DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

CAMERA SET, STILL PICTURE

KS-17A

HEADQUARTERS, DEPARTMENT OF THE ARMY

7 AUGUST 1961

TM 11-6720-211-10
C 3

CHANGE
NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *17 September 1973*

Operator's Manual
CAMERA SET, STILL PICTURE KS-17A

TM 11-6720-211-10, 7 August 1961, is changed as follows:

Page 3, paragraph 1.1. Delete paragraph 1.1 and substitute:

1.1. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment. Paragraph 2. Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP Pub 378 (Navy)/AFR 71-4 (Air Force)/and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP Pub 459 ..(Navy)/AFM 75-34 (Air Force)/and MCO P4610.19 (Marine Corps).

2.1. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028, Recommended Changes to Publications, and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-S, Form Monmouth, NJ 07703.

Page 6, paragraph 5. Change title to "Components and Dimensions."

After paragraph 5 add paragraph 5.1.

5.1. Items Comprising an Operable Camera Set, Still Picture KS-17A

The components of the Camera Set, Still Picture KS-17A are illustrated in Figure 1.

FSN	*QTY*	*Nomenclature, part No., and mfr code*
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.
6720-823-9722		Camera Set, Still Picture KS-17A. consisting of:
6760-224-9714	1	Adapter, Photographic Film Pack LM-13 (1)
6760-823-9708	1	Cable Release, Photographic Shutter, 12212-S, 09861
6760-242-5134	1	Cloth, Focusing, Photographic PH-130
6760-823-9711	1	Filter, Light, Photographic Lens, Series 7, type A, 8:3080
6760-283-9709	1	Filter, Light, Photographic Lens, Series 7, type A, 83080
6760-283-9712	1	Filter, Light, Photographic Lens, Series 7, type A, 83080
6760-256-9931	6	Holder, Photographic Film, LM-14 (1), 1238, 25734
6760-823-9705	1	Lens, Camera, General Photographic wide angle, 111 mm f/lg
6760-823-9713	1	Lens, Camera, General Photographic 165 mm f/lg
6760-823-9704	1	Lens, Camera, General Photographic 216 mm f/lg
6760-823-9703	1	Shade, Photographic Lens, 7S, 83080
6760-823-9707	1	Shade. Photographic Lens 7WA w/NO. 750 adapter and retaining ring, 83080
	1	Tripod, Photographic, model B floating action, M500

5.2. Expendable Consumable Items
A list of expendable consumable items required for operation appears in table 1-1.

Table 1-1. Expendable Consumable Supplies and Material

The supplies and material listed in this table are required for operation of this equipment and are authorized to be requisitioned by SB 700-50. The FSN for the applicable unit of issue required can be found in appropriate supply catalogs. The FSCM is used as an element in item identification to designate manufacturer or distributor or Government agency, etc, and is identified in SB 708-42.

Item	*Description*	*Ref No. and FSCM*	*FSC*
1	Paper Lens	SC-1	6640

Page 35, appendix II. Delete appendix II and substitute:

APPENDIX II
BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

1. Scope
This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of Camera Set, Still Picture KS-17A.

2. General
This Basic Issue Items and Items Troop Installed or Authorized List is divided into the following sect ions:

a. Basic Issue Items List - Section II. A list, in alphabetical sequence, of items which are furnished with, and which are furnished with, and which must be turned in with the end item.

b. Items Troop Installed or- Authorized List Section III. Not applicable.

3. Explanation of Columns.
The following provides an explanation of columns found in the tabular listings.

a. Illustration. This column is divided as follows:

(1) *Figure Number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item Number.* Not applicable.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. Description. Indicates the Federal item name and a minimum description required to identify the item.

f. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in, pr, etc).

When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. Quantity Furnished with Equipment (Basic Issue Items Only). Indicates the quantity of the basic issue item furnished with the equipment.

Section II. BASIC ISSUE ITEMS LIST

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)
(A) Fig. No.	(B) Item No.	Federal Stock Number	Part number	FSCM	Description Usable on code	Unit of meas	Qty furn with equip
1		6760-823-9702	MC-2457	09861	CAP, LENS FRONT	EA	3
1		6760-286-7870	MC-2458	09861	CAP, LENS REAR	EA	3
1		6760-823-9701	MC-2363	09861	CARRYING CASE. PHOTOGRAPHIC EQUIPMENT	EA	1
1		6760-893-2962	BA-44	04819	CARRYING CASE. PHOTOGRAPHIC TRIPOD	EA	1
1			MC-2363A	09861	SLING, CARRYING, BAG AND CASE, 1 in. W X 58 in. LG	EA	1

By Order of the Secretary:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

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AMC (1)
FORSCOM (1)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (4)
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MICOM (2)
TECOM (2)
USASTRATCOM (4)
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Armies (2)
Corps (2)
HISA (ECOM) (2)
Svc Colleges (1)
USASESS, (5)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTS (3)
WRAMC (1)
ATS (1)
Instl (2) except
Ft Gordon (10)
Ft Huachuca (10)
WSMR (1)
Ft Carson (10)
Ft Richardson (ECOM Ofc) (2)
Army Dep (2) except
LBAD (14)
SAAD (30)
TOAD (14)
ATAD (10))
Gen Dep (2)
Sig Sec Gen Dep (5)
Sig Dep (5)
Sig FLDMS (2)
USAERDAA (1)
USAERDAW (1)
MAAG (1)
USARMIS (1)
Units org under fol TOE:
(1 cy each)
11-16
11-96
11-117
11-158
11-500 (AA-AC)
29-134
29-136
30-25
30-26
30-500

NG & USAR: None
For explanation of abbreviations used, see AR 310-50

U.S. GOVERNMENT PRINTING OFFICE: 1973: 768109/289
811-096

TECHNICAL MANUAL

Operator's Manual

CAMERA SET, STILL PICTURE KS-17A

TM 11-6720-211-10
CHANGE NO. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *4 September 1963*

TM 11-6720-211-10, 7 August 1961, is changed as follows:

Page 3, paragraph 1. Add paragraph 1.1 after paragraph 1.

1.1. Index of Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to this equipment. DA Pam 310-4 is a current index of technical manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes and revisions of each equipment publication.

Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publication No. 378 (Navy), and AFR 71-4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended changes to DA technical manual parts lists or supply manual 7, 8, or 9) will be used for reporting these improvements. This form will be completed in triplicate using pencil, pen, or typewriter. The original and one copy will be forwarded direct to Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N.J., 07703. One information copy will be furnished to the individual's immediate supervisor (e.g., officer, noncommissioned officer, supervisor, etc.).

Page 28. Delete paragraph 30 and substitute:

30. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of the camera set are listed below, together with a reference to the paragraphs covering the specific maintenance functions.

a. Daily preventive maintenance checks and services (par. 32.2).

b. Weekly preventive maintenance checks and services (par. 32.3).

c. Visual inspection (par. 33).

d. Cleaning (par. 34).

e. Troubleshooting (par. 35).

Delete paragraph 32 and substitute:

32. Operator's Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 32.1, 32.2, and 32.3 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services chart (pars. 32.2 and 32.3) outlines functions to be performed at specific intervals. These checks and services are to maintain army electronic equipment in a combat serviceable condition; that is, in good general (physical) condition

***This change supersedes C 1, 9 November 1961.**

and in good operating condition. To assist operators in maintaining combat serviceability, the chart indicates what to check, how to check, and what the normal conditions are. The References column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by the operator, higher echelon maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

Add paragraphs 32.1, 32.2, and 32.3 after paragraph. 32.

32.1. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the camera, set are required on a daily and weekly basis.

a. Paragraph 32.2 specifies checks and services that must be accomplished daily and under the special conditions listed below.

(1) *Vehicular and transportable installation.*

(*a*) Before the vehicle or mobile unit starts on a mission.

(b) When the equipment is initially placed in service.

(*c*) When the equipment is returned to active service after being removed for any reason.

(*d*) At least once each week if the equipment is maintained in standby condition.

(2) *Fixed studio installation.*

(*a*) When the equipment is initially placed in service.

(*b*) When the equipment is returned to active service after being removed for any reason.

(*c*) At least once each week if the equipment is maintained in standby condition.

b. Paragraph 32.3 specifies *additional* checks and services that must be performed *once* each week.

32.2. Daily Preventive Maintenance Checks and Services

Sequence No.	Item	Procedure	Reference
1	Optical surfaces and mountings.	**Caution: Do not attempt to disassemble lenses to remove foreign matter from between lens elements. If internal cleaning is required, refer equipment to higher echelon for correction.** Remove dust and foreign matter from lenses, filters, and optical mountings.	Par. 34*a*.
2	Exterior surfaces.....	Remove dirt, dust, film chips, moisture, or other foreign matter from camera component, tripod, carrying case, tripod case, cut-film holders, etc., with a lint-free cloth.	Par. 34*b*.
3	Carrying case (fig. 1).....	Check carrying case for damage and improper seating of cover assembly. Carrying case must not be bent or broken; cover assembly must seat without forcing.	
4	Tripod case.....	Check tripod case and carrying strap for torn or frayed surfaces. Carrying case must be in good physical condition. Straps and cover flap must not be frayed or torn.	
5	Operation.....	During operation, be alert for unusual operating conditions.....	

32.3. Weekly Preventive Maintenance Checks and Services

Sequence No.	Item	Procedure	Reference
1	Camera Set, Still Picture KS-17A. Check the equipment for:		
	a. Completeness.....	*a*. Check to see that camera set (fig. 1) is complete	*a.* None.
	b. Cleanliness.....	*b*. Check to see that camera set components are clean, dry, and free of foreign matter.	*b*. Par. 34.
	c. Equipment markings	*c*. Check camera set to see that all equipment markings, and control and indicator markings are legible.	*c*. None.
	d. Publications.....	*d*. Check to see that pertinent publications are available, and that equipment manuals pertaining to operation and operational maintenance are complete and- in usable condition.	*d*. None.
2	Lens and shutter assemblies.	Check seating of lens and shutter assemblies in camera component. Lens and shutter assemblies must seat easily and be held firmly in position.	
3	Knobs, levers, and handles	Examine knobs, levers, and handles of camera set controls and indicators (pars. 12, 13, and 14) for bent, broken, or damaged parts. Control knobs, levers, and handles must be intact and firmly secured. Make sure that shutters are tripped before storing equipment.	

Page 29. Delete figure 10.

Page 30. Delete figure 11.

Page 35, appendix (as changed by C 1, 9 Nov 61). Redesignate the existing appendix as APPENDIX I and add the following additional references.

DA Pamphlets 310-4 Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.

TM 38-750 The Army Equipment Record System and Procedures.

Appendix II (as added by C 1, 9 Nov 61).

Delete appendix II and substitute:

APPENDIX II

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1.. Scope

a. This appendix lists items supplied for initial operation. The list includes tools, parts, and materials issued as part of the major end item. the list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis of requisitioning.

2. Columns

a. Source, Maintenance, and Recoverability Code. Not used.

b. Federal Stock Number. This column lists the 11-digit Federal stock number. In the absence of a Federal stock number, an interim number, for example, ‡L8Ra41C-12 in the description column, indicates that a Federal stock number is being processed for assignment. The L number may be used in emergencies to identify items.

c. Designation by Model. Not used.

d. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

e. Unit of Issue. The unit of issue is each unless otherwise indicated and is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

f. Expendability. Nonexpendable items are indicated by NX. Expendable items are not annotated.

g. Quantity Authorized. Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment.

h. Illustration. The "Figure No." column lists the figure and reference number used for identification of the items in the illustration.

Section II. FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPEND-ABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO.	(9) ILLUSTRATIONS ITEM NO.
	6720-823-9722		CAMERA SET, STILL PICTURE KS-174: a portable camera set for general					
			photography either outdoors or In studio Camera is 4x5 view type using cut film					
			or 12 exposure file pack Burke and James Inc part No. MC-2350					
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
							1	
	Ord thru AGC		TECHNICAL MANUAL TM 11-6720-211-10			2		
	6760-224-9714		ADAPTER, PHOTOGRAPHIC FILM PACK LM-13(1)			1	1	
	6760-823-9708		CABLE RELEASE, PHOTOGRAPHIC SHUTTER: Burke and James, Inc part No. 12212-S			1	1	
	6760-823-9702		CAP, LENS: front Burke and James, Inc part No. MC-2457			3	1	
	6760-286-7870		CAP, LENS: rear Burke end James, Inc part No. MC-2458			3	1	
	6760-823-9701		CARRYING CASE, PHOTOGRAPHIC EQUIPMENT: Burke and James, Inc part					
			No.MC-2363			1	1	
	6760-093-2962		CARRYING CASE, PHOTOGRAPHIC TRIPOD: Davis and Sanford Co P/N BA-44			1	1	
	6760-242-5134		CLOTH, FOCUSING, PHOTOGRAPHIC PI-130			1	1	
	6760-823-9711		FILTER LIGHT, PHOTOGRAPHIC LENS: Ednalite Optical Co Series 7 type A			1	1	
	6760-823-9710		FILTER, LIGHT, PHOTOGRAPHIC LENS: Ednalite Optical Co Series 7 type G			1	1	
	6760-823-9709		FILTER, LIGHT, PHOTOGRAPHIC LENS: Ednalite Optical Co Series 7 type K2			1	1	
	6760-823-9712		FILTER, LIGHT, PHOTOGRAPHIC LENS: Ednalite Optical Co Series 7 polascreen type			1	1	
	6760-256-9931		HOLDER, PHOTOGRAPHIC FILM LM-14(l): Graflex part No.1238			6	1	
	6760-823-9705		LENS, CAMERA, GENERAL PHOTOGRAPHIC: Wide angle, 111mm f/lg		NX	1	1	
	6760-823-9713		LENS, CAMERA, GENERAL PHOTOGRAPHIC: 165mm f/lg,		NX	1	1	
	6760-823-9704		LENS, CAMERA, GENERAL PHOTOGRAPHIC: 216mm f/lg		NX	1	1	
	6640-393-2090		PAPER, LENS: Starr Corp part No. SC1	pkg		5		
	6760-823-9703		SHADE, PHOTOGRAPHIC LENS: Ednalite Optical Co part No. 7S			1	1	
	6760-823-9707		SHADE, PHOTOGRAPHIC LENS: Ednalite Optical Co part No. TWA w/No.750 adapter			1	1	
			and retaining ring					
			SLING, CARRYING, BAG AND CASE: 1 in w x 58 in lg Burke and James			1	1	
			part No. MC-2363A ††L1WD41-15					
			TRIPOD, PHOTOGRAPHIC: Davis and Sanford part No. 11500 model B floating		NX	1		
			action ††L1WD41-79					
			RUNNING SPARES AND ACCESSORY ITEMS					
			NO PARTS AUTHORIZED FOR STOCKAGE AT FIRST ECHELON					

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

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Instl (2) except
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Br Svc Sch (2) except
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Sig Dep (OS) (12)
Sig Sec, GENDEP (5)
Army Dep (2) except
Ft Worth (8)
Lexington (12)
Sacramento (28)
Tobyhanna (12)
USA Elct RD Actv, White Sands (13)
USA Elct RD Actv, Ft Huachuca (2)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
USAOSA (1)
AMS (1)
WRAMC (1)
AFIP (1)
Army Pic Cen (2)
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Sig Fld Maint Shop (3)
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11-7
11-16
11-57
11-96
11-97
11-98
11-117
11-155
11-157
11-500 (AA-AE) (4)
11-557
11-587
11-592
11-597
30-25
30-26
30-500 (AA-AE)

NG: State AG (3); units same as active Army except allowance is one copy each unit.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

☆U. S. GOVERNMENT PRINTING OFFICE: 1974--553258

Technical Manual
NO. 11-6720-211-10

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *7 August 1961*

CAMERA SET, STILL PICTURE KS-17A

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Camera Set, Still Picture KS-17A (fig. 1) and covers its installation, operation, and operator's maintenance. It includes operation under unusual conditions, and cleaning aid inspection of the equipment.

b. The maintenance allocation chart will appear in the second echelon portion of the technical manual.

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out and forward DA Form 468 (unsatisfactory Equipment Report) to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMSML, Fort Monmouth, N.J., as prescribed in AR 700-38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58.

c. Preventive Maintenance Forms. Prepare DA Form 11-254 (Maintenance Check List for Signal Equipment (Still and Motion Picture Camera)) (fig. 10 and 11) in accordance with the instructions on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9) direct to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N.J., with comments on parts listings.

e. Comments on Manual. Forward any additional comments on this publication direct to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth, N.J.

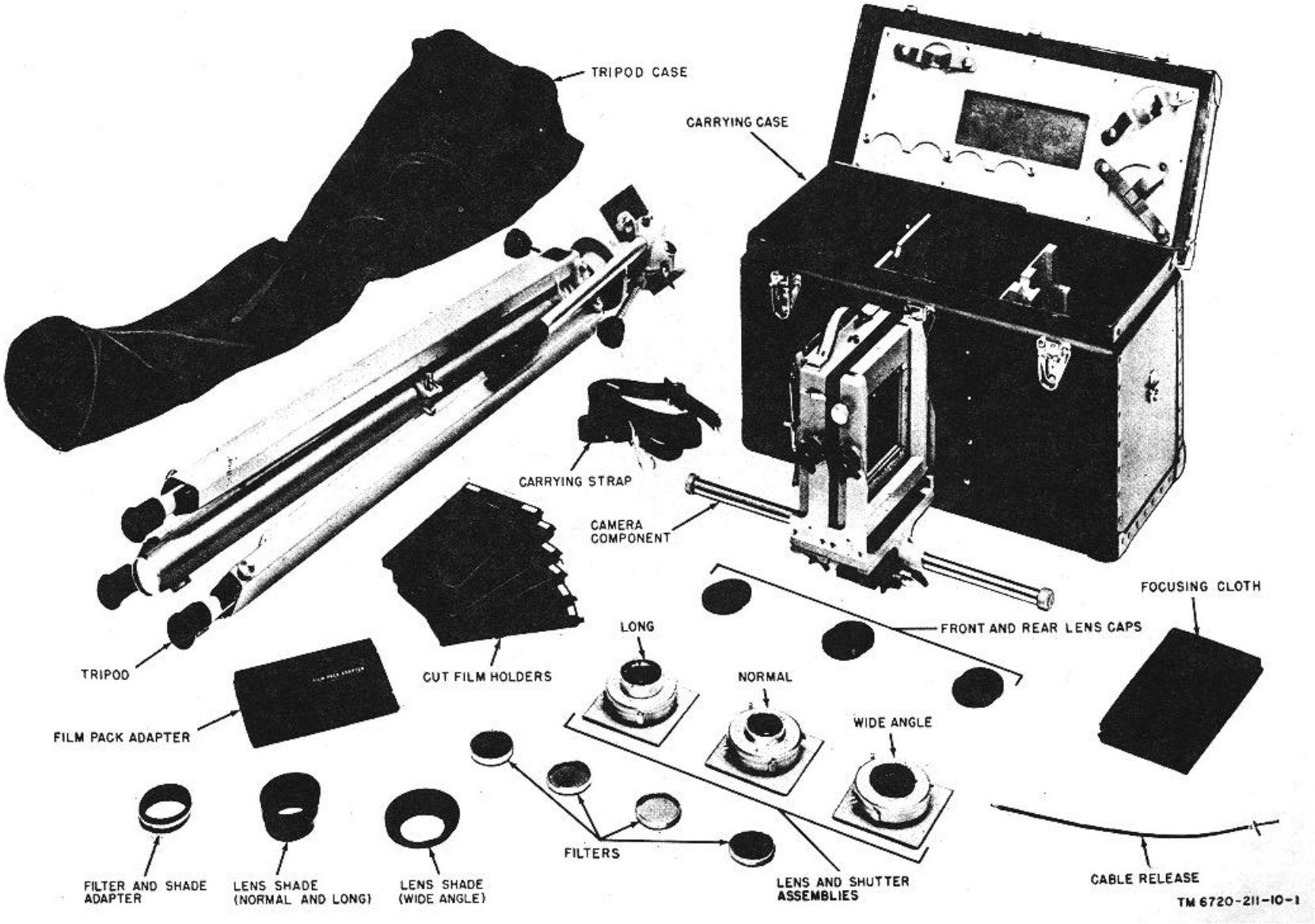


Figure 1. Camera Set, Still Picture KS-17A, components.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Purpose. Camera Set, Still Picture KS-17A is a self-contained portable view camera. The KS-17A is used to make still photographs using 4- by 5-inch cut film or film pack.

b. Use. The KS-17A is intended for use under field conditions and can be operated by personnel wearing mittens. The equipment can be used or stored under extreme temperature conditions.

4. Technical Characteristics

Camera:	
Type	View, still picture, rotating back.
Format	4 by 5 inch.
Film accommodation	Cut film or film pack.
Lenses	Wide angle, normal, and long (mounted on individual lensboards with between-the-lens shutters).
Camera component:	
Bed	Monorail.
Front adjustments	Tilt, swing, slide, and elevation.
Tilt	26° maximum from plane perpendicular to monorail bed.
Swing	12° maximum in either direction from plane perpendicular to monorail bed.
Slide	7/8 inch maximum left or right from centerline of monorail bed.
Elevation	3 inch maximum rise, 1 inch maximum drop from normal (centered) position.
Back adjustments	Tilt, swing, slide, and rotation.
Tilt	26° maximum from plane perpendicular to monorail bed.
Swing	12° maximum in either direction from plane perpendicular to monorail bed.
Slide	7/8 inch maximum left or right from centerline of monorail bed.
Rotation	360° in either direction.
Bellows draw	15 inches.
Lens and shutter assemblies:	
Lenses:	
Wide angle:	
Type	Anastigmatic, f/8 coated glass-air surfaces.
Mounting	Between-the-lens shutter.
Focal length	111 millimeters.
Angle of field	39° maximum.
Normal:	
Type	Anastigmatic, f/4.5, coated glass-air surfaces.
Mounting	Between-the-lens shutter.
Focal length	165 millimeters.
Angle of field	25° maximum.
Long:	
Type	Anastigmatic, f/6.3, coated glass-air surfaces.
Mounting	Between-the-lens shutter.
Focal length	216 millimeters.
Angle of field	21-1/2° maximum.
Shutters (common to all lens and shutter assemblies):	
Type	Between-the-lens.
Size	No. 3.
Speeds	1/200, 1/100, 1/50, 1/25, 1/10, 1/5, 1/2, and 1 second, bulb and time.
Diaphragm stops:	
Wide angle lens	f/8, f/11, f/16, f/22, f/32, and f/45.
Normal lens	f/4.5, f/5.6, f/6.4, f/8, f/11, f/16, f/22, and f/32.
Long lens	f/6.3, f/8, f/11, f/16, f/22, f/32, and f/45.
Synchronism	Built-in electrical contacts, continuously adjustable from 0 to 20 milliseconds with designated color dot settings, separate cocking.
Designated settings:	
Red dot	20 milliseconds delay.
Blue dot	5 milliseconds delay.
White dot	0 millisecond delay.
Lens caps	Velvet lined, friction fit.
Filters:	
Type	Type II gelatine.
Quantity	4 (K2, G, and A, and pola screen).
Mounting	B-glass.
Size	Series VII.
Lens shades:	
Quantity	2 (wide angle lens and normal and long lens).
Mounting	Screw in.
Size	Series VII.
Filter and shade adapter:	
Accommodation	Filter and/or lens shade.
Mounting	Friction fit over front lens barrel.

Cable release	10 inches long with locking device.
Focusing cloth	48 by 70 inches.
Cut filmholders:	
Type.....	Double-sided, equipped with slide locks.
Film accommodated	Cut film, 4 by 5 inch, 2 sheets.
Film pack adapter.....	Accommodates one 4- by 5-inch film pack.
Tripod:	
Type.....	Floating action with panhead.
Closed length	44 inches.
Leg extension.....	24-1/2 inches maximum.
Maximum height of panhead.....	90 inches.
Rotation of panhead	360°.
Tilt of panhead	150°.
Temperature and environmental ranges:	
Temperature:	
Operation	-35° F to +120° F.
Storage temperature.....	-65° F to +160° F.
Relative humidity	Up to 90 percent.
Elevation.....	Up to 10,000 feet above sea level.

5. Components of Camera Set, Still Picture KS-17A
(fig. 1)

The components of Camera Set, Still Picture KS-17A are listed in the following chart.

Quantity	Item	Dimensions (in.)			
		Height	Depth	Width	Weight (lb)
1	Camera component	11.75	20.125	8.625	10.25
1	Lens and shutter assembly (wide angle, 111 mm)	4	1.313	4	1.00
1	Lens and shutter assembly (normal, 165 mm)	4	1.5	4	1/20
1	Lens and shutter assembly (long, 216 mm)	4	1.875	4	1.25
3	Front lens cap		0.313	2.094 (dia)	0.03
3	Rear lens cap		0.313	2 (dia)	0.03
1	Cable release	0.5	12	0.75	0.03
1	Filter and shade adapter'		0.75	2 (dia)	0.05
1	Lens shade (wide angle)		0.75	3.25 (dia)	0.05
1	Lens shade (normal and long)		1.375	2.625(dia)	0.11
4	Filter, type II, gelatine (red A, deep yellow G, yellow K2, and pola screen)		0.25	2 (dia)	0.03
1	Focusing cloth		48	40	0.50
6	Cut filmholder	7.313	0.563	4.75	0.38
1	Film pack adapter	7.375	0.875	0.875	0.56
1	Tripod	44	7	9.5	14.50
1	Tripod case		44	10 (dia)	1.63
1	Carrying case	13.75	11.75	21.75	9.50
1	Carrying strap	1	55	1.75	0.44

6. Common Names
(fig. 1)

Common names have been assigned to the items listed below.

Item	Common name
Camera Set, Still Picture KS-17A	Camera set
Camera, still picture (basic unit)	Camera component
Camera, still picture (with a lens and shutter assembly attached)	Camera
Adapter, Photographic Film Pack LM-13(1)	Film pack adapter
Holder, Photographic Film LM-14(1)	Cut-film holder
Cable release, photographic shutter	Cable release
Cap, lens, front	Front lens cap
Cap, lens, rear	Rear lens cap
Carrying case, photographic equipment	Carrying case
Carrying case, photographic tripod	Tripod case

Item	Common name
Cloth PH-130-A	Focusing cloth
Filter, light, photographic lens	Filter
Lens, camera, general photographic	Lens and shutter assembly
Shade, photographic lens	Lens shade
Sling, carrying, bag case	Carrying strap
Tripod, photographic (with panhead attached)	Tripod

7. Description of Camera Set, Still Picture KS-17A

a. Camera Set, Still Picture KS-17A (fig. 1) includes two major components (camera component and tripod) and various minor components. The minor components consist of three lens and shutter assemblies (mounted on individual lens boards), a cable release, three sets of front and rear lens caps, two lens shades, four filters (red, yellow, deep yellow, and pola screen), a filter and shade adapter, a focusing cloth, tripod case, six cut-film holders and a film pack adapter, a carrying strap and a carrying case.

b. The camera component and the minor components are stored in the carrying case (fig. 2). The tripod (with the attached panhead) (fig. 1) is stored in the tripod case.

8. Description of Camera Set Components

a. Camera Component. The camera component, with a lens and shutter assembly attached, is a monorail bed view camera (fig. 3). Focusing is accomplished by means of front and rear carriage adjust knobs (fig. 5). An adjustable mounting adapter permits positioning the monorail bed so that the camera's center of gravity is over the point of attachment to the panhead (fig. 3). The camera has provisions that permit vertical tilt, horizontal swing, and lateral and vertical movement of the optical axis and film plane with respect to each other. Click stops facilitate returning movable parts to their normal resting position. A rack and pinion gear arrangement allows the lens and shutter assembly to be raised or lowered with respect to the camera's film plane. A camera level vial (fig. 5) is provided on top of the rear frame to facilitate the leveling of the camera when it is set up for operation. A lift handle (fig. 6) attached to the revolving back permits the cut-film holder and film pack adapter to be inserted in the camera easily. A 360° revolving back arrangement permits composing and making vertical or horizontal photographs without disturbing the camera's position on the tripod.

b. Tripod. The tripod (fig. 3) is equipped with a detachable panhead and a spring-loaded central support column (center post). The center post can be raised or lowered in a center post tube to which the three telescoping legs are attached. Each leg telescopes in two sections and is equipped with a rubber foot. A spirit level vial (fig. 6) is provided on the panhead to facilitate leveling the equipment when it is set up for operation.

c. Lens and Shutter Assemblies and Lens Caps. The lens and shutter assemblies furnished with the camera set are mounted on individual lens boards (fig. 8). Each shutter is fitted to accept a cable release and has a built-in adjustable time delay synchronization mechanism for synchronized flash photography. The glass-to-air surface of each lens is coated to reduce internal reflections. A pair of velvet-lined lens caps (front and rear) is furnished for each of the three lenses to protect the exposed optical surfaces when the lens is not in use. The lens caps are interchangeable since the optical parts of each lens and shutter assembly are mounted in barrels having the same outside diameter (51 millimeters).

d. Cable Release, Filters and Lens Shades. The cable release (fig. 8) supplied with the camera set is flexible and equipped with a plunger and lock on one end. The other end has a threaded tip

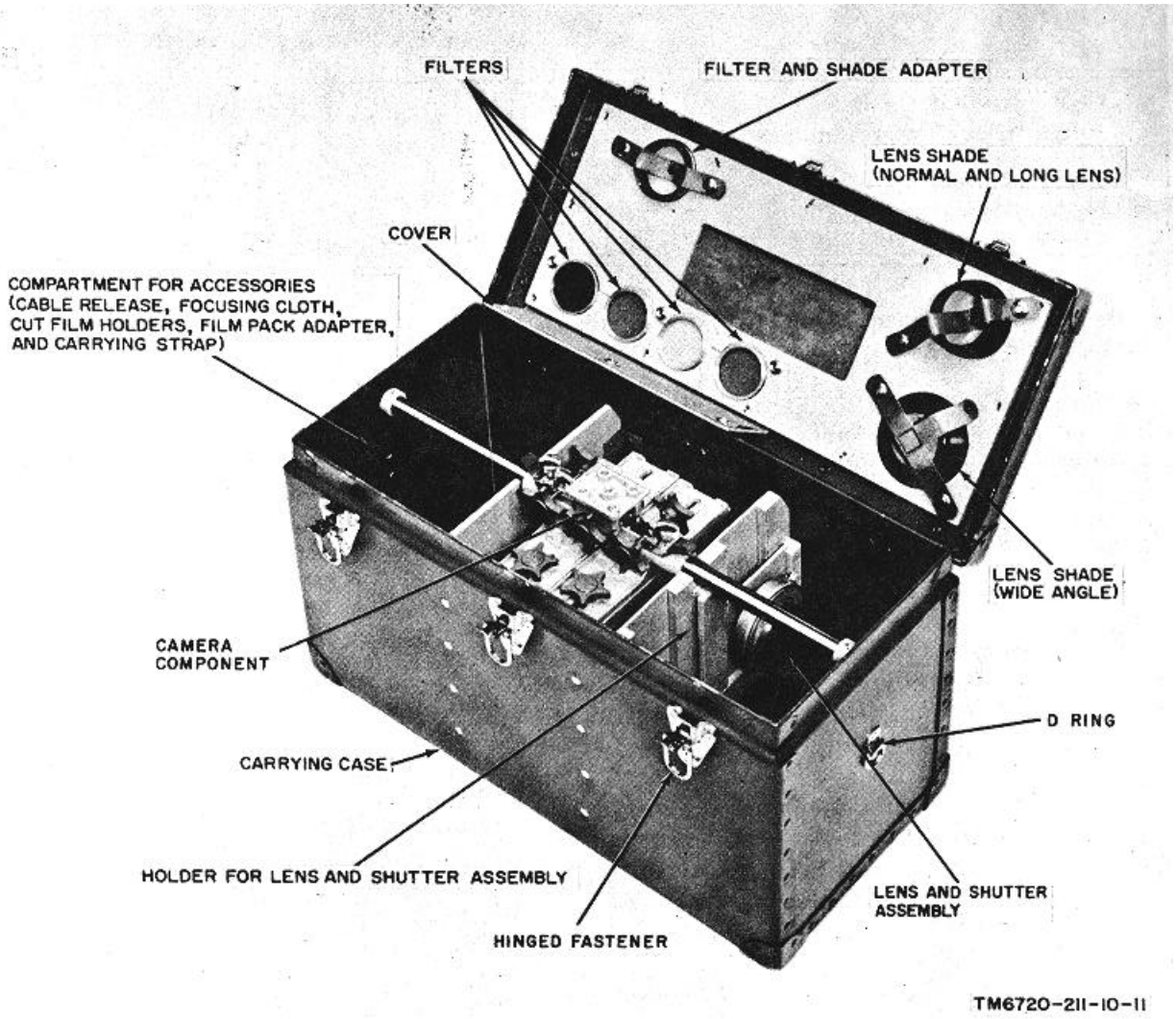


Figure 2. Carrying case, interior view.

which fits the cable release socket on each of the three lens and shutter assemblies. The filter and shade adapter (fig. 1) has a removable retaining ring and an adapter which fits over each of the three lenses. Either the normal and long lens shade or the wide angle lens shade can be screwed into the adapter. The filter and shade adapter will accommodate any of the gelatine (optical glass mounted) filters supplied as part of the camera set.

e. Cut-Film Holders and Film Pack Adapter. The dark slides of the cut-film holders and the film pack adapter have raised identification dots (A, fig. 9) for side identification in the dark. Each cut-film holder accepts two sheets of 4- by 5-inch sheet film. The film pack adapter accepts one 4- by 5-inch film pack containing 12 sheets of film.

f. Carrying Case, Carrying Strap, Focusing Cloth, and Tripod Case. The carrying case (fig. 2) has compartments to accept all the camera set components except the tripod (and attached panhead), which is stored in its own tripod case. The camera component is supported in the center compartment of the carrying case. The minor components are stored in the end compartments with the exception of the filters, filter and shade adapter, and lens shades. These items are stored in the specially fitted cover of the carrying case. A handle (not shown) on top of the carrying

case and a carrying strap that is attachable to the D-rings on the ends of the carrying case, permit carrying the enclosed equipment off the shoulder or in the hand. Three hinged fasteners on the carrying case secure the cover. The tripod case is equipped with snap fasteners to secure the opening end. A handle on the side of the tripod case facilitates transporting the tripod.

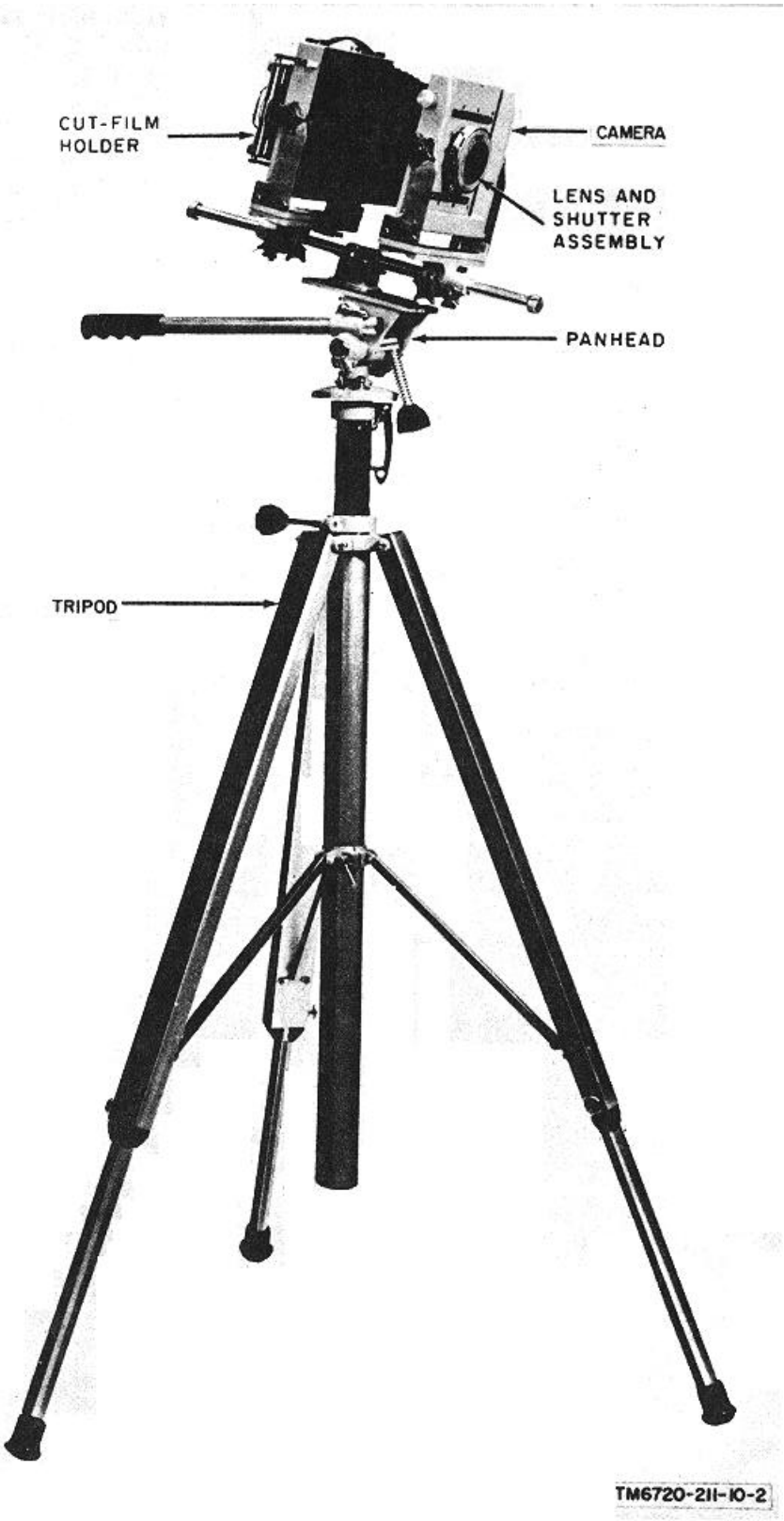


Figure 3. Camera mounted on tripod.

CHAPTER 2

SERVICE UPON RECEIPT OF EQUIPMENT

9. Unpacking

(fig. 4)

a. Packaging and Packing Data. The camera set is packed and shipped in two corrugated fiberboard cartons; one contains the carrying case with the camera component and minor components packed inside; the other contains the tripod case with the tripod enclosed. The approximate dimensions, volumes, and weights of the corrugated fiberboard cartons that contain the camera set are listed in the chart below.

Item	Approximate dimensions (in.)	Volume (cu ft)	Weight (lb)
Carrying case, including camera component and minor components.	23 x 15 x 13	2.3	30
Tripod case including tripod.....	46 x 10-1/2 x 8	3.2	22

b. Unpacking Camera Set.

Note.

When two or more camera sets are shipped to one location, the cartons that contain the camera sets are packed in a wooden crate. Carefully open the wooden crate and remove the cartons.

(1) Open the outer cartons and slit the heat-sealed vaporproof barriers.

(2) Remove the inner cartons.

(3) Carefully cut open the inner cartons and take out the carrying case and tripod case that contain the tripod.

(4) Open the carrying case and remove any packing material used to prevent damage to the minor components during shipment.

(5) In original shipment, various minor components are shipped in the original cartons. Remove the items from the original cartons and place them in the carrying case as shown in figure 2.

(6) Open the tripod case and remove the tripod.

Warning:

Do not loosen the center post lock knob (fig. 6). The center post is heavily spring-loaded and will eject with great force if the center post lock knob is loosened with no load on the panhead. Serious injury may result.

10. Checking Unpacked Equipment

a. Check the camera component, tripod, and minor components for bent, broken, or missing parts.

b. Check the snap fasteners on the tripod case and hinged fasteners on the carrying case for firm closure.

c. Check exposed optical and glass parts for broken, cracked, or scratched surfaces.

d. Check the overall equipment for any loss or damage that may have occured during shipment. If the equipment has been damaged or is incomplete, refer to paragraph 2.

e. Check the equipment against the packing list. When no packing list accompanies the equipment, the table of components (para 5) may be used as a general check to indicate the equipment which probably has been packed.

f. If the equipment has been used or reconditioned, check to see whether it has been changed by a modification work order (MWO). If modified, the MWO number will be marked on the carrying case near the nomenclature plate.

11. Checking Operation of Assembled Components

After completing the unpacking procedures (para 9) and checking procedures

(para 10), assemble and check the operation of the equipment as follows:

a. Set up the tripod (para 16).

b. Check the operation of the tripod controls (para 13) for proper operation.

c. Attach the camera component to the tripod panhead (para 17).

d. Operate the camera component controls (para 12); check for smoothness and ease of operation and effectiveness of locking devices.

e. Remove the front and rear lens caps from one of the three lens and shutter assemblies.

f. Install the lens and shutter assembly on the camera component (para 18*b*).

g. Operate the shutter controls (para 14).

h. Check each control and its function for ease and smoothness of operation.

i. Remove the lens and shutter assembly from the camera component.

j. Install the front and rear lens caps on the lens and shutter assembly and return the lens and shutter assembly to the carrying case.

k. Repeat the procedures in e through j above for each of the remaining lens and shutter assemblies.

l. After completing the assembly and checking procedures (*a* through *k* above) and if the camera is not to be used, disassemble the equipment and return it to the carrying case and tripod case.

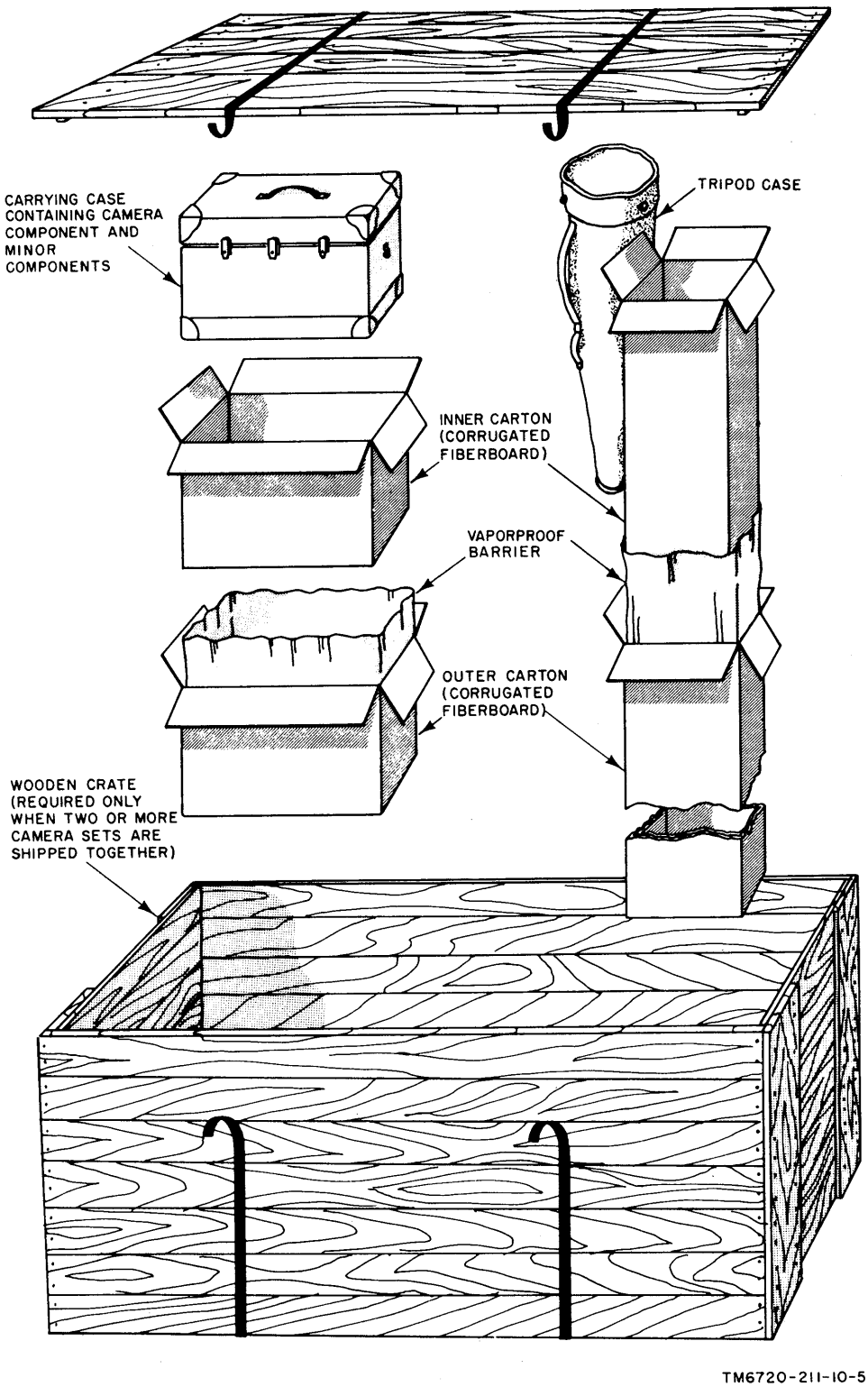


Figure 4. Camera Set, Still Picture KS-17A, packaging diagram.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INDICATORS

12. Camera Component Controls and Indicators

Control	Function
Camera mount lock (fig. 5).	Locks camera mount on monorail bed. When loosened, permits change of camera mount position on monorai4 bed.
Camera mount adjust knob (fig. 6).	Positions camera mount on monorial bed.
Rear carriage lock knob (fig. 5).	Locks rear carriage on monorail bed. When loosened, permits rear carriage to slide on monorail bed.
Rear carriage adjust knob.	Positions rear carriage on monorail bed.
Rear carriage release lever.	When raised, permits rapid sliding of rear carriage along monorail bed.
Back lift handle (fig. 6).	Raises pressure back to facilitate cut-film holder and film pack adapter insertion.
Back lock crank.	Locks revolving back in rotational position selected. When loosened, permits rotation of revolving back.
Rear slide and swing lock knob.	Locks rear frame (fig. 5) on rear carriage. When loosened, permits swinging and/or sliding of rear frame on rear carriage.
Rear-pivot lock knob (fig. 5).	Locks rear frame at degree of vertical tilt selected. When loosened, permits change in degree of vertical tilt.
Front carriage lock knob.	Locks front carriage on monorail bed. When loosened, permits front carriage to slide on monorail bed.
Front carriage adjust knob.	Adjusts position of front carriage on monorail bed.
Front carriage release lever.	When raised, permits rapid sliding of front carriage on monorail bed.
Front slide and swing lock knob (fig. 6).	Locks front frame in position on front carriage. When loosened, permits swinging and/or sliding of front frame on front carriage.
Front pivot !lock knob (fig. 5).	Locks front frame in degree of vertical tilt selected. When loosened, permits change in degree of tilt.
Camera level vial.	Facilitates leveling camera component.
Pinion knob (fig. 8).	Raises and lowers lens board mounting plate.
Lens board retainer.	Secures lens board to lens board mounting plate.

13. Tripod Controls and Indicator

Control or indicator	Function
Leg thumbscrews (fig. 7).	Locks telescoping legs in position. When loosened, permits telescoping legs to be lengthened or shortened.
Leg lock handle.	Locks telescoping legs at angle selected with respect to support column tube. When loosened, permits angle of telescoping legs to be changed.
Center post lock knob.	Locks center post in position. When loosened, permits adjustment of center post height.
Rotation lock knob (fig. 6).	Locks panhead swivel in position. When loosened, permits rotation of panhead swivel.

Control or indicator	Function
Tilt lock knob (fig. 7).	Locks panhead platform in position. When loosened, permits changing panhead platform angle of tilt.
Panhead locking lever (fig. 6).	Clamps base casting to center post.
Control handle (fig. 7).	Rotates and tilts panhead.
Handle lock.	Locks control handle to handle bracket.
Handle bracket lock.	Locks handle bracket on cross shaft.
Latch (fig. 6).	Secures center post in telescoped position.
Leveling locks (fig. 7).	Secure head casting to base casting.
Panhead level vial (fig 6).	Facilitates leveling tripod.
Camera thumbscrew.	Secures camera to panhead.
Camera locknut.	Secures camera thumbscrew to panhead platform.

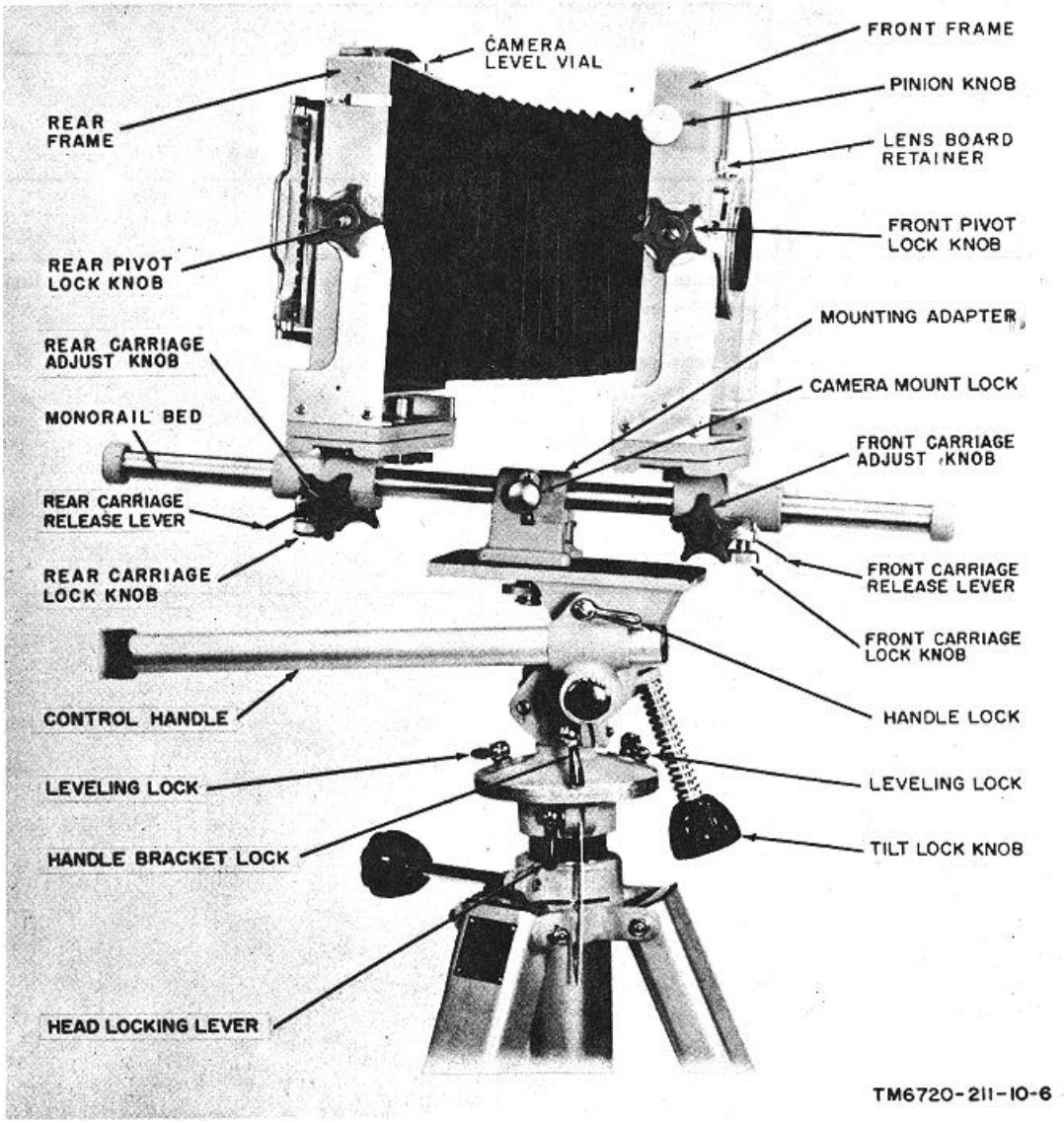


Figure 5. Camera component and tripod, right side view, operating controls.

14. Lens and Shutter Assembly Controls and Indicators
(fig. 8)

a. Controls.

Control	Function
Speed selector ring	Sets shutter speed exposure timing.
Lens opening selector	Sets diameter of lens opening (f/stop).
Cocking lever	Sets up shutter for tripping by tensioning actuating spring.
Focus button	Opens cocked shutter for focusing.
Release lever	Trips shutter actuating mechanism.
Cable release	Remotely trips shutter actuating mechanism.
Synchronism adjustment wheel wheel.	Adjust internal shutter synchronization delay for flashlamp and electronic flash use.
Synchronization cocking lever.	Sets up shutter synchronizing mechanism for operation.

b. Indicators.

Indicator	Function
Speed scale	Indicates length of time (in seconds) shutter will remain open during an exposure.
Fiducial mark	Indicates effective shutter speed setting.
f/stop scale	Indicates relative diameter of lens opening (f/stop opening) with respect to lens focal length.
Synchronism adjustment wheel (color dot markings).	Indicates effective synchronism contact closing before shutter reaches maximum opening: *Color Dot* — *Milliseconds Delay* White — 0 Blue — 5 Red — 20

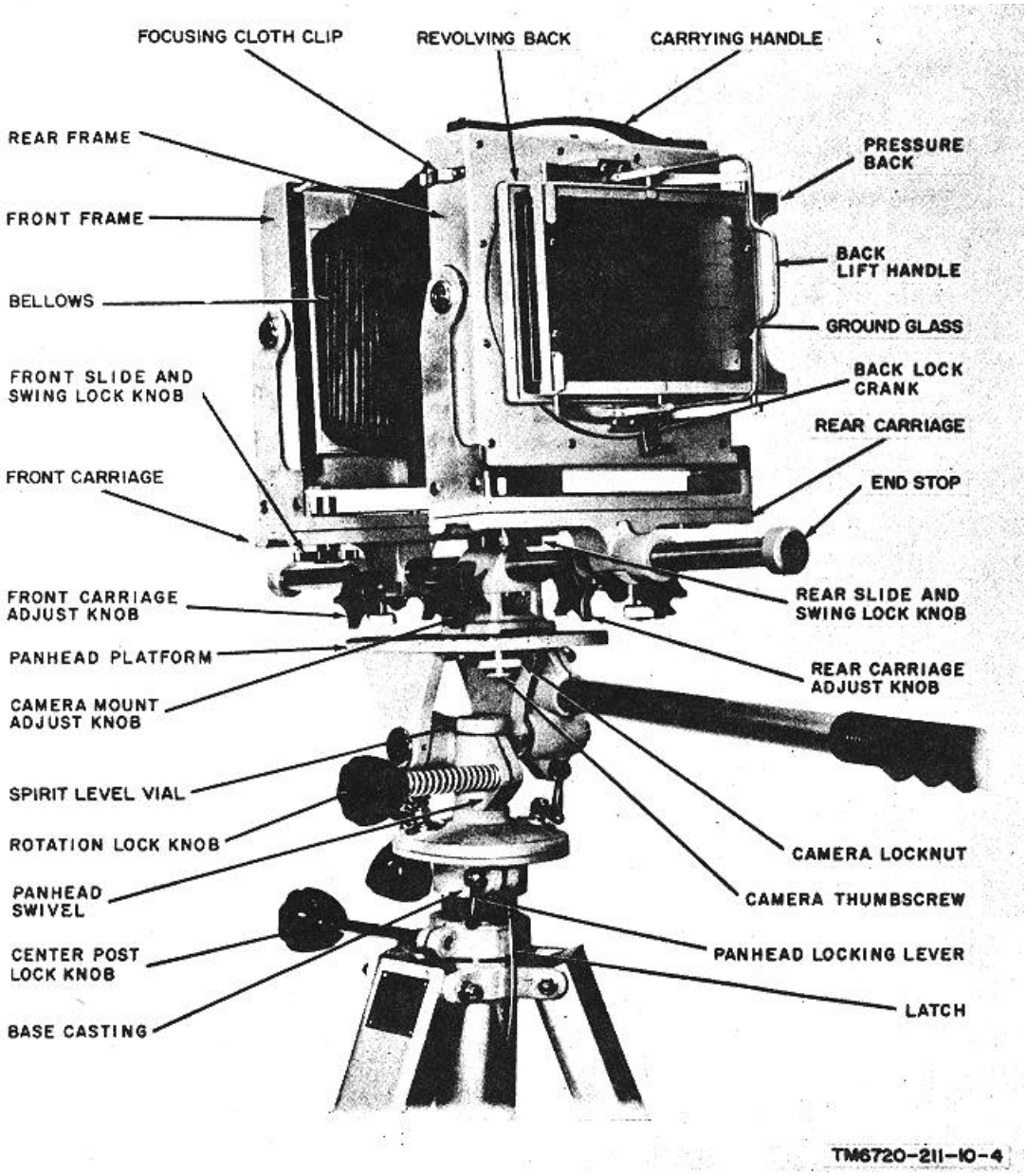


Figure 6. Camera component, left rear view, operating controls.

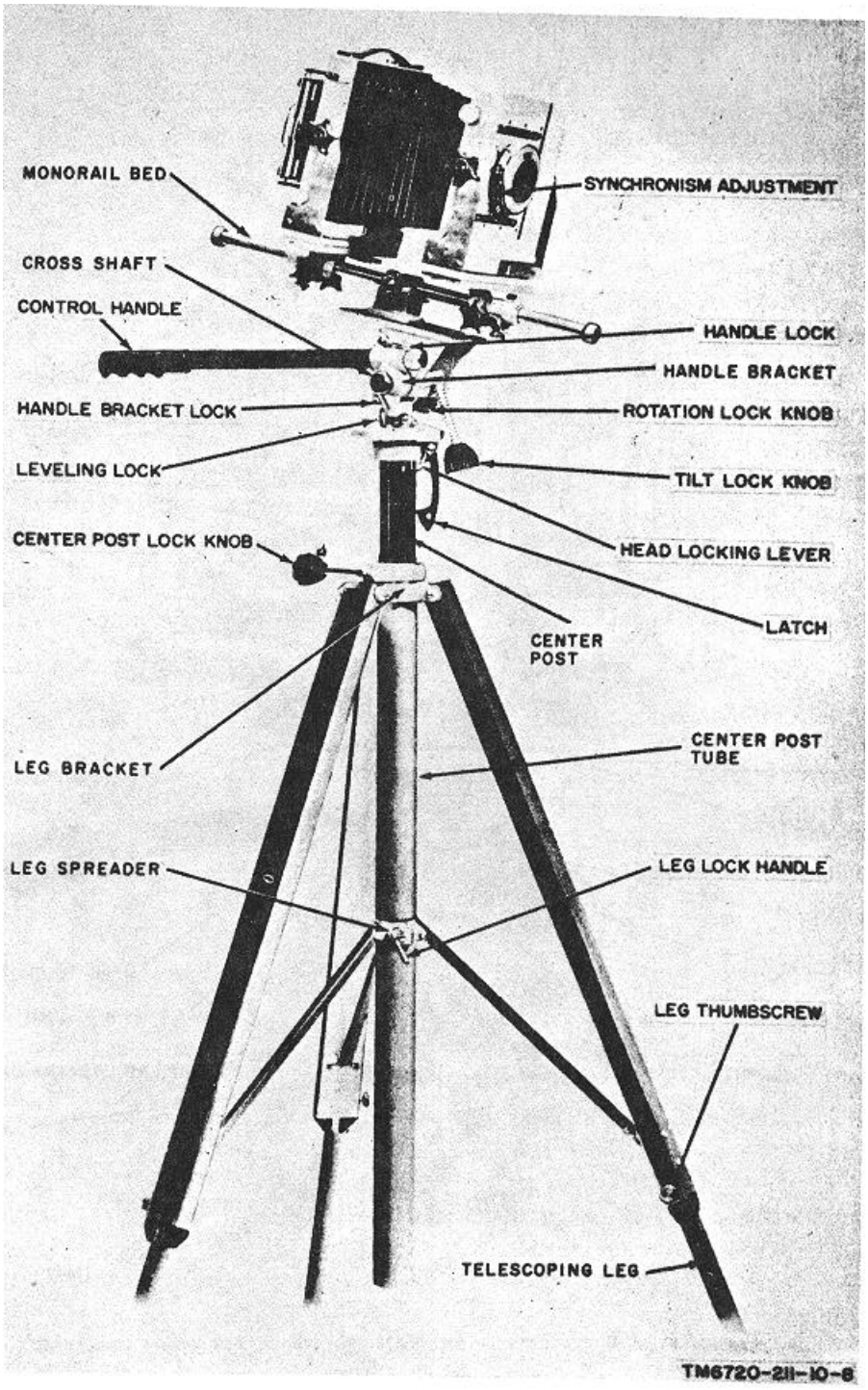


Figure 7. Tripod, operating controls.

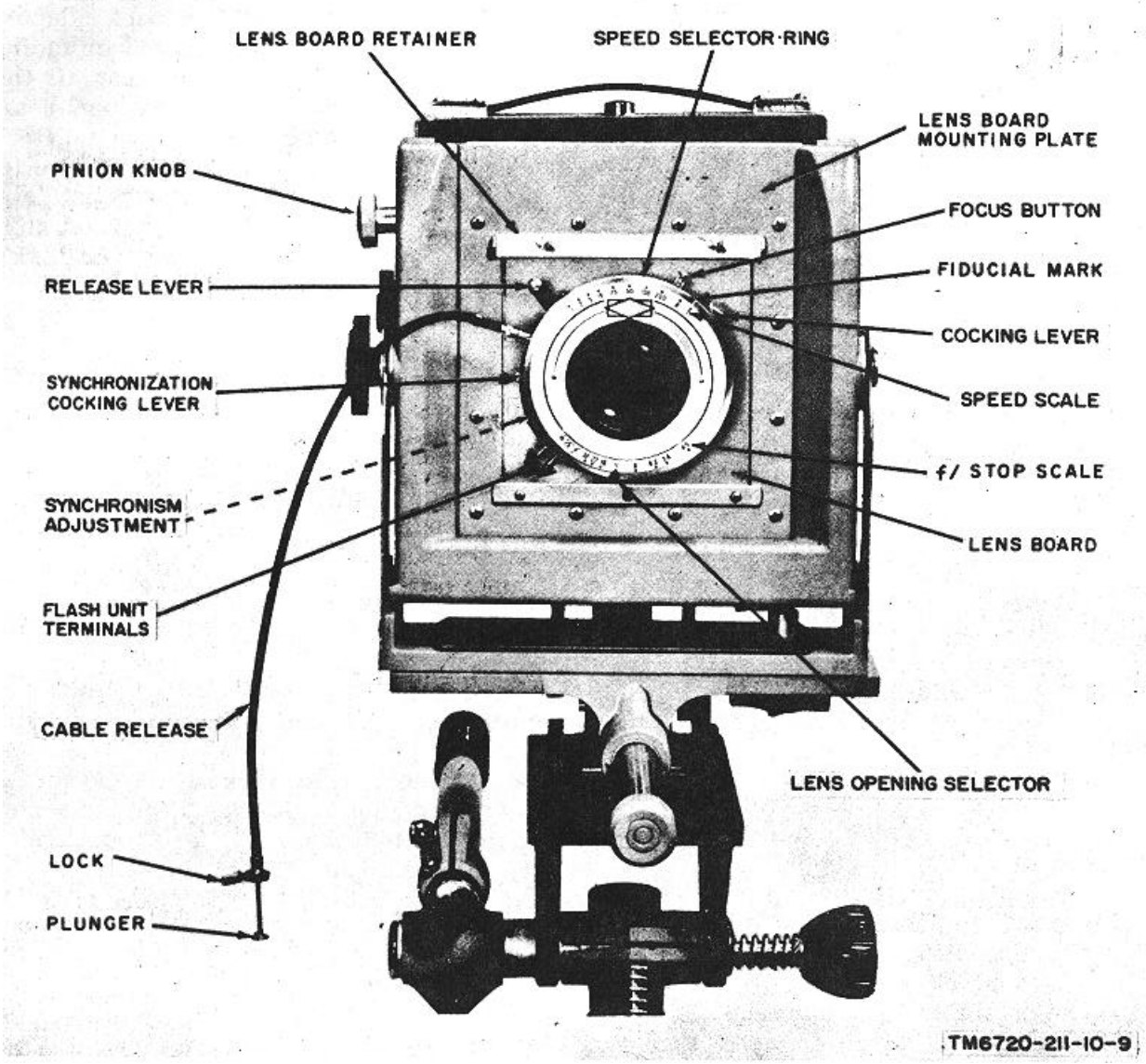


Figure 8. Controls on lens and shutter assembly.

Section II. PRELIMINARY PROCEDURES

15. Film Loading

The 4- by 5-inch film or film pack used will depend. on the individual situation and mission to be accomplished. Instructions for loading the cut-film holders and the film pack adapter are outlined in a and b below. Refer to TM 11-401 and the film manufacturer's instruction sheet (packed with the film to be used) for additional information.

a. Loading Cut-Film Holders (A, fig. 9). Load the cut-film holders only in a darkroom. Panchromatic film must be handled in total darkness. Other films may be handled in a darkroom equipped with a recommended safelight.

(1) Withdraw the dark slide from the cut-film holder.

(2) Swing the bottom flap out to open the bottom of the cut-film holder.

(3) Grasp a sheet of cut film by the edges so that the emulsion (dull) side is up and the identification notches are in the upper right-hand corner as shown.

Note

The identification notches may be felt with the right index finger when the unnotched shorter edge is toward the operator.

(4) Slip the corners of the unnotched shorter edge of the cut film under the film slips (along each long side of the septum) and slide the cut film completely into the cut-film holder.

(5) Swing the bottom flap closed and hold down firmly.

(6) Insert the dark slide into the slide with the channel so that the raised identification dots face away from the cut-film holder.

(7) Push the dark slide all the way into the cut-film holder; make sure the end of the leading edge of the dark slide engages the groove along the edge of the bottom flap.

(8) Turn the slide hook over the end of the dark slide to prevent accidental removal of the dark slide.

(9) Load the reverse side of the cut film holder by repeating the procedures in (1) through (8) above.

(10) Load additional cut-film holders by repeating the procedures in (1) through (9) above.

b. Loading Film Pack Adapter (B, fig. 9). The film pack adapter may be loaded under existing lighting conditions. Do not expose the film pack to direct sunlight during loading.

(1) Make sure the dark slide is inserted in the film pack adapter.

(2) Simultaneously press the two cover release studs to open the cover.

(3) Unwrap the film pack and insert in the film pack adapter as shown.

Caution

Hold the film pack carefully by the sides. Do not depress the black safetypaper cover or twist the metal frame; to do so may cause light to enter the film pack.

(4) Make sure that the film pack is inserted in the film pack adapter with the paper safety cover facing, the dark slide, and that all the paper tabs rest in the paper tab slot.

(5) Close the cover; make sure it latches and that all the paper tabs are centered in the paper tab slot.

(6) Draw out the safety cover to its stop (about 5 inches) and tear it off.

16. Setting up Tripod

Remove the tripod from the tripod case and set it up as follows:

a. Loosen the three leg thumbscrews (fig. 7) and extend the three telescoping leg extension. Perform this operation with the telescoping legs closed against the center post tube so that all three legs can be extended approximately the same amount.

b. Tighten the leg thumbscrews to secure the telescoping legs in their extended position.

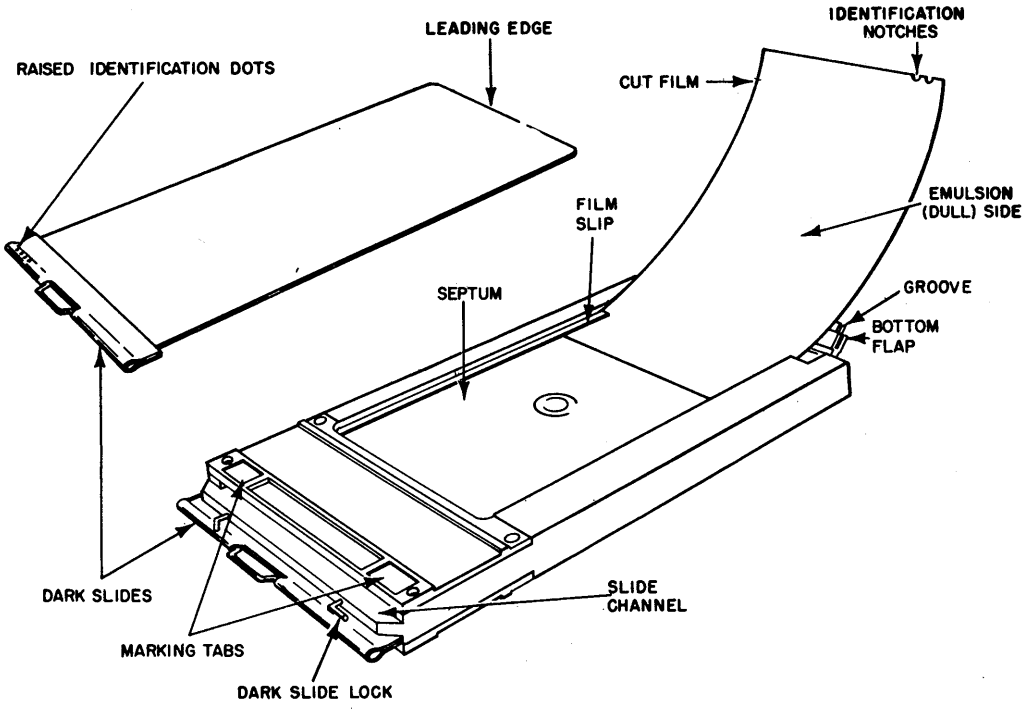
c. Loosen the leg lock handle and spread the telescoping legs away from the center post tube to provide a firm stance. Tighten the leg lock handle securely.

d. Loosen the tilt lock knob and place the top surface of the panhead in an approximately horizontal position.

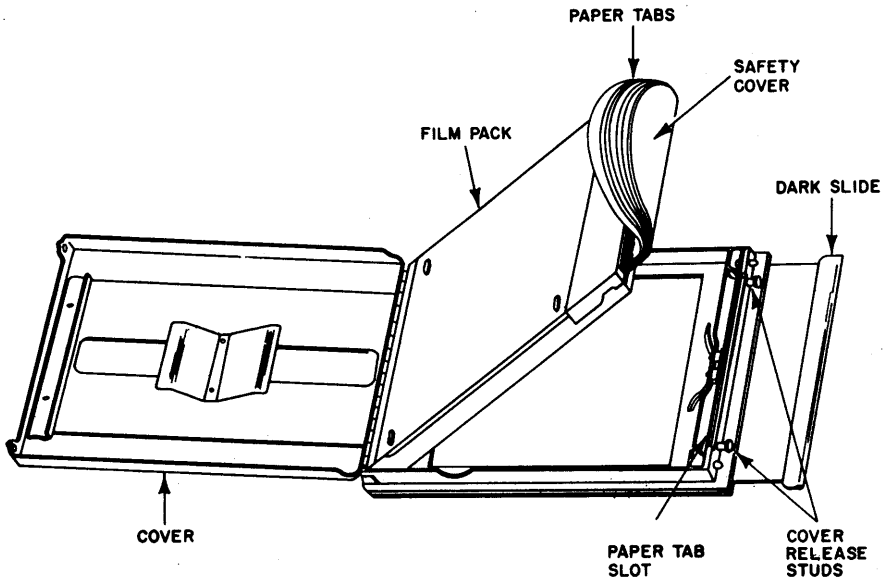
Note

The position of the control handle with respect to the plane of the panhead platform (fig. 6) can be changed by loosening the handle bracket lock and shifting the handle bracket on the cross shaft. Tighten the handle bracket lock securely after making the desired adjustment. The protrusion of the control handle (fig. 7) may be shortened by loosening the handle lock and sliding the shaft of the control handle in the handle bracket. Tighten the handle lock securely after adjusting the control handle.

e. Loosen both the leveling locks and shift the position of the upper portion of the base casting until the spirit level vial (fig. 6) indicates a level condition. Only limited adjustment is available by this method. If leveling cannot be obtained, lengthen or shorten one of the telescoping legs to bring the panhead within range of



A. LOADING CUT FILM HOLDER



B. LOADING FILM PACK ADAPTER

TM6720-211-10-10

Figure 9. Loading cut-film holder and film pack adapter.

the base casting adjustment. Tighten leveling locks securely after making the final adjustment.

17. Camera Component

a. Carefully remove the camera component (fig. 2) from the carrying case.

b. Center bottom of the mounting adapter (fig. 6) over the camera thumbscrew projecting through the panhead platform.

c. Turn the camera thumbscrew into the camera mounting adapter and tighten the camera locknut securely.

18. Selecting and Attaching Lens and Shutter Assembly

a. Selecting Lens and Shutter Assembly. The nature of the photographic mission to be accomplished will determine the selection of the lens. Refer to TM 11-401 for lens selection information.

(1) Remove the front and rear lens caps (fig. 1) from the lens and shutter assembly selected.

(2) Check the optical parts for cleanliness; if cleaning is required, refer to paragraph 34a for cleaning information.

(3) Install the front lens cap on the front cell of the lens and shutter assembly.

(4) Store the rear lens cap in the carrying case until it is needed.

b. Installing Lens and Shutter Assembly. Install the lens and shutter assembly in the front of the camera component as follows:

(1) Slide the lens board retainer (fig.8) to the left and upward as far as possible.

(2) Place the lens board in position on the lens board mounting plate with the lower edge behind the fixed lower lens board retainer.

(3) Seat the lens board completely in the recess on the front of the lens board mounting plate.

(4) Slide the lens board retainer down and to the right as far as possible to secure the lens board in place.

Note

Leave the front lens cap in position until actual use of the camera is required. This protects the lens from damage and unnecessary accumulation of dust and foreign matter.

(5) Attach the cable release to the cable release socket by screwing the threaded end of cable release into the socket.

Section III. OPERATION UNDER USUAL CONDITIONS

19. Coarse Focusing Procedure

a. Attach the focusing cloth (fig. 1) under the two focusing cloth clips (fig. 6) on the top sides of the rear frame.

b. Depress the cocking lever (fig. 8) until it latches in the cocked position.

c. Set the lens opening selector to the lowest f/number on the f/stop scale to provide maximum lens opening during focusing.

d. Remove the front lens cap from the lens.

e. Depress the focus button to open the shutter.

Note

The shutter will remain open until the cocking lever is depressed.

f. Loosen the front and rear carriage lock knobs (fig. 5) enough to allow the front and rear carriages to slide on the monorail bed when the front and rear carriage adjust knobs are rotated.

g. Increase the distance between the front carriage and rear carriage by turning the carriage adjust knobs until the object or scene to be photographed appears on the ground glass.

h. To produce the desired image on the ground glass, the height, angle, and direction of the camera may have to be changed. Use the tripod controls ((1) through (4) below) as required.

(1) To initially adjust the camera height, loosen the leg thumbscrews (fig. 7) and extend or retract the telescoping legs as required;

tighten leg thumbscrews securely after height adjustment is made.

(2) For additional height adjustment, loosen the center lock post knob and slide the center post up or down as required. After obtaining the desired height adjustment, tighten the center post lock knob securely.

Caution: Always maintain a firm grip on the tripod control handle when loosening the tilt lock knob.

Unless the camera is accurately balanced on the panhead, rapid tilting will occur with possible damage to camera or tripod.

(3) To adjust the degree of camera tilt, loosen the tilt lock knob and with the tripod control handle, tilt the camera to the desired angle. After obtaining the desired tilt adjustments, tighten the tilt lock knob securely.

(4) To change the rotational position of the camera, loosen the rotation lock knob and with the tripod control handle, rotate the camera to the desired angle; tighten the rotation lock knob securely after rotational adjustment is made.

20. Fine Focusing Procedure

The camera has provisions for raising, falling, swinging, and sliding tilts that can change the lens axis and film plane with respect to each other. To make maximum use of these provisions, refer to TM 11-401 and proceed as indicated in *a* through *f* below.

Note

The rising, falling, swinging, and sliding tilts provided on the camera, exceed the covering power of the lens and shutter assemblies supplied. Be careful when composing the subject on the ground glass not to exceed the covering power of the lens and shutter assembly in use to avoid cutoff at the corners.

a. To eliminate undesirable foreground or background from the photograph, raise or lower the lens board mounting plate (fig. 8) by pushing in and rotating the spring-loaded pinion knob until the desired degree of elimination is achieved.

b. After approximate focus has been obtained, slight changes in the image size on the ground glass may be obtained by moving the monorail bed with respect to the panhead as follows:

(1) Loosen the camera mount lock (fig. 5) and turn the camera mount adjust knob (fig. 6).

(2) After positioning the camera with respect to the subject, tighten the camera mount lock.

Note

Since the front and rear carriages are secured to the monorail bed, the distance between them is not changed by the rotating camera mount adjust knob.

c. When the camera cannot be centered horizontally with respect to the subject because of an obstruction, centering of the subject on the ground glass may be obtained by sliding the front or rear frame or both with respect to its carriage. Slide the front or rear frame as follows:

(1) Loosen the respective slide and swing lock knob.

(2) Gently slide the front or rear frame to the right or left as desired on its respective carriage.

(3) After the adjustment is made, tighten the respective slide and swing lock knob.

d. To place the plane of sharp focus of the lens in the most advantageous relationship to the subject, use the swings and tilts of the front frame. Tilt the camera front frame as follows:

(1) Loosen the front pivot lock knob (fig. 5).

(2) Tilt the front frame forward or backward to the angle desired.

(3) After the tilting adjustment is made, tighten the front pivot lock knob.

(4) Loosen the front slide and swing lock knob.

(5) Grasp the front frame (fig. 6) near the base and rotate it on the front carriage at the desired angle.

(6) After positioning the front frame, tighten the front slide and swing lock knob securely.

e. The rear frame has similar swinging and tilting provisions to permit correction for converging and diverging horizontal and vertical lines. The method of adjusting the rear frame is the same as described

in *d* above, except that the rear controls are used.

Note

Detents are provided to indicate when the front and rear frames are in the normal perpendicular and swing positions with respect to the monorail bed.

f. Changes in the orientation of the subject with respect to the long and short dimensions of the film may be made by rotating the revolving back. Rotation of the revolving back also permits more advantageous use of the film area when photographing long narrow subjects. The revolving back may be rotated in either direction through 360° and locked in any position. Detents are provided at each 90° point. Rotate the revolving back as follows:

(1) Rotate the back lock crank to the right to release the locking mechanism.

(2) Grasp the pressure back near the outer edges and rotate the entire assembly to the desired position.

(3) Rotate the back lock crank to the left to lock the revolving back securely in position.

21. Lens and Shutter Assembly Adjustment

a. After completing the focusing procedures (para 19 and 20), depress the cocking lever (fig. 8) to close the shutter.

b. Rotate the speed selector ring until the fiducial mark is opposite the desired shutter speed on the speed scale.

c. Move the lens opening selector until its pointer is opposite the desired f/stop number on the f/stop scale.

d. When a filter is required (TM 11-401), insert the filter in the filter and shade adapter and attach the adapter over the front of the lens.

Note

The lens shades may be screwed also into the filter and shade adapter for attachment to the lens either with or without a filter.

22. Inserting Cut-Film Holder or Film Pock Adapter

The spring-loaded pressure back (fig. 6) has an attached back lift handle to facilitate insertion of the cut-film holder or the film pack adapter. Insert the cut film holder or the film pack adapter as follows:

a. Pull the back lift handle outward until the two small rollers (on the ends of the back lift handle) engage the detent slots in the center of each of the two leaf springs. This produces a gap of approximately 1 inch between the pressure back and the frame of the revolving back.

b. Insert the cut-film holder or film pack adapter into the space between the pressure back and the cameraback. Make sure that the cut-film holder or the film pack adapter is pushed in as far as it will go, thus assuring a lighttight closure.

Caution

Do not allow the pressure back to snap closed from the fully open position without a cut-film holder or film pack adapter in position. The ground glass may snap closed with sufficient force to break the ground glass or other parts.

c. Lower the pressure back against the cut-film holder or film pack adapter by lowering the back lift handle.

Note

While operating the back lift handle, steady the rear frame with one hand while operating the back lift handle with the other hand. This will prevent possible shift in camera position or adjustments while inserting or removing a cut-film holder or film pack adapter.

23. Exposing Film Using Cut-Film Holder

After inserting the cut-film holder (para 22), expose the film as follows:

a. Depress the shutter cocking lever (fig. 8) to cock shutter actuating mechanism.

b. Carefully pull out the dark slide from the cut-film holder.

c. Depress the shutter release lever or the plunger on the cable release to operate the shutter.

Note

With the fiducial mark on the speed ring set opposite a number on the speed scale, the shutter opens and closes with one operation of the cable release or release lever. With fiducial mark set at B (bulb), the shutter opens when the cable release is operated and closes when the cable release plunger is released. If an opening of several seconds is required, fingertighten the lock on the c able release to hold the shutter open. With the fiducial mark set at T (time), two operations of the cable release or the release lever are required; the first opens the shutter and the second operation closes the shutter.

d. Carefully return the dark slide (A,

fig. 9) to position in the cut filmholder. Assure that the dark (painted) side of the dark slide handle is outward to indicate the film in the cut-film holder is exposed. Turn the dark slide lock over the end of the dark slide handle to prevent re-exposure or accidental removal of the dark slide.

e. Raise the back lift handle and remove the cut-film holder from the camera.

f. Turn the cut-film holder over and reinsert it in the camera.

i. Expose the film in the remaining side of the cut-film holder by repeating the procedures in a through e above.

24. Exposing Film Using Film Pack Adapter

After inserting film pack adapter (para 22), expose the film as follows:

a. Depress the shutter cocking lever (fig. 8) to cock the shutter actuating mechanism.

b. Carefully pull out the dark slide (B, fig. 9) from the film pack adapter.

c. Depress the shutter release lever (fig. 8) or the plunger on the cable release to operate the shutter. Shutter operation is the same as described in paragraph 23c.

d. After each exposure, pull out and tear off the lowest numbered paper tab, starting with No. 1. Pull each paper tab slowly, firmly, and straight out.

e. If the film pack adapter is to-be removed from the camera before all 12 films have been exposed, replace the dark slide in the film pack adapter before removing the film pack adapter from the camera.

Note

After the last paper tab has been pulled, the film pack is protected by a black tab and may be removed from the adapter without fogging.

25. Stopping Procedures

a. Leaving Equipment Set Up for Reuse. If the camera is to be reused at a later time at the same location and it is in a sheltered location, perform the following procedures:

(1) Remove the filter and shade adapter (fig. 1), the lens shade, and filter (if used) and store them in the carrying case.

(2) Install the front lens cap over the lens.

(3) Make sure that all the shutters are tripped. Do not leave them in the cocked condition.

(4) Drape the focusing cloth over the camera to prevent accumulation of dust on camera parts.

b. Repacking Equipment. When the equipment is to be moved or stored for future use, proceed as follows:

(1) Remove the cable release (fig. 8) from the shutter; store the cable release in the carrying case (fig. 1)

(2) Remove the filter and shade adapter, filter, and lens shade (if used) from the lens and shutter assembly on the camera component and store them in the carrying case.

(3) Make sure that the shutter is tripped and install the front lens cap.

(4) Place two of the lenses and shutter assemblies in the holders in the carrying case (fig. 2); assure that the front and rear lens caps are in place. The remaining lens and shutter assembly must be left mounted on the camera component.

(5) Remove the focusing cloth from the focusing cloth clips (fig. 6); fold the focusing cloth (fig. 1) and store it in the carrying case.

(6) Make sure the mounting adapter (fig. 5) is located approximately in the center of the monorail bed so that the camera can be fitted into the carrying case. If it is not, move the mounting adapter (para 20b) as required.

(7) Return all slides, swings, and tilts of the front and rear frames to the normal positions (indicated by detents). Refer to paragraphs 12 and 20 for information on camera component controls.

(8) Depress the front and rear carriage release levers (fig. 5) and slide the front and rear carriages (fig. 6) toward each other until each of the carriages contacts the mounting adapter.

(9) Hold the camera and loosen the camera locknut; unscrew (counterclockwise) the camera thumbscrew from the mounting adapter.

(10) Place the camera component (with one lens and shutter assembly installed) in the carrying case as shown in figure 2.

(11) Make sure all the minor components (para 7) are placed in the carrying case.

(12) Snap the cover in position over the filters in the carrying case lid.

Close the carrying case lid and fasten the hinged fasteners.

(13) Lower the centerpost, if required, by loosening the center post lock knob and pushing the center post down until the latch can be hooked under the leg bracket. Tighten the center post lock knob.

(14) Loosen the handle bracket lock and position the control handle parallel with the center post tube. Tighten the handle bracket lock.

(15) Loosen the leg lock handle in the leg spreader and slide the leg spreader upward on the center post tube to close the telescoping legs against the center post.

(16) Loosen the tripod leg thumbscrews (fig. 7) and retract the telescoping legs. Tighten the leg thumbscrews.

(17) Place the tripod in the tripod case, feet first; close the top and secure it with the snaps.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

26. Operation With Photoflash Equipment

Each of the three shutters is equipped with flash unit terminals (fig. 8) and an adjustable synchronizing mechanism. The camera may be operated with conventional photoflash equipment using either class M or class F flashlamps, or with electronic flash equipment. To operate the camera set with flash equipment (not supplied), refer to TM 11-401 and proceed as follows:

a. Attach the electrical cable from the flash equipment to be used to the flash unit terminals (fig. 8).

b. Focus; the camera (para 19 and 20).

c. Set the shutter speed and lens stop opening (para 21).

Note

If the fiducial mark is inadvertently set at either T or B, the shutter speed will automatically be 1/50 second when operation occurs with the synchronization mechanism cocked(e below). This prevents the spoiling of film and flashlamps.

d. With the thumbnail, rotate the synchronization adjustment wheel until the desired color code dot is opposite the black dot on the shutter housing. Use the color dot setting ((1), (2), and (3) below) that corresponds to the particular type of photoflash setup to be used.

(1) Blue dot-class M flashlamps (with 20-millisecond delay).

(2) White dot - class F flashlamps (with 5-millisecond delay).

(3) Blue dot - electronic flash equipment (requiring no shutter delay).

e. Operate the synchronization cocking lever downward until it latches in position, cocking the mechanism.

f. Insert the cut-film holder or film pack adapter in the camera (para 22).

g. Expose the film for cut-film holder (para 23) or film pack adapter (para 24).

27. Operation at Low Temperature

The camera set will operate at temperatures as low as -35° F and stored at temperatures as low as -60° F without damage.

a. Equipment to be operated at low temperature should be stored at approximately the same temperature as that in which it will be used. Avoid rapid changes in the equipment temperature whether the equipment is in use or in storage to prevent moisture condensation. When the camera set is stored at a low temperature and is to be used in a warm location, proceed as follows:

(1) Transfer the equipment from the

location of low temperature storage to the warmer location well in advance of anticipated use. Do not open the carrying case and tripod case containing the camera set components for at least 6 hours after transfer is made.

(2) Before operating the equipment, wipe off any moisture on the outer surfaces of the equipment with a soft, line-free cloth.

(3) Inspect the lenses for moisture. If moisture is present on the exposed optical surfaces, clean the optical surfaces with lens tissue moistened with lens cleaner. Dry the exposed optical surfaces with fresh lens tissue.

Note

If moisture has condensed on the inner surfaces of the lenses, allow it to evaporate before using any of the lenses. Moisture on the inner surfaces may be evaporated more rapidly by allowing the equipment to stand in a warm area. Do not ex ceed +160° F.

b. When the camera set is to be operated at low temperature, observe the following points:

(1) Keep the equipment in low temperature storage when it is not in use.

Use precautions to prevent moisture on camera parts, particularly on the lens and shutter assemblies.

(2) Avoid breathing directly on the equipment while at low temperature.

(3) Provide additional protection in storage to prevent exposure of the equipment to high humidity accompanied by freezing temperature.

28. Operation in Desert Areas or in Dust Laden Atmosphere

When the camera set is used in desert areas or other dust-laden atmosphere, observe the following precautions:

a. Expose the equipment to dust-laden air for minimum lengths of time.

b. Be sure that all minor components are free of excessive dust before inserting or attaching them to the camera component.

c. Install the lens caps as soon as possible after each use of the equipment.

d. Keep the camera component and the minor components in the carrying case and the tripod in the' tripod case at all times when the equipment is not in actual use.

e. Check the equipment frequently to see if cleaning will be required.

29. Operation in Tropical Regions

When operating the camera set in tropical regions, observe the following precautions:

a. Inspect the equipment daily for fungus, mold, mites, and metal corrosion. Clean the equipment (para 34b) and remove all fouling matter immediately.

b. Keep the camera component and the minor components in the carrying case and the tripod in the tripod case when the equipment is not in use.

c. When using the camera set, use additional precautions to prevent insects from entering the equipment. Do not leave the camera set exposed in insect-infested locations.

CHAPTER 4

OPERATOR'S MAINTENANCE INSTRUCTIONS

30. Scope of Operator's Maintenance

a. Operator's maintenance for the camera set consists of the following:

(1) Preventive maintenance (para 32).

(2) Visual inspection (para 33).

(3) Cleaning (para 34).

(4) Troubleshooting (para 35).

b. No special tools or test equipments are required for operator's maintenance.

31. Materials Required

The following Items are required by the operator to perform preventive maintenance:

a. Lint-free cloth (QM-27-C-11565-36).

b. Lens tissue (Federal stock No. 6640393-2090)1.

c. Lens cleaner (Federal stock No. 6760-408--5175).

d. Camel's-hair brush.

e. Hand blower (air syringe).

f. Cleaning Compound, liquid form (Federal stock No. 7930-395-9542).

Warning

Prolonged breathing of cleaning compound is dangerous. Make sure that adequate ventilation is provided. Cleaning compound is flammable; do not use near an open flame.

32. Preventive Maintenance

a. DA Form 11-254. DA Form 11-254 (fig. 10 and 11) is the preventive maintenance checklist to be used by the operator. Items not applicable to the equipment have been lined out. Reference in the ITEM block pertains to paragraphs that contain additional preventive maintenance information.

b. Use of Maintenance Form. The information given below supplements the instructions in DA Form 11-254. Item numbers correspond to the item numbers on the form.

Item	Maintenance procedure
1	Remove dust and foreign matter from lenses and filters by cleaning as outlined in paragraph 34a. Install front and rear lens caps after cleaning lenses. Clean lens mountings by wiping with lint-free cloth. **Caution** **Do not attempt to disassemble lens to remove foreign matter between lens elements. If internal cleaning is required, refer equipment to higher echelon for correction.**
2	Remove dirt, dust, moisture, or other foreign matter from bellows, metallic parts of camera, and tripod with lint-free cloth. If additional cleaning is required, refer to paragraph 34b.
3	Operate camera component controls (para 12) and tripod controls (para 13). Check for excessive looseness or binding. Operate controls on lens and shutter assemblies (para 14) to assure smoothness and ease of operation. Refer equipment defects to higher echelon for correction.
4	Carrying case cover should close tightly and be held securely closed by hinged fasteners.
7	Do not attempt to disassemble equipment to inspect for corrosion, worn spots, roughness, or binding threads.
8	Determine that shutter (fig. 8) is firmly attached to lens board and that lenses are secure in shutter.
9	Check for distortion in lens board (fig. 8) and for proper seating in lens board mounting plate.
13	With lens and shutter assembly removed, blow out any foreign matter inside camera component with air syringe.

33. Visual Inspection

a. Check the camera component for lighttightness through cracks or around loose parts. Also check for damage to the bellows which will admit light to the camera interior. Any light leakage may fog the film and reduce the contrast in the final negative.

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
STILL AND MOTION PICTURE CAMERA

(AR 750-625)

EQUIPMENT NOMENCLATURE

CAMERA SET, STILL PICTURE KS-17A

EQUIPMENT SERIAL NUMBER

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon:
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

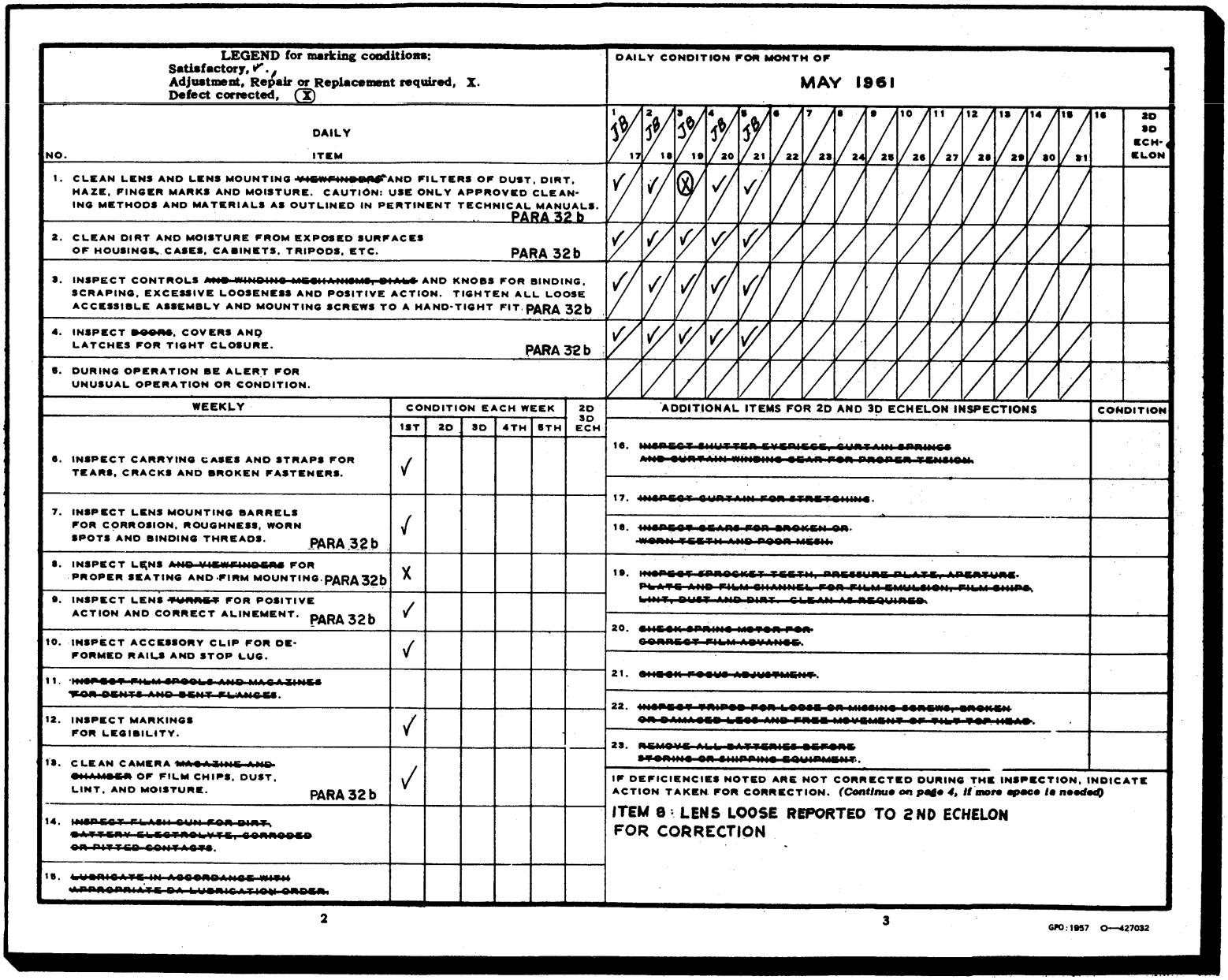
OPERATOR	2/3 ECHELON	DATE	SIGNATURE
✓		5 MAY 61	Joe Bordon

DA FORM 1 MAY 57 11-254

REPLACES DA FORMS 11-254, 1 SEP 55; 11-255, 11-256 AND 11-259; WHICH ARE OBSOLETE.

TM6720-211-10-12

Figure 10. DA Form 11-254, pages 1 and 4.



LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X)

DAILY CONDITION FOR MONTH OF MAY 1961

NO.	DAILY ITEM	1 JB 17	2 JB 18	3 JB 19	4 JB 20	5 JB 21	6 22	7 23	8 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	CLEAN LENS AND LENS MOUNTING ~~VIEWFINDERS~~ AND FILTERS OF DUST, DIRT, HAZE, FINGER MARKS AND MOISTURE. CAUTION: USE ONLY APPROVED CLEANING METHODS AND MATERIALS AS OUTLINED IN PERTINENT TECHNICAL MANUALS. PARA 32b	✓	✓	(X)	✓	✓												
2.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, CASES, CABINETS, TRIPODS, ETC. PARA 32b	✓	✓	✓	✓	✓												
3.	INSPECT CONTROLS ~~AND WINDING MECHANISMS, DIALS~~ AND KNOBS FOR BINDING, SCRAPING, EXCESSIVE LOOSENESS AND POSITIVE ACTION. TIGHTEN ALL LOOSE ACCESSIBLE ASSEMBLY AND MOUNTING SCREWS TO A HAND-TIGHT FIT. PARA 32b	✓	✓	✓	✓	✓												
4.	INSPECT ~~DOORS~~, COVERS AND LATCHES FOR TIGHT CLOSURE. PARA 32b	✓	✓	✓	✓	✓												
5.	DURING OPERATION BE ALERT FOR UNUSUAL OPERATION OR CONDITION.																	

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
6. INSPECT CARRYING CASES AND STRAPS FOR TEARS, CRACKS AND BROKEN FASTENERS.	✓					
7. INSPECT LENS MOUNTING BARRELS FOR CORROSION, ROUGHNESS, WORN SPOTS AND BINDING THREADS. PARA 32b	✓					
8. INSPECT LENS ~~AND VIEWFINDERS~~ FOR PROPER SEATING AND FIRM MOUNTING. PARA 32b	X					
9. INSPECT LENS ~~TURRET~~ FOR POSITIVE ACTION AND CORRECT ALINEMENT. PARA 32b	✓					
10. INSPECT ACCESSORY CLIP FOR DEFORMED RAILS AND STOP LUG.	✓					
11. ~~INSPECT FILM SPOOLS AND MAGAZINES FOR DENTS AND BENT FLANGES.~~						
12. INSPECT MARKINGS FOR LEGIBILITY.	✓					
13. CLEAN CAMERA ~~MAGAZINE AND CHAMBER~~ OF FILM CHIPS, DUST, LINT, AND MOISTURE. PARA 32b	✓					
14. ~~INSPECT FLASH GUN FOR DIRT, BATTERY ELECTROLYTE, CORRODED OR PITTED CONTACTS.~~						
15. ~~LUBRICATE IN ACCORDANCE WITH APPROPRIATE DA LUBRICATION ORDER.~~						

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
16. ~~INSPECT SHUTTER EYEPIECE, CURTAIN SPRINGS AND CURTAIN WINDING GEAR FOR PROPER TENSION.~~	
17. ~~INSPECT CURTAIN FOR STRETCHING.~~	
18. ~~INSPECT GEARS FOR BROKEN OR WORN TEETH AND POOR MESH.~~	
19. ~~INSPECT SPROCKET TEETH, PRESSURE PLATE, APERATURE PLATE AND FILM CHANNEL FOR FILM EMULSION, FILM CHIPS, LINT, DUST AND DIRT. CLEAN AS REQUIRED.~~	
20. ~~CHECK SPRING MOTOR FOR CORRECT FILM ADVANCE.~~	
21. ~~CHECK FOCUS ADJUSTMENT.~~	
22. ~~INSPECT TRIPOD FOR LOOSE OR MISSING SCREWS, BROKEN OR DAMAGED LEGS AND FREE MOVEMENT OF PAN TOP HEAD.~~	
23. ~~REMOVE ALL BATTERIES BEFORE STORING OR SHIPPING EQUIPMENT.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 8: LENS LOOSE REPORTED TO 2ND ECHELON FOR CORRECTION

2 3

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Figure 11. DA Form 11-254, pages 2 and 3.

b. Check the shutter for lighttightness as follows:

(1) Hold the lens and shutter assembly with the lens between a light source and the eyes.

(2) Set the lens opening selector for largest opening position.

(3) Observe 'that no light is visible through the shutter blades or around any part of the lens mounting.

(4) At various speed settings, operate the shutter release lever slowly until the shutter trips. Observe that the shutter blades do not start to open before shutter tripping occurs.

(5) If any defect in shutter operation appears, refer the trouble to higher echelon for correction.

c. Inspect the camera set for presence of all components which comprise the set. Replace any missing components.

d. Inspect all finished parts for scratched or marred surfaces. Refer finish defects to higher echelon for repair.

e. Inspect lens elements and filters for chipped surfaces, cracks, and scratches. Replace defective components of the camera set with serviceable components.

34. Cleaning

a. Optical and Glass Surfaces.

Caution

Dust particles may contain abrasive particles as hard as or harder than the fluoride coating on the lens surface. Dust the lens carefully ((2) below) before attempting removal of fingerprints or any o the r foreign matter from the optical surfaces.

(1) Remove the front and rear lens caps (fig. 1) from the lens and shutter assembly.

(2) Carefully remove all dust, dirt, and foreign matter from the exposed optical surfaces of the lens and shutter assembly, filters, and camera ground glass; use a camel's-hair brush, air syringe, or a gentle blast of moisture-free compressed air.

(3) Slightly dampen a small wad (one sheet) of lens tissue with lens cleaner.

Caution

Do not use lens tissue that contains silicone to clean optical surfaces. Any residue deposit that would be left on the optical surfaces by this kind of lens tissue could affect the performance of the lens and filters.

(4) Gently wipe the exposed optical surfaces of the lens and filters with the moistened lens tissue; using a circular motion, ,start from the edge of the glass and work toward the center.

(5) Dry the cleaned areas with afresh sheet of lens tissue; use the same circular motion described in (4) above.

(6) Clean the camera ground glass surface with a clean lint-free cloth dampened with clear water. After cleaning, dry the cleaned a r e a thoroughly.

(7) Install the front and rear lens caps on the lens and shutter assembly.

b. Mechanical Surfaces.

(1) Clean all exposed parts of the equipment with a dry lint-free cloth.

(2) Use a camel's-hair brush or an air syringe to remove dust, and foreign matter from hard-to-reach parts on the equipment.

(3) If foreign matter cannot be removed from the mechanical parts of the equipment by normal dry wiping, use a lint-free cloth moistened with cleaning compound to remove stubborn grime. Wipe the cleaned parts with a clean dry lint-free cloth immediately after cleaning.

Caution

Do not allow cleaning compound to come in contact with optical surfaces. Use cleaning compound sparingly.

35. Operator's Troubleshooting Checklist

a. General. The operator's troubleshooting checklist helps to sectionalize and

correct certain minor troubles. The corrective measures listed are those that the operator can perform. If the measures suggested do not restore the equipment to normal performance, troubleshooting and corrective action will be required by equipment; maintenance personnel. When referring equipment to higher echelon for maintenance or repair, note on the repair tag what corrective measures were taken and how the equipment performed at the time of failure.

b. Procedure. Generally, the operator can troubleshoot the camera set by examining the processed negatives for obvious symptoms. Refer to the Symptom column to locate the trouble indicated on the negative.

Symptom	Probable trouble	Correction
Film not exposed	Front or rear caps not removed	Remove front and rear lens cap (para 18).
	Dark slide (fig. 9) not removed from cut-film holder or film pack adapter.	Remove dark slide prior to making exposure (para 23 and 24).
	Shutter (fig. 8) not cocked	Cock shutter (para 23 and 24).
	Defective shutter (fig. 8)	Refer equipment to higher echelon for repair.
Film underexposed	Shutter speed too fast	Reset speed selector ring to proper shutter speed (para 21*b*).
	Lens opening selector (fig. 8) incorrectly set.	Reset lens opening selector to correct (larger opening) f/stop (para 21*c*).
	Actual shutter timing is not indicated by fiducial mark (fig. 8).	Refer equipment to higher echelon for repair.
Film overexposed	Lens opening selector (fig. 8) incorrectly set.	Reset lens opening selector to correct (smaller opening) f/stop (para 21*c*).
	Shutter speed too slow	Reset speed selector ring to proper shutter speed (para 21*b*).
	Actual shutter timing is not that indicated by fiducial mark.	Refer equipment to higher echelon for repair.
Film scratched	Film improperly loaded in cut-film holder.	Load cut-film holder (para 15) carefully.
Film fogged	Film improperly loaded in cut-film holder or film pack adapter.	Exercise care and observe safelighting procedures when loading cut-film holder (para 15*a*) or film pack adapter (para 15*b*).
	Cut-film holder or film pack adapter incorrectly inserted in camera.	Insert cut-film holder or film pack adapter in camera as indicated in paragraph 22 and 24.
	Dark slide (fig. 9) in cut-film holder or film pack adapter improperly removed or inserted.	Keep dark slide straight; remove and insert dark slide smoothly.
	Camera, cut-film holder, or film pack adapter not lighttight.	Refer equipment to higher echelon for correction.
Processed film not sharp (image hazy or diffused).	Camera moved during exposure	Steady camera during exposure.
	Camera not focused correctly	Refocus camera (para 19).
	Optical surfaces dirty	Clean optical surfaces (para 34*a*).
	Optical surfaces badly scratched	Refer equipment to higher echelon for repair.
Under or overexposure (when photoflash equipment is used).	Shutter speed incorrectly set -	Reset shutter speed (para 21*b*).
	Lens opening selector (fig. 8) incorrectly set.	Reset lens opening selector to correct f/stop setting (para 21*c*).
	Synchronism adjustment wheel (fig. 8) incorrectly set.	Reset synchronism adjustment wheel (para 26*d*)
	Synchronization cocking lever (fig. 8) not cocked prior to shutter operation.	Cock synchronization cocking lever before operating shutter (para 26*e*).
	Synchronization mechanism defective.	Refer equipment to higher echelon for repair.

CHAPTER 5

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

36. Disassembling Camera Set

All disassembly of the camera set for shipment and limited storage may be accomplished by the operator. For shipment or limited storage,. the equipment should be returned to the carrying case and tripod case as outlined in paragraph 25*b*. Assure that all shutters have been tripped. Also assure that all exposed film has been removed from the filmholders and film pack adapter for processing.

37. Repacking Camera Set for Shipment or Limited Storage

The exact procedure in repacking for shipment or limited storage depends on the material available and the conditions under which the equipment is to be shipped or stored. The procedures given below may be used or varied, as necessary. Refer to figure 4 and perform the following procedures in the order indicated.

a. Check to be sure that the procedures in paragraph 34 have been performed.

b. Inventory all components; check the components against the table of components (para 5).

c. Pack the components as follows:

(1) Check to see that one of the lens and shutter assemblies (with attached front and rear lens cap) is installed on camera component.

(2) Place the camera component (with attached lens and shutter assembly and front and rear lens caps) in the carrying case (fig. 2) as shown.

(3) Place the minor components in their respective compartments in the carrying case.

(4) Close the carrying case cover and fasten the hinged fasteners.

(5) Place the tripod in the tripod case and secure the cover on the tripod case.

(6) Insert the carrying case and tripod case into the fiberboard cartons.

(7) Close the tops of the fiberboard cartons and seal them with gummed paper.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

38. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. Use the destruction procedures outlined in paragraph 39 to prevent further use of the equipment.

39. Methods of Destruction

a. If complete destruction of the equipment cannot be accomplished in the time available, destroy the components in the order given.

(1) Lens and shutter assemblies.

(2) Camera component.

(3) Tripod.

(4) Cut-film holders and film pack adapter.

(5) Carrying case and canvas bag.

(6) Accessories.

b. Use any of the following methods:

(1) *Smash.* Smash lens and shutter assemblies, cut-film holders, film pack adapter, camera component, filters, lens shade, tripod, cable release and carrying case; use sledges, axes, handaxes, pickaxes or hammers.

(2) *Cut.* Cut camera component bellows, tripod case, and carrying case; use axes, handaxes, or machetes.

Warning

Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

(3) *Burn.* Cut-film holders, film pack adapter, carrying case, and tripod case; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

(4) *Bend*. Bend monorail, camera frames, cut-film holders, film pack adapter, and tripod column and legs.

(5) *Bury.* Bury or scatter destroyed parts in slit trenches, foxholes or throw them into streams or lakes.

APPENDIX

REFERENCES

The following publication contains information applicable to the operation of Camera Set, Still Picture KS-17A:

TM 11-401	Elements of Signal Photography

By Order of Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
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11-597
19-500 (AA-AE)
30-500 (AA-AE)

NG: State AG (3); Units-Same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

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P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C