point, using the template as indicated, require the letter first, then the horizontal (X) coordinates (Eastings), followed by the vertical (Y) coordinates (Northings). Therefore, a photograph 24 cm square or smaller scale could have a designation of "0123 2F22 408(R) TAC825 29Nov70, Point S32–65." In the case of a photograph larger than 24 cm square, it could read: "0017 V123 73 TAC421 15Apr70, Point R18–73," with "right to left" added depending on the part of the photograph covered by the template.

Section V. TARGET FOLDERS

9–14. General

Supervision of the aerial surveillance and reconnaissance aspects in support of the target development process is the responsibility of the G2 Air. To assist him in this function, imagery interpretation personnel provide intelligence information taken from aerial imagery that can be used in compiling target folders. Once a potential target has developed to the point where it is a suitable target for employment of a weapons delivery system, the G2 Air will recommend its inclusion among those targets selected for attack.

9–15. Target Folders

Before a target can be selected for attack, the type of target must be determined—its composition, strength, vulnerabilities, and permanency—to allow for the selection of an appropriate weapons system to be employed. A target study requires the collection and evaluation of many items of information all of which ultimately will add up to the identification or elimination of an actual target. The G2 Air and image interpreter use the target folder to compile the necessary information. A major prerequisite for starting a target folder is the relative degree of permanence of the potential target. Transitory targets must be selected for attack by employing methods other than the target folder.

9–16. Contents of Target Folder

A target folder should be maintained on all potential targets. The composition of the folder will vary with the type of target but should contain as a minimum—

a. A target folder index of items contained therein.

b. A target worksheet which includes a target designation, description, location, and any other desired intelligence information. It should also include the source and evaluation of the information, the date of confirmation, and all agencies who have been, or will be, furnished the information.

c. A target information sheet which contains a detailed listing of physical characteristics of the target to include separate elements of large or "hard" targets such as large supply facilities or multiple building complexes, the significance of the area as a military target, obstructions to low-flying aircraft in the area, and defenses around the area to include air defense measures.

d. A target illustration sheet which normally consists of an annotated photograph of the target area.

e. Any additional target information not included elsewhere.

Section VI. SECURITY CLASSIFICATION OF AERIAL IMAGERY

9–17. General

Aerial imagery is assigned a security classification according to the degree of classified information that it contains or according to the methods by which it was obtained. The determination to classify imagery according to content and the degree of classification selected is the responsibility of the commander of the area over which the imagery has been taken. In actual practice, the area commander will designate the classification procedures; however, the unit that controls the sensor equipment will be responsible for marking the imagery produced. Security classification of imagery will be accomplished in accordance with AR 380–5, AR 380–6, AR 380–7, AR 380–21 and AR 380–23. In accordance with AR 380–5, electronic transmission of aerial imagery, except by secure means, is prohibited.

9–18. Marking, Storage, Control, and Destruction of Classified Imagery

a. Actual marking of imagery is governed by the method in which it is handled and stored. Defense Intelligence Agency Manual (DIAM) 55–5 will be followed in the marking of defense security classifications on imagery. Titling for imagery for NATO use will be made as set forth in appendix E.

(1) Negatives and prints in uncut rolls need only be marked with the classification at the beginning and end on each strip.

(2) Negatives and prints that are cut must be marked individually. Individual negatives and prints must be marked top and bottom on each copy. In addition, the classification should be placed beneath the legend (title block) of each negative and in the center of the revers side of each print. Negatives must be marked so that the classification will reproduce clearly on all copies made.

b. In addition, all containers and wrappers used to store classified imagery must be conspicuously marked in compliance with AR 380–5. The storage of classified imagery is no less important than for other classified documents. Under conditions of 24-hour operations, large volumes of classified imagery can be secured by keeping it under the physical control of the duty team.

c. Classified imagery will be furnished only to those who possess clearance and have a need-to-know. Receipt and registration requirements are the same as for other documents.

d. Destruction of classified imagery is the same as for other classified documents. With imagery, bulk destruction is a normal but a time-consuming

process. To facilitate destruction procedures and eliminate keeping excess imagery on hand, all echelons should establish a periodic imagery review program to identify imagery no longer required so that it may be destroyed or furnished to other interested agencies. Local SOP will establish imagery retention periods; however, the tactical value of imagery normally will have been fully exploited within 90 days after acquisition. This period will be shortened or lengthened dependent upon the degree of tactical movement taking place in the combat area and the echelon of command at which the imagery is being retained.

9–19. Derivative Classification

Reports and special studies developed from classified imagery and referring directly to that imagery will require a derivative classification at least equal to the classification of the imagery itself. When the final classification is made on a derivative basis only, group markings must correspond to the group markings on the imagery.

Section VII. RETENTION, STORAGE, EVALUATION AND DESTRUCTION OF IMAGERY

9–20. General

Most aerial surveillance and reconnaissance imagery is acquired for analysis by an imagery interpreter. A notable exception is imagery acquired for testing, training or mapping purposes.

9–21. Retention Planning

a. Each echelon acquires that imagery necessary to support its intelligence production requirements utilizing either organic or supporting reconnaissance capabilities. Since field army headquarters, or similar echelon, is the principal planning staff, it assembles the plans for imagery acquisition and interpretation for all echelons and disseminates the intelligence results to the user.

b. During a tactical operation, a lower echelon will acquire imagery to meet its requirements. At the tactical echelon the imagery is usually of fine detail, but the strategic echelons are interested principally in the intelligence which alters the overall posture.

c. The original sensor-produced film will be retained at the acquiring echelon by the imagery interpretation section. In the case of coherent radar sensors, the first film positive imagery will be retained. The sensor signal film will be retained by the photographic processing laboratory/film library of the acquiring agency, unless used for interpretation purposes. The film library is an adjunct of the photographic laboratory. The original sensor film from other sensors will be retained originally by the imagery interpretation unit at the tactical level. When it is no longer of immediate value to the interpreter, this film will be retained within the film library of the echelon. The original imagery can be released, temporarily or permanently, to another echelon or command if priorities so dictate, or copies can be made for that organization. The period of retention within the library is dependent entirely upon the needs of the tactical commander and/or the operational situation.

d. Neither personnel nor facilities necessary to perform these library functions have been provided by TOE except in the MIBARS; however, it is primarily a clerical function requiring only limited skills and training. Recall of imagery at the tactical level can be performed by imagery interpreters, G2 Air, or other intelligence personnel.

9–22. Storage

a. A direct result of retention is the necessity for providing an adequate storage capability at each echelon. Storage in this case is divided between the TIIF and the library and is categorized as pertaining to originals and reproductions. This does not include imagery interpretation keys and map keys made in chip or book form.

b. Within the TIIF, storage will generally be in the form of the original roll of film, filed on standard reels in cans, and marked with sortie titling data. The principal exception to this is coherent radars which produce a signal film which is not intelligible to an interpreter until processed by a correlator, or unless a coherent radar imagery interpretation device is available to the imagery interpreters. The product of the correlator will be the film copy stored in the TIIF. Generally, the library will store the signal film from coherent radars, copies or duplicate film negatives or positive transparencies of imagery held in the TIIF, and original imagery for which the TIIF no longer has an immediate need but must retain for access on short notice. The library may store paper prints of aerial photography prepared for subsequent distribution to subordinate tactical

units in support of planned operations. Also, imagery received in print form from higher echelons or other services will be stored in the library after exploitation by imagery interpreters. Normally, prints will not be stored when of no further value to the echelon.

c. The original sensor film, whether negatives or positives, will be retained. The concept of storing the imagery in original film roll form is dictated by the probability that certain available data was not extracted from the imagery during the first interpretation. The interpreter is often required to recall imagery of an area or point, whether it was previously interpreted or not. However, if imagery is available of an area but does not contain the image of the target, it can still be effectively used if positional data of the target are otherwise available.

d. The storage facility of each echelon will have many common characteristics to include some environmental control to prevent damage and deterioration, sturdy racks to hold film cans and a method of rapid access to all film.

e. When there are many short lengths of film, as may be the case in SLAR imagery, it may be desirable to conserve space by splicing the short lengths together. The strips to be joined should be selected according to area, date or some other basis logical to the unit. Space may be conserved by periodic purging of the files through selective evacuation and/or destruction.

f. Imagery selected for storage is determined primarily by quality and origin. In most cases the imagery recorded in the sensor is the best; some exceptions have occurred when the imagery recorded by the ground sensor terminal (GST) is better than the sensor record. The G2 Air or the senior imagery interpreter will determine which film will be retained and the disposition of the other copies.

9–23. Evacuation

a. Imagery must be periodically evacuated to other commands for various uses. Higher echelons can usually exploit imagery more thoroughly than the lower tactical echelons. Map restitution, terrain studies, installation site selection, transportation route, and airfield construction are examples. Imagery which is representative of tactical situations is always required by intelligence schools at theater and CONUS installations. The production of imagery interpretation keys and enemy equipment handbooks also requires good imagery of all types. The constant accrual of new imagery at each echelon dictates the establishment of a sound, uniform imagery evacuation plan.

b. The evacuation plan must first consider the local echelon's requirement for imagery. All imagery of immediate tactical value will be retained at the acquiring echelon until it is superseded by better equivalent imagery or until the area covered by it is no longer of tactical significance, unless the imagery is required for comparative studies. The decision as to when imagery may be released for evacuation will depend primarily on the tactical situation, which may differ greatly between units. It will normally also differ with levels of warfare, from stability operations to a higher intensity type of warfare.

c. The evacuation plan must be uniform within a theater and must set forth what imagery acquired by subordinate echelons is to be forwarded through channels, what channel is to be used, and the criteria for evacuation selection. Most imagery is classified security information; therefore, adequate safeguards must be made for the imagery while in transit.

d. In a situation where a tactical unit is withdrawn from an area and is replaced by another unit, the imagery for that area should be transferred to the incoming unit, along with plots, reports, and sortie data. In this manner, continuity may be maintained.

9–24. Destruction

a. Excess or worthless imagery must be destroyed. Several factors must be considered in determining when imagery is excess or worthless. Normally the original negatives of aerial photographic missions will *never* be destroyed. The extremely high informational content of most photographic negatives can be exploited to greater depths at each succeeding higher echelon. But from the original negative may come several film positives, duplicate negatives and paper prints. Storage space and tactical mobility may require constant routine destruction of such reproductions. In addition, threatened loss through capture may demand immediate destruction of imagery. The G2, G2 Air, or senior imagery interpreter must determine what, when, and if destruction is to take place. The availability of replacement imagery or of the echelon's capability to obtain new imagery will affect such decisions.

b. Destruction of imagery can be accomplished by burning or by dissolution. Burning film and photographic prints is slow, tiresome, and expensive. The better method is through dissolving the emulsion on the film or paper, reclaiming the silver content, and reclaiming the base of the film. Film and paper which are properly cleared of imagery need no longer be classified. The reclaimed silver and film base have great economic value and these products must be returned to the national economy in accordance with national policy. Equipment for clearing of film and prints will be a component of the tactical imagery processing laboratory.

c. The introduction of the in-flight data transmission system, in which two or three rolls of imagery are produced for each sensor's operation, poses the same problem in destruction as in storage and retention. Normally, the best imagery will be retained. When the "best" has been determined, the other sets may be evacuated, stored or destroyed, dependent upon the tactical needs of the acquiring echelon and its higher headquarters. Routine clearing of film will permit optimal employment of the equipment and permit periodic evacuation of the recovered silver and cleared film.

CHAPTER 10

BRIEFINGS AND DEBRIEFINGS
STANAG 2134, 3377; SEASTAG 3377

Section I. GENERAL

10–1. Purpose

Briefings and debriefings are conducted for all aircrew members, aerial observers, and airborne sensor operators as a means of insuring the maximum utilization of all available aerial surveillance and reconnaissance means.

10–2. Briefings

Briefings serve the purpose of furnishing flying crews with a thorough understanding of the current enemy and friendly situation, the terrain, weather, mission requirements, and other administrative instructions that facilitate the successful accomplishment of their assigned tasks. Briefing by Army ARLO or G2 Air representatives may be given separately or as a part of a unit briefing presented by the commander of the Army or Air Force unit providing the supporting aircraft.

10–3. Debriefings

Debriefings of aircrew members are conducted to obtain information of intelligence value which they have acquired during the course of the mission. This information may be in addition to that collected by airborne sensors, or it may confirm or refute information indicated on sensor returns. Debriefings are conducted immediately upon return of a flying crew. Items of significant interest may be identified through debriefing before the sensor results have been processed and interpreted.

10–4. Conduct of Briefings and Debriefings

All briefings and debriefings discussed in this chapter are limited to those presented by the attached ARLO or G2 Air representative present with a flying unit. When possible, debriefings are conducted by the same person who conducted the briefings. These briefings and debriefings do not replace unit briefings conducted at the discretion of the flying unit commander.

Section II. BRIEFINGS

10–5. General Briefing

a. The ARLO or G2 Air representative's general briefing normally is given on a daily, preplanned basis to all flying crews of the flying unit. Usually it is presented as part of the flying unit's daily briefing. The unit's daily briefing includes presentations by the unit commander, the operations officer, the intelligence officer, the weather officer, and other specialists and technicians as directed by the unit commander. The general briefing of the G2 Air representative or ARLO acquaints flying personnel with current (next 24 hours) operations, the enemy and friendly situation, terrain and weather, and administrative instructions. This general briefing aids in reducing the amount of information which must be presented at the preflight briefing.

b. The information presented by the ARLO or G2 Air representative in the general briefing follows the format of a standard operation order (fig 10–1). Items habitually contained in an operation order such as weather, administration, or logistics can be eliminated by the ARLO or G2 Air representative briefing when covered by other briefers. As a minimum, subjects which should be covered in the general briefing include—

(1) *Current summary of the situation.*

(*a*) Current friendly and enemy activity.

(*b*) Resume of enemy order of battle.

(*c*) Current estimate of enemy's capabilities.

(*d*) Identification of enemy lines of communication and possible traffic choke points.

(*e*) Location of suspected or possible enemy assembly or activity areas.

(*f*) EEI or OIR—General and specific elements relative to zone in which mission is planned and the specific requirements of the mission.

(2) *Terrain in the area of operations.*

(*a*) Location of critical terrain features.

(*b*) Specific terrain and target area environmental characteristics and their impact on the assigned task (mission).

(*c*) Environmental/target characteristics and their effects or impact on selected sensor acquisition.

(3) *Discussion of the supported unit's aerial surveillance and reconnaissance plan.*

10–6. Preflight Briefings

A thorough understanding of the aerial surveillance or reconnaissance mission to be performed enhances mission accomplishment by the aircraft crew. The ARLO or G2 Air representative's preflight briefing is conducted to provide flight crews with the latest information concerning the purpose and importance of their mission, problems which may be encountered, and specific information desired by the requester. The preflight briefing is more specific than the general briefing. Time allotted for the preflight briefing will vary from a few minutes for an immediate mission to as much as 30 minutes for a preplanned mission. The briefing may be by the ARLO or G2 Air representative alone, or it may be given in conjunction with the preflight briefing presented by members of the flying unit. It may even be necessary to provide preflight-type briefing information to an aircraft crew in flight, should an adjustment be made to their current mission or an actual diversion be made to another mission. Items covered include—

BRIEFING GUIDE

SITUATION...
- ENEMY FORCES
- FRIENDLY FORCES
- WEATHER

MISSION...
- SUPPORTED UNIT
- FLYING ORGANIZATION

EXECUTION...
- PLAN FOR FLIGHT
- SPECIFIC REQUIREMENT
- PICKUP POINTS

SERVICE SUPPORT...
- PETROLEUM, OILS, LUBRICANTS
- MAINTENANCE FACILITIES
- SPECIAL EQUIPMENT REQUIREMENTS

COMMAND...
- CHAIN OF COMMAND
- AIRCRAFT CONTROL

SIGNAL...
- SIGNAL OPERATION INSTRUCTIONS
- AIR GROUND SIGNALS

Figure 10–1. Briefing guide.

a. Mission requirements.

(1) Identification of requesting unit.

(2) Mission priority.

(3) Type of mission.

(4) Location and description of target and target area.

(5) Time on target (TOT).

(6) Specific intelligence requirements.

(7) Type of coverage and desired scale, if a photomission.

(8) Coordinating instructions, unit call signs, preplanned fires, and rendezvous instructions.

(9) Frequencies and call signs for lifting supporting fires.

(10) Requirement for confirmatory photography, when appropriate.

(11) Requirement for in-flight reporting, when appropriate.

(12) Authentication system to be used with communications.

b. Changes in friendly and enemy dispositions since last general briefing.

c. Special checkpoints and other navigational aids.

d. Possible enemy countermeasures to include jamming and deception en route to, from, and in the target area.

10–7. Briefing Materials

a. Current information required to present accurate ARLO or G2 Air representative briefings is received through Army channels. The ARLO's normally receive their briefing material through their parent MIBARS organization. This material consists usually of an ARLO packet developed by the field army G2 Air duty team and delivered through the MIBARS operations and intelligence section by the battalion's organic delivery platoon or over the MIBARS operations net. G2 Air representatives receive current information from their own G2 Air section. This information normally is transmitted by signal communications means as discussed in chapter 6, or is delivered by scheduled courier runs. Other operational traffic on the MIBARS operations net or command intelligence net will furnish additional current information of briefing value.

b. To provide a rapid means of presenting preflight briefings on the most current information readily at hand, the briefing officer will require various briefing aids. The major aids necessary include—

(1) Situation maps to present both the enemy and friendly situations and show the target areas for specific missions.

(2) Aerial photographs to familiarize aircrews with terrain features, the target area, and possible target locations.

(3) Files and records for ready reference, to include intelligence reports, operation orders, order of battle, and special studies.

(4) Imagery interpretation keys to assist in the orientation of flying personnel on new equipment or to assist in debriefings by providing a means of identification of objects sighted.

(5) Any other graphic aid which will improve the flying crews' recognition and retention capabilities, or otherwise assist in mission preparation. Examples of these graphic aids are terrain models, special photographs, sketches, and equipment models.

Section III. DEBRIEFINGS

10–8. Purpose

Debriefings are an important part of the ARLO and G2 Air representative's duties. The purpose of debriefings is to insure the collection of the maximum amount of usable information and to expedite the dissemination of this information in the minimum amount of time after aircraft touch down. In-flight reports are included as part of the debriefer's mission report.

10–9. Planning Debriefings

To facilitate accomplishment of a debriefing, the use of aids should be preplanned. Items such as maps, special photography, models, and other aids which will assist flight crews in recalling observations should be used whenever possible. A Debriefing Checklist (fig 10–2) is used to keep a debriefing moving smoothly and to eliminate gaps in the information given and needless duplication of comments. When required for specific intelligence purposes, debriefers must utilize specialists or technicians, such as image interpreters, technical intelligence specialists, and other qualified intelligence specialists, to assist in debriefing by covering subject within their specialized areas. If the flying crew makes an in-flight transmission of information over a prearranged frequency direct

to the requesting unit, it should also be discussed in the debriefing for possible additional information.

10–10. Conduct of Debriefings

a. Debriefings normally are conducted in coordination with the flying unit's intelligence officer. They are conducted informally and with due consideration for the physical and mental fatigue of the flight crew. Each crewmember normally is debriefed individually to preclude their being influenced by one another. Debriefings generally are

DEBRIEFING CHECKLIST

Date: _____

Mission number: _____ Pilot: _____ Observer: _____

Element designation: _____

Type of mission: _____

Type of aircraft: _____

Target description: _____

In-flight reports made: _____

Contacts made during flight: _____

Deviations made from plan: _____

Sightings: _____ Location: _____

Description: _____ Time: _____

Installations: _____

Movements: _____

Communications and electronics: _____

_____

Weapons: _____

Defenses: _____

Obstacles: _____

Miscellaneous: _____

_____

Debriefer's name and organization

Figure 10–2. Debriefing checklist.

conducted without interruption. When possible, debriefings should be recorded to assist in developing the complete mission report after the debriefing is completed.

b. In the debriefing, each crewmember describes, in his own words, the mission and his observations or findings. The debriefer asks questions to clarify statements or guide the crewman in his narrative. The debriefer must establish rapport with the crewmember to be effective. He must rely upon his own personality and acquaintances with the personnel of the flying unit to put the crewmember being interrogated at ease. Before the debriefing is terminated, both the crewmember and the debriefer should review the notes for completeness and accuracy. The debriefer should not—

(1) Ask leading questions.

(2) Discredit the crewman's observations or beliefs.

(3) Be overly insistent in questioning.

(4) Argue or introduce needless discussion.

(5) Keep a briefing going longer than is necessary.

Section IV. RECORDS AND REPORTS

10–11. Records

All ARLO and G2 Air representatives maintain records to assist in the performance of their duties and serve as references for future operations and periodic resumes of operational accomplishments. The minimum records which will be maintained include—

a. Daily Journal (FM 101–5).

b. Aircraft and sensor equipment status record.

c. Current planned, in-flight, and completed missions.

d. Operation orders and intelligence reports.

e. Current briefing notes and aids.

f. Completed reports and action summarizations.

10–12. Reports

a. In-Flight Report. The in-flight report is transmitted by an aircraft crew during the conduct of a mission as soon as it is able to report the results of its mission or to report tactical information of such importance and urgency that delay in reporting would render the information useless. The report is transmitted by voice radio, in the clear, unless prearranged codes have been established. The format for the in-flight report has been standardized as shown in figure 10–3.

b. ARLO and G2 Air Representative Reports. Three types of reports normally are submitted by ARLO and G2 Air Representatives. Additional reports may be required by the supported G2 Air or the MIBARS elements commander as the situation dictates. The three common reports are—

(1) *Mission report (MISREP).* A mission report is submitted at the conclusion of each mission. It is based on notes and observations made during the debriefing and includes any in-flight report made by the aircraft crew. Preparation and dissemination of mission reports are accomplished as rapidly as possible after completion of the mission and normally not later than 30 minutes after aircraft touchdown. The format for a mission report has been standardized as shown in figure 10–4.

(2) *Hot photo report (HOTPHOTOREP).* This report is a short, concise report covering significant information of immediate tactical value (para 9–8). Normally it is disseminated as a result of quick sensor readout if this information was not included in the MISREP. The HOTPHOTOREP format has been standardized as shown in figure 9–3.

(3) *Summary report.* The summary report is a consolidation of information obtained on selected enemy activity and is submitted to the G2 Air according to an established schedule. These reports are used by the G2 Air to analyze the enemy situation, the effectiveness of the aerial reconnaissance and surveillance effort, and to assist in planning future operations. Format will vary with the requirements of the report.

c. Dissemination of ARLO and G2 Air Representative Reports.

(1) The normal dissemination of ARLO reports is through the MIBARS headquarters to the G2 Air. The ARLO transmits the MISREP's, HOTPHOTOREP's and Summary Reports over the MIBARS operations net through the Operations and Intelligence Section of the MIBARS to the field army and corps G2 Air sections, or he may use the delivery platoon. At the MIBARS the report is disseminated to other interested agencies, as directed. Copies of all ARLO reports at

(Classification)

USE STANDARD MESSAGE FORM HEADING

(Transmitted by voice radio)

FORMAT

IN-FLIGHT REPORT (Always start of message)

AIR TASK/MISSION NUMBER

A. Location identifier (only if necessary for clarification)

B. Time on target/time of sighting

C. Results of mission, brief description of obervation, recommendations for attack/ reattack if necessary

(Classification)

(Classification)

USE STANDARD MESSAGE FORM HEADING

(Transmitted by voice radio)

EXAMPLE MESSAGE

IN-FLIGHT REPORT

3/A501

A. LC/7354

B. Target sighted 1610Z

C. Observed five tanks in woodline and five additional tanks seen moving with troops west of HOF at 1615Z

(Classification)

Figure 10–3. In-flight report.

(Classification)

USE STANDARD MESSAGE FORM HEADING

FORMAT

MISREP (Always start of message)

AIR TASK/MISSION NUMBER

A. Location identifier, such as target number, coordinates, etc.

B. Time on target and time of sighting

C. Results

D. Photo confirmation

E. Other pertinent information

(Classification)

(Classification)

USE STANDARD MESSAGE FORM HEADING

EXAMPLE MESSAGE

MISREP

2/A55

A. LC 725355

B. 231150Z

C. Bridge over river U/C

D. Yes

E. Concentrated light antiaircraft artillery at target, 8/8 ceiling, 500 feet

(Classification)

Figure 10–4. Mission report.

detachment level are furnished to the detachment commander for his information and to assist the detachment's imagery interpreters in the accomplishment of their mission. ARLO reports may be transmitted in conjunction with imagery interpretation reports on the same mission if no time delay will be involved.

(2) The G2 Air representative normally will use radio, telephone, or courier to send his reports directly to the G2 Air. Copies of his reports are also furnished to the flying unit and supporting imagery interpretation elements.

Section V. INTELLIGENCE COLLECTION FROM NONINTELLIGENCE ORIENTED AVIATION ASSETS

10–13. General

It has become evident through after action reports and "lessons learned," from operations in Vietnam, that nonintelligence aviation assets are not being fully exploited for intelligence collection. All aviation assets can supplement the existing collection means, particularly the use of assault helicopter companies, aerial weapon companies, general support companies, and brigade aviation sections. Utilization of these assets, whose primary mission is not intelligence collection, would enhance and add to the intelligence collection effort.

10–14. G2 Air Responsibilities

Although aviation personnel have been indoctrinated and are aware that all flights over an area of operation could afford the opportunity to provide intelligence information of a possibly vital nature, the importance of visual reconnaissance during the conduct of normal missions must be continuously reemphasized. The G2 Air should insure that items of intelligence interest and EEI are provided, through proper channels, to the nonintelligence aviation units supporting his organization. However, the G2 Air must insure that he in no way interferes with the accomplishment of the basic mission of these aviation assets.

10–15. Debriefing

The G2 Air should insure that those nonintelligence directed aviation personnel are debriefed after completion of their missions. The method and type of debriefing will be dependent on the situation, time available, and location of personnel. All personnel should be encouraged to stimulate imaginative thinking in order to insure that all means of aviation information collection are fully exploited and provided to the intelligence analysts.

CHAPTER 11

AERIAL SURVEILLANCE AND RECONNAISSANCE IN STABILITY OPERATIONS

Section I. GENERAL

11-1. Introduction

Doctrine for aerial surveillance and reconnaissance in stability operations is the same doctrine as applied to other types of warfare. Methods and techniques of employment remain the same only varying in their application to the scope of surveillance and reconnaissance requirements unique to the particular insurgency situation and environment. However, the difficulty encountered in intelligence acquisition is greatly increased due to the nature of insurgency concepts, force structure, tactics, and practices. The insurgent forces in the areas of operation do not present or generate those indications of their existence that are easily detectable or identifiable. Conversely, aerial surveillance/reconnaissance aircraft operating in a stability environment have greater flexibility in tactics because of the lack of significant enemy air defense systems. This differs considerably from the relative ease enjoyed in detecting conventional enemy forces in the conventional types of warfare, and in the relative difficulty in surviving in a sophisticated hostile air defense environment. The success of aerial surveillance and reconnaissance efforts in counterinsurgency and stability operations will be relative to the degree of environmental acclimation of all participants beginning with the information requesters and continuing through to the image interpreters.

11-2. Special Considerations

a. Stability operations encompass the terrain of an entire country with the possible attendant problems of long seacoasts and ill-defined international boundaries. In addition, the terrain on which the enemy organizes his base areas may be remote, sparsely populated and characterized by extreme terrain configurations and poor lines of communication. His security practices and his ability to blend into existing cultural activities and features make his areas of habitation difficult to identify both in the host country and in the sanctuary areas.

b. The problem is to formulate realistic indicators of enemy activity which deviate from the natural civilian activity in all local environments. This must be accomplished, however, if enemy activity is to be separated from normal civilian activity.

c. The prerequisite to success is a thorough understanding of the total sum of the natural and human factors involved in the area of operations. These factors include detailed knowledge of enemy forces and methods of operation, coupled with physical geography and cultural aspects as well as the sociological and economical aspects of rural and urban configurations and activities, to include agriculture, industry, transportation, and communications.

d. Insurgents can be detected through indirect, as well as direct, evidence of their presence. Direct evidence normally is difficult to gather in stability operations. Such evidence includes uniforms, equipment, military type vehicles, deliberate field fortifications, logistical facilities, and large troop movements. Indirect evidences of insurgent presence are most probably the indicators which will be first discovered. Examples of indirect evidence are:

(1) Ostensible civilian activity in isolated areas or in areas where activity normally has not been observed.

(2) Unexplained increases in the dwelling density of a village or hamlet.

(3) Built-up areas not shown on official maps or which are detected as a result of comparative photography of the area.

(4) Unexplained movement of local inhabitants from one location to another or across international boundaries.

(5) Unexplained abandonment of villages, cultivated areas, equipment, or food sources.

(6) Isolated open areas being prepared for, or under cultivation with, food crops or small areas of forest being cleared of underbrush and thick foliage for no apparent reason.

(7) Logging, charcoal, and other rural-type production in areas previously unworked or not easily accessible to people of the area.

(8) Roads, cart trails, and footpaths that are inconsistent with population centers and the agricultural practices of the area.

(9) Other unexplained disturbances to the normal surface characteristics of the area.

(10) Fires in remote areas or burned out areas that have not been caused by local ground clearing operations or indigenous cultivation.

(11) Fish nets located in isolated areas or areas previously unfished.

(12) Abnormal increase in traffic on established roads or waterways.

(13) Beasts of burden grazing in uninhabited areas as well as the presence of edible livestock in these areas.

(14) Any unidentified or suspicious activity detected by IR, radar, or other sensory devices at night or during bad weather.

11-3. Requirements for Effective Aerial Surveillance and Reconnaissance

a. Aerial surveillance and reconnaissance is required throughout all phases of insurgency. Requirements differ at each level—national, regional, and tactical unit—according to the particular phase of insurgency involved.

b. The intelligence officer, by close liaison, coordination and cooperation, must insure the full integration of aerial surveillance and reconnaissance is integrated into the overall collection plan supporting stability operations. Further, he must coordinate closely with sources of information other than intelligence collection agencies. This includes host country civilian, paramilitary, and military agencies as well as US and allied military and civilian organizations in-country.

c. Maximum use must be made of comparative cover. This includes integration of all sensors and sensor modes available to include vertical and oblique photography, color and camouflage detection photography, visual observation, and infrared (IR) and side looking airborne radar (SLAR) imagery. Employment of sensors to detect enemy activity must be based upon a thorough knowledge and analysis of all available intelligence information.

d. Special consideration should be given to obtaining information from collateral sources to enlarge imagery interpretation key materials as early as possible in the operation. Established imagery interpretation keys must be periodically reviewed and updated to incorporate changes in enemy concepts and tactics.

Section II. AERIAL SURVEILLANCE AND RECONNAISSANCE OPERATIONS

11-4. General

General considerations in planning, operations, and coordination of aerial surveillance and reconnaissance as described in this manual remain valid for stability operations. However, due to the necessity of search for minute detail, the following amplification of methods and techniques is provided.

11-5. Visual Aerial Surveillance

a. Insurgent activity may be better identified by repetitive visual area search, by assigning pilot and observer personnel to the same area on a daily basis for as long as possible. By becoming intimately familiar with the topography, the man-made features of the area, and the same human activities that take place day after day, these personnel will more readily detect changes which indicate enemy activity. "Low and slow" type aircraft are the most suitable platforms because they afford a closer view of the terrain for a longer period of time than high performance aircraft.

b. A special employment of visual aerial surveillance in stability operations is the use of continuous day-night visual observation over friendly installations. Insurgent attacks against installations may involve the use of mortars, rockets, and recoilless rifles as well as demolitions and individual weapons. The employment of crew-served weapons requires the selection and preparation of weapons positions, field of fire, and the stockpiling of ammunition in advance of the attack. To accomplish these preparations, the insurgent must infiltrate the selected areas near the target installation. Continuous, visual aerial surveillance out to the maximum effective range of the weapons available to the insurgent may disclose unusual

movement or activity within the area, or even the actual preparation of firing positions.

11–6. Permanent Record Imagery

a. Hand-held Camera Photography. The use of hand-held cameras by trained observers in organic observation type aircraft provides an effective supplement to other aerial imagery in recording visual sightings and providing quick reaction photography of selected areas or objects of interest, particularly with self-developing film.

b. Conventional Photographic Imagery, Scale of Coverage.

(1) The scale of coverage, as a general rule, should be the largest possible consistent with the type of coverage desired, intended use, size of area to be recorded, time allocated for the mission, type of aircraft and systems available, and the degree of urgency of the desired information. The following recommended scales vary from those in chapter 4 due to the special factors inherent in stability operations: Initial record 1:10,000 —1:25,000, general intelligence record: 1:5,000 —1:10,000, and detailed intelligence record 1:5,000 or larger.

(2) Larger scales are required to aid in the search for individual activity such as one or two foxholes or a single weapons emplacement, camouflaged objects to include cave entrances and supply caches, mockups in training areas, huts or lean-to's, elevated OP construction, charcoal manufacturing activity and the use of pack animals, wagons, or handcarts.

c. Radar Imagery. Unlike photography or visual sightings, which can more readily permit identification of an indicator as insurgent or friendly, MTI radar will record friendly, neutral, and hostile indicators with equal uniformity. Additionally, many indirect indicators of insurgent activity are not recordable on present aerial imagery. As a general rule, radar surveillance should be established where insurgent movement is expected to occur in the degree necessary to be detected by available sensor equipment. This is best accomplished by targeting areas or lines of communication generally restricted to enemy occupation or by cessation of civilian movement under governmental curfew control.

d. Infrared Imagery. Infrared (IR) imagery and photographic imagery are complementary and for best results the two should be utilized together when possible. IR coverage can be used effectively particularly where the development of comparative covers allows an interpreter to detect changes of patterns by relative heat emissions within suspect areas. Heat emissions sources, however, can be removed from troop concentration or sufficiently attenuated either by dense natural overhead canopy or preparation of earth works. Therefore, the information interpreted from IR imagery must be correlated with extensive collateral information and a thorough knowledge of insurgency tactics.

11–7. Reports

While hot photo reports and initial photographic interpretation reports may continue to serve specific intelligence requirements in stability operations, there will be a concurrent, increased need for the more detailed general photographic interpretation reports. These reports are of greatest value to the requester who needs information on terrain characteristics, trafficability, road and trail reports, landing and drop zones, or other items unique to the situation/environment which requires extensive interpretation, evaluation, and photogrammetric measurements. In many instances, these reports include the preparation of other supporting material to include overlays and other graphic displays such as photomosaics, annotated photographs, and target folders.

11–8. Development of Interpretation Capabilities

a. In order to obtain the greatest value from imagery, interpreters must be oriented and acclimated toward a specific area of stability operations. All sources of background information germane to the area, its people, and the local environment should be furnished the interpreter to help him better understand the target area and the related indications he must detect, identify, and interpret. Maximum assistance must be made of host country military and civilian agencies as well as in-country US agencies that have background on-the-ground experience in the areas of interest, to identify and interpret new or unusual items discovered on imagery.

b. During early phases of insurgency, the image interpreters' efforts are directed primarily to acquiring and cataloguing initial record imagery, assembling basic data and reference material, establishing *localized* imagery interpretation keys and procuring required maps. Terrain and trafficability studies, and support to military and civil-

ian activities in internal development and relocation operations may be initiated on an as required basis.

c. The continuing development of *local* imagery interpretation keys on site becomes a necessity throughout subsequent phases of stability operations. These "local keys" are invaluable for keeping pace with changes in insurgent techniques and surveillance and reconnaissance countermeasures introduced in the vicinity or developed during the course of the insurgent operations. The urgency of intelligence needs coupled with the fleeting nature of insurgent forces and activities demands that local keys provide the timely means of making the initial detection breakthroughs in time to be of value to the local ground commanders.

11–9. Target Acquisition

Target acquisition involves the detection, location, and identification of ground targets in sufficient detail to permit the effective employment of weapons. It is discussed generally in FM 30–5 and more specifically in FM 6–121. In stability operations, combat surveillance furnishes much information for target acquisition, but because of the many difficulties in fixing the enemy, all means of target development including intelligence information from all available sources must be used in concert and maintained in detail by the G2 staff.

a. Target Folders. Individual targets range from the smallest and most rudimentary to the relatively large and complex. To facilitate planning, a target folder is developed as discussed in paragraphs 9–14 through 9–16. The target folder includes all available intelligence about the target. The collection effort is directed toward acquiring the specific additional information to verify, refute, identify, or locate the suspect target. All acquisition means are considered for the collection effort, particularly long range reconnaissance patrols, aerial observers, and aerial imagery.

b. Pattern Analysis. Because of the difficulty in obtaining substantive targeting information the technique of pattern analysis may be required to pinpoint enemy locations. This technique requires detailed plotting of all information obtained on enemy activity within a specified area to include order of battle information, enemy movements, enemy initiated incidents, trail and road activity, construction and the readout from airborne sensors. The base for plotting can be 1:50,000 scale maps or mosaics at larger scales. All information, plotted over a period of time, forms patterns of activity which when interrelated during analysis assists in locating major enemy areas such as headquarters, troop concentrations, supply bases, and training areas etc. The following are examples of procedures used in setting up a pattern analysis map:

(1) Plotting all information on one map for study.

(2) The taking, and plotting of seasonal imagery and information on one map thereby getting patterns seasonally, e.g., wet and dry seasons, or cold and hot seasons which may render certain areas unsuitable for insurgent operations or encampments, such as flooding or lack of foliage.

(3) Using overlays for each type of activity, which can be used in studying insurgent pattern as each is placed over the map either seasonally or annually.

c. Aids in Support of Quick Reaction Attack. Airborne sensors which provide an immediate readout capability may be employed in surveillance roles in much the same manner as forward air controllers (FAC) or airborne artillery observers. That is, information obtained on a near real time basis either by cockpit or data link readout can be immediately passed to tactical ground and air units for exploitation. Such a program involves close coordination and good communications between air to air and air to ground elements and other services as applicable. Most suitable areas of operations are those areas or lines of communications generally restricted to enemy movement or other activity either by general enemy occupation or curfew imposition on civilian activity. Disruption to the normal patterns in the area may be considered an indication of insurgent activity and, depending on the degree of identification achieved, either further investigated or attacked by friendly elements immediately upon detection.

Section III. EMPLOYMENT OF AIRBORNE PERSONNEL DETECTOR

11–10. General

a. The aircraft-mounted, airborne concealed personnel detector—commonly called the airborne personnel detector (APD)—is an aerial reconnaissance and surveillance device employed to provide a tactical commander with information

indicating whether or not an area is occupied by concealed personnel. A helicopter is normally used to carry the APD and its operator.

b. The APD is not capable of detecting humans but it is capable of indirectly detecting evidence of certain human-related activities which indicate the presence or recent presence of personnel in the area. These activities include, but are not limited to, campfires and internal combustion engine operation. They are sources of submicroscopic airborne particles (condensation nuclei particles) which are detected when air containing the particles is drawn into the APD.

c. The relative concentration of particles in an air sample is indicated by readings on two meters which can be visually monitored by the APD operator.

d. A detailed description of the APD and the functioning of its components is contained in TM 3–6665–267–12. Instructions for operation, operator maintenance, and organizational maintenance of the device are also contained in that manual.

11–11. Purposes of Employment

Purposes for which the APD may be employed include—

a. Providing information about probable enemy habitation of a specific area for immediate or future exploitation of this area.

b. Monitoring specific areas including convoy routes to determine human activity and patterns of movement.

c. Confirming, supplementing, or refuting information obtained from other reconnaissance, surveillance, and intelligence sources.

d. Supplementing low-level visual reconnaissance operations in areas where visual observation is limited.

11–12. Typical APD Missions

a. Mission for Collection of Intelligence Information. This mission is flown to obtain intelligence information or to confirm, supplement, or refute information obtained from other sources. Detection of suspect enemy activity normally is responded to by friendly fires only if the enemy can be seen or the detector aircraft is fired upon.

b. Mission for Reconnaissance of Areas Immediately Prior to Offensive Operations. Prior to insertion of troops into an area, the APD may be employed on a mission to determine specific areas of suspect enemy activity within the planned operational area or to indicate whether or not proposed landing zones are occupied. Detector readouts are immediately relayed to the tactical commander to assist him in completing his planning.

c. Target Acquisition Mission. This mission is usually based on information obtained from other sources. It is flown for the purpose of detecting targets to be attacked immediately by fire support or maneuver forces.

11–13. Mission Planning

a. Planning for APD missions to be flown over suspected enemy locations to confirm the enemy's presence and to pinpoint his location should be integrated into the overall tactical plan of the unit commander concerned.

b. Prior to the initiation of an APD mission to obtain information, plans should be made for actions to be taken upon completion of the mission. If immediate attacks on detected targets are anticipated, the use of field artillery, airstrikes, attack helicopters, air cavalry elements, or troop units should be planned and coordinated between the attacking force and the APD team. When field artillery and tactical air attacks are anticipated, plans should be made for a field artillery observer and a forward air controller to accompany the APD mission.

11–14. Typical Mission Coordination Procedures and Responsibilities

Typical APD mission coordination procedures and responsibilities are listed below.

a. The unit requesting the mission provides the G2/S2 of the unit controlling the mission with information pertaining to—

(1) The type of mission to be flown, the area to be searched, the specific information required from the mission, and when appropriate the reaction force to be employed.

(2) Radio frequency for the reporting of mission results.

(3) Locations of field artillery and airstrikes in the search area during the past 24 hours.

b. The G2/S2 Air of the unit controlling the mission—

(1) Obtains the commander's approval of the search area and determines mission priority.

(2) Arranges, in coordination with the G3/

S3 and the aviation staff officer, necessary aviation support.

(3) Informs the chemical officer and aviation staff officer as to the time of the mission and area to be searched.

(4) Compiles available intelligence information concerning enemy activity in the search area.

(5) Coordinates with the G3/S3 and obtains information about specific fire zones, location of friendly troops, and field artillery clearance procedures.

(6) Briefs the chemical officer, aviation staff officer, and when appropriate the field artillery aerial observer and forward air controller concerning the mission to include current intelligence.

c. The chemical officer of the unit controlling the mission:

(1) Designates the APD operator.

(2) Plans the search pattern to maximize the use of the APD.

(3) Briefs the APD operator and the helicopter pilot, copilot, and crew concerning the mission.

(4) Coordinates with the G2/S2 and arranges for intelligence personnel to debrief the APD operator and helicopter pilot, copilot, and crew, and to conduct a post-mission analysis of data gained from the mission.

11–15. Typical Post-Mission Analysis

a. After an APD mission has been completed, intelligence personnel debrief all personnel who were engaged in the mission. They analyze and correlate the information gained from the map plot and recorder strip chart with information obtained from other intelligence sources concerning the searched area.

b. The G2/S2 of the unit conducting the mission provides a consolidation and evaluated report to the unit requesting the mission as appropriate.

11–16. Aircraft Requirements

a. An APD mission requires one APD helicopter (utility or light observation) and at least one helicopter to provide plotter and covering fire support. When the number of supporting aircraft is one, the required type is an armed helicopter (gunship). When the number of supporting aircraft is two, a utility helicopter may provide plotter support while a gunship is required for fire support. Depending upon the situation and type of mission, there may be requirements for additional helicopters including light observation helicopters for visual observation and gunships for the attack of detected targets.

b. During an APD mission a backup, troop-carrying helicopter should be available for the rescue of the personnel of any helicopter which is forced down.

11–17. Typical APD Employment

a. The APD helicopter is flown at low altitude (nap of the earth) to obtain APD readings as near to the sources of airborne particles as is practicable. The optimum speed of the aircraft is between 80 and 90 knots.

b. The helicopter is flown perpendicular to the wind direction and in a series of parallel passes beginning at the downwind side of the search area and progressing to the upwind side. Distances between the passes vary according to the situation, terrain, and mission.

c. When a mission is conducted over rugged or mountainous terrain, the helicopter is flown at near treetop level just below the crest of the ridge. The aircraft is flown perpendicular to the upslope wind. (During the day air currents in contact with the slopes become lighter than the surrounding air and rise up the slopes; this air movement is called an upslope wind.)

d. An armed helicopter (gunship) orbits above the APD helicopter at an altitude of 1,000 to 1,500 feet. The gunship copilot acts as navigator for the APD helicopter, plots detections as they are called out over the radio by the APD operator, acts as a radio relay to the supported unit and designated target attacking force, as appropriate, and provides covering fires for the APD helicopter.

e. Depending on the terrain and the enemy situation within the search area, a second gunship may be required to provide additional covering fires for the detector helicopter. This gunship orbits above the APD helicopter at an altitude of 1,500 to 2,000 feet.

f. If the mission calls for an immediate reaction against detected targets by supporting fires, the door gunner or visual observer may drop smoke grenades from the detector helicopter to assist in marking detected targets for artillery fires, airstrikes, armed helicopter fires, or other supporting fires.

APPENDIX A

REFERENCES

(C) AR 10–122	United States Army Security Agency (U)
AR 95–1	Army Aviation—General Provisions
AR 115–10	Meteorological Support for the US Army
AR 310–31	Management System for Tables of Organization and Equipment (The TOE System)
AR 310–50	Authorized Abbreviations and Brevity Codes
AR 380-series	Military Security and Classification
AR 381–8	Data Recorded During Aerial Photographic Flights
AR 600–106	Aeronautical Designations and Flying Status for Army Personnel
AR 604-series	Personnel Security Clearance
AR 750–1	Maintenance Concepts
DA Pam 310-series	Military Publications Indexes
DA Pam 750–1	Preventive Maintenance Guide for Commanders
FM 1-series	Army Aviation
FM 3–10	Employment of Chemical Agents
(C) FM 3–10B	Employment of Chemical Agents (U)
FM 5–20	Camouflage
FM 5–30	Engineer Intelligence
FM 5–34	Engineer Field Data
FM 5–36	Route Reconnaissance and Classification
FM 6–20–1	Field Artillery Tactics
FM 6–121	Field Artillery Target Acquisition
FM 6–135	Adjustment of Artillery Fire by the Combat Soldier
FM 7–30	The Infantry Brigades
FM 11–20	Signal Operations, Theater of Operations
FM 11–21	Tactical Signal Communications Systems, Army, Corps, and Division
FM 11–40	Signal Corps Pictorial Operations
FM 11–50	Signal Battalion, Armored, Infantry, Infantry (Mechanized) and Airmobile Divisions
FM 11–57	Signal Battalion, Airborne Division
FM 11–92	Corps Signal Communications
FM 11–125	Field Army Signal Communications
FM 17–30	The Armored Brigade
FM 17–36	Divisional Armored and Air Cavalry Units
FM 17–95	The Armored Cavalry Regiment
FM 19–30	Physical Security
FM 21–26	Map Reading
FM 21–30	Military Symbols
FM 21–31	Topographic Symbols
FM 21–60	Visual Signals
FM 24–1	Tactical Communications Doctrine
FM 24–18	Field Radio Techniques
FM 24–21	Field Radio Relay Techniques
FM 29–24	General Support Maintenance Battalion
FM 30-series	Military Intelligence
FM 31–16	Counterguerrilla Operations
FM 31–21	Special Forces Operations—US Army Doctrine
(S) FM 31–21A	Special Forces Operations—US Army Doctrine (U)

FM 31–22	US Army Counterinsurgency Forces
FM 31–35	Jungle Operations
(C) FM 31–40	Tactical Cover and Deception (U)
FM 31–71	Northern Operations
FM 31–72	Mountain Operations
(C) FM 32–5	Signal Security (SIGSEC) (U)
(S) FM 32–10	United States Army Security Agency in Support of Tactical Operations (U)
(C) FM 32–20	Electronic Warfare (U)
FM 44–1	US Army Air Defense Artillery Employment
FM 57–35	Airmobile Operations
FM 61–100	The Division
FM 100–5	Operations of Army Forces in the Field
FM 100–26	Air Ground Operations System
FM 101–5	SOFM, Staff Organization and Procedures
FM 101–10-series	SOFM Organization, Technical and Logistical Data
JCS Pub 1	Dictionary of United States Military Terms for Joint Usage
JCS Pub 2	Unified Action Armed Forces
JCS Pub 12	Tactical Command and Control Procedures for Joint Operations
TOE 30-series	Intelligence Organizations
TM 5–545	Geology and Its Military Applications
TM 3–6665–267–12	Operator and Organization Maintenance Manual: Detector, Concealed Personnel, Aircraft Mounted, XM3
(C) TM 11–5850–203–12	DS and GS Maintenance Manual, Detecting Set, Infrared AN/AAS–14 and Transmitting Set, Radio AN/ART–41 (Airborne Components of Surveillance System, Infrared AN/UAS–4) (U)
(C) TM 11–5850–218–12	Organizational Maintenance Manual: Detecting Set, Infrared AN/AAS–14A and Transmitter, Radio AN/ART–41A (Airborne Components of Surveillance System, Infrared AN/UAS–4A) and Cable Assembly Sets, Electrical MX–7268/AAS–14A and MX–7270/UAS–4A (U)
TM 11–5895–431–12	Operator and Organizational Maintenance Manual: Tactical Imagery Interpretation Facility, AN/TSQ–43
TM 30–245	Photographic Interpretation Handbook
TM 30–246	Tactical Interpretation of Air Photos
TM 38–750	The Army Maintenance Management System (TAMMS)

APPENDIX B

ABBREVIATIONS

ACE	Airspace Control Element
APD	Airborne Personnel Detector
ARLO	Air Reconnaissance Liaison Officer
ARSPT	Air Reconnaissance Support
CTOC	Corps Tactical Operations Center
DASC	Direct Air Support Center
DTOC	Division Tactical Operations Center
ECM	Electronic Countermeasures
EEI	Essential Elements of Information
ESM	Electronic Warfare Support Measures
EWE	Electronic Warfare Elements
FAC	Forward Air Controllers
FATOC	Field Army Tactical Operations Center
FEBA	Forward Edge of the Battle Area
FSE	Fire Support Element
FTI	Fixed Target Information
GIIR	General Imagery Interpretation Report
GPIR	General Photo Interpretation Report
GST	Ground Sensor Terminals
HOTPHOTOREP	Hot Photo Report
HOTREP	Hot Report
II	Imagery Interpretation
IIIR	Initial Imagery Interpretation Report
INTSUM	Intelligence Summary
IP	Initial Point
IPIR	Initial Photo Interpretation Report
IR	Infrared
MAAG	Military Assistance Advisory Group
MTI	Moving Target Indicator
MIBARS	Military Intelligence Battalion Aerial Reconnaissance Support
MISREP	Mission Report
OIR	Other Intelligence Requirements
RATT	Radio Teletypewriter
SEASTAG	SEATO Standardization Agreement
SLAR	Side Looking Airborne Radar
SOLOG	Standardization of Certain Aspects of Operations and Logistics
SSB	Single Side Band
STANAG	NATO Standardization Agreement
TACC	Tactical Air Control Center
TACP	Tactical Air Control Party
TAF	Tactical Air Force
TASE	Tactical Air Support Element
TIIF	Tactical Imagery Interpretation Facility
TOC	Tactical Operations Center
TWE	Technical Warfare Element

APPENDIX C

EXAMPLE APPENDIX II (AERIAL SURVEILLANCE AND RECONNAISSANCE) ANNEX A (INTELLIGENCE) TO OPERATIONS ORDER

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Thirtieth Army
HEIMERSHEIM, (595120) GERMANY
100930 July 19__
XR 273

Appendix II (Aerial Surveillance and Reconnaissance) to Annex A (Intelligence) to Operation Order 6.

Map Edition: GERMANY, 1:250000, AMS Series 508, Sheets K51, K52, K53, L51, L52, L53, M51, M52, M53.

1. Situation

a. Enemy. Annex A (Intelligence) to OPORD 6.

b. Friendly Forces. 373 Tactical Reconnaissance Wing, Ninth Tactical Air Force supports Thirtieth Army.

2. Mission

Reconnaissance elements of Ninth Tactical Air Force supports Thirtieth Army with 60 day, 15 night, and 4 electronic sorties per day from 170600 to 231800 May.

3. Execution

a. Concept. Maximum use will be made of Army aircraft for visual, photo, and electronic missions. TAF reconnaissance will be used for photo and visual missions beyond organic capabilities. Target program to receive priority of support. Priority of Support: Army artillery, 3 Corps, 1 Corps, 2 Corps.

b. Immediate Missions. Request via air request net as required. Use Tab A (Routes), Tab B (Areas), and Tab C (Point) overlays for visual requests.

c. Preplanned Missions. Thirtieth Army SOP.

d. 205th MIBARS. Plot all TAF photography, furnish daily master cover traces to army, corps, division; perform immediate interpretation of imagery flown in support of Army; conduct three flights daily between TAF recon bases, MIBARS, corps, divisions; other tasks as approved this HQ.

e. Imagery Interpretation Responsibilities.

(1) Divisions. All imagery produced organically; TAF imagery as requested.

(2) Corps. Same as division.

4. Administration

a. Distribution of imagery—Thirtieth Army SOP.

b. Procedures for submission of mission requests—SOP.

c. Other Imagery. Negatives of all photo, SLAR, and IR imagery produced at corps and division forwarded to this headquarters only on direction.

5. Command and Signal

a. Army Air Request Net to be used for submission of preplanned requests only.

b. Divisions monitor MIBARS Operations Net, if possible.

c. All units having capability monitor TAF in-flight report net.

d. Base plan index, frequencies, and call signs—current SOI.

Acknowledge.

CALLAN
LT GEN

Tabs: A (Routes)
B (Areas)
C (Points)
D (Preplanned Missions)*

DISTRIBUTION: C

OFFICIAL
/s/ Jones
JONES, G2

*NOTE: Reference paragraph S–18.

APPENDIX D

MINIMUM SCALES FOR INTERPRETATION AND IDENTIFICATION

D–1. This table is designed to indicate minimum acceptable photographic scales for interpretation purposes. These minimum scales are the conclusions of a qualified panel of interpreters. It is not expected that they will be valid for every situation or that they will be in complete accord with the opinions or experiences of all who refer to them. They will, however, serve as a guide to the minimum scales at which object-images can be identified and analyzed. The many variables in equipment capabilities, atmospheric conditions, and film processing which affect an aerial photograph will tend to alter these scales. These scales are based on average quality photography. Improvements in such factors as image-motion compensation, film resolution, optics, and camera mount vibration, will permit the use of smaller scales.

D–2. Column I indicates the minimum scale required for recognition of an object class (e.g., motor vehicle, artillery piece, multiengine aircraft, etc.). Column II indicates the minimum scale necessary for a detailed analysis of specific objects within an object class (e.g., to distinguish 2½-ton trucks from 5-ton trucks; 105 mm Howitzer from a 155 mm Howitzer). The scales in column II are presented for guidance of aerial surveillance and reconnaissance personnel in planning missions designed to photograph specific installations for detailed technical analysis, while those in column I are the minimum scales for normal intelligence requirements. All scales refer to vertical stereo photo coverage. Low-level oblique photography or continuous-strip photography, when indicated, may also prove extremely helpful in conducting detailed analyses.

Subject	Breakdown	Minimum scale identification	Minimum scale technical analysis
Industry	Industries which lend themselves to interpretation; e.g., coke, iron, and steel, petroleum, aluminum, etc.		
	(Typical)	1/30,000	1/12,000
	(Atypical)	1/15,000	1/8,000
	(Petroleum and chemical plants require 1/6,000 for technical analysis.)		
	Industries which do not lend themselves to interpretation; e.g., ball-bearing, instrument electronics, etc.	1/10,000	1/6,000 & low-level oblique continuous strip.
Defenses	Coastal defenses guns	1/20,000	1/5,000 & low-level oblique.
	Heavy AA	1/15,000	1/3,000 & low-level oblique.
	Light AA	1/10,000	1/2,000 & low-level oblique.
Artillery	All types	1/10,000	1/2,000 & low-level oblique.
Vehicles	Motor vehicles	1/10,000	1/2,000
Transportation	Rail	1/30,000	1/8,000
	Road	1/30,000	1/5,000
	(Reliable road surface conditions cannot be given from aerial photography.)		
	Inland waterways	1/30,000	1/10,000
	Bridges (over 100′)	1/30,000	1/10,000 oblique.
Utilities	Sewage	1/20,000	1/10,000
	Water purification	1/20,000	1/10,000
	Gas plants	1/20,000	1/8,000
	Municipal thermal powerplant (typical)	1/30,000	1/10,000

Subject	Breakdown	Minimum scale identification	Minimum scale technical analysis
	Industrial thermal powerplant (typical)	1/15,000	1/8,000
	Hydroelectric powerplant	1/30,000	1/10,000
	Powerlines (to trace)		1/6,000
Terrain	Major landforms	No limit	1/20,000
	Minor landforms	1/20,000	1/8,000
Vegetation	(Scales given are applicable to optimum season only.)	1/20,000	1/8,000 & low-level oblique, continuous strip.
Shipping	Naval vessels—BB, CV, CA, CL (or units larger than DD)	1/25,000	1/12,000
	DD and minor combat craft	1/15,000	1/7,000
	SS	1/25,000	1/5,000 & low-level oblique.
	Merchant vessels:		
	Units above 200′	1/25,000	1/5,000
	Units below 200′	1/15,000	1/5,000
Shipping facilities	Ports	1/25,000	1/12,000
	Docking facilities (piers, wharves, etc.)	1/20,000	1/8,000
	Services (cranes, wharf trackage, etc.)	1/12,000	1/8,000
Electronics	Radar:		
	Fixed	1/10,000	1/5,000
	Mobile	1/8,000	1/5,000
	Fire control	1/5,000	1/2,000
	Communications:		
	Lattice masts	1/15,000	1/8,000
	Stick masts	1/10,000	1/5,000
	D/F:		
	Open adcock	1/18,000	1/11,000
	Portable or unusual types	1/8,000	1/3,000
	Navigation aids	1/18,000	1/11,000
Airports	Major (with facilities and surfaced landing area)	No limit	1/10,000
	Auxiliary (surfaced landing area —no facilities)	1/30,000	1/10,000
	Auxiliary (unsurfaced landing area—no facilities)	1/10,000	1/10,000
Aircraft	Wing span:		
	under 40 ft	1/10,000	1/2,000
	40 to 60 ft	1/12,000	1/3,000
	60 to 100 ft	1/15,000	1/4,000
	over 100 ft	1/20,000	1/5,000
Personnel	Personnel activity	Unknown	1/5,000 comparative cover essential. Low-level oblique. Continuous-strip (along travel routes including trials).
	Individual personnel	Unknown	1/1,000 & low-level oblique continuous-strip.
Structures	Structural analysis	1/12,500	
	Urban area analysis	1/12,500	

APPENDIX E

TITLING OF AIR RECONNAISSANCE, AIR SURVEY, AND MAPPING PHOTOGRAPHY

STANAG 3189

E-1. General

Each end of each roll of air reconnaissance, air survey, and mapping photography shall be titled. This detailed information will be placed immediately before the first negative and immediately after the last negative and will include complete details of each run over each separate target. The different items of information shall be arranged in the order shown below.

E-2. Titling Sequence

In order to prevent errors and false information the following format will be used for titling of air reconnaissance photography. Example: 121 F21 408(R) USAF 109 15 Jun 68 = 1630Z 36IN × 4 12,000FT 4032N7607W WYLAM ATC 68-1 SECRET.

a. Item No. 1 (Negative Number) "121"—denotes the 121st exposure of a consecutive sequence of exposures. Exposures from each magazine shall be numbered consecutively. If more than one magazine of a single camera is exposed on a mission or sortie, the exposures shall be numbered consecutively from exposure one (1) of the first magazine to the last exposure of the last magazine. Simultaneous exposures on trimetrogen, split vertical, and convergent installations shall have their adjoining exposures matched and numbered identically.

b. Item No. 2 (Camera Position) (Depression Angle) "F21"—The following symbols shall be used to indicate camera position. Cameras will be numbered from port to starboard relative to the position photographed on the ground along the line of flight.

(1) *V-Vertical*—The single letter V shall indicate a single vertical installation of one camera not titled more than 5° from the vertical.

Note. To indicate the first of more than one vertical, the symbol V1 shall be used, and V2 to indicate the second vertical. The cameras shall be numbered from nose to tail and where two are side by side, the left or port camera shall be numbered first.

(2) *F-Fan*—The single letter F shall indicate a fan of two or more cameras. The F shall be followed by two digits; the first to indicate the number of cameras in the fan; the second to indicate the camera number.

(3) *C-Convergent Camera Installation*—The single letter C shall indicate two cameras, installed in separate mounts, in the same mount, or 2 cones in the same camera body, the photography from which is used as a unit for mapping purposes. Normally, the cameras shall be disposed so that their principal plane is in the direction of flight with one camera pointing forward and the other rearward. The C shall be followed by a single digit; 1 to indicate the forward looking camera and 2 to indicate the rearward looking camera.
e.g., C1, C2

(4) *Oblique.*

P—Port (left)—A port facing oblique camera

S—Starboard (right)—A starboard facing oblique camera

N—Nose—A forward facing oblique camera

T—Tail—A rear facing oblique camera

H—Handheld

(5) *Depression Angle*—When oblique photography is titled, the depression angle in degrees measured from the horizontal plane of the aircraft shall be noted, between brackets, immediately following the camera position. (Not applicable for handheld obliques.)

(6) When cameras with an odd number of mirrors are used, the letter "M" shall be inserted immediately after the camera position to indicate that the film must be reversed when printing. This is only to be shown with the titling information at the beginning and end of a roll.

c. Item No. 3 (Taking Unit) "408(R)"—denotes No. 408 Reconnaissance Squadron. Units shall utilize their official identifying symbol to identify their particular unit. The squadron detachment letter or number shall follow the squadron number. When a letter is used, the letter shall

be separated from the "Service" symbol by a single hyphen, e.g., "58A-DAF." When a number is used, it shall be separated from the squadron number by a single hyphen, e.g., "58-15 USAR."

d. Item No. 4 (Service) "USAF—denotes photographs made by the US Air Force. Other services shall utilize appropriate symbols.

e. Item No. 5 (Sortie or Mission Number) "109"

f. Item No. 6 (Date) "15 JUN 68"—denotes the date photography is accomplished in the immediate area photographed.

g. Item No. 7 (Time Group and Zone letter) "1630Z."—Greenwich Mean time (Z) shall be used in every case.

h. Item No. 8 (Focal Length) and Enlargement Coefficient "36IN×4" (Focal length of lens in inches (IN) or Centimeters (CM)—denotes equivalent focal length of lens indicated in inches or centimeters, except that all photography produced by calibrated cameras shall show the focal length in millimeters to the number of significant figures available data provide. Calibrated focal length shall be preceded by the letter C when the certificate of calibration is current, e.g., "C153.52MM" (Calibrated focal length of lens in millimeters (MM)). The sign × (multiplied by) followed by a whole number (the linear enlargement coefficient) indicates that the print results from a format equal to or larger than the negative. 61N×1 indicates a contact print; 61N×4 indicates that the print is enlarged by four times.

i. Item No. 9 (Altitude) "12,000FT"—denotes altitude above Mean Sea Level in feet (FT) or meters (M).

j. Item No. 10 (Kind of Photography)—The following symbols shall be used to indicate the kind of photography, other than reconnaissance—

R—Infrared

C—Charting

S—Survey and mapping (1st or highest order of accuracy)

C—Survey and mapping (2nd order of accuracy or below—Charting)

*SH—Survey and mapping horizontally controlled electronically

*SV—Survey and mapping vertically controlled electronically

*SHV—Survey and mapping horizontally and vertically controlled electronically

H—Historical

X—Experimental

**Note.* The appropriate electronic positioning data symbol shall be placed on each survey and mapping negative that is acceptably controlled, as determined by the taking unit.

k. Item No. 11 (Geographical Coordinated)—"4032N7607W." Coordinates given shall apply to the center of the photograph and be recorded to the nearest minute of latitude and longitude (based on Greenwich). The coordinates listed above indicate the geographic location of the first exposure of the roll or run used to photograph the target. Similarly, the coordinates shall be indicated for the last exposure of a roll or the last exposure of a run over each separate target. When coordinates are recorded on each individual negative or print, they shall always represent the center of the negative or print. If other coordinate systems are used, this fact shall be clearly stated.

l. Item No. 12 (Descriptive Title) "Wylam"—denotes the appropriate place or subject of the photograph.

m. Item No. 13 (Project Number, Year Assigned, Code Name) "TAC 68–1"—denotes the year (1968) and the first project assigned by the highest echelon directing the project.

n. Last Item (Security Classification) "SECRET"—denotes the security classification assigned to the photography in accordance with existing regulations or directives.

E–3. Titling of Air Survey and Mapping Photography

In addition to the information contained in paragraph E–2 above, all air survey and mapping photography will have additional items of information included. This information will follow item 13 (para E–2*m*).

a. Item 14. Camera type and serial number.

b. Item 15. Cone serial number.

c. Item 16. Lens type and serial number.

d. Item 17. Magazine type and serial number.

e. Item 18. Type and manufacture of photographic film and type of photographic filter used.

f. Item 19. Mean terrain elevation above Mean Sea Level (MSL).

E-4. Special Instructions

a. Items 1 through 6 shall form the negative/frame reference and shall be followed by a double hyphen (=). When operational factors prevent addition of the full titling data, the following absolute minimums will apply:

(1) Frame Number.
(2) Sortie/Mission Number.
(3) Date Time Group (Z) DTG (Z).

b. Items 1 through 9 shall be the minimum titling on each reconnaissance photograph. Item 10 shall appear on each survey and mapping negative, accompanied by acceptable electronic positioning data.

c. The appropriate security classification shall be shown on all material produced from the original roll of film.

d. If additional data must be inserted, it shall immediately precede the security classification which shall be the last item listed.

e. All titling shall be permanently marked in clearly legible capital letters and in such a position as to obscure minimum detail.

APPENDIX F

EXAMPLE OF A G2 AIR COLLECTION PLAN

(Located in back of manual)

INDEX

Order of the Secretary of the Army:

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General, United States Army,
Chief of Staff.

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Major General, United States Army,
The Adjutant General.

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APPENDIX F

EXAMPLE OF A G2 AIR COLLECTION PLAN

EEI	INDICATIONS	BASIS FOR SPECIFIC ORDERS OR REQUESTS	12 JULY						13 JULY							
			Type Recon & Sensor	Frequency of Recon	TOT	Scale Photo & Nr Prints	Hot Reports	Army Req Nr	Type Recon & Sensor	Frequency of Recon	TOT	Scale Photo & Nr Prints	Hot Reports	Army Req Nr	Type Recon & Sensor	Frequency of Recon
1. What are enemy dispositions? Special Attn	a. Location & est strength of enemy in contact, reserves, arty	(1) Report location, strength, and activities of troops NYSTAD–THORN Ridge (Div Obj)	Photo[1] & Visual[2]	P–One time V–4 hrs	P–1000 V–0600–1600	1:5,000 2 sets	No Yes		Visual[2]**	2 hrs	0600–1800	1:7,500 1 set	Yes		Visual	1 hr
		(2) Rpt loc and str acc strong pts vic Hill 609 (1551) & Hill 406 (1151)	Photo[3] & Visual[4]	P–One time V–2 hrs	P–1100 V–0600–2000	1:5,000 2 sets	No Yes		Visual **	1 hr	0600 2000	1:7,500 1 set	Yes		Visual	Continuous
		(10) Rpt loc arty & mortar psns in zone – incl unoc and number pcs.	Visual **	Continuous all missions spec emphasis. See[5]		1:7,500 1 set	Yes		Visual **	Continuous missions spec emphasis. See[5]		1:7,500 1 set	Yes		Visual	Continuous all missions spec emphasis. See[5]
	b. Presence of obstacles	(11) Rpt loc & extent obstacles & road blocks along N–S rds DR1247–1156 & DR1647–1456.	Visual **	4 hrs	0940–1630	1:7,500 1 set	Yes		Visual **	4 hrs	0940–1940	1:7,500 1 set	Yes		Visual	1 hr
	c. Dumping, ammunition & engr supplies	(12) Rpt evid fortifications bldg in zone, emphasis St ELM (DR1351) & PRUTH (DR 1454).	Photo	One time	1300	1:10,000 7 sets	No		-Photo	One time	1000	1:10,000 1 set	No			
		(13) Rpt loc CPs, supply and evac instls in div zone N of St ELM (DR1351) depth line DR09580215	Visual **	4 hrs	0600–2000	1:7,500 1 set	Yes		Visual **	4 hrs	0600–2000	1:7,500 1 set	Yes		Visual	2 hrs
2. Will enemy attack prior 140430	a. Movement hostile units forward	(16) Rpt volume & type traffic across HOST Canal and rds ldg S from NYSTAD & THORN.	Visual	1 hr	0600–2000	– – –	Over 10 vehicles		Visual	1 hr	0600–2000		Over 10 veh.		Visual	Continuous
		(17) Rpt mvt tnk unit (est div) vic DR 1273.	Visual[6]	4 hrs	0600–2400	– – –	Yes		Visual[6]	2 hrs	0000 2400		Yes		Visual	1 hr
		(18) Night and inclement weather coverage (same items as 16 & 19)	SLAR	2 hrs	2000–0600	– – –	No		SLAR	2 hrs	2000-0600		No		SLAR[7]	2 hrs
	b. Increased air reconnaissance	(19) Rpt amount & type air activity in zone	All Flights													
	c. Replacement or reinforcement	(20) Rpt mvt on roads North FEBA	Visual[8]	1 hr	0600–2000	– – –	Over 10 veh.		Visual[8]	1 hr	0600 2000	– – –	Over 10 veh.		Visual[8]	1 hr
3. Can enemy w/draw over HOST Canal	a. condition bridges & alternate crossing points	(26) Rpt alt crossing points HOST Canal & condition bridges DR 1157 and DR 1657	Photo	One time	1400	1:10,000 2 sets	No		Visual **	2 hrs	0600	1:10,000 1 set	Yes		Visual	1 hr

APPENDIX F

EXAMPLE OF A G2 AIR COLLECTION PLAN

12 JULY						13 JULY						14 JULY						
Type Recon & Sensor	Frequency of Recon	TOT	Scale Photo & Nr Prints	Hot Reports	Army Req Nr	Type Recon & Sensor	Frequency of Recon	TOT	Scale Photo & Nr Prints	Hot Reports	Army Req Nr	Type Recon & Sensor	Frequency of Recon	TOT	Scale Photo & Nr Prints	Hot Reports	Army Req Nr	Remarks ** With confirming photography
Photo[1] & Visual[2]	P–One time V–4 hrs	P–1000 V–0600–1600	1:5,000 2 sets	No Yes		Visual[2]**	2 hrs	0600–1800	1:7,500 1 set	Yes		Visual	1 hr	0600 Obj sec	– – –	Yes		1. Defense overlay DR097540, DR155571, DR150582, DR900550 2. Subsequent visual – confirmatory photo of major changes
Photo[3] & Visual[4]	P–One time V–2 hrs	P–1100 V–0600–2000	1:5,000 2 sets	No Yes		Visual **	1 hr	0600 2000	1:7,500 1 set	Yes		Visual	Continuous	0500 until Obj sec	– – –	Yes		3. Defense overlay of area 4. Subsequent visual; confirming photo significant changes
Visual **	Continuous all missions spec emphasis. See[5]		1:7,500 1 set	Yes		Visual **	Continuous missions spec emphosis. See[5]		1:7,500 1 set	Yes		Visual	Continuous all missions spec emphasis. See[5]			Yes		5. Points for specific search developed in coordination w/chief, FSCE
Visual **	4 hrs	0940–1630	1:7,500 1 set	Yes		Visual **	4 hrs	0940–1940	1:7,500 1 set	Yes		Visual	1 hr	0500 until obj sec	– – –	Yes		
Photo	One time	1300	1:10,000 7 sets	No		Photo	One time	1000	1:10,000 1 set	No								
Visual **	4 hrs	0600–2000	1:7,500 1 set	Yes		Visual **	4 hrs	0600–2000	1:7,500 1 set	Yes		Visual	2 hrs	0500 until obj sec	– – –	Yes		
Visual	1 hr	0600–2000	– – –	Over 10 vehicles		Visual	1 hr	0600–2000		Over 10 veh.		Visual	Continuous	0500 until obj sec		Over 5 veh		
Visual[6]	4 hrs	0600–2400	– – –	Yes		Visual[6]	2 hrs	0000 2400		Yes		Visual	1 hr	0000–2400		Yes		6. TAC Air Reconnaissance – special emphasis possible air strike; keep close contact
SLAR	2 hrs	2000–0600	– – –	No		SLAR	2 hrs	2000-0600		No		SLAR[7]	2 hrs	2000–0600		Yes		7. Coverage shifts to area North Line DR 0958, DR 2158
All Flights																		
Visual[8]	1 hr	0600–2000	– – –	Over 10 veh.		Visual[8]	1 hr	0600 2000	– – –	Over 10 veh.		Visual[8]	1 hr	0500–2000		Over 5 veh		8. Combine w/item 16; after objective taken coverage shifts to area N line DR 0958, DR 2158
Photo	One time	1400	1:10,000 2 sets	No		Visual **	2 hrs	0600	1:10,000 1 set	Yes		Visual	1 hr	0500 until obj sec	– – –	Yes[9]		9. Hot rpts on attempts to repair or cross canal–probable lucreative arty or close air support tgt

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