

MHI
Copy 3

FM11-40

DEPARTMENT OF THE ARMY FIELD MANUAL

SIGNAL PHOTOGRAPHY

REFERENCE USE
ONLY

NOT TO BE TAKEN FROM LIBRARY

DEPARTMENT OF THE ARMY • JANUARY 1951

DEPARTMENT OF THE ARMY FIELD MANUAL
FM 11-40

SIGNAL
PHOTOGRAPHY



DEPARTMENT OF THE ARMY

● JANUARY 1951

United States Government Printing Office
Washington: 1951

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 10 January 1951

FM 11-40 is published for the information and guidance of all concerned.

[AG 06.2 (22 Sep 50)]

BY ORDER OF THE SECRETARY OF THE ARMY:

OFFICIAL:

EDWARD F. WITSELL
Major General, USA
The Adjutant General

J. LAWTON COLLINS
Chief of Staff
United States Army

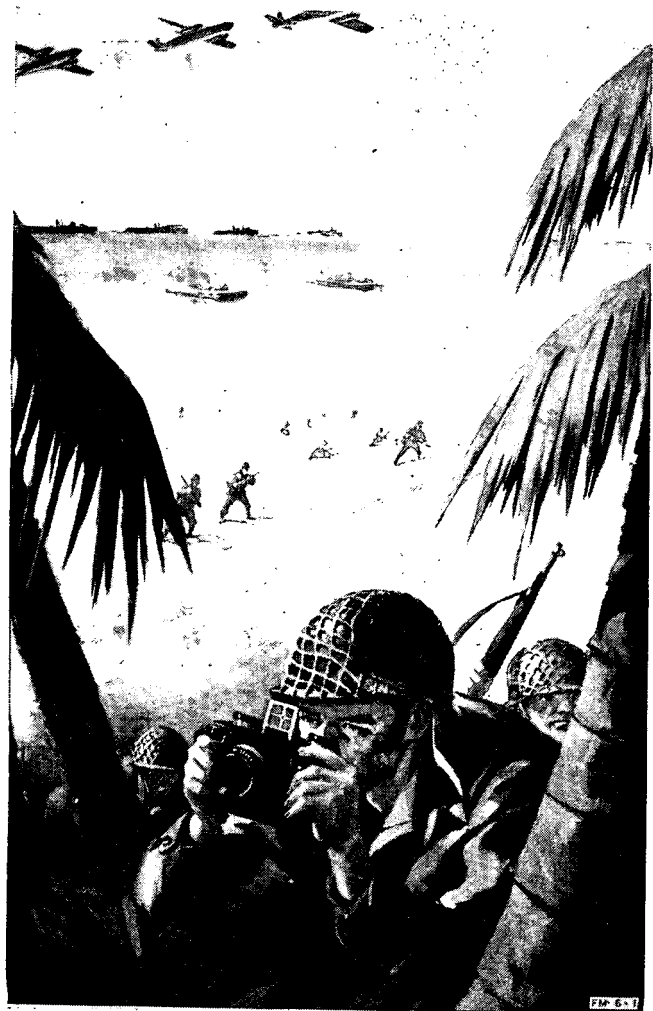
DISTRIBUTION:

GSUSA (5); SSUSA (5); Tech Svc (2); Arm & Svc Bd (1); AFF (10); OS Maj Comd (5); Base Comd (3); MDW (2); A (20); CHQ (2); D (2); B (2); R (2); Bn (2); C (1); FC (2); Sch (5) except USMA (2); Dep 11 (5); Tng Cen 11 (20); PE (5), OSD (SigO) (2) Ars (SigO) (1); Lab (SigO) (2); 4th & 5th Ech Maint Shops 11 (2); T/O&E 11-500 EK, FA, FB, FC, FD, FE, FF, FH, FI, FJ, FK, FL, FM, FG (2); SPECIAL DISTRIBUTION.

For explanation of distribution formula see SR 310-90-1.

CONTENTS

	<i>Paragraphs</i>	<i>Page</i>
CHAPTER 1. INTRODUCTION	1-3	1
CHAPTER 2. ORGANIZATION		
<i>Section I.</i> Theater of operations	4-11	3
<i>II.</i> Continental United States	12-15	11
CHAPTER 3. PLANNING AND OPERATIONS		
<i>Section I.</i> Theater of operations	16-32	14
<i>II.</i> Continental United States	33-37	33
<i>III.</i> Security	38-40	40
CHAPTER 4. STILL PHOTOGRAPHY		
<i>Section I.</i> Employment	41-51	42
<i>II.</i> Techniques	52-66	55
<i>III.</i> Equipment	67-70	82
<i>IV.</i> Photographic laboratories	71-83	85
CHAPTER 5. MOTION PICTURE PHOTOGRAPHY		
<i>Section I.</i> General	84-87	95
<i>II.</i> Techniques	88-103	99
<i>III.</i> Equipment	104-106	119
CHAPTER 6. TRAINING		
<i>Section I.</i> Specialist training	107-110	125
<i>II.</i> Field training	111-116	128
CHAPTER 7. SUPPLY		
<i>Section I.</i> Procedures	117-119	133
<i>II.</i> Maintenance	120-121	134
<i>III.</i> Storage and shipping	122-127	136
CHAPTER 8. SIGNAL PHOTOGRAPHIC COMPANY		
<i>Section I.</i> General	128-130	144
<i>II.</i> Headquarters platoon	131-133	145
<i>III.</i> Laboratory platoon	134-136	150
<i>IV.</i> Assignment platoon	137-141	154
INDEX		158



CHAPTER 1

INTRODUCTION

1. PURPOSE

This manual is intended to provide military personnel with a general orientation concerning tactical employment of military photography and the functions, organization, and responsibilities of Signal Corps photographic units.

2. SCOPE

The subject matter includes tactical application and general techniques of still and motion picture photography. Basic information is given on the operation and employment of film libraries, photographic laboratories, and Signal Corps photographic companies and sections. Also included is specific information on plans and training, functions of military photography, and methods of supply and storage peculiar to photographic equipment and supplies.

3. OBJECTIVE OF MILITARY PHOTOGRAPHY

The object of Signal Corps photography is to provide all types of required photographic service wherever military operations benefit or are simplified through such service. During combat, the

camera essentially is a tactical tool. Through the photographs it produces, the camera provides positive information which is used to clarify, substantiate, and support modern military operations. Complete understanding of the application of military photography by using units is necessary to insure cooperation and full utilization of photographic service.

CHAPTER 2

ORGANIZATION

○

Section I. THEATER OF OPERATIONS

4. GENERAL

In a theater of operations, photographic activities are widely dispersed. Photographic organization is flexible and varies with the situation, troop strength, and type of operation. Most theater photographic activities are organized to meet the requirements of land-based operations. To insure a well-coordinated, efficient, and successful theater photographic service, a thorough working knowledge of the available photographic units in the theater by signal officers and photographic officers is necessary.

a. Signal Officers. Signal officers at all echelons are charged with the responsibility of military photography (fig. 1). To provide theater, army, and corps signal officers with the necessary technical and tactical photographic information, at least one thoroughly qualified photographic officer is on each signal staff. Although the division signal officer does not have a photographic officer on his staff, necessary information is obtained from the photographic officer in the photographic section of the division signal company.

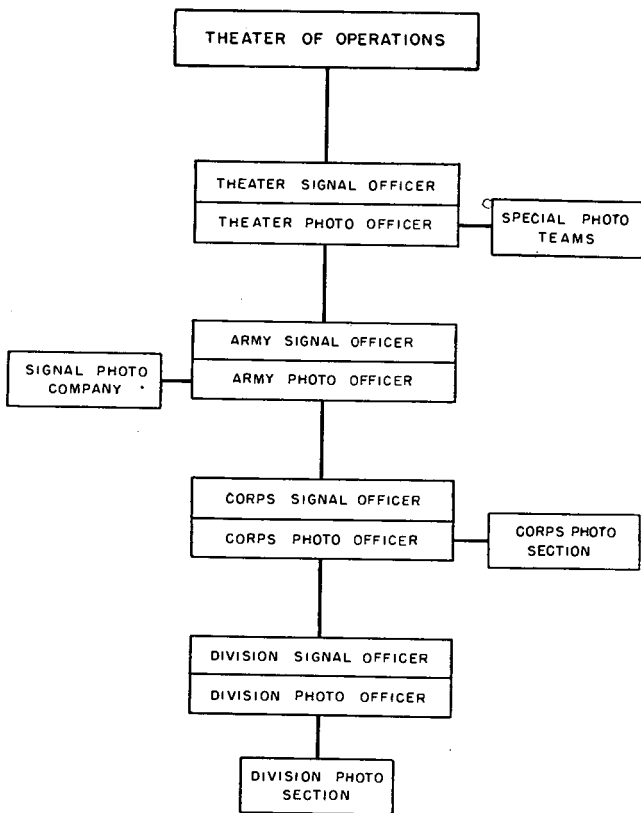


Figure 1. Photographic technical channel for theater of operations.

b. *Photographic Officers.* At staff level, the signal officer delegates technical responsibility and tactical control over the photographic units to the photographic officer. Within the photographic

companies and sections, photographic officers have direct command and technical responsibility.

5. THEATER LEVEL

To meet photographic requirements at theater level, a photographic service unit organized under T/O & E 11-500, 22 September 1944, is utilized. The photographic service unit normally operates in the communications zone. However, teams from the unit may perform special photographic missions in echelons as low as division. The unit is normally large and flexible enough to be adapted to meet many situations. The strength of the photographic unit determines the size of the headquarters section. This section is made up of administration, mess, and motor maintenance teams. The required operational elements are normally composed of the following cellular teams:

Photographic assignment (FA) team.

Photographic laboratory (FB) team.

Newsreel assignment (FC) team.

Identification (FD) team.

Telephoto transmission (FF) team.

Photographic maintenance (FG) team.

Signal photographic production (FH) team.

Still picture (FL or FM) team.

6. ARMY

At army level the photographic requirements are met by an organic photographic company which operates the army laboratory and provides

photographic coverage at army headquarters. Elements of the photographic company also operate in division areas to accomplish army photographic assignments. When necessary, elements of the photographic company are used to augment corps and division photographic activities. For additional information on the company see chapter 8.

7. CORPS

Personnel to accomplish the photographic coverage and operate the corps photographic laboratory are provided by the corps signal battalion. The photographic section is a part of the headquarters company of the battalion. Personnel of the section operate at corps headquarters and, when necessary, may augment the division photographic activities. Whenever augmenting teams are needed at corps, they are assigned from army and are attached to the photographic section of the corps signal battalion. Normally, the augmenting personnel use the corps laboratory facilities.

8. DIVISION

Photographic sections that are part of the division signal company are furnished to infantry, armored, and airborne divisions. Personnel from these sections provide basic photographic coverage for the division. However, augmenting teams from the army or theater photographic agencies can be requested to assist the division photographic sections whenever additional assistance is necessary.

9. UTILIZATION OF CELLULAR TEAMS

a. Service Units. Signal photographic service companies or detachments that are used at army and theater level are formed by combining the necessary cellular teams authorized by T/O & E 11-500. These photographic service units operate in the same manner as an organic photographic company but are preferable in certain circumstances because of their flexibility. They may be utilized by theater commanders when—

- (1) Existing photographic facilities are not adequate.
- (2) Photographic demands do not warrant an organic photographic company.
- (3) More than the normal number of a certain type of team is needed to complete a specific photographic mission.
- (4) An organic photographic company cannot meet the demands.

b. Augmenting Teams. Variation of the normal mission or work load of an organic organization occasionally requires an increase of personnel and equipment. Whenever this occurs locally and not on an army-wide basis, cellular teams are used for the augmentation. Sufficient teams to meet the demands of the situation are obtained and absorbed by the organic unit. This form of augmentation is on a permanent basis.

c. Special Teams. In a theater of operations, special teams which are controlled by the Department of the Army are often utilized for special coverage. Normally, the signal photographic pro-

duction team is used on these special projects and is attached to the theater photographic laboratory. This team usually functions in the communications zone. Elements of the team, however, may operate in forward echelons.

10. TYPES OF TEAMS

Teams authorized by T/O & E 11-500 are used in the formation of photographic units, augmenting teams, and special teams. They are cellular type teams and vary in size and functions. Typical teams are:

a. Photographic Assignment Team. The mission of this team is to provide still and motion picture photography in a combat area and to supplement the activities of other photographic units. Identifying code designation—FA Team.

b. Photographic Laboratory Team. This team normally is the nucleus of the theater photographic service unit and operates the theater photographic laboratory. Personnel and equipment are adequate for the processing of both still and motion picture film. Identifying code designation—FB Team.

c. Newsreel Assignment Team. This team provides newsreel-type motion pictures and news-type still photographs and operates in the communications zone and combat zone. Identifying code designation—FC Team.

d. Identification Team. This team is equipped to take and process identification pictures. Identifying code designation—FD Team.

e. Still Picture Laboratory Team. This team is capable of processing material for two photographic assignment teams and two newsreel assignment teams. A still picture laboratory team is used when a photographic laboratory team is not needed. Identifying code designation—FE Team.

f. Telephoto Transmission Team. This team installs, operates, and maintains telephoto or facsimile transmission equipment. Identifying code designation—FF Team.

g. Photographic Maintenance Team. This team performs depot maintenance of projector and photographic equipment in a theater of operations. Identifying code designation—FG Team.

h. Signal Photographic Production Team. This is a basic photographic unit in the communications zone which makes motion picture reports of personnel, material, conditions, and techniques in the development and use of all weapons and means of warfare. It is provided particularly for the use of staff agencies but its use must be authorized by the Department of the Army. When authorized by the Department of the Army, this unit also provides public information and historical motion picture coverage. Identifying code designation—FH Team.

i. Still Picture Team. This team usually is attached to intelligence or public information sections. Its personnel can provide news, identification, reconnaissance, and tactical or technical still photography. Identifying code designation—FL or FM Team.

j. Film and Equipment Exchange Team, Class A. This team serves a minimum of 75,000 troops at a theater headquarters or other unit not served by a class B or C film and equipment exchange. It trains projectionists and supplies troops with films and projectors for training, orientation, entertainment, education, and other purposes. The team consolidates requests for film, projectors, and other equipment necessary in the operation of the theater film library. The theater film and equipment exchange stocks films and maintains control of all film and equipment exchanges in the theater. Identifying code designation—FI Team.

k. Film and Equipment Exchange Team, Class B. This team is capable of providing 60,000 troops with films and projection equipment. Service is identical to that provided by the class A film and equipment exchange team. The team performs organizational maintenance of projector equipment. Identifying code designation—FJ Team.

l. Film and Equipment Exchange Team, Class C. This team serves isolated units or schools of 10,000 troop strength and performs the same function as a class B film and equipment exchange team. Identifying code designation—FK Team.

11. FILM AND EQUIPMENT EXCHANGES

To provide the necessary instructional films, recreation films, and projection equipment in a theater of operations, a system of film and equipment exchange is established. Organization of the exchanges is dependent upon the situation and number of troops to be served. The signal officer

of the particular echelon served by an exchange is responsible for its operation. Normally, at theater level a class A film and equipment exchange team is needed to provide a sufficient number of operating personnel and equipment. At army level, personnel and equipment are provided by a class B exchange team. The theater exchange is considered the central and controlling exchange and all other issuing agencies are designated sub-exchanges.

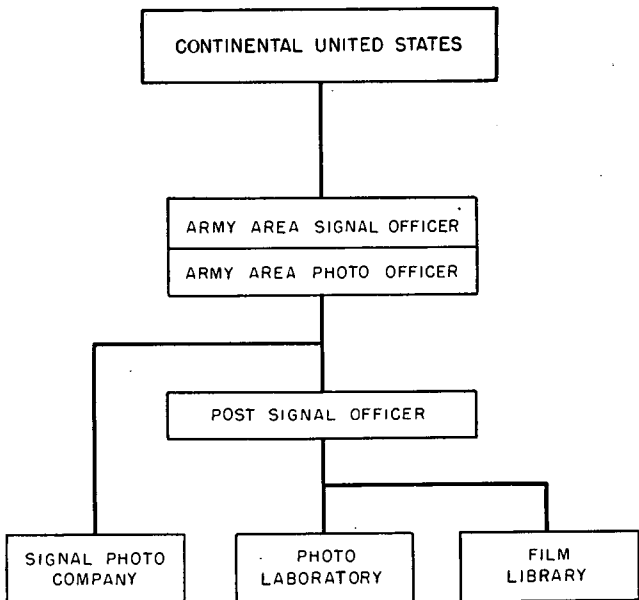
Section II. CONTINENTAL UNITED STATES

12. GENERAL

Since photographic operations within the continental United States are on a much smaller scale than in a theater of operations, photographic activities are correspondingly smaller and are organized under a different chain of command (fig. 2). Practically all photographic coverage within the continental United States is accomplished by photographic laboratories. Organization of photographic laboratories is discussed in chapter 4.

13. ARMY AREAS

a. Command. A central command directs all photographic activities in the continental United States. This command directs, processes, and formulates policies and plans pertaining to military photography. Authority and supervision are delegated through army photographic officers to the



FM 6-3

Figure 2. *Photographic technical channel for continental United States.*

various photographic organizations throughout the continental United States.

b. Army Photographic Officer. In each army area there is a photographic officer on the signal officer's staff. The army photographic officer exercises operational control over all photographic activities and film libraries throughout the area. The number of these activities depends upon the size of the army area and the installations it contains. The normal chain of command is direct to the installation commander, who disseminates directives

and instructions to photographic activities within his command.

14. FILM LIBRARIES

Film libraries in the continental United States have the same organization and functions as film and equipment exchanges have in the theater of operations. Film libraries distribute visual training aids and equipment on a loan basis to all military organizations of an installation. A central library, which is operated at each army area headquarters, functions as the controlling library. All other installations in the army area are provided with sublibraries. The army area commander is responsible for all film library activities in the army area. For further details on film libraries and film and equipment exchanges, see SR 110-30-5.

15. PHOTOGRAPHIC COMPANY

In the continental United States, utilization of organic photographic companies is very limited because photographic requirements do not warrant units of this size. A photographic company normally is located at an army area headquarters and is under control of the army photographic officer. The company's functions are training and the accomplishment of special Department of the Army projects. Teams from the photographic company may be utilized by the army photographic officer to alleviate excessive work loads at any of the army installations or to complete additional special photographic tasks.

CHAPTER 3

PLANNING AND OPERATIONS

Section I. THEATER OF OPERATIONS

16. GENERAL

Good planning is a form of insurance. It gives specific purpose to preparations and impetus to operations. In photographic planning, effort should be made to anticipate every possible factor which may affect photographic performance. Military photographers must participate in all types of operations. Even under adverse conditions, and with minimum equipment, they should be able, by intelligent use of field expedients, to provide satisfactory photographic service. Only good planning insures such service in all military situations. Primary consideration in photographic planning is the type of military operation.

17. INFANTRY OPERATIONS

The pictorial service normally provided for infantry units represents the basis for planning for all types of operations. Photographic coverage may include participation in reconnaissance missions with scouting parties or intelligence teams. Coverage may be made from observation posts, vantage points, and reconnaissance airplanes. In

most situations both still and motion picture photography are employed to provide suitable photographic coverage (fig. 3).

18. ARMORED OPERATIONS

In an armored unit, tactical photography presents special problems because of the mobility of the unit. Photographic coverage usually is obtained from a leading tank or from an armored vehicle on a reconnaissance mission. Processing of pictures may have to be performed in an armored vehicle and often while the unit is moving.

19. AIRBORNE OPERATIONS

Airborne operations require light, compact photographic equipment. Processing equipment must be portable and easily assembled to facilitate transportation and use. Such equipment is dropped and assembled immediately. Because of the nature of airborne operations, photographers must carry enough equipment and film to function independently for sustained periods. Photographic coverage begins with the initial stages of the operation and continues until the objective has been reached. Tactical photographs should be processed as soon as possible after personnel have completed the jump and established a position. Photographers must have specialized training in this type of operation.

20. SPECIAL OPERATIONS

Special methods and equipment are required for joint amphibious landings and for hot and cold



Figure 3. Both still and motion picture photographs are sometimes employed.

weather operations. In amphibious missions photography is a coordinated effort between army, air force, and navy personnel, with specific missions detailed to individual photographers. The navy photographic service should be consulted on such problems as water-level photography and shore reconnaissance aerial photography, which is used to determine water depth and suitability for landing troops. In hot and cold weather operations, the climate influences the choice of equipment and procedures for maintenance and processing. Special equipment is provided for extremely cold weather so that cameras can be operated with gloves, films can be safely transported in the camera, and camera equipment can be properly winterized. In extremely hot climates, equipment is moistureproofed and fungiproofed, films are stored with desiccators, and lenses are treated to prevent their destruction by bacteria and fungus. Processing requires temperatures within certain limits and certain chemical processes. For general information on use of equipment in hot or cold climates, see TB SIG 189 and TB SIG 190.

21. RESPONSIBILITY

At each echelon, the signal officer is responsible for military photography. To insure the successful and efficient operation of photographic units, personnel must be thoroughly trained, equipped, and informed on their missions. The signal officer sees that these requirements are met and maintains control through periodic inspections of photographic personnel and equipment. During in-

inspections of photographic units, the following important details should be considered:

Cleanliness and condition of installation.

Space and arrangement for convenient work flow.

Speed and quality of photographic service.

Care and maintenance of equipment.

Supply control and records.

Proper filing and captioning of negatives and prints.

Security of classified material in accordance with AR 380-5.

Fire precautions in storage.

Transportation maintenance and records.

Military appearance and discipline of personnel.

22. THEATER PHOTOGRAPHIC STANDING OPERATING PROCEDURE

In a theater of operations, photographic planning should specify assignment and utilization of all photographic units—with particular reference to activities that have precedence during combat. To eliminate the need for detailed orders, the theater photographic officer prepares an SOP (standing operating procedure) which includes the more permanent aspects of all photographic activities within the theater. To insure a thorough and efficient SOP, close coordination is necessary between the theater photographic officer and the various staff sections. Coordination and policy-

making with other services and allied forces are also essential. The theater SOP establishes procedures for—

Forwarding record and nonrecord negatives. Disposition, storage, and handling of classified negatives and prints.

Handling and forwarding color film.

Facsimile transmission of photographs.

Expediting processed and unprocessed still picture negatives.

Theater training of photographic personnel.

Issuing special photographic passes and identification cards.

Coordination with G-2 and PIO (public information officer).

Cooperation with authorized civilian photographers.

Augmenting photographic units when necessary.

Personnel reports in event of critical MOS (military occupational specialty) shortage.

Critical shortage reports.

Production reports of sublaboratories.

Faulty or inadequate equipment reports.

The theater SOP should also establish—

Regulations restricting photography of certain subjects.

Policies governing aerial photography.

Policy on official and unofficial photography.

Operation of equipment under local climatic conditions.

Number blocks for still negatives and 35-mm still rolls.

- Lists for normal and special photographic print distribution.
- Security specifications in accordance with AR 380-5.
- Standards of photographic performance expected in the theater.
- Lists of special subjects for historical photographs.
- Method of handling captured enemy photographic equipment and supplies.
- Method of handling acquired enemy still and motion pictures.
- Special operational instructions for tactical and combat photography.
- Emergency instructions for a sudden advance, retreat, or unprecedented action.
- Disaster plans indicating the location and duties of every photographic unit and team within the theater.

23. CHANGES TO SOP's

Although photographic SOP's are intended to cover military photography under all conditions and circumstances, the following factors may necessitate changes to the SOP:

- Large scale tactical moves.
- Unprecedented enemy weapons and operations.
- Seasonal or climatic changes.
- Terrain changes resulting from tactical moves.
- Logistical difficulties.

24. ARMY PHOTOGRAPHIC SOP

For general organization and planning control, the army photographic officer prepares an SOP based on the theater photographic SOP, the type of campaign, and the employment of photographic units within the army. The theater SOP usually covers over-all photographic policy. The army SOP gives more detailed and specific information directed to specific units. Additional information is obtained by the army photographic officer through coordination with the corps photographic officers and the photographic company commander. The army photographic officer also confers with the army signal officer and various staff sections to facilitate execution of the SOP and to assure that requirements of photographic personnel for transportation, subsistence, and equipment are met. He makes arrangements for photographers to be given freedom of action in combat areas. Through the army signal officer he coordinates with theater, corps, and division, to meet staff photographic requirements. During the planning phases and the making of the army SOP, the photographic officer should strive for a coordinated, cooperative, and productive operation. Essential considerations in making the army photographic SOP are—

Primary photographic mission.

Special types of operations.

Unusual tactical developments.

Extreme climatic conditions.

Difficult types of terrain.

Use of unexpected weapons by the enemy.
Type and strength of enemy forces.
Number of available photographic units.
Sector assigned to each photographic unit.
Photographic supplies and equipment.
Transportation.
Individual equipment of personnel.
Supporting operations between photographic units.
Supporting operations between terrestrial and aerial photography.
Photographic service chain for processing and distribution.
Location of processing teams and laboratories.
Emergency distribution list of tactical photographs.
Security measures.
Communications.
Captured enemy photographic equipment.

25. CORPS

There is no designated corps photographic officer. However the photographic officer of the corps signal battalion may act in the capacity of corps photographic officer if the signal officer so desires. This photographic officer is concerned with photographic requirements and special requests from theater. He acts as technical advisor to the corps

signal officer and as liaison officer in all matters pertaining to military photography. Planning by the corps photographic officer should be directed toward broad and thorough photographic coverage. To accomplish the necessary coverage, augmenting teams from the army photographic company may be requested. Planning for photographic activities within the corps should also prevent overlapping efforts between adjacent corps. Corps photographic policies and SOP's are based on the army SOP.

26. DIVISION

The division signal officer is responsible for the photographic program within the division. He commands the division photographic section and, when necessary, consults the division photographic officer on technical aspects of military photography. The division photographic officer is in charge of the photographic section and directs its activities. He acts as advisor to the division staff, recommends special equipment needs, and reports on particular problems and conditions which should be considered in planning. Thorough planning is essential to insure the maximum efficiency of the section. Better cooperation and coordination between photographic personnel and combat unit personnel are achieved by assigning photographic personnel to operate with the same combat unit whenever possible. The division photographic SOP is the responsibility of the photographic officer and is based on the corps photographic SOP.

27. PHOTOGRAPHIC UNIT

The operation of each photographic unit (company, detachment, or section) is planned by the unit commanding officer. At times it may be necessary to reorganize the unit into operating groups to meet the requirements of the signal officer's operation orders. Only careful advanced planning prevents confusion and laxness among personnel of these operating groups when they are widely dispersed for sustained periods. Planning should also provide alternate solutions for problems likely to be encountered during combat. Dissemination of the completed plans is made by unit operation orders and unit SOP's.

28. UNIT SOP

Unit SOP's are prepared by the commanding officer of the photographic company, the corps signal battalion photographic section and the division photographic sections. These SOP's are based on the army SOP and on signal or operation orders. The degree of detail necessary in a unit SOP is determined by the proficiency and training of the personnel who make up the unit. Newly organized units require a more detailed SOP than do well-trained or seasoned units. A detailed unit SOP normally covers the—

System for maintaining liaison and coordination between the photographic unit and the organizations served.

- System used in filling pictorial requests from the public information office at division, corps, and army.
- System used in filling special requests for the historical section.
- Maximum time limits for each type of photographic coverage. (Usually 24 hours for public information office assignments, 6 hours for tactical photographs, etc.)
- Distribution list of photographic prints.
- Detailed procedure for handling and forwarding films and negatives.
- Procedure for arranging electrical transmission of photographs.
- Location of photographic laboratory where films are to be processed.
- Route and number of daily trips between photographic unit and photographic laboratory.
- Type and number of vehicles available.
- System for repair and maintenance of vehicles.
- System of resupply and periods when additional supplies are available.
- Ration points for unit mess, ration pickup points for individual photographers, or unit messes to which photographers are assigned.
- Special instructions for personnel separated from the unit because of sudden advance, retreat, disaster, or other emergency.

Channels to be used for emergency support of transportation, messing, or personal equipment.

Specific procedure for immediate replacement when camera equipment breaks down or is lost.

Handling of captured enemy photographic equipment.

List of enemy photographic supplies which may be used in emergencies.

Special instructions pertaining to security and safeguarding military information.

Brief outline of the normal photographic procedure for every type of photographic coverage anticipated in a particular campaign.

Definition of the limits to which aerial photography is supplied by Signal Corps personnel.

Method of obtaining aerial photographic support through channels.

Procedure for obtaining permission to use reconnaissance aircraft.

29. TEAM

a. Standing Operating Procedure. Often the unit SOP does not fully apply to individual teams operating on special assignments. When this occurs, it is necessary to provide the individual teams with SOP's. The applicable parts of the unit SOP are used with necessary additional in-

formation. Additional factors to be considered in the team SOP are—

Sectors of operation.

Support of photographic personnel from adjacent sectors.

Climatic extremes.

Difficult terrain.

Available special equipment.

Precautions and directions governing use of special equipment.

b. Special Reports. It is essential for the unit commander to require weekly operational reports to be filed with the unit headquarters by personnel of a photographic team on detached service. These reports should contain information on the number of photographs taken, types and number of projects, special problems, supplies used, and requests for additional supplies. By means of these reports, control is exercised over the activities of the photographic team and SOP's are adjusted to solve specific field problems. These reports are also valuable sources of information for the supply sections. By checking requests for supplies against photographs taken, a close control can be kept of expenditures.

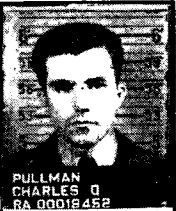
30. PERSONNEL

a. General. Basic personnel of all photographic units include still and motion picture photographers and laboratory technicians. Some units also have camera repairmen for maintenance and

repair, special operators for transmitting photographs by means of facsimile equipment, and sound recording technicians. For successful combat and tactical photography, these men must be well trained in their specialties and thoroughly indoctrinated in the principles and purposes of military photographic service. Planning should provide for such training and indoctrination, as well as for refresher training in new techniques for improved individual and team performance. Standards of military conduct should be set, and a proper method of reporting to units for photographic assignments should be established.

b. Identification. Official army photographers are issued an identification card (DA AGO Form 11-176). This card (fig. 4) is an official military document which establishes the occupational status of the bearer. For visible identification, army photographers wear a dark blue brassard above the left elbow. The brassard is 18 inches long and 4 inches wide with words OFFICIAL U.S. ARMY PHOTOGRAPHER in golden orange on a black rectangle. This brassard is worn by the photographer only when he is actually working on a photographic assignment.

c. Reporting. When photographic units, teams, or individuals are assigned a photographic mission, they report, through the adjutant or G-2, to the officer in charge of the organization to which they are assigned. The purpose of this reporting is to make their presence and mission officially known to the organization and to request any necessary technical, operational, or administrative

OFFICIAL HEADQUARTERS 17TH ARMY		
THIS CARD CERTIFIES THAT		
SIGNATURE <i>Charles Q. Pullman</i>	SGT CHARLES Q. PULLMAN	PULLMAN CHARLES Q RA 00018452
	(GRADE) (FULL NAME)	
	IS AN	ARMY SERIAL NO.
	OFFICIAL U. S. ARMY PHOTOGRAPHER	RA 00018452
He WILL NOT be interfered with in the performance of his official photographic duties.		VOID AFTER
BY COMMAND OF: GEN KNIGHT		1 JUNE 1951
<i>Maj John Jules, Supt.</i> (ADJUTANT)		CARD NO.
		77
<p><i>This card is issued for official use of the holder designated hereon. Its use by any other person is unlawful and will make offender liable to heavy penalty.</i></p> <p>WD AGO FORM 11-176 1 MAR 1946</p> <p>15-47437-1 GPO</p>		

FM 6-5

Figure 4. DA AGO Form 11-176.

assistance. The manner of reporting should be clearly defined because it reveals the military discipline and training of photographic personnel. It also creates an immediate basis of understanding between command and the photographic service.

31. FILM AND EQUIPMENT EXCHANGES

In a theater of operations, training films and film strips are made available for troop training programs. These training films and film strips are distributed by film and equipment exchanges at all echelons. Film libraries in combat zones may also distribute recreational films in forward

echelons. These recreational films are received from the Army Motion Picture Service. Exchanges must be ready at all times to supply tactical troops and to adapt themselves to service situations peculiar to different types of oversea locations. Because of this constant shifting of the center of activity, major problems in planning are—

Locating a good center for distributing the film after each move.

Distributing the projectors and film in a new area.

Controlling the use of equipment and film while units are moving.

Maintaining and repairing the projection equipment.

Maintaining and storing the film.

Finding a means for retaining mobility without impairing service.

32. SPECIAL CONSIDERATIONS

a. Aerial. Aerial photography by Signal Corps units is a supporting function. During the development of a tactical operation, aerial photographs, maps, or reconnaissance information may need further clarification. From reconnaissance aircraft, the military photographer can pin-point and can make detailed photographs of the objective. The policy on aerial photography is formulated through coordination of the signal officer, photographic officer, and G-2. This necessary coordination should be stated clearly in appropriate

SOP's. This policy should establish the procedure to be followed in arranging for aerial photography to supplement and support terrestrial photography and should define the practical limits to the use of aerial photography by Signal Corps personnel.

b. Telephoto. Telephoto or telephotographic coverage is photographic recording with special cameras having extremely long focal length lenses. Through these long focal length lenses, distant details can be photographed for tactical analysis. This type of coverage is useful for artillery observation and for intelligence work.

c. Facsimile. Photographs, as well as text material and maps, may be rapidly transmitted over wire or radio circuits by means of facsimile equipment. The equipment is available at corps and higher headquarters and may also be found at division headquarters. It is installed and operated by a telephoto transmission team which is made up of specially trained photographic personnel, including photoradio operators and a darkroom technician. The equipment may be located in a photographic laboratory or in a comcenter. When it is necessary to locate the facsimile equipment some distance from a photographic laboratory, additional equipment is necessary to facilitate the processing of received and transmitted material. The additional equipment is procured through normal supply channels. Detailed information on facsimile transmission is given in TM 11-375B, with portions superseded by TM 11-2258.

d. Emergencies. Since tactical situations are not always favorable, planning should include pro-

visions for such emergencies as withdrawal, loss of equipment, and separation from normal supply channels. Photographers must learn to accept unfavorable conditions and to accomplish their missions with the barest essentials. Even the most careful advance planning cannot provide for every contingency. Special planning may be necessary to cover subject matter not previously considered or to provide adequate results when difficult conditions cause either equipment or normal photographic methods to fail. Introduction of unfamiliar weapons by the enemy may also create special problems of photographic coverage. Initial planning should outline procedures for photographing details of construction and operation of such weapons.

e. Field Expedients. Photographic field expedients are adjustments, changes, or new applications of equipment during routine or emergency field operations. Their purpose is to provide for continued operation when standard equipment fails to operate or is not available. New photographic techniques or new methods of processing, filing, etc., may also be considered field expedients. With a little ingenuity the signal photographer can work out improvements in cameras or accessories when necessary. With permission from G-2 or signal intelligence he may use captured cameras to improvise new photographic equipment. The commanding officer should study each new expedient or development within his unit. If the adjustments are worth-while, he should forward the information to the signal officer for consideration.

f. Static Situations. Victory in a theater of operations is often followed by a static situation when military forces establish law and order and organize an acceptable form of government. During this period there are many opportunities for historical, documentary, and public information photography (fig. 5). When military occupational duties begin and a military government directs national activities, photographic planning should illustrate the following conditions of national life:

Economic and physical state of the defeated country.

Housing facilities, destruction of homes, factories, and defenses.

Civilian cooperation.

Climate and terrain.

Condition of roads, public utilities, and transportation facilities.

State of security and extent of national organization of the territory.

Political and police conditions, including slave labor camps, concentration camps, and other violations of human rights.

Section II. CONTINENTAL UNITED STATES

33. GENERAL

In the continental United States, military photography is on a comparatively smaller scale than in a theater of operations—principally because civilian agencies supplement military photo-



Figure 5. Shooting historical photographs in conquered areas.

graphic coverage. Photographic interests are centered on training and activation of photographic units and the development of considerable public relations photography. Because the photographic installations are usually small and dispersed over a large area, operational control, supervision, and coordination are of great importance in planning for efficient functioning of photographic installations.

34. ARMY AREAS

In each army area, the army photographic officer is responsible for the planning and formulating of policy on photographic activities and film libraries. Detailed planning is necessary for the efficient functioning of these installations. The following essential points in planning are incorporated in directives, administrative orders, etc., issued by army headquarters:

Channels to be utilized in forwarding negative materials.

Numbering systems for still negatives and negative strips.

Policy on photographic supply.

Policies for coordination of photographic projects.

Supervision and coordination of film libraries —including supply, special film procurement, and equipment maintenance.

Detailed training programs for photographic personnel.

Special training programs for ROTC and reserve units.

Lists of necessary equipment for special projects and maneuvers in different temperate zones.

Types of maneuvers and extent of participation by the various installations within the army area.

Procedures for issuing photographic passes.

Distribution of pertinent regulations and photographic data.

Maintenance policies for photographic equipment.

Policies for the control and coordination of civilian personnel employed in photographic laboratories.

Detailed inspections of photographic installations with emphasis on conservation, security, and efficient operation.

35. POST PHOTOGRAPHIC INSTALLATIONS

The extent of photographic activities at any installation is determined by the number of troops and the type of photographic personnel assigned to the installation. Operational control of photographic activities is usually delegated to the post signal officer who, in turn, may delegate direct control and responsibility for planning and training to a photographic officer. Photographic installations in the continental United States are operated by small units; therefore, it is essential

to have job rotation so that efficiency may not be lowered by sudden loss of personnel. This rotation is possible because most of the duties within a photographic activity overlap or are closely related.

a. Laboratories. Photographic laboratories in the continental United States are an integral part of most installations. Pictorial requests for identification, portrait, copy, training, and public relations photography are processed by the laboratories, which perform the complete cycle of photographic operations. Photographic laboratories are discussed in detail in chapter 4.

b. Film Libraries. Film libraries make available on a loan basis to units within an army area, 16-mm films, 35-mm film strips, 16-mm projection equipment, transparencies, film slides, records, overhead projectors, and allied materials. The libraries train 16-mm projectionists for the using agencies; provide required assistance in the audio-visual training program, and may also make recommendations for new films and publicize the availability of films through local army area publication facilities. The libraries within the army area are divided into a central film library and into as many sublibraries as are necessary to fill the training requirements of the area. Although all film library facilities within the area are under the staff supervision of the army photographic officer who formulates the photographic program, authority is delegated to the officer in charge of the central library to see that all facilities and sublibraries cooperate in the program. For de-

tailed information regarding the operation of Signal Corps film libraries, see SR 110-30-5.

36. PHOTOGRAPHIC COMPANY

a. General. In the continental United States a photographic company is normally located at an army headquarters. The company's functions are training and working on special Department of the Army projects. Teams from the photographic company may be utilized by the army photographic officer to alleviate excessive work loads at any of the army installations or to accomplish special photographic tasks. Planning within the unit is the responsibility of the company commander and is directed toward training, maneuvers, and special projects. The entire company does not ordinarily engage in maneuvers, since teams or combinations of teams can meet photographic requirements. A portion of the company is normally operating in the field while remaining personnel are training under an organized program. Because of the company's pattern of operation, planning is generally directed toward individual teams. However, planning for full scale operations necessitating the use of the complete company is of equal importance.

b. Standing Operating Procedure. Detailed plans should be incorporated in an SOP for each team engaged in a mission that removes the team from the immediate vicinity of the company headquarters. The extent of the information in the SOP depends on the training status of personnel but it should include—

- Type of terrain in which the unit is to operate.
- Climatic conditions to be encountered.
- Need of additional equipment.
- Need to winterize or tropicalize equipment.
- Procedures for resupply and maintenance of units separated from the company.
- Procedures for motor vehicle maintenance.
- Policies for communication with the parent unit and other teams in the field.
- Types and number of operational reports to be submitted.
- Numbering blocks for negatives.
- Channels for the return of still and motion picture material.
- Distribution of prints to using agencies.
- Designation of commander to whom the team officer or noncommissioned officer in charge reports.
- Arrangement for messing.
- Procedure for coordinating a march order when a large number of teams are moving great distances by motor convoy.

37. MANEUVERS

Maneuvers are the only practical testing ground for actual combat conditions. They provide opportunities to test the photographic capacity of a unit and of individual photographers, the supply service, processing methods, and the practicability of camera equipment. Planning for maneuvers

should be as thorough as for actual combat. Photographic service which has been perfected under ideal conditions should be tried under more difficult conditions. Most military planning in the continental United States should not be based on the assumption that photographers always function with maximum equipment. Planning should encompass the possibilities of minimum equipment and climatic extremes. Systems functioning perfectly in good weather may fail miserably in heavy rain, snow, or extreme heat. Maneuvers should determine the practical value of photographic equipment and operational methods under a variety of circumstances and should result in recommendations for adjustments.

Section III. SECURITY

38. GENERAL

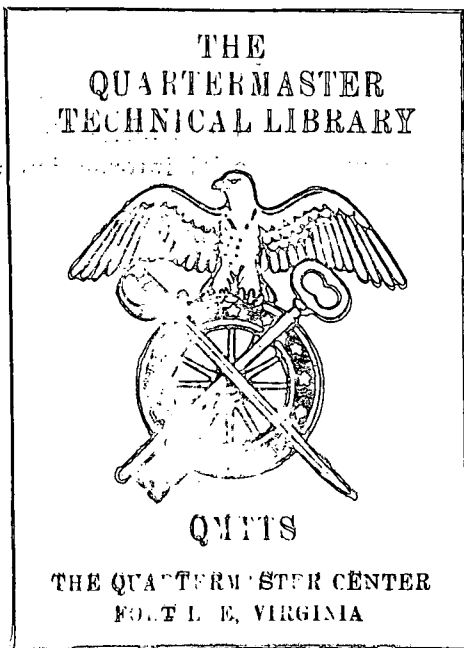
Regulations governing the taking, processing, and handling of classified photographs are given in AR 380-5 and SR 110-5-1.

39. PHOTOGRAPHIC SECURITY

Signal Corps photographers are official Army photographers and as such are authorized to photograph, under the supervision of the appropriate commander, classified material, equipment, and military activities of the Department of the Army. The photographing of all classified matter must be accomplished in accordance with AR 380-5 and SR 110-5-1.

40. LABORATORY SECURITY

The making of prints from negatives of classified material, equipment, and military activities must be in accordance with AR 380-5. Only the required number is produced, and the prints must be properly safeguarded during finishing and processing. Negatives and all prints of restricted, confidential, or secret photographs must be marked appropriately and conspicuously. Exposed films which cannot be developed locally are forwarded with proper security measures to army headquarters for processing.



CHAPTER 4

STILL PHOTOGRAPHY

Section I. EMPLOYMENT

41. INTRODUCTION

A clear understanding by command and all photographic personnel of the functions of military photography and its tactical employment is necessary for adequate photographic service. The value of still photography lies in the speed with which pictures can be made available. Military photography serves numerous tactical and technical agencies with pictorial information necessary for the successful completion of an operation. Technical photographs of equipment and methods also have logistical and training value. Photographers must thoroughly understand the nature of the photographic mission, and must have the technical ability to accomplish it.

42. TACTICAL

a. General. Tactical photography is the application of the camera in combat. Using the camera as an eye, the military photographer records pictorial information that supplements, supports, or establishes data related to combat operations

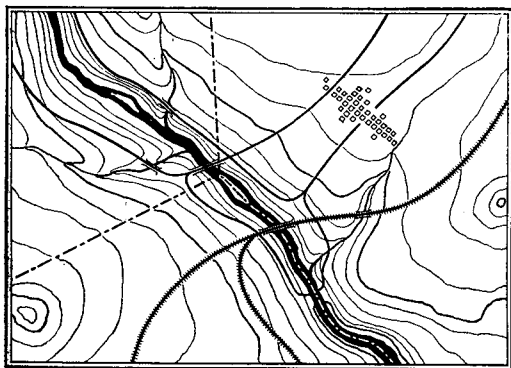
(fig. 6). Such photographic coverage includes troops in action, conditions under which they operate, and results of actual contact with the enemy. Additional information is obtained from photographs of enemy strong points, defenses, troops, weapons, and other equipment. Tactical photographs may be made on reconnaissance missions, from observation and vantage points, or during an advance or retreat. Photographs should be processed immediately and made available to command since the pictures may contain information that will influence the tactical and operational planning of a combat unit.

b. Reconnaissance. This category of still photography provides pictures to supplement or support observations made during reconnaissance assignments or information secured through tactical activities. Normally the photographer accompanies a reconnaissance team and takes the necessary photographs requested by command.

c. Terrain Studies. Terrain studies are pictorial records of terrain features that are of tactical importance to command. These photographs normally depict one specific subject and are used to supplement air force, engineer, and artillery photographic material. Terrain studies amplify, clarify, and pin-point a subject. Bridges, river fords, roads, obstacles, defenses, and other tactical details of terrain which appear too small on maps or aerial photographs are taken in detail by signal photographers (fig. 7).



Figure 6. Shooting tactical photographs.



FM 6-8

Figure 7. *Terrain photography supplements maps and aerial photography.*

d. Action Photography. Action photography is the pictorial recording of actual combat activities. Battle details are photographed to show the effectiveness of material, planning, and performance and to indicate the need for operational adjustments. Action photography follows a military operation from beginning to end. Complete photographic coverage is necessary on all phases of a combat activity. For example, military photographers should provide pictorial coverage not only of friendly artillery in action, but also of the resulting destruction of the target and accuracy of artillery fire. Action photography also attempts to show the enemy in action, especially where new enemy equipment and weapons are in use.

e. After-Action Photography. After an operation has ended, a thorough photographic coverage should be made of the combat area. After-action photographs show the effectiveness of friendly weapons and methods used against defenses and tactical operations of the enemy. Such photographs may also show reclamation and rehabilitation work (fig. 8). The detailed pictorial coverage includes such subjects as tanks, armored vehicles, weapons, defenses, installations, and supply centers. Photographs of captured military installations and fortifications are of special importance since these photographs may have great future value. For example, if a large fortification is recaptured by enemy troops, photographs made during its occupation by friendly forces may serve as a basis for planning offensive measures.



Figure 8. After-action photography.

43. TECHNICAL

a. General. Technical photography provides photographic illustrations of equipment, methods, and techniques. It is usually accomplished under the supervision of technical specialists who are familiar with the type of equipment to be photographed and the purpose of the required photographs. Photographic coverage should be detailed, complete, and of high definition and clarity (fig. 9).

b. Field Expedients. Alterations, modifications, and adaptations of equipment and methods by combat troops are known as field expedients. Photographs of these new techniques and methods should clearly show the nature and details of recommended changes of equipment and operational methods.

44. PUBLIC INFORMATION

Photographs are used by public information officers to promote interest and understanding by the public on military matters. These photographs must be newsworthy and of general interest to the public. The photographer should portray phases of military life that graphically explain the work and activities of the military service. These photographs are widely distributed by the public information office to publications and news services.

a. Public Information Officer. At all echelons, liaison between the commander and the public is maintained by the PIO. Since providing photographic coverage for the PIO is a function of the

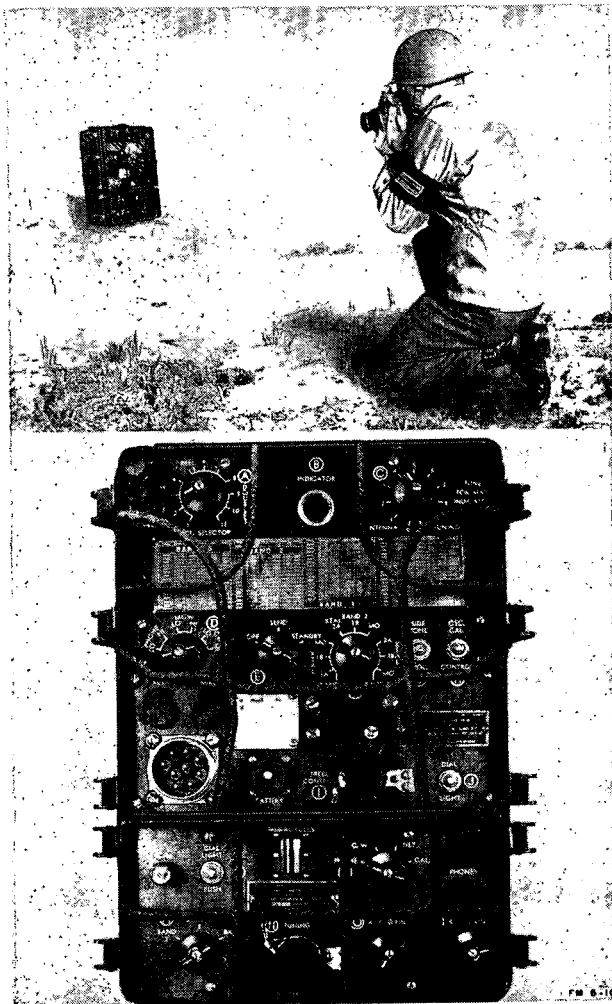


Figure 9. Shooting technical photographs.

Signal Corps photographic service, close association and coordination between this officer and the photographic officer is of greatest importance. To the photographic officer, the PIO can be a valuable source of information as to possible or probable future events that will require photographic coverage. In many situations, the PIO has knowledge of events that require no PIO photographic coverage but may be of great interest to the photographic officer.

b. Authorized Civilian Photographers. Civilian photographers are often authorized by the PIO to cover military subjects of news interest. On such occasions, courtesy, coordination, and cooperation are essential between military and civilian news photographers. There should be a clear understanding of the photographic requirements that each photographer must meet. The military photographer, while following instructions from his headquarters, should give assistance or advice when requested and when practicable to a civilian photographer. He should bear in mind that the civilian photographer has been cleared through the PIO for the required photographs. The civilian photographer represents the press and his function is to help the PIO tell the public what the army is doing. By courteous and proper military behavior, the military photographer can avoid cause for criticism and assure good publicity for the army.

45. INTELLIGENCE PHOTOGRAPHY

a. General. Intelligence photography includes coverage of all enemy activities as well as captured personnel and matériel. When photographers are specifically assigned to cover subjects of concern to military intelligence, the cameraman should stress technical details where possible. Intelligence photographs generally are not used as publicity or propaganda photographs because of the specialized and technical nature of the subject matter and the functional composition of the picture.

b. Captured Enemy Troops. Photographs of captured enemy troops should feature the physical fitness and general appearance of prisoners of war to indicate the logistical success or failure of the enemy. Photographs should clearly define the face, insignia, rank, and other uniform markings plus any unusual personal equipment carried on the person of the prisoner.

c. Captured Enemy Matériel. Photographs of this type include all kinds of captured enemy equipment, such as tanks, armored vehicles, communication equipment, weapons, ammunition, explosives, transportation, and other matériel. Normally, it is necessary to place a ruler or another object of known size with the intelligence subject for a comparison of the dimensions of the intelligence subject. Photographs are usually made under direction of qualified technical personnel.

46. IDENTIFICATION PHOTOGRAPHY

Identification pictures are used on official passes and identification cards. This service is normally

a function of personnel in the photographic unit laboratories, but may be performed by designated photographic personnel in other units. Pictures are normally made with a standard type of identification camera and lights (fig. 10). Additional information on identification photography is given in SR 110-50-5.

47. ILLUSTRATIONS FOR REPORTS

Military reports are clearer and more comprehensible when accompanied by specially prepared illustrations. The military photographer is often requested to provide the necessary illustrative material. Detailed instructions concerning the required photographs are furnished by the requesting agency. The photographer should have a general knowledge of the report so that he may better understand the photographic requirements. Photographs may also be used to illustrate unsatisfactory equipment reports, accident investigations, or other forms of military reports.

48. LEGAL PHOTOGRAPHY

Routine criminal investigation photography is normally performed by military police or other investigating agencies. However, signal photographers are often directed to prepare photographs for use by criminal investigating agencies. Considerable care must be taken when making photographs that are to be used as evidence. The photographs must render the subject in true perspective, tone separation, and size and must not be

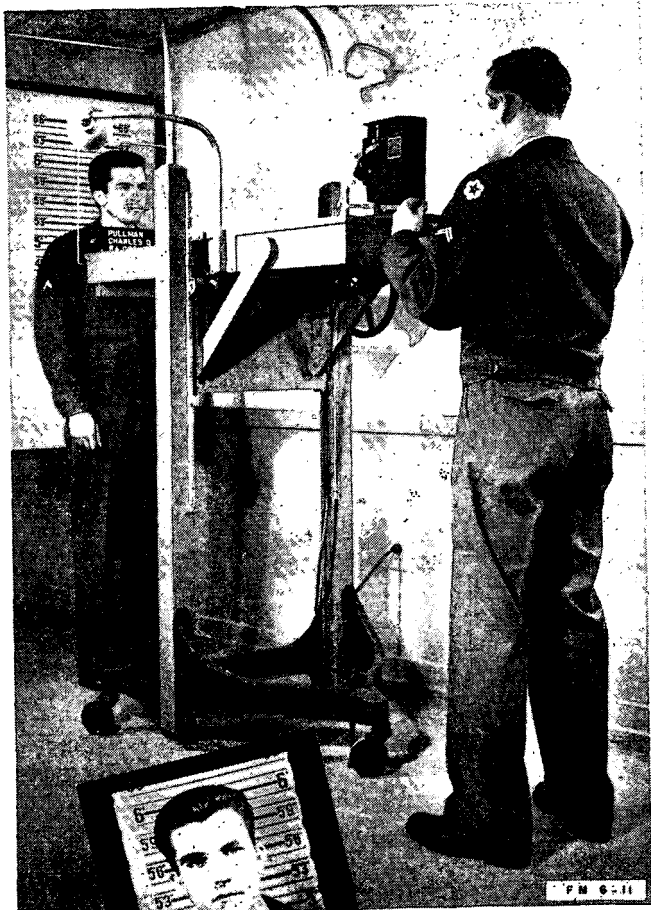


Figure 10. Identification photography.

retouched. All legal photographs must be accompanied by related written data giving the photographer's name, type of film, time of day, exposure, artificial light used, type of camera, and accessories used.

49. TRAINING PHOTOGRAPHY

Training photography is the pictorial recording of any phase of military operations or equipment to be used in a training program, usually as a visual training aid. These still pictures are often used in the production of film strips.

50. AERIAL PHOTOGRAPHY

Signal Corps photographers may sometimes be required to perform aerial photography, such as simple vertical, low, or high obliques. Low obliques should be shot at an angle of at least 60 degrees from the horizontal. High obliques are pictures that include the horizon. Such types of aerial photography are used to supplement tactical ground photography.

51. MISCELLANEOUS

Since the phases of tactical and technical photography are varied and extensive, numerous situations may arise that are not familiar to the military photographer. Whenever advice is necessary, the photographic officer should be consulted. Routine missions in photography, such as a daily photographic record of a situation map, are directed by the responsible signal officer.

Section II. TECHNIQUES

52. GENERAL

Most techniques of tactical photography are based on field and combat conditions. Photographs should have good definition, clear-cut contour lines, and tone separation. These qualities are obtained by giving attention to the following details:

Lighting.

Exposure.

Contrast.

Arrangement or composition.

Angle or perspective.

53. LIGHTING

a. Since lighting conditions usually are not ideal during tactical situations, the photographer must learn to make the best use of available natural light. Flood lamps and flash bulbs may not always be available in the field. To depend on them is not good practice. When the photographer has acquired some proficiency in working with natural light, he is better prepared to undertake the real problems of tactical photography.

b. In determining the value of light, consider the source and direction of light and the amount of reflected light. Natural light is weaker photographically during morning and evening hours. An overcast sky diffuses light and softens shadows. Although this condition means a loss of light, it offers the advantage of a more even illumination and is useful for types of photog-

raphy requiring over-all soft tones and soft shadows.

c. When the source of light is directly behind the subject to be photographed, it is called back-lighting. This light effect is especially valuable to show depth and roundness of a subject. Increased exposure is usually necessary to bring out details in the shadows. Side lighting results when the source of light is directly to the right or left of the subject. This is a striking and forceful light effect which emphasizes texture and details. Whenever possible, supplement side lighting with reflected light from improvised reflectors or natural scenic features such as a bright beach or a white wall.

d. Light contrast is the differentiation between the tones of the subject and its background. The subject or center of interest should never blend with its surroundings or be lost among similar tones. To obtain contrast, balance the light and dark tones so that the subject is distinct and stands out from the background. If the subject is dark in color or is in shadow, the background should be light. If the subject is of light color, choose an angle which will give a dark background.

e. If artificial light—such as flash bulbs, flood lamps, etc.—must be used, make certain that such use does not violate security or blackout regulations.

54. SHUTTER SPEED

a. A shutter is an adjustable mechanism in a camera through which light passes before it

reaches the film. When the shutter is released it opens for a definite period of time. The period of time, during which the shutter remains open to permit rays of light to reach the film, is known as the shutter speed.

b. If the movement of the subject is slow, the shutter speed may also be slow. If movement is fast, the shutter speed must be fast in order to record the object in detail and clarity. Always use a shutter speed fast enough to prevent the effect of camera vibration or movement of the subject. Under normal conditions, hand-held shots of stationary objects require a speed of not more than $\frac{1}{100}$ second. If the camera is mounted on a tripod or other steady support, speeds slower than $\frac{1}{60}$ second can be used. To photograph moving objects, a shutter speed of greater than $\frac{1}{100}$ second is normally used.

c. Shutter speed also controls exposure. When a large amount of light is available and the lens aperture is set at the smallest opening, the shutter speed is the only variable factor that controls the light reaching the film. Shutter speeds ranging from one second to $\frac{1}{1000}$ of a second are usually satisfactory for most photographic operations.

d. Cameras are equipped with time and bulb settings for use when an exposure of more than one second is desired. When the shutter is set at T (time) and released, the exposure lasts until the shutter is released a second time. When the shutter is set at B (bulb), the downward pressure against the shutter release opens the shutter and the shutter remains open until pressure is with-

drawn. It is necessary to have the camera on a rigid support when using time or bulb settings.

55. EXPOSURE FACTORS

Exposure is the act of permitting light to reach the sensitive surface of a photographic negative. Basic factors which influence exposure are—type of film, shutter speed, amount of available light, and setting of lens aperture. Correct exposure is the result of controlling these factors. It is desirable that the military photographer use only one type of film and become thoroughly familiar with its characteristics. By doing this, one of the factors which influence exposure is fixed. With given light conditions and a certain film type, the only variable factors are the shutter speed and the lens opening. The faster the shutter speed for a given light and film, the larger must be the lens aperture. To determine the correct exposure for a given type of film, it is necessary to consider the amount of light on the subject and any movement of the subject. If light is limited, use either a large lens opening or a slower shutter speed. If the subject is moving, the shutter speed cannot be decreased; therefore, the only solution is a larger lens opening. If the subject is well lighted by bright sunlight, it may be necessary either to decrease the lens opening or to increase the shutter speed, or both. It is important to remember that for a given type of film and for a fixed light condition, there are two variable factors—size of lens aperture and speed of shutter—which the photographer must control in order to obtain correct exposure.

56. ESTIMATING EXPOSURE

By setting the appropriate shutter speed and lens aperture, the photographer obtains a correct exposure of a moving or stationary subject. The correct application of these photographic controls can only be accomplished through practice and experience.

a. If there is doubt as to the characteristics of the film used, the instruction sheet included with most types of film is accurate enough to guide the photographer in solving exposure problems.

b. To determine exposure, the quantity and type of light during certain hours of the day and time of the year should be considered. Improved rendition of low contrast or extremely flat scenery—such as foggy or monochromatic landscapes, and exceptionally uninteresting terrain studies—is possible through exposure control (fig. 11).

c. Dark objects—heavy vegetation, forests, dark clothing—require overexposure if details in the shadows are to be recorded on the negative. Light bright colors and distant objects usually reflect more light and need less exposure. Considerably less exposure is needed for glaring white beaches, white cliffs, and snowy terrain than for terrain with vegetation.

d. When the estimate of an exposure is difficult or doubtful, three photographs of the subject should be taken. The first exposure should be one lens stop above, the second one stop below, and the third at the estimated exposure. This procedure usually gives one good negative.

CONDITIONS AFFECTING EXPOSURE

<i>Subject Contrast</i>	<i>Lighting</i>	<i>Light</i>	<i>Speed of Movement</i>	<i>Time of Year</i>	<i>Time of Day</i>	<i>Aperture</i>	<i>Shutter Speed</i>
PREDOMINANT DARK TONES	BACKLIGHTING	OVERCAST SKY	OBJECT STATIONARY	WINTER AND LATE FALL	MORNING AND EVENING	COMPLETELY OPEN f/3.5 - f/4.5	$\frac{1}{10} - \frac{1}{25}$
DARK AND LIGHT TONES	SIDE LIGHTING	CLOUDY SKY	SLOW MOVING OBJECT	SPRING AND FALL	FORENOON AND AFTERNOON	HALF CLOSED f/5.6	$\frac{1}{50}$
LIGHT TONES	FRONTAL LIGHTING	NORMAL SUN	FAST MOVING OBJECT	SUMMER	NOON	SMALL f/8 - f/11	$\frac{1}{250}$

FM 6-12

Figure 11. Photographic exposure.

e. If correct exposure is difficult to obtain, the photographer should take the picture and then state on the caption sheet that special attention in processing is necessary. The relationship between various lens apertures and relative exposures is given in figure 12.

*Apertures and Light Values Relationship
Between Lens*

LENS APERTURE	$f/2.8$	$f/4$	$f/5.6$	$f/8$	$f/11$	$f/16$	$f/22$
RELATIVE AMOUNT OF EXPOSURE	1	2	4	8	16	32	64

FM 6-13

Figure 12. Lens aperture and relative exposure.

57. EXPOSURE METERS

Exposure meters are delicate precision instruments calibrated in light values or foot-candles. They provide a means for converting light-value information into proper combinations of lens aperture and shutter speed. They become unreliable unless carefully handled. Consequently, the military photographer must be proficient in estimating exposure and in using the exposure meter.

58. COMPOSITION

The arrangement of subjects in a photograph to make a harmonious scene is known as composition. Principal elements of good composition

are simplicity and balance. A photograph should include only the details necessary to serve a specific purpose or convey a desired meaning. Arrange and balance these details in an orderly manner without affecting the naturalness of the subject or the military value of the photograph.

a. Framing. Framing determines the picture limits and is an important factor in composition. Do not include too many objects in the frame as they may distract the eye and scatter interest (fig. 13). Emphasis on the center of interest, with elimination of unnecessary details, can often be attained by moving closer to the subject or changing the angle of view.

b. Parallax. Although a photographer frames the subject by looking through the optical view finder of the camera, there is usually a slight difference between what is seen through the view finder and what is shown in the photograph. This difference is known as parallax and is caused by a slight variance of the angle between the camera lens and view finder. The closer the subject is to the camera, the greater the angle. Therefore, the effect of parallax is more pronounced in close-up photography. Without parallax correction, a picture may fail to include all of the subject (fig. 14). To correct for parallax, most cameras have a mechanical adjustment on the view finder. The closer the subject, the more accurate must be the adjustment. In some cameras, the view finder is automatically corrected for parallax. If the mechanical adjustment does not function, or the camera cannot be adjusted for parallax, the pho-



Figure 13. Examples of good and bad composition.

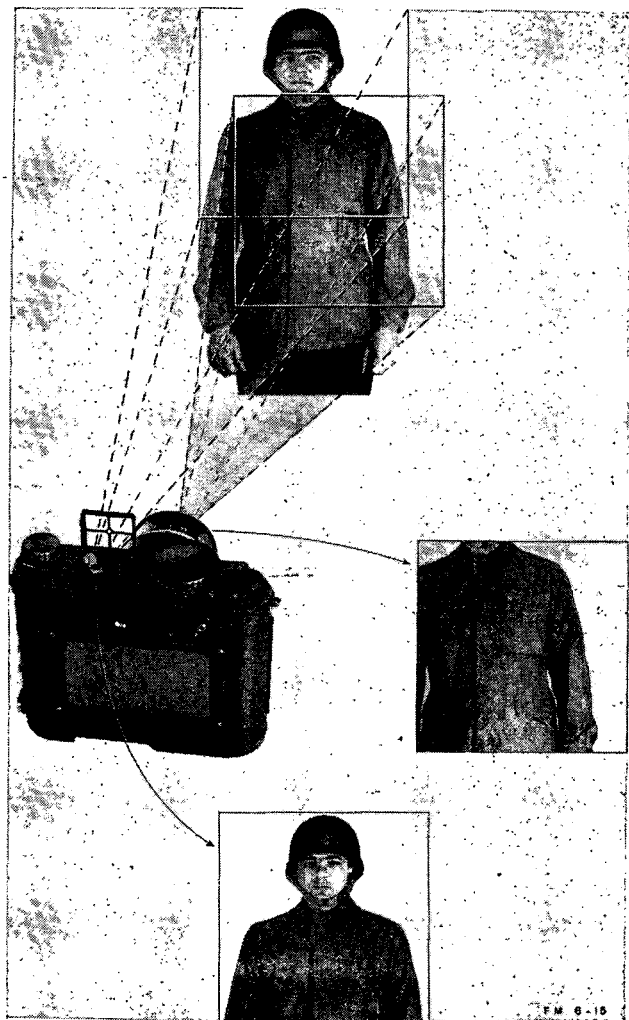


Figure 14. Effect of parallax.

tographer should study his photographs and determine how much extra space he must allow in his view finder to prevent misplacing the subject in framing.

59. ANGLE AND PERSPECTIVE

a. Perspective is the optical effect which makes objects appear to decrease in size as their distance from the eye increases. It is also the effect in photography that adds depth to objects and areas. For example, if you stand in the middle of a street with houses of equal height on each side, and gaze down the center of the street, the lines of the sidewalk and the tops of the houses appear to converge in the distance (fig. 15). The point where lines meet is known as the vanishing point. In perspective, all parallel lines appear to converge at the same vanishing point. As seen by the camera, the perspective of an object can be affected or changed by varying lens-to-subject distances and using different focal length lenses. A large angle of coverage is obtained by using a wide angle lens. This lens must be used correctly or distorted perspective results. Telephoto lenses magnify subjects and have a narrow angle of coverage.

b. By changing the angle at which an object is viewed, the perspective (with respect to the object) can be changed. By using different angles, the perspective can be varied and controlled. Avoid photographing high buildings at a low angle position and pointing the camera upward in order to include the entire building. The resulting photo-



Figure 15. Effect of perspective.

graph will be a distortion of the original subject. The building should be taken at a greater distance with a normal or telephoto lens. If space is not available to move back, the photographer should use a wide-angle lens and take the picture from a point about half as high as the building.

c. In tactical photography, correct perspective is the photographing of an object from such an angle and in such a manner that there is no noticeable or objectionable distortion. For this reason it is usually desirable to employ a long focal length lens. In tactical photography, special effects of perspective are usually not desired.

60. NEGATIVE CONTRAST

Negative contrast is the degree of difference between the shades of tones forming the photographic negative. Military photographers should produce the type of negative which, under normal processing, yields a good range of tones and normal contrast. A negative with normal contrast has a full range of tones in the brightness scale and maximum details in the shadows. It is a brilliant negative which retains soft middle tones and, when printed, gives what is known as a *snappy print*. Overexposed negatives have low contrast or slight gradation of tone. Underexposed negatives similarly have very low contrast. Slight overexposure or underexposure may still give a good negative with printing control.

61. LENS

a. Aperture. The lens aperture is the adjustable diaphragm between the lens elements which controls the amount of light entering the camera. The greater the lens opening, the more light reaches the film. The smaller the aperture, the less light reaches the film. Each lower stop of the aperture gives half the amount of light of the previous stop.

b. Angle. The normal camera lens has an angle of coverage of approximately 45° . Photographic lenses with angles smaller than 45° are long focal length, medium telephoto, and telephoto lenses. Photographic lenses with angles larger than 45° are wide angle lenses. By using lenses of different angles, the size of the center of interest can be controlled from the same taking distance (fig. 16). For example, when photographing a complete building from across a narrow street, use a wide angle lens. The larger the degree of angle, the larger the area of subject coverage. When photographing an architectural detail on the same building, use a telephoto lens which has a narrow angle. Telephoto lenses enlarge subjects which cannot be approached closely enough to obtain the proper image size.

c. Focal Length. The focal length of a lens is an optical characteristic which determines the size of the recorded image on the film. The normal focal length lens of a camera should be equal to the diagonal of the film size of the camera. For example, if the camera uses 4- by 5-inch film, the diagonal is $6\frac{1}{8}$ inches. The normal focal length

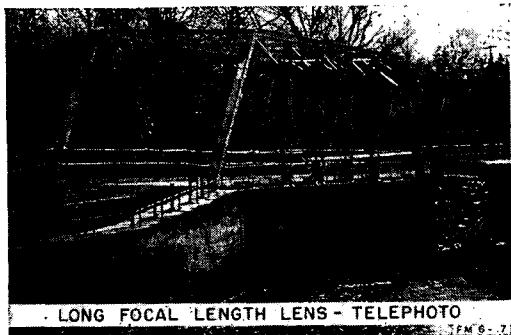
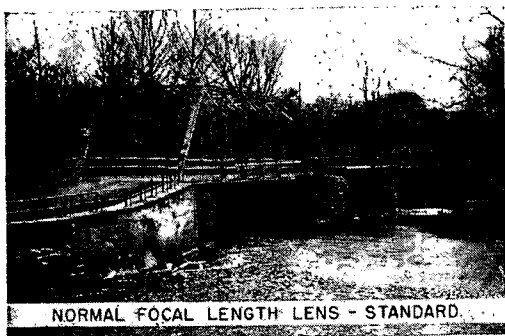
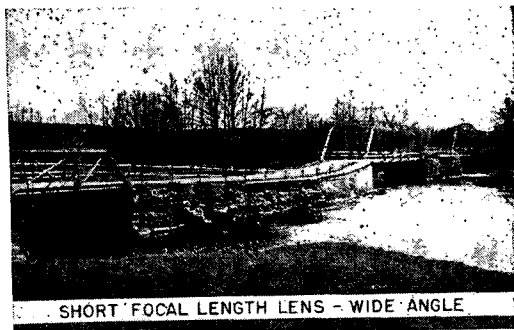


Figure 16. Angles possible with interchangeable lenses.

lens for this camera is approximately $6\frac{1}{4}$ or $6\frac{1}{2}$ inches. Often a shorter focal length lens is used with a 4- by 5-inch camera, giving a slightly wide-angle effect but allowing a greater angle of coverage and at the same time a greater depth of field.

d. Depth of Field. Depth of field is the distance between the nearest and farthest objects that are sharply registered through a lens at a given lens opening and a given distance. The depth of field varies with the focal length of the lens. Depth of field of telephoto lenses is much less than that of normal and wide angle lenses. If tables of depth of field are not available, use the graphic guides shown in figures 17 and 18 for determining depth of field for different focal length lenses. The guide shown in figure 17 indicates settings of distance and aperture for different focal length lenses to achieve sharpness or depth of field from 11 feet to infinity. Guides shown in figure 18 indicate depth of field for various lenses at various distances with aperture set at $f/8$ or $f/16$.

62. USE OF FILTERS

Military photographers normally use yellow, green, orange, or red filters to increase clarity, eliminate haze, give tone correction, and produce contrast. Filters give improved tone separation between colors. Filters require an increase in exposure time. The increase in exposure time for orange and light red filters may vary considerably depending on the density of the filter. To determine the necessary increase of exposure time,

To Obtain a Depth of Field From 11 ft. to Infinity

WITH CAMERA FOCUSED ON
SUBJECT 25 FOOT DISTANCE

FOR FOCAL LENGTH

$5\frac{1}{4}''$	set	$f/22$
$3''$	set	$f/11$
$2''$	set	$f/8$

FM 6-18

Figure 17. Guide for obtaining maximum depth of field.

check the instructions issued with each filter, or examine the filter mount on which the time increase is usually marked. A chart showing the effect of filters on various colors of the spectrum is given in figure 19. Before moving into combat, the photographer should be familiar with filters and the necessary compensating time values.

63. STILL SERIES

To provide a complete view of an item of equipment or of a continuing phase of military action,

To Determine Depth of Field FOR VARIOUS FOCAL LENGTHS

WITH APERTURE AT $f/8$

FOR FOCAL LENGTH	SET DISTANCE	TO GET DEPTH OF FIELD
5 $\frac{1}{4}$ ''	62'	27' - ∞
3''	25'	14' - 120'
2''	12'	8' - 60'

WITH APERTURE AT $f/16$

FOR FOCAL LENGTH	SET DISTANCE	TO GET DEPTH OF FIELD
5 $\frac{1}{4}$ ''	62'	18' - ∞
3''	25'	12' - ∞
2''	12'	6' - ∞

FM 6-19

Figure 18. Guides for determining various depths of field.

the photographer makes several related pictures that are known as a still series. Such a series of pictures is comprehensive, and usually contains

COLOR OF FILTER	<i>Effect on Red</i>	<i>Effect on Orange</i>	<i>Effect on Yellow</i>	<i>Effect on Green</i>	<i>Effect on Blue</i>	<i>Effect on Violet</i>
<i>Red</i>	MORE INTENSE RED	BECOMES GRAYISH	BECOMES GRAYISH	BECOMES GRAYISH	BECOMES DARK GRAYISH	BECOMES DARK GRAYISH
<i>Orange</i>	REDDISH ORANGE	MORE INTENSE ORANGE	LITTLE CHANGE	OLIVE GREEN	BECOMES GRAYISH	BECOMES GRAYISH
<i>Yellow</i>	LITTLE CHANGE	LITTLE CHANGE	MORE INTENSE	DARKER YELLOWISH GREEN	BECOMES AQUAMARINE	MUDDY DARK GRAYISH
<i>Green</i>	DARK BROWNISH GRAY	DARK BROWNISH GRAY	LIVELY GREEN	MORE INTENSE GREEN	BECOMES GREEN	BECOMES GREEN

FM 6-20

Figure 19. Effect of filters on the various colors of the spectrum.

close-ups and over-all pictures. There are two types of still series.

a. One is of a stationary object—such as a piece of captured enemy equipment—in which the series consists of several photographs taken at different angles. The combined set of pictures gives a complete view of the object from all sides.

b. The second type of still series is a running photographic record of a phase of continuing action. Each photograph is complete in itself, but consecutive pictures show progressive changes in the action (fig. 20).

c. A film strip essentially is a still picture series which has been combined for clarity, simplicity, effectiveness, and practicability on one roll of 35-mm (millimeter) perforated film.

64. AERIAL PHOTOGRAPHY

a. General. Aerial photographs may be taken from a helicopter or a reconnaissance airplane. Photography from a helicopter allows slower shutter speeds and better control over pictorial results. When taking pictures from a standard type reconnaissance airplane, use a shutter speed of $\frac{1}{200}$ of a second or faster at an altitude of 1,000 feet when the ground speed is about 120 miles per hour. This shutter speed minimizes the effect of camera movement and vibrations transmitted by the airplane. At an elevation of 500 feet, use a shutter speed of $\frac{1}{400}$ of a second. By banking the airplane and obtaining a view which is not at right angles to the course of the airplane, a slower shutter



Figure 20. Still series.

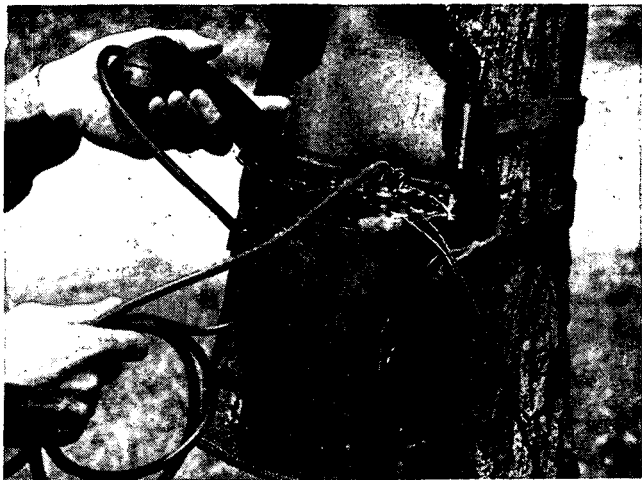


Figure 20—Continued.



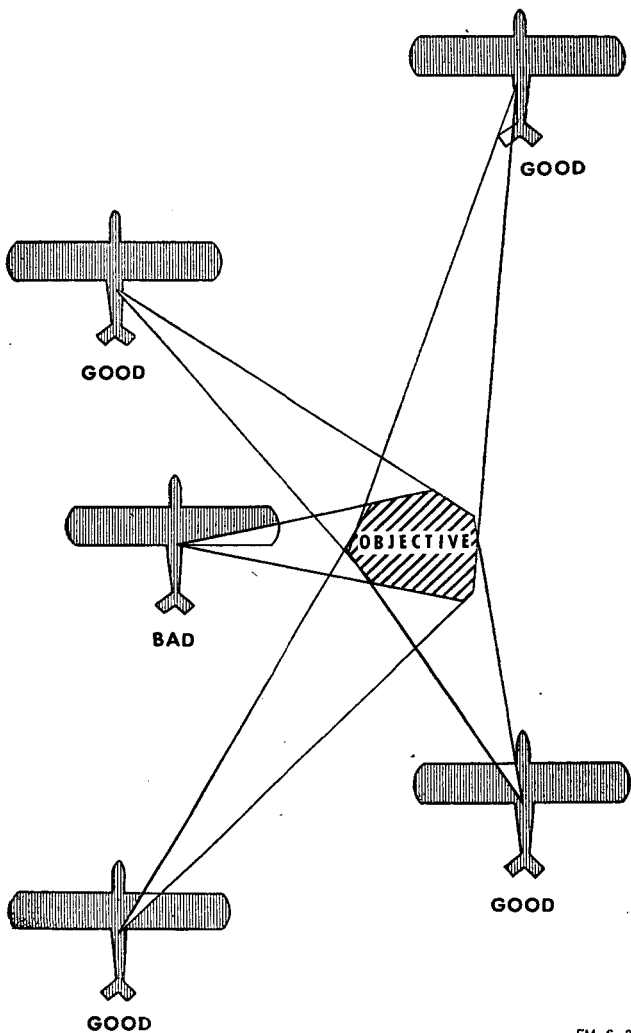
Figure 20—Continued.

speed is possible (fig. 21). At lower altitudes, record the object directly from the front or rear of the airplane, or at an angle of 45 degrees or less to the direction of flight. For extremely detailed coverage at higher altitudes, long focal length lenses are necessary. The photographer should coordinate his work with the course and flight direction planned by the pilot.

b. Light. Time of day and direction of the sun are important considerations in aerial photography. Morning and afternoon are best because long shadows bring out details. Terrain contours and heights of objects can best be determined by their shadows. In aerial photography, vegetation and the ground do not reflect a great deal of light. Accordingly, the shutter speed should be decreased to compensate for less reflected light. Aerial photographs should be made on clear, bright days.

65. COLOR PHOTOGRAPHY

Use of color film is limited in tactical photography. Since it requires complicated developing processes, photographs are not available immediately or in sufficient quantities to be of practical value. Color film is unsatisfactory under poor light conditions. However, it can be of great value for special purposes, such as photographic coverage of terrain and camouflaged areas, when color improves contrast. It may show dead leaves among normal vegetation, indicating camouflaged areas in enemy territory, and point out details which are sometimes lost in black and white photography.



FM 6-22

Figure 21. Flight directions for aerial photography.

66. CAPTIONS

a. A caption is a statement of the vital facts about a photograph. Every military photograph taken in the field must be accompanied by a caption prepared on a caption data sheet (fig. 22). These sheets are issued in the photographer's caption book (WD AGO Form 11-178). The caption sheet should contain the date, the cameraman's full name, serial number, photographic unit designation, and any special mark or symbol assigned by the Department of the Army, unless specifically forbidden by the theater SOP. Space is given for special developing instructions for a particular negative. This may be filled in by the photographer. The file number is filled in by the laboratory. If WD AGO Form 11-178 is not available any suitable writing material should be used. Captions should be clear, concise, readable and accurate.

b. Complete the remaining part of the caption sheet by answering the following questions:

Who?

What?

When?

Where?

How?

Give full names of persons photographed, their home towns, grade, army serial number, and branch of service. Identify everything that has been photographed. Include time of day, weather conditions, and other influencing factors. State the location of the area covered in the picture. If

*To be filled in
by laboratory*

PHOTOGRAPHER'S CAPTION DATA SHEET		DATE		8 MAY 1950	
PHOTOGRAPHIC LABORATORY (Installation)					
56 SIG PHOTO CO					
PHOTOGRAPHER			FILE No. (Lab. Data)		
SGT C. Q. PULLMAN					
DEVELOPING INSTRUCTIONS					
NORMAL	OVER	UNDER	HOLDER No.	MISC.	
✓	—	—	—	—	
WHO					
MAJ GEN JAMES CRANK CG 4TH INF DIV					
WHAT					
TACTICAL ORIENTATION					
WHERE					
BLUE MOUNTAIN - 13TH ARMY HQ					
HOW					
MAJ GEN COUSE DISCUSSES PROPOSED ROUTES OF TRANSPORTATION WITH STAFF OFFICERS					
(For additional space use another sheet)					

WD AGO FORM 11-178
1 MAR 1948

16-47944-1 GPO

FM 6-23

Figure 22. Caption data sheet.

it is a terrain photograph, give geographical names, map references and coordinates of objective, focal length lens used, and location of camera. If it is an aerial photograph, include direction of flight, altitude, time of day, and speed of airplane. Explain the operation of the object photographed and the conditions under which it is employed. Inclose applicable maps, charts, or documents. Use as many caption sheets as necessary. It is better to include too many details than too few.

Section III. EQUIPMENT

67. GENERAL

Camera equipment used by Signal Corps photographers consists of many types and models, according to the photographic requirements. For convenience, still cameras can be considered in three classes: the small size camera, medium size camera, and large size camera (fig. 23).

68. SMALL SIZE CAMERA

The small size camera uses a perforated film with a picture size $2\frac{1}{4}$ inches by $2\frac{3}{4}$ inches. This camera is small and light in weight. It has no external parts to obstruct operation or to become easily damaged. It gives excellent photographic results under difficult conditions which make coverage impossible with larger equipment. Advantages of the small camera over bulkier equipment are in the speed and ease with which pictures can be taken and the adaptability of the equipment to almost any requirement. Of great importance in combat is the small space taken up by the equipment and its light weight. A combat photographer equipped with such a camera, several lenses, film, and filters can accomplish a far more comprehensive coverage with less effort and in a shorter period of time than is possible with bulkier and less flexible equipment. An automatic film transport operated by a spring in conjunction with the shutter permits a series of still pictures to be produced by the camera in rapid succession. The

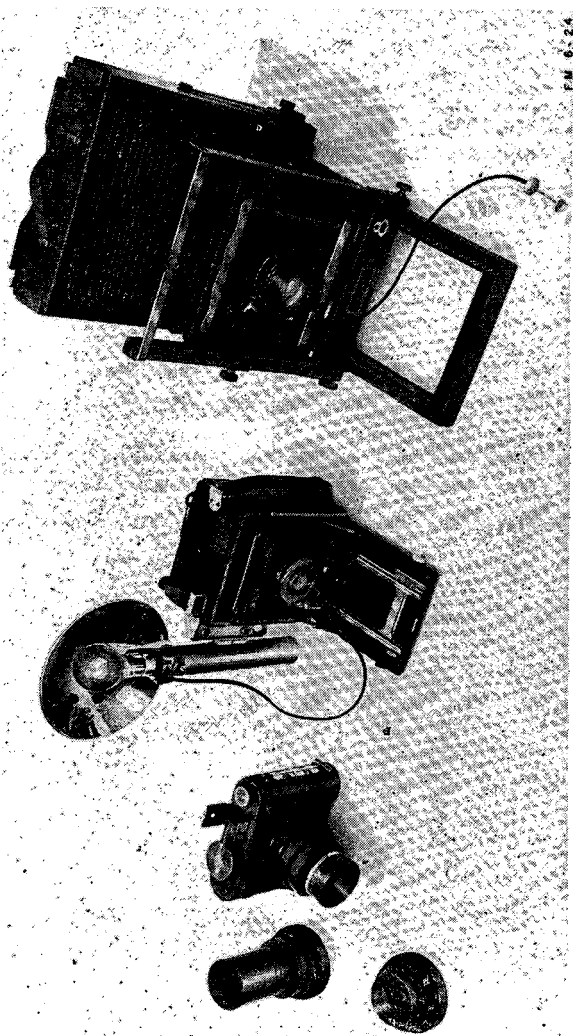


Figure 23. Typical still cameras.

shutter has a range of speeds from one second to $\frac{1}{1000}$ second. This camera is the ideal equipment where action requires interchangeable lenses and where angles and perspective must be controlled.

69. MEDIUM SIZE CAMERA

a. *Press Camera.* The medium size camera is a typical press camera with a negative size of 4 by 5 inches. Although this camera is utilized in the field, it is somewhat limited in application because of its size and weight and the size of its accessories. This camera is best used for public information subjects and after-action photography. The 4- by 5-inch negative serves to record details in terrain studies which are impractical to record with the small size camera, particularly when the area is extensive. The medium size camera has double bellows extension and is therefore suitable for close-up photography without special accessories. It has a rear curtain shutter and a front between-the-lens shutter.

b. *Aerial Camera.* The lightweight K-20 camera is used by signal photographers to make rapid and accurate aerial photographic coverage at a range often as close as a few hundred feet. The camera has a 4- by 5-inch negative size, weighs approximately 11 pounds when loaded, can take 50 exposures with each roll of film, and is compact enough to fit into the limited space of a liaison type airplane. It consists of an f/4.5 lens of $6\frac{3}{8}$ -inch focal length, a shutter, a lens cone, a film magazine, a built-in film transport, and a direct vision view finder. The shutter, which is released by a trigger

built into the camera handle, has speeds of $\frac{1}{125}$, $\frac{1}{250}$, and $\frac{1}{500}$ of a second. The lens and shutter unit has a bayonet type lock for attaching filters. The film transport moves and the shutter cocks simultaneously when the handgrip lever on the right side of the camera is pressed. The handgrip on the left side is designed only for holding the camera.

70. LARGE SIZE CAMERA

The large size camera with a negative size of 8 by 10 inches or larger is used mainly in photographic laboratories of installations for certain types of technical photography, portraiture, group pictures, and similar phases of still photography. The practical application of this type of camera is limited because of its size, weight, and slowness of operation. It is usually impractical for combat photography.

Section IV. PHOTOGRAPHIC LABORATORIES

71. GENERAL

Photographic laboratories in the continental United States are service units which are usually located at army headquarters or installations. Their function is to provide efficient, dependable, and fast photographic service.

72. RESPONSIBILITY

The commanding officer of a headquarters or installation is responsible for the operation of

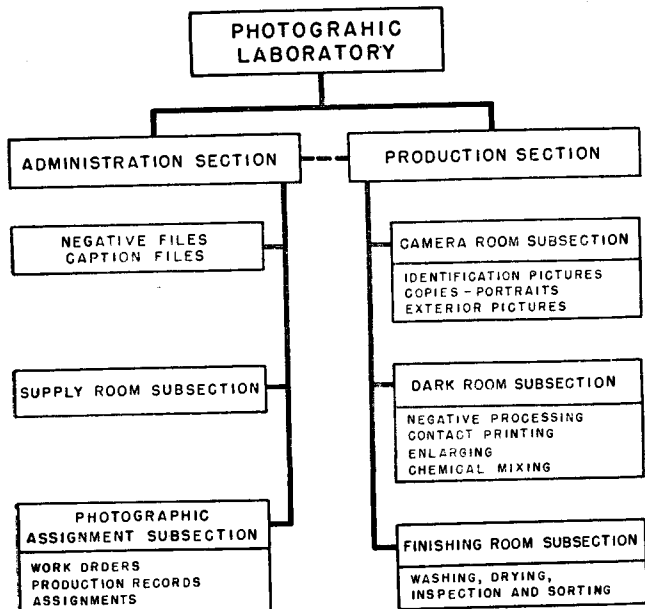
the photographic laboratory. This responsibility is delegated to the signal officer of the headquarters. In turn, the signal officer may assign a photographic officer to supervise activities of the operating personnel and establish a photographic production program to meet the requirements of the headquarters. He controls laboratory performance by selecting qualified photographic personnel, by directing the maintenance of necessary photographic files and records, and by frequent inspections.

73. ORGANIZATION

The size and organization of a photographic laboratory are determined by the requirements of the headquarters which it serves. The laboratory is usually organized in two sections for administration and production (fig. 24). The number of personnel in these sections varies with the work load of the laboratory. Organization and administration are kept flexible to meet the photographic requirements.

74. TYPES

There are four types of photographic laboratories—A, B, C, and D. The type is normally determined by the amount of work the laboratory must handle and the size of the headquarters it must serve. Type A laboratories serve an army headquarters and other large agencies. Type B laboratories are found at installations requiring no more than a 5-man photographic unit. Type C



FM 6-25

Figure 24. Typical organization of a photographic laboratory.

laboratories of 2 or 3 men serve a small troop concentration. Type D photographic laboratories serve medical illustration sections. See SR 110-50-5.

75. LABORATORY PROCEDURES

Operating procedure of a photographic laboratory consists of two major functions: administrative control and photographic production.

a. The administration section maintains records and reports and prepares work orders, schedules, and assignments. It also keeps files of photographs, negatives, and captions for reference purposes. An additional function is the requisitioning of equipment and expendable supplies through the signal officer.

b. Production includes the photographic coverage of assignments in a studio or on location and the processing and printing of pictures in the laboratory. The studio is used for identification, copy, and portrait photography. The darkroom serves for chemical mixing, film processing, contact printing, and enlarging. The finishing room is for washing, drying, inspecting work, and sorting orders.

c. Still picture work is requisitioned from photographic laboratories by means of DA AGO Form 11-161, Still Picture Requisition and Work Order (fig. 25). This form, when properly completed in accordance with instructions printed on the back of the form, shows authorization for processing the work order, identification, priority of the order, and routing schedule within the laboratory. It may be used for assigning photographers to perform the photographic assignments. It also includes information necessary for tracing shipment of finished material and other data.

76. TYPES OF PHOTOGRAPHY

Photographic laboratories perform several types of photography. Principal types of coverage

STILL PICTURE REQUISITION AND WORK ORDER						1. SECURITY CLASSIFICATION NONE	
2. TO (Name of photographing laboratory) 29th DIV PHOTO LAB				3. DATE OF REQUISITION 3 MAY 1950			
4. FOR (Name of activity, name and address of organization) ASST CHIEF STAFF - G 2							
ATTENTION OF LT COL W. P. COUSE		TELEPHONE 2		EXT.		<input checked="" type="checkbox"/> WILL CALL <input type="checkbox"/> MAIL	
5. NATURE OF REQUEST		PRINTS (Enter quantity of each desired)		<input type="checkbox"/> LETTER (Only used) <input checked="" type="checkbox"/> VERBAL		DATE JOB ORDERED 4 MAY '50	
		<input type="checkbox"/> 4 X 5 <input checked="" type="checkbox"/> 6 X 6 <input type="checkbox"/> 8 X 10		<input checked="" type="checkbox"/> GLOSSY <input type="checkbox"/> MATTE			
6. ANY ADDITIONAL INFORMATION, ENCLOSURES, ETC. INCLUDE CAPTIONS							
7. PICTURES ACQUIRED (If necessary attach separate sheet) ASSIGN PHOTOGRAPHER TO MAKE PICTURES AS DIRECTED BY LT COL COUSE							
8. PURPOSE FOR WHICH ORDERED INTELLIGENCE				9. I CERTIFY THAT THE PICTURES REQUESTED ARE FOR THE PURPOSE SPECIFIED W.P. Couse (Signature) NAME (Type in full) W. P. COUSE GRADE AND ARMSERVICE LT COL TELEPHONE NO. 2			
SPACE BELOW FOR USE BY INSTALLATION PHOTO LABORATORY ONLY							
10. PHOTOGRAPHER 1ST SGT VERGAGNI			REPORT TO LT COL COUSE			TIME AND DATE 0800 3 MAY '50	
LOCATION 29 DIV HQ G-2 SECTION				TRANSPORTATION TO BE FURNISHED			
11. WORK ORDER NO. 675		DATE 3 MAY 50		12. DEVELOPED BY RA		13. PRINTED BY JFR	
<input type="checkbox"/> PORTRAIT <input checked="" type="checkbox"/> SCENE <input type="checkbox"/> COPY <input type="checkbox"/> REPRINT		15. SHIPPING DATA 18 EA		14. CHECKED BY PHS			
PRINTING ROOM DEADLINE 3 MAY 50		16. DATE RECEIVED 3 MAY 50 BY (Signature) V. Planson 1st Lt AGC					
17. NEGATIVES		PRINTS					
PORTRAITS AND IDENTIFICATIONS <input type="checkbox"/>	PUBLIC RELATIONS <input type="checkbox"/>	ALL OTHER <input checked="" type="checkbox"/>	IDENTIFICATION <input type="checkbox"/>	4 X 5 <input type="checkbox"/>	5 X 7 <input type="checkbox"/>	8 X 10 <input checked="" type="checkbox"/>	11 X 14 <input type="checkbox"/>
		3				18	
18. ROUTING AND AUTHORIZATION (Check, initial, and date appropriate designation)							
MAIL FILE		ORDER DESK		ASSIGNMENT		0945 3 MAY	
RESEARCH SUBJECTS		ADM. ASST.		FROM LABORATORY		7100 2 MAY	
RESEARCH AIDS		CHIEF		DELIVERY DESK		0500 4 MAY	

NEGATIVES ASSIGNED FOLLOWING NUMBERS:
ETO 765-483
ETO 765-499
ETO 765-495

DA AGO FORM 11-161 1 JAN 42 REPLACES AGO FORM 11 161, 1 MAR 47, WHICH MAY BE USED. 18 50-101 FM - C-25

Figure 25. DA AGO Form 11-161.

are identification, portrait, copy, training, and public information photography. All types are taken for a specific purpose and are based on official requests.

77. PERSONNEL

Since personnel of a photographic laboratory consist of only a small group, it is desirable to rotate men from one job to another. Photographers should also be proficient in darkroom procedures. Laboratory technicians are normally employed in the darkroom but may assist as identification photographers and help the clerk with administrative work. For an average size installation laboratory, the following personnel are recommended:

- 1 photographic laboratory chief.
- 1 or 2 photographers trained in public information photography.
- 1 portrait photographer.
- 1 to 3 laboratory technicians.
- 1 clerk.

78. LABORATORY ARRANGEMENT

The lay out of a photographic laboratory should give prominence to production facilities. The laboratory ordinarily has the following divisions: administrative office, photographic studio, darkroom, finishing room, and supply room. The studio should be large enough to accommodate necessary identification, portrait, and copy equipment. The darkroom should be designed to permit processing without time-consuming movements and should be provided with an air conditioning unit. The finishing room should utilize natural light or have sufficient artificial light for washing,

drying, and sorting of prints without unnecessary eyestrain.

79. SUPPLIES

Supplies are requested through the signal officer according to procedures given in SR 110-50-5.

80. PROCESSING

a. The functions of a photographic laboratory are the processing of exposed film and the production of prints.

b. Although the standard developing process usually gives good results, irregularities in exposure often produce negatives that are flat and have low contrast, or negatives of low contrast that are extremely dense and underexposed. The laboratory technician should attempt to produce the best photographs from either normal, overexposed, or underexposed negatives by corrective processing (fig. 26).

c. A correctly exposed negative printed on a normal grade paper gives rich, snappy prints with pleasing contrast, excellent middle tones, deep black shadows, and details in the lighter shadows. The resulting prints have force, detail, and depth.

d. Underexposed negatives, because of their low contrast, low density, and extremely short scale of tones, must be printed on a hard grade paper. The improved photograph may have practical value but can never equal the details in the middle tones and the brilliance achieved by a normal negative.

PRINTING CONTROLS

<i>When the Negative is</i>	<i>Concentration of Developer</i>	<i>Developer</i>	<i>Exposure in Printing</i>	<i>Type of Enlarger</i>	<i>Grade of Paper</i>	<i>Developing Time</i>
HARD, DENSE, OVER DEVELOPED, UNDER EXPOSED AND HAS STRONG CONTRAST	DILUTE BELOW NORMAL	INITIAL BATH IN 1% SOLUTION OF POTASSIUM BICHROMATE	LONGER THAN NORMAL	DIFFUSER TYPE WITHOUT CONDENSER	SOFT "0" "1"	LESS THAN 2 MINUTES
NORMAL GAMMA 0.8-1 AND HAS NORMAL CONTRAST	NORMAL STRENGTH	SOFT WORKING OR NORMAL WORKING METOL HYDROQUINONE	NORMAL	OPAL LAMP DIFFUSER AND CONDENSER	NORMAL "2"	ABOUT 2 MINUTES
SOFT, THIN, UNDER DEVELOPED OVER EXPOSED, FLAT AND HAS SLIGHT OR DELICATE CONTRAST	MORE CONCENTRATED ADD ALKALINE	HIGH DENSITY PRODUCING DEVELOPER	SHORTER THAN NORMAL	CONDENSER AND PROJECTION LAMP	HARD "3" AND EXTRA HARD	MORE THAN 2 MINUTES

F. M. 6-28

Figure 26. Printing of negatives.

e. Overexposed negatives have weaknesses similar to those of thin, underexposed negatives. They have a short scale of tones and low contrast but high density. Accordingly, overexposed negatives must be printed on soft paper to counteract the poor quality of the negatives.

f. The laboratory technician controls the final composition of a picture through printing or enlarging. By masking, cropping, correcting the vertical lines, dodging, printing in clouds and sky, and spotting enlargements, the laboratory technician can salvage and utilize many photographs which otherwise would be discarded as useless.

81. RELEASE OF PHOTOGRAPHS

Photographs which have been selected for public information release must bear the following stamp on the back:

PLEASE CREDIT
U. S. ARMY PHOTOGRAPH

The Department of Defense has no objection to the use of this photograph in commercial advertisement, provided copy and lay-out are submitted to the Department of Defense, Office of Public Information, Security Review Branch, The Pentagon, Washington 25, D. C., and written permission is obtained.

Additional information pertaining to the release of military photographs is contained in SR 110-50-5.

82. RECORD NEGATIVES

Record negatives are negatives that have been selected for possible retention in Department of the Army files. They are forwarded to the signal officer for further screening before being sent through channels for final determination of value and retention in the files. Record negatives include the following subjects:

a. News photographs of nation-wide interest such as views of combat and base activities, new equipment, nationally known men in the service, and similar photographic material.

b. Photographs which have been released to any publications or news service for public presentation.

c. Photographs of interest to the Department of the Army, consisting of prints or negatives seized or acquired from enemy sources or obtained from any other foreign source.

d. Instructional photographs showing training methods or techniques, field expedients, or material for orientation, information, and education.

e. Photographs made specifically to illustrate or accompany reports.

f. Photographs which show the awarding of citations and decorations to U. S. Army personnel.

83. MISCELLANEOUS

Additional information on administrative and technical details such as negative numbering, captioning, filing, work orders, and production reports is given in SR 110-50-5.

CHAPTER 5

③

MOTION PICTURE PHOTOGRAPHY

Section I. GENERAL

84. EMPLOYMENT

Military employment of motion picture photography is equally as important as that of still photography. However, for immediate tactical use, its military value is limited because of the time required to send film back for processing and the difficulty of projecting film in the field. Consequently, most military motion picture photography is concerned with the production of training, orientation, historical record, and public information films. In motion picture photography, two types of action are employed.

a. Controlled Action. Controlled action photography is the filming of scenes that are planned and rehearsed and which usually follow a written scenario. This type of photography permits control of the film material, production period, type and length of scenes, and continuity. Controlled action photography is used in the production of complete films or when it is necessary to stage scenes or phases of action which are specifically planned to fit in and complete a film consisting of both controlled and uncontrolled sequences. In filming controlled action sequences, care must be

taken to insure natural and authentic action as well as continuity in the scenes. Controlled action photography enables the cameraman to retake scenes that prove unsatisfactory. This opportunity to correct mistakes and improve scenes is an important advantage over uncontrolled action photography. Another advantage of controlled action photography is that desired weather conditions can be simulated in a studio.

b. Uncontrolled Action. Uncontrolled action photography is the shooting of spontaneous incidents. Action is unrehearsed and scenes are shot in any order permissible under given circumstances. Normally, it is impossible to retake a scene in this type of photography. Therefore, the first take must be correct. Speed and alertness are necessary in recording uncontrolled action. The photographer should make a preliminary mental outline of his course of action and take into consideration the following factors:

- (1) Coordination with operational units to obtain advanced information.
- (2) Coordination with other cameramen in order to get a complete story.
- (3) Location of an observation post that permits good over-all motion picture coverage.
- (4) Use of various focal length lenses for specific details of action.
- (5) Order and type of shots—extreme long shots, long shots, medium shots, close-ups, and extreme close-ups.
- (6) Data necessary for caption sheet.

85. TRAINING FILMS

Training films normally are produced in a rear echelon of a theater or at military installations in the continental United States. They generally show training methods, techniques, or application of equipment in the field (fig. 27). The Chief Signal Officer is responsible for the training film program. Normally the chiefs of technical services initiate the original request for training films. The requesting agency furnishes technical advisors to assist the cameraman, director, and crew. Although training photography is based on a scenario, uncontrolled action sequences of actual combat or after-action shots may be inserted during editing to emphasize doctrines or to increase the effectiveness of the film as a whole. Training films must reflect realistic conditions, circumstances, and operations.

86. PUBLIC INFORMATION FILMS

Most military motion picture coverage is suitable for public information. Motion pictures taken during training, combat, and occupation phases often provide desirable material for public information films. These films are used to convey a pictorial story of military activities and are intended to keep the general public informed.

87. DOCUMENTARY AND HISTORICAL FILMS

Documentary films are essay type pictorial productions covering authentic conditions and situations which are of general or special interest to



Figure 27. Training film photography.

the public and military personnel. Examples of subjects that may be used in documentary films are special army training phases in a parachute regiment, living conditions in a captured enemy town, the role played by scientific inventions in modern war techniques, etc. Historical films are documentary films that contain pictorial information of lasting or permanent importance. Normally, historical films are a compilation of various types of military motion picture footage and acquired enemy films which have been expertly edited for a definite purpose.

Section II. TECHNIQUES

88. PICTORIAL CONTINUITY

Pictorial continuity is the portrayal of a continuing thought or action by logically connected sequences to create a well-joined and coherent motion picture story.

89. SEQUENCE

The sequence is the fundamental unit of pictorial continuity. It is a related series of shots consisting of three basic working elements—the LS (long shot), the MS (medium shot), and the CU (close-up). These elements are similar to the three stages in which a subject is viewed by the human eye. For example, in new surroundings the eyes first scan the over-all scene to establish the location. As the distance from the subject diminishes, the eyes tend to eliminate the establishing

factors. Finally, the eyes stop scanning and focus on the center of interest. In order to present a subject as naturally as possible, the motion picture camera is used to imitate the eye through utilization of the LS, MS, CU and other related shots (fig. 28).

a. Long Shot. The LS in motion picture photography registers the over-all scene for orientation in the same manner as the first glance of the human eye. Normally, this shot is the first one taken in a sequence. It should be of sufficient length to establish the scene properly. This first shot usually is made from a stationary position and should be taken from an angle that offers the most interesting and pleasing effect.

b. Medium Shot. The eyes are constantly making a transition as their distance from a subject decreases. To copy this transition, the MS is made. This shot is very useful in maintaining sequence continuity because it bridges the gap between the LS and CU. Without an MS, the sequence would be jumpy and the subject build-up would be too rapid. The MS is made at the best angle and distance to achieve the proper transition from the LS to the CU. Since the distances for these shots are relative, the position for taking the MS in a particular sequence must be determined by circumstances, by the nature of the subject, and by the cameraman's personal judgment.

c. Close-Up. The CU is the most difficult shot of the sequence to execute. It must present the



LONG SHOT—USING WIDE ANGLE OR NORMAL LENS



MEDIUM SHOT—USING NORMAL LENS



CLOSE UP—USING TELEPHOTO OR NORMAL LENS

Figure 28. Types of motion picture shots.

center of interest in the most detailed and striking way possible, since it forms the climax of the sequence after the build-up by the LS and MS. The CU must be clear-cut and show the exact center of interest.

90. VARIATIONS OF BASIC SEQUENCE

a. General. To add interest and to prevent stereotyped sequences, variations of the basic sequence are necessary. By exercising imagination and originality, the motion picture photographer learns to shoot more complex and interesting sequences. One of the simplest methods of preventing stereotyped sequences is to vary the relative distances of the three basic shots. Normally, the size of the subject determines the relative distances of the basic shots in a sequence. For example, in making an outdoor sequence of a parade, the LS may be made from a distance of several hundred feet, but an indoor LS of an individual making a speech may be shot from a distance of only 15 feet. However, two photographers shooting the same subject may have different preferences and the distances of their shots also will differ. In addition to the basic shots, extreme long shots and extreme close-ups also are used to provide variety.

b. Extreme Long Shot. The ELS (extreme long shot) is simply an exaggeration of the LS. It often is referred to as a *location* or *situation shot* because it depicts a distant subject and its surroundings. Since specific details do not show at

great distances it is not necessary for the ELS to include any action. An aerial view of a subject is an ELS.

c. Extreme Close-Up. The ECU (extreme close-up) is an exaggerated close-up that is used to depict minute details. It is often referred to as an *insert*. Relative distance applies to the ECU just as it does to other types of shots in the sequence. For example, when photographing a tank, it may be desirable to make a shot of one of the treads or a much more detailed shot of one of the tiny carburetor springs used in the tank. Either shot may be an ECU.

91. REESTABLISHING SHOT

a. General. The purpose of an RS (reestablishing shot) is to achieve coherence and continuity between sequences. This shot may be either an LS or an MS. It is termed the RS because it establishes the scene again in the same manner as the original LS of the sequence. Since a motion picture is composed of a large number of sequences, an RS is needed to reestablish each sequence and carry the action over smoothly from one sequence to another. The RS may be made in the original setting or in a new location. For example, a sequence shows an army cook peeling potatoes at a kitchen table. The first shot in the next sequence will show him washing the potatoes in the sink. To provide a connecting link between the two sequences, an RS is made that shows the cook carrying the potatoes to the sink. This type of re-

establishing shot is commonly called the *stand-off* since the photographer merely moves back sufficiently to show the general scene again when a new subject enters the scene or a new scene is necessary.

b. Reverse-Angle Reestablishing Shot. The reverse-angle reestablishing shot is more difficult to make than the stand-off shot. It is generally used to show a subject changing location over a distance too great to show in a stand-off shot. For example, a sequence shows a soldier removing the battery from a jeep in the motor park. The next sequence will show him placing the battery on a charging rack in a distant motor shop. To show how he moved to the motor shop, a reestablishing shot must be made. Since it would be impractical for the camera to follow him over the entire distance, the reverse-angle shot is used. The first shot from the rear shows the soldier walking away from the jeep carrying the battery. To complete the reverse-angle, a shot is made showing the soldier approaching the charging rack. All reverse-angle shots are in two parts and require two separate shots to show the switch—one from the rear and one from the front of the subject. The front and rear shots may be made at different angles.

c. Pan Reestablishing Shot. The pan reestablishing shot is used to follow a subject from one location to another, usually over a short distance. To make this shot, the camera is moved slowly and smoothly, following the subject from the old scene into the new (par. 98). When possible, how-

ever, the stand-off and reverse-angle reestablishing shots should be used since they are much easier to make.

92. INCIDENTAL SHOTS

a. General. Incidental shots are used in addition to the basic shots for building and carrying the subject action in a sequence. These shots are known as *cuts*. Normally, they are CU's and ECU's and are very brief. Although cuts are of secondary importance, they add interest and are a valuable means of maintaining good continuity.

b. Cut-In. The cut-in shot is used to cut into the main subject action. By use of a cut-in, the action of the subject can be more clearly shown. For example, a scene showing marching troops has just been made. Cut-ins of this scene might include a close-up of the heads and shoulders of the troops marching, a close-up of the marching soldiers' feet, or a close-up of their arms swinging. All these shots strongly emphasize the subject's main action, which is marching. A cut-in must be closely related to the main subject's action.

c. Cutaway. The cutaway is used to lead from the main subject's action to a related subject or separate action which has been previously established. Normally, a cutaway is a CU or an ECU. In the example given in *b* above, one of the cut-ins was a CU of the feet of marching soldiers. A cutway in this instance would be a shot of spectators applauding the soldiers, or it could be a shot of the reviewing stand. A cutaway must be re-

lated in some way to the main subject's action. It also may be used to denote a lapse of time.

93. OVERLAP

Overlap footage and matching action are necessary to provide smoothness and good pictorial continuity in a sequence. An overlap is the reshooting of a small part of the last subject action in a scene. For example, the last shot was an MS showing a soldier fastening the top button of his jacket. The next shot will be a CU of the soldier adjusting his cap. However, since an overlap is necessary for smooth connection between the MS and CU, the CU must begin with the soldier repeating a small part of the last action of buttoning his jacket. If the CU were to be made only of the soldier adjusting his cap, there would be a jump in action because it would not be obvious how the soldier's hands moved from buttoning his jacket to adjusting his cap. To complete the overlap and match the action, editing is necessary. The action is matched by splicing the MS at the point where the soldier's hands are at the same position in both shots. The overlap shot is the actual footage used to make the overlap. Matching action is the process used in editing the overlap footage. Any footage that causes duplication is discarded. Overlap does not always follow a definite pattern. Action can be matched in an LS and an MS. It also is possible to match the action of footage from different sequences. To obtain overlap with one camera,

controlled action photography is necessary. When shooting uncontrolled action, however, several cameras are required.

94. DIRECTIONAL CONTINUITY

a. General. Directional continuity is the proper portrayal of direction of moving objects with a motion picture camera. The direction of subject movement when viewed on a screen must be consistent. For instance, if the subject enters the frame from left to right it should continue in the same direction throughout the sequence. Any change of direction, unless carefully introduced, destroys continuity and creates audience confusion. For example, shots of a parade taken from opposite sides of the street create a confusing sequence because, on the screen, the parade will appear to be moving first in one direction and then in the opposite direction. This illusion is caused by the limitations of the screen which tend to eliminate the establishing factors by which the eyes normally would make the visual transition from one side of the street to the other. Therefore, to avoid confusing reversals of direction, take all shots in the sequence from the same side of view, if possible.

b. Reversals. Certain reversals of direction that are self-explanatory are permissible when the reversal can be shown within the screen. For example, a jeep enters the scene from the left and stops, a prisoner gets into the back seat with a guard, the jeep makes a turn and leaves the field of view. When it is impossible to avoid reversals

of screen direction that are unaccounted for by the action, make the reversals less obvious by the technique of *distraction*. This technique consists of separating the scenes of the sequence by cut-ins and cutaways, thereby momentarily neutralizing the directional action. When the new directional action occurs, it is less apparent because the neutralization draws the attention of the audience away from the original direction of action. Cut-ins and cutaways used for this purpose must not show any cross-screen direction.

95. LIGHTING

a. General. Lighting is critical for motion picture photography because differences in exposure between sequences cannot be corrected easily during development of the film. For this reason, exposures should be estimated carefully, and continuity of lighting must be considered.

b. Continuity of Lighting. Consistent lighting throughout successive scenes is necessary for continuity. If a filter is used for one shot, the same filter should be used throughout the sequence. Otherwise, the difference will be immediately apparent on the screen and continuity will be interrupted. Continuity of lighting is particularly vital in outdoor sequences when intermittent clouds cause variations in the quality of light and lapses of time change the direction of light. It is essential, in outdoor sequences, to be careful that changes in the length of shadows do not betray a lapse of time when none is supposed to occur.

96. ANGLE

To prevent stereotyped continuity, change either the size of the image, the camera angle, or both. Image sizes are changed in the basic shots of the sequence by varying the camera distance or by using different focal length lenses. Interest and variety are added to a sequence by varying both image size and camera angle. When properly used, camera angles provide the cameraman with opportunities for originality in conveying the theme. Care must be taken, however, to avoid exaggeration and overuse of angles. The capabilities and limitations of the various types of angles can be learned only through experience. Generally speaking, high camera angles (when shooting down) appear to reduce the height of a subject and slow the subject's action. Low angle shots (when shooting up) tend to exaggerate height and add speed to the subject's action. To add depth and perspective to a subject, a side angle shot may be used. This shot gives a three-dimensional effect and can make a subject appear wider or thinner, depending on the degree of angle used. The flat-angle or head-on shot should be used sparingly, since it lacks interest and depth. Reverse-angle shots are used to add variety. They are made by shooting the subject from the reverse side of view.

97. COMPOSITION

Composition is very important in motion picture photography because corrections in composition

when printing motion picture film are practically impossible. In still photography, corrections in composition can be made by cropping, enlarging, and dodging. However, these methods are not possible in motion picture photography. Consequently, it is necessary to film a scene exactly as it is to appear on the screen. The most important consideration in composition is to keep the center of interest sharp and free from distracting objects. Only the object or objects that are the center of interest should be included in a scene, regardless of the type of shot used. To prevent excessive foreground and cropped subjects, proper framing is necessary. Certain shots like the MS, cuts, or CU's require careful framing when being shot. Care must be taken in making these shots, since parallax may cause unwanted cropping at short camera-to-subject distances.

98. PANNING

A pan shot is used to record the subject's action only when other shots will not suffice. Although it can be used effectively, the pan is a difficult shot and often is misused. Panning should never be attempted without having the camera on a sturdy tripod. Direction of a pan usually is from left to right. The pan shot should be lengthy when possible. Panning must be slow and smooth. The movement of the pan should be level and in a continuous direction, usually horizontal or vertical. Panning is necessary for certain subjects—such as a race or an armored vehicle maneuvering—when a long shot may be impossible. If it is neces-

sary to pan a subject from a moving airplane, boat, or vehicle, the pan must be made from the direction of travel to the rear in the same direction as the scenery appears to be traveling. The pan should begin at a narrow and acute angle to the subject. To end the shot, the subject should be permitted to leave the scene.

99. PLANNING FOR CONTINUITY

In addition to the motion picture techniques briefly described in the preceding paragraphs, certain factors in planning are necessary to achieve pictorial continuity. These factors include the scenario (when used), the story (mental or written), and plans for coordination with other cameramen.

a. Scenario. A scenario is a detailed plan or guide to the action of a motion picture production. It is a listing of all the scenes required for a motion picture. It also is known as a script. Motion picture films based on a scenario usually are produced in a military studio or on location in the rear echelon of a theater of operations or in the continental United States. Although shooting from a scenario is not always possible in the field, the cameraman should *think out* a story for each section of action which he plans to shoot.

b. Story. The motion picture story is the plan a photographer makes of the order and type of shots needed to depict his theme or thought of the subject. Before any scenes are shot, the photographer first must analyze his subject and deter-

mine how he desires to portray it. After a theme has been developed, the various shots necessary to record the theme are determined. The motion picture story should be written in detail, if possible, and should describe the order and type of shots needed to make the story. This written story serves as a guide. Variations that improve the original story are desirable during the actual shooting. If the order of shots is changed during shooting, proper arrangement can be restored in the editing process.

c. Coordination of Coverage. To complete a story properly and achieve good pictorial continuity, coordination between photographers is necessary. Since most military motion picture photography is of the uncontrolled action type, several cameramen usually are employed to obtain complete coverage of a subject. When this is done, the story is very valuable in coordinating the efforts of all the cameramen. In planning the story, the responsibility of obtaining certain shots is delegated to separate cameramen. For example, one cameraman may take the cut-ins and cutaways, while another cameraman takes the MS's and CU's, and still another takes all the LS's and ELS's. During editing, these separate shots are combined to portray the theme of the story.

100. EXPOSURE

a. General. The factors of lens aperture and film speed are common to both still and motion picture photography. However, shutter operation and the synchronized camera speed of motion pic-

ture cameras are the great differences between still and motion picture photography. The lens aperture, shutter opening, and shutter speed control the light that reaches the film.

b. Shutter Opening. Most 16-mm motion picture cameras have a fixed shutter opening. Studio type 35-mm and certain 16-mm motion picture cameras have adjustable shutter openings. Most fixed shutters have an opening of 170°. Adjustable shutters give the cameraman an additional control over exposure. Combat cameras usually have a fixed shutter opening.

c. Camera Speed. The speed of motion picture cameras is calibrated in frames per second. This is the rate that film is transported, frame by frame, past the film aperture. The film movement is synchronized with the shutter to permit exposure of each frame. Most cameras have speeds that may be set at 8, 16, 24, 32, and 64 frames per second. At 8 frames per second, the speed of moving objects appears faster because motion occurring during 1 second is represented by only 8 individual pictures. With 16 frames per second, the action is more natural. Normally, 24 frames per second is used as the standard speed. At 32 and 64 frames per second, motion is slowed down considerably. These latter speeds are commonly employed to show action in slow motion.

101. COLOR PHOTOGRAPHY

Because of its slow speed and other characteristics, employment of color film in motion picture photography is limited and exposure is critical.

Color film usually requires more skillful handling than black and white film. Normally, only well-lighted subjects should be considered, preferably in bright sunlight.

102. CAPTIONS

a. Field Caption Card. Motion picture captions are explanatory notes pertaining to a particular roll of film. They are written by the cameraman on a field caption card (DA AGO Form 11-191) when available (fig. 29). Captions are prepared in duplicate. The cameraman retains the duplicate and forwards the original caption card with the film. To prevent confusion in case of separation, the notes and film package must contain markings which identify them as belonging together. Captions should answer the following questions as completely as possible:

- (1) Who? (Give the full name of persons photographed, grade, serial number, home town, and branch of service.)
- (2) What? (Identify everything photographed.)
- (3) When? (Give date and time of day.)
- (4) Where? (State location as accurately as possible.)
- (5) How? (Explain the operation of the subject and the special conditions and circumstances connected with its functioning.)

b. Caption Sheet. A caption sheet (DA AGO Form 11-198) is filled out by the photographer in detail and includes all the information given on

MOTION PICTURE FIELD CAPTION CARD		Nº 125751
CAMERAMAN	SGT CHARLES Q. PULLMAN	DATE 25 MAY 1950
FILM TYPE	35-MM PLUS-X	UNIT NO COMBAT ASST. 1
LOCATION	MILLSDROP ON ROAD TO BROADTOWN	ROLL NO. 1
SUBJECT ENEMY PLANES ATTACK CONVOY CO B 3RD BN		
SCENE NO.	FEET	DESCRIPTION
1	20	516 INF REG 20TH INF DIV LS CONVOY ROLLING TOWARDS BROADTOWN
2	15	MS OF LEADING CONVOY VEHICLE APPROACHING RD JCT, SIGN IN BACKGROUND POINTING TOWARDS BROADTOWN
3	15	CUT IN, TRUCK WHEELS CHURNING IN SNOW
4	15	CUT IN GRIM FACED GI'S PEERING OUT OF VEHICLE
5	15	LS MP DIRECTING TRAFFIC AT RD JCT
6	10	MS MP SIGNALS CONVOY TO STOP
7	10	CU MP POINTS TO MAP SHOWING CONVOY LEADER DANGER AREA
DA AGO FORM 11-191 ○ 1 DEC 47		

FM 6-31

Figure 29. Field caption card.

the caption cards pertaining to related rolls of film (fig. 30). The completed forms are forwarded

PARENT PHOTO UNIT		MOTION PICTURE CAPTION SHEET		SECURITY CLASSIFICATION	
199 Photo Co		199 Photographic Company 33rd Army Hq.		UNIT WORK ORDER NO. PROJECT NO.	
DETACHMENT Combat Assignment Unit No. 1.				SHIPPING DESIGNATOR AND NO. 199-344-6	
DELIVER TO:		LOCATION Road to Broadtown via Millsdrop			
SUBJECT Enemy planes attacking convoy en route Broadtown		SOUNDMAN		DATE SHOT 30 May 1950	
CAMERAMAN Sgt Charles Q. Pullman		NUMBER PRIOR SHIPMENTS THIS SUBJECT None		MORE TO FOLLOW <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
CAMERA Ryemo G		FOOTAGE EXPOSED 1151-333-2 300		<input checked="" type="checkbox"/> 35mm <input type="checkbox"/> 16mm <input type="checkbox"/> B & W	
SOUND SYSTEM		LIGHT CONDITIONS bright-overs.		HOW SHIPPED Motor Messenger	
CAN NO. ROLL NO.		FILM SPEED AND DATE 50 W 1 Jan 1951		DATE SHIPPED 30 May 1950	
SCENE NO.		DESCRIPTION OF SCENES (Give background of story, caption card number and tabulation of scene lists)			
1	1	IS Convoy rolling towards Broadtown.			
2	1	MS Leading convoy vehicle approaching rd jct, sign in background pointing towards Broadtown.			
3		CU Cut in, truck wheels churning in snow.			
4		CU Cut in, grim faced GI's peering out of vehicle.			
5		IS MP directing traffic at rd jct			
6		MS MP signals convoy to stop and walks over to leading vehicle.			
7		CU MP points to map showing convoy leader danger area.			

- | | | |
|---|---|---|
| 1 | 2 | LS 5 enemy fighter planes approaching. |
| 2 | 2 | MS Vehiclee come to a stop at side of road and GI's disperse. |
| 3 | | LS Exploding truck. |
| 4 | | MS Cut in, 2 GI's carrying wounded buddy. |
| 1 | 3 | LS Airplanes make second pass. One is hit and crashes. |
| 2 | | MS Burning plane. |
| 3 | | MS Destroyed vehicle is pushed off road. |
| 4 | | LS GI's get back on trucks. |
| 5 | | MS Medics loading wounded man into vehicle. |
| 6 | | CU PFC. Marc Del Vitto from Pungsley, Bulb County, Penn.
Wounded in attack cheerfully accepts cigarette. |
| 7 | | LS Convoy moves on. |

This enemy strafing took place 35 miles south of Broadtown in the vicinity of Millsdrop. Involved was Co B, 3rd Bn, 516th Inf Reg, 20th Inf. Div. The only casualty Pfc. Marc Del Vitto was wounded in left leg. Injury was not serious. One of the enemy fighter aircraft was destroyed. Enemy strafed the convoy twice and destroyed one truck which exploded. After clearing the damaged vehicle off road the convoy continued on road to Broadtown where the Company engaged the enemy in combat. The two medics, SGT Virgil Hanson of Dobbozy, McKean County, Miss. and PFC. Ray Mattingly of Golden Harbour, New Jersey, were responsible for immediate attention to the wounded soldier. The large heavy set medic is Sgt. V. Hanson and the small, light medic PFC. R. Mattingley.

Note: These three rolls are complete. There will be no additional film.

IMPORTANT: SPELL NAMES CORRECTLY. IDENTIFY ALL PERSONALITIES, LOCATIONS, ORGANIZATIONS, WEAPONS AND EQUIPMENT. ENCLOSE FIRST TWO COPIES OF CAPTION SHEET IN FILM BOX, BUT NOT INSIDE CANS, AND TAPE THIRD COPY TO BOTTOM OF CAN. SHIP BY AIR WHEN POSSIBLE. OTHERWISE USE NEXT FASTEST METHOD. SEE SPECIAL REGULATION J10-50-5.

DA
1 DEC 49

AGO FORM 11-198

REPLACES SC FORM 601, 15 OCT 48, WHICH MAY BE USED

16-52000-1 U. S. GOVERNMENT PRINTING OFFICE

FM 6-32A

Figure 30. Motion picture caption sheet.

with the film to a photographic laboratory. At the laboratory, another caption sheet (Form DA 11-198) is prepared. This form accompanies the film to the next higher headquarters for processing. Caption sheets should be filled out as completely as possible because they serve at a later date as the source of information for the writing of commentaries.

103. SLATING

Slating is the photographic recording of a notation to establish identity of the film with its correct caption sheet (fig. 31). This notation is a permanent part of the film. All motion picture film must be slated, preferably at the beginning of each roll. When no slate is available, a wall, board, box, equipment container, or even sand, can serve as a surface on which the necessary data can be written and then recorded with the camera. The following information should be included:

Name of cameraman.

Organization.

Subject.

Date.

Place.

Film roll number.

Special symbols or markings assigned by the
Department of the Army.

999 Photo Co		PROJ. NO 438
CAMERAMAN SGT. J GUY	DATE 4/5/50	
SUBJECT MEDAL Presentation		CAMERA NO 57
LOCATION Pinxy, Pa.		ROLL NO 1

FM 6-33

Figure 31. Slate.

Section III. EQUIPMENT.

104. GENERAL

Military motion picture equipment normally is designed to operate under field conditions. Special equipment is provided for studio production work. Motion picture camera equipment that will provide satisfactory results under a variety of field conditions is constantly being designed and developed. Weight, size, and performance under climatic extremes are important considerations in designing new equipment for combat conditions. Both 16-mm and 35-mm motion picture cameras are used in military photography.

105. 16-MM CAMERAS

The 16-mm motion picture cameras are lighter and more compact than the 35-mm equipment and, consequently, are used in situations where speed and ease of mobility are required. Accessories are relatively light and compact. Much less film is needed to cover the same footage required with a 35-mm camera. For example, 100 feet of 16-mm film gives the photographer 4,000 individual frames which last for 160 seconds of continuous exposure at a camera speed of 24 frames per second; while 100 feet of 35-mm film will give the photographer only 1,600 individual frames that last for 65 seconds, using the same camera speed. Another special advantage of the 16-mm camera is that it is particularly suitable for color photography.

a. PH-430. This motion picture camera, although somewhat larger and heavier than most 16-mm cameras, is used for field assignments and production photography. It can be used with a 100-foot or 200-foot magazine, and can be adapted to handle special effects by mechanical adjustment or through the use of accessories. The camera has a spring-wound motor. The lens turret holds two lenses. A battery of various focal length lenses is available for this camera and gives it a wide range of application.

b. PH-430-A. This is a 3-lens turret-head, 100-foot load camera of sturdy design. Because it is relatively small, compact, and sturdy, it is especially adaptable for combat photography. It

has a spring-wound motor. It is not designed to meet the requirements of production work, although it can be used for supplementary background shots and general motion picture coverage.

c. PH-431. This is an exceptionally small, light camera with a spring-wound motor. The film comes in a special 50-foot magazine which eliminates threading and is loaded automatically. It has a single lens mount which will take lenses of various focal lengths. This camera is particularly practical for combat situations.

106. 35-MM CAMERAS

The 35-mm motion picture cameras are primarily used for black-and-white production and general types of field photography. Certain camera models are designed for hand-held operation while others are used for studio shooting and must be operated from a tripod.

a. PH-330-A through H and J. These models are typical newsreel cameras, exceptionally flexible and of rugged design. Although construction is basically similar, certain models have turrets holding three lenses and allow the use of 100-foot as well as 400-foot rolls of 35-mm motion picture film. Others are of the single lens mount type. The 400-foot rolls of motion picture film are loaded into special magazines which can be attached to the camera housing. These cameras can be used for practically all types of production work. They are especially suitable for documentary photography. Basic camera models have spring-wound

motors. Advanced models have electric motors and allow increased photographic application through the use of various accessories. The advantages of this camera are its rugged design and dependability.

b. PH-274-A. This is the production type studio camera, large and heavy and superior for the kind of photography for which it was designed. It is not employed in actual combat, although it may be used to cover after-action and captured areas. Application in the field is limited to production work of training, educational, historical, and documentary films. This camera has an electric motor drive and all adjustments and accessories of a production camera. This camera can be used with double-system sound recording.

c. PH-270. This is a sound-recording camera. It has all the features of a studio production motion picture camera and, in addition, permits direct recording of sound on film. The unit is large and has numerous accessories which supplement its operation. This camera is used primarily in military studios and for interior work. Newsreel and public information photography are possible with this camera. It also is utilized in the production of training films and other military films which require immediate synchronization of sound on film. This camera has an electric-motor drive.

d. PH-330-K. This motion picture camera is of a unique design which is particularly practical for military application. It is relatively light and compact (fig. 32). By means of a reflex arrangement, the view finder allows direct pictorial control

through the recording lens even while the camera is in operation. Because of this mechanical development, the camera needs no parallax adjustments, requires no additional view finders, and has the advantage of permitting continuous control over the focus of the lens while the camera is in operation. This camera generally is used with an electric motor built into the handle. The motor is driven by a portable battery which is carried in a case on a shoulder strap by the photographer. The electric motor may be removed and replaced by a spring-wound motor of similar shape which also is used as a camera handle to facilitate hand-held operation. The camera turret holds three lenses. Special 200-foot or 400-foot magazines can be used with the camera. When a tripod is used, the motor is removed from the bottom and placed on the side of the camera housing. This camera is designed primarily for tactical field motion picture photography but may be used to advantage in most other types of military photography.



Figure 32. Combat motion picture camera.

CHAPTER 6

TRAINING

Section I. SPECIALIST TRAINING

107. PURPOSE

The purpose of specialist training is to prepare photographic personnel for combat duty with tactical units. Personnel are selected after basic training is completed. Selection is based on amateur or professional background and experience or aptitude of personnel. Selected personnel are trained in an appropriate photographic service school.

108. SPECIALTIES

The following military specialties are available in signal photography for enlisted personnel:

Still photographer (SSN 0152).

Motion picture photographer (SSN 0043).

Sound motion picture film recorder (SSN 0208).

Laboratory technician (SSN 0945).

Camera repairman (SSN 0042).

Projector repairman (SSN 0206).

109. SERVICE SCHOOLS

Photographic service schools offer extensive training in the various phases of military still and

motion picture photography. Primarily, training at the schools is concerned with the technical aspects of field photography and with the preparation of personnel for actual tactical assignments. In addition, basic photographic techniques, procedures, and principles are included in the training program so that students are able to perform the routine pictorial tasks required of military photographers under various conditions at all echelons.

110. CRITIQUES

To determine the training progress of individual students and, at the same time, offer constructive comment on photographic work, critiques on each student's work are prepared at regular intervals by the instructors. The critiques are written or verbal comments that analyze the individual's work. Such comments are categorically filed and offer the school commander a source to check on the ability and effort of every student. Since the student receives a copy of every critique, he can study his efficiencies and deficiencies and follow the given recommendations. The use of such critiques is not limited to schools but can be carried on also within photographic units. Critique sheets are prepared by the unit. Responsible officers may work out critique sheets covering all points that are pertinent in pictorial coverage and techniques. These sheets should be prepared in duplicate, one copy for the photographer and the second copy to be retained in the personnel file. Several critique sheets of one person's work indicate the degree

of photographic progress made over a period of time. The following is a suggested group of items generally stated on critique sheets:

a. Motion Picture Work. (Describe mistakes and merits.)

(1) *Story*—

- (a) Action.
- (b) Angles
- (c) Balance.
- (d) Sequence.
- (e) Coverage.
- (f) Selection of subject matter.

(2) *Technical*—

- (a) Exposure.
- (b) Focus.
- (c) Framing.
- (d) Lighting.
- (e) Panning.
- (f) Fogged or scratched film.
- (g) Slates.
- (h) Captions.

b. Still Photography. (Describe mistakes and merits.)

(1) *Story*—

- (a) Story coverage.
- (b) Subject matter.
- (c) Balance.
- (d) Action.
- (e) Angles.

(2) *Technical*—

- (a) Exposure.
- (b) Focus.

- (c) Framing.
- (d) Lighting.
- (e) Movement of subject.
- (f) Captions.
- (g) Processing.

Section II. FIELD TRAINING

111. PURPOSE

Photographic field training familiarizes personnel with the photographic requirements of combat units. It indoctrinates men in photographic operating procedures in the field under climatic extremes and gives them pertinent information concerning the operations and tactics of the organizations with which they work. The training increases the service value of personnel and establishes a standard of tactical photographic performance and procedure throughout the army. The training is divided into different categories, depending on the type of photographic unit. Various phases and training steps increase photographic preparedness until the necessary tactical readiness is reached.

112. UNIT TRAINING

Field training in photographic units is the application of basic principles to tactical, intelligence, identification, public information, historical, and other phases of field photography. The training usually is given by cadre personnel who are se-

lected on the basis of previous military photographic experience or training. Training may be accomplished by individual instruction or by unit deployment. Field training familiarizes personnel with the operations and organizations in a theater of operations and with the role that photography plays in the operations. Training should include—

Film processing procedures in the field.

Shipping and handling of all types of film.

An over-all outline of the photographic work required at different echelons.

A detailed treatise of the purpose and mission of military photography in the field.

An outline of the various types of photographic units employed in the field.

A familiarization course of military organizations in a theater of operations.

A discussion pertaining to photographic administration and all phases of operations in the field.

An explanation of photographic SOP's, operation orders, signal annexes, and other military orders.

113. REFRESHER TRAINING

Photographers who have been away from their unit for special training, or on detached service, should receive refresher training in their photographic specialty upon return to the unit. Refresher training is necessary to reorient men in certain important photographic routines. It consists of lectures, orientation talks, reading assign-

ments, examinations, motion pictures, demonstrations, and practical exercises. Such training increases the over-all effectiveness of unit service and improves the performance of individual photographers. The primary purpose of refresher training is to increase the quality of photographic performance. In order to determine the progress made by individuals engaged in refresher training, the commander should observe personnel regularly, inspect work, and encourage the trainees to increase their photographic knowledge and proficiency. It is the responsibility of the commanding officer to guide the personnel and to determine where further training is necessary.

114. ROTATION

When personnel are thoroughly qualified in one photographic specialty, they should be rotated to another assignment to acquire a secondary photographic specialty. The aim is to have every man of the unit proficient in at least two photographic specialties. For example, a still photographer who has completed his training, and who has functioned as a still photographer for some time, is ready for additional training in another photographic specialty. Accordingly, the commanding officer directs that the photographer is to receive additional training as a laboratory technician. With this training completed, the photographer can readily be assigned to one of two positions, depending on emergencies. Rotation is a form of insurance that gives a man maximum training and the army maximum service.

115. LABORATORY

Training in a photographic laboratory is accomplished through direct instruction and by rotating duties. Laboratory personnel perform in their primary military specialty until they become proficient and are then rotated to other positions where they can acquire a secondary military specialty. The aim is to increase the quality of the work and extend the limit of the laboratory production capacity. Additional training in the form of direct instruction is given by the noncommissioned officer in charge or by the photographic officer. The purpose of individual instruction is to correct inadequate procedures discovered by the officer during inspections and supervision of photographic work. Such instruction also allows the photographic officer to familiarize laboratory personnel with new photographic methods and equipment.

116. TRAINING FILM LIBRARY

The instruction given to training film library personnel is different from the training given to other signal photographic organizations. Personnel of this organization are not engaged in the production of photographs. Since film libraries serve as centers of distribution which provide visual aids, training should insure maximum efficiency in distribution and maintenance of projection equipment and films. The training of film library personnel includes instruction in the correct way of showing training films and the proper

use of projection equipment under all conditions, the way to fill out the necessary administrative records to make fullest utilization of equipment possible, and the method of keeping training personnel of adjacent units informed of applicable training films, films strips, and other visual aids that are available.

CHAPTER 7

SUPPLY

Section I. PROCEDURES

117. GENERAL

Procurement and distribution of photographic supplies are essentially the same as for all types of Signal Corps supplies. Local procurement may also be authorized for photographic units in an oversea command.

118. COMPANY

In a photographic company, the supply responsibility lies with the supply and maintenance section of the headquarters platoon. The supply and maintenance section has a supply subsection which is responsible for the storage and issue of supplies and the maintenance of supply levels. During periods when the company is located at such distances from the portable laboratory that supply requirements cannot be readily filled, an additional supply subsection is maintained at the portable laboratory and operated by the personnel of the chemical mixing room. The laboratory supply subsection stocks only enough items for operational needs. The use of this subsection saves much time because it eliminates unnecessary traveling

between the laboratory and the supply subsection at company headquarters. Supply procedures and related problems of photographic units, detachments, and sections are generally similar to those of the organic photographic company.

119. TYPES OF PHOTOGRAPHIC SUPPLIES

Photographic supplies are grouped under separate designations as follows:

A—Photographic equipment.

B—Photographic paper.

C—Photographic chemicals.

D—Film.

E—Photographic lamps.

F—Film library equipment.

P—Maintenance parts for photographic equipment.

Section II. MAINTENANCE

120. GENERAL

Organizational maintenance is performed by photographers operating the equipment as well as by maintenance personnel of the unit. Photographers are responsible for preventive maintenance. Preventive maintenance includes care in operating equipment, cleaning equipment, minor adjustments—such as tightening accessory screws—and frequent inspection of the equipment to detect the presence of fungus or corrosion. In

addition to performing routine preventive maintenance, photographers check their critique sheets to determine if the pictorial results obtained indicate any mechanical failure of the camera equipment. If major adjustments are necessary, the equipment is given to maintenance-personnel for repair. Maintenance personnel are responsible for the replacement of worn parts; the adjustment of synchronizers, shutters, and range finders; and the general overhauling of the equipment. Only *qualified maintenance personnel* should be permitted to repair or adjust operating mechanisms of photographic equipment.

121. ITEMS

Cleanliness of items and detection of faults are the most important factors in preventive maintenance. In general, photographers are responsible for the care of the following items:

a. Lenses. Lenses must be kept clean and free from sand, dust, oil, and other foreign matter. To avoid scratching lenses when cleaning, dust should be blown off or carefully removed with a camel's-hair brush or specially provided lens-cleaning tissue. Use gentle, circular motions while cleaning. In warm, moist climates, a lens-cleaning fluid is used to check fungus growth. Although camera lenses are carefully checked and tested by the maintenance subsection before being issued to photographers, it is important that the photographers check the lenses and look for indications of loose components.

b. Motion Picture Cameras. Cameras must be checked daily for appearance and condition of camera aperture, gates, sprockets, magazines, and take-up spools. Necessary adjustments beyond cleaning or straightening the take-up spool are the responsibility of maintenance personnel and should be reported immediately.

c. Still Cameras. Still cameras must be cleaned daily and all accessible parts checked for correct performance. Adjustments may be needed for range finder, footage scale indicator, shutter speeds, and synchronizers. These adjustments are handled by maintenance personnel.

d. Batteries. Photographers using storage batteries for photographic equipment must check the batteries before each assignment and must make sure that the batteries have been properly charged by maintenance personnel. It also is necessary to check and replace dry cell batteries frequently.

Section III. STORAGE AND SHIPPING

122. GENERAL

Storage and shipping are important phases in the link from the production line to the using organization. Supplies must be quickly and properly shipped to their point of destination. They must be correctly stored and cared for in transit to insure that they are in usable condition when issued. If the quality of supplies is affected in this process, replacement is usually necessary. Replacement means not only loss of time and money but

a decrease in the military efficiency of the unit awaiting the item of supply. Consequently, the storing and shipping phase of the supply system is very vital.

123. PHOTOGRAPHIC SUPPLIES

a. General. Because of their physical properties, special storage and shipping precautions are necessary for photographic supplies. Films, photographic papers, and chemicals must be stored in a cool, dry place, and inflammable film must be stored in fireproof vaults or shipped in fireproof containers. Photographic supplies that deteriorate with age should be stored in such a manner that the oldest stock is used first. Appropriate training manuals, technical bulletins, army regulations, and other publications specify in detail the precautions and proper methods for the storing and shipping of photographic supplies.

b. Unexposed Film. Still and motion picture film usually is packed in containers that provide protection from the climatic conditions prevailing in the area where it is to be used; however, additional protection should be given film by storing it in a cool, dry place. In the tropics, refrigerated storage should be provided for film. The ideal storage temperature for unexposed film is 60° F. with a relative humidity of 40 to 60 percent. The humidity may be checked by the use of wet and dry bulb thermometers. Film required for an assignment should be removed from storage approximately 24 hours before being used, since a sudden extreme change of temperature will cause

condensation. By keeping the sealed container in the new temperature for approximately 24 hours, accumulation of moisture on the film can be prevented. To avoid film deterioration, it is necessary to prevent contact with or storage near formaldehyde, industrial gases, motor exhausts, and vapors from solvent materials.

c. Exposed Film. Normally, film is processed immediately after exposure. When immediate processing is not possible, exposed still picture film should be placed in the original package and kept cool and dry until it can be developed. Exposed motion picture film which has not been processed may be placed in the original film can, but should not be sealed airtight unless the film has been thoroughly dried. When the excess moisture is removed, the film may be sealed in a container and stored in a refrigerator or shipped to the developing laboratory. Storage precautions are also necessary for exposed film that has been processed. Processed still film is placed in individual paper preservers and stored in dustproof cabinets. Motion picture film has either a nitrate or acetate base. Film with a nitrate base is highly inflammable and requires storage in fireproof vaults. Accordingly, special precautions must be taken when such film is stored. All other motion picture film is considered safety film and may be stored in wooden buildings. Storage of the film at moderate temperatures reduces the possibilities of emulsion deterioration, fungus, or mold. It is also necessary to protect exposed film against hydrogen sulfide and coal gas fumes.

d. Other Supplies. Photographic papers normally are stored under the same conditions as unexposed film. Paper should be located at a safe distance from photographic chemicals, kept in sealed containers, and stored in a cool, dry place. Precautions to be observed in storing chemicals or other photographic supplies are usually printed on the labels of the containers.

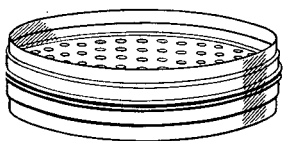
124. FILM LIBRARY MATERIAL

Film libraries are responsible for the proper storage of film strips, training films, entertainment films, orientation films, and necessary projection equipment.

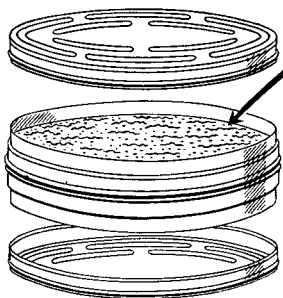
a. Positive Film. The method used in the storage of positive motion picture film prints and film strips depends on the type of film base. Similar to negative motion picture film, positive film may have a nitrate or acetate base. The detailed procedure for storing nitrate base film is given in AR 850-65. Safety type positive film stock requires no special attention and can be stored without special fire-prevention measures. Film strips are always printed on safety type motion picture positive film. In a humid climate, before storing either type of film, place the film in a metal can with a desiccating agent to remove any excess moisture from the film. If containers with built-in compartments for the desiccating agent are not available, a simple desiccator (fig. 33) can be constructed as follows: Solder the bottoms of two film cans together and drill approximately 20 holes

through both surfaces. Fill one of the cans with a moisture-absorbing material, such as silica-gel, rice, tea leaves, or dry paper, and then seal the can. Place the film in the other can and seal the can. This method of constructing a desiccator usually gives satisfactory results. The life of the moisture-absorbing material depends on the humidity within the film library. Normally, the relative humidity within the film can should be from 40 to 50 percent at a temperature between 70° and 75°F. Extreme cold weather creates special problems in storing film. When exposed to extremely low temperatures, film becomes brittle and easily breaks in handling. Under such conditions, storage should be in any available shelter which will protect the film from the effects of the temperature.

b. Equipment. Since film library equipment is constantly being issued and handled by many using agencies, it requires special attention when returned for storage. Upon receipt from the using agencies, the equipment must be thoroughly inspected for damage, rust, corrosion, fungus, mold, and moisture. The necessary corrective measures must be taken to insure that the equipment is clean and dry before storing. In a humid climate, a desiccating agent must be inclosed with the equipment to prevent the accumulation of moisture during storage. Detailed information concerning storage, shipping, and maintenance of film library equipment is given in SR 110-30-5.



**2 FILM CANS (PREFERABLY 1000')
SOLDERED BACK TO BACK
DRILL HOLES THROUGH BOTH
BOTTOMS**



**PUT MOISTURE ABSORBING
MATERIAL IN ONE CAN**

**THEN PUT COVER
BACK ON AND SEAL IT**

**PLACE FILM IN OTHER CAN,
PUT COVER ON AND SEAL IT**

FM 6-35

Figure 33. Improvised desiccator.

125. PHOTOGRAPHIC EQUIPMENT

a. General. All photographic equipment must be cleaned and, where applicable, the mechanisms should be lubricated before storing. During storage, frequent inspections are necessary to check for the presence of rust, corrosion, fungus, or mold. Shutters, lenses, bellows, film gates, turrets, and camera accessories are the most likely locations for the effects of deterioration. When possible, the equipment should be kept in a well-ventilated place that has a low relative humidity.

b. Cold Climates. In extremely cold climates, either specially designed photographic equipment or standard equipment with winterization modifications is used. Special instructions are published concerning the use and storage of all types of equipment used in cold climates. Most moving parts of the equipment are lubricated with a special winterization oil before storing. Equipment treated with the winterization oil must be kept in a dry place that has a constant cold temperature. Should the equipment be exposed to a warmer temperature, the special oil is rendered ineffective and the winterization process must be repeated before the equipment can be issued for use. It is also necessary to prevent accumulation of moisture in the equipment because a drop in temperature may cause the moisture to freeze and form a thin coat of ice which impairs sensitive parts. Desiccators suitable for use in cold climates should be placed with the equipment to prevent moisture accumulation.

c. Hot Climates. In hot climates, steps must be taken to prevent rot, fungus, and moisture accumulation during storage of photographic equipment. Application of a thin coat of lacquer, where possible, is an excellent safeguard against rot and fungus. Desiccators are also used to prevent moisture accumulation within equipment storage packing cases. In hot climates, equipment must be stored in a cool, dry place, when possible.

126. SAFEGUARDING EQUIPMENT

Special precautions in shipping and storage are necessary to safeguard photographic equipment and supplies from loss by theft. Photographic teams on field assignments should be supplied chests or boxes that can be locked. Equipment which is not in use should be stored in these locked containers. Such precautions discourage pilfering and thereby eliminate hours of work and costly delay in getting replacement issues.

127. SHIPPING FILMS

Each parcel containing film should show on its exterior the required identification and whether or not the contents are inflammable, exposed, or processed. Identifying labels may be procured through normal photographic supply channels. Current regulations determine the mailing procedures for photographic negative and positive material for any particular locality.

CHAPTER 8

SIGNAL PHOTOGRAPHIC COMPANY

Section I. GENERAL

128. MISSION

The signal photographic company furnishes the army commander with pictorial combat intelligence, as well as with technical, tactical, and routine photographic service. The company may also provide photographic coverage for theater and Department of the Army requirements as directed by the theater photographic officer; usually the theater commander provides additional photographic teams for this purpose.

129. FUNCTION

The function of the signal photographic company is to provide military still and motion picture photography in both black and white and color for the army. The full values of photography as a tactical aid to military operations, including combat, should be completely understood by all commanders. The value of photography is limited only by the lack of imagination of those commanders who do not fully utilize the available facilities. It is the responsibility of the signal photographic company to familiarize using agencies with available facilities and services.

130. ORGANIZATION

The signal photographic company T/O & E 11-37 usually is assigned to an army. Normally, elements of the company are attached or allotted to corps or other headquarters in accordance with tactical requirements (fig. 34). The company is made up of a headquarters platoon, a laboratory platoon, and an assignment platoon (fig. 35). If additional personnel are required, the company is augmented by units from other photographic service companies or by teams authorized by T/O & E 11-500.

Section II. HEADQUARTERS PLATOON

131. GENERAL

The headquarters platoon normally is located near the headquarters of the army to which the photographic company is assigned. It is composed of a headquarters section and a supply and maintenance section and performs the duties associated with administration, supply, mess, transportation, and certain photographic equipment repairs. It also coordinates the activities of the laboratory and assignment platoons.

132. HEADQUARTERS SECTION

a. Administration. The administration subsection is responsible for administrative duties of the headquarters platoon. The subsection assists in any function for proper administration of the head-

- (1) HQ PLATOON. Normally located at army headquarters. Provides mess, supply, operational control, and administration.
- (2) PORTABLE LAB UNIT. Normally located at army headquarters. Processes major work load.
- (3) IDENTIFICATION UNITS (2). Normally based at army headquarters and employed throughout army area.
- (4) NEWSREEL UNITS (2). Normally based at army headquarters and employed throughout army area.
- (5) ASSIGNMENT HQ SEC. Operates with portable lab unit, coordinates photographic requests, and makes team assignments.
- (6) CORPS SIG BN PHOTO SEC. Normally operates corps photo lab. Provides photographic coverage for corps.
- (7) COMBAT LAB UNITS (3). Employed anywhere in army area. May be used to augment corps photo lab unit.
- (8) DIV PHOTO SEC (SECTION OF DIV SIG CO). Provides photographic coverage for division. Is employed throughout division area.
- (9) COMBAT ASSIGNMENT UNIT. Normally employed to fulfill army photographic assignments. May be used to augment division or corps photographic sections.

NOTE: Normally, all photographic company teams are not employed at the same time, since several divisions may be in reserve and not require augmenting photographic service. When necessary, teams may be grouped in any combination or number to complete the photographic requirements. Photographic company teams are used to augment division or corps photographic sections and to fulfill special army photographic assignments.

FM 6-36A

Figure 34. Typical assignment of units of an army photographic company.

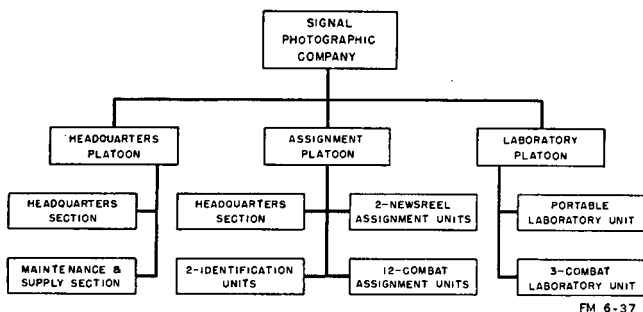


Figure 35. Photographic company.

quarters platoon or of the company as a whole. It assigns personnel, keeps company records and allied papers, and handles the necessary correspondence between the company and other organizations. It coordinates all administrative reports of company units.

b. Mess. The mess subsection operates the mess for members of the company and any other units, teams, or personnel stationed with the company. It is not responsible for the messing of personnel on detached service to corps or other headquarters. It maintains a complete field kitchen ready to operate at all times.

133. SUPPLY AND MAINTENANCE

The supply and maintenance section is composed of 1 warrant officer and 15 enlisted men. It performs the supply and maintenance duties for the company. The section is divided into supply, photographic maintenance, and motor maintenance subsections.

a. *Supply.* This subsection is responsible for obtaining, storing, and issuing all company and photographic supplies and equipment used by the company and attached units. It is also responsible for resupplying the photographic requirements of units operating away from the company. It maintains supply levels in accordance with existing regulations.

b. *Photographic Maintenance.* This subsection performs the photographic maintenance function of the supply and maintenance section. Its duties consist principally of maintaining in efficient operating condition all cameras, photographic laboratory equipment, photographic accessories, and allied equipment of the photographic company and attached units. It maintains records of the volume of work handled, type of repairs, and, whenever possible, the apparent reason for the break-down of the equipment. This subsection performs all organizational and certain field maintenance. The amount of field maintenance that can be performed is limited by its tools and the amount of spare parts. Equipment in need of repairs beyond the capabilities of this subsection is sent to a signal depot, signal base maintenance organization, or other units authorized to make such repairs.

c. *Motor Maintenance.* This subsection performs organizational maintenance for all vehicles of the company, except for those vehicles which are used by personnel on detached service and temporary duty away from the company. Field and depot maintenance is performed by the appropri-

ate automotive maintenance organization. If additional drivers are assigned to the photographic company, they may be attached to the motor maintenance subsection. All drivers perform the organizational maintenance of the vehicle to which they are assigned and are responsible for the completion of trip tickets and for obtaining the signature of the person using the vehicle.

Section III. LABORATORY PLATOON

134. GENERAL

The laboratory platoon is composed of 1 officer and 28 enlisted men. It performs the company duties of processing and distributing still pictures in compliance with directives. Its headquarters is normally established near the army headquarters. The platoon is made up of one portable laboratory unit and three combat laboratory units.

135. PORTABLE LABORATORY UNIT

The portable laboratory unit is usually located near the platoon headquarters. It processes still picture film exposed by units that are attached or assigned to the company. This processing does not include the work done at the combat laboratories. The unit edits still pictures, makes prints and enlargements, duplicates negatives as required, and makes lantern slides, reproductions, and reprints. It compiles detailed photographic coverage requirements for the assignment units. The unit also receives motion picture critiques

from the Department of the Army or motion picture field laboratory and transmits them to the assignment platoon commander. It receives requests for photographic material directly from army headquarters agencies and determines the appropriateness and priority of handling such requests in accordance with the limitations imposed by combat, supply, SOP, the desires of the requesting agency, and the existing work load of the laboratory. In accordance with existing directives, the unit maintains files of negatives and prints (except identification pictures) and captions of both still and motion picture material made by the company.

a. Editing. Still picture editing is supervised by the officer in charge and is done either by laboratory supervisors or by personnel furnished by the army photographic officer. Editing work includes—

- (1) Selection of negatives developed by the unit that are technically usable.
- (2) Determination of whether any of the submitted material is duplicated in the files or duplicated by another mission.
- (3) Selection of negatives to be retained for record or company reference purposes.

b. Editor and Assistants. The still picture editor determines what material should be shipped to the Department of the Army as record material and what material should be retained in the company files. After the laboratory personnel have completed the printing of the negatives selected

by the editor, the editor's assistants compile the captions and assign file numbers. The editor then determines the distribution requirements and the number of prints to be made in addition to those required by the requesting agency. Distribution is made in accordance with the SOP provided by the army photographic officer. The SOP gives the editor wide latitude in permitting special distribution of prints of selected negatives to agencies which, in his opinion, should be informed for official military purposes. In some cases, the distribution of captions alone serves to inform using agencies of available prints. Then if such prints are desired they can be provided as requested. The editor periodically reviews the negatives and prints in the unit files in accordance with current directives and prepares still picture critiques when necessary.

c. Critiques. Technical critiques are prepared by the editor on photographs taken in the field by company members who are unable to see the results of their photography. These critiques usually are sent to the team officer. This officer makes any necessary notations concerning techniques and results and then sends the critiques to the members in the field. The purpose of critiques is to keep the photographer informed of the technical quality and usability of his work.

136. COMBAT LABORATORY UNITS

The laboratory platoon includes three combat laboratory units which consist of three men each and which normally operate in forward areas such

as corps or similar headquarters. When operating in forward areas, these units are under the supervision of the photographic officer of the headquarters to which they are attached. When not operating in forward areas the units may be used to supplement the portable laboratory unit. The duties of combat laboratory units include—

a. Processing of Negatives. Normally, the units develop negatives made for a specific mission to which they are assigned. Usually such a mission is to provide pictures requested by a specific combat commander for immediate local tactical employment. Negatives processed by the units operating in forward areas are given a preliminary negative number for purposes of identification. Negatives are held by the combat laboratory until the immediate tactical requirements for prints from such negatives are fulfilled, at which time they are sent to the portable laboratory unit to be handled with other incoming negatives. Photographic material is processed by combat laboratory units only if it pertains to the mission of combat unit. All other material delivered to the combat laboratory is sent to the portable laboratory. Combat laboratories, however, are not made collecting points for such material unless they receive additional personnel to handle it.

b. Processing of Prints. The processing of prints is kept to a minimum for the essential immediate tactical use. Prints are made in the smallest usable size in order to maintain the laboratory's mobility and its ability to handle assignments with a speed consistent with its emergency

nature. In the event that the combat laboratories may be required to develop and make prints from negatives made with aerial cameras, as is frequently the case in combat, provisions should be made to anticipate such requirements by obtaining the necessary processing equipment in advance.

c. Reports. Combat laboratory units operating in forward areas are required to make daily reports of their activities and, if known, the employment of material handled by them.

Section IV. ASSIGNMENT PLATOON

137. GENERAL

The assignment platoon consists of 15 officers and 71 enlisted men. It is normally established near army headquarters and in the same area as the laboratory platoon or portable laboratory unit. The assignment platoon is responsible for the actual picture-taking of the signal photographic company. It performs the company duties of making both still and motion pictures. The platoon is made up of a headquarters section, two identification units, two newsreel assignment units, and 12 combat assignment units.

138. HEADQUARTERS SECTION

The headquarters section is responsible for the tactical control of all units and personnel of the assignment platoon. In some instances, it controls the activities of the combat laboratory units. The

section receives work orders from the laboratory platoon for specific coverage and assigns the mission to the applicable photographic field unit. If possible, work orders should be written because they provide a basis for the photographic field unit to draw supplies. The headquarters section prepares and forwards to the army photographic officer, through the company commander, a weekly digest of the volume of still and motion picture films exposed and the purpose for which the films were taken.

139. IDENTIFICATION UNITS

The two identification units of the platoon take official still pictures, either of military personnel or prisoners of war, for identification and security purposes or for such other purposes as may be directed by the army commander. Each unit is a self-contained operating unit and maintains its own files and records. Identification photographs taken by the units are not subject to normal distribution, except that G-1 may require prints for the 201 files of the individuals concerned. Identification photographs are considered nonrecord and are retained only as long as they are required for reference purposes by the army commander.

140. NEWSREEL ASSIGNMENT UNITS

The two newsreel assignment units, each consisting of one officer, three motion picture cameramen, one sound recorder, and two still picture photographers, are normally employed in or around

army headquarters. These units usually cannot operate in forward areas because of the size of their equipment; therefore, forward area missions are generally assigned to the motion picture cameramen of the combat assignment units. The basic function of the newsreel assignment unit is to furnish controlled silent and sound motion picture coverage and still picture coverage of technical, training, and historical subjects for the various staff agencies at army level and for theater and Department of the Army requirements. The still picture photographers of these units may supplement motion picture coverage or may be assigned independent missions.

141. COMBAT ASSIGNMENT UNITS

The 12 combat assignment units may be utilized anywhere in the army area and may be attached to any organization. Each unit is composed of an officer, two motion picture cameramen, and two still photographers. For a particular operation, a unit may be divided into two teams, with a motion picture cameraman and a still photographer in each.

a. Mission. Combat assignment units usually perform missions of a straight reporting nature. In combat, they specialize in tactical, combat intelligence, technical, and general coverage photography. It is possible for the unit to accomplish any photographic mission normally required of the signal photographic company, except those missions performed by the laboratory, newsreel assignment, and identification units.

b. Responsibilities. Whether on combat intelligence, tactical, or technical missions, the personnel of the combat assignment units must be familiar with the equipment, operation, and objective of the organization with which they work. If photographers are not provided with technical advisers, they must find out for themselves all pertinent data necessary to perform the mission successfully. With or without technical supervision, the technique, manner of securing coverage, and final photographic results are the responsibility of the man with the camera.

INDEX

	<i>Paragraph</i>	<i>Page</i>
After action photography-----	42	42
Angle:		
Motion pictures-----	96	109
Still pictures-----	59	65
Aperture-----	61	68
Army SOP, photographic-----	24	21
Brassard-----	30	27
Cameras:		
Motion pictures-----	104-106	119
Still pictures-----	67-70	82
Caption:		
Motion picture-----	102	114
Still picture-----	66	80
Caption data sheet-----	66	80
Civilian photographers-----	44	48
Close-up-----	89, 90	99, 102
Color photography-----	65, 101	78, 113
Company, photographic.		
(See Photographic company.)		
Composition-----	58-97	61
Controlled action-----	84	95
Corps SOP, photographic-----	25	22
Credit-----	81	93
Cutaway shots-----	92	105
Cut-in shots-----	92	105
Depth of field-----	61	68
Desiccator-----	124	139
Division SOP, photographic-----	26	23
Equipment:		
Motion picture cameras-----	104-106	119
Still cameras-----	67-70	82
Exposure:		
Motion pictures-----	100	112
Still pictures-----	55, 56	58, 59

	<i>Paragraph</i>	<i>Page</i>
Exposure meters-----	67	82
Field caption card-----	102	114
Film and equipment exchanges-----	11	10
Film and equipment exchange teams.	10	8
Film libraries-----	14	13
Film strips-----	63	71
Filters-----	62	70
Focal length-----	61	68
Framing-----	58, 97	61, 109
Identification-----	30	27
Identification photography-----	46	51
Identification team-----	10	8
Incidental shots-----	92	105
Insert-----	90	102
Intelligence photography-----	45	51
Laboratories:		
Arrangement-----	78	90
General-----	71	85
Organization-----	73	86
Personnel-----	77	90
Post installations-----	35	36
Printing-----	80	91
Procedures-----	75	87
Processing-----	80	91
Record negatives-----	82	94
Release of photographs-----	81	93
Supply-----	79	91
Types-----	74	86
Legal photography-----	48	52
Lighting:		
Motion pictures-----	95	108
Still pictures-----	53	55
Location shot-----	90	102
Long shot-----	89, 90	99, 102
Matching action-----	93	106
Medium shot-----	89	99

	<i>Paragraph</i>	<i>Page</i>
Motion picture caption card.....	102	114
Motion picture photography.....	84	95
Motion picture techniques		
Angles.....	96	109
Captions.....	102	114
Close-up.....	89	99
Color photography.....	101	113
Composition.....	97	109
Cutaway shots.....	92	105
Cut-in shots.....	92	105
Directional continuity.....	94	107
Exposure.....	100	112
Extreme close-up.....	90	102
Extreme long shot.....	90	102
Incidental shots.....	92	105
Insert.....	90	102
Lighting.....	95	108
Long shot.....	89	99
Matching action.....	93	106
Medium shot.....	89	99
Overlap footage.....	93	106
Panning.....	91, 98	103, 110
Pictorial continuity.....	88, 99	99, 111
Reestablishing shot.....	91	103
Scenario.....	99	111
Sequence.....	89	99
Slatting.....	103	118
Story.....	99	111
Newsreel assignment team.....	10	8
Officers, photographic.....	4	3
Operations:		
Aerial.....	32, 50, 64	30, 54, 74
Airborne.....	19	15
Armored.....	18	15
Army.....	24	21
Corps.....	25	22
Division.....	26	23

	<i>Paragraph</i>	<i>Page</i>
Operations—continued		
Facsimile-----	32	30
General-----	16	14
Infantry-----	17	14
Special-----	20	15
Team-----	29	26
Telephoto-----	32	30
Theater-----	22	18
Unit-----	27, 28	24
Continental United States-----	33	33
Organization:		
Army-----	6	5
Corps-----	7	6
Division-----	8	6
Film and equipment exchanges-----	11, 31	10, 29
Film libraries-----	14, 35	13, 36
Laboratories-----	35, 71-83	36, 85
Photographic company-----	6, 15, 36, 128-141	5, 13, 38, 144
Post installations-----	35	36
Teams-----	9, 10	7, 8
Theater of operations-----	5	5
Continental United States-----	12	11
Overlap footage-----	93	106
Panning-----	91, 98	103, 110
Parallax-----	58	61
Perspective-----	59	65
Photographic assignment team-----	10	8
Photographic company:		
Assignment platoon-----	137-141	154
Function-----	129	144
Headquarters platoon-----	131-133	145
Laboratory platoon-----	134-136	150
Mission-----	128	144
Organization-----	130	145
Continental United States-----	15, 36	13, 38
Photographic laboratory team-----	10	8
Photographic maintenance team-----	10	8

	<i>Paragraph</i>	<i>Page</i>
Pictorial continuity-----	88, 99	99, 111
PIO photography-----	44	48
Planning		
Theater of operations-----	16	14
Continental United States-----	33	33
Printing-----	80	91
Public information photography-----	44	48
Reconnaissance-----	42	42
Record negatives-----	82	94
Reestablishing shot-----	91	103
Release of photographs-----	81	93
Reversals-----	94	107
Reverse-angle shot-----	91	103
Scenario-----	98	110
Security:		
General-----	38	40
Laboratory-----	40	41
Photographic-----	39	40
Shipping films-----	127	143
Signal photographic company. (See Photographic company.)		
Signal photographic production team.	10	8
Situation shot-----	90	102
Slating-----	103	118
Standing operating procedures:		
Army-----	24	21
Corps-----	25	22
Division-----	26	23
Theater-----	22	18
Unit-----	28	24
Stand-off shot-----	91	103
Still cameras-----	67-70	82
Still picture laboratory team-----	10	8
Still series-----	63	71

	<i>Paragraph</i>	<i>Page</i>
Still techniques		
Angle	59	65
Aperture	61	68
Captions	66	80
Color	65	78
Composition	58	61
Contrast, light	53	55
Contrast, negative	60	67
Depth of field	61	68
Exposure	55, 56	58, 59
Filters	62	70
Focal length	61	68
Framing	58	61
Lens	61	68
Lighting	53	55
Negative contrast	60	67
Parallax	58	61
Perspective	59	65
Shutter speed	54	56
Story	98	110
Supply:		
Maintenance	120-121	134
Procedures	117-119	133
Storage and shipping	122-127	136
Tactical photography	42	42
Teams:		
Cellular	9, 10	7, 8
Service units	9	7
Special	9	7
Technical photography	43	48
Telephoto transmission team	10	8
Terrain studies	42	42
Theater SOP, photographic	22	18
Training:		
Critiques	110	126
Field	111	128
Film library	116	131
Laboratory	115	131

Training—continued

Refresher.....	113	129
Rotation.....	114	130
Service schools.....	109	125
Specialties.....	108	125
Unit.....	112	128
Training films.....	85	97
Uncontrolled action.....	84	95
Unit SOP, photographic.....	28	24

☆ U. S. GOVERNMENT PRINTING OFFICE: 1951—914938

