

RESTRICTED

FM 30-10

WAR DEPARTMENT

BASIC FIELD MANUAL



MILITARY INTELLIGENCE

OBSERVATION

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OBSERVATION

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Chief of Staff



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III

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SECTION I

GENERAL

■ 1. SCOPE OF MANUAL.—*a.* This manual furnishes commanders and staff officers a statement of the capabilities and limitations of the various means of observation available to the intelligence service. It is intended as an aid in the coordination of these means so that they may contribute their important part to the building up of the complete picture of enemy capabilities that is essential to the commander in the conduct of battle.

b. The employment and training of specialized intelligence observers are covered in this manual. The details of employment and training of technical observers for the various arms are covered in their respective field manuals. Publications bearing on observation are listed in appendix I.

■ 2. GENERAL CONSIDERATIONS ON OBSERVATION.—*a.* The value of information obtained by observation varies with the nature of the terrain, the visibility, the degree of training of the observer, the specialized equipment, and the maps, aerial photographs, and other photographic documents available to the observer.

b. Even a trained observer is able to note only a part of the total phenomena available in his assigned area. His observation will be the most effective if his attention has been directed to certain specific types of action, or to particular areas. The assignment of specific missions to observers is a function of the unit intelligence officer, and is based upon the essential elements of information indicated in the commander's plan, or in orders received from a higher echelon.

c. When observations are recorded by photography or by electrical apparatus, the phenomena are available for study

at leisure. These records amplify, supplement, correct, and confirm visual observations. They give a record of conditions as they existed at a given moment.

d. Observation is extended over both enemy and friendly territory. Observation into the enemy zone is pushed to the limit of the facilities available. Areas denied to ground observers by distance, difficult terrain, or hostile ground action may be observed by employing aerial observation.

e. In our own territory observation covers not only the combat zone, but the entire theater of operations. In the rear areas observation must be maintained to guard against attack by air and by mechanized forces, as well as by parachute troops and disloyal inhabitants.

f. Effective observation requires the cooperation of every echelon and every means at the disposal of the commander.

g. Observers of different echelons may be especially watchful for certain types of phenomena of particular interest to their own unit; however, all information that may be of use to any echelon should be reported. Information that may appear unimportant to one observer may have great importance when compared with information from other sources. All information of military value should be reported whether or not it appears of direct interest to the observer's own unit.

■ 3. COORDINATION OF OBSERVATION AGENCIES.—a. Maximum results may be obtained from observation agencies at the commander's disposal by the proper use of the intelligence plan for collection of information. (See FM 30-5.) This plan serves as a check list to coordinate the observation facilities of subordinate units with those at the direct disposal of the commander. Action by the agencies concerned is secured by fragmentary orders or by appropriate paragraphs in the intelligence annex, as outlined in FM 30-5.

b. In rapidly moving situations the intelligence plan and orders should be very brief. But when time permits, as in coordinated attacks or defensive operations, the intelligence plan should be developed progressively and should assure complete and coordinated use of all observation agencies at the disposal of the unit, as well as specific requests upon higher and adjacent units for assistance in obtaining essential in-

formation through the employment of their observation agencies.

c. Highly centralized control of all observation is undesirable. Subordinate units should be permitted to retain control of their own means of observation. The higher unit maintains coordination of effort by assigning to subordinate units missions or questions to be answered, and by providing for observation in areas beyond the scope of the observation facilities at the disposal of the subordinate units.

■ 4. TRANSMISSION OF INFORMATION.—a. If observation is to serve its purpose, reports must be transmitted from the point of observation to the agency that is able to utilize the reports, in time to be of use. The urgency of transmission must be in proportion to the importance of the information to the commander who is to receive it. Therefore, in the development of the intelligence plan for collection of information, statements should be included which indicate the general classes of information to be transmitted without delay as well as the methods to be used in transmission, if other than normal. Subsequent instructions to observation agencies, based upon this intelligence plan, will include these details of instruction to such observation agencies as require them.

b. The signal or communication officer must be given early information as to the locations of observation posts, so that adequate signal means may be provided.

SECTION II

CAPABILITIES AND LIMITATIONS OF OBSERVATION AGENCIES

■ 5. ENUMERATION OF AGENCIES.—Observation is effected by the following agencies:

- a. Unit commander in person and his staff officers.
- b. Aviation.
- c. Troop units in contact with the enemy.
- d. Special intelligence personnel from ground observation posts.
- e. Field artillery observers and sound and flash ranging stations of the field artillery observation battalions.

- f. Antiaircraft artillery intelligence service.
- g. Seacoast artillery observation stations.
- h. Aircraft warning service.
- i. Radio intercept and position-finding sections of the signal intelligence service.
- j. Engineer reconnaissance agencies.
- k. Weather service.
- l. Special observation posts, such as antimechanized defense and gas-warning sentinels.

■ 6. PERSONAL OBSERVATION BY COMMANDER AND HIS STAFF OFFICERS.—*a.* (1) The commander of a unit larger than a battalion will seldom find a ground observation post that affords a view of his entire combat area; however, he must study the terrain over which his troops are to be engaged with the enemy. This will usually require a reconnaissance in person, assisted by certain members of his staff. This reconnaissance may be made from several ground observation posts, or, in appropriate cases, from the air.

(2) In certain situations air observation will furnish the best, and sometimes the only, means to obtain a good general view of the area that is likely to be the scene of operations. Commanders and staff officers must have sufficient experience in air observation so that they may take full advantage of opportunities.

b. Usually the commander will wish to follow the course of the combat, especially at critical periods or in important areas. For this purpose a suitable observation post will be sought that has good means of signal communication and that is conveniently located with respect to the command post. Adequate measures must be taken to conceal the observation post and to insure its security against surprise raids.

c. When he has personal observation, the commander is able to evaluate reports with greater assurance. However, he must be on his guard against assigning undue importance to his own observations as compared with reports from other sources or from areas not visible from his own observation post. Otherwise he risks getting a distorted picture of the situation.

■ 7. AIR OBSERVATION (See ch. 5, FM 1-5).—*a. General.*—(1) Air reconnaissance and observation operations are characterized by wide range and great depth, by the detail of the aerial photographs taken, and by the rapidity with which information is obtained and transmitted.

(2) Air observation is limited by poor visibility, bad weather, closely covered terrain, camouflage, good camouflage discipline on the part of the enemy, antiaircraft fire, and the opposition of hostile combat aviation. It is not ordinarily possible to maintain continuous air observation over definite areas unless there is air superiority.

(3) Reports from air observation must be subject to critical evaluation. Negative reports cannot be considered as conclusive, because the observer may have failed to note important objects that are motionless or well camouflaged. The most valuable reports are those that verify information from other sources or that amplify or confirm reports made by other air observers. Many reports from air observation cannot be verified by other agencies. Such reports must be evaluated with special care in the light of other established information.

(4) Important assistance can be rendered mechanized and armored forces by air observation through orientation of reconnaissance detachments as well as of main columns.

(5) Air observation is not limited to personnel of observation aviation. All Air Corps personnel who have been over the enemy's line must be trained to report their observations.

b. Observation by airplane.—(1) The airplane constitutes an aerial observation post that must be constantly in motion in order to maintain itself in the air and to protect itself. The airplane observer can concentrate his attention on a specific area for a limited time only, and from a constantly changing point of view. Thus, while he cannot give the careful and continued study to a particular area that is possible for ground or balloon observers, he has the advantage of observation from different angles. Aerial photography may be employed to supplement, amplify, and extend visual observation. (See FM 30-21.) Trained specialists are able to study photographs at leisure and may discover indications that escape the direct notice of the flyer. Study of successive

photographs of the same terrain may reveal modifications made by the enemy. Stereoscopic photographs are of special value for this purpose.

(2) The airplane observer is subject to the following limitations:

(a) Units on the ground cannot easily be identified from the air. It is often difficult to distinguish between friend and foe. Numbers and strength can be estimated only in very general terms.

(b) An observation team can operate efficiently for a limited period only. A certain lapse in continuity of observation must be anticipated while a new team relieves another on a mission.

(c) Presence of hostile pursuit may distract the observer's attention and even prevent any observation.

(3) The calls for observation by air will usually be greater than the means available. This will require an establishment of priorities by G-2 and coordination with G-3, acting under the authority of the commander of the unit to which aviation is assigned or attached. In many situations, special consideration must be given to artillery observation and to liaison and observation planes for armored forces.

(4) Like other intelligence agencies, air observation is most effective when it is directed by specific missions. Usually these are best stated in the form of concise questions. The observer may report by radio, visual signal, or dropped message any important information that comes to his notice, but he concentrates on answering the questions that are of special interest to G-2 at that particular time.

(5) Since the *observer* in the air cannot at all times make reliable deductions or inferences because of the limitations under which he operates, he *reports facts only*, as accurately as possible. For example, the approximate length, composition, location, and direction of movement of a column is reported, not the observer's guess as to the tactical unit he believes it to be. After landing, the observer makes a full written report. The G-2 section of the unit served usually keeps a liaison officer or branch intelligence officer at the landing field to question returning observers on points that are especially important to G-2.

(6) A form for a pilot or observer report is given in FM 1-40.

c. *Air reconnaissance.*—(1) Air reconnaissance is carried out over hostile territory to the depth required by the interests of the echelon served. GHQ, theater headquarters, and independent commands are interested in such items as the following:

(a) Areas in which hostile strategic concentrations are likely to take place with evidences of cantonments, bivouacs, and presence of troops and transport, and especially mechanized units.

(b) Enemy bases or ports, with ships, railway equipment, and motor transportation.

(c) The volume and direction of traffic on the railways, the location of railheads and regulating stations, and the quantity and type of rolling stock in the yards. The quantity of motor and animal transport in the vicinity and any signs of troops or matériel entraining or detraining.

(d) The volume, nature, and direction of traffic on the roads, the strength and composition of the enemy's main columns, and ships moving over water lines of communication.

(e) The organization of the enemy's lines of communication, the location and extent of advanced depots, dumps, refilling points, and water points, and any new road, telephone line, or railway construction in progress.

(f) The location of airdromes and the number and type of enemy aircraft observed on them.

(2) Army echelons carry on distant reconnaissance over areas in which enemy forces may affect the operations of the echelons concerned. Corps and division reconnaissance echelons carry out close and battle reconnaissance in appropriate areas. This work may be supplemented by observation and liaison aviation, including lighter-than-air aircraft. (See FM 1-5.)

d. *Air reconnaissance areas.*—(1) Reconnaissance duties are divided on a fundamental consideration that each military commander with reconnaissance aircraft at his disposal is responsible for obtaining information on all matters that primarily affect his own immediate plans. The areas within which subordinate commanders will be responsible for air

reconnaissance will vary with the circumstances and will, in each case, be defined by the superior commander. The lateral boundaries of these areas will frequently correspond with the frontages of the units concerned, but the depth will vary with the dispositions of the enemy, the nature of the operations of the friendly forces, the character of the terrain, the type of opposing forces, and the capabilities of the aircraft available.

(2) Reconnaissance boundaries should be defined boldly by a few points, preferably features which are clearly visible from the air. They are usually inclusive to both areas concerned.

e. Night reconnaissance.—(1) In order to reduce the risk of detection and attack by aircraft, important enemy movements are likely to be made during darkness. Night reconnaissance by aircraft will, therefore, be necessary, and this may be either distant or close.

(2) Visibility at night varies greatly with the phase of the moon, the amount of cloud, and the presence of mist, but under favorable conditions railway activity and large bodies of troops on main roads can be observed. The chances of a remunerative night reconnaissance are considerably increased if the aircraft crews are highly trained and are familiar with the area of reconnaissance; also if lights on the ground are not dimmed or if there is an easily distinguishable terrain feature in the vicinity to assist in locating the objective.

(3) Detailed information can rarely be obtained without the use of parachute flares. Considerable detail can then be seen, but an airplane can carry only a limited number; therefore, the number of observations that can be made is limited. Flares can best be utilized to enable pilots to give information about a few definite points (for example, crossroads) at definite times. Night photography is accomplished by the use of flash bombs, which must be carried by the airplane in addition to parachute flares, which further limits the number of night observations which can be performed from any one airplane.

(4) For night reconnaissance, whether distant or close, a high standard of air navigation is essential. The crews require special training in and facilities for night navigation.

Night reconnaissance will reduce the amount of work which squadrons can perform by day.

(5) Although the information obtained by night reconnaissance is often meager, the moral effect on the enemy may be considerable, as he will be uncertain whether or not his movements have been discovered.

f. Lighter-than-air observation.—(1) Balloon observation is impractical in areas where enemy fighter aviation is free to operate. The continuity of balloon observation cannot be relied upon in areas over which our own local air supremacy is being contested or is not established.

(2) Captive balloons offer the advantage of an elevated position that can reach portions of the battlefield that are defiladed from ground observation posts. Balloon observers have continuous two-way telephone communication and are particularly suitable for controlling fires. They are able to maintain general surveillance over given zones for periods limited only by the visibility, the endurance of the observer, and the absence of hostile aerial attacks.

(3) The balloon is usually in the general area of the troops and command posts it serves. Because of good signal communication, the observer carries out several missions simultaneously or in succession. It is practicable to modify his mission or to give him new ones while he is in the air. The balloon does not permit accurate angular measurements, because of swaying in the wind. Hence it is of little value for accurate observation by intersection.

(4) The vulnerability of the balloon and its ground equipment generally require that its point of ascension be beyond the range of hostile light artillery. The more effective the friendly counterbattery, the farther the balloon's point of ascension may be advanced.

(5) The use of motorized baskets gives greater flexibility in the choice of emplacements and reduces the time required for displacements.

(6) Balloon observation is subject to atmospheric conditions. Fog, heavy and low-hanging clouds, and gusty or heavy winds usually prevent ascensions. Temperatures much below freezing affect the cordage and keep the balloon out of action. Hail and thunderstorms may prevent balloon operations.

(7) On clear nights, balloon observation can furnish general information on friendly artillery fires and on enemy movements of some size if the enemy light discipline is poor. A check can be furnished on the effectiveness of our own discipline and light control. When balloons are used at night, the time and place of ascension must be coordinated with friendly aviation. The use of balloons at night is limited to special occasions, when the results to be expected will justify the effort and risk.

■ 8. TROOP UNITS IN DIRECT CONTACT WITH ENEMY.—*a.* Much valuable information about the enemy comes from the observation by troop units in direct contact. Reconnaissance detachments gain first ground contact with the enemy and report their observation by the most rapid means available. Patrols are, in effect, mobile observation posts that advance close to or within the enemy lines and obtain information through their eyes and ears. Constant scrutiny of the hostile dispositions and activities is provided by observers of platoons and companies in the front lines. Platoon sergeants, communication sergeants, buglers, and messengers of rifle units are given special training in observation, but all soldiers of infantry and cavalry rifle units should become proficient in field observation as given in *FM 21-45.

b. Troops must be taught that their observation plays an important part in the whole scheme of intelligence and that anything they discover about the enemy should be reported to higher authority. The intelligence picture that is developed at higher headquarters is composed of small items that may seem unimportant to the unit reporting them. The complete picture, however, will enable the commander to formulate his own plan and to counter enemy action and so help the reporting troops themselves.

c. Troops should not expect sensational results from their reports. They may never become aware of the part these reports play in completing the intelligence picture. However, troops should be taught that all reports contribute their part, and that they serve their purpose even if not acknowledged.

*See appendix I.

d. Troops should be impressed that negative information may be highly important. The fact that no enemy activity is observed in a given area may be a valuable clue to the enemy's capabilities.

e. In the stress of combat it is exceedingly difficult for units in contact to report promptly the results of their observations. These reports may be facilitated if platoon and company commanders are furnished outline forms that may be quickly filled in and sent to the next higher echelon.

f. Observation by engineer reconnaissance parties is usually supplied in the form of engineer reconnaissance reports. (See par. 15.)

g. Whenever operations are sufficiently stabilized, information from shell fragments should be sought. Troops must be taught that the caliber of hostile artillery firing on any point is important information. Often experienced observers can judge this by the size of shell craters. When practicable, any sizeable shell fragments are gathered and turned over to the nearest artillery command post with exact information on location of shelled area and the time shelling occurred. Duds should be carefully marked and reported. Fuze fragments or rotating bands are of special interest. Whenever gas shells are being used, a sample of gas-contaminated earth from a shell crater, as well as fragments of such shell, should be sent to the rear for examination by the chemical field laboratory and identification of the gas used.

h. Information of enemy chemical warfare means and methods may sometimes have great importance. Samples of enemy chemical agents, captured chemical weapons, and gas masks are obtained by the unit gas officers and sent through the division chemical officer. Reports of observation of the enemy's chemical warfare activities are transmitted through intelligence channels.

i. Enemy messages, codes, cipher devices and keys, signal operation instructions, circuit diagrams, etc., taken from prisoners, casualties, or captured in raids, from pigeons, or after abandonment by the enemy may be extremely valuable and should be physically transmitted without delay. (See FM 30-15.)

9. SPECIAL INTELLIGENCE PERSONNEL AT GROUND OBSERVATION POSTS.—*a.* Ground observation posts cover the terrain in depth. Their areas of responsibility include those of the units in contact; they reinforce the observation of their subordinate echelons. Areas that are defiladed from one post can often be observed from other positions. As soon as the situation becomes sufficiently stabilized, a coordinated plan should be made by each intelligence officer to secure maximum results from his own observers and from those of subordinate units. The observation net operates continuously, day and night. During periods of rapid movements, information about the enemy is sought especially on the following points:

- Location of advanced elements.
- Emplacements of automatic weapons, antitank guns, and chemical weapons.
- Location of observation and command posts.
- Artillery positions.
- Tank obstacles and traps.
- Movements of troops.
- Location of supply points.
- Friendly areas subject to aerial attack or observation or contaminated with persistent gas.

b. When fronts stabilize for more than a few days, observers obtain information on the following points:

- Daily routine of the enemy.
- Hours of relief and supply.
- Routes frequently used.
- Emplacements of weapons of any type.
- Works such as trenches, obstacles, and observation and command posts.
- Use of visual and sound communication, including the signals used and their probable meanings as evidenced by enemy actions following the signals.

At all times, forward areas held by friendly troops are kept under observation. Location of friendly advanced elements are particularly noted. Any signals made by them are promptly relayed.

c. Every ground observation post needs the following items as basic equipment:

Field glasses or telescope.

Instrument for measuring angles (aiming circle, BC-telescope, prismatic or lensatic compass, etc.).

Watch.

Map, sketch, or photograph of terrain under observation.

Material for recording observations, including journal and special report forms, overlay paper, and colored pencils.

Means of signal communication with command post, preferably telephone.

When the situation stabilizes and observation posts become more completely organized, the following equipment may be added:

- Range finders.
- Periscopes.
- Higher power telescopes.
- Additional maps and aerial photographs.
- Panoramic sketches and range cards.
- Map or plotting boards.
- Alternate means of signal communication.

d. Certain factors reduce the effectiveness of ground observation.

(1) Some areas are certain to be defiladed from even the best observation post.

(2) Rain, fog, and darkness limit observation.

(3) Shifting back and forth of the front line reduces the effectiveness of advanced observation posts.

(4) An observation post located by the enemy may become ineffective, because the enemy may conceal his activities in the field of vision or he may neutralize the observation post by fire or smoke.

e. The selection and organization of ground observation posts are covered in section IV.

f. The number of favorable points of observation is limited in many types of terrain. Unless the commander coordinates their use, there is likely to be a congestion of observing parties that will offer fruitful targets to the enemy's artillery or aerial attack and may disclose the plan of action. In the initial stages of contact, it may be difficult or undesirable to

control the use of observation posts too closely; however, areas available for selection of observation posts should be indicated in advance whenever possible, so that there may be a minimum of shifting during action, and an opportunity to install signal communication. As the situation develops, intelligence officers must be constantly on the alert to recommend adjustments in observation posts that will insure most complete coverage of the entire battlefield and also reduce the congestion of certain areas.

g. (1) Observation posts must be carefully camouflaged. When a post is to be constructed in a system of field fortification, it should not be at the same location as the temporary observation post used during the initial stages of battle. The new location should be far enough from the old one so that it will not be neutralized by artillery fire directed at the former location. The erection of camouflage must precede the construction. (See FM 5-20.)

(2) The mere fact that an enemy does not fire on an observation post does not insure that he is in ignorance of its location. He may have the post spotted and may intend to neutralize or destroy it at critical phases of the battle. Hence every observation post should have an alternate location that is able to cover approximately the same field and that has an alternate means of signal communication available.

h. In order to preserve the secrecy of observation posts, all military personnel must be made to observe the following precautions:

(1) Only intelligence or signal communication personnel and individuals authorized by the unit commander or higher authority should be permitted to visit an observation post.

(2) Authorized persons approaching or departing from an observation post should use the utmost care to avoid disclosing its location.

(3) No form of transportation should stop near an observation post.

(4) Trails are plainly visible on aerial photographs. Hence every effort should be made to prevent the development of new trails or paths leading to or from an observation post. Only marked and established trails should be used. (See FM 30-25 and 30-21.)

(5) Fires, smoking, lights, loud talking, and any unnecessary noise should be prohibited.

i. (1) If the maps available do not have sufficient names for easy reference, the division G-2 may give designations to important features, such as hills, woods, and road intersections in the division area. These designations are furnished all observation elements.

(2) As soon as possible, infantry regiments and supporting artillery units determine the accurate location of their observation posts and their positions relative to each other. These locations are furnished the division G-2, who causes them to be communicated to the intelligence sections of all units in the division.

(3) As soon as these coordinated observation posts, together with the location of principal reference points, are available, observation reports can be quickly transmitted in the following form:

Observation post (may be designated by code name over the telephone).

Azimuth of object reported.

Distance in yards.

Object reported (frontage and depth if appropriate).

Time observed.

Any additional details of location.

An example of such a message follows:

"OP Magic one; 270 degrees, 1,500 yards; machine gun; 10:15 AM; east of red barn."

■ 10. FIELD ARTILLERY AGENCIES.—a. The field artillery organization includes the following observation agencies:

Posts using direct observation for fire direction and fire control.

Observation battalions using sound and flash ranging. (See FM 6-120.)

b. These agencies are primarily for technical artillery functions, but they contribute much information that is of value to the general intelligence service. Since they have a technical mission, they must not be expected to furnish the same general surveillance of the battlefield as the ground observation posts of the intelligence service. However, they may

properly be given special questions that are of particular interest to the commander, and in special situations can maintain surveillance over certain areas that are defiladed from intelligence observation posts.

c. To conduct its fires effectively, each artillery battery must have good observation available. This may be obtained by separate observation posts for each unit or, when good positions are limited, several observing parties may conduct observation from a combined post. In making his plan for the coordination of all observation, G-2 must give special consideration to the requirements of the artillery.

d. In addition to general surveillance of particular areas, the artillery observation agencies can be expected to furnish information on the following subjects:

(1) Information on the location of the mass of the hostile artillery as well as detailed information on the hostile batteries such as caliber, usual missions and objectives, normal times of activity, and, possibly, groupment to which they belong. This information gives valuable indications to G-2 in establishing the enemy's order of battle and his capabilities. It may furnish valuable data on which the commander may decide in which phase of the battle counterbattery of certain batteries will be most effective; information that certain batteries are firing normal barrage missions in front of the hostile main line would be highly important.

(2) The location of hostile observation posts with the approximate visible and defiladed area for each.

(3) Targets suitable for harassing and interdiction fires.

(4) Effect of our own fire.

(5) Location of front lines of both our own and enemy Infantry.

e. (1) The observation battalion is part of the corps artillery brigade (FM 6-120). It includes two batteries, each with a sound-ranging and a flash-ranging platoon. It furnishes data for all artillery with the corps, but is of especial importance to medium artillery. One battery can cover a zone about 10,000 yards wide and 12,000 yards in depth under average conditions. These distances vary with the character of the terrain and the prevailing conditions of weather. The

battalion can furnish observation for a corps deployed on a fairly wide front.

(2) During periods of movement, observation batteries may be used to leapfrog each other in order to maintain observation for the artillery with the corps in the zone of greatest importance.

(3) Under favorable conditions, the batteries can be installed in 6 to 8 hours. This period of installation may be greatly increased by unfavorable circumstances, such as difficult terrain, bad weather, and hostile interference. The observing stations must be located by precise surveys. The accuracy of results is in proportion to the exactness of the location of stations. All must be connected by reliable wire communication with the central plotting station.

(4) Although accurate results cannot be expected until stations have been surveyed, some valuable preliminary information may be furnished as to the general location of the mass of the hostile artillery. If conditions are favorable, information may begin to come in within 4 or 5 hours.

(5) In mobile operations the advance parties of the observation battalion should be pushed forward with the most advanced elements, so that they may facilitate the early employment of the artillery.

(6) The stations of the sound-ranging platoon and the flash-ranging platoon are usually deployed along the same general front. To use them in separate areas is exceptional. A sound-ranging platoon must have at least 4 stations in operation; ordinarily it employs 6 stations. A flash-ranging platoon operates from 3 to 6 stations.

f. (1) When conditions are favorable, sound ranging can locate hostile batteries with considerable accuracy and may even be used to adjust fire on the batteries located. Under less favorable conditions it can at least establish the general location of the mass of the hostile artillery and can give good data on the calibers in use.

(2) Sound ranging is most effective in damp, foggy weather when visual observation is most difficult. Strong or variable winds make sound ranging least effective. The difficulties of sound ranging increase with the total volume of artillery fire

on a given front. However, even in periods of considerable activity trained observers can furnish valuable data.

(3) The sound-ranging listening stations are sensitive microphones. Once established, no personnel is required to remain with the microphone. However, wire communication with them must be maintained, so they must be accessible. They usually operate satisfactorily when placed in rear of crests.

(4) The microphones give best results when installed in rear of the line of friendly light artillery. However, if it becomes necessary, they may be pushed farther forward.

(5) Flash-ranging stations are, in effect, ground observation posts continuously manned by specially trained observers who are equipped with powerful optical instruments. They must have sufficient elevation to see deep into the hostile position. The stations must be accurately located and must have reliable wire communication.

■ 11. ANTI-AIRCRAFT ARTILLERY AGENCIES.—*a.* (1) Surveillance of the air by means of observation from the ground is continuous over the area defended by anti-aircraft artillery. This observation is maintained by the personnel of the anti-aircraft artillery units and comprises, with the signal communication net, the anti-aircraft artillery intelligence service (AAAIS) (FM 4-105).

(2) The mission of the anti-aircraft artillery intelligence service is to obtain and disseminate information of the approach of enemy aircraft necessary for the effective use of anti-aircraft artillery weapons. Incidental to its own requirements it may furnish some information on the nature and extent of hostile aerial activity.

b. (1) The anti-aircraft artillery intelligence service is established by the commander of the anti-aircraft artillery units operating within the area, zone, or theater of operations. The advanced observation posts are located, equipped, and manned so as to be able to listen, observe, and furnish specific information of the approach of hostile airplanes so that the aircraft may be engaged at the limit of effective range of the anti-aircraft artillery weapons making up the defense.

(2) In the anti-aircraft artillery defense of an objective,

where 6 gun batteries and 30 searchlights are employed, the outer ring of observation posts may be as far as 27,000 yards from the center of the objective. The distance between two adjacent observation posts on this outer line of observation does not ordinarily exceed 8 miles. Observation posts should be located on high ground or other high places with an all around unobstructed field of view.

c. Signal communication with observation posts is normally established by the searchlight battery. The operating personnel is provided by intelligence sections of the regiment, battalions, or batteries as may be directed by the regimental commander. A sufficient number of observation posts are established to meet the requirements of the particular situation. Insofar as practicable, telephone communication is provided for the transmission of messages and the collection and dissemination of information by the anti-aircraft artillery intelligence service. Radiotelephone or radiotelegraph may be used as an auxiliary to the wire telephone net.

d. Observers in the anti-aircraft artillery intelligence net are normally equipped with field glasses. The effective range of observation is limited by the power of the field glass and by visibility conditions. During hours of darkness and poor visibility, main reliance for observation must be placed on sound locators. Under favorable conditions, the maximum horizontal range of the sound locator is about 17,000 yards.

■ 12. SEACOAST ARTILLERY AGENCIES.—*a.* The Coast Artillery Corps establishes observation stations wherever it operates. These stations are established primarily for use in the tracking of naval targets and, as such, are of primary interest to coast artillery personnel. However, they may also serve as intelligence agencies for the higher commanders. (See FM 4-5.)

b. The use of these stations for purposes of intelligence can be generally classified as follows:

(1) *Naval intelligence.*—Within a range commensurate with their elevation and the prevailing weather conditions, these stations can be expected to observe the sea area and to report promptly any enemy naval activity. By the nature of this activity, the local Army commander may judge in

which parts of the shore line the enemy is particularly interested.

(2) *Landing operations.*—Although not their primary function, the locations of the coast artillery observation stations are usually such that a large part of the land and beach area can be observed from these stations. From intelligence gained in this manner, the higher commander may be kept informed of the locations and status of enemy landing or raiding operations on a shoreline.

(3) *Information of friendly troops.*—Because of the fixed character of coast artillery signal communication and the strategic location of the observation stations, information of the dispositions of friendly troops may reach the higher echelons through coast artillery channels as a supplementary means to the normal command channels.

■ 13. AIRCRAFT WARNING SERVICE.—*a.* In order to give warning of the approach of hostile aircraft to defense organizations, especially pursuit aircraft and antiaircraft artillery, as well as to the civil population, an aircraft warning service is organized. Incidental to its main mission, this service can sometimes furnish information on other subjects, such as incursions of armored forces or landings of parachute troops.

b. (1) All Army, Navy, Marine Corps, and Coast Guard observation agencies transmit without delay to aircraft warning service headquarters, information they may obtain, of the approach of hostile or unidentified aircraft. This is accomplished as incidental to their primary missions.

(2) Arrangements may be made with sources other than military organizations for direct reports to be made to the aircraft warning service of aircraft observed. Such sources include the Lighthouse Service, Coast Guard Life Saving Stations, friendly commercial shipping, commercial airline pilots in flight, commercial airport control towers, forestry service lookouts, and county and state highway police stations and radio cars.

■ 14. SIGNAL INTELLIGENCE SERVICE.—*a.* (1) Information of the enemy obtainable through observation by signal intelligence agencies may be divided into two categories:

(a) Technical signal information which requires digest, interpretation, and correlation by a signal intelligence service to convert it to a form usable by military intelligence agencies.

(b) Information which from its nature is directly usable by military intelligence agencies.

(2) Specific signal corps organizations are provided for—

(a) Collection of information. The Signal Corps unit provided for this purpose is the radio intelligence company.

(b) Reception, digest and correlation, and the conversion of technical information to a form usable by military intelligence agencies. The organizations provided for these purposes are the signal intelligence services at GHQ and army, respectively.

b. The following means for collecting information of the enemy may be considered special forms of observation:

(1) Radio position finding.

(2) Radio intercept.

(3) Wire intercept (direct and induction).

(4) Reading of signals from enemy visual signal stations on land or ship when transmissions from such stations can be observed.

(5) Observing pyrotechnic signals.

(6) Reports on hostile panel stations by air observers.

c. Digest and correlation of technical information.—The digest and correlation of technical information includes—

(1) Solution of enemy codes and ciphers.

(2) Detection of secret inks and the solution of messages written with secret inks.

(3) Correlation of technical information obtained from various sources.

d. Signal intelligence service, GHQ.—This intelligence service assigns missions to the radio intelligence companies assigned to the signal service, GHQ, and utilizes the information obtained. Among others, it includes a document, goniometric (position-finding), security, and inks section; and a code and cipher solution section. The duties of the former section include obtaining information for the location of unauthorized radio stations, and for such control as is directed of civil radio stations in the theater of operations, and the detection of such

messages written in secret inks as may be brought to it. The duties of the latter section are the same as those of the enemy code and cipher solution section of the army signal intelligence service. All pertinent information coming to this signal intelligence service is converted into a form usable by the military intelligence section of the GHQ general staff. Technical data regarding solution of enemy codes and ciphers is exchanged between signal intelligence service, GHQ, and the signal intelligence service, War Department, as well as with the signal intelligence services of the various armies.

e. Army signal intelligence service.—This service assigns missions to the radio intelligence company of the army signal service, and utilizes the information obtained from it. The headquarters, army signal service, includes an enemy code and cipher solution section and a position-finding section.

f. Radio intelligence company.—(1) A radio intelligence company is assigned organically to each army signal service and to the signal service, GHQ. Additional radio intelligence companies may be attached to each signal service. The duties of the radio intelligence company include the establishment and operation of radio stations for the following purposes:

- (a) Interception of enemy radio transmissions.
 - (b) Finding positions of enemy radio transmitters.
 - (c) Finding positions of unauthorized radio transmitters operating in theaters of operations occupied by our own forces.
 - (d) Monitoring regular friendly radio traffic to insure radio discipline and cryptographic security.
- (2) The company is capable of covering, under most favorable conditions, a front of about 25 miles. The depth of the area which can be searched depends upon the power of the transmitters in the area being searched. The company is provided with special signal equipment for performing its duties.

g. Radio intercept.—(1) Radio intercept consists of listening to and recording radio transmissions. It is limited only by the power and range of the transmitters whose signals are intercepted, and the sensitivity of the intercepting receivers.

Intercept stations can be rapidly installed practically anywhere in an army area and can begin functioning immediately. Any radio station operated by any personnel whatsoever, which is capable of receiving signals which it is desired to intercept, may be designated to intercept such signals. The last-named arrangement may be employed for the purpose of shortening the time required for transmission of regular traffic between two radio stations not normally in direct communication with each other. For example, it is contemplated in the joint defense of a coast by the Army and the Navy, that certain headquarters will receive information by intercepting messages sent from reconnaissance airplanes to aviation headquarters, rather than waiting for the relay of the message through aviation headquarters.

(2) Information obtained through radio interception may include—

(a) The number of enemy operating stations heard and radio frequencies employed by each. An increase in the number of stations in a given area may indicate an increase in the size of the hostile force. This information is usually of a technical nature.

(b) The enemy's general radio activity or lack of activity from which the status of his communication facilities may be inferred. This is technical information.

(c) Copies or recordings of enemy transmissions. Information obtained from enemy voice or clear text transmission is generally in a directly usable form, except that foreign languages must be translated. Cryptographed messages require action by the code and cipher solution section of the proper signal intelligence service before the information can be of use to military intelligence agencies. The status of the enemy's signal security may also be inferred from a technical viewpoint from cryptanalysis and from the extent to which he fails to send in secret language information which may be of use to our own forces or those of our allies, if any.

(d) After a period of time sufficient to enable intercept operators to become familiar with the hand transmitting or voice characteristics of various operators of enemy radio stations they may be able to determine that radio stations of

certain hostile units are in operation and occasionally recognize that new units are in the area. This information is of direct value to military intelligence agencies.

(e) The speed and frequency of transmissions, the types of radio emission, the nature of transmissions (messages or artillery firing orders) can be determined. This is technical information.

h. Radio position finding.—(1) Radio position finding is a process whereby two or more specially designed radio direction finders can determine by triangulation the location of a particular enemy transmitter. With present equipment and under field conditions consistent accuracy of less than 2° of error in azimuth determination cannot be expected. Many factors influence the accuracy of direction finding, the most important of which are peculiarities of terrain, atmospheric electrical characteristics, strength of the enemy transmitter, accuracy of location and orientation of direction finders, and skill of the operating personnel. Provision must be made for interconnecting direction-finder stations by telephone, for the simultaneous and rapid operation of all stations on a particular target, and for directing activities of all stations at various targets from time to time. A plotting and control station must be set up for each group of stations and each station must be accurately located. In the case of a group of direction-finder stations operating well to the rear, the end stations may be separated by as much as 20 miles. Thus the time of preparation for operation, after arrival at particular locations, may be anywhere from 8 to 24 hours, depending on existing telephone facilities, location surveys, and the preparation of calibration correction charts. In rapidly moving actions where reliance is placed by the enemy on radio communication, position-finding operations are extremely valuable but are limited by the time required to set up establishments, and the rapidity with which enemy stations move out of range.

(2) Information obtained from radio position finding may include—

(a) *Location of enemy ground radio transmitters.*—From the locations of enemy transmitters, the goniometric identification section of the signal intelligence service determines the

locations of hostile unit headquarters served by such stations. By means of a thorough search of an area, numerous headquarters can be located, thus permitting G-2 to make a good estimate of the enemy dispositions, and often resulting in the selection of important hostile communication centers and command posts as objectives for our air attack for the purpose of disrupting enemy lines of communication.

(b) *Location of enemy vehicular radio transmitters.*—The movement of vehicular radio transmitters may be tracked and a change in location of previously located and identified ground stations may be determined. The displacement of enemy stations, and the opening up of new stations may be of especial value as usable military information.

(c) *Location of unauthorized radio transmitters.*—Unauthorized radio transmitters in favorable radio-frequency bands and within range can be located, thus permitting prompt action to eliminate them.

(d) *Tracking of hostile aircraft.*—Hostile aircraft which uses its radio in favorable radio-frequency bands may be tracked by means of position-finding equipment.

i. Wire communication intercept.—(1) *Direct wire tapping.*—Direct wire tapping consists of connecting a telephone or telegraph set, similar to that normally used for signal communication, across a wire circuit and receiving the voice or telegraph signals being transmitted on that circuit. Neither special equipment nor extensive training of signal personnel is required in order to perform these operations. The signals intercepted are usually in clear and are thus readily usable as military information. However, the opportunities for direct wire tapping are relatively few and are only feasible when enemy wire lines are accessible and tapping operations can be conducted without detection. When such tapping is feasible the time required for such operation is a matter of minutes. Armored and mechanized reconnaissance detachments may employ direct wire tapping, even to the extent of laying and concealing a wire, on their return to friendly territory. In an exploitation of a break through, or in an encircling movement, frequent opportunities for direct wire tapping may occur. In any case, the enemy can usually detect electrically the presence of an additional instrument connected on a circuit;

consequently wire tapping operations can be expected to be of only short duration. Mechanized and armored reconnaissance detachment units may be charged with this mission and with the seizure of files of messages from enemy telegraph and cable offices.

(2) *Induction methods.*—Signals being transmitted over a wire circuit can in some cases be detected by the use of an induction coil or a large wire loop placed in the vicinity of the circuit, and an amplifier or other device connected to the coil or loop to make the signals intelligible. Signals may also be intercepted by utilizing ground currents which may leak from poorly constructed or wet circuits. In either case Signal Corps or other specially trained troops and special apparatus are required. With the exception that the enemy is usually unable to detect electrically the presence of induction interception devices, the powers, limitations, and types of information obtainable are the same as they are for direct wire tapping. Under exceptional circumstances in a stabilized situation, a large wire loop may be placed on friendly ground or in trenches so as to parallel enemy wire lines which might be relatively close, and earth induction methods employed for interception. Depending on the accessibility, type of equipment, state of training of the personnel, and the requirements for concealment during installation, induction interception may be accomplished in from 1 to 24 hours.

(3) *Listening devices.*—In trench warfare, microphones may be thrown or placed near enemy trenches and connected to amplifiers and head receivers or recording devices in our own front trenches for gathering information contained in enemy conversations.

(4) Details of signal intelligence service are covered in FM 11-5 and 11-20.

■ 15. **ENGINEER RECONNAISSANCE AGENCIES.**—In addition to the observation effected by the engineer troops in contact with the enemy (FM 5-5), information of value to the unit engineer is obtained by means of personal reconnaissance, and report from engineer patrols and such civilian sources as lumber yards and railroad and highway agencies. Engineer reconnaissance units observe and report important facts concerning—

a. Routes of communication—characteristics and capacities of roads, bridges, railways, canals, rivers, etc.

b. Material and equipment of value to engineers available in the locality. This includes explosives, lumber, timber, gravel and stone, quarries, boats, etc.

c. Utilities—power systems, water supply, and ports and harbors.

d. Possibility for barrier zones—characteristics and location of defiles, bridges, tunnels and other sensitive structures, and terrain features.

■ 16. **OBSERVATION BY WEATHER SERVICE.**—a. A weather service is maintained by the Air Corps. Its mission is to obtain current weather observations and issue to Air Corps units and to divisions and larger units of the ground forces, forecasts of weather probabilities for periods up to 48 hours. In the United States, the weather service operates under the Chief of the Air Corps. Maximum use is made of existing civilian weather observation stations. In theaters of operations, the weather service will operate under the theater commander. It will be coordinated with the service in the United States. Weather observation squadrons are organized for use in theaters of operations. These squadrons provide a number of four-man units that are distributed at appropriate places to provide the necessary observations. Provision is made for prompt transmission of the weather observations to the central forecasting stations. These forecasting stations are units of 8 to 15 highly trained specialists furnished by weather squadrons.

b. Based on the information received from observer units, the forecasting units publish information and forecasts to include such weather elements as ceiling, visibility, precipitation, temperature, wind direction, and velocity. Accuracy of forecasts is in proportion to the amount of information available, the ability and experience of the forecasters, the shortness of the period forecast, and geographical position relative to the enemy territory. The amount of information depends on location of observation stations and especially on the signal communication facilities.

c. Air masses may move as far as 1,000 miles in 24 hours.

Therefore, if forecasts are to be obtained for 48 hours in advance, observations must be had of those air masses 48 hours away, or 2,000 miles distant.

d. In the temperate zones weather moves generally from west to east; therefore, that nation west of any battle front has a distinct advantage, provided its weather data are kept from the enemy as required by FM 30-25.

e. Weather service forecasts furnish a commander a reasonably accurate prognostication as to weather for the next 12 hours; forecasts for the period of the ensuing 24 to 48 hours give general information as to the probable character of the weather. Beyond 48 hours it is difficult to make predictions. Artillery units maintain weather sections to give local meteorological conditions for use in computing firing data.

f. See *FM 1-50 and TM 1-230.

■ 17. SPECIAL OBSERVATION AGENCIES.—Special lookouts may be posted to watch for attacks by mechanized units or to give the alarm in case of a gas attack. These observation posts may sometimes furnish information along other lines, especially as to hostile air activity.

SECTION III

OBSERVATION IN DIFFERENT PHASES OF BATTLE

■ 18. PRIOR TO BATTLE.—a. At the beginning of operations theater headquarters will immediately employ aviation and ground reconnaissance forces for distant reconnaissance. Arrangements will be made for prompt use of radio intelligence and aircraft warning services. Ground observation will be organized on the frontiers.

b. Aviation will seek especially for information about the enemy on the following points: Concentration areas; principal movements of rail and motor transport; detrainment zones; bivouac areas; deployment of his aviation; areas being organized for defense; zones being prepared for destruction and demolition.

c. Night reconnaissance will be especially important during this period.

*See appendix I.

d. The signal intelligence service plays a highly important role at the beginning of operations because in the course of setting up his organization the enemy is likely to disclose important information both by the positions and movements of his radio stations and possibly by careless use of his codes.

e. The aircraft warning service has a most important task in the early phases of operations. Its observation posts are advanced as far as possible and a lookout service is established that includes any permanent observation posts of territorial defense as well as of tactical units at the disposition of the theater commander. Information on hostile air activity is transmitted through the organized information centers with whom G-2 organizes a close system of liaison. (See FM 100-5.)

f. (1) From the beginning of mobilization all units must provide for their own close security by means of observation against attacks by hostile air or mechanized forces. If the unit is charged with defense of an area that has a coast line, lake front, or other large water area, provision for observing possible attacks by water must be made. The commander of every large unit in the theater of operations, whether on the march or in bivouac, must provide permanently manned observation posts, even though his unit is at a distance from the enemy. Zones favorable for hostile landings, either of parachute troops or airplanes, and possible routes of approach for mechanized forces are given special attention. Provision is made for gas sentinels.

(2) The commanders of large units allot missions and zones of observation to subordinate echelons. Intelligence observers may be used for surveillance of areas in the vicinity of command posts.

(3) Army commanders provide for the organization of observation in the army rear areas. Commanders of communications zones and zone of interior areas and installations make provision for observation at critical points in their respective zones.

■ 19. OFFENSIVE OPERATIONS.—a. During the approach to battle, aviation and mechanized distant reconnaissance initially furnishes most important observation, but appropriate

steps must be taken to provide for prompt employment of all observation agencies as soon as the opposing forces come within their range of action.

b. Aviation seeks out and reports the enemy main forces. Mechanized and cavalry units determine the limits of hostile advance and identify his leading elements. Areas found to be contaminated with persistent gas or mined in preparation for such gassing are promptly reported and posted, thus protecting other friendly units from marching into them without warning. The signal intelligence service locates the hostile command posts and observes their movements; it also intercepts hostile radio communications. The aircraft warning service not only furnishes warning of hostile attacks, but by reporting hostile air activity furnishes G-2 with valuable indications as to the areas to which the enemy is giving greatest attention; this may be a factor in determining the enemy's capabilities. If the air situation permits, observation balloons may be utilized whenever the situation becomes sufficiently stable to make their employment worth while. Consideration is given to the possible loss of surprise by use of balloons.

c. During the advance to battle, axes of march are frequently designated along which the ground observation of mobile units is advanced by bounds. These axes of observation are integrated with the movements of advance guards and main bodies so that the whole zone of the advance is covered as completely as possible with an observation net.

d. Special observation agencies whose installation requires a certain delay, such as the artillery observation units, aircraft warning service, and certain signal intelligence units, may be held initially in reserve; however, advance echelons of these agencies are pushed forward to the extreme limit of advance, protected, if necessary, by special security detachments. This enables these agencies to accelerate their entry into action and to furnish the results of their observations in time to be of value to the commander in planning his battle.

e. As soon as contact is established, the observation network developed during the approach march is reinforced. When the enemy is defending a position, observation continues to operate as during the approach march. All agencies concentrate their efforts on determining the details of

position and the dispositions of the enemy. The observation service concentrates on securing information that will aid the commander in preparation for an attack.

f. When in contact with an enemy in superior force who continues to advance aggressively, the complete system of ground observation is deployed on the position selected by the commander for his principal resistance. The observation agencies concentrate on following the deployment of the hostile forces and seek to determine the probable directions of the enemy's main effort as indicated by his attack dispositions. The establishment of the observation system is given high priority in the organization of the defense.

g. The system of ground observation is advanced by echelons as the attack progresses.

h. There is always danger of congestion on prominent points and consequent destruction of means of observation by hostile artillery fire or air attack. To prevent this the commander may designate certain axes of observation along which subordinate units will move their observation posts.

i. During pursuit and exploitation, observation is used in the same general manner as in the approach march.

j. An attack against a prepared position or a zone defense requires a careful and detailed preparation. The observation service plays an important part in this preparation. It may be necessary to limit the amount of air and balloon observation in order to attain surprise. (See FM 30-25.)

■ 20. DEFENSIVE OPERATIONS.—a. Observation is of particular importance in defensive operations. Observation posts remain in position for considerable periods; the exact locations of the posts can be determined with great precision. The enemy is apt to disclose important information by variations in the routine he has established. The locations of new batteries and new dumps of munitions and matériel are hard to camouflage completely. The observation system must cover the battlefield completely and continuously so that in spite of the enemy's efforts to screen his activities our intelligence system will have the indications that will permit a determination of the enemy's capabilities.

b. Reports on hostile air activity are of particular impor-

tance in defense. Reports of observation and photographic flights, areas, and times at which the enemy furnishes pursuit protection, and areas subjected to hostile air attack are all reported by the ground observation posts and troop observers as well as by the antiaircraft observers and the aircraft warning service.

c. Any indications of employment of tanks or emplacements of chemical mortars are of special importance.

d. Units charged with the defense of unusually wide frontages give special attention to organizing their observation. In order to economize troops, many areas will depend chiefly on observation for their protection. Dependence will be placed upon fire or reserves to meet any enemy movement through these areas. The observation agencies of some of the units held in reserve may be called upon to cover some of the areas in which their troops may later be employed. However, no reserve unit should be completely stripped of its organic observation because it may have to operate unexpectedly in another area. Special attention must be given to providing for the prompt transmission of information gained.

■ 21. SPECIAL OPERATIONS.—*a. Operations at night or in fog.*—Observation is of special importance at times of low visibility. Particular attention must be given to sound-ranging and to listening posts during these periods. Dusk and dawn require special alertness at all observation posts. Visual observers can often obtain quite accurate information at night, especially as to the direction of lights observed. Inasmuch as fog may lift unexpectedly, all observation posts must remain on the alert during such periods, in the hope of surprising the enemy in some movement he hopes to conceal.

b. *Combat in woods.*—The short fields of vision available in this type of battle compel special measures by observers. Personal reconnaissance is facilitated because movement is camouflaged by the woods. In the attack, observation post locations are sought at the edges of the woods, in clearings, and in more open portions. In the defense, arrangements are made to improve the field of vision. In dense woods listening posts are established.

c. *Mountain operations.*—(1) The following special conditions apply in this type of battle:

(a) Fields of vision are likely to be extensive, but to contain many defiladed areas.

(b) Atmospheric conditions are subject to extreme and often sudden variations; fog and mist may be followed quickly by very clear weather.

(c) The noise of streams and effects of echoes may be very deceptive as to source of sounds.

(d) The character of the terrain and the fields of vision may change abruptly in very short distances.

(2) The following measures may be used to overcome observation difficulties in mountain operations:

(a) Increase in observation personnel, especially on the defense and when on extended fronts.

(b) Careful coordination of all means of observation; use of special posts on lower levels combined with those on high points.

(c) Maximum use of aerial photographs, both verticals and obliques.

(d) Use of natural shelters for observation posts, both for camouflage and for protection.

(e) Special attention by observation agencies to defiles and routes through which movements must be made; provision for general surveillance and air patrol of impassable areas.

(3) For signal communication in mountainous areas, full use must be made of visual and radio means. Wire lines are difficult to lay and to maintain.

SECTION IV

OBSERVATION POSTS

■ 22. SELECTION.—*a.* The selection of sites for observation posts will be influenced by the degree of mobility of the operations. In rapidly moving situations, the post must be hastily selected and frequently moved. In periods of slower movement, the location may be selected more deliberately. The site selected for an observation post should be that point within the sector of the unit concerned from which the best view of

the terrain toward the enemy and in rear of his front lines can be secured, and which at the same time is sheltered from his view. An ideal site will afford an excellent and unobstructed view to such a distance as will afford ample warning of an enemy advance; it will be completely sheltered from the view of the enemy's observers, both ground and aerial; and the approaches to it will be such as to render it easily accessible and permit individuals to come and go without being seen by the enemy.

b. Care must be taken that observation over the entire front is provided for. At times a unit will lack good observation over a part of its front because of a hill, a deep ravine, or woods, but effective observation may be possible from the area of an adjacent unit. This may be covered by cooperation between units by having the adjacent unit cover this part of the front or by arranging for the first unit to place an observation post in the adjacent unit's territory to provide observation behind the obstacle. An observation post should, if practicable, be within easy reach of the command post, but the two should always be separated by such a distance as will prevent the activities of the one from interfering with the special functions of the other and insure against one's being caught in fire directed at the other. Alternate positions should be selected.

c. Frequently the military crest of a hill is the best site for an observation post. Observers may be required to establish themselves in trees, towers, and houses. Often satisfactory observation posts will be found on side slopes rather than crests. Side positions are usually easier to conceal and to approach from the rear. In stabilized operations the best available site may be in some portion of the trench system, but an observation post should be so placed only when there is no other site practicable, as the constant passage of men along the trenches will probably operate to divert the attention of the observers.

d. Before and during an advance or an attack, successive sites for new observation posts must be tentatively selected. These should possess as many as possible of the qualities mentioned above, and should be within the zone of advance of

the unit. The same procedure will apply in the event of a retrograde movement.

e. When the unit is engaged in an advance or an attack, the necessity for continuous observation requires the "leap-frogging" of observation posts. Careful arrangements are required in order that while one observing group is moving, another may be able to remain constantly in observation of the enemy and of the terrain toward him.

■ 23. CONSTRUCTION.—a. An observation post in open warfare will ordinarily be but a point on the terrain with the use of some natural camouflage, such as grass and leaves, as an aid to concealment and the removal of obstructions which interfere with the observers' view. Construction, under most favorable conditions, will be limited to rough shelter from rifle and machine-gun fire. Until the operations become stabilized, the hasty preparation of selected points for use as observation posts is made by the intelligence personnel concerned.

b. When troops remain in the same position for longer periods, there will be sufficient time and necessity for carefully constructed observation posts. New sites are chosen and carefully camouflaged before construction begins. More elaborate provisions are made for concealment, for protection against artillery fire and bombing, and for the convenience of the observing group.

c. The construction of observation posts of more or less permanent type is supervised by intelligence officers, but the actual work is done by details from other troops. Intelligence personnel should have a thorough understanding of the fundamentals applying to the construction and camouflage of permanent observation posts. (See FM 5-20.)

■ 24. OPERATION.—a. The observation post is allotted a definite area or sector to be covered by its observation. This sector is marked on the map furnished the observing group, and its limits should be clearly understood by every member of the group. If but one observation post is to be established by the unit, the sector extends laterally, for a short distance, into the terrain in front of the units on the right and left.

If the unit is operating alone or on an exposed flank, the sector extends laterally for a distance sufficient to prevent a surprise attack against the exposed flank or flanks. If two or more observation posts are to be established, the sectors allotted to them overlap to an extent that will insure effective observation of all terrain with which the unit is concerned. Sometimes an observing group is directed to observe and report upon ground in front of another unit, which cannot be covered by the latter's observation; in this case the particular ground must be clearly marked on the map.

b. Detailed recording and routine transmittal of information are more or less impracticable when troops are on the move and during periods of special activity. If accurate information is secured and transmitted to the command post in time to be of value, the details of operation are of minor importance.

c. *Observing group.*—When the observation post is to be operated for more than a few hours it should consist of not less than four men. As the performance of their duties involves considerable strain, observing groups are relieved every 24 hours, when practicable. In stabilized or semistabilized operations an observing group may have to remain at its post for several days; in this case arrangements for food and water are necessary. Men actually engaged in observing cannot maintain their alertness more than about 2 hours. Better results will be obtained if the observer and recorder exchange places at intervals of about 30 minutes. The pair is then relieved every 2 hours. If the group is not equipped with a telephone, one or two additional men may be attached to it for messenger service, or those not actually on watch may be used for this purpose.

d. *Posting the group.*—(1) Upon arrival at the selected site, the group leader immediately posts one or more men in observation of the sector allotted him. He then selects the exact point to be occupied by his observation post, orients his map, marks his location thereon, and arranges for the necessary camouflage.

(2) The first step is to locate the position on the map with

the greatest accuracy possible, as explained in *FM 21-25. A basic orientation line is selected toward some prominent object near the center of the field of vision of the observation post. The magnetic azimuth of this line is recorded and its distance noted. The magnetic azimuth readings and distances of other important reference points on the terrain are then noted.

(3) These data are registered on a range card and furnish the basic means by which the observer can quickly locate and report any object in his field of vision. The coordinates of the map in use are transposed to the range card to facilitate reference in messages and reports.

(4) With the oriented map before them, all members of the group are made familiar with the terrain to be watched. If necessary, important features are marked on the map, and the group is made thoroughly familiar with their names or special designations.

(5) The group is then divided into reliefs of two men each, designated as the observer and the recorder, respectively. When an observation post is first established it is advisable to assign several men to watching the terrain at the same time; as soon as it becomes apparent that the enemy is not dangerously active, all but one team is relieved. The first relief having been placed on watch, the group leader reports his exact location together with the gist of the enemy information secured. The men not on watch retire far enough to avoid interference with the first relief.

e. *Observer.*—(1) The observer divides the terrain included in his sector of observation into a series of overlapping zones, the nearest of which takes in the ground just beyond the front line of his unit while the farthest includes the limiting line, in depth, of his sector. He settles himself into a comfortable position, which affords a steady rest for his glasses and from which he can secure an unobstructed view of the sector of observation. He then searches the terrain for indications of enemy activity.

(2) Beginning with the zone nearest him the observer

*See appendix I.

makes a slow and thorough examination of the terrain, searching from one edge of the zone to the other. Proceeding to the examination of the next zone, he searches it in the opposite direction, and he continues in this manner until the whole sector has been examined. If any movement catches the eye, the point where it occurred should be watched closely for a few moments.

(3) The observer searches not only for movements but also for other indications of enemy activity, such as trenches, paths, gun positions, observation posts, and wire.

(4) Having determined the character of the movement or object discovered, the observer locates it on his map and transmits the information at once to the recorder.

f. Recorder.—(1) The recorder accurately records information secured by the observer and operates the telephone.

(2) Information is recorded on blanks furnished for that purpose, on the map, and in the form of sketches. See appendix II, Form for Ground Observer's Report. Carbon copies of reports are made in the observer's book and retained at the observation post.

(3) All information secured is recorded. Items that seem of little or no value to the observing group may develop great value when studied by intelligence sections in connection with other information. Recurrences and discontinuances of acts or events already reported upon may be of prime importance. Time, place, and character of action must be accurately noted. When pertinent, such deductions as are warranted by conditions may be included but clearly as *deductions* and not as statements of fact.

(4) The locations of hostile units, trenches, weapons, wire, and observation posts are plotted on the map.

(5) The position of the recorder should be sufficiently close to that of the observer to permit conversation in low tones.

g. Transmittal of information.—(1) If the observation post is equipped with a telephone, information of immediate importance is telephoned to the command post, or if that is impracticable, it is visually signaled or sent by messenger. Especially in situations of rapid movement, prearranged visual signals or code groups may be advantageous for conventional messages such as "Nothing to report," "Enemy in sight," or

"Enemy tank approaching." In the use of signaling or radio, special care is necessary to prevent detection. It may be desirable to set up the sending station at some distance from the observation post.

(2) The accumulated observer's reports are sent by messenger periodically (usually twice a day) to the intelligence officer unless they have been of sufficient urgency to be sent by special messenger. An observer's book should be maintained at the observation post in which a carbon copy of the observer's report is kept for reference.

SECTION V

TRAINING OBSERVERS

■ 25. BASIC QUALIFICATIONS OF GROUND OBSERVERS.—Men selected for training as ground observers should have keen sight and hearing. They should be able to withstand fatigue and to continue to exercise their faculties under difficult circumstances. They must be of more than average intelligence, preferably with a high school education, and able to understand instructions, to express themselves clearly, and to describe what they have seen accurately and without exaggeration. Ability to write legibly and to make simple sketches or overlays is essential. They must be patient, conscientious, and persevering. Before beginning their training as observers, they should be qualified as basically trained soldiers and have thorough instruction in scouting and patrolling.

■ 26. SPECIAL TRAINING OF GROUND OBSERVERS.—There are three phases to be covered in the training of ground observers. First, their physical senses of perception must be developed; second, they must be given technical training in handling the tools with which they work; third, they must have tactical training in the situations they will meet in different types of combat.

a. Development of physical aptitudes of sight and hearing.—The object of this phase of training is to develop alertness and the ability to remember and report what has been seen and heard. Observers begin their training with practice in observing simple objects at varying distances; geometric

figures on target frames, groups of men, vehicles, and weapons are suitable for this purpose. They should then study visible objects for color, form, number, dimensions, details of construction, and direction and distance from their own position. Their sense of hearing should be developed by teaching them to recognize the characteristic sounds produced by wagons and carts, automobiles and trucks, tanks, airplanes, discharges of various weapons, whistles, men talking or singing, and rattle of bayonets and other equipment. They should be taught to analyze the cause of a sound, its direction, and the approximate distance. Training should emphasize the difference in sight and sound by day and by night.

b. Technical instruction.—The object of this phase of training is to accustom the observer to handle the tools with which he must work. Qualification in map and aerial photograph reading is essential so that the observer may transfer what he sees on the ground to the map. (See *FM 21-25.) As a minimum, the observer must be qualified in the following elements of map reading:

- Orientation of map.
- Location and use of coordinates.
- Distance and map scales.
- Direction and angular measurement.
- Relief by contours.
- Conventional signs and symbols (FM 21-30).
- Aerial photograph reading, including use of stereoscope.

The student is taught to write out reports and to make overlays and rough sketches to accompany messages.

Instruction in the use of the following instruments is given (FM 23-55):

- Field glasses and telescope.
- Prismatic or lensatic compass.
- Aiming circle.
- Range finder.
- Periscope, including construction of emergency periscope from mirrors.

*See appendix I.

Instruction is given in the estimation of distances under varying conditions. (See FM 23-55.)

Observation personnel should be instructed in establishing signal communication. They should be able to install and operate the telephone, qualified in the Morse code, and able to use the signal lamp, flags, telegraph, and radio. (See FM 24-5.)

c. Tactical instruction.—Having had his sense of perception developed and having a working knowledge of the tools of his trade, the observer then completes his training with tactical instruction that teaches him to apply his specialty to battlefield situations.

(1) From an observation post, the student is given an opportunity to see the various indications of enemy activity that may be observed on a battlefield, such as—

Movement of troops, as individuals and by small groups, in rushes and by infiltration, at various distances.

Columns of foot troops, artillery, tanks, trucks, etc., at considerable distances. (Size of column should be estimated, then compared with actual numbers obtained from troops observed.)

Artillery in position.

Automatic and antitank weapons in firing positions with varying degrees of concealment.

Different types of entrenchments and field works seen from varying distances.

Defense accessory works, such as wire entanglements, mine fields, tank traps, etc.

Observation posts and observer groups.

Locating points from which rocket signals are fired.

Traffic on distant railroads.

Destruction of dumps and stores.

Appearance of armored vehicle. (See *FM 30-40.)

Appearance of chemical weapons and gas protective equipment.

(2) Observers are made familiar with various indications that may show locations of our own advanced elements, such as firing, signals, panels, flares, smoke, etc.

*See appendix I.

(3) Observers are instructed in the recognition of aircraft, both hostile and friendly (FM 30-30). They should be able to estimate altitudes and distances and to determine types of aircraft.

(4) Tactical training of observers can be profitably integrated with that of other troops. The observer groups can be assigned locations and required to observe and report the movements made by other troops incidental to their own training. When one-sided field exercises are held, it will be advantageous to use the observers at the enemy positions so that they may observe the movements from the enemy point of view. This is greatly to be preferred to having the observers occupy an observation post on their own side when they have no opportunity to work against a represented enemy.

(5) The final step in the training of observers is the functioning of the complete team as part of their own unit in two-sided maneuvers. The importance of prompt reports by suitable means of communication should always be emphasized.

■ 27. AERIAL OBSERVERS.—*a.* Satisfactory performance of the various types of air observation and reconnaissance missions requires a high degree of training. An aerial observer must be a trained aerial gunner, an aerial navigator by at least pilotage means, an expert radio operator, an aerial photographer, and should be qualified in the use of pyrotechnics and in drop and pick-up message procedure. He must also have a comprehensive knowledge of the tactics and technique of ground, naval, and air forces, both friendly and enemy. (See *FM 1-20.)

b. In addition to specialized aerial observers, the maximum number of ground officers should be given practice in observing from airplanes. This is of special importance in the case of commanders and staff officers of larger units.

*See appendix I.

APPENDIX I

LIST OF REFERENCES

- *FM 1-20, Tactics and Technique of Air Reconnaissance and Observation.
- FM 1-35, Aerial Photography.
- FM 1-40, Intelligence Procedure in Aviation Units.
- *FM 1-50, Weather.
- FM 2-15, Employment of Cavalry. (Now published as CFM, vol. III.)
- FM 4-5, Seacoast Artillery—Organization and Tactics.
- FM 4-105, Antiaircraft Artillery—Organization and Tactics.
- FM 6-20, Field Artillery—Tactics and Technique.
- FM 6-120, Field Artillery—The Observation Battalion.
- FM 11-5, Mission, Functions, and Signal Communication in General.
- FM 11-20, Organization and Operations in the Corps, Army, Theater of Operations, and GHQ.
- FM 21-25, Elementary Map and Aerial Photograph Reading. (Now published as ch. 5, BFM, vol. I.)
- *FM 21-26, Advanced Map and Aerial Photograph Reading.
- FM 21-30, Conventional Signs, Military Symbols, and Abbreviations.
- FM 21-35, Sketching.
- FM 21-40, Defense against Chemical Attack.
- FM 21-45, Individual Protection in the Field. (Now published as ch. 9, BFM, vol. I.)
- FM 23-55, Browning Machine Gun, caliber .30, M1917 (for range estimation and use of instruments).
- FM 24-5, Signal Communication.
- FM 30-5, Military Intelligence—Combat Intelligence.
- FM 30-15, Examination of Enemy Personnel, Repatriates, Documents, and Matériel.
- FM 30-21, Military Intelligence—Role of Aerial Photography.
- FM 30-25, Military Intelligence—Counterintelligence.
- FM 30-30, Military Intelligence—Identification of U. S. Government Aircraft.
- *FM 30-40, Identification of Armored Vehicles.

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