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DEPARTMENT OF THE ARMY FIELD MANUAL

Reference

AERIAL SURVEILLANCE—RECONNAISSANCE, FIELD ARMY (AERIAL SURVEILLANCE COMPANY)



HEADQUARTERS, DEPARTMENT OF THE ARMY
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**AERIAL SURVEILLANCE-RECONNAISSANCE, FIELD
ARMY (AERIAL SURVEILLANCE COMPANY)**

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CHAPTER 1

INTRODUCTION

1. Purpose

This manual provides guidance for the training, operation, and employment of the Aerial Surveillance Company, TOE 1-128T.

2. Scope

a. This manual provides information on the mission, organization, equipment, capabilities, limitations, command and control, communications, training, planning for and the employment of the aerial surveillance company. The material presented herein is applicable without modification to both nuclear and non-nuclear warfare situations. It also provides guidance on techniques that may be used in aerial surveillance reconnaissance and operations in an internal defense situation.

b. Users of this manual are encouraged to submit recommended changes or comments. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to the Commanding Officer, U.S. Army Combat Developments Command Intelligence Agency, Fort Holabird, Maryland 21219.

3. Definitions

The following terms used in this manual are defined as follows:

a. *Tactical Air Reconnaissance.* Missions undertaken in direct support of tactical operations to obtain, by use of aerial platforms or vehicles equipped with visual, optical, electronic, and/or other sensor devices; specific information about the activities and resources

of an enemy or potential enemy; or to secure data concerning the meteorological, hydrographic or geographic characteristics of a particular area.

b. *Aerial Battlefield Surveillance.* Missions undertaken by use of aerial platforms or vehicles equipped with visual, optical, electronic, and/or other sensory devices to:

- (1) Maintain a continuous all-weather, day and night systematic watch over the battlefield to provide timely intelligence information for ground tactical operations. Aerial Surveillance in its broadest sense encompasses day/night observation over the entire area as contrasted to air reconnaissance which is a mission in time and place to obtain information of the enemy, terrain, or weather.
- (2) Perform target acquisition to identify targets, by precise and timely location in 3-dimensions with respect to weapons which are able to engage these targets.

c. *Observation.* The examination or study made of such things as terrain, artillery fire, or atmospheric conditions to obtain information of military value.

- (1) *Direct observation.* Observation which is visual observation, frequently aided by the use of binoculars, telescopes, and mechanical ranging devices.
- (2) *Indirect observation.* Observation employing radar, infrared, photographic, airborne radio direction finding (ARDF) and other electronic means.

d. *Radio Direction Finding.* Radio station

location in which the direction or relative position of a station is determined by means of its emissions.

e. Operational Control. The authority granted a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time or location; to deploy units concerned, and to retain or assign tactical control of those units. It does not include authority to assign separate employment of components of the units concerned. Neither does it, of itself, include administrative or logistic control.

f. Target Acquisition. That part of combat intelligence which involves the detection, identification, and location of a target in sufficient detail to permit target analysis and the effective employment of weapons.

g. Aerial Reconnaissance Liaison Officer (ARLO). A qualified Army Aerial Surveillance Officer, MOS 9809, provided by the G-2 Air to function as a liaison officer to the aerial surveillance company. ARLO functions include passing tactical information to the company, coordinating missions, briefing and debriefing, and submitting reports to the G-2 Air.

CHAPTER 2

MISSION, ORGANIZATION, CAPABILITIES, AND LIMITATIONS

Section I. MISSION AND ORGANIZATION

4. Mission

To provide combat surveillance and target acquisition capabilities to corps and/or division units through the use of organic aircraft, sensor equipment, and ground data stations.

5. Organization

a. General. The aerial surveillance company is assigned to field army, corps, or separate task forces, as required. The company is organized under TOE 1-128T, see figure 1. The aerial surveillance company is a semi-independent unit capable of near all weather, day and night surveillance of the supported area. The company is dependent on a higher headquarters for administrative and logistical support. To achieve maximum effectiveness from this unit it should be employed from a fixed airfield with instrument landing facilities. Operational control of the aerial surveillance company is vested in the commander of the supported unit and exercised through the ACofS, G-2, of the supported unit. The aerial surveillance company is organized with a company headquarters, operations platoon, surveillance platoon, signal platoon, and a service platoon. This organization provides functionalized sections for efficiency and flexibility of command and employment. The organization of this company is not tailored for detaching elements for extended periods of time.

b. Company Headquarters. The company headquarters consists of the company commander, executive officer, first sergeant and necessary personnel to perform company administrative, mess, supply, and vehicle maintenance. The company will be required to fur-

nish continuous day and night support and will require four to five meals per day. A 24-hour mess capability is provided based on the assumption that 50 percent of the rations will be consumed at other than normal duty hours. A motor sergeant and wheeled vehicle mechanics are necessary to administer and maintain wheeled vehicles organic to the company. The power generator foreman and powerman are necessary to maintain the auxiliary ground power equipment organic to the company. The ordnance parts specialist performs limited replacement of parts on the weapons of the company and requisitions required ordnance parts. One light truck driver is necessary to drive and maintain the company commander's vehicle and operate and maintain the radio mounted in this vehicle. The armorer and supply clerk perform the normal duties associated with these positions.

c. Operations Platoon. The operations platoon consists of a platoon headquarters and an imagery interpretation section. The platoon is the focal point for scheduling, briefing, debriefing, interpreting, producing and reporting aerial surveillance mission accomplishments.

- (1) *Operation platoon headquarters.* The platoon headquarters consists of a flight operations officer and sufficient personnel to provide continuous flight operations scheduling. Missions are received by the platoon headquarters, checked for completeness, priorities monitored, resources analyzed, and subsequently passed to the surveillance platoon for execution. Platoon headquarters coordinates with the

AERIAL SURVEILLANCE COMPANY

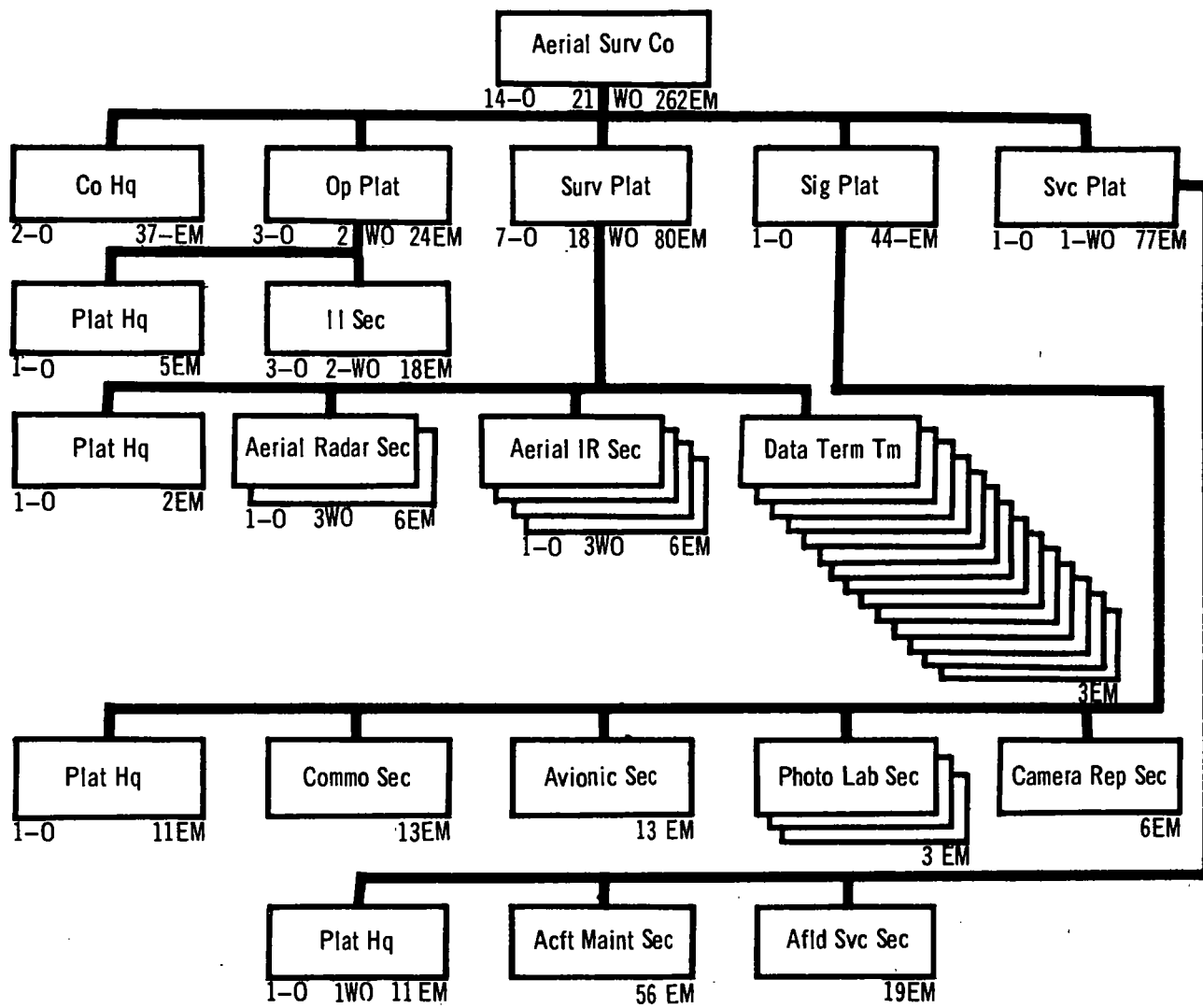


Figure 1. ORGANIZATION CHART

Figure 1. Organization chart.

service platoon regarding aircraft availability and keeps the service platoon informed of projected aircraft requirements. Flight plans are processed and monitored by the platoon headquarters.

(2) Imagery interpretation section.

- (a) The image interpreters organic to the company are intelligence specialists trained in the techniques of extracting information from im-

agery produced by sensors. The image interpreter knowing the intelligence requirements and other available information can more quickly identify, locate and report information obtained from the imagery. The interpreters should be located in close proximity to the processing facilities to reduce administrative dead time in acquiring the imagery for interpretation. The

specific duties of the imagery interpretation section include the following:

1. Assist in the planning for aerial surveillance missions.
 2. Interpret imagery and report on enemy offensive and defensive installations and civilian concentrations and movements.
 3. Assist in the preparation of target folders, enemy air defense concentration maps and related material.
 4. Prepare mosaics.
 5. Make map corrections from imagery.
 6. Prepare terrain models.
 7. Prepare terrain analysis.
 8. Assist in the briefing and debriefing of air crews.
- (b) To perform the functions stated in the previous paragraph the imagery interpretation section must receive from the supported unit intelligence summaries (ISUMS), Order of Battle, Prisoner of War, ARDF and other intelligence reports. These reports are used as a base for preparation of imagery reports and in maintaining and updating the situation map and the intelligence portion of the daily mission briefings.
- (c) The section is organized to man two AN/TSQ-43 (TIIF) in two 12-hour shifts. Interpreting the imagery acquired by the Surveillance Platoon and processed by the Photo Laboratory Section, the Imagery Interpretation Section produces reports such as those shown in Appendix B (STANAG 3377). These reports and their required submission times are as follows:
1. Mission Photo Report (MISREP)—within 30 minutes after aircraft engine shut-down. If possible sensor readout should be included.
 2. Hot Photo Report—as soon as possible but not later than one hour after mission aircraft lands.

3. Immediate Photographic Interpretation Report (IPIR)—not later than four hours after the aircraft land, if required.

4. General Photographic Interpretation Report (GPIR)—as directed by the requestor.

(d) Information acquired during the interpretation is forwarded to the requesting unit G-2 Air and/or by the fastest means available consistent with classification of the contents and local regulations.

(e) Telephone and teletypewriter equipment are components to the AN/TSQ-43, however, TT operators will have to be provided by the signal organization supporting the command. In addition a radio with operators is required with each AN/TSQ-43. If radios are not provided, imagery reports requiring transmission by radio will be transmitted by the operation platoon headquarters to the G-2 Air using the AN/GRC-46, air surveillance and liaison net (fig 3).

d. Surveillance Platoon. The surveillance platoon consists of a platoon headquarters, two aerial radar sections, four aerial infrared sections and fourteen ground data terminal teams.

(1) *Surveillance platoon headquarters.* The surveillance platoon headquarters consists of a platoon commander, platoon sergeant, and one light truck driver. The platoon commander and platoon sergeant exercise supervisory control over officers and enlisted personnel of the component sections. The light truck driver drives and maintains the platoon $\frac{3}{4}$ ton truck.

(2) *Two aerial radar sections.* Each radar section consists of a section leader, three surveillance aviators, three aerial sensor operators, and three aircraft crew chiefs. One aviator and one sensor operator comprise the flight crew for one aircraft (OV-1B). Prior to departing on missions the flight crew receives a detailed mission briefing; concurrently, preflight of the sen-

- sensor equipment is accomplished. After departure on a mission the aircraft may contact one or more ground sensor terminal teams who can monitor the inflight recording of imagery. All aircraft are equipped with the doppler navigational system which permits accurate target location. Sensor operators are jointly trained as both infrared and radar operators.
- (3) *Four aerial infrared sections.* Each infrared section consists of a section leader, three surveillance aviators, three aerial sensor operators, and three aircraft crew chiefs. The aerial infrared sections receive their missions, conduct briefings and preflights in the same manner as the aerial radar sections, the only difference being the techniques of employment, which are characteristic of infrared operations. Aircraft of the infrared sections are also equipped with the doppler navigational system.
- (4) *Ground data terminal teams.* In order to provide near real time (about 3 minutes delay) readout of Side Looking Airborne Radar (SLAR) and Infrared (IR) imagery at subordinate headquarters fourteen data terminal teams are provided. These teams cannot produce photographic prints. Each team consists of two E5 and one E4 airborne sensor specialists. Equipment in the team includes one TKQ-1, radar data receiving set, and one TAQ-1, infrared surveillance information center. Each of these ground sensor terminals is mounted on a $\frac{3}{4}$ -ton truck and each has a generator mounted on a $\frac{3}{4}$ -ton trailer. Each vehicle is provided with an AN/VRC-46 radio to operate in the 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 TKQ-1 receives data from the OV-1B aircraft SLAR. The data is transferred to film and then the film developed using the RO-166 processor. The film is ready for viewing in about 3 minutes by the operator and image 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. Unlike the TKQ-1 this film must be developed after the IR mission is finished. It must be developed in a photo lab and is then viewed by the image interpreter.
- (d) Fourteen teams are provided to support tactical units within the corps. The following is a recommended employment of these teams. Three teams are sent to each of the three divisions within a Corps: one team to the division Tactical Operations Center (TOC), one to the alternate TOC, and the third to division artillery. Three teams also support the Corps headquarters: one team to Corps TOC, one to the alternate Corps TOC, and one to Corps Artillery. One team is sent to the Armored Cavalry Regiment and one to the Corps Separate Brigade. All of these teams work with the Tactical Imagery Interpretation Facility (TIIF) that is provided to these headquarters by the Military Intelligence units.
- (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 call sign and frequency and the frequency to be used in data transmission. They can be alerted either through the company command net

via their VRC-46 radio or through the supporting headquarters.

- (f) These teams should be attached to the unit which they are supporting. They will require support in the form of rations, POL and limited 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.

e. *Signal Platoon.* The signal platoon consists of a platoon headquarters, communications section, an avionics repair section, three photographic laboratory sections, and a camera repair section.

- (1) *Platoon headquarters.* The platoon headquarters consists of a platoon commander, platoon sergeant, and a signal supply specialist. The platoon commander and platoon sergeant exercise supervisory control over the personnel and functions of the platoon. The signal supply specialist is provided to accomplish the necessary signal supply functions for the company.
- (2) *Communications section.* The communications section consists of a communications chief, two radio teletype teams, four radio repairmen, two switchboard operators, and one wireman. The two radio teletype teams operate the section's two radio teletypewriter sets which comprise the aerial surveillance/liason net (RATT). One of these sets normally is collocated with the supported G2 Air; the second set is located with the company operations. The radio repairmen perform organizational maintenance on the company radio equipment. The switchboard operators and wireman comprise a team to install the company wire, lay trunk lines to the nearest

area communications center and operate the company switchboard.

- (3) *Avionics repair section.* This section consists of one senior aerial sensor operator, the section chief, and necessary personnel to perform organizational maintenance on the avionics, SLAR, and infrared equipment organic to the OV-1 aircraft. During the mission briefing and preflight planning period the personnel of this section perform the necessary preflight of the SLAR and infrared sensor equipment. This section performs all organizational maintenance of electronic sensory and avionics systems installed on the aircraft.
- (4) *Photographic laboratory element.* The photographic laboratory element of the company consists of three photographic laboratory sections which normally are collocated with the Image Interpretation Section. Each section contains one senior photographic laboratory specialist and two photographic laboratory specialists. Overall supervision of the sections is provided by a photographic laboratory supervisor. These sections process all exposed film for the company and produce photo prints with appropriate titling data. Appendix C prescribes the titling data that is to be placed on reconnaissance film. Each section is equipped with an ES-38 photographic darkroom facility which provides: rapid, continuous and automatic processing of 70mm, 5-inch and 9½-inch roll film, and 9¾-inch roll paper; continuous contact printing of 9½-inch film; projection printing of 70mm and 9½-inch film on 9¾-inch wide paper; and semi-automatic print chopping and plotting table for viewing film.
- (5) *Camera repair section.* The camera repair section consists of a section chief, four surveillance photographic repairmen, and a surveillance photographic repairman helper. Based on mission briefings the surveillance photographic repairmen preflight the air-

borne photographic surveillance system for the specific aircraft to be employed on that mission. This section performs all organizational maintenance of the airborne photographic surveillance systems installed on the company mission aircraft.

f. Service Platoon. The service platoon consists of a platoon headquarters, aircraft maintenance section and airfield service section. The platoon schedules and supervises aircraft maintenance, aircraft servicing and crash rescue activities.

- (1) *Service platoon headquarters.* The platoon is commanded by an aircraft maintenance officer. He is assisted by an airplane maintenance technician, qualified to supervise aircraft maintenance and perform test flights. The Platoon Sergeant coordinates the enlisted personnel functions of the platoon. The remainder of the platoon headquarters consists of Airplane Technical Inspectors, Maintenance Data Specialists, Aircraft Parts Specialists, Aircraft Supply Clerk and Typist. The Service Platoon Headquarters is responsible for planning for employment and administration of the aircraft maintenance and airfield service sections of the aerial surveillance company. The Service Platoon Headquarters maintains the technical library, aircraft records, aircraft parts supply (organizational), and conducts technical inspections and quality control of the activities of organic sections. The platoon coordinates maintenance and supply

requirements with the direct support maintenance detachment or company assigned to support the aerial surveillance company.

- (2) *Aircraft maintenance section.* This section is part of the Service Platoon. It consists of a section chief who is a qualified airplane repairman and fifty-five aircraft mechanics and helpers. This section performs normal organizational maintenance on the assigned airplanes. Such maintenance includes performance of periodic inspections, modification work orders, testing, adjusting, replenishing airplane systems, and replacing major components. The section can be formed into support teams for flight sections and can work in shifts to support day and night operations.
- (3) *Airfield service section.* This section is part of the Service Platoon and consists of a section chief, who is a Fuel Handling Specialist, and also includes other Aircraft Fuel Handling Specialists and a Crash Rescue Team. The primary functions of this section are fueling and defueling of assigned aircraft and forced entry and rescue from crashed aircraft. This section also replenishes the aircraft oxygen and oil lubrication systems. It is provided four 2½-ton fuel truck and trailer combinations capable of transporting 1500 gallons of aviation fuel and one 5000 gallon tanker. The 5000 gallon tanker is normally utilized to replenish the fueling trucks.

Section II. CAPABILITIES AND LIMITATIONS

6. Capabilities

At strength level I this unit has the following capabilities:

a. To provide sustained near all weather, day or night, surveillance of a corps portion of the field army area of influence for which the Army has primary aerial surveillance responsibility.

b. To conduct aerial reconnaissance of

routes, zones, and areas using visual, photographic, side looking airborne radar and aerial infrared systems.

c. To disseminate the imagery produced by SLAR and IR systems to various headquarters in near real time through its ground data stations.

d. To process and interpret the imagery produced and to disseminate the information

obtained from this imagery, as well as from visual observation, to all intelligence information subscribers, including other collection agencies.

e. To acquire target acquisition information through the use of the above systems.

f. To acquire information for post-strike analysis of nuclear weapons effects.

g. To acquire information for CBR survey using aerial means.

h. To provide one hundred per cent mobility utilizing air and ground vehicles.

i. Individuals of this organization can engage in effective, coordinated defense of the units' area or installation.

7. Limitations

a. For near all weather operations, this company should be deployed at an airfield which

has airfield services to include instrument approach facilities or be augmented with personnel and equipment to provide these services.

b. The utilization of the ground data stations is limited by the requirement for line-of-sight between the sensor stations and the aircraft conducting a mission.

c. The company must be provided support in the form of light observation helicopters or equivalent to conduct command and control of ground data stations, to deliver hard copy photography to requesting units, and for use in command and liaison functions with other organizations within the Corps area.

d. When fully committed, additional communication support may be required.

e. This unit is dependent upon its higher headquarters for administrative and logistical support.

CHAPTER 3

EMPLOYMENT

Section I. COMMAND, CONTROL, AND COMMUNICATIONS

8. General

a. Aerial surveillance and reconnaissance of the battlefield normally is performed in support of the field army and subordinate units by organic aerial surveillance units. Additional aerial reconnaissance and surveillance support, as required, is available from the U.S. Army Security Agency units and from other service reconnaissance and surveillance systems. The aerial surveillance company is equipped and specifically designed to provide the ground commander current information of the area of operations to include friendly and enemy forces.

b. The company normally will be employed as an integral unit at an instrumented airfield within the supported unit's area of operations. Direct support to subordinate units normally will be performed on a mission basis. It is capable of near all weather, day or night surveillance of the corps portion of the field army area of influence for which the Army has primary aerial surveillance responsibility.

9. Command

a. Normal unit administrative, logistical, and maintenance actions are processed through command channels to the company's parent higher headquarters. The conduct of training for the surveillance company is the responsibility of the company commander with general guidance being provided by the parent organization and the G-2 through his principal assistant, the G-2 Air.

b. The company's maintenance capabilities are limited to organizational level. Direct and general support maintenance will be provided

by direct and general support battalions and/or by direct attachment of a direct support detachment to the company based on the policies established by the Army component commander.

10. Control

a. The surveillance company normally is employed to provide aerial surveillance and target acquisition capabilities to supported units, under the operational control of the G-2.

b. To provide the necessary staff supervision of the company's activities and recommendations for its employment, the G-2 Air serves as the principal assistant to the G-2. In this capacity the G-2 Air exercises operational control of the company by directing the surveillance effort through the assignment of specific missions and priorities for accomplishment. A representative of the G-2 Air, Aerial Reconnaissance Liaison Officer (ARLO), is provided the company to conduct briefings of the air crews on mission requirements and debriefing of crews upon their return. The information obtained is passed to the G-2 Air, the requesting headquarters, and other collateral intelligence collection agencies as required.

11. Communications

a. General. Telephone is the normal means of communication within the company area. FM voice radio provides communications between company elements when moving, with higher or supported headquarters and with mission aerial vehicles for control and coordination of data transmission. UHF voice radio is used for air traffic control. AM radio teletype is used to operate between the company operations and

the G-2 Air. When possible the company enters the area communications systems for telephone and teletype communications.

b. *Wire.* Telephones are provided each platoon and subordinate section or element requiring communications in the company wire net (fig 2). The operations platoon headquarters has been provided an additional telephone (not shown on the wire net diagram, fig 2) for direct communications with the air traffic control element. One teletypewriter and necessary associated terminal equipment is available in the company operations van for communications with the supported command. Eighteen miles of wire are provided to install the company wire net, perimeter security net and trunk lines to the area communications system. Telephones in the company are as indicated in chart I.

c. *Radio.* Radio equipment is provided to meet the minimum requirements of the company. Equipment for remote control operation of radio sets has been included where required. Complete equipment for remote operation in these instances is provided with one Tool Equipment TE-33, Radio Control Group AN/GRA-39, Reel RL-39, and two DR-8's each

with 1/4 mile wire. Radio equipment in the company is as indicated in chart II and in the radio diagram (fig 3).

d. *Frequency Assignment.* The company requires frequency/channel assignments in the appropriate SOI as follows:

- (1) One FM channel for the company command net FM.
- (2) One FM channel for the alternate company command net FM.
- (3) One UHF frequency for air traffic control.
- (4) One AM frequency for the air surveillance/liaison net (RATT).

e. *Antenna Systems.*

- (1) Five directional antennas, AT-984/G, are provided to increase radio communications ranges as follows:
 - (a) Two in the operations platoon headquarters.
 - (b) Three in the communications section of the signal platoon.
- (2) One ground plane type antenna, 20-389mc is provided the operations platoon headquarters.

Section II. PLANNING

12. General

Aerial surveillance and reconnaissance planning is based on the mission, the commander's concept of operation and the essential elements of information (EEI). In preparing an aerial surveillance plan the GS-S2 Air at each level

will consider his requirements as well as those of subordinate units. The aerial surveillance plan is developed to answer those portions of the EEI that can be best collected by aerial means. The plan will integrate the capabilities of the aerial surveillance company with the

Chart I. Telephones.

01 Co HQ	3 Tel	V31211 1	TA-312/PT
02 Op Plat HQ	1 Tel	V30252 1	TA-1/PT
	3 Tel	V31211 1	TA-312/PT
03 II Sec	4 Tel	V31211 1	TA-312/PT
04 Survl Plat HQ	1 Tel	V31211 1	TA-312/PT
05 (2) Aerial Radar Sec	2 Tel	V31211 1	TA-312/PT
06 (4) Aerial IR Sec	4 Tel	V31211 1	TA-312/PT
07 (14) Data Terminal Team	14 Tel	V31211 1	TA-312/PT
08 Sig Plat HQ	1 Tel	V31211 1	TA-312/PT
09 Comm Sec	3 Tel	V31211 1	TA-312/PT
10 Avionics Repair Sec	2 Tel	V31211 1	TA-312/PT
11 (3) Photo Lab Sec	None		
12 Camera Repair Sec	None		
13 Svc Plat HQ	1 Tel	V31211 1	TA-312/PT
14 Acft Maint Sec	1 Tel	V31211 1	TA-312/PT
15 Afd Svc Sec	2 Tel	V31211 1	TA-312/PT

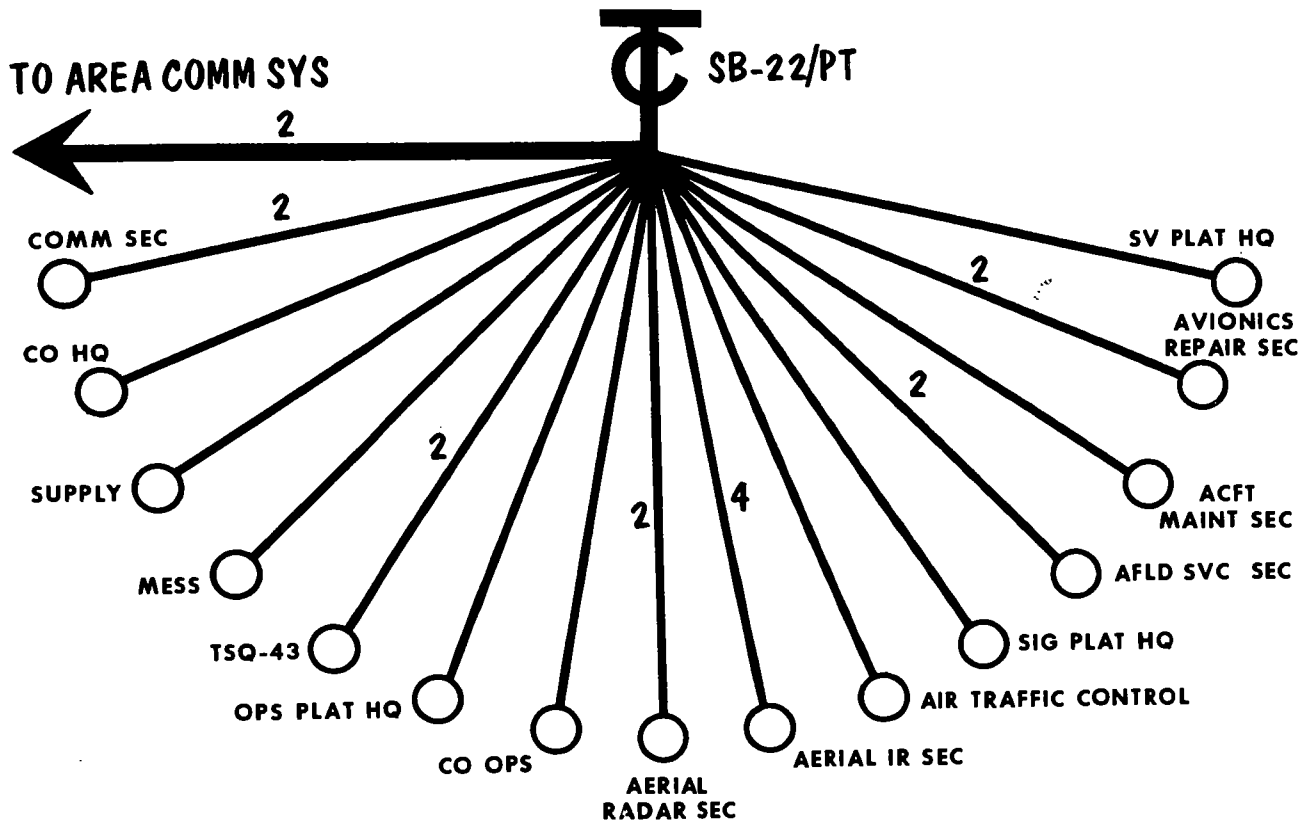


Figure 2. TYPE WIRE NET

Figure 2. Type wire net.

Chart II. Radio Set Tabulation.

Section	Radio	Vehicle	User	Net
Co HQ	VRC-47	¼ ton	CO	Co Comd Net FM and Higher HQ Comd Net FM
Op Plat HQ	GRR-5	Van	Op	Warning Net AM
	VRC-24	¾ ton	Op	Air Traffic Control
	VRC-46	¾ ton	Op O	Co Comd Net FM
	VRC-47	Van	Op	Co Comd Net FM and Higher HQ Comd Net FM
Data Term Team	VRC-46	¾ ton	Team	Monitor Co Comd Net FM, switch to mission channel when directed
Comm Sec	VRC-46	¾ ton	Sec	Co Comd Net FM
	GRC-46	¾ ton	Sec	Air survl/LO Net AM

information gathering capabilities of the aerial surveillance-reconnaissance elements of the Army, to include the collection capability of the U.S. Army Security Agency, the Air Force, and Navy. The general considerations for development of the aerial surveillance plan are: (a) determination of aerial surveillance re-

quirements, (b) assignment of a priority to each requirement, and (c) determination of aerial surveillance capabilities.

13. Aerial Surveillance Mission Planning

The G-2 Air processes requests for aerial surveillance missions based on the aerial surveil-

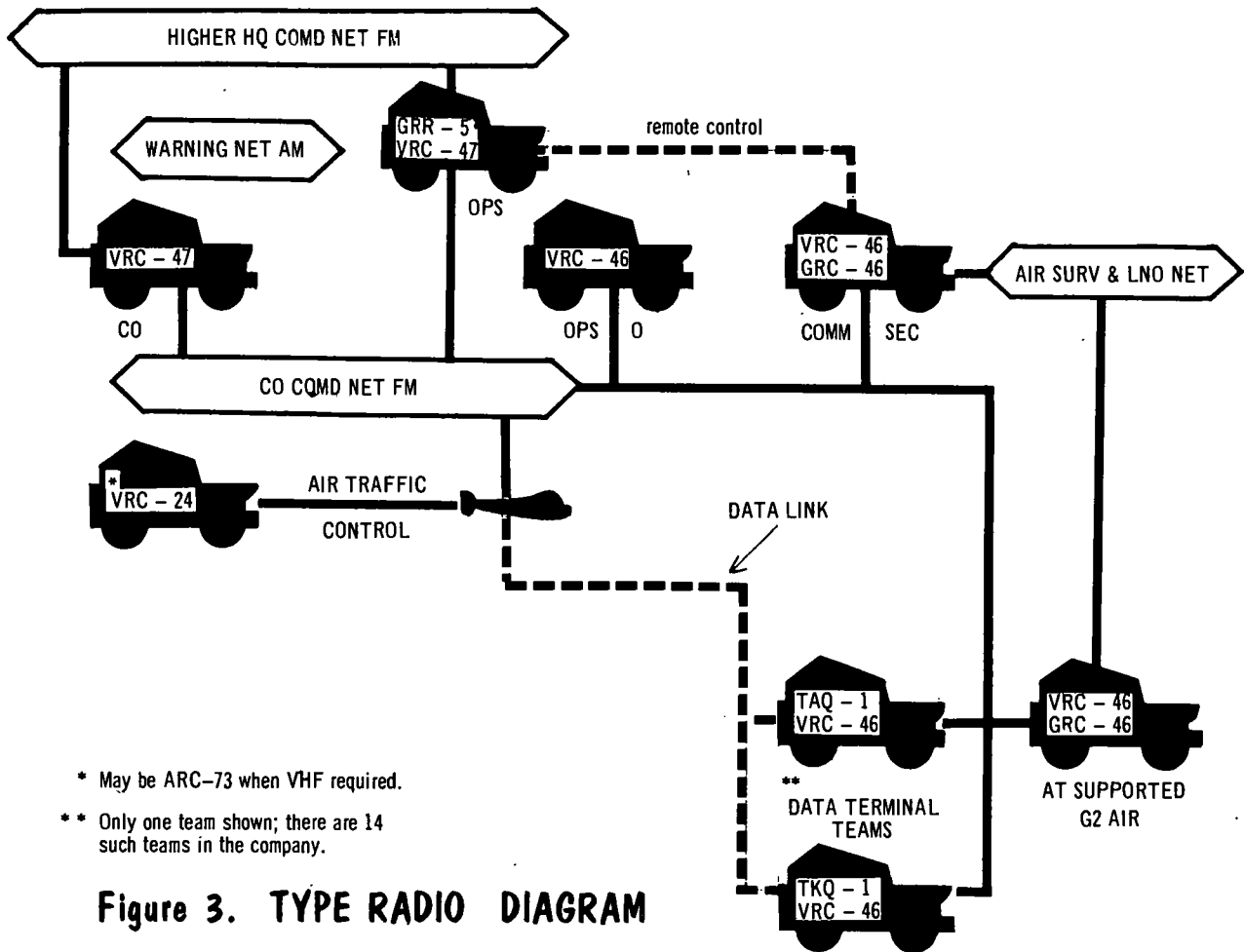


Figure 3. TYPE RADIO DIAGRAM

Figure 3. Type radio diagram.

lance plan and will assign missions and priorities according to the approved plan. Additional aerial surveillance missions as dictated by the changing tactical situation, newly acquired intelligence information, and the requirements of subordinate elements are integrated into the planned operations of the aerial surveillance company. Aerial surveillance missions are classified in two categories: preplanned and immediate.

a. Preplanned Missions. These are missions from requests for information that can be anticipated and scheduled in advance. These requests are generated by the need to maintain a systematic watch over the battlefield or areas of influence.

b. Immediate Missions. Immediate type missions are those which cannot be foreseen and which require quick response. Because these re-

quests are generated by an urgent need to confirm, deny, or amplify reports of possible targets received from other sources, some equipment must be maintained in ready standby for immediate response.

14. Priorities

a. Priority will be assigned to each mission by the G-2 Air. The availability of equipment and current overall requirements may dictate the priority. Priorities generally fall into the following categories:

- (1) *Priority I.* Surveillance of enemy units or activities that would prevent the execution of the friendly force mission.
- (2) *Priority II.* Surveillance of enemy units or activities capable of immediate serious interference with the

mission: and the surveillance required in the conduct of current tactical operations.

- (3) *Priority III.* Surveillance of enemy units or activities capable of ultimate serious interference with the mission: and the surveillance required to support planned future operations.
- (4) *Priority IV.* Surveillance of enemy units or activities capable of limited interference with the mission: the surveillance required for administrative and logistical purposes. These priorities may change with the local command and the tactical situation.

b. Determination of whether a mission will be assigned to the aerial surveillance company or forwarded for accomplishment by other organic aircraft, ARDF, or other services will depend on the following factors:

- (1) Whether the information is available from another source or is in the process of being obtained.
- (2) Capability and status of the organic effort to perform the mission.

- (3) Time the requested information will no longer be of value.
- (4) Capability of enemy air, air defense and other countermeasures.
- (5) The assigned mission, current situation, and its posture and relation to adjacent units.
- (6) Distances, mission time, weather and terrain.

15. Coordination

a. Aerial surveillance requests will be coordinated with the appropriated staff section by the G-2 Air as well as elements that accomplish operational functions within the intelligence collection effort.

b. When a mission is to be flown by the aerial surveillance company, pertinent data is transmitted by the G-2 Air via communications net or land lines. It is desirable to provide a fully qualified pilot of the aerial surveillance company as liaison officer to the G-2 Air to participate and assist in mission planning, coordination and assignment. The mission data transmitted to the company will include, but not be limited to, the information required by appendix D.

Section III. CONCEPT OF EMPLOYMENT

16. General

Specific missions, whether they be day or night, are categorized as surveillance or reconnaissance. Additionally any given mission may employ one or more of the sensors organic to the OV-1 aircraft. During a particular mission an aviator-observer team may change in-flight to another type mission or may perform both types concurrently when directed through command channels. This section will describe aerial observation requirements and reporting, and surveillance/reconnaissance mission operation techniques.

17. Conduct of Operations

The operations of the aerial surveillance company are characterized by rapid response to mission requirements derived through:

- a. Mission type tasking of the unit to permit maximum flexibility and utilization of resources in obtaining the desired information.
- b. Clear understanding of methods of opera-

tion of supported units, preplanned sequence of events, and mission requirements.

c. Flexibility to respond to mission changes during flight.

d. Reliable and secure communications with the tasking agency, (G-2 Air).

e. Flexibility of mission performance afforded by multiplicity of performance capabilities inherent to the aircraft, pilots, and surveillance systems.

f. Thorough knowledge of enemy situation, and capabilities, gained by repetitious use of personnel given operational areas, when possible.

g. Training of unit personnel in proficiency, teamwork, and discipline.

h. Current standard operating procedures.

18. Considerations in Planning Employment

In planning the employment of surveillance aircraft, the following must be considered:

a. Availability of aircraft and sensors, to include previously established priorities.

b. The locations of enemy units and their air defense capability.

c. Existing and forecasted weather conditions en route to and in the target area.

d. Specific results desired, i.e., what information is the requestor looking for.

e. Altitude over area of interest and en route altitudes.

f. Aircraft density in the target area and control of air traffic.

g. Friendly tactical situation and supporting fires in the target area.

h. Tactical air support plan.

i. Current authentication and identification systems.

j. Selection of designated landing field to effect direct coordination with supported units. This will include alternate airfield when required.

k. Coordination for tracking by radar, if required.

l. Escape and evasion information.

m. Aircraft abandonment areas.

n. Thorough briefing.

o. Technical proficiency of pilot observer and ground data link operators.

p. Imagery processing, interpretation, reporting, and print delivery times.

q. Coordination with ARDF operations.

19. Briefing

a. *General.* The Aerial Surveillance Company will be tasked to execute missions involving flight over one or more corps areas. The aircraft crews and company support personnel must be completely familiar with the mission to be flown, must adequately plan and prepare for the mission, and use prescribed methods of reporting mission data.

b. *General Briefing.* All air crews are given a daily briefing concerning the next 24 hours of operations. This briefing will include, but not limited to the following: weather, enemy unit location and sites of known ground fire, friendly unit locations, preplanned air strikes, major heliborne operations and emergency procedures.

c. *Preflight Briefing.* To support thorough understanding of the assigned mission, the aviator observer team receives preflight briefings. The G-2 Air representative (ARLO) usually conducts the portion of the briefing specifically related to mission requirements (see app E). The company commander, or his representative, conducts that portion of the briefing pertaining to the overall tactical situation and aviation situation.

d. *Mission Support Briefing.* The support personnel who will be involved in the handling of missions, specifically the imagery interpretation section, photo lab sections and the data terminal teams, also require briefing. The imagery interpretation personnel will normally participate with the crew in planning the mission and thus receive the information they need. The photo lab personnel must be briefed on requirements of each mission and alerted prior to the completion of a flight. The imagery interpretation section will inform the photo lab of the anticipated processing requirements and the dead line for completion of the processing. The data terminal teams must be alerted through company communications or by the G-2 Air of the headquarters to which they are attached. They will require pertinent items of information about the mission in order to monitor and produce imagery at their location.

20. Inflight Reports

To provide commanders and staffs with critical information during the conduct of the mission, the air crew must be able to make inflight reports, to include cockpit readout of sensors, to the requesting unit, or other designated unit, by means of radio (the primary means), message drop, or prearranged signals. Inflight radio reports will usually be rendered during each mission, unless the tactical situation warrants radio silence (app B, STANAG 3377).

21. Debriefing

a. The G-2 Air representative (ARLO) will conduct the debriefing of the aircraft crew. This information is consolidated into two categories—mission and general information.

(1) *Mission.* During the debriefing, the air crew is asked specific questions concerning all aspects of the mission.

(2) *General.* Any additional information obtained which was not an assigned mission task. Information such as areas of ground fire, areas that have a significant lack of activity, movement of indigenous personnel and suspected enemy locations.

b. Use of a debriefing form will aid the debriefer in compiling mission data and shorten the time required for debriefing. A sample is shown in appendix F.

c. A sensor data log and a flight log (pilots trace) are maintained for each sensor mission flown. These are reviewed for completeness during the debriefing. It is desirable that the air crew be present with the imagery interpreter during the initial readout of the imagery obtained from the mission.

d. On occasion an aircraft will be required to land at a supported unit to render mission

results because of communication failure or nature of the information obtained.

22. Direct Aerial Observation

The aviator-observer air crew of the surveillance company operate as a team to insure optimum mission accomplishment. While en route to, within, or returning from the target area, many opportunities exist for observing and reporting enemy activity or inactivity. To insure that maximum value can be obtained from these timely sightings, sufficient detail must be contained in the reports. The information should contain, but not be limited to—

a. Time of observation.

b. Location of sighting being reported.

c. Identification of sighting.

d. Strength or size estimate.

e. Activity.

f. Disposition.

Section IV. TECHNIQUES FOR AERIAL SURVEILLANCE-RECONNAISSANCE OPERATIONS

23. General

Aerial surveillance and reconnaissance are defined in chapter 1. Both of these operations encompass target acquisition. The sensors used for aerial surveillance and reconnaissance are the same and are discussed in this section.

24. Types of Surveillance-Reconnaissance Missions

a. *Area Search.* Area search is normally conducted for the purpose of covering a general area, monitoring any movement within an area, detecting military activities, or monitoring movement of civilian populace. The limits of the area to be searched are designated in the mission request, however, the aircraft crew must plan the flight pattern to be flown to insure complete coverage. Search areas will vary widely in size dependent upon the tactical requirements.

b. *Specific Search.* Specific search normally is conducted to detect military, para-military, or significant civilian activity within suspected, likely, or known locations. Specific search usually is employed for spot targets and for specific information.

c. *Route.* Observation of roads, railroads, waterways, and international borders may be conducted to determine enemy activity or inactivity. Usually it is performed on a point-to-point or town-to-town basis over a selected route which may pass through several search areas.

d. *Artillery Adjustment.* The aerial surveillance company can be expected to conduct indirect fire adjustment missions when the requirement exists and the priority of employment permits. Normally, fire adjustment missions for artillery or naval gunfire will result from inflight reports rendered by the OV-1 air crew or immediate requests from supported units.

e. *Contact Reconnaissance.* Contact reconnaissance is an aerial observation mission undertaken to locate friendly units that are isolated or cut off from the main force, e.g., a long range patrol out of contact with higher headquarters.

25. Visual/Photo Missions

Aerial visual/photographic missions will be discussed jointly as the KS-61 camera system is organic to all OV-1 aircraft. Habitually,

significant visual sightings will be confirmed by photography.

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

b. Visual reconnaissance and surveillance 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; however, the specific area of interest may require low level observation at nap-of-the-earth altitudes. If low level observation is performed 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 must be made from random directions.

c. Visual/photographic missions are ideally accomplished by employing flight teams of two aircraft as opposed to single aircraft missions. This method of employment permits the two aircraft to mutually support each other in their visual observation techniques. Additionally, one aircraft can perform a photographic mission while the other aircraft maintains visual observation over the area of interest. In the case of an aircraft being downed by ground fire, this flight team method of employment facilitates rapid recovery of the aircrew.

d. The OV-1 aircraft is equipped with the KS-61 photographic surveillance system employing the KA-30 aerial camera. This camera can be positioned in flight to provide vertical (with 20 percent to 80 percent forward overlap) or oblique (15° to 30° depression angle) photographs of the terrain. Additionally, some OV-1 aircraft are equipped with the KA-60 aerial camera. The KA-60 is fixed mounted in the nose of the OV-1 and provides a panoramic horizon to horizon photographic capability specifically designed for high speed, low flying aircraft. The camera is used in the forward oblique position to present a sequence of photographs of the ground beneath the aircraft

to the forward horizon, and through lateral horizons. This camera is especially valuable for taking photography of helicopter landing zones from the planned helicopter flight approach path.

e. Techniques used in the accomplishment of visual/photographic missions vary dependent upon the tactical situation, enemy strength and disposition, weather, terrain, and are limited only by the imagination of the pilot-observer team. Described below are some techniques appropriate to the accomplishment of visual/photographic missions.

- (1) One of these techniques is reconnaissance of a point target by a flight team of two aircraft. The aircraft approach the target area in a loose echelon formation so positioned that the target is on the observer's side of the aircraft. Altitude will usually be 1,000-1,500 feet above the terrain during the initial observation; if a close reconnaissance of the target is required, the aircraft will fly past the target then make a descending turn and execute a low level, high speed pass over the target area from a different direction (fig 4). If photographs are required or desired, one aircraft will overfly the target at the appropriate photo altitude.
- (2) The offset technique can be frequently employed when a single low pass over a target can accomplish the mission (fig 5). Utilizing this technique the aircraft approach the target at an altitude of 1,000-1,500 feet and as soon as the target is located in the distance the aircraft turn away from the target and descend towards a readily identifiable initial point (IP). To achieve surprise over the target area, the route from the IP to the target will be made at nap-of-the-earth altitudes.
- (3) Route reconnaissance of a railroad, highway, or waterway can best be accomplished by a flight team of two aircraft. Using this technique the aircraft fly in a loose echelon formation at an altitude sufficient to clear terrain obstacles, each aircraft positioning

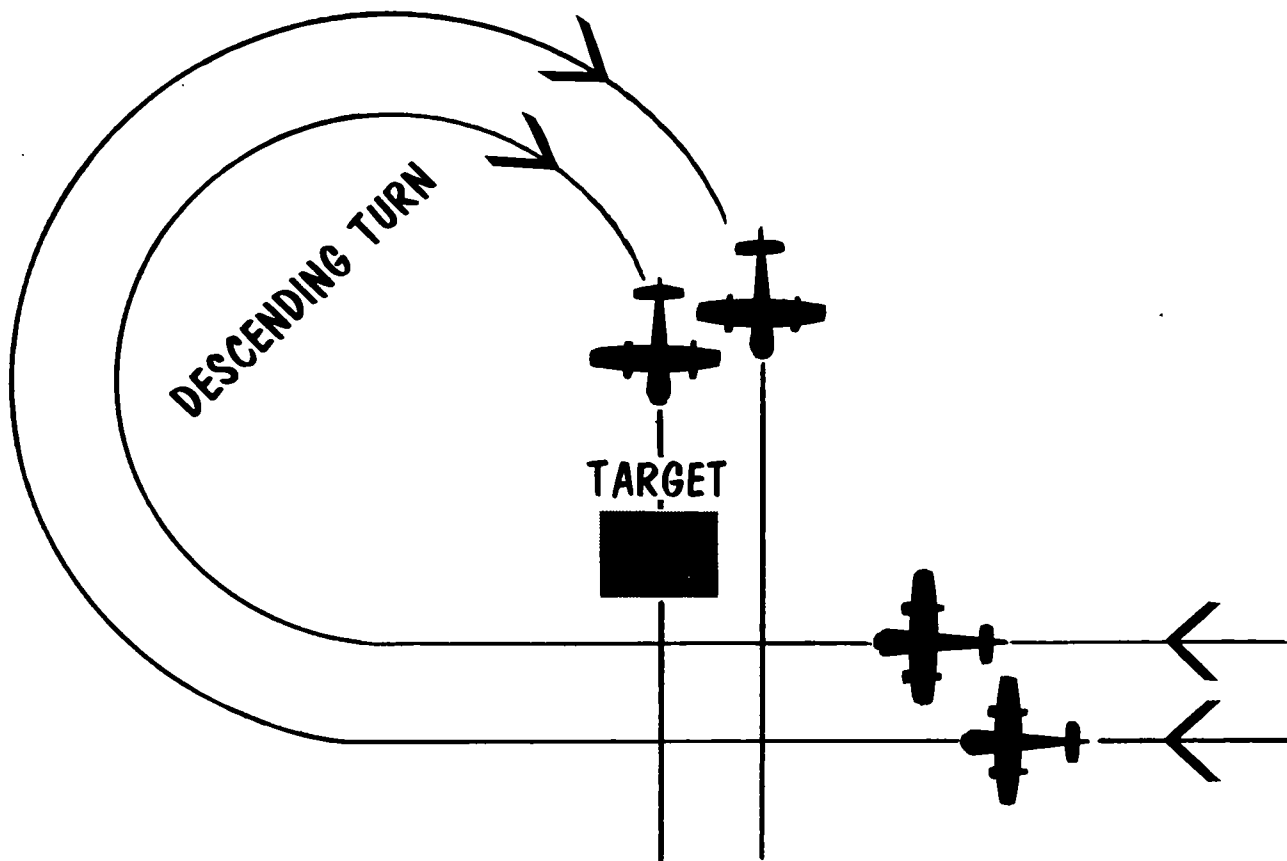


Figure 4. VISUAL/PHOTO POINT TARGET RECONNAISSANCE

Figure 4. Visual/Photo point target reconnaissance.

itself over opposite sides of the route to be surveyed (fig 6). This permits observation across the route and under any foliage that might conceal the periphery of the route.

- (4) The KA-30 aerial camera, organic to the OV-1 aircraft, has a limited area coverage capability; however, this capability should be employed only for small areas. The requesting unit should furnish the aerial surveillance company 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 aviation unit can plot the flight traces after considering all the factors

affecting the mission. Using the doppler navigation system and the aircraft's autopilot, accurate parallel flight paths can easily be flown, producing the required imagery.

26. Aerial Radar Missions

a. The OV-1B aircraft of the aerial surveillance company are equipped with the AN/APS-94 Side Looking Aerial Radar System (SLAR). The SLAR produces permanent echo (PE) and moving target indicator (MTI). Basically, the PE mode of the radar provides a map-like presentation of the ground with natural and manmade objects appearing similar to that on a photograph. The MTI mode of the radar is designed to present, in the form of an elec-

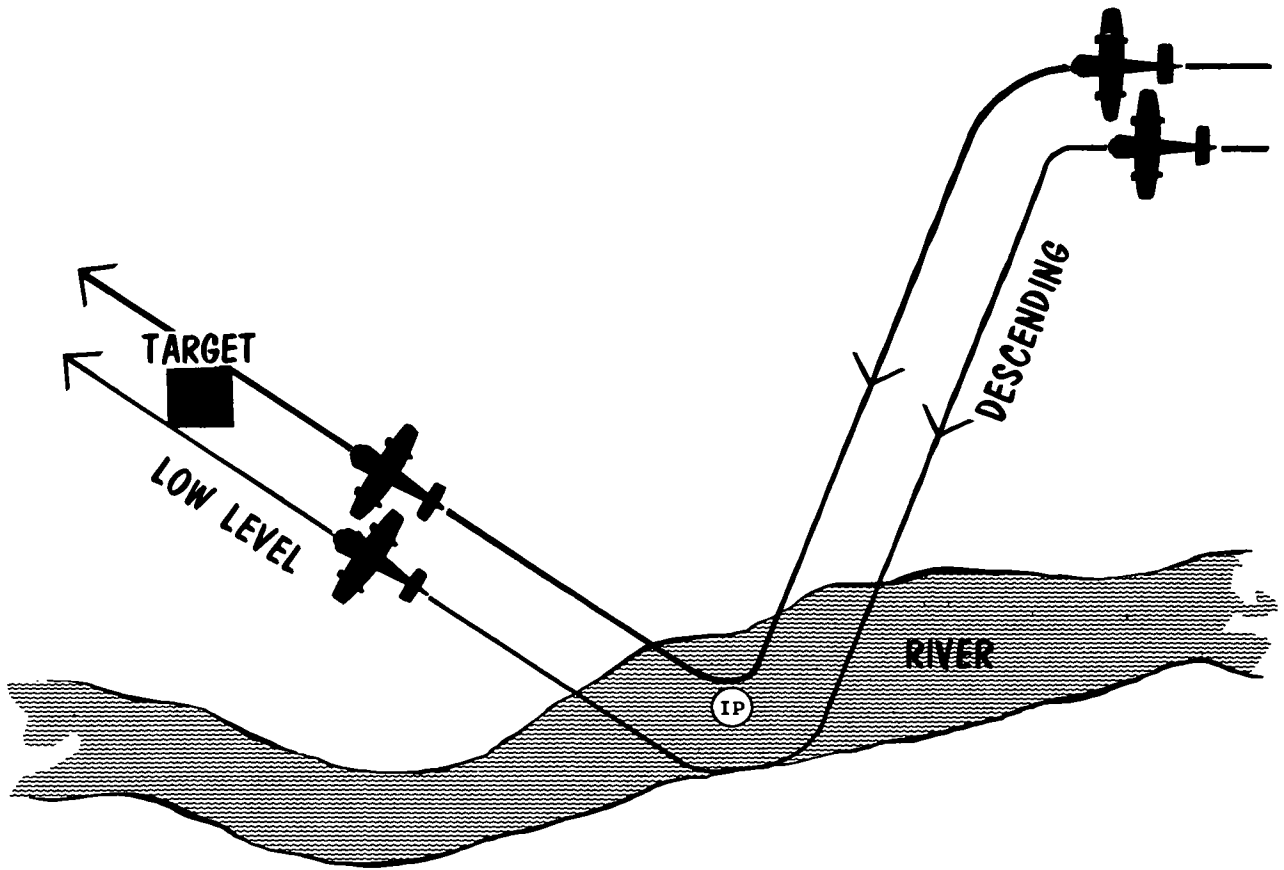


Figure 5. VISUAL/PHOTO OFFSET TECHNIQUE

Figure 5. Visual/Photo offset technique.

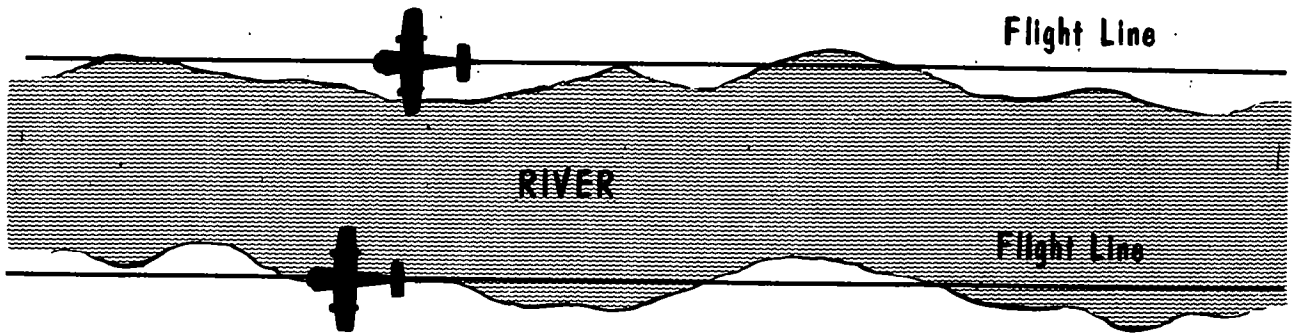


Figure 6. VISUAL/PHOTO ROUTE RECONNAISSANCE

Figure 6. Visual/Photo route reconnaissance.

tronic signal, only moving objects on the ground. The characteristic of radar which makes it so valuable as a sensor is that it can be used effectively during the night or during periods of poor weather conditions. The radar will operate in total darkness, but extreme weather conditions (heavy rain, sleet, or snow) limit the effectiveness of radar in either a PE or MTI mode. Another limitation of radar is its vulnerability to electromagnetic countermeasures. This is not considered significant in internal defense operations since insurgent's electronic capabilities are normally limited. However, net authentication procedures must be followed during each transmission in order to counter enemy attempts at imitative communication deception.

b. When the SLAR system is equipped with the RO-166 Rapid Data Processor, near real time target data information is produced in the cockpit of the aircraft (approximately three minutes after target detection). The rapid data processor permits the aerial sensor operator to transpose the viewed targets to a tactical map, thereby permitting immediate inflight reports to be rendered to ground stations not in communications with the TIIF.

c. There is an AN/TKQ-1 ground sensor terminal available for use with the OV-1B aircraft. The ground sensor terminal receives the signals from the aircraft and duplicates the image seen in the aircraft. It is processed through a rapid data processor and made available for plotting by a trained operator. The ground data receiver will usually be positioned near the supported unit TOC.

d. SLAR is generally employed in an area search mode or in surveillance of linear distances such as coastlines and international boundaries. During the conduct of SLAR missions it is essential that the aircraft be flown in a straight and level attitude; air turbulence will degrade the quality of the imagery produced. All SLAR missions should be flown at the optimum flight altitude for the recording of imagery.

e. The following are examples of typical SLAR missions:

- (1) *Area search.* Flight paths are planned to insure that the target area is con-

tinuously being mapped by the SLAR. This can be accomplished by using either a triangular or rectangular pattern as illustrated in figure 7.

- (2) *Coastal or border surveillance.* This mission is executed by flying parallel courses perpendicular to the area of interest. Standoff distances can be utilized up to the maximum capability of the system. Throughout the conduct of these missions inflight reports can be rendered based on target read-out from the RO-166. Examples of typical SLAR missions are shown in figure 8.

27. Aerial Infrared Missions

a. The OV-1C aircraft of the aerial surveillance company is equipped with the AN/UAS-4 Infrared Set (IR). The infrared sensor is not an area surveillance device, as it scans directly beneath the flight path of the aircraft and has operational altitude limitations; however, small area coverage is feasible. The AN/UAS-4 is an airborne dual channel system capable of detecting simultaneously infrared energy and available light radiated or reflected from the terrain through the use of a photomultiplier or two IR channels. Infrared missions are usually executed during the hours of darkness, as the cooling of the ground permits a larger heat emission differential from "hot targets."

b. All information received by the airborne infrared sensor can be simultaneously transmitted to a Ground Sensor Terminal AN/TAQ-1. Information received by the ground sensor terminal is displayed and recorded in the same manner as in the aircraft.

c. The aerial infrared sensor is generally employed to provide infrared coverage of routes, small areas, suspected enemy locations or installations. The aerial infrared system is not an all weather system and will not receive heat emissions through cloud layers, dense jungle canopies, or other similar heat-absorbing environments.

d. The success of night infrared missions is contingent upon accurate navigation to the target area. In remote areas of the world navigation can prove to be very difficult. Consequently,

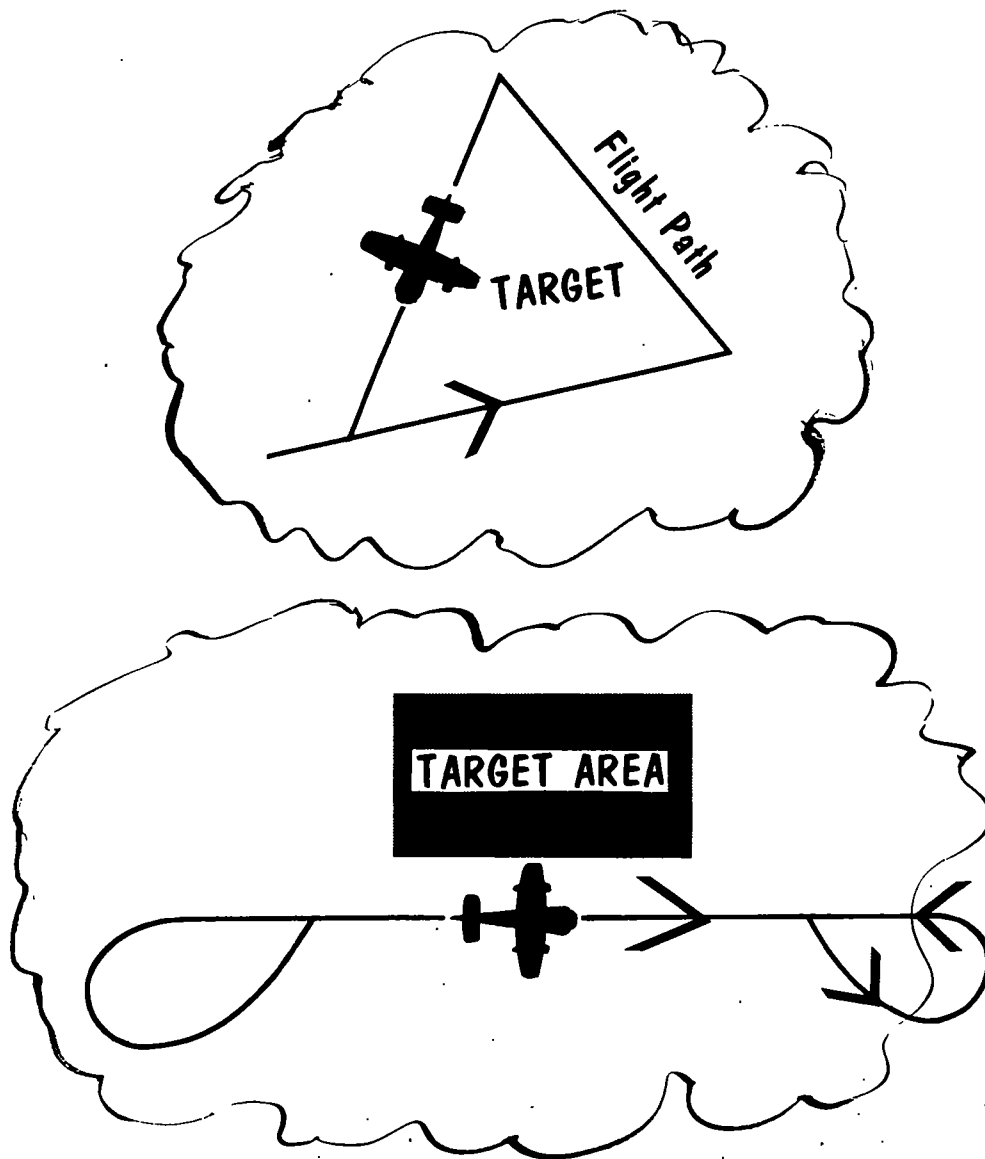


Figure 7. SLAR AREA SEARCH

Figure 7. SLAR area search.

the flight planning prior to an infrared mission must be accurate, detailed, and complete. Optimum results from night infrared missions can be achieved using the AN/ASN-64 Doppler Navigational System. When preflight planning for an infrared mission the pilot must develop the doppler navigational coordinates for the target area; additionally the coordinates of a readily identifiable terrain feature of man-made feature in proximity to the target area

are essential for up-dating of the computer just prior to the imagery run. Utilizing the doppler navigational computer the pilot can execute the infrared mission employing parallel or random passes over an area and minimize his exposure to ground fire.

28. Multiple Sensor Operations

The surveillance and reconnaissance resources within the aerial surveillance company

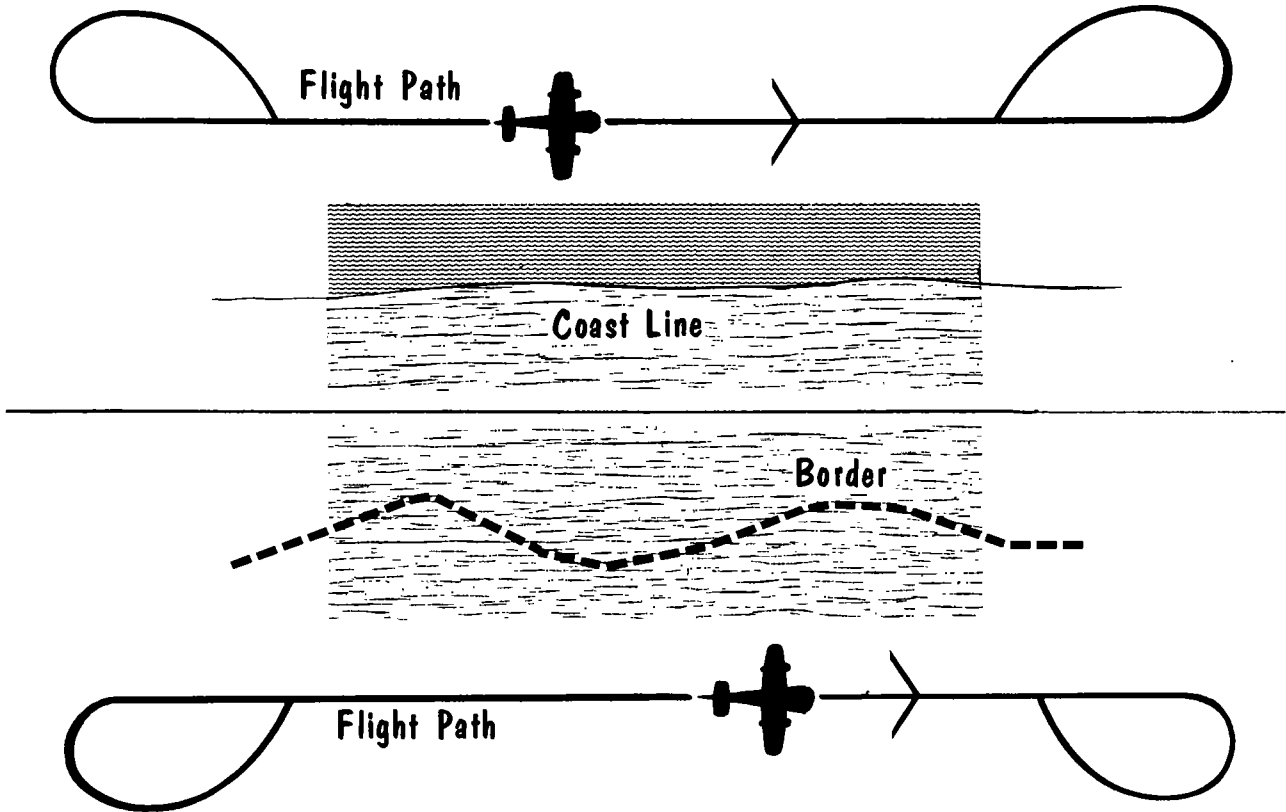


Figure 8. SLAR LINEAR COVERAGE

Figure 8. SLAR linear coverage.

can be most efficiently employed if the unit is mission tasked, EEI provided, and permitted maximum latitude in the execution of the mission. This will permit the G-2 Air representative (ARLO) at the surveillance company,

imagery interpretation personnel, and the operations officer of the aviation company to jointly plan the use of the most efficient combination of sensors to accomplish the mission within the required time frame.

CHAPTER 4

ARMY SECURITY AGENCY OPERATIONS

29. Introduction

The concept of aerial surveillance and reconnaissance employment is discussed in this manual and chapter 3, FM 30-20. U.S. Army Security Agency operations as they pertain to the development of intelligence and its interface with aerial surveillance have not been included and are discussed below.

30. Concept

a. Integration of Signal Intelligence (SIGINT) and imagery intelligence (IMINT) at the earliest practical moment in the intelligence collection effort is a clearly defined requirement (imagery interpretation) for the most effective target acquisition, surveillance and reconnaissance support to the tactical commander. SIGINT information can complete, confirm or refute, and, in many instances, tip off other reconnaissance and surveillance systems.

b. In order to facilitate timely integration, obviate handling delays normally incurred when dealing with special intelligence, and particularly to assist the tactical commander in the

effective employment of SIGINT resources at his disposal, the U.S. Army Security Agency will assign an ASA qualified staff officer at army, corps and division, and attach ASA support detachments to each supported division and independent brigade. These detachments will provide personnel for a Technical Warfare Element (TWE) in the TOC.

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.

31. Coordination

It is the responsibility of the G-2/S-2 to provide for coordination of ASA activities and those of the Aerial Surveillance Company.

APPENDIX A

REFERENCES

AR 320-5	Dictionary of US Army Terms.
AR 750-1	Maintenance Concepts.
AR 750-2	National Maintenance Points.
FM 1-5	Aviation Company.
FM 1-80	Aerial Observer Training.
FM 1-100	Army Aviation.
FM 30-20	Aerial Surveillance-Reconnaissance, Field Army.
TM 30-245	Photographic Interpretation Handbook.
(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).

APPENDIX B

NATO STANDARDIZATION AGREEMENT (STANAG 3377)— AIR RECONNAISSANCE INTELLIGENCE REPORT

Original English/French translation

STANAG 3377

DETAILS OF AGREEMENT (DofA)

AIR RECONNAISSANCE INTELLIGENCE REPORT FORMS

- Annexes :
- A(DofA). In Flight Report.
 - B(DofA). Mission Report.
 - C(DofA). Hot Photo Report.
 - D(DofA). Immediate Photo Interpretation Report.
 - E(DofA). General Photo Interpretation Report.

INTRODUCTION

1. It is an intelligence responsibility to derive information from accomplished aerial reconnaissance missions, including both those of visible observations and those which acquire photography and/or other sensor images. Interpretation and dissemination of resultant intelligence completes the air reconnaissance cycle. Reconnaissance intelligence is obtained by means of visual observation and sensors, including photography, radar and infrared, and is reported as obtained from inflight through detailed interpretation of the images by the following types of report:

- a. Inflight Report.
- b. Mission Report.
- c. Hot Photo Report.
- d. Immediate Photo Intelligence Report.
- e. General Photo Interpretation Report (without format).

SCOPE

2. Participants agree to use, as required, the Report Forms in Annexes A through E when reporting the results of reconnaissance missions. A MISSION REPORT will be produced, if possible for every mission sortie furnishing reconnaissance information. An INFLIGHT REPORT will be made in the course of every mission. The HOT PHOTO REPORT, and the IMMEDIATE PHOTO INTERPRETATION REPORT will be provided only when circumstances dictate, i.e., when further reconnaissance information from the sortie makes it necessary to supplement or amend the Mission Report or when the tasking authority so requests. The GENERAL PHOTO INTERPRETATION REPORT will be provided only on special request. There is no special format for this report. The Report Forms embraced in this STANAG are designed for the transmission of air reconnaissance information from unit level up to ATAF/ARMY GROUP/JCCC level. They are not intended to preclude employment of other reports in addition (e.g. strike mission reports, intelligence summaries, etc.).

PURPOSE OF REPORTS

3. The following are the standard air reconnaissance intelligence reports to be used in combat and as directed during exercises:

- a. The purpose of the IN-FLIGHT REPORT is to transmit, from the air-borne system, intelligence observed both at the target and on the route to and from the target.
- b. The purpose of the MISREP is rapid reporting of intelligence collected during a flight and reported as a result of mission debriefing including quick sensor readout. The intelligence may amplify information contained in the IN-FLIGHT REPORT.
- c. The purpose of the HOT PHOTO INTERPRETATION REPORT is to provide a means for supplementing or amending a MISREP should further essential reconnaissance information be derived from sensor readout.
- d. The purpose of the IMMEDIATE PHOTOGRAPHIC INTERPRETATION REPORT is to provide a more complete readout of the photographic mission. This report is only submitted when specifically requested.
- e. The purpose of the GENERAL PHOTOGRAPHIC INTERPRETATION REPORT is to provide a secondary interpretation and more detailed readout of the information contained in the photographic mission. This report is only submitted when specifically requested. No special format is used.

CROSS REFERENCE OF TASK, MISSION AND REPORT SERIAL NUMBERS

4. a. The mission and report serial number should always be the same as the AIR REQUEST and AIR TASK No., and are used to identify the mission throughout these procedures. When used in the air, the mission number may be abbreviated: for example MISSION 3/A501 may be abbreviated to "MISSION 501."
- b. If, for any reason, the tasking agency decide that (for example) Air Request 3/A501 is to be flown as Air Task 3/A550 they send the Accept/Refuse Message as "AR 3/A501 accepted as 3/A550". Thereafter the mission is tasked, flown, controlled, recovered and reported upon as 3/A550.

IMPLEMENTATION OF THE AGREEMENT

5. This agreement will be considered to have been implemented when the necessary orders directing the forces concerned to adopt the formats contained herein, have been issued.

IN-FLIGHT REPORT

1. PURPOSE. An IN-FLIGHT REPORT is the standard form of message whereby strike, attack and reconnaissance pilots/crews report mission results while in flight. This report is also to be used for reporting any other tactical information sighted of such importance and urgency that the delay, if reported by normal debriefing, would negate the usefulness of the information.

2. FORMAT.

USE STANDARD MESSAGE FORM HEADING	(See notes)
FORMAT (Not to be transmitted)	↑ EXAMPLE MESSAGE
IN-FLIGHT REPORT: Always start of message.	IN-FLIGHT REPORT.
AIR TASK/MISSION NO.	3/A501.
A. LOCATION IDENTIFIER (only if necessary for clarification)	A. LC 7354.
B. TIME ON TARGET/TIME OF SIGHTING.	B. Target attacked 1610Z.
C. RESULTS. Results of mission, brief description of observation, recommendation for attack/re-attack if necessary.	C. Two tanks destroyed, one damaged. 20 tanks and troops seen moving West out of HOF. 1615Z.

3. NOTES.

a. Procedure.

- (1) Submitted by. All units/wings in a strike/attack or reconnaissance role.
- (2) Frequency. As ordered by the requesting authority and/or at the discretion of the mission leader.
- (3) Time. As soon as possible after results are known, and aircraft is within radio range of a reporting post on the ground.
- (4) Method of transmission. Voice broadcast to appropriate reporting post or as briefed.

b. Precedence. As required.

c. Security. Code words established by local SOP may be used if necessary.

ANNEX B TO
DETAILS OF AGREEMENT
OF STANAG 3377

MISSION REPORT
(MISREP)

1. PURPOSE. The MISREP is the standard form of message whereby the airbase/carrier informs the tasking agency and, if necessary, the requesting unit/formation of the results of each mission. A MISREP is to be used to report essential information derived from attach and reconnaissance operations. (See Notes 1 and 7.)

2. FORMAT.

USE STANDARD MESSAGE FORM HEADING
(See Note 2)

FORMAT (Not to be transmitted)	EXAMPLE MESSAGE
<u>MISREP:</u> Always start of message.	MISREP
Mission Number	2/A 255
A. LOCATION IDENTIFIER such as: Target No./Coordinates, Line Search No. or relation to a line (as applicable) (See Note 3).	A. LC 725355
B. TIME ON TARGET/TIME OF SIGHTING	B. 231150Z
C. RESULTS (See Note 4)	C. BRIDGE RAIL OVER RIVER U/S.
D. PHOTO CONFIRMATION (See Note 5)	D. YES
E. OTHER INFORMATION (including WEATHER) (See Note 6)	E. Concentrated LAA at target. 8/8 ceiling 500 (167 Metres) ft.

NOTES

1. Procedure. The message is compiled at the air base/carrier by the operations staff, Ground Liaison Officer/Carrier Borne Ground Liaison Officer, or by photo interpreters as appropriate. It is passed by fastest means (Command Channel or Ground Liaison Officer Net) to the tasking agency.
2. Precedence. Depending on the tactical urgency to the addressees in relation to other message traffic.
3. Serial A. Either the Target Number, Target Location, or Line Search Number is to be stated.
4. Results.
 - a. Attack Missions
Attack missions will report on damage inflicted, e.g., percentage destroyed, number destroyed or damaged, sunk, etc.
 - b. Reconnaissance Missions
Given as follows:
 - (1) Single word designators where this will describe the intelligence being reported.

(2) Narrative, if results require explanation, e.g., Order of Battle of air or ground forces, direction of movements, etc.

(3) Unusual or new equipment or concentrations of enemy forces will be reported.

5. Photographic Confirmation

a. To be answered with YES if the result of the mission was derived from verbal debriefing and quick sensor readout.

b. To be answered with NO if no photos were taken or no sensor readout took place.

6. Other Information

Includes any items not specifically mentioned in above categories, e.g., enemy air defenses. Weather data will be reported using the Weather Codes.

7. Due Out Time (Reconnaissance Missions only). Speedy completion of the MISREP is vital and it should be completed within 30 minutes after aircraft engine shut-down. If sensor readout can be accomplished within these 30 minutes, the MISREP will include sensor results. If sensor readout cannot be accomplished within 30 minutes, the additional data may be reported as soon as possible by a HOTPHOTOREP. When further interpretation of images reveals significant changes to earlier information, this will also be reported by a HOTPHOTOREP.

8. Security Classification.

In the interest of speed the lowest acceptable classification should be used.

ANNEX C TO DETAILS OF AGREEMENT
OF STANAG 3377

HOT PHOTO REPORT
(“HOTPHOTOREP”)

1. PURPOSE. A Hot Photo Report is the standard form whereby the air base/carrier informs the tasking agency, and, if required, the requesting unit/formation of the results of quick sensor readout if this intelligence information was not reported in the MISREP. It is to be used only as a means to supplement or to amend the information contained in the MISREP in the case of essential additional or contradictory information being revealed by sensor readout.

2. FORMAT.

USE STANDARD MESSAGE FORM HEADING

(See notes)

FORMAT (Not to be transmitted)	↑	EXAMPLE MESSAGE
HOTPHOTOREP: Always start of message.		HOTPHOTOREP 2/A255
A. LOCATION IDENTIFIER such as: Target No. Co-ordinates, Line Search No. etc.		A. LC. 725355
B. TIME PHOTOS TAKEN		B. 231150Z
C. RESULTS		C. FROGMEN IDENTIFIED IN TARGET VICINITY
D. TYPE OF PHOTOGRAPHY, EXPOSURE NO.		D. P0001-0003
E. QUALITY OF PHOTOGRAPHY/SENSOR IMAGE/APPROX SCALE		E. GOOD, LARGE
F. PERCENTAGE OF PHOTO/SENSOR COVERAGE		F. 100 PER CENT

NOTES

1. Frequency. In each case when the MISREP needs to be supplemented by vital information or amended by contradictory information or when higher authority so requests.
2. Submission Time. As soon as possible but not later than one hour after mission aircraft lands.
3. Classification. In accordance with local regulations.
4. Method of Transmission. Fastest means available consistent with classification of the contents.
5. Submitted To. All MISREP addressees.

ANNEX D TO DETAILS OF AGREEMENT
OF STANAG 3377

IMMEDIATE PHOTOGRAPHIC INTERPRETATION REPORT
(IPIR)

1. PURPOSE. An IMMEDIATE PHOTO INTERPRETATION REPORT (IPIR) will be produced only when specifically requested. It will provide more detailed intelligence information (obtained by means of photo interpretation or other sensor readout) than the MISREP. The report gives an appraisal of the mission and will contain positive statements in answer to the purpose for which the mission was flown.

2. FORMAT.

USE STANDARD MESSAGE FORM HEADING
(See notes)

FORMAT (Not to be transmitted).	EXAMPLE MESSAGE
IPIR: Always start of message.	IPIR 2/A603
A. LOCATION IDENTIFIER, such as: Target No./Grid Reference, etc.	A. HWY BRIDGE AT NA 418384.
B. TIME PHOTOS TAKEN.	B. 121050Z AUG.
C. RESULTS.	C. This bridge is a six span masonry arch structure length 200 metres; width 10 metres. It is based on 5 concrete piers and two concrete abutments. At time of photography the bridge was fully usable.
D. TYPE OF PHOTOGRAPHY/EXPOSURE NOS.	D. P 0012-0014
E. QUALITY OF PHOTOGRAPHY/SENSOR IMAGE/APPROX. SCALE	E. GOOD, PHOTO, LARGE
F. PERCENTAGE OF PHOTO/SENSOR COVERAGE	F. 100 PER CENT

NOTES

1. Frequency. On request only.
2. Submission Time. Not later than four hours after the aircraft lands.
3. Classification. According to local instructions.
4. Method of Transmission. Fastest means available consistent with classification of the content. If text only is required, teletype will be used. If photographs are to accompany the text, courier service will be used.

ANNEX E TO DETAILS OF AGREEMENT
TO STANAG 3377

GENERAL PHOTOGRAPHIC INTERPRETATION REPORT (GPIR)

1. PURPOSE. To provide detailed intelligence by photo interpretation of imagery obtained on a given photo reconnaissance mission. This report is used primarily to aid wartime staffs in planning for future operations.

2. FORMAT. No special format used. The content will be in accordance with the requirements of the requestor.

3. REPORTING INSTRUCTIONS

- a. Frequency : On request only.
- b. Due Out Time : As directed. Every effort will be made to complete the report at the earliest possible time after the request has been received by the preparing organization.
- c. Classification : As directed by the content of the report.
- d. Method of Transmission : The GPIR will be transmitted by teletype, facsimile, or courier depending on the content and urgency it contains.

APPENDIX C
NATO STANDARDIZATION AGREEMENT (STANAG 3189,
EDITION NO. 2)—TITLING OF AIR RECONNAISSANCE,
AIR SURVEY, AND MAPPING PHOTOGRAPHY

ANNEX 'A' TO DETAILS OF AGREEMENT
OF STANAG 3189
(Edition No. 2)

INSTRUCTIONS FOR TITLING

GENERAL

1. The information detailed at paragraph 2 below, shall be titled on each end of each roll of air reconnaissance, air survey, and mapping photography, immediately before the first negative, and immediately after the last negative. This information shall include complete details of each run over of each separate target. The different items shall be arranged in the order shown. An example is given at paragraph 9 of this annex, and an explanation of each item in paragraph 2 is given at Annex 'B'.

TITLING SEQUENCE

- 2. + 1 Negative Number
- + 2 Camera Position (depression angle)
- + 3 Taking Unit
- + 4 Service
- + 5 Sortie/mission number
- + 6 Date (followed by a double hyphen (=))
- + 7 Time Group and Zone Letter
- + 8 Focal Length
- + 9 Altitude
- + + 10 Kind of Photography
- 11 Geographical Coordinates
- 12 Descriptive Title
- 13 Projective Number
- 14-19 Survey and Mapping Data, if required
- 20 etc. Additional Data, if required

Last Item: Security Classification

3. Items 1 to 6 inclusive 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: Frame No.

Sortie/Mission No.

Date Time Group (Z) DTG(Z)

4. The starred items 1 to 9 inclusive shall be the minimum titling on each reconnaissance photograph. The double-starred item 10 shall appear on each survey and mapping negative, accompanied by acceptable electronic positioning data.

5. The appropriate security classification shall be shown on all material produced from the original roll of film.

6. If additional data must be inserted, it shall immediately precede the security classification which shall be the last item listed.

7. All titling shall be permanently marked in clearly legible capital letters, in such a position as to obscure the minimum of detail.

TITLING OF AIR SURVEY AND MAPPING PHOTOGRAPHY

8. The following information shall be titled on each end of each roll of air survey and mapping photography:

14. Camera Type and Serial Number.

15. Cone Serial Number.

16. Lens Type and Serial Number.

17. Magazine Type and Serial Number.

18. Type and Manufacturer of Photographic Film, and Type of Photographic Filter Used.

19. Mean terrain elevation above M.S.L. (Mean Sea Level).

EXAMPLE (For Titling of Air Reconnaissance Photography)

9. 121 F21 408(R) RCAF 109 15 JUN 56 = 1630Z 36IN 12,000FT 4032N7607W TORONTO
ATC56-1 SECRET

ANNEX 'B' TO THE DETAILS OF AGREEMENT
OF STANAG 3189

(Edition No. 2)

EXPLANATION OF ITEMS USED FOR TITLING

(See EXAMPLE at Para 9 of Annex 'A')

1. 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.

2. Item No. 2 (Camera Position) "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.

a. V-Vertical—The single letter V shall indicate a single vertical installation of one camera not tilted 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.

b. 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.

e.g., A split fan—F21, F22

3 camera fan—F31, F32, F33

5 camera fan—F51, F52, F53, F54, F55

Note: When more than one fan is installed, the letter F shall be preceded by the number of the fan, these being numbered from nose to tail.

e.g., First fan—1F31, 1F32, 1F33

Second fan—2F21, 2F22

Third fan—3F51, 3F52, 3F53, 3F54, 3F55

c. 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

d. 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—Hand held

Cameras in multiple oblique installations will be designated by the letter P1, P2, etc., (Port), S1, S2, etc. (starboard) numbered from front to rear; N1, N2, etc., (Nose) T1, T2, etc., (Tail) numbered from port to starboard.

e. 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 hand held obliques.)

- f. 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.

3. 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. Where 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."

4. Item No. 4 (Service) "RCAF"—denotes photographs made by the Royal Canadian Air Force. Other Services shall utilize appropriate symbols.

5. Item No. 5 (Sortie or Mission Number) "109"

6. Item No. 6 (Date) "15 JUN 56"—denotes the date photography is accomplished in the immediate area photographed.

7. Item No. 7 (Time Group and Zone letter) "1630Z." Greenwich Mean time (Z) shall be used in every case.

8. Item No. 8 (Focal Length) "36IN" (Focal length of lens in inches (IN) or Centimetres (CM))—denotes equivalent focal length of lens indicated in inches or centimetres, except that all photography produced by calibrated cameras shall show the focal length in millimetres to the number of significant figures available data provides. 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 Millimetres (MM)).

9. Item No. 9 (Altitude) "1200FT"—denotes altitude above Mean Sea Level in feet (FT) or metres (M).

10. Item No. 10 (Kind of Photography)—The following symbols shall be used to indicate the kind of photography, other than reconnaissance:—

- R—Infra-red
- C—Charting
- S—Survey and mapping (1st or highest order of accuracy)
- C— " " " (2nd order of accuracy or below—Charting)
- *SH— " " " horizontally controlled electronically
- *SV— " " " vertically controlled electronically
- *SHV— " " " 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 acceptable controlled, as determined by the taking unit.

11. Item No. 11 (Geographical Coordinates)—"4032N7607W." Coordinates given shall apply to the centre 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 (Toronto). 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 centre of the negative or print. If other coordinate systems are used, this fact shall be clearly stated.

12. Item No. 12 (Descriptive Title) "Toronto"—denotes the approximate place or subject of the photograph.

13. Item No. 13 (Project Number, year assigned, code name) "ATC56-1"—denotes the year (1956) and the first project assigned by the highest echelon directing the project. In this instance, Air Transport Command, RCAF.

14. Last Item (Security Classification) "SECRET"—denotes the security classification assigned to the photography in accordance with existing regulations or directives.

APPENDIX D

**NATO STANDARDIZATION AGREEMENT (STANAG 3277,
EDITION NO. 3)—AIR RECONNAISSANCE REQUEST FORMAT**

ANNEX 'A' TO STANAG 3277 (Edition No. 3)

1. Front of Air Reconnaissance Request Form

PRECEDENCE

(Security Classification)

FROM:

TO:

AIR RECONNAISSANCE REQUEST FORM

- L. ORIGINATOR'S SERIAL NUMBER
- M. TYPE OF RECONNAISSANCE
- N. NATIONAL MAP SERIES AND SHEET NUMBER
- O. DESCRIPTION OF TARGET AND MAP REFERENCES
- P. OBJECT OF THE 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 TIME AND DATE
- U. SPECIAL INSTRUCTIONS

Signature of Requesting Officer

Signature of Approving Officer

Rank, Position,

Rank, Position

2. Back of Air Reconnaissance Request Form (English)

NOTE: The letters A to K have a special significance for certain organizations, and are purposely omitted from the form.

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, ARCENT, AFNORTH, 4ATAF.

- M. TYPE OF RECONNAISSANCE** For example: visual, electronic, weather, fire control or photographic reconnaissance (vertical, oblique 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 operations by nations, these details must be given in full.
- O. DESCRIPTION OF TARGET AND MAP REFERENCE** So as to leave the recipient of the request in no doubt as to the requirements, it is necessary to give an exact locations, e.g., railway bridge 775386. In the case of oblique, the NEAR boundary of the area to be photographed will be given. If GRID reference is used, state GRID type, i.e., UTM, GEOREF, etc., otherwise state latitude and longitude to the nearest minute.
- P. PURPOSE OF 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 produced.
- Q. PHOTO SCALE OR SCALE LIMITS ACCEPTABLE** Whenever possible, this heading should be filled in on the advice of a photographic interpreter. The scale should be quoted in figures, e.g., 1/10,000.
- R. NUMBER OF PRINTS, PLOTS OR REPORTS REQUIRED** This should never exceed the number actually required. If a photo 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 dealt with.
- T. LATEST ACCEPTABLE TIME/DATE** The date and/or time after which the prints, plots or reports are no longer required. If delivery cannot be made by the date stated, the request will be cancelled.
- U. SPECIAL INSTRUCTIONS** T.O.T., if required, the degree of urgency, or when making more than one request, the degree of priority, and the security classification of the material requested. Note whether first, second or third phase photo interpretation is desired from the photographs. Give any instructions or information not already provided, that will aid the planning, or successful accomplishment of the mission.

APPENDIX E
BRIEFING CHECKLIST

Mission Number _____ Date _____

Type Mission _____

Target Description (Primary) _____

Target Description (Alternate) _____

Target Locations _____

Specific Results Desired _____

Photo Scale (if applicable) _____ Number of Prints _____

Type Report Desired _____

Call Signs or SOP _____

Frequencies or SOP _____

Desired Time on Target _____

Desired Time for Results _____

Time No Longer of Value (TNLOV) _____

Priority _____

APPENDIX F
DEBRIEFING CHECKLIST

Date _____

Mission Number _____ Pilot _____ Observer _____

Element Designation _____

Type of Mission _____

Aircraft _____

Target Description _____

In Flight Reports Made _____

Contacts Made During Flight _____

Any Deviations Made from Plan _____

Sightings	Location	Description	Time
Installations	_____	_____	_____
Movements	_____	_____	_____
Communications and Electronics	_____	_____	_____
Weapons	_____	_____	_____
Defenses	_____	_____	_____
Obstacles	_____	_____	_____
Miscellaneous	_____	_____	_____

Debriefers Name and Organization _____

By Order of the Secretary of the Army:

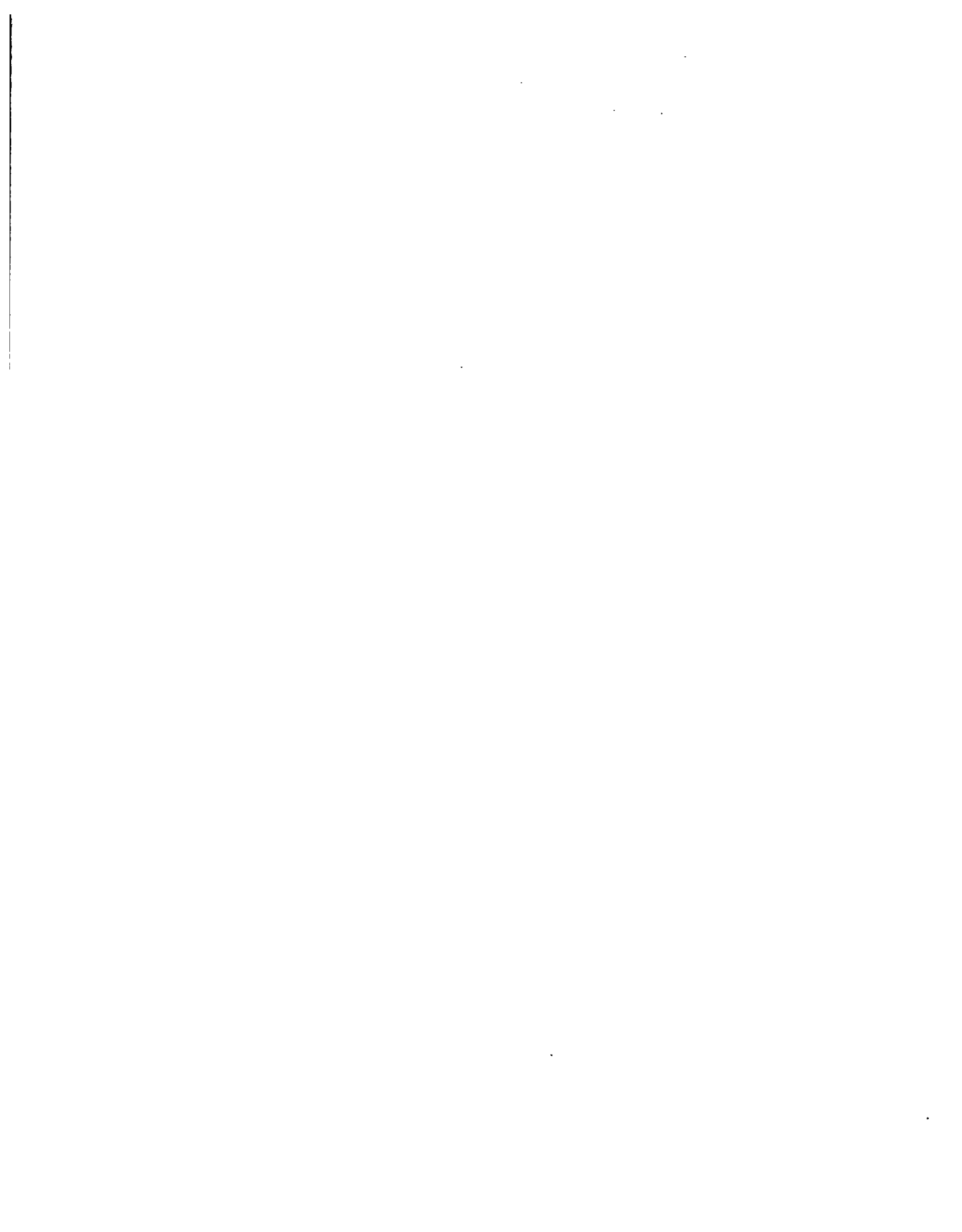
HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

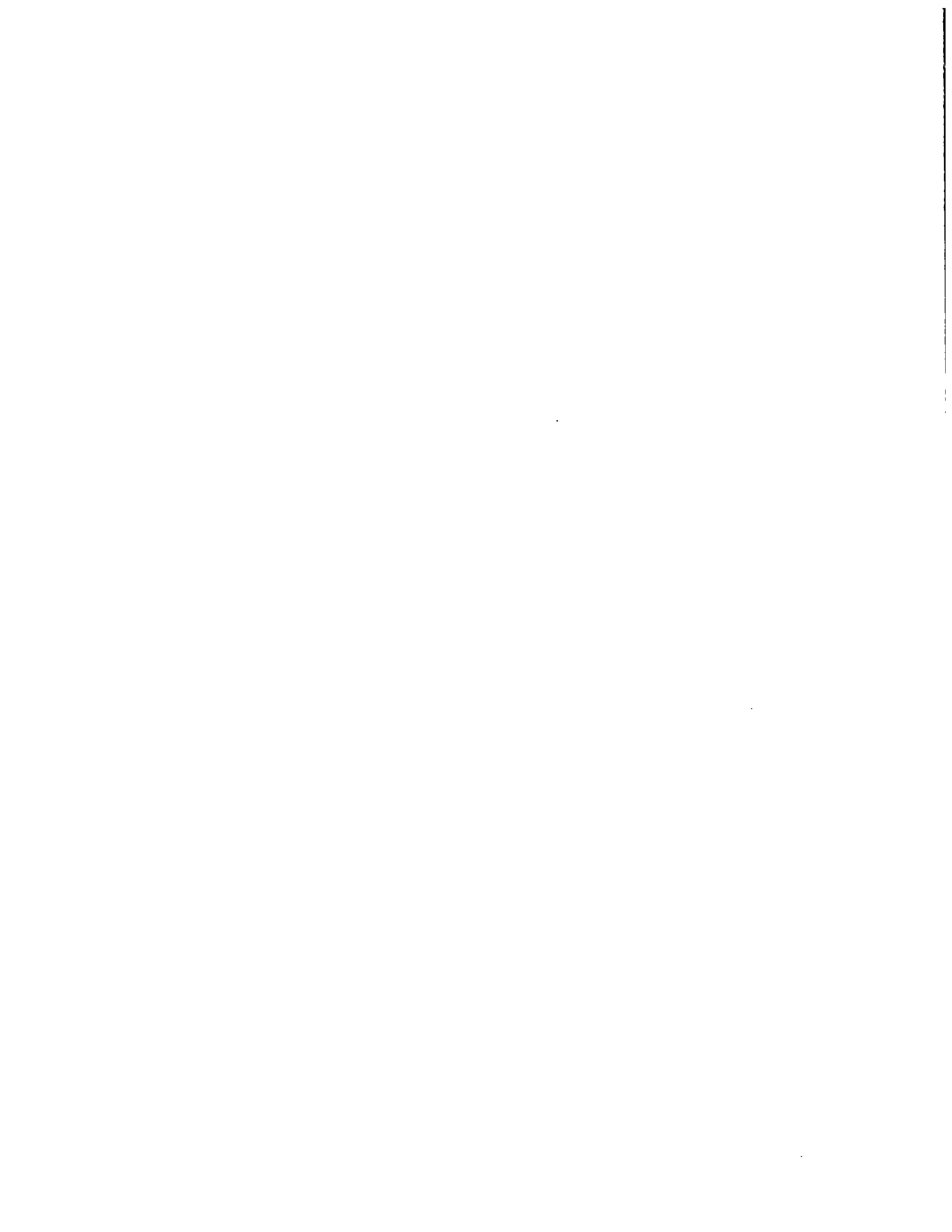
Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

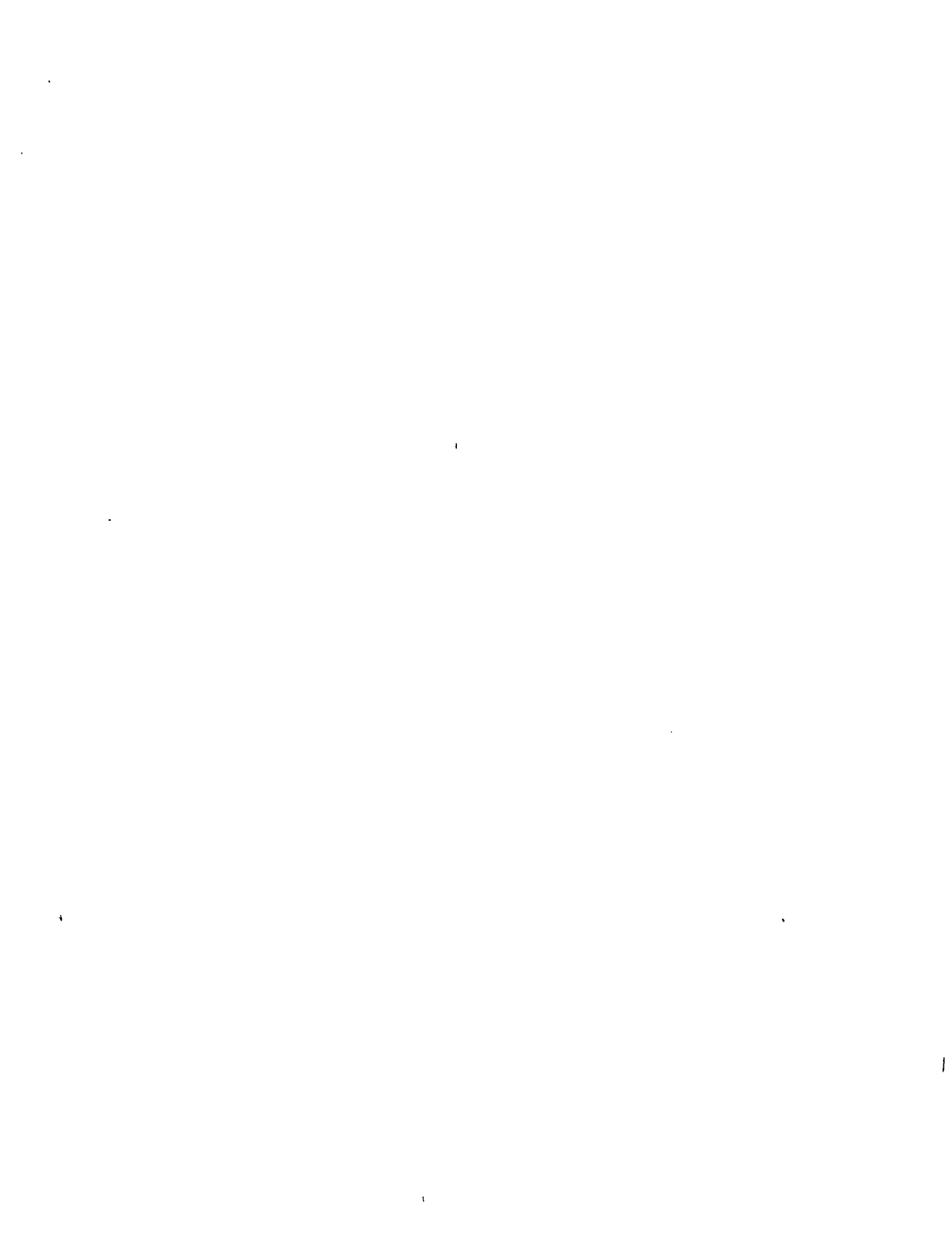
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