TM 11-6720-253-10

TECHNICAL MANUAL

OPERATOR'S MANUAL
FOR
CAMERA SET,
STILL PICTURE KS-99C
NSN 6720-00-602-5099

This copy is a reprint which Includes current pages from Change 1

HEADQUARTERS, DEPARTMENT OF THE ARMY
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C1

CHANGE No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *10 November 1981*

OPERATOR'S MANUAL

CAMERA SET, STILL PICTURE KS-99C AND KS-99C(1) (NSN 6720-00-602-5099)

TM 11-6720-253-10, 30 June 1975,is changed as follows to reflect the addition of Camera Set, Still Picture KS-99C(1). The title of the manual is changed as shown above.

Page i Table of Contents, after line 9, add: Hand Receipt 1-6.1
After line 14, add: Items comprising an operable Camera Set, Still Picture KS-99C(1) 1-8.1
Page ii After line 8, add: Flash unit, mode1285, controls and indicators. 2-2.1
After line 27, add: Attaching flash unit, model 285, On camera 2-13.1

After 29, add: Operating flash unit, model 285, on camera in automatic mode 2-14.1
Operating flash unit, model 285, on camera in manual mode.. . . . . 2-14.2
Page iii. After line 6, add: Making multiple exposures with KS-99C(1) 2-19.1
Page iv. Appendix B is superseded as follows:
APPENDIX B. COMPONENTS OF END ITEMS AND BASIC ISSUE ITEMS LISTS FOR KS-99C(1)
Section I. Introduction B-1
Section II. Components of end item B-3
Section III. Basic issue items. . . . . B- 11
Add Appendix C after Appendix B.
APPENDIX C. EXPENDABLE SUPPLIES AND MATERIALS LIST
Section I. Introduction C-1
Section II. Expendable Supplies and Materials List C-3
Page 1-1. Paragraph 1-1, line 2. After "KS-99C" add: "KS-99C(1)."
Paragraphs 1-3b and c are superseded as follows:

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400-54/MCO 4430.3E.

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/NAVSUPINST 4610.33B/AR 75-18/MCO P4610.19C/DLAR 4500.15.

Page 1-2. Paragraph 1-4. Lines 6 and 7 are changed to read: "US Army Communications-Electronics Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703."

Add paragraph 1-6.1 after 1-6.

1-6.1 Hand Receipt

Hand receipts for Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) items are published in a Hand Receipt manual, TM 11-6720-253- 10-HR. This manual is published to aid in property accountability and is available through: US Army Adjutant General Publication Center, 2800 Eastern Boulevard, Baltimore, MD 21220. Paragraph 1-7a, line 1. After "KS-99C" add: "and KS-99C(1)."

Page 1-3. Add figure 1-1.1 after figure 1-1.

Page 1-4. Paragraph 1-7a, line 10. After "(telephoto and wide-angle)" add: "(zoom and wide--angle)."

Line 13. After "AC/charge unit" add: "AC adapter, charge unit 15 with NC-3 battery pack for KS-99C(1) camera set."

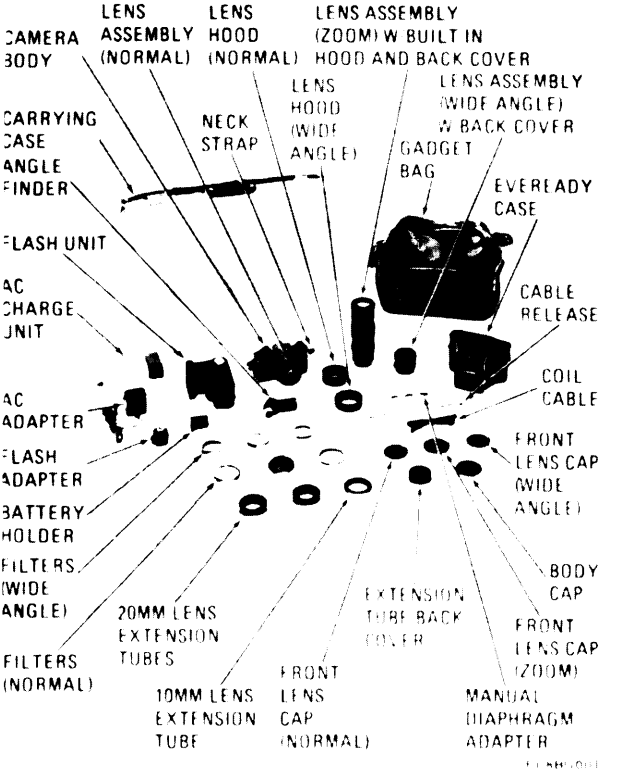


Figure 1-1.1. Camera Set, Still Picture KS-99C(1)

Line 17. After “bayonet mounts” add: “breech-lock mounts for KS-99C(1) camera set.”
Paragraph 1-8.1 is added after 1-8.

1-8.1 Items Comprising an Operable Camera Set, Still Picture KS-99C(1).

The items listed in table 1-1.1 make up an Operable Camera Set, Still Picture KS-99C(1).

Page 1-5. Table 1-1.1 is added after table 1-1.

Page 1-6. Paragraph 1-9, line 19. After "25 to 2000" add: "25 to 3200 for KS-99C(1) camera set." Line 26. After 1.3V add: "1.35V for KS-99C(1) camera set."

Page 1-7. Paragraph 1-9. After line 15, add: For KS-99C(1) camera set:

35 mm lens:

Type.	Wide angle.
Magnification	0.13 X*
Angle of view.	63 degrees diagonal, 54 horizontal, 38 perpendicular.
Aperture system.	Automatic or manual.
Aperture scale.	f/2.8, 4, 5.6, 8, 11, 16, 22.
Focusing Range.	14 inches to infinity.

After line 23, add: For KS-99C(1) camera set:

50 mm lens:

Type.	Standard.
Magnification.	0.1 X*
Angle of view.	46 degrees diagonal, 40 horizontal, 27 perpendicular.
Aperture system. . . .	Automatic or manual.
Aperture scale. . . .	f/1.8, 2.8, 4, 5.6, 8, 11, 16, 22.
Focusing range.	1 ft. 11 in. to infinity.

Table 1-1.1. Items Comprising an Operable Camera Set, Still Picture KS-99C(1)

NSN	Item	Dimensions (in.)				Weight (oz)
		Quantity	Height	Depth	Width	
	Body, camera	1	$3^{15}/_{16}$	$1^{15}/_{16}$	$5^{3}/_{4}$	$29^{13}/_{16}$
	Lens, camera, 50 mm, f/1.8	1		$2^{7}/_{32}$	$2^{21}/_{32}$	8
	Adapter, flash	1	$^{7}/_{8}$	$1^{1}/_{8}$	$1^{1}/_{4}$	$1^{1}/_{2}$
	Flash unit	1	$5^{7}/_{32}$ *	$4^{7}/_{32}$	4	14**

*Head in 0 degree position

**Without batteries

After line 31, add: For KS-99C(1) camera set:

80-200 mm lens:

Type . . . . . Zoom
Magnification 0.12-9.29X*
Angle of view . . . . . 30-12 degrees diagonal, 25-10 horizontal, 17-7 perpendicular.
Aperture system . Automatic or manual.
Aperture scale . . . . f/4, 5.6,8, 11, 16, 22, 32.
Focusing range . . . 3 ft/5 in. to infinity.

Page 1-8. Paragraph 1-9. After line 18, add:

Flash unit (model 285):

Dc power source . . Four 1.5 V size AA alkaline batteries. Rechargeable nickel cadmium batteries, if faster recycling time is desired.
Ac adapter . . . . . 120/220 Vat, 60 Hz.
Ac battery charger 15 with NC-3 battery pack . . . . 110 Vat.
Automatic flash range, ... 2 to 21 feet (0.6 to 6.4 m).
Automatic flash speed . . . . . 1/1000 to 1/30,000 sec (automatic) 1/1000 sec (manual).
Automatic lens setting. . . . . Choice of 2 for each film speed.
Battery charging . Approximately 1 hr (before first use).
Flashes per charge (average) . . . . . 8 after 5 min charging. 20 after 15 min charging. 65 + after 60 min charging.
Recycle time. . . . AC-0.3-20.0 sec. DC-0.3-1 1.0 sec

* At closest focusing distance.

Paragraph 1-10 is rescinded.
Page 1-9. Table l-2 is rescinded.
Paragraph 1-11 is rescinded.
Page 1-10. Table l-3 is rescinded.
Page 2-3. Add figure 2-2.1 after figure 2-2.

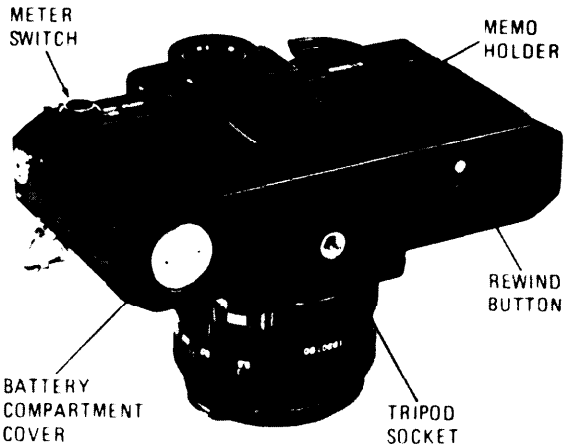


Figure 2-2.1. Camera (bottom view).

Page 2-5. Paragraph 2-1b, line 2. After "bayonet mount," add: "or breech-lock mount."
Page 2-7. Add paragraph 2-2.1 after paragraph 2-2.

2-2.1. Flash Unit Controls (Model 285) and Indicators

a. Flash Unit Controls. The following list itemizes the flash unit controls used by the operator and describes their function.

Control	*Function*
Open flash button (fig. 2-3.1)	Completes electrical circuit to discharge capacitor through flash tube.
Battery compartment cover (fig. 2-3.1)	Provides access to battery compartment.
Zoom/bounce flash head (fig. 2-4.1)	Coordinates field coverage of flash with field covered by camera lens.
Bounce angle scale (fig. 2-4.1)	Composed of five positions (O, 45, 60, 75, and 90 degrees). When flash unit is set at any of these positions, light can be bounced off reflective surfaces to create softer lighting.
Calculator dial light button (fig. 2-4.1)	Illuminates the calculator dial.
On-off switch (fig. 2-4.1)..	Energizes the capacitor and builds up the charge.
Mounting foot LOCK lever (fig. 2-4.1)	Secures the mounting foot in place.
Mounting foot (fig. 2-4.1.	Is inserted into the flash adapter of camera. Permits connection of flash unit to camera.
Shutter cord socket (fig. 2-4.1)	Receptacle for shutter cord.

Control	*Function*
A/C adapter (fig. 2-4.1)	Adapts the flash unit for use with standard AC electrical outlets as an optional power source.
Vari-power settings (fig. 2-3.2)	Reduces light output levels from full power to 1/2, 1/4 or 1/16 power
Vari-power dial (black arrow) (fig. 2-3.2)	Works in conjunction with mode selector dial and camera aperture setting to reduce light output.
F-stop dial (fig. 2-3.2) . .	Sets the amount of light required for the f/stop setting at either close range or extended range.
ASA/DIN film speed dial (fig. 2-3.2)	Adjusts flash in accordance with film speed desired.
Mode selector dial (fig. 2-3.1)	Works in conjunction with vari-power dial and camera aperture setting to reduce light output.
Mode selector window (fig. 2-3.1)	Shows vari-power setting.
Vari-sensor module (fig. 2-3.1)	Measures reflected light from subject and automatically adjusts flash to provide right amount of light for exposure.
Battery holder (fig. 1-1.1).	Holds four 1.5V size AA alkaline batteries.
28 mm wide-angle lens (fig. 2-3.1)	Used with zoom/bounce flash head in the WIDE position.
Coil cable (fig. 1-1.1)	Allows off-camera flash photography.
AC adapter (fig. 1-1.1) . .	Plugged into a 120 V/220 Vac convenience receptacle, the AD adapter provides direct current to batteries through a rectifier circuit.

Page 2-6. Add figures 2-3.1 and 2-3.2 after figure 2-3.

b. Flash Unit Indicators. The following list itemizes the flash unit indicators observed by the operator and describes their function.

Indicator	***Function***
Illuminated calculator dial (fig. 2-3.1)	Built in guide for determining flash exposures.
ASA indicator arrow (fig. 2-3.1)	Shows ASA or DIN number of film being used.
Zoom setting indicator (fig. 2-4.1)	Gives position of zoom/bounce flash head: WIDE-NORM-TELE.
Sufficient light indicator (fig. 2-4.1)	Indicates if the light output will be sufficient for a proper exposure.
Ready (fig. 2-4.1)	Three stage indicator that glows red when flash is at 1/2 power; glows green when flash is ready to be fired; and blinks alternately red and green when battery saving circuit is in operation.
Distance scales (ft. & m.) (fig. 2-3.2)	Indicates effective range in feet and meters, that flash will cover.
Auto modes (colored wedges) (fig. 2-3.2)	Colored wedges with trailing lines each representing an automatic operating mode which corresponds to an automatic f/stop.

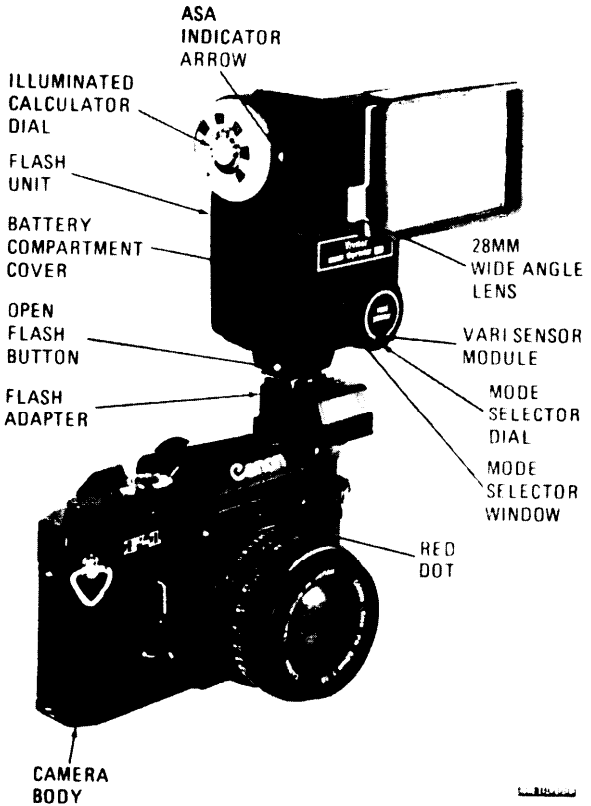


Figure 2-3.1. Camera with flash unit, model 285 (front view).

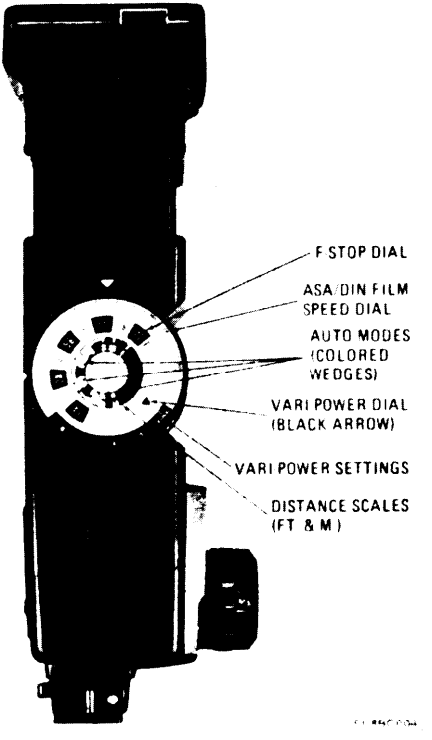


Figure 2-3.2. Flash unit, model 285, calculator or dial.

Page 2-8. Add figure 2-4.1 after figure 2-4.

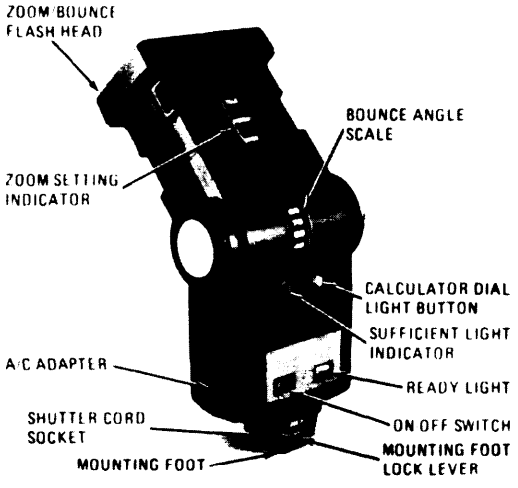


Figure 2-4.1 Flash unit, model 285, /rear view).

Page 2-9. Paragraphs 2-4a(2) and (3). After "bayonet mount" add: "or breech-lock mount." Paragraph 2-4a(2). Add the following NOTE.

NOTE

On camera body with breech-lock mount, do not press the lens release button when mounting the lens. Only when the button pops out can you be sure the lens is mounted correctly.

Paragraph 2-4a(3). Add the following at the end of the sentence. "Lens is properly seated when release button pops out with an audible click."

Page 2-10, Add figure 2-5.1 after figure 2-5.

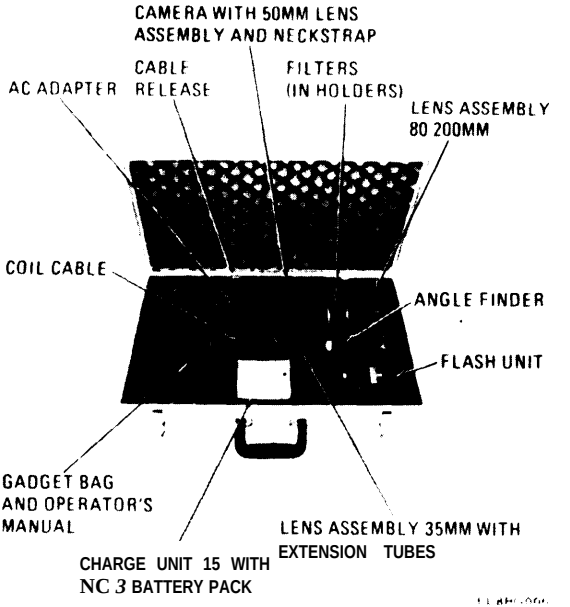


Figure 2-5.1 Camera set KS- 99C(1) in case.

Page 2-10. After paragraph 2-4b(l) add:

NOTE

On camera body with breech-lock mount, depress the lens release button and turn the breech-lock mount ring (fig. 2-1) counterclockwise, until the red dot on the ring is lined up with the red dot on the camera body.

Page 2-16. Paragraph 2-7 is superseded as follows:

2-7. Battery Installation

a. Unscrew the battery cover (fig. 2-2) by using a thin coin or a small screwdriver.

CAUTION

Unclean battery poles can cause corrosion and damage the camera.

b. Before inserting battery, wipe off fingerprints or stains on the battery poles with a dry cloth.

NOTE

Exposure meter will not function properly if battery is installed incorrectly.

c. Insert the battery into the battery compartment with the positive (+) side toward the battery cover.

d. Screw the battery cover back in place.

NOTE

If the camera will not be used for an extended length of time, take the battery out of the battery compartment to prevent possible damage to the terminals from corrosion.

Page 2-17. Figure 2-10 is superseded as follows:

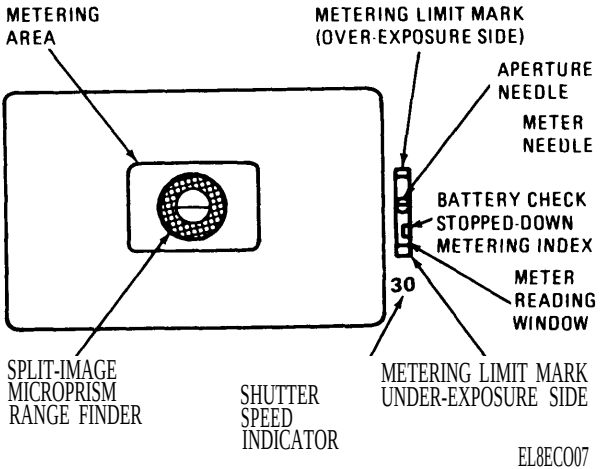


Figure 2-10 Viewfinder presentation.

Page 2-18. Paragraph 2-9, lines 2 and 4 of CAUTION. After "green circle" add: "or green A."

Page 2-19. Following paragraph 2-9k, add:

NOTE

When the shutter is set at a slow speed outside the coupling range (slower than 1/2 **sec** with ASA 100 film), the meter window turns red, and metering will become impossible even if the aperture is changed. When the window turns red and metering cannot be performed, use high-speed film.

Paragraph 2-9. Add paragraph 2-91 after 2-9k.

1. When using KS-99C(1) at given film speeds, the built-in exposure meter couples within the f/stops and shutter speeds. For example, when using the FD 50mm f/1.8 lens at ASA 100, the exposure meter couples fully within the range of EV 3.8 to EV 18.

Page 2-21. Add paragraph 2-13.1 after paragraph 2-13.

2-13.1. Attaching Flash Unit, Model 285

a. Move the flash unit mounting foot LOCK lever (fig. 2-4.1) all the way to the left (unlocked position).

b. Insert the mounting foot into the flash adapter.

c. Move the mounting foot LOCK lever to the right until it clicks into the LOCK position.

d. Slide the adapter, with the flash unit attached, onto the camera.

e. Push the adapter as far toward the front of the camera as you can. (The flash unit should be perpendicular to the top of the camera as shown in figure 2-3.1.)

f. If flash adapter is not used, connect the flash unit PC cord to the shutter cord socket (fig. 2-4.1) on the flash unit, and to the flash socket on the camera (fig. 2-l).

NOTE

Flash, flash adapter, and camera all have built-in hot shoe contacts and do not require PC cord for normal on-camera operation.

Page 2-22. Add paragraphs 2-14.1 and 2-14.2 after paragraph 2-14.

2-14.1. Operating Flash Unit, Model 285, on Camera in Automatic Mode

a. Direct Flash.

(1) Set the camera shutter speed dial at 60 and the camera meter switch at OFF-FLASH.

(2) Set the flash unit zoom/bounce head to NORM position.

(3) Set the calculator dial, on the flash unit, to the ASA rating of the film loaded in the camera.

NOTE

The four color wedges on the calculator dial now line up below the four automatic f/stops for the film you are using.

(4) Select any one of the four automatic mode color wedges and matching f/stops, on the calculator dial, that will give you the desired operating range or depth of field.

(5) Turn the mode selector dial, on the varisensor module, until the color that matches the f/stop selected in (4) above in the mode selector window on the side of the module.

(6) Set the camera lens to the automatic f/stop setting selected in (4) above.

(7) Set the flash unit head to the 0 degree (straight ahead) position.

NOTE

An example of on-camera direct flash operation is given in the following.

(8) To photograph a subject 10-feet away with more depth of field proceed as follows:

(a) Using ASA 100 film, set the flash unit zoom/bounce head to NORM position.

(b) Set the flash unit mode selector dial to the blue position.

(c) Set the camera lens to f8 position.

(d) Your automatic operating range is from 2 to 15-feet (0.6-4.5 m).

(9) Slide the flash unit on-off switch to the RED ON position and focus the camera.

(10) Test the exposure using the sufficient light indicator as follows:

(a) After the green ready light glows, fire the flash by pushing the open flash button.

(b) If the flash exposure is good, the green sufficient light indicator will glow for about two seconds, immediately after firing the flash.

(c) If the sufficient light indicator does not light, do one of the following

1. Set your flash unit and camera to an automatic mode that uses a larger f/stop opening.

2. Decrease the flash-to-subject distance.

NOTE

The flash unit will automatically determine correct exposures without further adjustments, as long as you stay within the automatic range you have selected.

(11) Zoom settings. When the zoom/bounce head is used in TELE (extend) or WIDE (retract) position, it will not affect the operation of the flash unit automatic sensing system. However, it will affect the operating range and the flash light performance. Refer to table 2-1 to determine automatic f/stop settings and matching ranges

Table 2-1. Automatic f/Stop Settings and Corresponding Ranges

	Film Speed								Zoom Flash Head Position			
ASA DIN	25 15	64 19	80 20	100 21	125 22	160 23	200 24	400 27	Super Wide 28mm	WIDE 35mm	NORM 50mm	TELE 105mm
YELLOW Mode f/stop	1.0	1.4	2.0	2.0	2.0	2.8	2.8	4.0	4-35 ft (1.2-10.6m)	5-50 ft (1.5-15.1m)	6-60 ft (1.8-18.3m)	7-70 ft (2.1-21.3m)
RED Mode f/stop	2.0	2.8	4.0	4.0	4.0	5.6	5.6	8.0	3-18 ft (1.0-5.5m)	5-25 ft (1.5-7.5m)	5-30 ft (1.5-9.1m)	6-35 ft (1.8-10.6m)
BLUE Mode f/stop	4.0	5.6	8.0	8.0	8.0	11.0	11.0	16.0	2-9 ft (0.7-2.6m)	2-12 ft (0.7-3.7m)	2-15 ft (0.7-4.4m)	2-18 ft (0.7-5.5m)
PURPLE Mode f/stop	5.6	8.0	11.0	11.0	11.0	16.0	16.0	22.0	2-6 ft (0.7-1.8m)	2-9 ft (0.7-2.6m)	2-11 ft (0.7-3.3m)	2-12 ft (0.7-3.7m)

when the head is used in either TELE or WIDE positions.

(12) To photograph a subject using a zoom setting proceed as follows:

(a) Using ASA 100 film, set the flash unit zoom/bounce head to TELE position.

(b) Set the flash unit mode selector dial to the blue position.

(c) Set the camera lens to f8 position.

(d) Your automatic operating range is now 2 to 18-feet (0.7 – 5.5m), instead of 2 to 15-feet (0.7 – 4.4m) as in the NORM position.

b. Bounce Flash. When the flash unit zoom/bounce head is set to 45, 60, 75 or 90 degrees, the light can be bounced off the ceiling or another reflective surface to create a softer light. When using color film, keep in mind that the bounced light will take on the color of the reflective surface. Unless you are creating a special effect, make sure you only bounce the light off white or neutral colored surfaces. As a general rule, set the tilt angle of the head so that the light is directed at the midpoint between the flash unit and the subject.

(1) Set the camera shutter speed dial at 60.

(2) Set the flash unit zoom/bounce head to NORM position.

(3) Set the calculator dial, on the flash unit,

to the ASA rating of the film loaded in the camera.

(4) After positioning the subject, aim the flash head for the desired bounce angle.

(5) Select any one of the four automatic f/stops on the calculator dial that will give you the automatic operating range or depth of field you want.

(6) Turn the mode selector dial on the vari-sensor module until the color that matches the f/stop, selected in (5) above, appears in the window on the side of the module.

NOTE

The automatic operating range mus be sufficient to include the entire flash-to-reflector-to-subject distance.

(7) Set the camera lens to the automatic f/stop selected in (5) above.

(8) To photograph a subject using a bounce flash proceed as follows:

(a) Using ASA 100 film, bounce the light off an eight-foot high ceiling onto a subject at a total flash-to-reflector-to-subject distance of 20 feet (6.1 m) from the flash unit using relatively shallow depth of field.

(b) Set the flash unit head to the proper bounce angle.

(c) Set the zoom/bounce head to NORM position.

(d) Set the camera lens to f4.0 position.

(e) Set the flash unit mode selector dial to the red position.

NOTE

Bouncing off surfaces such as curtains or acoustical tile ceilings will add to the effective distance between flash unit, reflective surface, and subject, because they absorb light. Check that the automatic mode operating distance covers this effective distance.

(f) Slide the flash unit on-off switch to the RED ON position and focus the camera.

(g) Take the picture when the green ready light comes on.

2-14.2. Operating Flash Unit, Model 285, on Camera in Manual Mode

The following procedures contain operating instructions for taking pictures beyond the automatic flash range in either direct, or zoom bounce flash methods.

a. Direct Flash.

(1) Set the flash unit mode selector dial to M (manual) position.

(2) Focus the camera and check the distance indicated on the camera lens barrel.

(3) Check the flash-to-subject distance on the flash unit calculator dial distance scale.

(4) Set your camera lens to the f/stop indicated above the distance shown on the calculator dial distance scale.

NOTE

In manual mode operation, disregard the color wedges on the flash unit calculator dial.

(5) As an example, if you are 40-feet from the subject and you are using ASA 100 film with the flash head in the NORM position, set your camera lens f/stop to 12.8.

(6) Slide the flash unit on-off switch to RED ON position.

CAUTION

To avoid possible damage to the flash unit, do not shoot more than 25 flashes in a continuous series. Allow the unit to rest for four minutes between series.

b. Zoom Settings. When the zoom/bounce head is used in TELE (extend) or WIDE (retract) position, it will affect your f/stop and/or operating range.

(1) Recheck the calculator dial for the information shown.

(2) Refer to table 2-1 to determine your f/stops. Divide the guide number, for the various speeds given by the flash-to-subject distance.

NOTE

Keep in mind that the guide number will change with the extension or retraction of the zoom/bounce head.

c. Bounce Flash.

(1) Set the mode selector dial to the M position.

NOTE

When shooting in this mode, your f/stop setting is dependent on the size and color of the area and the total flash-to-subject distance. The following options are available to you.

(2) In rooms of average size and color, it is best to open your lens two f/stops wider than you would normally use for direct shooting.

(3) Once you have set the ASA number on the calculator dial, find the total flash-to-reflector-to-subject distance on the dial.

(4) Note the f/stop indicated on the dial above that distance.

(5) Open your lens one f/stop wider than the indication on the dial.

(6) When your total bounce distance is more than the maximum appearing on the calculator dial, proceed as follows:

(a) Measure the distance from the flash unit to the reflecting surface on the subject.

(b) Then, divide that total distance into the flash guide number for the film speed you are using and the position of the zoom/bounce head.

(c) When you get this number, round it off to the nearest f/stop and open your lens to one f/stop wider.

Page 2-25. Paragraph 2-16 *a* and c. After "AC charge unit" add: "or AC adapter. "

Paragraph 2-16b, line 5. After "AC\charge" add: "or AC adapter."

Page 2-27. Add: paragraph 2-19.1 after paragraph 2-19.

2-19.1. Making Multiple Exposures

NOTE

The camera must be removed from the everready case (para 2-3) to make a multiple exposure.

a. Turn the film rewind crank slowly clockwise to take up the slack in the film.

b. After making the first exposure, press in the film rewind button (fig. 2-2).

NOTE

Film rewind button will remain depressed when finger is removed from the button.

c. Turn the film advance lever slowly with single winding. Do not turn lever with short

stroke winding. (The camera is now ready to make a second exposure on the film.)

NOTE

By repeating the above procedure, the same frame can be exposed over and over again. When you have taken pictures of multiple exposures, the frame counter will advance, by one, each time you turn the film advance lever.

Page 2-29. Add: paragraph 2-21b.1 after paragraph 2-21b.

b 1 *Setting Lenses on KS-99C(1).*

NOTE

All lenses are set for manual diaphragm operation in the same manner.

(1) Before mounting the lens, insert the hole of the manual diaphragm adapter (fig. 2-13.1) over the tip of the automatic aperture lever at the rear of the lens. Push the lever to the right and lower the adapter into the groove to lock the lever in that position.

(2) Mount the lens onto the accessory. The diaphragm will now open and close as the aperture ring is rotated.

(3) When you set the lens this way, also set the camera for stop-down metering as instructed in paragraph 2-21.

CAUTION

When the manual diaphragm adapter is attached on the rear of one of the lenses, never mount the lens directly on the camera.

(4) To return the lens to normal operation, remove the manual diaphragm adapter from the automatic aperture lever.

Page 2-30. Add: figure 2-13.1 after figure 2-13.

Page 3-5, Table 3-1, sequence No. 10a and *b*. Under Item to be inspected/procedure column, after "AC/charge unit, " add: "or AC adapter. "

Page 3-11. Table 3-2, step 3. In lines 1 and 4, after "AC/charge unit" add: "or AC adapter. " In line 5, after "AC charge" add: "or AC adapter."

Page 3-20. Add paragraph 3-8.1 after paragraph 3-8.

3-8.1. Flash Unit, Model 285

a. Charging Battery.

NOTE

Charge the flash unit battery before and after each use. Also charge the battery whenever it takes more than 30 sec for the ready light (fig. 2-4.1) to come on again after flashing.

(1) Using thumb, slide open battery compartment cover on flash unit (fig. 2-3.1).

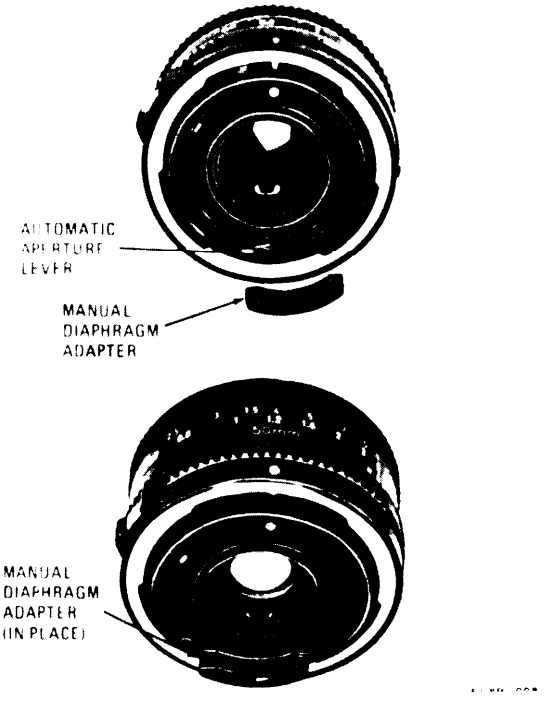


Figure 2-13.1. Lens (rear view) with manual diaphragm adapter.

(2) Remove NC-3 battery pack.

CAUTION

Use only NC-3 battery pack with charg-

ing unit 15. Failure to do so may damage charger and/or batteries.

(3) Align square corner of battery pack with square corner of charge unit 15. Insert NC-3 battery pack into charge unit 15 battery receptacle with exposed battery terminals facing down.

(4) Slide the battery compartment cover closed.

(5) Plug charge unit 15 into AC receptacle.

(6) On charge unit 15, depress PUSH TO CHARGE indicator switch button. The indicator lamp will glow to show that the battery pack is being charged.

NOTE

The charge unit 15 will charge the NC-3 battery pack in about 15 minutes.

(7) If the PUSH TO CHARGE indicator switch lamp does not come on when button is depressed, wait about 15 minutes for the battery pack to cool off, before attempting to charge it.

NOTE

The NC-3 battery pack has a thermal switch which will prevent charging if the battery pack temperature exceeds 104°F (40°C).

b. Forming Capacitor.

NOTE

The capacitor in the flash unit must be formed (electrically activated) whenever the unit has not been used for 30 days or more. Do this after the battery has been charged.

(1) Se tmode selector dial, on flash unit, to M (manual) position (fig. 2-3.1).

(2) If the battery is charged, slide the on-off switch to the RED ON position.

(3) If the optional SB-6 AC adapter (fig. 1-1.1) is used, plug it into the flash unit AC receptacle and an AC convenience outlet.

NOTE

The flash unit on-off switch must be in the off position when using the AC adapter.

(4) When the green ready light comes on, fire the flash five times using the open flash button. Allow the ready light to glow 15 to 20 seconds after each flash.

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists integral components of and basic issue items for the camera set to help you inventory items required for safe and efficient operation.

B-2. General

This Components of End Item List is divided into the following section:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the camera set and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the camera set in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the camera set during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

B-3. Explanation of Columns

a. Illustration. This column is divided as follows

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

(2) *Item number.* The number used to identify item called out in the illustration.

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

c. Part Number. Indicates the primary number used by the manufacturer, 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. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

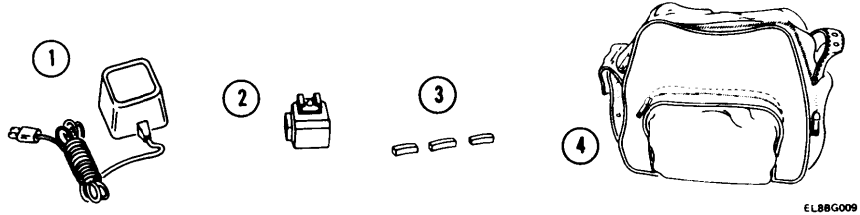
e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. Not applicable. "USABLE ON" codes are included to help you identify which component items are used on the different models. Identification of the codes used in these lists are:

Code	*Used on*
DA C	KS-WC
EQH	KS-99C(1)

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item at a later date; such as for shipment to another site.



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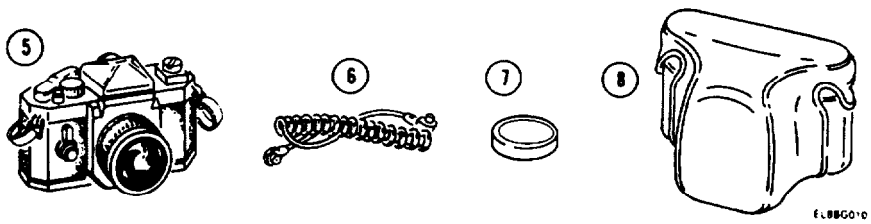
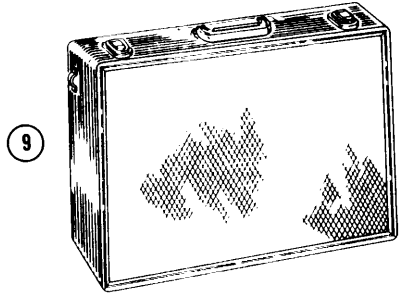
SECTION II COMPONENTS OF END ITEM

(1) PLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
		ADAPTER: Ac, SB-6 (Z2630) 0-0000-22	EQH	EA	1
		ADAPTER: Flash (Z2630) 5-02111-00	DAC, EQH	EA	1
		ADAPTER: Manual diaphragm (Z2630) CA4-2420	EQH	EA	3
	6720-00-615-9054	BAG: Gadget (Z2630) 0-00001-25	DAC,EQH	EA	1



SECTION II COMPONENTS OF END ITEM

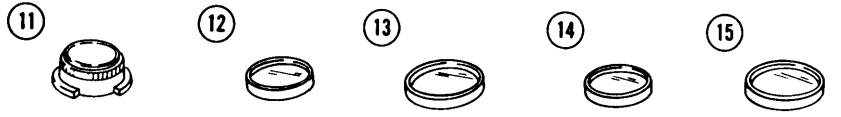
(1) ILLUS No.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
5	6720-01-018-1682	BODY Camera (Z2630) C12-0731-211	DAC, EQH	EA	1
6		CABLE Coiled (Z2630) 0-00001-23	DAC, EQH	EA	1
7	6720-00-024-3872	CAP Body (Z2630) 4-52021-00	DAC, EQH	EA	1
8	6720-00-602-5101	CASE Camera (Z2630) C46-803-000	DAC, EQH	EA	1



EL8BG011

SECTION II COMPONENTS OF END ITEM

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
9	6720-00-602-5107	CARRYING CASE: Metal (Z2630) P-24B	DAC,EQH	EA	1
10		CHARGE UNIT 15: Ac with NC-3 battery pack (52311) 0-00001-21	DAC,EQH	EA	1



EL8BG012

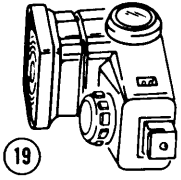
SECTION II COMPONENTS OF END ITEM

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
11		COVER: Back, extension tube (Z2630) 43-1473	DAC, EQH	EA	1
12		FILTER: Orange, 52 mm (Z2630) 4-34361-00-7-5205	DAC,EQH	EA	1
13	6760-01-017-6470	FILTER: Orange, 58 mm (Z2630) 4-34361-00-7-5805	DAC,EQH	EA	1
14	6760-01-017-5805	FILTER: Ultra-Violet, 52 mm (Z2630) 4-34361-00-7-5201	DAC,EQH	EA	1
15	6760-01-024-3894	FILTER: Ultra-Violet, 58 mm (Z2630) 4-34361-00-7-5801	DAC,EQH	EA	1

16

17

18

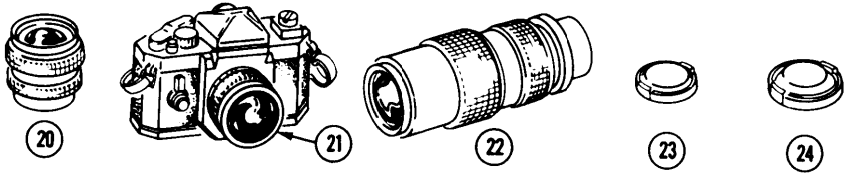


19

EL8BG013

SECTION II COMPONENTS OF END ITEM

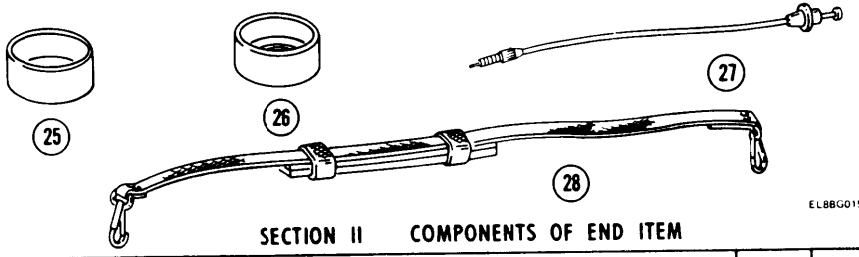
(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
16	6760-31-020-4568	FILTER: Yellow-Green, 52 mm (Z2630) 4-34361-00-7-5204	DAC,EQH	EA	1
17	6760-01-024-3895	FILTER: Yellow-Green, 58 mm (Z2630) 4-34361-00-7-5804	DAC,EQH	EA	1
18	6760-01-614-9257	FINDER: Angle (Z2630) 5-40711-00	DAC,EQH	EA	1
19		FLASH UNIT: Model no. 285 (52311) 0-00001-21	EQH	EA	1



SECTION II COMPONENTS OF END ITEM

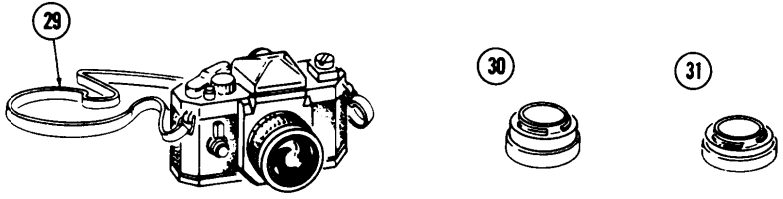
EL8BG014

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
20	6720-01-018-1682	LENS: 35 mm (Z2630) C21-5241-201	DAC,EQH	EA	1
21		LENS: 50 mm (Z2630) C21-6107-207	DAC,EQH	EA	1
22		LENS: 80-200 mm (Z2630) C21-9112-201	EQH	EA	1
23		LENS CAP: Front, normal and wide-angle (Z2630) CG2-0070	DAC,EQH	EA	2
24		LENS CAP: Front, zoom, model 658 (Z2630) 29-9662	DAC,EQH	EA	1



SECTION II COMPONENTS OF END ITEM

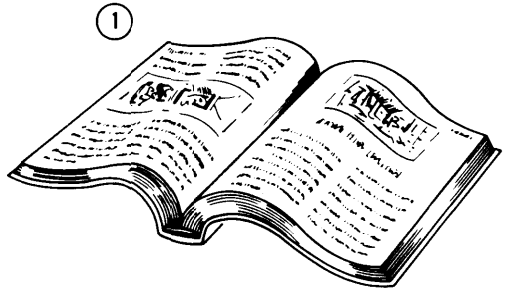
(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
25		LENS HOOD: BS52 (Z2630) C44-5204	DAC,EQH	EA	1
26		LENS HOOD: BW52A (Z2630) C44-5201	DAC,EQH	EA	1
27	6720-01-621-1847	RELEASE: Cable (Z2630) 5-63061-00	DAC,EQH	EA	1
28		STRAP: Carrying Case (Z2630) 0-00001-26	DAC,EQH	EA	1



EL8BG016

SECTION II COMPONENTS OF END ITEM

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQD
29	6720-00-602-5102	STRAP: Neck (Z2630): 5-61131-00	DAC,EQH	EA	1
30	6760-00-061-9282	TUBE: Extension, M10 (Z2630) 4-25317-00	DAC,EQH	EA	1
31	6760-00-061-9312	TUBE: Extension, M20 (Z2630) 4-25322-00	DAC,EQH	EA	2



EL8BG017

SECTION III BASIC ISSUE ITEMS

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION (FSCM) AND PART NUMBER / USABLE ON CODE	(4) U/M	(5) QTY REQD
1		PUBLICATION: TM 11-6720-253-10	EA	1

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the camera set KS-99C and KS-99C(1). These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. Explanation of Columns

a. Column 1 – Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D').

b. Column 2– Level. This column identifies the lowest level of maintenance that requires the listed item.

C– Operator/Crew

O– Organizational Maintenance/Aviation Unit Maintenance

F– Direct Support Maintenance/Aviation Intermediate Maintenance

H– General Support Maintenance

c. Column 3— National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4– Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufac-

turer (FSCM) in parentheses followed by a part number.

e. Column 5— Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NO AND FSCM	(4) UNIT OF MEAS
		6135-00-299-6918	BATTERY, 1.35V M20 (MALLORY PX-625)	Ea
			BA-1006/V	
			BATTERY, 1.5V, SIZE AA,ALKALINE	Ea
			LIST OF FILM	
		6750-00-945-6084	FILM B&W 35mm, 20 ex ASA 400	R1
		6750-00-986-0464	FILM B&W 35mm, 20 ex ASA 40	R1
		6750-00-514-2374	FILM B&W 35mm, 36 ex ASA 25 to 40	R1
		6750-00-174-5436	FILM B&W 33mm, 36 ex ASA 64	R1
		6750-00-045-1945	FILM KODACHROME X 35 mm, 20 ex ASA 64	R1
		6750-00-723-9947	FILM COLOR EX 135, 36, ex ASA 64	R1
		6750-00-925-7683	FILM ANSCOCHROME 35 mm, 20 ex ASA 64	R1
		6750-00-953-9392	FILM EXTACHROME X 35 mm, 20 ex ASA 64	R1
		6750-00-834-4498	FILM EXTACHROME X 35 mm, 20 ex ASA 160	R1
		6750-00-986-0408	FILM EXTACHROME X 135 mm, 20 ex ASA 25	R1
		6750-00-656-1261	FILM EXTACHROME X 35 mm, 20 ex ASA 200	R1
		6750-00-144-6916	FILM EXTACHROME X 35 mm, 20 ex ASA 500	R1

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TECHNICAL MANUAL
No. 11-6720-253-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., *30 June 1975*

OPERATOR'S MANUAL
CAMERA SET, STILL PICTURE KS-99C
NSN 6720-00-602-5099

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for use in operating and maintaining Camera Set, Still Pictures KS-99C.

1-2. 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.

1-3. 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 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A, and DSAR 4145.8.

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/NAVSUPINST 4610.33A/AFR 75-18/MCO P4610.19B, and DSAR4500.15.

1-4. Reporting of Errors

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 Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-Q Fort Monmouth, NJ 07703.

1-5. Administrative Storage

For procedures, forms and records, and inspections required during administrative storage of this equipment, refer to TM 740-90-1.

1-6. Destruction of Army Materiel

For destruction of Army materiel to prevent enemy use, refer to TM 750-244-2.

Section II. DESCRIPTION AND DATA

1-7. Description

(fig. 1-1)

a. General. Camera Set, Still Picture KS-99C (camera set), is a single lens reflex 35 millimeter (mm), self-contained, portable, hand-operated cam-

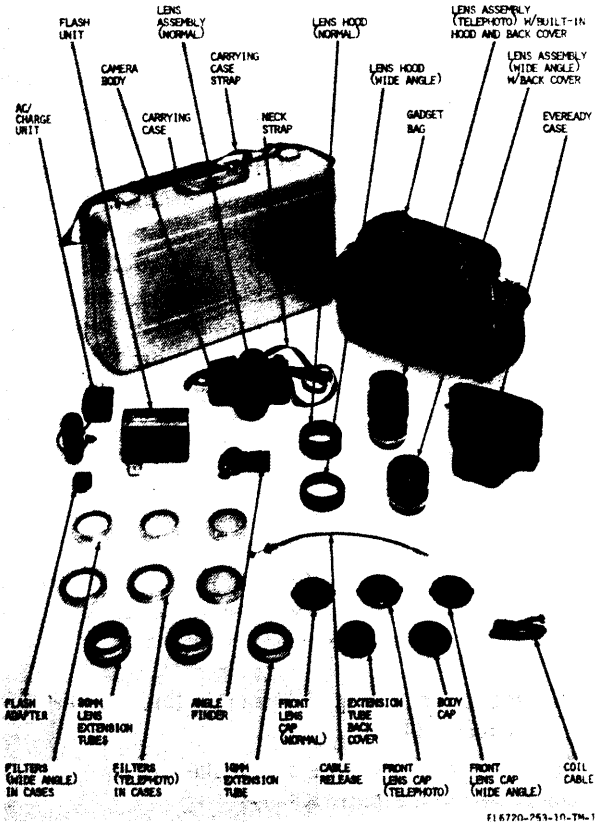

Figure 1-1. Camera Set, Still Picture KS-99C.

era equipment. The camera can be used to photograph most still and moving subjects under normal or adverse lighting. It is used mainly for black and white or color photography under conditions where small, readily portable equipment is desired, and small picture format may be used. The camera set includes four major components and various minor components. The major components consist of a camera (with its normal lens assembly), two additional lens assemblies (telephoto and wide-angle), and a flash unit. The minor components consist of six filters, two lens hoods, six lens caps, three lens tubes, a cable release, an angle finder, an AC/charge unit, flash extension cable, adapter, neck strap, eveready case, gadget bag, and a fitted carrying case. The camera body has provisions for accepting interchangeable lens with modified bayonet mounts and has a built-in meter for through-the-lens light measurements.

b. Additional Information. If you need a detailed description of the camera set and its components, ask your supervisor to see TM 11-6720-253-24.

1-8. Items Comprising an Operable Camera Set, Still Picture KS-99C

The items listed in table 1-1 make up an operable Camera Set, Still Picture KS-99C.

Table 1-1. Items Comprising an Operable Camera Set, Still Picture KS-99C

NSN	Item	Quantity	Dimensions (in.)			Weight (oz)
			Height	Depth	Width	
	Body, camera	1	3 7/8	1 11/16	5 3/4	1 lb 12 oz
	Lens, camera, 50 mm, f/1.8	1		2 7/32	2 21/32	8
	Adapter, flash	1	7/8	1 1/8	1 1/4	1 1/2
	Flash unit	1	3 1/4	1 3/4	4 1/2	15

1-9. Tabulated Data

Camera type	Still picture, general purpose, 35 mm single lens reflex.
Shutter data:	
Type	Two-curtain focal plane shutter.
Speed settings ., . .	B, 1, 1/2 , 1/4, 1/8, 1/15, 1/30, 1/60,1/125, 1/250 , 1/500, 1/1000, and 1/2000 sec; Internally coupled to a built-in exposure meter.
Flash synchronization	X – synch at 1/60 sec or under. M -- synch at 1/30 sec or under. FP – synch at 1/125- 1/2000 sec; synch at 1/30 sec or under.
Self-timer	Up to 10-sec delayed shutter release.
Film accommodated:	
Type	35 mm, double-perforated, black and white or color.
ASA speeds	25 to 2000.
Picture size	24 by 36 mm (0.095 by 1.42 in.).
Capacity	36 exposures (approximately 5 1/2 ft) .
Exposure meter	Match needle type, through-the-lens full aperture metering mechanism.
Exposure meter power .	One H-D type, 1.3V mercury battery.
Viewfinder:	
Type	Eye-1evel finder, pentaprism.
Magnification	0.77 x with standard 50 mm lens at infinity.
Focusing screen. . .	Fresnel lens, standard focusing glass with microprism screen rangefinder.
Metering.	Meter needle and aperture needle, metering limit marks.

Visible information Meter needle and aperture needle, outside shutter speed coupling range indicator, fixed dot for stopped-down metering use and battery check mark, shutter speed scale, metering limiting marks.

35 mm lens:

Type. . . . . Wide angle.
Magnification. . . . 0.7x
Angle of view . . . . 63 degrees diagonal, 54 horizontal, 38 perpendicular.
Aperture system . . Automatic or manual.
Aperture scale. . . . f/2, 2.8, 4, 5.6, 8, 11, 16.
Focusing range . . . 11 inches to infinity.

50 mm lens:

Type. . . . . Standard.
Magnification. . . . 1.0X .
Angle of view . . . . 47 degrees diagonal, 39 horizontal, 27 perpendicular.
Aperture system . . Automatic or manual.
Aperture scale. . . . f/1.8, 2.8, 4, 5.6, 8, 11, 16.
Focusing range . . . 1 ft 9 in. to infinity.

135 mm lens:

Type. . . . . Telephoto.
Magnification . . . . 2.7 X .
Angle of view . . . . 18 degrees diagonal, 15 horizontal, 10 perpendicular.
Aperture system . . Automatic or manual.
Aperture scale. . . . f/2.5, 4, 5.6, 8, 11, 16, 22.
Focusing range . . . 4 ft 6 in. to infinity.

Flash unit:

Dc power source . . Rechargeable nickel cadmium batteries.

Ac operating and charging cable assembly . . . . . 120/220 Vat, 60 Hz.

Automatic flash range . . . . . 2 to 21 feet (0.6 to 6.4 m).

Automatic flash speed . . . . . 1/1000 to 1/30,000 sec (automatic). 1/1000 sec (manual) .

Automatic lens setting. . . . . Choice of 2 for each film speed.

Battery charging. . Approximately 1 hr (before first use).

Flashes per charge (average) . . . . . 8 after 5 min charging. 10 after 15 min charging. 65+ after 60 min charging.

Recycle time . . . . . AC – 7 sec (average). DC – 6 sec (average).

Angle of coverage:

Normal . . . . . 70° horizontal, 50° vertical.

With wide-angle attachment . . . . 70° horizontal, 70° vertical.

Camera set:

Weight . . . . . 18 lb loz.

Size:

Depth . . . .l ft 2 1/4 in.

Width . . . . . 1 ft 9 1/4 in.

Height . . . .6 1/2 in.

Operating temperature range . . . . . 0°F (–18°C) to 120°F (49°C).

1-10. Functional Items Required for Operation

Table 1-2 contains a list of items which are required for equipment operation and must be requisitioned by the user.

Table 1-2. Functional Items Required for Operation

NSN	Item	U/M
6135-00-299-6918	Battery, 1.3V M20 (Mallory PX-625) BA-l006/v	Ea
	List of Film	
6750-00-945-6084	Film B&W 35mm, 20 ex ASA 400	R1
6750-00-986-0464	Film B&W 35mm, 20ex ASA 40	R1
6750-00-514-2374	Film B&W 35mm, 36ex ASA 25 to 40	R1
6750-00-174-5436	Film B&W 35mm, 36ex ASA 64	RI
6750-00-045-1945	Film Kodachrome X35mm, 20ex ASA 64	R1
6750-00-723-9947	Film Color EX l35, 36ex ASA 64	R1
6750-00-935-7683	Film Anscochrome 35mm, 20ex ASA 64	R1
6750-00-953-9392	Film Ektachrome X35mm, 20ex ASA 64	R1
6750-00-834-4498	Film Ektachrome 35mm, 20ex ASA 160	R1
6750-00-986-0480	Film Kodachrome 135mm, 20ex ASA 25	R1
6750-00-656-1261	Film Anscochrome 35mm, 20ex ASA 200	R1
6750-00-144-6916	Film Anscochrome 35mm, 20ex ASA 500	R1

1-11. Items Comprising a Complete Camera Set

Table 1-3 contains a list of items comprising a complete camera set.

Table 1-3. Items Comprising a Complete Camera Set, Still Picture KS-99C

NSN	Item	Quantity
	Adapter, flash	1
6720-00-615-9054	Bag, gadget	1
	Body, camera	1
	Cable, coiled	1
	Cap, body	1
6720-00-602-5101	Case, everready	1
6720-00-602-5107	Case, carrying	1
	Charge unit, AC.	1
	Cover, back, extension tube	1
	Filters, lens (telephoto) . . .	3
	Filters, lens (wide angle). .	3
	Finder, angle	1
	Flash unit	1
	Lens, 35 mm (wide angle)	1
	Lens, 50 mm (normal) . . .	1
	Lens, 135 mm (telephoto)	1
	Lens cap (normal)	1
	Lens cap (wide angle)	1
	Lens cap (telephoto)	1
	Lens hood (normal).	1
	Lens hood (wide angle) . . .	1
6760-00-621-1847	Release, cable	1
6720-00-602-5102	Strap, camera, neck	1
	Strap, carrying case	1
	Tube, lens extension (20 mm)	2
	Tube, lens extension (l0 mm)	1

CHAPTER 2

OPERATING INSTRUCTIONS

CAUTION

If equipment fails to operate, refer to trouble-shooting procedures in chapter 3.

Section I. OPERATOR'S CONTROLS AND INDICATORS

2-1. Camera Controls and Indicators

a. Camera Controls. The following list itemizes the camera controls used by the operator and describes their function.

control	*Function*
Preset aperture ring (fig. 2-1)	Facilitates movement of aperture ring for setting diaphragm of lens assembly.
Cable release socket . . .	Permits attachment of cable release to shutter for remote tripping of shutter mechanism.
Film speed set ring	Spring-loaded, two-position control for setting ASA speed.

Position	*Action*
up	Facilitates setting ASA film speed in ASA film indicator window.
Down (normal)	Facilitates setting of shutter speed.

Film advance lever	Advances film one frame, cocks shutter, and prepares the aperture and mirror for the next shutter release.
Flash socket	Extends internal shutter synchronization contacts outside of camera, permits connection of flash unit cable to camera.
Focusing ring.	Facilitates focusing of lens assembly.
Shutter speed dial.	Selects desired shutter speed.

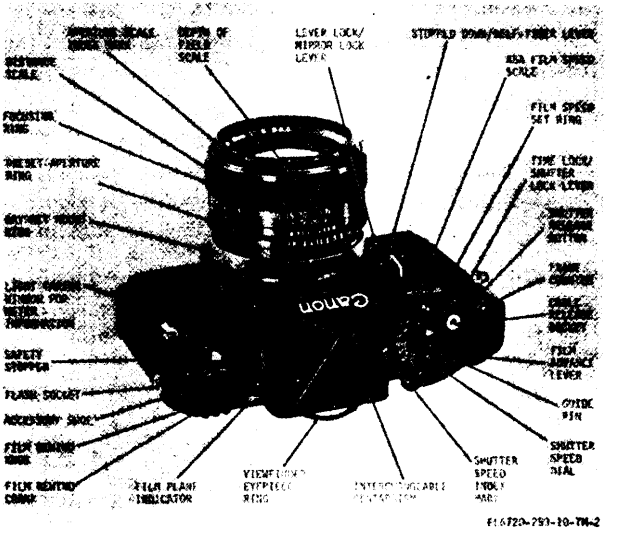

Figure 2-1. Camera controls and indicators, front top view.

Film rewind button (fig. 2-2)	Releases film wind mechanism to permit exposed film to be rewound into fllrn cartridge.
Film rewind crank (fig. 2-1)	Facilitates operation of rewind knob.
Film rewind knob.	Rewinds exposed film into film cartridge.
Shutter release button .	Releases cocked shutter mechanism to make an exposure.
Safety stopper	Prevents inadvertent opening of back cover.
Stopped -down/ self - timer lever	Delays shutter release approximately 10 sec.
Tripod socket (fig. 2-2)	Permits camera to be mounted on tripod.

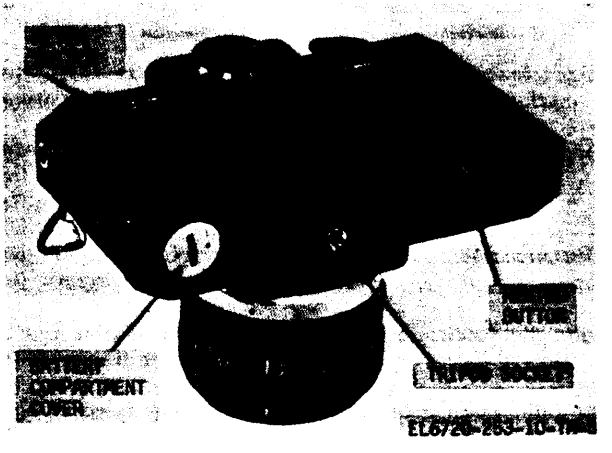

Figure 2-2. Camera (bottom view).

Lever lock/mirror lock lever (fig. 2-1)	Locks mirror in the up position, sets camera for stopped -down metering.
Time lock/shutter lock lever	In L position locks shutter release button; in A position releases shutter release button.
Meter switch (fig. 2-2)	In C position permits battery to be checked; in ON position, energizes built-in exposure meter; in OFF FLASH position, deenergizes built-in exposure meter and permits use of flash unit.

b. Camera Indicators. The following list itemizes the camera indicators used by the operator and describes their function.

Indicator	*Function*
Aperture scale index mark (fig. 2-1)	Indicates (on aperture scale) lens aperture to which the aperture ring adjustment control is set.
Depth of field scale. . . .	Indicates zone of acceptable sharp focus for given lens opening (in front of and behind point focused upon).
Distance scale.	When camera is focused, indicates camera to subject distance (in feet and meters).
Film plane indicator. . .	Indicates location of film and is used for accurate distant measurements.
ASA film speed scale . .	Indicates ASA film speed of film loaded in camera.
Frame counter	Indicates number of exposures taken.

Red dot (fig. 2-3)	Indicates starting position for inserting lenses in bayonet mount on camera.
Shutter speed index mark (fig. 2-1)	Reference mark for shutter speed scale.
Shutter speed dial.	Indicates length of time (in seconds) shutter will remain open during exposure; also indicates when shutter is set up for bulb (B) exposure function. The numbers on the dial indicate the fractional part of a second the shutter will be open; 60 means an exposure time of 1/60; 250 means an exposure time of 1/250 sec.

2-2. Flash Unit Controls and Indicators

a. Flush Unit Controls. The following list itemizes the flash unit controls used by the operator and described their function.

Control	*Function*
Open flash button (fig. 2-3)	Completes electrical circuit to discharge capacitor through flash tube.
Automatic f/stop selector (fig. 2-3)	Sets the amount of light required for the f/stop setting at either close range (Red, 2-10 ft) or extended range (Blue, 2-21 ft).
On-off switch (fig. 2-3)	Energizes the capacitor and builds up the charge.
AC/charge receptacle (fig. 2-4)	Provides an external power source for the flash unit or for recharging the built-in nickel cadmium batteries.

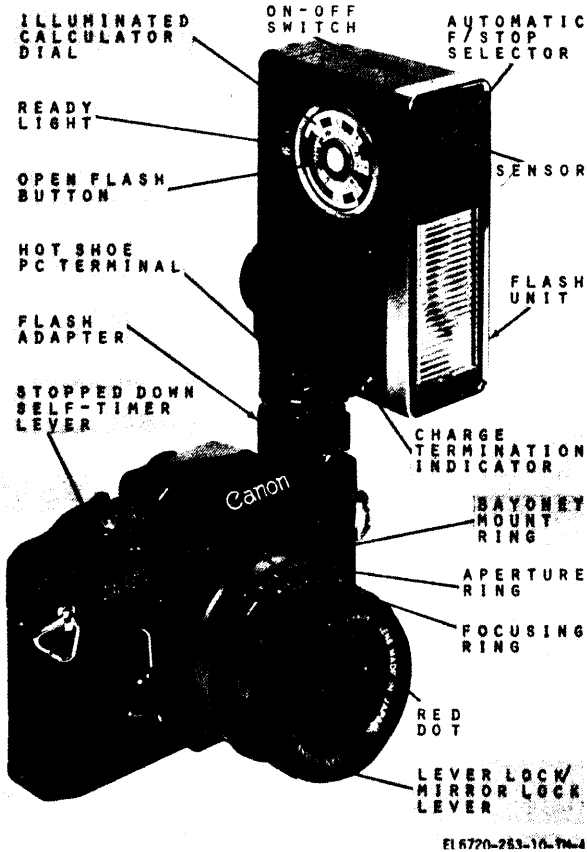

Figure 2-3. Camera with flash unit (front view)

Auto/manual control switch (fig. 2-4)	In A (Auto) position, the sensor measures the amount of light (or duration of flash) required for the camera lens setting. In M (Manual) , the lens must be set for the calculator setting.
AC/charge unit (fig. l-1)	Plugged into a 120V/220V convenience receptacle, the charge unit provides direct current to the batteries through a rectifier circuit.
Charger voltage selector (fig. 2-5)	Provides a choice of either 120V or 220V to power the flash unit or charge the batteries.
Shoe lock nut (fig. 2-4)	Secures mounting shoe.
Hot shoe PC terminal (fig. 2-3)	When PC cord is attached, flash unit is fully synchronized to the camera.

b. Flash Unit Indicators. The following list itemizes the flash unit indicators observed by the operator and describes their function.

Indicator	*Function*
Ready light (fig. 2-3)	Indicates the flash unit is ready to fire.
Illuminated calculator dial	Determines proper lens setting for Manual or proper Automatic f/stop selector setting. Pulsating light indicates Battery Saving Circuit is in operation.
Charge termination indicator	Indicates when batteries are fully charged.
Sensor	Automatically senses the amount of light or duration of the flash required for the camera lens set - ting.

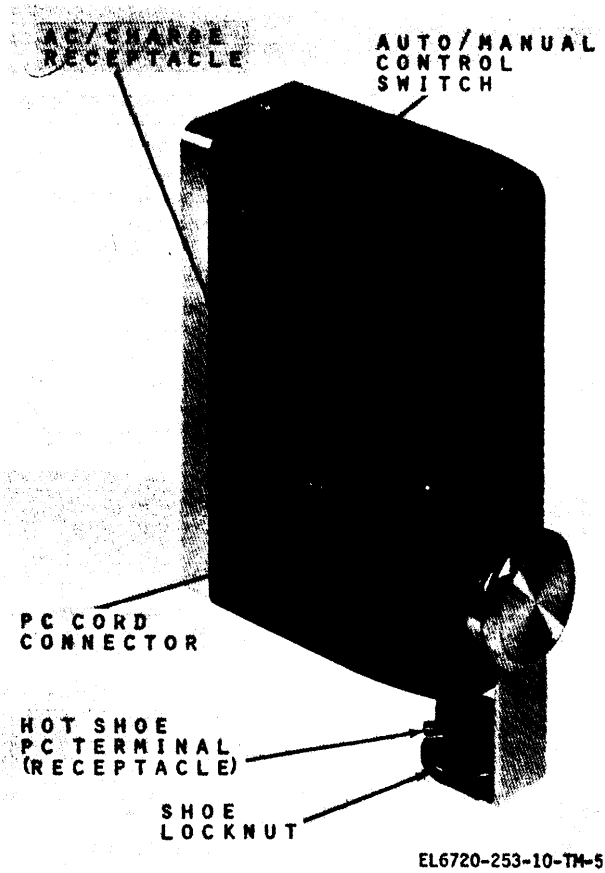

Figure 2-4. Flash unit (rear view).

Section II. PRELIMINARY PROCEDURES

2-3. Removing Camera from Everready Case

a. Take the camera from its set carrying case (fig. 2-5) .

b. With the everready case in an upright position, unfasten the snap fastener on the rear.

c. Lift the case top up, and over the camera front.

d. Turn the retaining screw, on the bottom of the everready case, counterclockwise until it disengages the camera.

e. Lift the camera out of the case.

2-4. Mounting and Removing Lens

a. Mounting Lens.

CAUTION

Before mounting a lens, check to see that the red dot inside the lens mount below the mirror is covered. If the red dot is visible, turn the mirror lock lever (fig. 2-3) counterclockwise to the white rectangle. While attaching the lens, make sure that the self-timer lever is not moved clockwise from its white dot. While holding lens barrel, insure that bayonet mount ring (fig. 2-3) is turned fully counterclockwise and will not turn clockwise.

(1) Place the lens on the camera body with the red dot on the bayonet mount ring lined up with the red dot on the body.

(2) Lower the lens onto the body. (The bayonet mount ring should turn slightly clockwise by itself.)

(3) Turn the bayonet mount ring as far clockwise as you can.

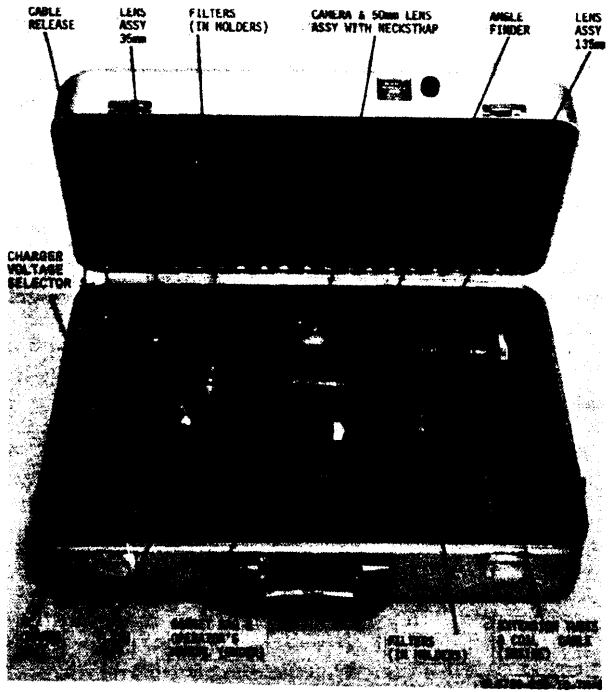

Figure 2-5. Camera set in case.

b. Removing Lens.

(1) Turn the bayonet mount ring (fig. 2-3) counterclockwise (as seen from the front of the camera) until the red dot on the ring is lined up with the red dot on the body.

(2) Lift the lens off the camera body.

(3) Turn the ring counterclockwise until you hear a click and cannot turn the ring in either direction.

2-5. Loading Film

a. Release the back cover by pressing the safety stopper and pulling the film rewind knob up (fig. 2-6).

b. Open the back cover and put in the film cartridge (fig. 2-7) .

c. Press the film rewind knob all the way down. (If the knob does not go all the way in, turn it slightly in both directions.)

d. Pull enough film from the cartridge so you can put the film tip into a slot in the takeup spool (fig. 2-8). (The tooth in the slot must fit into one of the holes in the edge of the film.)

e. Using your thumb, turn the film advance lever to wind some film onto the takeup spool.

f. Engage the teeth on the film advance sprocket with the holes in the edges of the film. (The film must be snug against the camera body and the cartridge in the right position.)

g. Close the back cover by pressing down on it.

h. Check that the cover is latched by gently trying to pull it open.

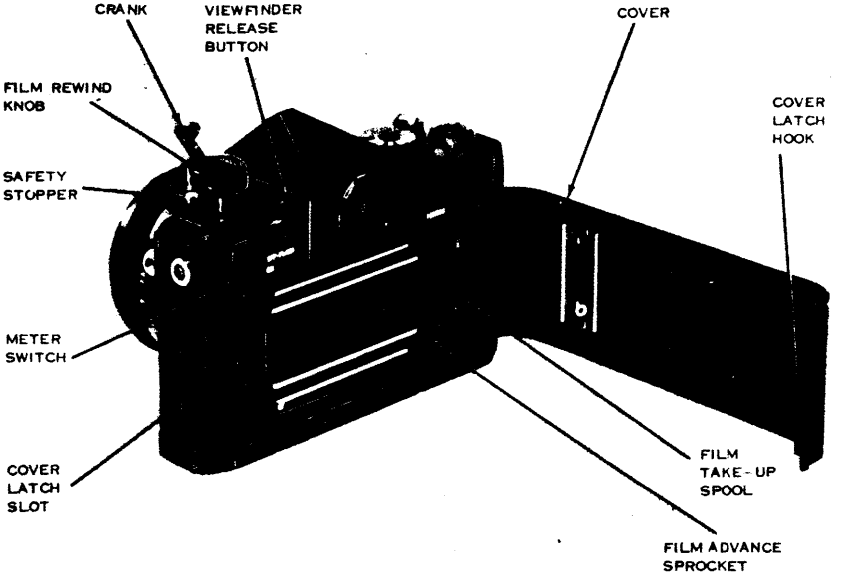

Figure 2-6. Camera with back open.

Figure 2-7. Inserting film in camera.

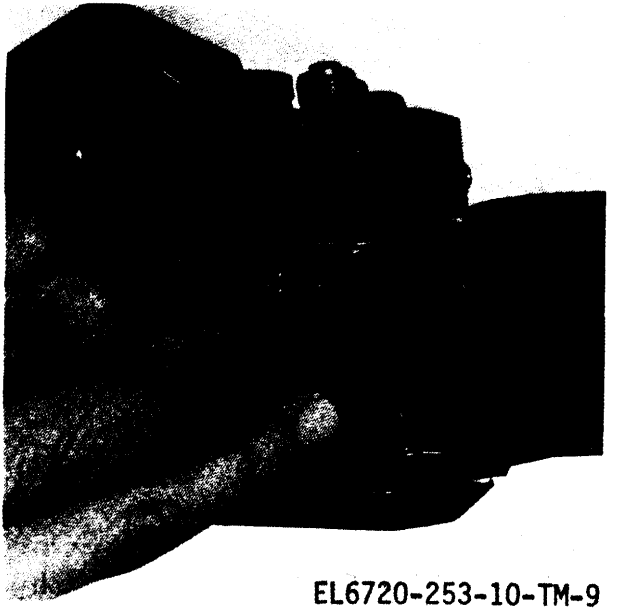

Figure 2-8. Engaging film in takeup spool.

2-6. Advancing Film

a. Set the time lock/shutter lock lever (fig. 2-9) to position A.

b. Press the shutter release button.

c. Move the film advance lever to the right until it stops.

d. At the same time check to see that the film rewind knob turns and that the film rewind button (fig. 2-2) is out and turning. (If the film rewind knob does not turn, the film is not caught in the takeup spool teeth. Open the case and engage teeth with the holes in the edges of the film.)

e. The frame counter (fig. 2-9) must move from position S to the first dot.

NOTE

The frame counter shows only even-numbered frames by number (2, 4, 6, etc.); odd-numbered frames are shown by dots between the numbers.

f. Press the shutter release button again and turn the film advance lever until it stops. (The frame counter should now point at 0.)

g. Again press the shutter release button and turn the film advance lever until it stops. (The frame counter should now point at the dot between 0 and 2.)

h. Be sure a cap in on the lens.

i. Set the proper ASA film speed by lifting the rim of the shutter speed dial (fig. 2-9) and turning it until the correct film speed shows in the window.

j. Set the time lock/shutter lock lever to position L.

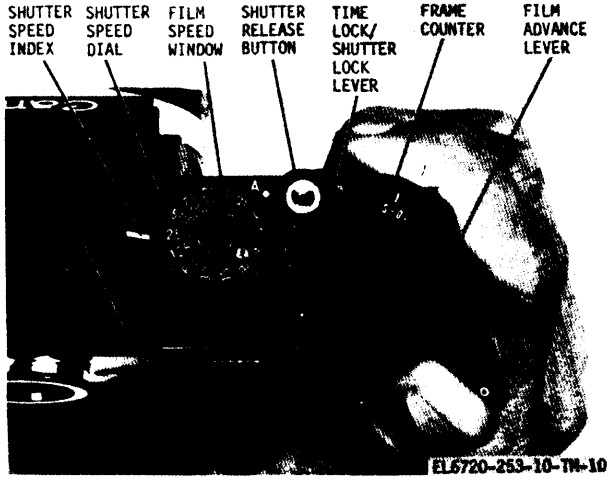

Figure 2-9. Winding film.

2-7. Battery Installation.

a. Unscrew the battery cover by using a thin coin or a small screwdriver (fig. 2-2) .

b. Insert battery in the space with the positive (+) side of the battery toward the cover.

c. Screw the cover back in place.

2-8. Checking Camera Battery

a. Set the film speed at 100 and turn the shutter speed dial to 2000.

b. Turn the meter switch on the back of the camera (fig. 2-6) to C.

c. Check to see that the needle points to the fixed blue rectangle (fig. 2-10); if it does not, replace the battery.

d. Turn the meter switch to OFF-FLASH.

e. Reset the film speed dial as desired.

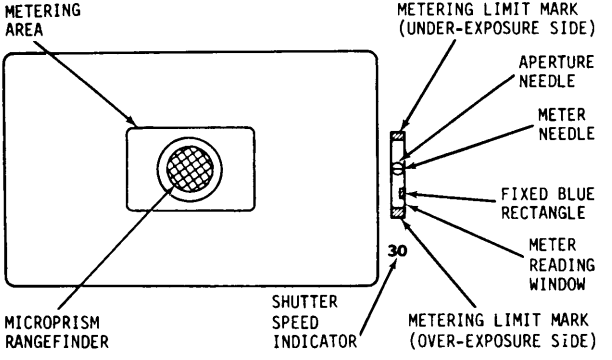

Figure 2-10. Viewfinder Presentation.

Section III OPERATION UNDER USUAL CONDITIONS

2-9. Full Aperture (Normal) Metering

NOTE

The exposure meter measures light through the full aperture. Exposure meter needle range is adjusted by the preset aperture ring.

a. Remove the lens cap by pressing the latch buttons and lifting off the cap.

b. Turn the meter switch to ON (fig. 2-6).

c. Turn the shutter speed dial to desired shutter speed (fig. 2-9).

d. Check that the selected shutter speed shows below the exposure meter in the viewfinder (fig. 2-10).

e. Hold the camera in the horizontal or vertical position (fig. 2-11).

f. Point the camera so that the viewfinder screen metering area (fig. 2- 10) includes the part of the subject you want correctly measured.

g. Observe the needles in the meter reading window (fig.2-10).

CAUTION

Before turning preset aperture ring, check that the ring is not locked with the green circle at the orange index. If it is, press the button at the green circle and turn the ring.

h. Turn the aperture ring (fig. 2-3) to align the aperture needle circle with the meter needle.

i. Check to see that the meter needle splits the aperture needle (fig. 2-10).

NOTE

In case of f/stop priority, turn the shutter speed dial to align the meter needle with the aperture needle.

j. Turn the shutter speed dial to align the two needles if the aperture needle does not align with the meter needle.

k. Increase shutter speed to move the needle downward; decrease shutter speed to move needle upward.

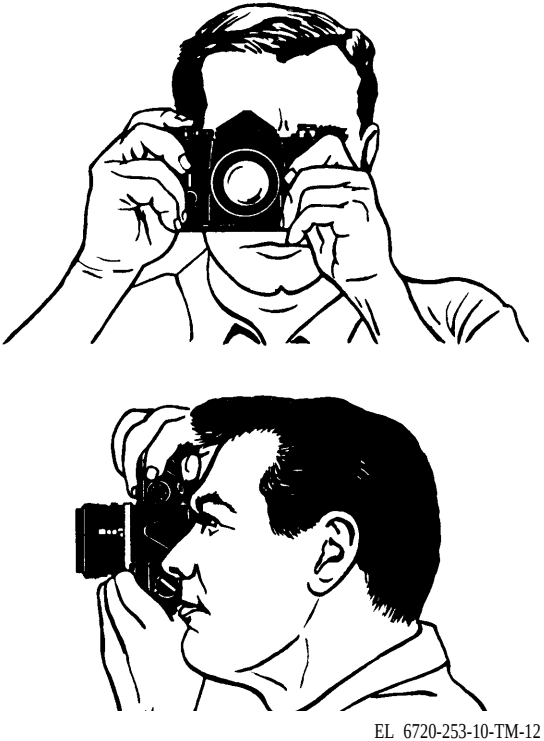

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FIG 2-11 HOLDING THE CAMERA

Figure 2-11. Holding camera.

2-10. Making Exposure

a. Turn the shutter lock lever to A (fig. 2-1).

b. Hold the camera as shown in figure 2-11 and look through the viewfinder again; check to see that the part of the subject that must be in sharp focus is in the circle in the center of the viewfinder screen.

c. Turn the lens focusing ring (fig. 2-3) until the circle in the center of the viewfinder screen shows the subject most clearly.

d. Point the camera so that what you see in the viewfinder is exactly the way you want the picture to look.

e. Press the shutter release button.

2-11. Advancing Film to Next Exposure

a. Turn the film advance lever.

b. Check to see that the frame counter moves to the next frame number.

CAUTION

Do not advance the film beyond the number of exposures in the cartridge because you may tear the film from the cartridge spool. If that happens, you must unload the camera in a darkroom or a changing bag. You can tell that you have torn the film from the cartridge spool by watching the rewind knob. The rewind knob stops turning even though you are turning the film advance lever .'

c. Keep turning the film advance lever until it stops.

d. Put on the lens cap if you are not going to take another picture right away.

e. Set the time/lock shutter release locking knob at Land turn the meter switch to OFF-FLASH.

2-12. Rewinding Film

a. Rewind the film into the cartridge after all exposures on the film have been made, or if you want to change to a different type of film.

b. Take the camera out of its everready case (para 2-3) .

c. Press the film rewind button on the camera bottom all the way in (fig. 2-2). (It should click and stay in.)

d. Unfold the crank in the film rewind knob and turn the crank clockwise (in the direction of the arrow on the crank) until the film rewind button stops turning and rewinding resistance gets light.

e. If you are rewinding a partially used cartridge to change film types, record the number of the last frame exposed so that you can reload the film later.

f. Open the back cover (para 2-5b).

g. With the film rewind knob out, lift out the film cartridge.

h. Check that the frame counter returns to S.

i. Fold in the film rewind crank.

2-13. Attaching Flash Unit

a. Attach the flash unit (fig. 2-3) to the flash adapter by sliding the adapter onto the mounting shoe of the flash unit. Slide it on from the front of the unit.

b. Tighten the shoe locknut on the flash unit to hold the unit and the adapter together.

c. Slide the adapter, with the flash unit attached, onto the camera.

d. Push the adapter as far toward the front of the camera as you can. (The flash unit should be perpendicular to the top of the camera as shown in figure 2-3.)

e. Connect the attached PC cord to the hot shoe PC terminal (receptacle) on the flash unit. (The cord should remain attached to this terminal (receptacle) during normal operation.)

2-14. Operating Flash Unit on Camera

a. Set the camera shutter speed dial at 60 and the camera meter switch at OFF-FLASH.

b. Test the flash unit by turning the ON-OFF switch (fig. 2-3) to ON.

c. After the ready light comes on, press the open flash button. (The unit should flash. For battery charging instructions, see paragraph 3-8.)

d. Check to see that the calculator dial lights when the ON-OFF switch is set at ON.

NOTE

A capacitor in the flash unit stores electricity received from the battery and discharges it to the flash tube when the circuit is triggered. An integrated circuit (IC) senses capacitor voltage level and regulates current flow from the batteries to prolong battery life. When the flash unit is ON, the calculator dial remains lighted at a constant level until the IC circuit activates. The circuit is in operation when the dial begins to blink or pulsate. Dial blinking or pulsating ends when a picture is taken or the ON-OFF switch is set at OFF.

e. Set the flash unit ON-OFF switch at OFF.

NOTE

If the ON-OFF switch is left at ON, or the unit is not flashed, the calculator dial light will start to blink shortly after the ready light comes on.

f. Operate the flash unit under automatic control or manual control.

g. For automatic control, proceed as follows:

(1) Set the flash unit AUTO/MANUAL control switch (fig. 2-4) at A.

(2) Set the calculator dial (fig. 2-3) on the flash unit to the ASA rating of the film loaded in the camera.

(3) Set the automatic f/stop selector at either the red or blue position.

NOTE

The blue position is for greater flash-to-subject distances (2 to 21 ft). The red position is for closeups (2 to 10 ft) and greater depth of field.

(4) Set the camera lens to the desired f/stop within the calculator dial triangle the color of which matches the setting of the automatic f/stop selector switch.

(5) Set the flash unit ON-OFF switch to ON.

(6) Compose and focus the picture in the camera viewfinder.

(7) When the ready light on the flash unit comes on, make the exposure.

h. For manual control, proceed as follows:

(1) Set the flash unit AUTO/MANUAL control switch at M (fig. 2-4).

(2) Set the calculator dial (fig. 2-3) on the flash unit to the ASA rating of the film loaded in the camera.

(3) Focus the camera on the portion of the scene to be properly illuminated.

(4) Read the f/stop indicated on the calculator dial for the camera focusing setting. Set the camera lens at this f/stop.

(5) Set the flash unit ON-OFF switch at ON.

(6) Compose and focus the picture in the viewfinder of the camera.

(7) When the ready light on the flash unit comes on, make the exposure.

i. After making last flash exposure, allow the ready light to come on; then set the flash unit ON-OFF switch at OFF.

2-15. Using Flash Unit Detached

a. Disconnect the flash adapter from the camera and hold the flash unit in the desired position.

b. Connect the flash unit's PC cord to the PC socket on the camera.

c. Operate the flash unit and camera as described in paragraph 2-14, except that you must remember that all distances (except camera focusing) are from the flash unit to the subject.

2-16. Operating Flash Unit on AC

NOTE

Operate the flash unit on AC when you want to take more pictures in a shorter period of time than

the flash unit battery will accommodate without being recharged.

a. Check to see that the charger voltage selector on the AC charge unit is in the 120V position.

b. Plug the charge cord into the AC/charge receptacle (fig. 2-4) on the flash unit.

c. Plug the AC charge unit into an AC receptacle.

d. Operate the flash unit as described in paragraph 2-15.

2-17. Angle Finder

NOTE

Use the angle finder for copy work, closeup photography, or for photographing a subject from a low angle.

a. To install angle finder (fig. 2-12), unscrew the viewfinder eyepiece ring (fig. 2-1).

b. Screw the angle finder onto the viewfinder eyepiece.

c. Turn the angle finder until the knurled collar (fig. 2-12) is snug against the camera.

NOTE

What you see through the angle finder is exactly what you would see if you were looking directly through the viewfinder. You can turn it clockwise to any position.

d. To take off the angle finder, turn the knurled collar (fig. 2-12) on the angle finder counterclockwise until it comes off.

e. Put the ring back on the viewfinder.

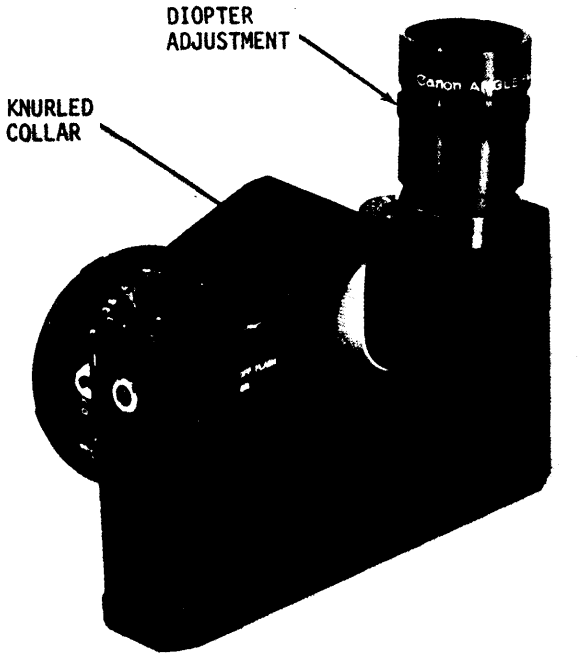

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Figure 2-12. Angle finder.

2-18. Cable Release

NOTE

The cable release is used when you want to take a picture with as little shaking of the camera as

a. With the time lock/shutter lock lever set at the L

position (fig. 2-9), screw the end of the cable release into the top of the shutter release button.

b. If you want the release to hold for a time exposure, turn its knurled ring counterclockwise all the way before pressing the release button.

c. At the end of the exposure, turn the knurled ring clockwise. (The release button will pop out.)

d. Before removing the cable release, insure that the time lock/shutter lock lever is set at L; then unscrew the cable release from the shutter release button.

2-19. Making Double Exposure

NOTE

The camera must be removed from its everready case to make a double exposure (para 2-3) .

a. After making the first exposure, press in the film rewind button (fig. 2-2).

b. With the crank, turn the rewind knob clockwise until the film rewind button makes exactly one-half turn counterclockwise.

c. Hold the rewind crank lightly and turn the film advance lever (fig. 2-9).

d. Stop turning the lever when you feel resistance on the crank.

e. Turn the film advance lever once more. (The camera is now ready to make a second exposure on the frame.)

NOTE

The frame counter advances one frame with each exposure. The frame counter will indicate one count higher than the actual total exposures.

Therefore, you must remember that you have made a double exposure.

2-20. Locking Mirror Up

NOTE

Camera vibration can be reduced by locking the mirror up.

a. Turn the lever lock/mirror lock lever (fig. 2-3) clockwise to L and press the stopped-down/self-timer lever as far clockwise as you can.

CAUTION

Keep the lens covered when the mirror is locked. Otherwise, the film may be fogged.

b. Then turn the lever lock/mirror lock lever clockwise to M. (This raises the mirror out of the light path to the film.)

NOTE

When the mirror is in the UP position, viewing through the viewfinder is not possible. Distances must be estimated; the 1/2000 second shutter speed cannot be used.

c. To return the mirror to its normal operation, turn the lever lock/mirror lock lever counterclockwise as far as it will go.

2-21. Stopped-Down Metering

a. Setting Camera.

(1) Turn the lever lock/mirror lock lever (fig. 2-3) clockwise to L and turn the stopped-down timer lever clockwise as far as it will go.

(2) Turn meter switch to ON (fig. 2-6).

(3) set the shutter speed dial at the desired speed.

(4) Face the camera toward the subject and look into the viewfinder.

NOTE

Only the meter needle (fig. 2-10) will be visible in the viewfinder.

(5) Turn the preset aperture ring on the lens until the meter needle (fig. 2-10) points to the fixed blue rectangle.

(6) To return the camera to normal full-aperture metering, turn the lever lock/mirror lock lever counterclockwise as far as it will go.

b. Setting Lens.

(1) On the back of the 50 mm lens assembly (fig. 2-13), hold the automatic-manual lever as far counterclockwise as possible and turn the locking lever to L. The 35 mm and 135 mm lenses do not have locking levers; just move the automatic-manual lever as far counterclockwise as possible (fig. 2-14).

(2) When you set the lens this way, also set the camera for stopped-down metering.

(3) To return the 50 mm lens to regular operation, set the locking lever at the white dot. (The automatic-manual lever snaps back in position by itself.)

(4) To return the 35 mm or 135 mm lens to regular operation, just move the automatic-manual lever as far clockwise as it will go.

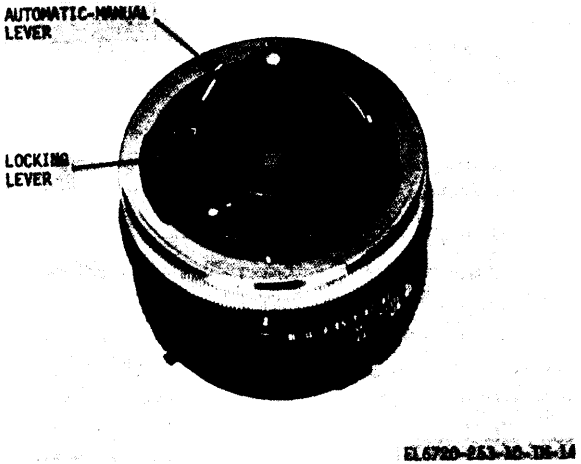

Figure 2-13. 50-mm lens (rear view).

2-22. Checking Depth of Field

a. To check the depth of the field using full-aperture metering, turn the stopped-down/self-timer lever as far clockwise as it will go,

b. Look through the viewfinder and observe the depth of field.

2-23. Using Self-Timer

NOTE

The self-timer is used to delay shutter operation until approximately 10 seconds after the shutter release but ton is depressed.

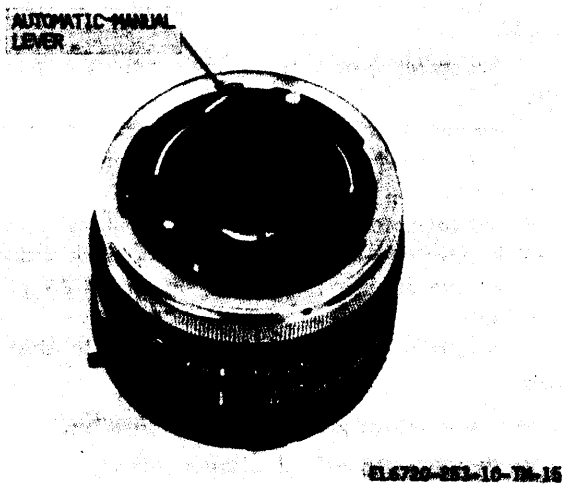

Figure 2-14. 35-mm and 135-mm lenses (rear view).

a. Wind the film advance lever (fig. 2-9).

b. Turn the stopped-down/self-timer lever counterclockwise as far as you can.

c. Momentarily press the shutter release button. (The timer lever will turn and release the shutter in approximately 10 sec.)

2-24. Using Lens Extension Tubes

NOTE

When making pictures that are the same size as the subjects, use the three extension tubes and the 50 mm lens.

a. Support the camera with a tripod or tabletop stand.

b. Set the lens for stopped-down metering (para 2-22) .

c. Attach the tubes, lens and camera body to each other the same way you would attach a lens to the body (para 2-4).

d. To focus for an exact actual-size image, set the lens at infinity and move the camera back from, or toward, the subject to get the sharpest view in the viewfinder,

e. Adjust focus ring for best obtainable final setting.

2-25. Replacing Camera Set in Carrying Case

a. Replace the optical components of the camera set in the carrying case insuring that all parts are seated firmly in the foam padding.

b. Roll the gadget bag up tightly so that it does not protrude above the edge of the case.

c. Wrap the camera strap carefully around the camera lens in its everready case.

d. Check the case contents with figure 2-5 to be sure that everything is in correct position.

e. Close the case and secure the latches before lifting the case by the handle.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-26. Operation at Low Temperatures

NOTE

Equipment to be operated at low temperatures should be stored at approximately the same temperature as that in which it will be used. The camera set can be operated normally at low temperatures if the procedures given in *a* and *b* below are followed.

a. Storing Equipment at Low Temperatures.

CAUTION

Avoid rapid changes in temperature. Such changes affect the film. If the equipment is stored in a colder location than where it will be used, follow the procedures given in (1) , (2) , and (3) below.

(1) Transfer the equipment from the low-temperature storage location to the warmer location at least 6 hours in advance of its anticipated use.

(2) Remove any moisture on the outer plastic and metal surfaces of the equipment with a soft, lint-free cloth before operating the equipment.

(3) Clear the surfaces with a lens tissue dampened with lens cleaner if any moisture is present on the exposed optical surfaces.

(4) Dry the exposed optical surface with a clean lens tissue.

NOTE

If moisture has condensed on the inner surfaces of the optical components, allow the equipment to remain long enough for the moisture to evaporate.

Allow the equipment to remain in a warm area to evaporate the moisture more rapidly. Do not allow the temperature to exceed 125° F (52° C).

b. Operating Camera at Low Temperatures.

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

(2) Prevent moisture from forming on the camera and the flash unit parts, particularly on the optical assemblies.

(3) Avoid breathing directly on the equipment while it is at a low temperature.

(4) Provide additional precautions and protection to the equipment while it is in storage to prevent its exposure to high humidity and freezing temperature.

2-27. Operation in Desert Areas or in Dust-Laden Atmosphere

NOTE

Follow procedures given below when the camera set is used in desert areas or other dust-laden atmospheres.

a. Expose the equipment to dust-laden air for only minimum lengths of time. Keep lens cap in place until ready to take picture.

b. Provide protection for changing lenses or avoid changing lenses in dust-laden atmosphere.

c. Return the camera to the everready case as soon as possible after each use.

d. When the equipment is not in actual use, keep all components of the camera set in the carrying case.

2-28. Operation in Tropical Regions

NOTE

Follow procedures given below when the camera set is used in tropical regions.

a. Keep the equipment free of, exterior surface, fungus, mites, and metal corrosion.

b. Keep all components of the camera set in the carrying case when the equipment is not in use.

c. Prevent insects from entering the equipment when the camera set is used. Keep set case closed when not getting access to the equipment.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-1. Purpose

Preventive maintenance checks and services (PMCS) is the systematic care, service, and inspection of equipment to insure that the equipment is serviceable and to prevent the occurrence of trouble.

a. Operator's maintenance consists of the following:

(1) Daily and monthly preventive maintenance.
(2) Troubleshooting.
(3) Cleaning.

b. Repair of the still picture camera components is not authorized at operational level. If corrective maintenance or repair is required, refer the equipment to the next level of maintenance.

3-2. PMCS Periods, Reporting, and Procedures

a. PMCS Periods. Preventive maintenance checks and services table 3-1 lists checks to be performed daily when camera set is in use. If the camera set is not used daily, it should be checked and serviced immediately before being put to use and as soon after being used as possible. When not in regular use, do not allow

the camera set to go beyond 1 week without performing the daily preventive maintenance checks and services.

b. PMCS Reporting. Record all checks in accordance with TM 38-750.

c. PMCS Procedures. Table 3-1 lists procedures for performing preventive maintenance checks and services. The first column lists the interval and sequence that a particular check or service is required. This column is subdivided into two columns: D (Daily) and M (Monthly). The second column lists the item to be inspected and the procedure. For detailed information on performing the inspections, refer to paragraphs 3-6, 3-7, and 3-8.

3-3. Tools and Materials Required

No tools are required for operator's maintenance. The materials required are listed below.

NSN	Item	Use
7920-00-356-4694	1-inch bristle brush	Clean metal surfaces.
8020-00-246-8806	Camel's-hair brush	Clean glass surfaces.
8305-00-267-3015	Lint-free cloth	Clean metal surfaces.
8305-00-170-5062	Lens tissue	Clean glass surfaces.
6750-00-408-5175	Lens cleaner (liquid)	Clean glass surfaces.

Table 3-1. Preventive Maintenance Checks and Services

D – Daily
Time required: 4

M – Monthly
Time required: 1.2

Interval and Sequence No.		Item to be inspected Procedure	Worktime (M/H)
D	M		
		CAMERA SET Check to see that Camera Set KS-99C is complete as shown in figure 1-1.	0.1
		CAMERA BODY EXTERIOR SURFACES *a.* Check for physical damage. *b.* Remove dust, dirt, and moisture with a clean, lint-free cloth.	0.1
		EXTERIOR SURFACES OF LENSES AND FILTERS *a.* Check for physical damage. *b.* Clean metal and optical surfaces if required.	0.1
		OPERATION *a.* During operation, be alert for any unusual conditions. *b.* Listen for unusual sounds when winding, rewinding, and operating shutter release. Feel for binding or erratic operation of controls and film winding lever.	0.1

Table 3-1. Preventive Maintenance Checks and Services – Cont.

D – Daily
Time required: 4

M – Monthly
Time required: 1.2

Interval and Sequence No.		Item to be inspected Procedure	Worktime (M/H)
D	M		
	5	CAMERA BODY *a.* Check back cover hinge and lock to be sure that they are not loose. b. Check operation of shutter at each speed setting. c. Check shutter speed control for tightness and for alignment of numbers with index. *d.* Check frame counter for correct operation. *e.* Check to see that depressing safety stopper allows film rewind knob to be lifted up. Check that back cover opens slightly when knob is lifted all the way up. *f.* Load film in camera (para 2-5). Check film transport for smooth winding and rewinding. *g.* Check operation of self-timer.	0.3

Table 3-1. Preventive Maintenance Checks and Services – Cont.

D – Daily
Time required: 4

M – Monthly
Time required: 1.2

Interval and Sequence No.		Item to be inspected Procedure	Worktime (M/H)
D	M		
		h. Check to see that lens mounting surface is smooth.	
	6	LENSES *a.* Check operation of focusing mount. *b.* Check operation of diaphragm ring.	0.1
	7	FILTERS Check mounting threads for damage.	0.1
	8	CABLE RELEASE *a.* Check operation. *b.* Inspect threads.	0.1
	9	LENS HOODS Inspect lens hoods for cracks or other damage.	0.1
	10	FLASH UNIT *a.* Check condition of flash unit, AC/charge unit, and connecting cords. *b.* Remove dirt, dust, and moisture from the flash unit and AC/charge unit with a lint-free cloth.	0.2

Table 3-1. Preventive Maintenance Checks and Services – Cent.

D–Daily
Time required: 4

M – Monthly
Time required: 1.2

Interval and Sequencc No.		Item to be inspected Procedure	Worktime (M/H)
D	M		
	11	CARRYING CASE AND MINOR COMPONENTS *a.* Inspect all minor com - ponents for completeness and condition. Report any damage or shortage to organizational maintenance. *b.* Clean carrying case inside and outside. Remove all dirt, dust, and moisture with a clean, lint-free cloth dampened with water. Wipe dry.	0.3

Section II. TROUBLESHOOTING

3-4. General

This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the camera set. Each malfunction in table 3-2 is followed by a list of tests or inspections which will help you to determine probable

causes and corrective actions for you to take. You should perform the tests/ inspections and corrective actions in the order listed. Repair of camera components is not authorized at operational level. If corrective maintenance or repair is required, refer the camera set co the next higher category of maintenance.

3-5. Unlisted Malfunctions

This manual cannot list all possible malfunctions that may occur, or all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, notify your supervisor.

NOTE

Before you use this table, be sure you have performed all applicable checks.

Table 3-2. Troubleshooting

MALFUNCTION TEST OF INSPECTION CORRECTIVE ACTION
CAMERA
1. VIEWFINDER AREA IS DARK.
Step 1. Check to see that lens cap was removed. Remove lens cap.
Step 2. Check to see that mirror is not locked in up position. Unlock mirror by turning lever lock/mirror lock lever as far toward lens mount as possible.

Table 3-2. Troubleshooting– Cont.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

2. VIEWFINDER AREA IS CIRCULAR AND DOES NOT FOCUS PROPERLY.
   Check to see that viewfinder screen was installed after cleaning.
   Put viewfinder screen in correct position.

3. NO EXPOSURE.
   Step 1. Check to see that film is properly loaded in camera.
   Load film properly (para 2-1).
   Step 2. Check to see that film is not defective.
   Use good quality film.

4. IMPROPER EXPOSURE.
   Step 1. Check camera battery.
   If battery condition indication is low, replace battery.
   Step 2. Check to see that film speed dial setting matches rating of film loaded in camera.

5. FILM WILL NOT ADVANCE.
   Step 1. Check to see that film is properly loaded in camera.
   Load film properly (para 2-5).
   Step 2. Check to see that film is not past last exposure.
   If film is past last exposure, rewind film.
   Step s. Check cartridge spool.
   If spool does not rotate, obtain a new cartridge and load the camera.

Table 3-2. Troubleshooting – Cont.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

6. FILM CANNOT BE REWOUND.
   - Step 1. Check to see that the film rewind button has been pressed.
     Press the film rewind button and rewind the film.
   - Step 2. Check to see that the film has not been pulled off the supply spool (para 2-11).
     If the film has been pulled off the supply spool, take the camera into a darkroom or changing bag. Then unload the camera and rewind the film onto the cartridge by hand.

7. METER INOPERATIVE.
   Check camera battery.
   If camera battery condition indication is low, replace battery.

8. SCRATCHES ON NEGATIVE.
   Check to see that the camera film path is free of dirt and dust.
   If dust or dirt is present, clean the camera with a lint-free cloth or soft brush.

9. LIGHT LEAKS ON FILM.
   - Step 1. Check to see that the back cover is completely closed.
     If the cover is not closed, insure that the cover hook is inserted in its slot in the camera body and that the cover latches with an audible click when it is pressed in place.

Table 3-2. Troubleshooting– Cont.

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
Step 2. Check to see that the back cover was not opened before the film was rewound.	Exercise care not to open the back cover before the film has been com - pletely rewound.
FLASH UNIT	
10. FLASH UNIT DOES NOT FIRE WHEN READY LIGHT IS ON AND SHUTTER RELEASE IS PRESSED.	
Step 1. If flash unit is mounted on camera, check to see that flash unit is securely fastened to flash adapter, that PC cord is connected to the hot shoe PC terminal (receptacle on flash unit) and that adapter is pushed as far toward the front of the camera as possible.	If these conditions are not satisfac- tory, attach the flash unit to the camera correctly.
Step 2. If flash unit is hand-held, check to see that cord is securely connected to camera and flash unit.	If these conditions are not satisfac- tory, connect the cord properly.
11. FLASH UNIT READY LIGHT DOES NOT COME ON WITHIN 1 MIN AFTER PLUGGING UNIT INTO AC OUTLET.	
Step 1. Check to see that outlet has power.	

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
		If there is no power, use another outlet or switch to DC operation.
	Step 2. Check to see that ON-OFF switch is at ON.	If switch is at OFF, move it to ON position.
	Step 3. Check to see that AC/charge unit is properly connected to flash unit.	If unit is not properly connected, plug AC/charge unit connector securely into AC/charge receptacle on flash unit.
	Step 4. Insure that the flash unit capacitor is properly activated.	Form (electrically activate) the capacitor.

Section III. MAINTENANCE PROCEDURES

3-6. Inspection and Oparating Checks

NOTE

Rewind the film and remove it from the camera (para 2-12) before carrying out the following procedures.

a. Interior.

(1) Remove the lens from the camera body (para 2-4b).

(2) Lock the mirror up (para 2-20).

(3) Open the back of the camera (para 2-5a).

(4) Remove the pentaprism by squeezing both release buttons (fig. 3-1) with your fingers and sliding the pentaprism toward the rear of the camera.

(5) Remove the viewfinder screen by lifting up on the rear edge with your fingernail (fig. 3-2). (There is a notch on each side to make this easier.)

(6) For easier cleaning of the viewing window, unscrew the eyepiece ring.

(7) Check the pressure plate (fig. 2-6) for scratches, pits and dirt; clean if required (para 3-*7a(2)(b)*).

(8) Check the interior of the camera body for dust, film clips, and foreign particles; clean if required (para *3-7a(2)(a)*).

b. Shutter Operation.

(1) Remove the lens and open the back of the camera body as in *a.* above.

(2) Point the camera body toward a light area and look at the rear of the shutter curtain.

(3) Turn the film advance lever until it stops and then press the shutter release button.

(4) Repeat this for each speed on the shutter speed dial.

(5) The shutter should open each time it is tripped.

c. Shutter Speed Control.

(1) Rotate the shutter speed dial throughout its range.

(2) Check that it is not loose. (Each indicated shutter speed should have a positive click and align

with the shutter speed index.)

d. Frame Counter.

(1) Turn the film advance lever until it stops and then press the shutter release button.

(2) Do this several times. (The frame counter should move one division each time the shutter is wound.)

e. Film Rewind Knob.

(1) Unfold film rewind crank and rotate it several turns.

(2) Check for smooth operation. (The film rewind fork, inside the camera body, should rotate as the rewind knob is turned.)

f. Self-Timer.

(1) Wind the shutter.

(2) Turn the stopped-down/self-timer lever away from lens mount until it stops.

(3) Press the shutter release button. (The shutter should open after a delay of approximately 10 sec.)

g. Lens Mounting Flange.

(1) Check to see that the surface of the flange is smooth and free of dirt, nicks and burrs. (The mounting screws should be tight.)

(2) Mount a lens on the camera and lock it in position. (It should not bind while mounting. The lens lock should hold the lens securely.)

h. Film Transport.

(1) Load the camera with film. (The film advance lever should operate smoothly and the film should not drag or bind.)

(2) Rewind the film. (Rewinding should be smooth and without binding.)

NOTE

To avoid waste, use a roll of outdated film if it is available.

i. Camera Synchronization and Flush Unit Circuit.

(1) Rewind and remove the film if the camera is loaded.

(2) Mount flash unit on the camera (para 2-13).

(3) Set the shutter speed dial to 60.

(4) Turn the flash unit on and wait approximately 5 seconds.

(5) Turn the film advance lever until it stops and then press the shutter release button.

(6) Do this several times. (The flash should flash each time.)

j. Lenses.

(1) Mount the lens on the camera body. (Mounting should be smooth and the lens should lock securely.)

(2) Rotate the focusing ring throughout its range. (Rotation should be smooth and free of binding.)

(3) Rotate the preset aperture ring throughout its range. (It should operate smoothly and without binding. Each aperture number and one intermediate position should have a positive click.)

(4) Check the filter mounting threads.

(5) Check self-storing lens hood on telephoto

lens for freedom of movement and for physical damage.

k. Cable Release.

(1) Depress and release the plunger. (The spring in the cable release should return the plunger to its out position.)

(2) Depress the plunger and lock it in the depressed position with the locking screw. (The plunger should remain depressed until the locking screw is released.)

(3) Attach the cable release to the camera shutter release and operate it several times. (It should remain securely fastened.)

(4) Inspect the fabric covering for signs of wear.

l. Lens Hoods for Normal and Wide Angle Lenses.

(1) Inspect the lens hoods for damage.

(2) Mount the lens hoods on the lenses. (They should mount securely.)

m. Eveready Case.

(1) Inspect the interior and exterior of the case for damage. (The snap fasteners should hold the cover in the closed position.)

n. Neck Strap.

(1) Check to see that the neck strap is free of breaks and tears.

(2) Check to see that the fasteners lock securely on the camera body.

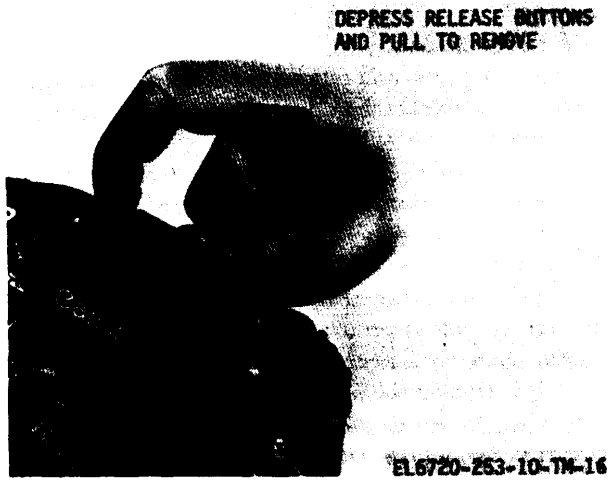

Figure 3-1. Removing pentaprism.

3-7. Cleaning

CAUTION

Do not use cleaning materials other than those authorized.

Cleanliness is essential for proper operation and preservation of precision photographic equipment. Dirty or scratched lens surfaces will seriously affect the quality of the photograph.

a. Camera Body.

(1) Exterior.

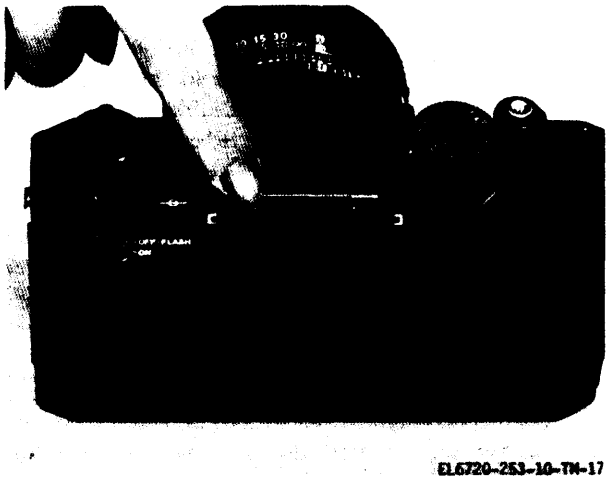

Figure 3-2. Removing viewfinder screen.

(a) Metal surfaces and body covering. Remove the lens from the camera. Brush the camera body with a soft bristle brush and wipe it with a clean, lint-free cloth.

NOTE

A small stick with lens tissue or cotton on the end may be used in areas otherwise inaccessible.

(b) Optical surfaces. Clean the illuminating window, viewfinder screens viewfinder prism, and eyepiece. Follow the procedure described for cleaning lens in *b* (2) below.

(2) *Interior.*

(a) Transport mechanism. Remove the lens from the camera, Lock the mirror in the up position (para 2-20). Swing open the back of the camera body. Blow out any dust or foreign particles that may be inside the camera body.

(b) Pressure plate (fig. 2-6). Gently wipe the surface of the pressure plate with a clean piece of lens tissue. If further cleaning is required, moisten a piece of lens tissue with lens cleaner and wipe the pressure plate. Remove any moisture with a piece of dry lens tissue.

b. Lenses.

(1) *Metal surfaces.* Clean the outside metal surfaces of the lens, Follow the procedure for exterior cleaning as described in *a* (1) above.

CAUTION

Dust particles are abrasive and can damage optical surfaces. Fingermarks and other foreign matter should be removed carefully as soon as possible. Do not use tissue or cloth intended for eyeglass cleaning. Such materials usually contain silicone which will leave a deposit damaging the coating of the lens. Do not use more lens cleaner than necessary to moisten the lens tissue. excess liquid may seep between the elements, dissolve the binding medium, and damage the lens.

(2) *Optical surfaces.*

(a) Front surface. Brush the surface with a clean camel's-hair brush. If further cleaning is required, breathe lightly on the surface and wipe with a

clean piece of crumpled lens tissue. If foreign matter still remains, moisten a piece of lens tissue with lens cleaner and wipe the surface. Remove any moisture with a fresh piece of lens tissue.

(b) Rear surface. Clean the rear surface as described in *(a)* above.

(c) Everready case. Wipe down the interior and exterior surfaces with a clean, lint-free cloth. Remove dirt from around the snaps. Blow dust from inside the case. If necessary, the exterior of the case may be cleaned with a damp cloth and mild soap. Remove all soap with a clean damp cloth.

3-8. Flash Unit

a. Charging Battery.

NOTE

Charge the flash unit battery before and after each use (para 2-14). Also charge the battery whenever it takes more than 30 sec for the ready light (fig. 2-3) to come on again after flashing.

(1) Insure that the battery ON-OFF switch on the flash unit is set at OFF.

(2) Insure that the AC/charge unit VOLTAGE SELECTOR IS SET FOR THE AC line voltage available.

(3) Plug the AC/charge unit into an AC receptacle.

(4) Connect the AC/charge unit cord to the flash unit.

NOTE

A full charge should take approximately 1 hr; variations in charging conditions may cause full charging to take up to **1½** hrs. You will get an average of 65 + flashes after the unit is fully charged. Shorter charging times will give you fewer flashes. On an average, you will get eight flashes from 5 min of charging, and 20 flashes from 15 min.

(5) Charge unit until charge termination indicator (fig. 2-3) glows.

NOTE

Unplug AC/charge unit when the AC/charge unit is unplugged from a power source. Failure to do so will allow the flash unit battery to discharge.

b. Forming Capacitor.

NOTE

The capacitor in the flash unit must be formed (electrically activated) whenever the unit has not been used for 30 days or more. Do this after the battery has been charged.

(1) After the battery has been charged, leave the AC/charge unit connected to the flash unit, and slide the ON-OFF switch to ON.

(2) When the ready light comes on, fire the flash by pressing the open flash button (fig. 2-3).

(3) When the ready light comes on again, press the switch.

(4) Do this for a total of five flashes.

APPENDIX A
REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	Index of Modification Work Orders.
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.

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

Section I. INTRODUCTION

B-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-99C.

B-2. General

This basic issue items and items troop installed or authorized list is divided into the following sections:

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

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

B-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.* This column indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* Not applicable.

b. Nationa/Stock Number. Indicates the National

Stock Number assigned to the item and will be used for requisitioning purposes.

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

(1) *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.

(2) *Federal supply code for manufacturer* (FSCM) . The FSCM is a five-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc. , and is identified in SB 708-42.

d. 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.

e. 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 (A) FIG. NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER & FSCM / USABLE ON CODE	(4) QTY FURN WITH EQUIP
1-1			BAG, GADGET, SPECIAL 8-40000 (Z2630)	1
1-1			CASF, CAMFRA 4-60801-00 (Z2630)	1
1-1			CASE, PHOTOGRAPHIC EQUIPMENT 4-80001-S1 (Z2630)	1

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United Stat es Army
The Adjutant General

Distribution:
Active Army:
USASA (2)
Dir of Trans (1)
COE (1)
TSG (1)
USAARENBD (1)
AMC (1)
TRADOC (2)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (4)
LOGCOMDS (3)
MICOM (2)
TECOM (2)
USACC (4)
MDW (1)
Armies (2)
Corps (2)
HISA (Ft Monmouth) (43)
Svc Colleges (1)
USASESS (5)
USAADS (2)

USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTCS (3)
WRAMC (1)
ATS (l)
Fort Gillem (10)
Fort Gordon (10)
Fort Huachuca (10)
WSMR (1)
Fort Carson (5)
Ft Richardson (ECOM Ofc) (2)
Army Dep (1) except
LBAD (14)
SAAD (30)
TOAD (14)
USA Dep (2)
Sig Sec Dep USA (2)
Sig Dep (2)
SigFLDMS (1)
USAERDAA (1)
USAERDAW (1)
MAAG (1)
USARMIS (1)
Units org under fol TOE:
(1 copy each unit)
11-500 (AA-AC)
29-134
29-136

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

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