TM 11-2330A

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

STILL PICTURE PROJECTOR AP-5 (1)

This reprint includes all changes in effect at the time. of publication; changes 1 through 5.

DEPARTMENT OF THE ARMY DECEMBER 1954

Changes in force: C 2, C 3, C 4, and C 5

TM 11-2330A
C 5

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *13 September 1977*

Projectors, Still Picture AP-5(1) (NSN 6730-537-9268) AND AP-5(2) (NSN 6730-00-903-4409)

TM 11-2330A, 20 December 1954, is changed as follows:

The title of the manual is changed as shown above.

Page 1. Paragraph 2 is superseded as follows:

2. Forms and Records

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

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form (Packaging Improvement Report) as prescribed in AR 700-58/NAVSLIPINST 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 DSAR 4500.15.

2.1. Reporting of Errors

The reporting of errors, omissions, anti 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: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

2.2. Reporting Equipment Improvement Recommendations (EIR)

EIR's will be prepared using DA Form 2407 (Maintenance Request). Instructions for preparing EIR's are provided in TM 38-750. the Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Electronics Command. ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

2.3. Administrative Storage

Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740-90-1.

2.4. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

Page 49.1. Appendix C is superseded as follows:

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General.

This appendix provides a summary of the maintenance operations for AN/GKM-2A and AN/GKM-2B. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance Function.

Maintenance functions will be limited to and defined as follows:

a. inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to he made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing seating, or fixing into position an item, part, module (component or assembly) in manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining or resurfacing) to restore serviceability to an item by correcting specific damage, fault malfunction, or failure in a part , subas-Text sembly, module (componector assembly), end item, or system. This function does not include the trail and error replacement of running spare type item such as fuses , lamps or electrons tubes

j.Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition is prescribed by maintenance performed by the Army. Overhaul does not normally technical publications . Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

C-3. Column Entries.

a. Column 1 Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2 Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4 , Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of

maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories appropriate" "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the speciflc tasks identified by the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C—Operator/Crew
O—Organization
F—Direct Support
H–General Support
I—Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code those common tool sets (not individual tools) and special tools, test, and support equipment requiredto preform the designated function.

f. Column 6, Remarks. Not applicable

C-4. Tool and Test Equipment Requirements (See III).

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in the column indicate the maintenance category allocated the tool or test

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parenthes.

(Next printed page is C-4).

SECTION II MAINTENANCE ALLOCATION CHART
FOR
PROJECTOR, STILL PICTURE (AP-5[illegible])

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					5. TOOLS AND EQUIPMENT
			C	O	F	H	D	
00	PROJECTOR, STILL PICTURE AP-5[illegible] & (2)	Inspect	0.2					
		Test		0.2				
		Service		0.2				2
		Align			0.3			2
		Replace	1.0					
		Repair		0.2				1 thru 3
		Overhaul					5.0	

[illegible] 6031

[illegible]

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
PROJECTOR, STILL PICTURE (AP-5(1)(2)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	MULTIMETER AN/URM-105	6625-00-581-2036	
2	O	TOOL KIT TK-77/GF	5180-00-752-9068	
3	O	TOOL KIT TK-109/GF	5180-00-856-9653	

By order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Amy
Chief of Staff

Official:

J.C PENNINGTON
Brigadier Genaral United States Army:
The Adjutant General

Distribution

Active Army
- USASA (2)
- COE (1)
- TSG (1)
- USAARENBD (1)
- DARCOM (1)
- TRADOC (1)
- OS Maj Comd (4)
- TECOM (2)
- USACC (4)
- MDW (1)
- Armies (2)
- Corps (2)
- HISA (Ft Monmouth) (33)
- Svc Colleges (1)
- USASIGS (5)
- USAADS (2)
- USAFAS (2)
- USAARMS (2)
- USAIS (2)
- USAES (2)
- USAICS (3)
- MAAG (1)
- USARMIS (1)
- USAERDA (1)
- USARDAW (1)
- Sig FLDMS (1)
- Instl (2) except
  - Fort Gillem (10)
  - Fort Gordon (10)
  - Fort Huachuca (10)
  - Fort Carson (5)
  - Fort Richardson (ECOM) (2)
  - LBAD (14)
  - SAAD (30)
  - TOAD (14)
  - SHAD (3)
- (Units org under fol TOE:
  - (1 cy each unit)
  - 8-650
  - 11-27
  - 11-99
  - 11-117
  - 11-500 (AA-AA)
  - 29-134
  - 29-136
  - 30-7

NG: State AG (3); Units—Same as Active Army.

USAR: None

For explanation of abbreviations, used see AR 310–50.

TM 11-2330A
C 4

CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *10 December* 1973

PROJECTORS, STILL PICTURE AP-5(1) AND AP-5(2)

TM 11–2330A, 20 December 1954, is changed as follows:

Page 1, paragraph 2. Delete paragraph 2 and substitute:

2. Forms and Records

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

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

c. *Discrepancy in Shipment Report (DISREP) (SF* 861). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP PUB 459 (Navy)/AFM 75-34 (Air Force)/and MCO P4610.19 (Marine Corps).

2.1. Reporting of 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 forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-S, Fort Monmouth, NJ 07703.

Page 2, paragraph 4. Change title to read "Components and Dimensions".

After paragraph 4, add:

4.1. Expendable Consumable Items

A list of expendable consumable items required for operation appears in table 1–1.

Table 1-1. Expendabie Consumable Supplies and Materials.

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

Item	Description	Ref. No. and FSCM	FSC
1	Cleaner, Lens	No p/n; 19139	7930
2	Paper, Lens	UU–P–313, type No. 1; 81348	6640
3	Cloth, Textile	CCC–C–271a	

4.2. Items Comprising Operab Still Picture Projectors AP-5(1) and AP-5(2)

FSN	QTY	Nomenclature. part *No.*, and mfr code	Usable on code
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc. **NOTE** In usable on code column number 1 refers to AP-5(1); number 2 refers to AP–5(2).	
6730-537-5487	1	Cable Assembly, Power, Electrical: A-B, S, 3.1–2; 07055	1
6760-200-2810	1	Lens, Projection, Viewing: A-BS.1.1-12-6; 07055	1
6760-839-1174	1	Lens Projection: 12064; 07055	2

Page 49, appendix B. Delete appendix B and substitute:

APPENDIX B

BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

B–1. Scope

This appendix lists basic issue items and items troop installed or authorized required by the crew/operator for installation, operation, and maintenance of Projectors, Still Picture AP–5 (1) and AP–5 (2).

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 Authorize List—Section III. A list, in alphabetical sequence, of items which, at the discretion of the unit commander, may accompany the end item, but are not subject to be turned in with the end item.

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.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* Not applicable.

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

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

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

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

f. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

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

h. Quantity Authorized (Items Troop Installed or Authorized Only). Indicates the quantity of the item authorized to be used with the equipment.

B-4. Special Information

Usable on codes are included in Column 4. Uncoded items are applicable to all models. Identification of the usable on codes are as follows:

Code	*Used on*
1	AP-5(1)
2	AP-5(2)

Section II. BASIC ISSUE ITEMS LIST

(1) Illustration		(2)	(3)	(4)	(5)		(6)	(7)
(A) Fig. No.	(B) Item No.	Federal stock	Part number	FSCM	Description	Usable on code	Unit of meas	Qty furn with equip
5-l5		6760-597-1450	A. B.S.-2.8-2	07055	Cap, Lens	1	E A	1
2.1		6760-732-1638	B.S.2.-8-3	07055	Cap, Lens	2	E A	1
2		6730-092-1565	R-5250	07055	Case, Carrying, Photographic	1	E A	1
2.1		6730-718-6134	12225	07055	Case, Carrying	2	E A	1

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) Federal stack number	(2) Part number	(3) FSCM	(4) Description	Usable on code	(5) Unit of meas	(6) Qty auth
	B.S.2.10-1	07055	Brush, Lens	1,2	EA	2
5120-596-1183			Screwdriver TL-456/U	1,2	EA	1

By Order of the Secretary of the Army:

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

Official:

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

Distribution:

Active Army:

USASA (2)
CNGB (1)
ACSC-E (2)
Dir of Trans (1)
COE (1)
TSG (1)
USAARENBD (1)
USAMB (10)
AMC (1)
TRADOC (2)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Cored (4)
AVCOMMCEN (1)
LOGCOMDS (3)
MICOM (2)
TECOM (2)
USASTRATCOM (4)
MDW (1)
Armies (2)
Corps (2)
HISA (ECOM) (18)
Svc Colleges (1)
USASESS (5)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTS (3)
WRAMC (1)
USACDCEC (10)
ATS (1)
Instl (2) except
Ft Gordon (10)
Ft (Huachuca (10)
Ft Huachuca (10)
WSMR (1)
Ft Carson (5)
Ft Richardson (ECOM Oft) (2)
Army Dep (2) except
LBAD (14)
SAAD (30)
TOAD (14)
ATAD (10)
Gen Dep (2)
Sig Sec Gen Dep (2)
Sig Dep ((2)
SigFLDMS (1)
USAERDAA (1)
USAERDAW (1)
MAAG (1)
USARMIS (1)
Units org under fol TOE:
(1 cy each)
8-650
11–27
11-96
11–117
11–158
11-500 (AA-AC)
29-134
29-136
30-7

NG: State AG (3); Units—Same as Active Army.

USAR: None,

For explanation of abbreviations used, see AR 310-50.

Changes in force: C 1, C 2, and C 3

TM 11-2330A
***C 3**

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *10 February 1969*

PROJECTORS, STILL PICTURE AP-5(1) AND AP-5(2)

TM 11-2330A, 20 December 1954, is changed as follows:

Note. The parenthetical reference to a previous change (example: page 1 of C 2) indicates that pertinent material was published in that change

Page 1, paragraphs 1.1 and 2 (page 1 of C 2). Delete and substitute:

1.1 Indexes of Publications

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

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are Modification Work Orders (MWO's) pertaining to the equipment.

2, Forms and Records

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

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

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

d. Reporting of Equipment Publication Improvements. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N.J. 07703.

***This change supersedes so much of TM 11-6730-204-12P, 3 December 1959, including C 1, 14 July 1960, as pertains to basic issue items and maintenance allocation.**

Page 49. Appendix, references (page 12 of C 2). Delete and substitute:

APPENDIX A

REFERENCES

Following is a list of applicable publications that are available to the maintenance personnel of Projectors, Still Picture AP–5 (1) and AP-5(2).

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----------	U.S. Army Equipment Index of Modification Work Orders.
SB 11-573----------	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
TB SIG 364----------	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 9-213 ----------	Painting Instructions for Field Use.
TM 11-6625-203-12----------	Operator and Organizational Maintenance: Multimeter AN/URM-105, Including Multimeter ME-77/U.
TM 11-6730-204-12P -------	Operator's Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Projector, Still Picture AP-5 (1).
TM 11-6730-204-35P----------	Field and Depot Maintenance Repair Parts and Special Tools Lists: Projector, Still Picture AP-5(1).
TM 38-750----------	Army Equipment Record Procedures

Appendix B is added after appendix A.

APPENDIX B

BASIC ISSUE ITEMS

Section I. INTRODUCTION

B-1. Scope

This appendix lists items comprising an operable equipment and those required for installation, operation, or operator's maintenance for Projectors, Still Picture AP-5 (1) and AP-5(2).

B-2. Explanation of Columns

The following is a list of explanations of columns in section II.

a. Source, *Maintenance, and Recoverability Codes (SMR) Column.*

(1) *Source code* (S). The selection status and source for the listed item is the first code indicated in this column. The source codes used and their explanations are-

Code	*Explanation*
P--------	Applies to repair parts that are stocked in or supplied from GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
A--------	Applies to assemblies that are not procured or stocked as such but are made up of two or more units, each of which carries an individual tick number and description and is procured and stocked and can be assembled by units at indicated maintenance categories.

(2) *Maintenance code (M).* The lowest category of maintenance authorized to install the item is indicated by the second code in the column. The maintenance category code and its explanation is-

Code	*Explanation*
C------ ------ ------ ------ ------ ---	Operator/crew.

(3) *Recoverability code (R). The* recoverability code is the third code in the column. It indicates whether unserviceable items should be returned for recovery or salvage Recoverability 'code and its explanation is as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	*Explanation*
R--------	Applies to repair parts and assemblies that are economitally repairable at DSU and GSU activities and are normal] y furnished by supply on an exchange basis.

b. Federal Stock Number Column. This column indicates the Federal stock number for the item.

c. *Description Column.* This column includes the Federal item name and any additional description of the item which may be required. A part number or other reference number is followed by the applicable five-digit Federal Supply Code for Manufacturers. When required to indicate that the part is used on the models, so identified, the numbers 1 and/or 2 are placed under the heading Usable *on Code.* An explanation of the codes used precedes the first item in section II of the basic issue items list.

d. Unit of Measure Column. The unit used as a basis of measure (e.g., ea, pr, ft, yd, etc.) is given in this column.

e. Quantity Incorporated in Unit Column. The total quantity of the item used in the equipment is given in this column.

f. Quantity Furnished With Equipment Column. This column lists the quantity of the item supplied for initial operation of the equipment and/or the quantities authorized to be kept on hand by the operator for maintenance of the equipment.

g. *Illustrations Column*

(1) *Figure number (a).* The number of the illustration on which the item is shown is indicated in this column.

(2) *Item No. or reference designation (b).* Not wed.

B-3. Federal Supply Codes

This paragraph lists the Federal supply code with the associated manufacturer's name.

code	*Manufacturer's name*
07055	Charles Beseler Co.
07108	R. and J. Dick Co., Inc.
19139	Eastman Kodak Co.
81348	Federal Specifications.
81349	Military Specifications
96906	Military Standards.

SECTION II. BASIC ISSUE ITEMS

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS (a) FIG. NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
A-C-2	6730-537-9268	PROJECTOR, STILL PICTURE AP-5(1): A portable reflecting projector for opaque objects up to 10 X 10 inches (This item is nonexpendable.)					2, 5	
A-C-2	6730-903-4409	PROJECTOR, STILL PICTURE AP-5(2): 12060; 07055					2.1, 5.1	
		TECHNICAL MANUAL TM 11-6330A For technical manuals the quantity indicates the maximum number of copies authorized for packing (or issue) with the equipment. Where a number of these equipment are concentrated in a small area, the quantity on hand may be reduced to minimum normal requirements as determined by the Commanding Officer of the unit. NOTE: Usable on code 1 refers to AP-5(1); 2 refers to AP-5(2).		ea	2	2		
P-C	6730-537-5487	CABLE ASSEMBLY, POWER, ELECTRICAL: A-B.S.3.1-2; 07055	1	ea	1	1	5-12	
P-C	6760-597-1450	CAP, LENS: A.B.S.2.8-2; 07055	1	ea	1	1	5-15	
P-C	6760-732-1638	CAP, LENS: B.S.2.8-3; 07055	2	ea	1	1	2.1	
P-C	6730-092-1565	CASE, CARRYING, PHOTOGRAPHIC EQUIPMENT B-3830; 07055	1	ea	1	1	2	
P-C	6730-718-6134	CASE, CARRYING: 12825; 07055	2	ea	1	1	2.1	
P-C	5920-280-5002	FUSE, CARTRIDGE: 10 amp; FUSILIER; 81349	1	ea	2	7	5-14	
P-C	5920-199-9502	FUSE, CARTRIDGE: 15 amp; MS30075-7; 96906	2	ea	2	7	14.1	
P-C	6240-143-3044	LAMP, PROJECTION: No. T11A; 07108	1,2	ea	1	3	2, 2.1	
P-C	6760-200-2810	LENS, PROJECTION, VIEWING: A-B.1.1-12-6; 07055	1	ea	1	1	2	
P-C	6760-839-1174	LENS PROJECTION: 12058; 07055	2	ea	1	1	2.1	
		ACCESSORIES, TOOLS, AND TEST EQUIPMENT						
P-C		BRUSH, LENS: B.S.2.10-1; 07055	1,2	ea	1	2	2.1	
P-C	7930-392-9751	CLEANER, LENS: No p/n; 19139	1,2	ea	1	1		
P-C		CLOTH, TEXTILE: CCC-C-271a; 81348	1,2	yd	1	1		
P-C	6640-393-2090	PAPER, LENS: UU-P-313, Type No. 1; 81348	1,2	pk	1	4		
P-C	5120-596-1183	SCREWDRIVER TL-496/U	1,2	ea	1	1		
		NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT						

Appendix C is added after appendix B.

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Projectors, Still Picture AP–5 (1) and AP-5 (2). It authorizes categories of maintenance for specific maintanance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Explanation of Format for Maintenance Allocation Chart

a. Group Number. Not used.

b. Componentt Assembly *Nomenclature.* This Column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. *Maintenance Function.* This column indicates the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows :

Code	Maintenance *category*
C----------	Operator/crew.
O----------	Organizational maintenance
F----------	Direct support maintenance.
H----------	General support maintenance.
D----------	Depot maintenance

d. Tools and Equipment. The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. *Remarks.* Self-explanatory.

C-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

a. Tools and Equipnwnt. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance catagory normally allocated the facility.

c. *Nomenoclature.* This column lists tools, test and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number.

e. *Tool Number.* Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	PROJECTORS, STILL PICTURE AP-5(1); AP-5(2)	C		C					C					Preventive maintenance, replace lamp, fuses
			O			O			O	O			1,2	Continuity test, align mirrors, lubricate focus optical assy, replace blower motor
			F			F					H		1,2,3	Optical pointer assy
													1,2,3	
												D	1,2,3	Plus shop support

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AP-5(1) & AP-5(2) (continued)		
1	O,F,H,D	MULTIMETER AN/USM-105	6625-581-2035	
2	O,F,H,D	TOOL KIT TK-77/GF	5180-752-9068	
3	F,H,D	TOOL KIT TK-109/GF	5180-896-9653	

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

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

Distribution:

Active Army:

USASA (2)
CNGB (1)
ACSC-E (7)
Dir of Trans (1)
CofEngrs (1)
TSG (1)
Cofspts (1)
USAARENBD (2)
USACDCEA (1)
USACDCBRA (1)
USACDCEA (1)
USACDCEA
Ft Huachuca (1)
USACDCOA (1)
USACDCQMA (1)
USACDCTA (1)
USACDCADA (1)
USACDCARMA (1)
USACDCAVNA (1)
USACDCARTYA (1)
USACDCSWA (1)
USAMC (5)
USCONARC (5)
ARADCOM (5)
ARADCOM Rgn (2)
OS Maj Cored (4)
LOGCOMD (2)
USAMICOM (4)
USASTRATCOM (4)
USAESC (70)
MDW (1)
Armies (2)
Corps (2)
Svc Colleges (2)
USASESCS (5)
USAADS (2)
USAAMS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USATC Armor (2)
USATC Engr (2)
USATC Inf (2)
USASTC (2)
WRAMC (1)
Army Pic Center (2)
USACDCEC (10)
USAINTC (1)
AV-COMM-CEN (1)
Instl (2) except
Ft Hancock (4)
Ft Gordon (10)
Ft Huachuca (10)
WSMR (5)
Ft Carson (25)
Ft Knox (12)
Army Dep (2) except
LBAD (14)
SAAD (30)
TOAD (14)
LEAD (7)
SHAD (3)
NAAD (5)
SVAD (5)
CHAD (3)
ATAD (10)
Gen Deps (2)
Sig Sec Gen Deps (5)
Sig Dep (12)
Sig FLDMS (2)
AMS (1)
USAERDAA (2)
USAERDAW (13)
USACRREL (2)
USAPA (5)
Nat'l Censorship Sta (5)
USAG Arlington Hall (5)
USACOMZEUR (5)
Units organized under following TOE's (2 cys ea):

11-27
11-57
11-90
11-117
11-155
11-157
11-500 (AA-AE) ; FE, FG, FH, FJ, FK, FL
11-587
11-592
11-597

NG: State AG (3) ; units-same as active Army except allowance is one (1) copy per unit.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

TM 11-2330A
C 2

PROJECTORS, STILL PICTURE AP-5(1) AND AP-5(2)

CHANGE No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *11 October 1963.*

TM 11-2330A, 20 December 1954, is changed as follows:

Note. The parenthetical reference to a previous change (example: "page 2 of C 1") indicates that pertinent material was published in that change.

Page 1, paragraph 1 (page 2 of C 1). Delete paragraph 1 and substitute:

1. Scope

This manual describes Projectors, Still Picture AP-5 (1) and AP–5 (2) and covers their installation, operation, and maintenance. It includes detailed operating instructions, instructions for cleaning and inspection of the equipment, and replacement of specified maintenance parts. The functioning of the equipment is covered in paragraphs 35 through 40.1.

Add paragraph 1.1 after paragraph 1:

1.1 Index of Publications

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

Delete paragraph 2 (page 2 of C 1) and substitute:

2. Forms and Records

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

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71-4 (Air Force).

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

Page 8, paragraph 9. Make the following changes:

Delete subparagraph *b.*

Add paragraph 9.1 after paragraph 9:

9.1 Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (par. 2).

b. See that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against the first echelon functional parts list (TM 11-6730-204-12P) or against the table of components (par. 4 or 4.1). Report all discrepancies in accordance with TM 38-750. Shortage of a minor component or part that does not affect proper functioning of the equipment should not prevent use of the equipment.

c. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear near the nomenclature plate. Check to see whether the MWO number (if any) and appropriate notations concerning the modification have been entered in the equipment manual.

Note. Current MWO's applicable to the equipment are listed in DA Pam 310—4.

Page 17, paragraph 18b. Make the following changes:

Line 2. Change "paragraph 22" to: paragraph 26 *b.*

Paragraph 19 *c.* Delete last sentence:

Page 18, section I (page 9 of C 1). Delete sections I and II and substitute:

Section 1. OPERATOR'S PREVENTIVE MAINTENANCE

20. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of the equipment are listed below together with a reference to the paragraphs covering the specific maintenance functions. The duties asigned do not require any tools or materials other than those listed in paragraph 21.

a. Daily preventive maintenance checks and services (par. 24).

b. Weekly preventive maintenance checks and services (par. 25).

c. Cleaning (par. 26).

21. Tools and Materials Required

The following tools and materials are required for operator's maintenance.

a. Lint-free cloth (FSN 8305–170-5062).

b. Hand blower (air syringe).

c. Camel's-hair brush.

d. Lens cleaner (FSN 6760-108-5175).

e. Lens tissue (FSN 6640-393-2090).

f. Cleaning compound (FSN 7930-395-9542).

22. Operator's Preventive Maintenance

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

a. *Systematic Care.* The procedures given in paragraphs 24, 25, and 26 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (pars. 24 and 25) outline functions to be performed at specific intervals. These checks and services are to maintain the equipment in a serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the references column lists the paragraphs that contain supplementary information. If the defect cannot be remedied by the operator, higher echelon maintenance is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38–750.

23. Operator's Preventive Maintenance Checks and Services Periods

a. *Daily.* Preventive maintenance checks and services of the equipment are required on a daily basis while the equipment is in use. If the equipment is maintained in a *standby (ready* for immediate operation) condition, the daily checks and services should be performed once each week. Paragraph 24 specifies the checks and services that must be performed daily and under the following special conditions:

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

(2) When the equipment or any of its major components is removed from service for any reason.

b. Weekly. Perform the maintenance functions indicated in the weekly preventive maintenance checks and services chart (par. 25) once each week. A week is defined as approximately 7 calendar days of 8-hour-per-day operation. If the equipment is operated for more than 8 hours a day, the weekly maintenance interval should be adjusted. Adjustment of the weekly maintenance interval should be made to compensate for any unusual operating conditions. Equipment maintained in a *standby* condition must have weekly maintenance performed on it. Equipment in *limited storage (requires* service before operation) does not require weekly maintenance.

24. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Completeness____	Check to see that all items required for operation are available.	Pars. 4 or 4.1.
2	Cleanliness_____	Clean all exterior surfaces of equipment (except optical surfaces).	Par. 26a.
3	Ventilation_____	Inspect ventilating louvers on sides and top of projector housing (fig. 2 or 2.1) to see that they are clean and free of any obstructions to free circulating air.	Par. 26a.
4	Controls _____	Examine knobs, levers, and handles of controls (fig. 5 or 5.1) for bent, broken, and damaged parts. Control knobs, levers, and handles must be firmly secured.	
5	Hardware _____	Inspect all components for loose or missing screws, nuts, and bolts.	
6	Operation_____	During operation; be alert for any unusual operating conditions. *Note.* If the projector is not used daily, the projection lamp and the blower should be turned on for about 10 minutes to prevent moisture from accumulating in the equipment.	

25. Weekly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Projector ---------	*a.* Clean projection lens (fig. 5 or 5.1).	a. Par. 26 *b.*
		b. Inspect front surface mirror (fig. 13); *do not clean unless absolutely necssary.*	*b.* Par. 26 *c.*

25. Weekly Preventive Maintenance Checks and Services Chart-Cont.

Sequence No.	Item	Procedure	References
1	Projector..	*c.* Inspect secondary mirrors (fig. 4 or 4.1); clean if necessary.	*c* Par. *26b.*
		d. Inspect parabolic reflector (fig. 4 or 4.1); clean if necessary.	*d.* Par. 26 *b.*
		e. Inspect condition of projection lamp (fig. 4 or 4.1); clean or replace as necessary.	*e.* Pars. 10 *e* and 26 *b.*
2	Optical pointer	*a.* Clean projection lens (fig. 16 or 16.1).	*a.* Par. 26 *b.*
		b. Inspect front surface mirror (fig. 16 or 16.1); *do not clean unless absolutely necessary.*	*b.* Par. 26 c.
		c. Inspect condenser lens (fig. 16 or 16.1); clean if necessary.	c. Par. 26 *b.*
		d. Inspect rear surface mirror (fig. 16 or 16.1); clean if necessary.	*d.* Par. 26 *b.*
3	Copy feeding unit..	Inspect copy feeding unit; clean if necessary.	Par. 26 *a.*

26. Cleaning

a. Exterior Surfaces. Clean the exposed exterior surfaces (except optical surfaces) of the equipment as follows:

(1) Remove dust and dirt from all exposed parts with a clean, dry, lint-free cloth.

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

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.**

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

(3) If foreign matter cannot be removed from the exposed parts by normal dry wiping, use a clean, lint-free cloth slightly moistened with cleaning compound. Wipe the cleaned parts with a clean, dry, lint-free cloth immediately after cleaning.

b. Optical Surfaces. Clean the optical surfaces (except the front surface mirror) of the equipment as follows:

(1) Carefully remove all dust, dirt, and foreign matter from the exposed optical surfaces of the equipment; use a camel's-hair brush or an air syringe.

Caution: **Do not use lens tissue that contains silicone to clean optical surfaces. Use only the lens tissue authorized for use with the equipment (par. 21). Any residue left on the optical surfaces by lens tissue that contains silicone could affect the performance of the optical parts.**

(2) Slightly dampen a wad of lens tissue with lens cleaner.

(3) Gently wipe the exposed optical surfaces of the equipment with the moistened lens tissue; use a circular motion starting from the edge of the glass and working toward the center.

(4) Dry the cleaned optical surfaces with a fresh lens tissue, using the circular motion described in (3) above.

c. Front Surface Mirror. Clean the front surface mirror as follows:

Caution: **The reflecting coating of the front surface mirror is deposited on the front surface and is not protected by glass. This surface is extremely delicate. Do not rub or touch with the fingers. Do not clean with water.** ***Use the cleaning procedures (I)-(4) below only when absolutely necessary.***

(1) Carefully remove all dust, dirt, and foreign matter from the reflecting surface; use a camel's-hair brush or an air syringe. If additional cleaning is required, perform the procedures in (2), (3), and (4) below.

Caution: **Do not use lens tissue that contains silicone to clean the f rent surface mirror. Use only the lens tissue authorized for use with the equipment (par. 21).**

(2) Slightly dampen a wad of lens tissue with lens cleaner.

(3) Gently wipe the reflecting surface with the moistened lens tissue.

(4) Dry the cleaned surface of the mirror with a fresh lens tissue.

Add section 2 (page 10 of C 1) :

Section II

SECOND ECHELON PREVENTIVE MAINTENANCE

27. Scope of Second Echelon Maintenance

The maintenance duties assigned to the second echelon maintenance personnel of the equipment are listed below together with a reference to the paragraphs covering the specific maintenance functions.

a. Monthly preventive maintenance checks and services (par. 29.2).

b. Quarterly preventive maintenance checks and services (par. 29.4) .

c. Troubleshooting (pars. 32 and 43).

28. Tools, Materials, and Test Equipment Required

In addition to the tools and materials listed in paragraph 21, the following items are required.

a. Tool Kit, Photographic Repair TK-77/GF.

b. Sandpaper (No. 000).

c. Lubricating Oil, General Purpose, Light (LO) (FSN 9150-261–8146) .

d. Multimetar AN/URM-105.

29. Second Echelon Preventive Maintenance

a. Second echelon, preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdowns, and assure maximum operational capability. Preventive maintenance is the responsibility of all echelons concerned with the equipment and includes the inspection, testing, and repair or replacement of parts, subassemblies, or units that inspection and tests indicate would probably fail before the next scheduled periodic service. Preventive maintenance checks and services of the equipment at the second echelon level are made at monthly and quarterly intervals unless otherwise directed by the commanding officer.

b. Maintenance forms and records to be used and maintained on this equipment are specified in TM 38-750.

29.1 Monthly Maintenance

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (par. 29.2) once each month at the same time that the daily (par. 24) and weekly (par. 25) preventive maintenance checks and services are performed. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a *standby* condition must have monthly preventive maintenance checks and services performed on it. Equipment in *limited storege* does not require monthly preventive maintenance.

29.2 Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Power cable____	Inspect power cable (fig. 2 or 2.1) to see that it is in good condition. See that connectors are attached securely and that contacts are not bent or corroded.	Par. *26a.*
2	Wiring ----------	Inspect wiring to see that it is in good condition and that all connections are tight and clean.	
3	Preservation----	Inspect all painted surfaces for cracks, chipped paint, rust or corrosion, and mildew or fungi.	Par. 29.5.
4	Operation _____	Operate equipment in accordance with equipment performance checklist (pars. 31 and 32).	Par. 43.
5	Lubrication -----	Lubricate in accordance with instructions.	Par. *29.6a.*

29.3 Quarterly Maintenance

Quarterly preventive maintenance checks and services on the equipment are required. Periodic daily (par. 24), weekly (par. 25), and monthly (par. 29.2) preventive maintenance checks and services constitute a part of the quarterly preventive maintenance checks and services and must be performed concurrently. All deficiencies or shortcomings will be recorded in accordance with the requirements of TM–38–750. Perform all the checks and services listed in the quarterly preventive maintenance checks and services chart (par. 29.4) in the sequence listed.

29.4 Quarterly Preventive Maintenance Checks and Services Chart

Sequencc No.	Item	Procedure	References
1	Publications -----	See that all publications are complete, serviceable, and current.	DA Pam 310-4.
2	Modifications-----	Check DA Pam 310—4 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled.	DA Pam 310—4 and TM 33-750.
3	Optical mountings.	Inspect all optical mountings for proper seating and firm mounting.	Par. 43.
4	Doors----------	Check doors for tight closure and effective light sealing.	
5	Bellows ----------	Check bellows (AP-5(1) only) for light leakage.	
6*	Lubrication-------	Lubricate equipment in accordance with instructions.	Par. 29.6h

• To be accomplished semiannually instead of quartarly.

29.5 Touchup Painting Instructions

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9-213.

29.6 Lubrication

Lubrication of the projector is required monthly *(a* below) and semiannually *(b* below).

a. *Monthly.* Lubricate the pinion shaft and pinion gear on the lens mount rack (fig. 13) every month as follows:

(1) Remove all dirt, oil, and foreign matter with a lint-free cloth.

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

(2) If necessary, dampen the cloth slightly with cleaning compound; dry clean area thoroughly.

(3) Apply a few drops of oil (LO) to the pinion shaft and pinion gear. Remove any excess oil.

b. SemiannuaUy. Lubricate the fan motor (fig. 12 or 12.1) at 6-month intervals as follows:

(1) Clean the areas around the oilholes (fig. 10) of the fan motor (a(l) and (2) above).

(2) Apply 3 or 4 drops of oil (LO) to each bearing. Remove any excess oil.

Note. Each bearing is covered by a brass cap containing a felt disk that holds the oil. The brass cap has a hole through which the oil Is applied.

Page 26, paragraph 32, checklist, Corrective measures column, items No. 7 and 8. Change “par. 22” to: par. 26b and c.

Page 31, paragraph 42, line 2. Change “paragraphs 22 and 32” to: paragraphs 24,25, and 32.

Page 33, paragraph 43, chart, Correction column, third line from bottom. Change “par. 22” to: par. 26 *b* and *c.*

Page 49. Add the following appendix after chapter 7:

APPENDIX
REFERENCE

Following is a list of publications available to the maintenance personnel of Projectors, Still Picture AP 5 (1) and AP 5 (2).

DA Pam 310-1	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
TM 9-213	Painting Instructions for Field Use.
TM 11-6625-203-12	Operation and Organization Maintenance Multimeter AN/URM-105, including Multimeter ME-77/U.
TM 11–6730-204-12P	Operator's Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Projector, Still Picture AP-5 (1).
TM 11-6730-204-35P	Field and Depot Maintenance Repair Parts and Special Tool List; Projector, Still Picture AP-5 (1).
TM 38-756	The Army Equipment Record System and Procedures.

By Order of the Secretary of the Army:

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

Official:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General

Distribution:

Active Army:

DASA (6)
USASA (2)
CNGB (1)
CofEngrs (1)
TSG (1)
CsigO (7)
cofT (1)
CofsptS (1)
USACDA (1)
USCONARC (5)
USAMC (5)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Cored (8)
OS Base Cored (2)
LOGCOMD (2)
USAECOM (5)
USAMICOM (4)
USASCC (4)
MDW (1)
Armies (2)
corps (2)
USA Corps (3)
USATC AD (2)
USATC Engr (2)
USATC Inf (2)
USATC Armor (2)
USASTC (5)
Instls (2) except
Ft Monmouth (65)
Svc colleges (2)
Br Svc Sch (2)
GENDEP (OS) (2)
Sig SW, GENDEP (OS) (5)
Sig Dep (OS) (12)
Army Dep (2) except
Ft Worth Army Dep (8)
Lexington Army Dep (12)
Sacramento Army Dep (28)
Tobyhanna Army Dep (12)
USACECDA (1)
USARMIS E1 Salvador (5)
USAINTCA (5)
USA Elct Rsch & Dev Actv White Sands (13)
USA Elct Rsch & Dev Actv Ft Huachuca (2)
POE (1)
Trans Tm1 Comd (1)
Army Tm1 (1)
USAOSA (1)
AMS (1)
WRAMC (1)
AFIP (1)
Army Pictorial Cen (2)
USA Mob Spt Cen (1)
USA Elct Mat Agcy (12)
Chicago Proc Dist (1)
USARSOUTHCOM Sig Agcy (1)
Sig Fld Maint Shops (3)
Units org under fol TOE:
(2 copies ea UNOINDC)
8-650 11-155 11-597
11-7 11-157 30-7
11-16 11-500 (AA-AE) (4)
11-57 11-557
11-96 11-587
11-117 11-592

NG: State AG (3) ; units-same as Active Army except allowance is one copy for each unit.

USAR: None.

For explanation of abbreviations used see AR 320-50.

TECHNICAL MANUAL

PROJECTORS, STILL PICTURE AP-5(1) AND AP-5(2)

TM 11-2330A
CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *17 April 1961*

TM 11-2330A, 20 December 1954, is changed as indicated so that the manual also applies to the following equipment:

Nomenclature	*Order No.*	Serial No.
Projector, Still Picture AP-5 (2)	AF33 (600) 41661	1-2358

Change the title of the manual as shown above.

Page 1. Add the following note below the title of chapter 1.

Note. Projector, Still Picture AP-6 (2) is similar to Projector, Still Picture AP-6 (1). Information in this manual applies to both projectors unless otherwise specified.

Add "only" after "AP-5 (1)" in the following places:

Page 4, figure 2, caption.
Page 13, figure 5, caption.
Page 28, figure 8, caption.

Add "For AP-5 (1) only," after subparagraph designation in the following places:

Page 11, paragraph 10 *e.*
Page 14, paragraph 13 *d.*
Page 46, paragraph 49 *b* (3) *(b)* and *(c).*
Paragraph 49 *b* (4) *(b)* and *(c).*

Add" (AP-5 (1) Only)" in the following places:

Page 2, paragraph 4, heading.
Page 4, paragraph *5b,* heading.
Page 6, paragraph 5 *g, h,* and *i* headings.
Page 11, figure 4, caption.
Page 12, paragraph 11, heading.
Page 15, paragraph 16, heading.
Page 16, paragraph 17, heading.
Page 29, paragraph 38, heading.
Page 30, paragraph 39, heading.
Paragraph 40, heading.
Figure 9, caption.

Page 33, "Symptom" column, line 3.

Page *34*, paragraph 44, heading.
Paragraph 45, heading.

Page 35, figure 10, caption.

Page 36, figure 11, caption.
Figure 12, caption.

Page 37, paragraph 46, heading.

Page 39, figure 14, caption.

Page 41, figure 15, caption.

Page 43, figure 16, caption.

Page 1, paragraph 1. Delete "only" in the last sentence.

2. Forms and Records

(Superseded)

a. Unsatisfactory Equipment Report.

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

(2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00–35D-54.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700-58 (Army) and AFR 71-4 (Air Force).

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

d. Comments on Manual Forward all other comments on this publication direct to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS–PA2d, Fort Monmouth, N.J.

Page 2, paragraph 3. Change " (figs. 1, 2 and 5)" to: (figs. 1, *2, 2.1*, and 5).

Page 3.

4.1. Table of Components, Projector, Still Picture AP-5(2)

(fig. 2.1)
(Added)

Quantity	Component	Dimensions (in.)				Weight (lb)
		Length	Width	Height	Dia	
1	Carrying case	25	17	28	.....	14
1	Projector housing	22	15	26½	.....	36
1	Projection lens	6⅛	.....	.....	5⅜	3½
3	Projection lamp 1,000 watts; 1 in use, 2 spares	5½	.....	.....	2¼	1
1	Power cable	180	.....	.....	.....	1
3	Lens tissue (100 sheets per pkg)	5	3	.....	.....	1/16
1	Lens brush	8½	3	1/16	.....	⅛
4	Fuse, 15 amperes, 2 in use, 2 spares	1¼	.....	.....	¼	
1	Ground adapter	1¾	⅞	1	.....	1/16
1	Lens cap	¾	.....	.....	5 1/16	¼

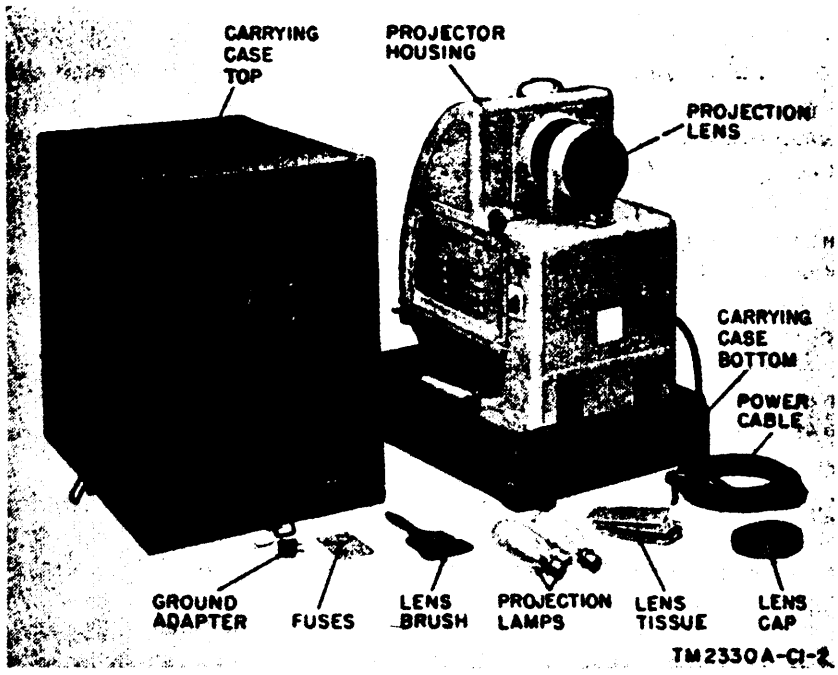


Figure 2.1. (Added) Projector, Still Picture AP-5(2), component parts.

Page 4, paragraph *5a*, heading. Change " (fig. 2)" to: (figs. 2 and 2.1).

Page 5, paragraph *5*. Make the following changes:

Add the following subparagraph:

b. 1. Projector *Housing (AP-5 (2)) (fig.* 5.1). The projector housing contains ventilating louvers on the sides and back. On

the front of the projector housing are two openings for the blower assembly and an opening for the optical pointer assembly. The back of the projector housing is fitted with a hinged door. On the bottom of the projector housing is an undercarriage (11). The top portion of the projector housing forms a shelf for mounting the lens (5) and associated components.

Subparagraph c, heading. Change" (fig. 5) "to: (figs. 5 and 5.1).

Subparagraph, heading. Change" (figs. 8, 13 and 15) "to: (figs. 8, 8.1, 13, and 15).

Subparagraph e, heading, Change" (figs. 4 and 8)" to: (figs. 4, 4.1,8, and 8.1).

Page 6, paragraph 5. Make the following changes:

Subparagraph *f,* heading. Change "(figs. 8, 14, and 15)" to: (figs. 8, 8.1 14, 14.1, and 15).

Add the following subparagraphs:

g.1. *Optical Pointer Assembly (AP-5(2)) (figs.* 14.1 and 16.1). The built-in optical pointer assembly collects stray light from the projection lamp by means of properly located mirrors. The collected light is used to project the image of an arrow on the projection screen. The arrow image can be used to point out details anywhere on the projection screen. The optical pointer *assembly* includes two mirrors, a lens tube, two convex lenses (projection lens and collector lens), an aperture plate containing the arrow, a pointer knob, and a bracket to mount the assembly on the projector housing.

h.1. Undercarriage Assembly, Still Projector AP-5 (2) (figs. 8.1 and 10.1). The undercarriage assembly consists of the blower assembly ((1) below), the undercarriage ((2) below) and the copy feeding unit ((3) below).

(1) *Blower assembly.* The blower assemby includes a motor mounting, tailpipe, and two blower wheels driven by a common motor. The blower assembly is in the front of the projector housing and is fastened to the base of the projector. An air seal is formed with the orifice plate of the copy feeding unit when the undercarriage is in the projection position. The two blower wheels produce a vacuum effect in the copy feeding unit of the undercarriage as well as cooling for the lamp chamber.

(2) *Undercarriage.* The undercarriage contains four parallel arms and a mounting for the copy feeding unit. The four parallel arms are connected to the base of the projector and to the mounting for the copy feeding unit by shoulder screws which act as pivots. The undercarriage control lever moves the parallel arms, which in turn

raises or lowers the undercarriage. Tension springs are connected between the front pair of parallel arms and the projector base to assist in raising the undercarriage.

(3) *Copy feeding unit.* The copy feeding unit is a conveyor-type and includes a frame, a roller at each end of the frame, and a conveyor belt stretched over the two rollers. One roller is crank-operated and drives the conveyor belt. The other roller turns freely with the movement of the conveyor belt. Turning the handcrank moves the conveyor belt, which moves the copy in or out of projection position.

Page 7.

7.1. Differences in Models

(Added)

Item	AP-5(1)	AP-5(2)
Access door	Located on right side (figs. 4 and 6).	Located at the rear (fig. 4.1).
Power cable	Separate cable with a connector at both ends (fig. 5).	Cable permanently attached to the projector (fig. 14.1).
Lens assembly	Contains a bellow (fig. 5).	Contains a sliding lens tube (fig. 8.1).
Fuses	Located on the front (fig. 5).	Located on the left side (fig. 14.1).
Power switch	Two-position ON-OFF switch on the front (fig. 5 and 9).	Three-position ON-FAN ONLY-OFF switch located on the right side (14, fig. 6.1 and figs. 8.1 and 9.1).
Undercarriage	Does not contain an undercar riage control lever.	Contains an undercarriage control lever for raising or lowering the undercarriage (11, fig. 5.1) .
Blower	Single fan (figs. 8, 10, and 12)	Dual blower wheels, driven by a single motor, with a tail-pipe (figs. 10.1 and 12.1).
Pointer	Pointer located on the right side (figs. 4, 14, and 16).	Optical pointer assembly located in front (fig. 14.1).

Paragraph 8, line 3. Change" (fig. 2)" to: (figs. 2 and 2.1).

Page 11, paragraph 10. Add the following subparagraph:

e.1. For the AP-5 (2), open the access door (fig. 4.1) by turning the latch (fig. 8.1). The projection lamp socket (fig. 4.1) is now accessible. Remove the projection lamp from the container. The base of the projection lamp has two ears, one wider than the other. Set the base of the projection lamp into the projection lamp socket so that the wide ear of the projection lamp enters the wide slot of the projection lamp socket. Push the projection lamp gently downward until the ears are below the rim of the projection lamp socket, and rotate the projection lamp 90° to the right until

it comes to a positive stop. Close the access door and secure it by turning the latch (fig. 8.1).

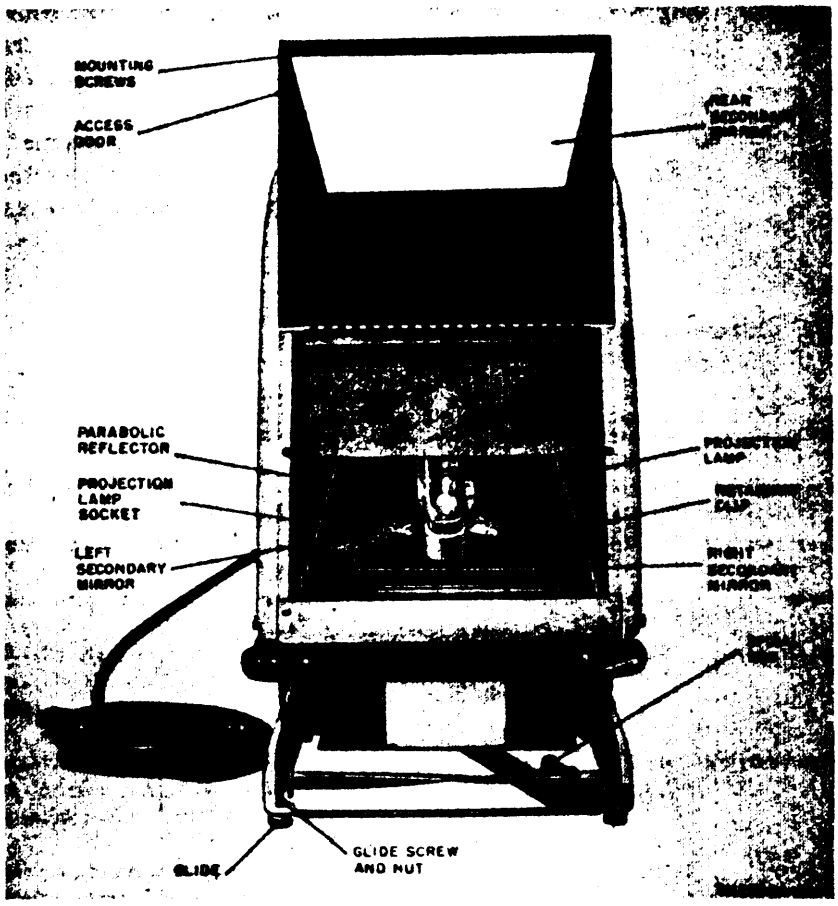


Figure 4.1 (Added) Projection lamp installed, Projector, Still Picture AP-5(2).

Page 12.

11.1. Controls, Projector, Still Picture AP-5(2)

(fig. 5.1)

(Added)

Note. This paragraph describes, locates and furnishes the operator with the information pertaining to the various controls provided for proper operation of the equipment. Do not attempt the operation of this equipment until the use of all operating controls is fully understood.

a. OFF-FAN ONLY-ON Switch S1, OFF-FAN ONLY-ON switch (14) is used to turn power on or off, and to control the blower motor and the projection lamp.

(1) When switch S1 is at OFF, power is disconnected from projection lamp DS1 and blower motor 131.
(2) When switch S1 is at FAN ONLY, blower motor B1 is energized.
(3) When switch S1 is at ON, projection lamp DS1 and blower motor B1 are energized.

b. Focusing Knob. The focusing knob (1) is at the end of the pinion shaft (16) on the right side of the projector. It moves the lens tube (19) in and out of the projector to permit focusing of the image on a projection screen.

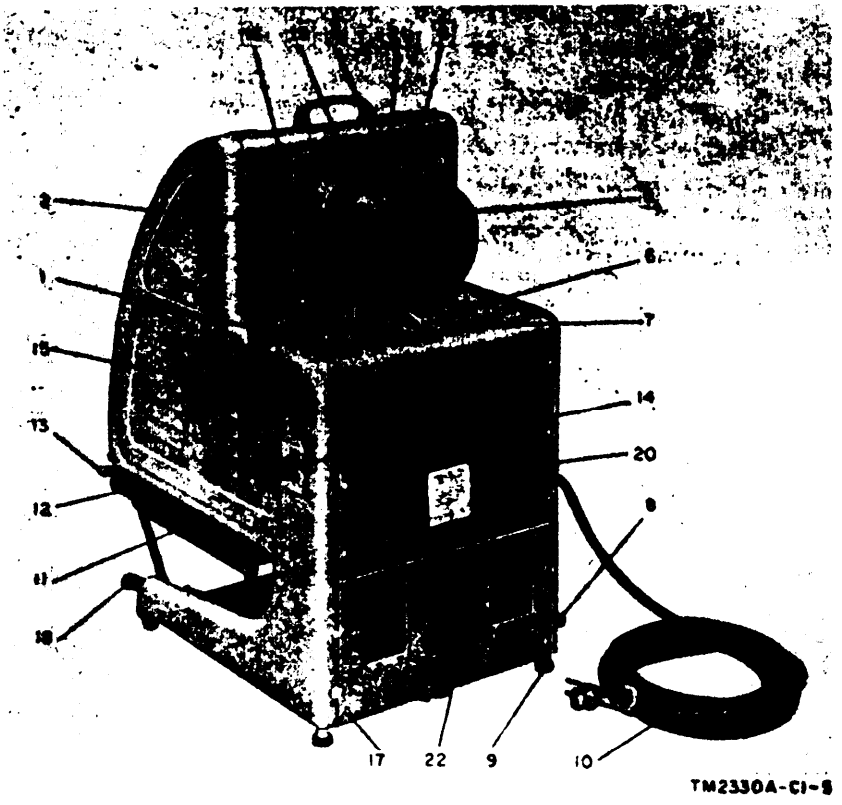
c. *Pointer Knob.* The pointer knob (15) is on the side of the housing above the OFF-FAN ONLY-ON switch (14). It positions the arrow image on the illuminated projection screen.

d. Handcrank. The handcrank (13) is on the right side of the undercarriage (11). It rotates a perforated belt, moving copy into position under the aperture for projection and out of the projector after projection.

e. *Undercarriage Control Lever.* The undercarriage control lever (18) is at the rear of the projector below the undercarriage (11). It raises or lowers the undercarriage.

f. Elevating Legs. The two elevating legs (9) are mounted inside the front of the projector housing. They raise or lower the projected image on the projection screen. When the image is in the desired position, the elevating legs are clamped with the leg clamp screws (8).

Page 13.



1 Focusing knob
2 Channel
3 Lens mount
4 Lens clamp screw
5 Projection lens
6 Stop screw
7 Rack
8 Leg clamp screw
9 Elevating leg
10 Power cable
11 Undercarriage
12 Copy feeding unit
13 Handcrank
14 OFF-FAN ONLY-ON switch
15 Pointer knob
16 Pinion shaft
17 Panel mounting screw
18 Undercarriage control lever
19 Lens tube
20 Front panel
21 Receiver assembly
22 Bottom panel

Figure 5.1. (Added) Projector, Still Picture AP-5(2), assembled.

Page 14, paragraph 13, Add the following subparagraph:

e. For the AP–5 (2), when the presentation has been completed, turn the OFF-FAN ONLY-ON switch (14, fig. 5.1) to FAN ONLY and allow the projector to cool *15* minutes before turning it off. Replace the lens cap.

Page *15*, paragraph 15, heading. Change " (figs. 1, 5, and 10)" to: (figs. 1.5, 5.1, 10, and 10.1).

Page 16.

16.1. Projecting Thick Copy and Physical Objects, Projector, Still Picture AP-5(2)

(Added)

Thick objects (up to 1 ½ inches thick) are protected by lowering the undercarriage (11, fig. 5.1), placing the object on the copy feeding unit, and raising the undercarriage as far as it will go.

a. Moving the undercarriage control lever (18) from right to left will lower the undercarriage (11). The undercarriage will remain in any position and will slant slightly toward the back of the projector, thus permitting easier insertion of copy.

b. Place the copy or object on the copy feeding unit (12). Move the undercarriage control lever (18) from left to right to raise the undercarriage (11) to the required position for projection.

c. When one object has been projected and the next is readyto be inserted, repeat procedures in *a* and *b* above.

17.1. Operating Optical Pointer Assembly, Projector, Still Picture AP-5(2)

(fig. 5.1)

(Added)

The optical pointer is operated by a pointer knob (15) by moving the pointer knob in the direction the arrow image is to move. When the pointer knob is pushed in (toward the projector), the arrow will move to the left and when the pointer knob is pulled out (away from the projector), the arrow will move to the right. Turning the pointer knob to the right (clockwise) moves the arrow down. Turning the pointer knob to the left (counterclockwise) moves the arrow up. The arrow image is projected through a hole in the front panel (20) of the projector.

Page 20, paragraph 22. Delete the information in the "How to check" column for item No. 3 and substitute the following:

Open the access door (fig. 4 or 4.1). Open the shield (AP-5(1) only). Remove the projection lamp and wipe it clean with a clean lint-free cloth. Use a camel's-hair brush and lens tissue (with lens cleaner if necessary) to clean the parabolic reflector surface and the three secondary mirror surfaces. Remove dust from the front surface mirror (fig. 8 or 8.1) by gently brushing with a camel's-hair brush. Relate the projection lamp. Close the shield (AP-5(1) only). Close the access door (fig. 4 or 4.1).

Page 21. Make the following changes:

Delete paragraph 23.

Delete figure 6.

Page 22. Delete figure 7.

Page 29. Delete section II.

Page 25, paragraph 32, checklist, Make the following changes:

Item No. 1, "Action or condition" column. Change "to projector and" to: projector.

"Normal indication" column. Delete "and on projector receptacle."

Item No. 2, "Corrective measures" column, line 2. Delete "the front of."

Page 28, paragraph 35, heading. Change " (fig. 8)" to: (figs. 8 and 8.1).

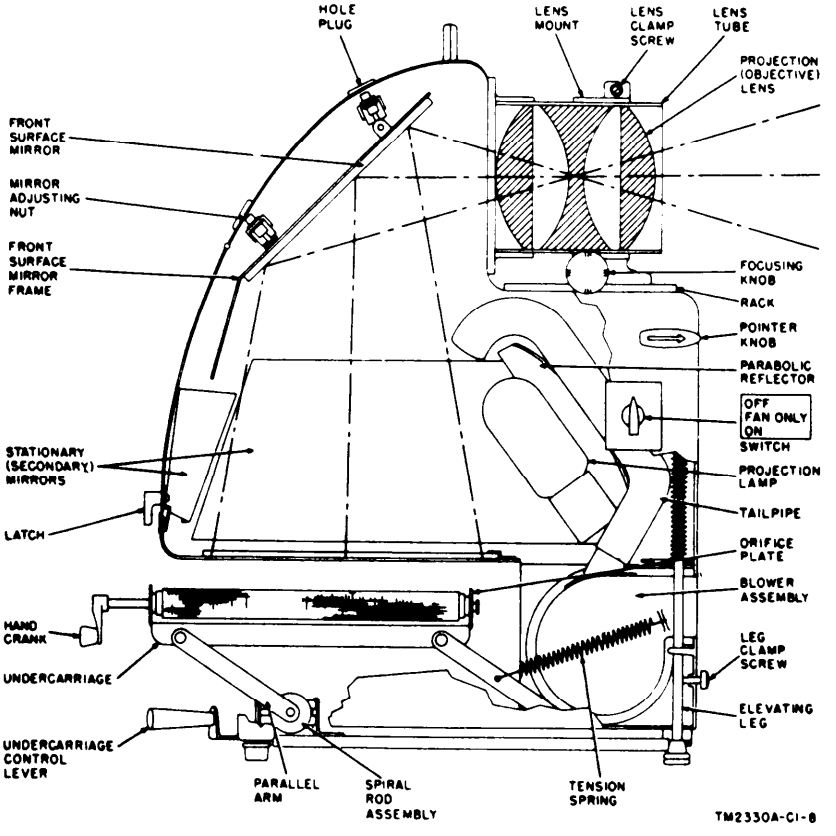


Figure 8.1. (Added) *Projector, Still Picture AP-5(2), functional diagram.*

Page 29, paragraph 36, heading. Change "(fig. 8)" to: (figs. 8 and 8.1).

Paragraph 37. Make the following changes:

Heading. Change " (figs. 10 and 11)" to: (figs. 10, 10.1, 11, and 11.1).

First sentence. Delete "neoprene."

38.1. Optical Pointer Assembly, Projector, Still Picture AP-5(2)

(fig. 16.1)

(Added)

The optical pointer assembly includes an aperture plate that contains the arrow, lens tube, condenser lens, projection lens, a rear surface mirror, and a front surface mirror. The rear surface mirror collects the light and reflects it into the lens tube. The light passes through the aperture plate that contains the arrow, through the condenser lens and projection lens, and strikes the front surface mirror. The light reflected from the front surface mirror is directed onto a projection screen. The projected arrow image is controlled by operating the pointer knob, which moves the front surface mirror. Pushing the pointer knob in or pulling it out moves the front surface mirror on a vertical axis and moves the arrow image left or right. Rotating the pointer knob about its own shaft moves the front surface mirror on a horizontal axis and moves the arrow image up or down.

39.1. ventilation, Projector, still Picture AP-5(2)

(figs. 8.1 and 10.1)

(Added)

The blower assembly (fig. 10.1) contains two separate blower wheels driven by a common motor and provides the necessary ventilation for the projector. Both blowers produce a vacuum to hold the copy being projected, but only the blower on the right side of the projector (viewed from the rear) provides cooling air for the projection lamp and projector housing (fig. 8.1).

40.1. Power Source

(fig. 9.1)

(Added)

The projector operates from 115-volt, 60-cps power source. Three-position rotary switch S1 (OFF-FAN ONLY-ON) controls the power to blower motor B1 and projector lamp DS1. The circuit contains 15-ampere fuses F1 and F2, which fuse both sides of the powerline. Power is applied to the equipment through ground adapter P1 (used for grounding the equipment), connector J1, and cable W1.

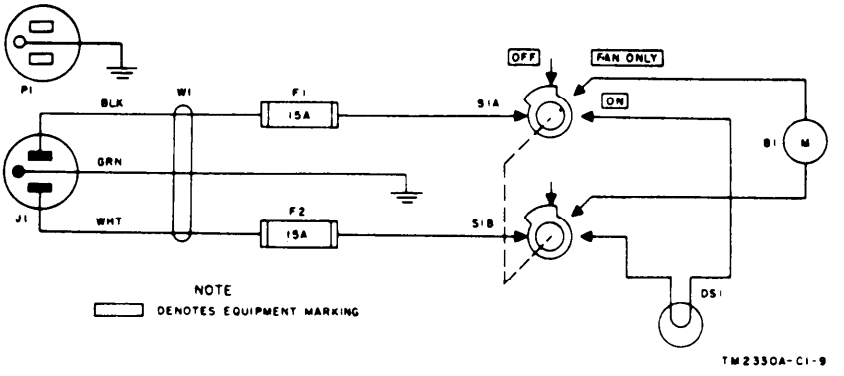


Figure 9.1. (Added) Projector, Still Picture AP–5(2), schematic diagram.

Page 34.

44.1. Lens Tube and Lens Mount, Still Picture Projector AP-5(2)
(fig. 5.1)
(Added)

a. Lens Tube.

(1) Remove the lens tube (19) from the lens mount (3) by loosening the lens clamp screw (4) and carefully sliding the lens tube (19) out of the lens mount (3).

(2) Replace the lens tube (19) in the lens mount (3) by reversing the procedure in (1) above,

b. Lens Mount.

(1) Removal.

(a) Remove the lens tube *(a* (1) above).

(b) Remove the stop screw (6) from the rack (7).

(c) Rotate the focusing knob (1) to the right until the pinion shaft (16) is disengaged from the rack (7).

(d) Slide the lens mount (3) off the rack (7).

(e) Slide the receiver assembly (21) from the channels (2).

(2) *Replacement.* Replace the lens mount by reversing the procedures in (1) above.

c. *Focusing Knob.*

(1) *Removal.*

(a) Loosen the two setscrews (not shown) in the collar of the focusing knob (1),

(b) Slide the focusing knob (1) off the pinion shaft (16).

(2) *Replacement.* Replace the focusing knob by reversing the procedures in (1) above.

Page 35.

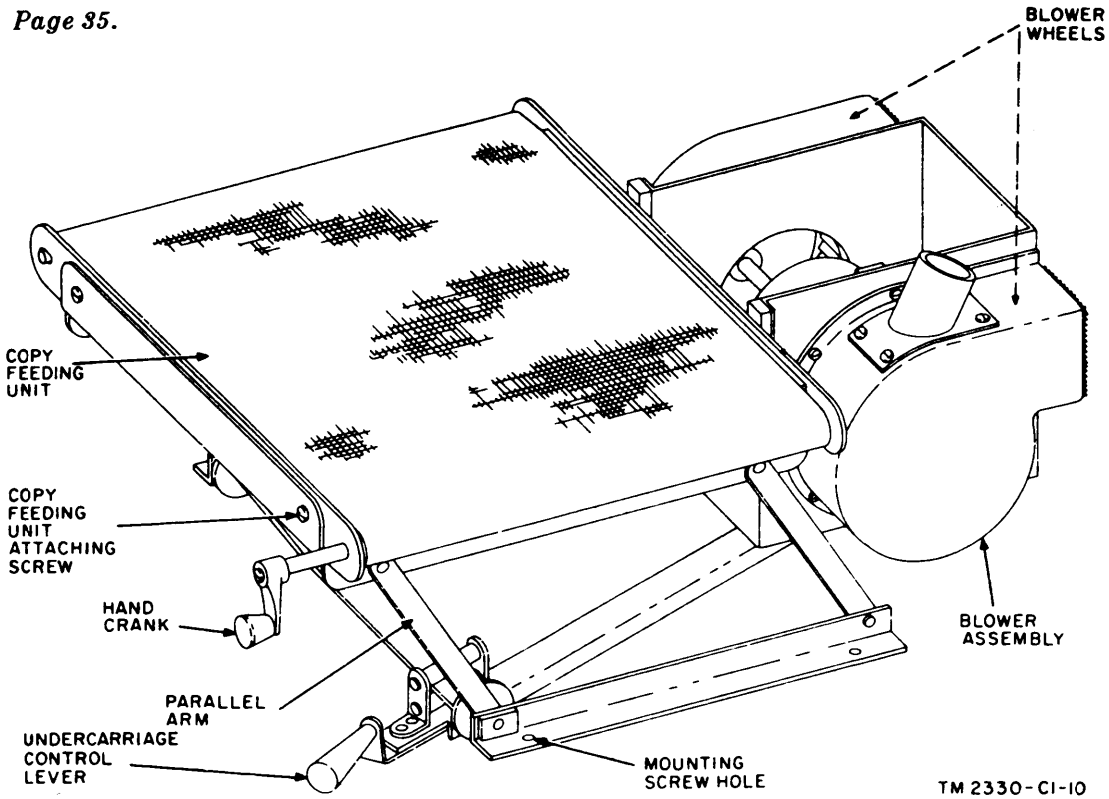
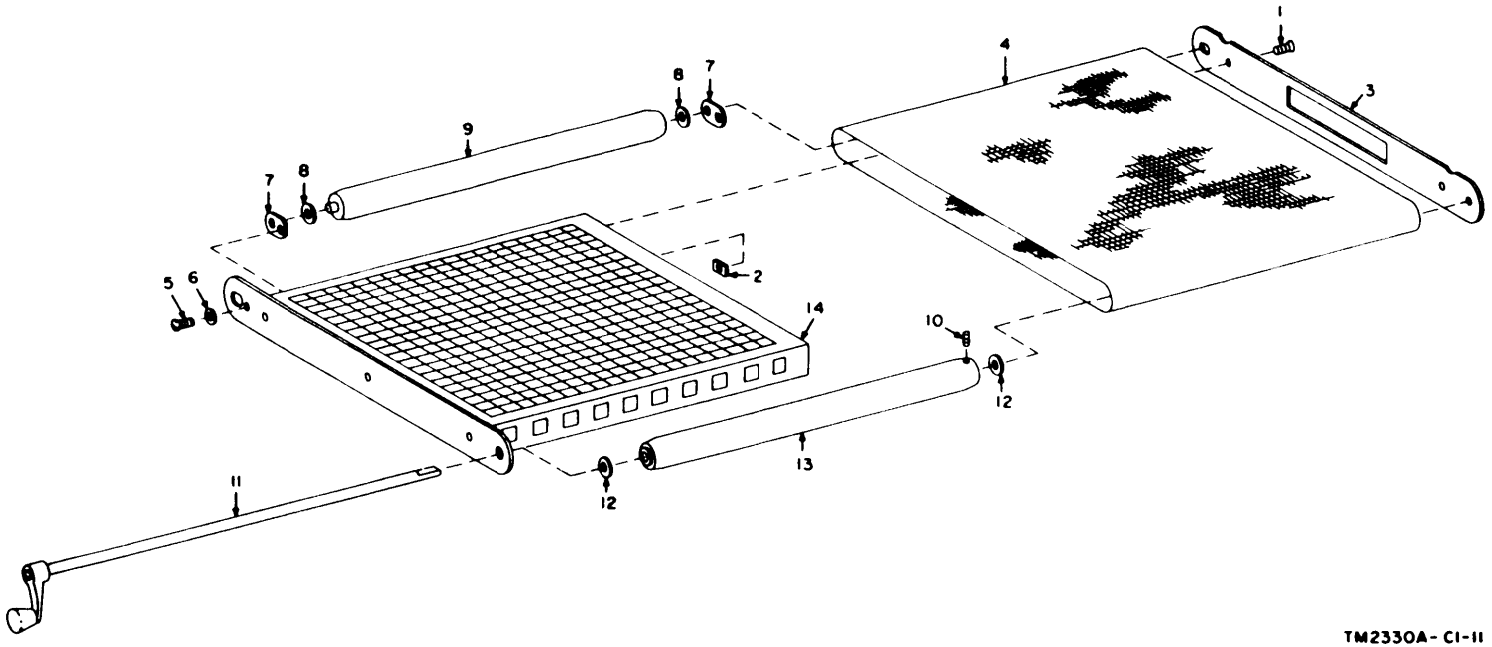


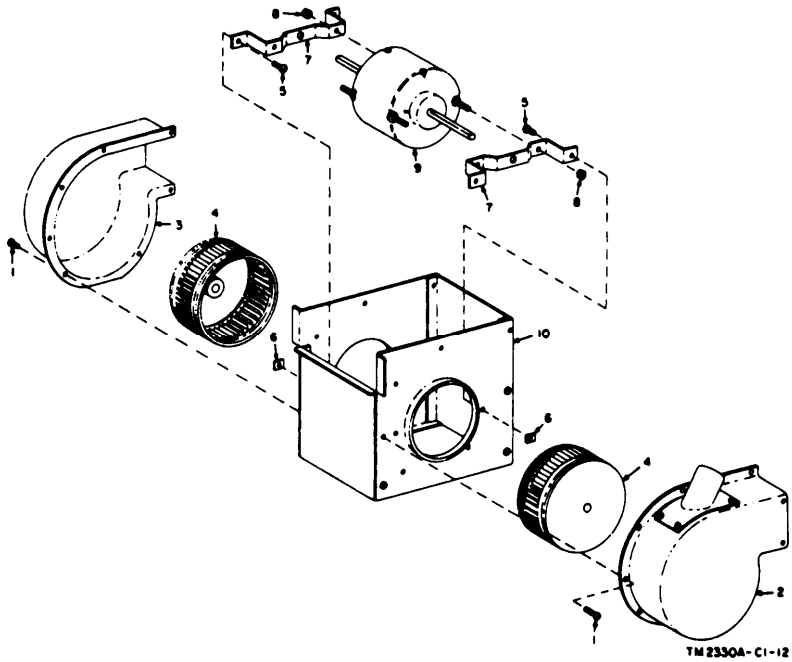
Figure 10.1. (Added) *Undercarriage assembly, Projector, Still Picture AP-5(2).*



8 Spacer (MP150)
9 Idler roller (O112)
10 Setscrew (H162)
11 Handcrank (A134)
12 Spacer (MP152)
13 Drive Roller (O113)
14 Body assembly (A126)

1 Sheet metal screw (H220)
2 Speed nut (H221)
3 Orifice plate (MP142)
4 Copy feed belt (MP146)
5 Screw (H223)
6 Washer (H224)
7 Roller adjust strip (MP143)

Figure 11.1. (Added) *Copyholding unit, Projector, Still Picture AP-5(2), disassembled.*



1 Screw (H201)
2 Right blower scroll (A146)
3 Left blower scroll (A147)
4 Blower wheel (0118,0119)
5 Screw (H203)
6 Speed nut (H204)
7 Motor support bracket (MP182)
8 Hexagonal nut (H205)
9 Blower motor (B1)
10 Motor housing

Figure 12.1. (Added) Blower assembly, Projector. Still Picture AP-5(2), disassembled.

Page 37.

45.1. Undercarriage Assemby, Projector, Still Picture AP-5(2) (Added)

a. Undercarriage.

(1) *Removal.*

(a) Turn the projector face down and remove the two tension springs (fig. 8.1),

(b) Remove the four mounting screws from the mounting screw holes (fig. 10.1) that hold the undercarriage to the frame of the projector.

(c) Lift the undercarriage out of the projector,

(2) *Releasement.* Replace the undercarriage by reversing the procedures in (1) above.

b. Copy Feeding Unit.

(1) *Removal (fig.* 10.1).

(a) Remove the four copy feeding unit attaching screws.

(b) Lift the copy feeding unit out of the undercarriage.

(2) *Disassembly (fig.* 11.1).

(a) Remove the two sheet metal screws (1) and speed nuts (2).

(b) Remove the orifice plate (3).

(c) Slide the copy feed belt (4) off the rollers (9 and 13).

(d) Remove the screw (5) and washer (6).

(e) Remove the idler roller (9) from the body assembly (14).

(f) Slide the two roller adjustment strips (7) and spacers (8) off the idler roller (9).

(g) Loosen the setscrew (10) and slide the drive roller (13) and spacers (12) off the handcrank (11).

(h) Slide the handcrank (11) out of body assembly (14).

(3) *Reassembly.* Reassemble the copy feeding unit by reversing the procedures in (2) above.

(4) *Replacement.* Replace the copy feeding unit by reversing the procedures in (1) above.

c. Blower Assembly.

(1) *Removal.*

(a) Place the projector on its left side (viewed from the rear).

(b) Remove the panel mounting screws (17, fig. 5.1) that hold the bottom and front panels (20 and 22) to the projector housing.

(c) Remove the bottom and front panels.

(d) Remove the four blower assembly mounting screws (not shown) from the bottom of the projector.

(e) Slip the tailpipe (fig. 8.1) off the right blower scroll (2, fig.12.1).

(f) Slide the blower assembly out of the projector housing.

(2) *Disassembly (fig, 12.1).*

(a) Remove the seven screws (1) that hold the right blower scroll (2) to the motor housing (10).

(b) Remove the right blower scroll (2).

(c) Remove the seven screws (1) that hold the left blower scroll (3) to the motor housing (10).

(d) Remove the left blower scroll (3).

(e) Loosen the setscrews (not shown) on the two blower wheels (4) and slide the blower wheels off the shafts of the blower motor (9).

(f) Remove the four motor support bracket mounting screws (5) and speed nuts (6).

(g) Slide the blower motor (9) and motor support brackets (7) out of the motor housing (10).

(h) Remove the four motor mounting hexagonal nuts (8) and slide the motor support brackets (7) off the blower motor (9).

(3) *Reassembly.* Reassemble the blower assembly by reversing the procedures in (2) above.

(4) *Replacement.* Replace the blower assembly by reversing the procedures in (1) above.

Page 39.

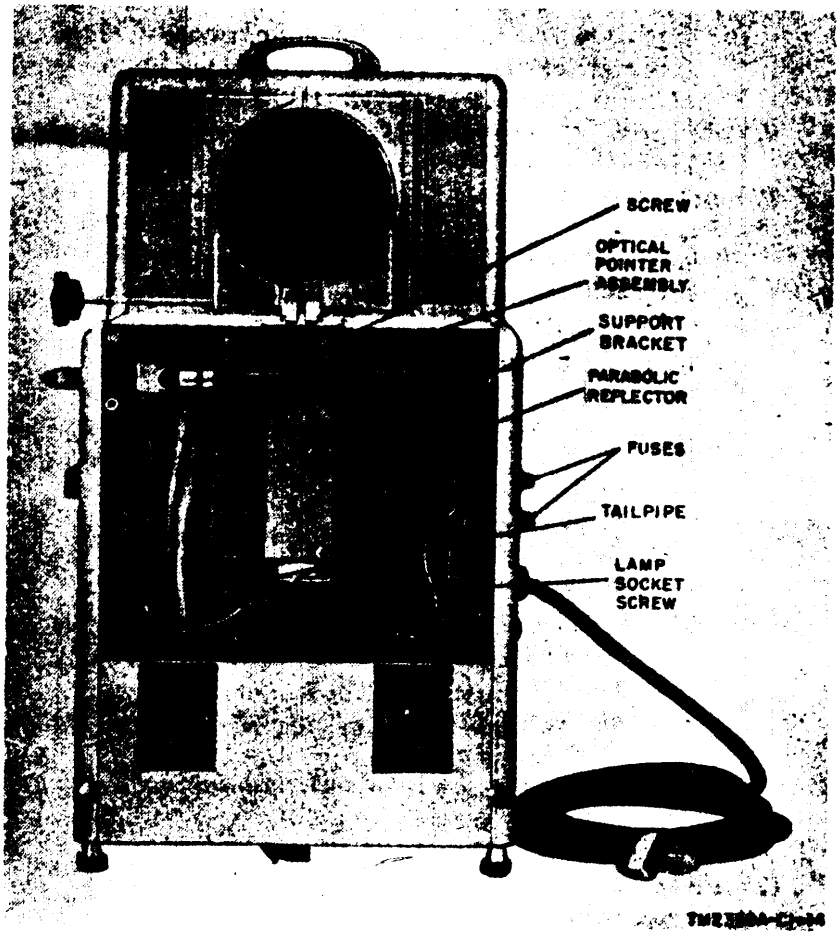


Figure 14.1. (Added) *Projector, Still Picture AP-5(2), front panel removed.*

46.1. Projector Housing, Projector, Still Picture AP-5(2)
(Added)

a. Rack (figs. 5.1 and 13).
(1) *Removal.*
(a) Remove the lens mount (par. 44.1 *b* (1)).
(b) Remove the seven rack screws (fig. 13) lockwashers and nuts (not shown).
(c) Lift the rack (7, fig. 5.1) off the projector housing.
(2) *Replacement.* Replace the rack by reversing the procedures in (1) above.

b. Projection Lamp (fig. 4.1).
(1) *Removal.*
(a) Open the access door.
(b) Push down on the projection lamp, rotate it to the left (counterclockwise), and lift the projection lamp out of the projection lamp socket.
(2) *Replacement.* Replace the projection lamp by reversing the procedures in (1) above.

c. *Parabolic Reelector.*
(1) *Removal.*
(a) Remove the projection lamp *(b(1)* above).
(b) Remove the nine panel mounting screws that hold the front panel (20, fig. 5.1).
(c) Remove the f rent panel (20).
(d) Remove the optical pointer assembly *(l* (1) below).
(e) Remove the tailpipe (par. 45.1 *c* (1) *(e)).*
(f) Remove the two upper and two lower screws that hold the support bracket (fig. 14.1).
(g) Lift up the support bracket.
(h) Lift up the parabolic reflector until it is out of the retaining clips (fig. 4.).
(i) Rotate the parabolic reflector toward the rear of the projector housing until the reflective surface is facing the bottom of the projector housing.
(j) Slide the parabolic reflector out of the front of the projector housing (fig. 14.1).
(2) *Replacement.* Replace the parabolic reflector by reversing the procedures in (1) above.

d. Access Door (fig. 4.1).
(1) *Removal.*
(a) Open the access door.
(b) Remove the four screws and speed nuts (not shown) that hold the access door to the hinge.

(c) Lift the access door off the hinge.

(2) *Replacement.* Replace the access door by reversing the procedures in (1) above.

e. *Secondary Mirrors (fig.* 4.1). The following procedures apply to each secondary mirror (left, right, and rear) :

(1) *Removal.*

(a) Remove the six mounting screws and speed nuts (not shown) that hold the mirror in its mounting.

(b) Slide the secondary mirror out of its mounting.

(2) *Replacement.* Replace the secondary mirror by reversing the procedures in (1) above.

f. Front Surface Mirror Frame Assembly and Front Surface Mirror.

(1) *Removal of front surface mirror frame assembly.*

(a) Remove the lens tube and lens mount (par. 44 *a(1)* and b(1).

(b) Replace the projector on its back.

(c) Remove the three hole plugs (fig.8.1).

(d) Turn the three mirror adjusting nuts to the left (counterclockwise) until the front surface mirror frame assembly is free.

(e) Lift the front surface mirror frame assembly out of the projector housing.

(2) *Replacement of front surface mirror frame assembly.*

(a) Reverse the procedures in (1) above.

(b) Adjust the front surface mirror (par. 49 *a).*

(3) *Removal of front surface mirror.*

(a) Remove the lens tube and lens mount (par. 44 *a* (1) and b(l)).

(b) Place the projector on its back.

(c) Loosen the three retaining strip screws (fig. 13).

(d) Slide the mirror retaining strip away from the front surface mirror.

(e) Carefully lift the front surface mirror out of the projector.

Caution: **Do not touch the front reflecting surface of the front surface mirror with the hands or allow tools or coarse cloth to come into contact with it. The reflecting surface is delicate and is easily scratched or marred.**

(4) *Replacement of front surface mirror.* Replace the front surface mirror by reversing the procedures in (3) above.

g. *Projection Lamp Socket.*

(1) *Removal.*

(a) Remove the projection lamp *(b* (1) above).

(b) Remove the front panel and *(c)* above).
(c) Remove the lamp socket screws (fig. 14.1).
(d) Lift the projection lamp socket out of its mounting hole (fig. 4.1).
(e) Disconnect the two leads from the base of the projection lamp socket.
(f) Remove the projection lamp socket from the projector housing.

(2) *Replacement.* Replace the projection lamp socket by reversing the procedures in (1) above.

h. OFF-FAN ONLY-ON Switch.

(1) *Removal.*
(a) Remove the front panel *(c* (1) *(b)* and (c) above).
(b) Loosen the knob setscrew (not shown) and remove the knob of the OFF-FAN ONLY-ON switch (14, fig. 5.1).
(c) Remove the hexagonal nut and lockwasher (not shown) from the switch.
(d) Slide the switch out of the mounting hole and disconnect the leads.
(e) Remove the switch from the projector housing.

(2) *Replacement.* Replace the OFF-FAN ONLY-ON switch by reversing the procedures in (1) above.

i. Fuses ond Fuseholders (fig, 14.1). The following procedures apply to each fuse or fuseholder:

(1) *Removal of fuse.*
(a) Push in on the fuse cap and twist it to the right (counterclockwise).
(b)) Pull the fuse cap out of the fuseholder.
(c) Remove the fuse from the fuse cap.

(2) *Replacment of fuse.* Replace the fuse by reversing the procedures in (1) above.

(3) Removal of fuseholder.
(a) Remove the front panal *(c* (1) (1)) and *(c)* above)
(b) Disconnect the two wires from the fuseholder.
(c) Remove the hexagonal nut and lockwasher (not shown) from the fuseholder.
(d) Remove the fuseholder.

(c) Slide the leg halfway out the projector housing and tighten the leg clamp screw.

(d) Drive the split pin (not shown) out of the hole in the elevating leg.

(e) Loosen the leg clamp screw and remove the elevating leg.

(f) Remove the leg tension spring and washer.

(2) Replacement. Replace the elevating leg by reversing the procedures in (1) above.

k. Glide (fig. 4.1). The following procedures apply to each glide:

(1) *Removal.*

(a) Place the projector on its left side.

(b) Unscrew the glide nut from the glide screw.

(c) Remove the glide from the projector.

(2) *Replacement.* Replace the glide by reversing the procedures in (1) above.

l. Optical Pointer Assembly (figs. 14.1 and 16.1).

(1) *Removal.*

(a) Remove the front panel *(c* (1) *(b)* and *(c)* above).

(b) Remove the rod retaining screw and pivot screw (fig. 16.1) and slide the pointer knob off the pointer control shaft.

(c) Remove the two screws (fig. 14.1) that hold the bracket to the projector housing.

(d) Slide the optical pointer assembly out of the projector housing.

(2) *Disassembly.*

(a) Remove the three screws that secure the rear surface mirror mounting (fig. 16.1).

(b) Remove the rear surface mirror mounting from the lens tube.

(c) Straighten the retaining clip and slide the rear surface mirror out of the rear surface mirror mounting.

(d) Remove the lens collar screws and slide the lens collar off the lens tube.

(e) Slide the retaining spring (not shown) and projection lens out of the lens collar.

(f) Slide the front surface mirror housing off the lens tube.

(g) Remove the two screws from the retaining ring and slide the retaining ring off the lens tube.

(h) Remove the sleeve from the pointer control shaft.

(i) Remove the two screws that hold the mirror frame and slide the mirror frame out of the front surface mirror housing,

(j) Straighten the retaining clips on the mirror frame and remove the front surface mirror from the mirror frame.

(3) *Reassembly.* Reassemble the optical pointer assembly by reversing the procedures in (2) above.

(4) *Replacement.* Replace the optical pointer assembly by reversing the procedures in (1) above.

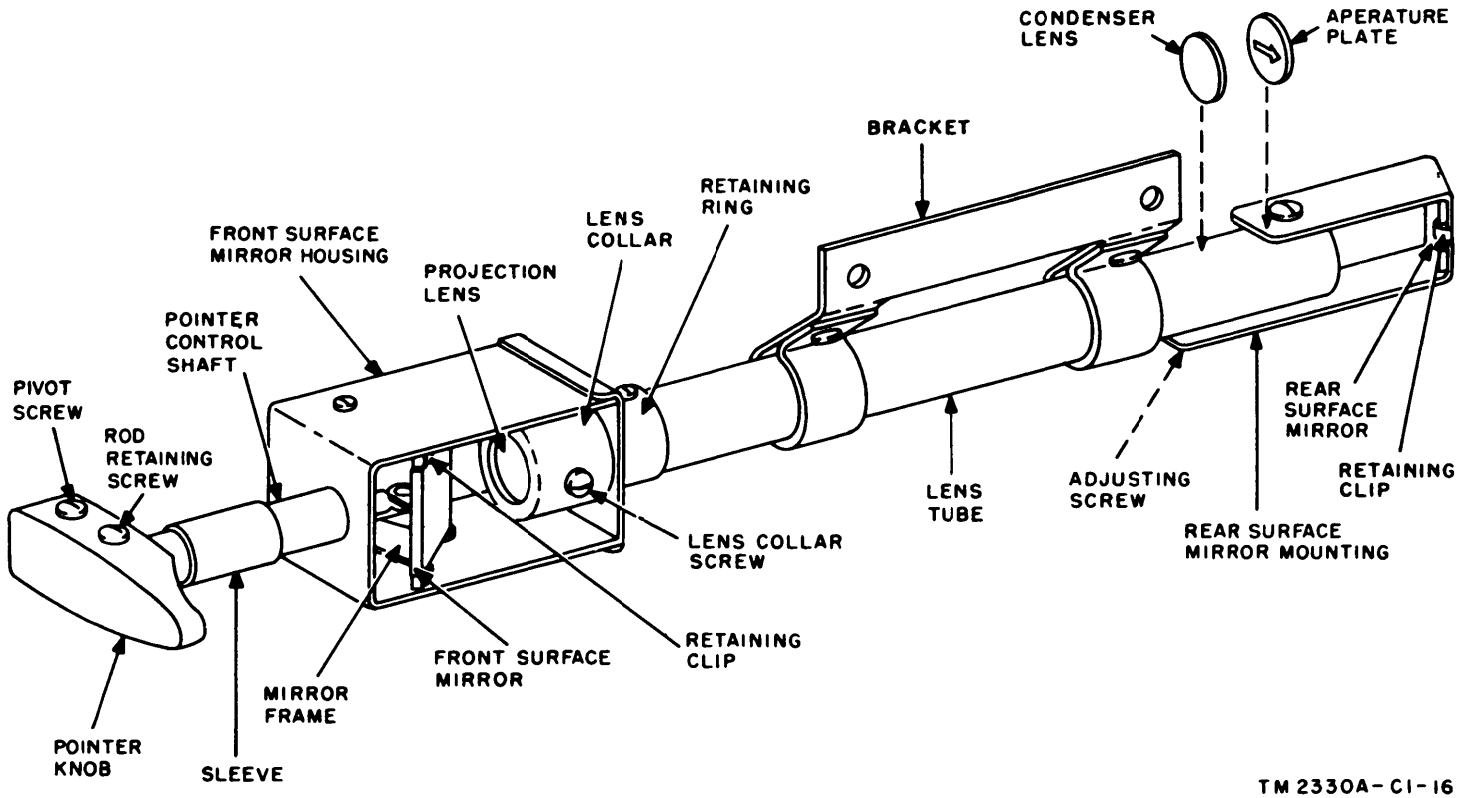


Figure 16.1. **(Added)** *Projector, Still Picture AP–5(2), optical pointer assembly.*

Page 45, paragraph 49 *a* (2) *(a).* Change "(figs, 1 and 8)" to: (figs. 1,8, and 8.1).

Page 46, paragraph 49 *b* (3) Add the following subparagraphs:

(b. 1) For the AP-5(2), if the arrow cannot be seen over the entire picture area, optical alinement is necessary. To aline the optical pointer assembly, remove the front panel (par. 46.1 *c* (1) *(b)* and *(c)),* Loosen the adjusting screw (fig. 16.1) on the rear surface mirror mounting. Adust the rear surface mirror mounting by sliding it toward the projector housing or away from the projector housing until the arrow can be positioned by the pointer knob over the entire picture area.

(c. 1) For the AP-5(2), replace the front panel.

Paragraph 49(4). Add the following subparagraphs:

(b.1) For the AP-5(2), remove the front panel (par. 46.1 *c* (1) *(b)* and *(c)).* Loosen the lens collar screws (fig. 16.1). Focus the arrow by sliding the lens collar back and forth on the lens tube until the arrow image is in sharp focus on the projection screen.

(c. 1) For the AP-5(2), replace the front panel.

Page 48, paragraph 55a. Change" (fig. 2)" to: (figs. 2 and 2.1).

BY ORDER OF THE SECRETARY OF THE ARMY:

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

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

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USAR: None.

For explanation of abbreviations used, see AR 820-60.

TECNICAL MANUAL
NO. 11-2330A

DEPARTMENT OF THE ARMY
Washington 25, D. C., 20 Decmber 1954

STILL PICTURE PROJECTOR AP-5(1)

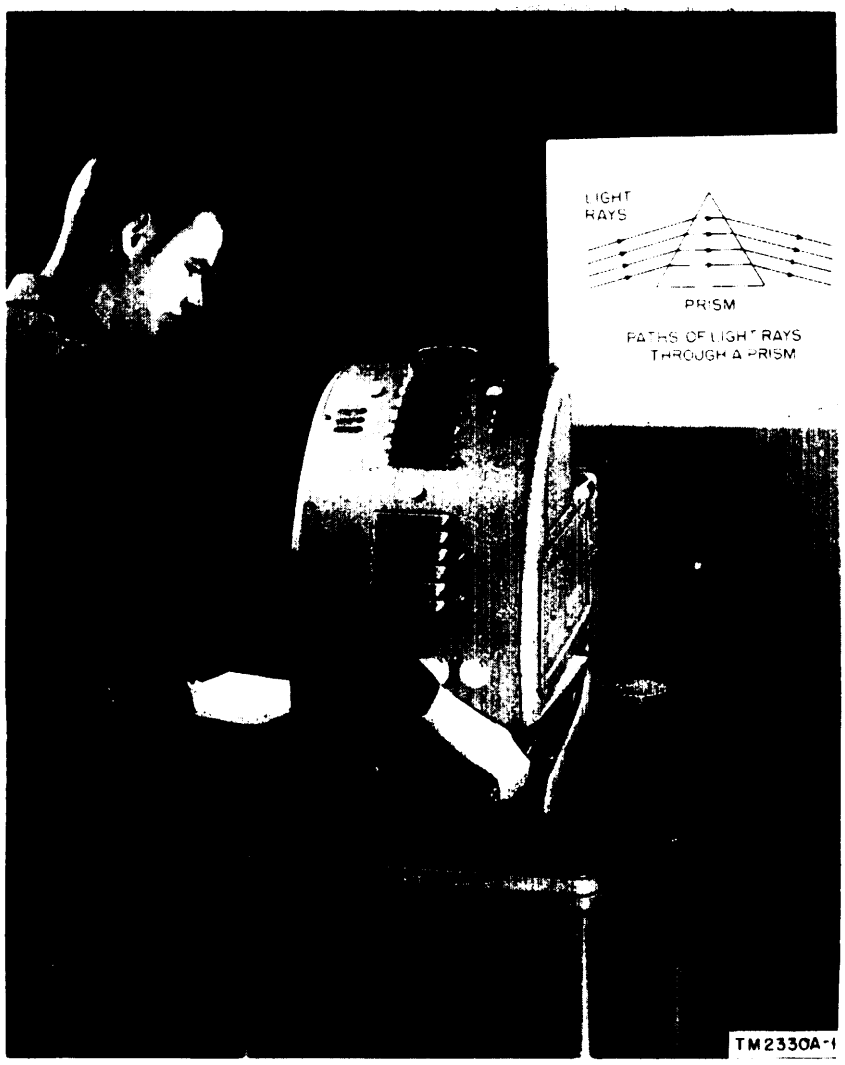


FIGURE 1. Still Picture Projector AP-5(1), in operation.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

This manual is published for the information and guidance of all concerned It Contains information on operation, organizational and field maintenance, and theory of operation, as well as a description of components. The instructions apply only to Still Picture Projector AP-5(1).

2. Forms and Records

The following forms will be used for reporting unsatisfactory conditions of Army equipment and in performing preventive, maintenance:

a. DD Form 6, Report of Damaged or Improper Shipment, will be filled out and forwarded as prescribed in SR 745-45-5 (Army), Navy Shipping Guide, Article 1850-4, and AFR 71-4 (Air Force) .

b. DA Form 468, Unsatisfactory Equipment Report, will be filled out and forwarded to the Office of the Chief Signal Officer, as prescribed in SR 700-45-5.

***c.* DD Form 535, Unsatisfactory Report, will be filled out and forwarded** to Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio, as prescribed in SR 700-45-5 and **AF TO 00-35D-54.**

d. DA Form 11-256, Operator First Echelon Maintenance Check List for Signal Corps Equipment– (Projector Equipment), will be prepared in accordance with the instructions printed on the back of the form (fig. 6) .

e. DA Form 11-257, Second and Third Echelon Maintenance Check List for Signal Corps Equipment– (Projector Equipment), will be prepared in accordance with instructions printed on the back of the form (fig. 7).

f. Use other forms and records as authorized.

Section II. DESCRIPTION AND DATA

3. General

(figs. 1, 2 and 5)

Still Picture Projector AP-5 (1) is used to project an image of opaque material on a screen. The projected copy may be a photograph, a sheet of paper or board on which the operator writes or draws, or some other opaque printed material suitable for projection. The image is projected to a screen in front of the projector. The projector can be used as a visual aid in teaching and briefing, for the presentation of progress charts and similar data, and for the comparison of small physical objects with each other or with a template or standard. It also can be used to enlarge drawings or maps so that they can be traced or studied. The projector consists of a housing that contains a projection lamp, an optical system, a projection stage, and a projection lens assembly. The lens assembly is mounted on the upper section of the housing. All components are packed in a portable carrying case.

4. Table of Components

(fig. 2)

The following list is for general information only. See appropriate supply publications for information pertaining to requisitioning of parts.

4. Table of Components (contd)

(fig. 2)

Quantity	Component	Dimensions (in.)				Weight (lb.)
		Length	Width	Height	Dia.	
1	Carrying case	27½	19½	29½		14
1	**Projector housing**	22	15	26½		36
1	Lens	6			4 11/16	3½
1	Lens cap	¾			4¾	¼
3	Projection lamp, 1000 w, 1 in use, 2 spares	6⅝	2⅞	2⅞		¼
1	Power cable	8	10	1½		1

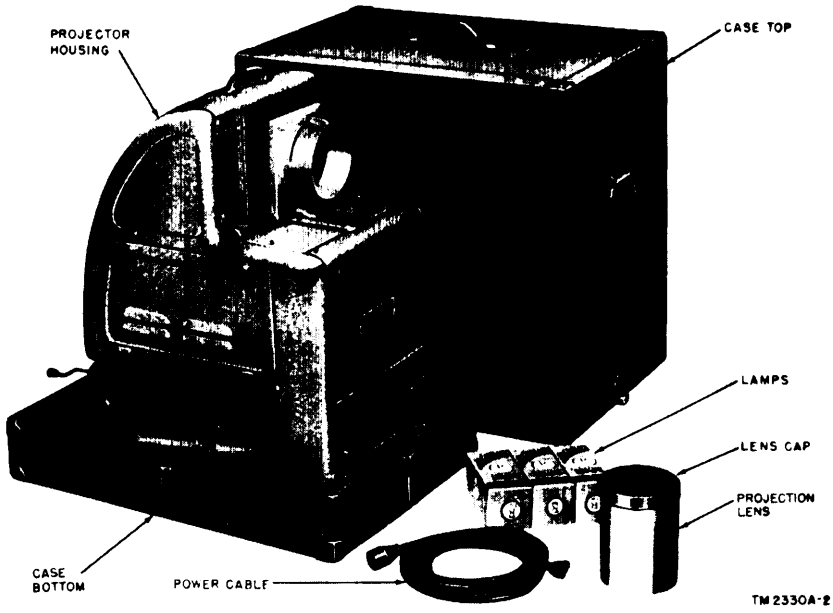


Figure 2. Still Picture Projector AP-5 (1) , component parts.

5. Description of Components

a. Carrying Case (fig. 2) . Still Picture Projector .4 P-5 (1) is furnished in a carrying case which is made of olive-drab, hard vulcanized fiber, suitably reinforced. The case consists of a shallow bottom section and a deep, completely removable top cover fastened with four latches. Inside the cover there is a fiber pocket in which the power cable is carried. The cover has one carrying handle on the top and one on each end. The bottom section contains a board which is shock-mounted on four sponge rubber pads. The board is retained by means of two steel angles, one of which is riveted to the bottom. The other angle is fastened by means of screws and nuts to permit removal of the board, if necessary. Compartments are provided in the bottom section of the case for storing the projection lens and the projection lamps.

b. Projector Housing (figs. 2, 4, and 5) .

(1) The projector housing is made up of two aluminum castings and a sheet metal wrap-around. The whole assembly is finished with an olive-drab crackle finish. The sheet metal sides and back of the housing contain ventilating louvers. One side of the housing is fitted with a hinged door which provides access to the interior of the housing where the reflector stand assembly,

secondary mirror assembly, and front surface mirror assembly are contained. The hinged door is secured by means of two captive screws. A hinged light shield is located just inside the access door and secured by one captive screw. A carrying handle is located on the top of the housing, and hand-holes to facilitate carrying are located in the front and rear of the housing.

(2) The bottom of the housing is provided with a 10- by 10-inch opening, normally closed by a spring actuated undercarriage (fig. 15) . The undercarriage contains the copy-holding and feeding mechanism and the cooling fan and motor. It is mounted on parallel arms, which pivot on shoulder screws, fastened to the base of the projector.

(3) The upper portion of the front of the housing forms a shelf on which the lens assembly is mounted. The lens assembly is equipped with a rack and pinion focusing device operated by a focusing knob, and it is connected to the housing by means of a bellows.

(4) An optical pointer control knob is located on the side of the housing, near the access door. On the front, in line with this knob, is the aperture through which the pointer arrow is projected. On the lower portion of the front are located on ON-OFF switch, two fuse holders, the power cable receptacle, elevating leg set screws, and a hand-hole.

c. Lens and Lens Mount Assembly (fig. 5) . The projector is equipped with a 4 1 1/16 -inch diameter, 22-inch focal length projection anastigmatic lens which is fully coated for maximum light transmission. The lens barrel is anodized aluminum. The lens mount consists of an aluminum casting and includes the pinion and focusing shaft which is part of the rack and pinion focusing mechanism. The lens is held in the mounting casting by means of a clamping screw, which clamps the cast ing around the lens. A lens cap is provided to cover and protect the lens when it is installed in the lens mount.

d. Front Surface Mirror Assembly (figs. 8, 13 and 15) . The front surface mirror picks up the light from the illuminated surface of the copy and directs it toward the lens. The front surface mirror assembly consists of a mounting frame, which has three pivoted mounting screws on the back and two retaining channels on the forward side. One mirror retaining channel is riveted to the frame; the other channel is fastened with screws to permit replacement of the mirror in the event of damage. The front surface mirror is designed for maximum light reflection and minimum optical distortion.

e. *Secondary* Mirror *Assembly (figs. 4* and 8). The secondary mirrors

reflect light (wich night otherwise be lost) back onto the copy help to make the illumination unform. The secondary mirror assembly consists of an aluminum sheet metal frame and three secondary rear surface mirrors that are held in the frame by means of retaining strips. Shock absorbing material is placed between the mirrors and frames to minimize breakage. The entire assembly is mounted in the projector by means of U-type self locking speed nuts and sheet metal screws.

f. Reflector and Lamp Holder Assembly (figs. 8, 14, and 15) . The reflector assembly consists of a steel frame in which are mounted the lamp holder and the parabolic reflector. The lamp holder is fastened to the frame by means of two screws, and the parabolic reflector is held by means of two clamping straps.

g. *Pointer (figs.* 4, 5, 8, anti 16) . The built-in optical pointer takes stray light from the side of the lamp filament and, by means of properly located mirrors and lenses, projects the image of an arrow on the screen. This imagc can be moved to point out details anywhere on the screen. The pointer system consists of a bracket (mounted on the inside of the housing) on which are mounted a condensing lens, an adjustable rear surface mirror, an aperture plate containing the arrow to be projected, a front surface mirror, and a lens tube.

h. Undercarriage Assembly (figs. 5, 8, and 10) . The undercarriage assembly, supported on a parallel linkage, is self-locking when in the lowered position. The assembly includes an orifice plate and a vacuum box projection stage (par. 15) on which a crank operated conveyor belt type, copy feeding mechanism is mounted. The cooling fan and motor are mounted in the forward end of the undercarriage above the orifice plate and are inclosed on three sides and protected on ‘the top and bottom by screens. The four parallel arms are connected to the base of the projector by shoulder screws on which the parallel arms pivot. Tension springs, connected between the projector base and the forward pair of parallel arms, serve to hold the undercarriage either in the raised or lowered position for the insertion of thick copy.

i. Copy Feeding Mechanism (figs. 10 and 11) . The copy feeding unit consists of an aluminum structure that supports two rollers. One roller is crank operated and the other roller is mounted so that it can rotate freely. An endless perforated neoprene belt is stretched over both rollers and a perforated metal shelf. The copy feeding unit is supported on the undercarriage vacuum box. As the exhaust fan forces the air out, it creates a vacuum at the top of the perforated belt. Material placed on this belt is held down upon it and, as the crank is operated, the material is carried into the projector and on out as the cranking is continued. The belt also serves as the projection stage for thick objects.

j. Power Cable (fig. 2) . The power cable consists of 15 feet of hard service cord containing two stranded wire conductors. On one end is a molded male connector and on the other is a molded female connector.

6. Technical Characteristics

Type . . . .Opaque object

Projection lamp . . . . . 1,000-watt, 115-volt, T-20 medium prefocus, C13 filament.

Projected image . . . . From 34 by 34 in. at 7.5 ft. to 120 by 120 in. at 22½ ft. (using 10 by 10 in. aperture) .

Fan motor . . . . . 115-volt ac, 60-cycle, single phase, open construction, shaded pole.

Power supply . . . . . 115.volt ac, 60-cycle.

Projection lens . . . . . 22 in. effective focal length, 41 1/16 in. dia.

7. Additional Equipment Required

A projection screen is required. Any type of semimatte screen may be used. A flat, light-colored wall surface will give fair results if no screen is available.

8. Packaging and Packing Data

Still Picture Projector AP-5 (1) with its components and accessories are placed within the designated compartments in the carrying case (fig. 2). The cover of the carrying case is closed and secured with its four fastenings. The carrying case is cushioned at each corner and at the top and bottom with fiberboard inserts and is placed within a waterproof, fiberboard carton. The entire closure is sealed with waterproof tape. The packaged equipment is placed within a second corrugated carton and sealed with gummed tape.

CHAPTER 2

OPERATION

Section I.
SERVICE UPON RECEIPT OF EQUIPMENT

9. Uncrating, Unpacking, and Checking
(fig.3)

a. Be vary careful when uncrating and unpacking the equipment. Avoid thrusting tools into the interior of the shipping container. Do not damage the packaging materals any more than is absolutely nccessary to remove the equipment; these materials may be required for future packaging. Stow the interior packaging materials within the shipping container. When uncrating and unpacking the equipment, follow the procedure outlined below:

(1) unpack the equipment in a location where it will not be exposed to dust, dirt, or excessive moisture.

(2) Cut [he tape, which seals the top flaps of the outer cat-ton, so that the carton remains undamaged. Remove the inner carton.

(3) cut the waterproof tape, open the inner carton, and remove the **pads and fillers.**

(4) Lift out the carrying case containing the equipment.

(5) Save all packaging material for use in future repacking.

b. Open the four carrying case latches and lift the case top off the base. Thoroughly check all equipment against the shipping documents. Carefully inspect all components for possible damage during shipment. Pay particular attention to the condition of the lenses, mirrors, and reflector.

Note. The uncrating, unpacking. and checking procedure for used or reconditioned equipment will be the same as that followed for new equipment. It is very important to check used equipment for a possible shortage of components. Check the components of used equipment for damage so that any damaged parts can be replaced immediately.

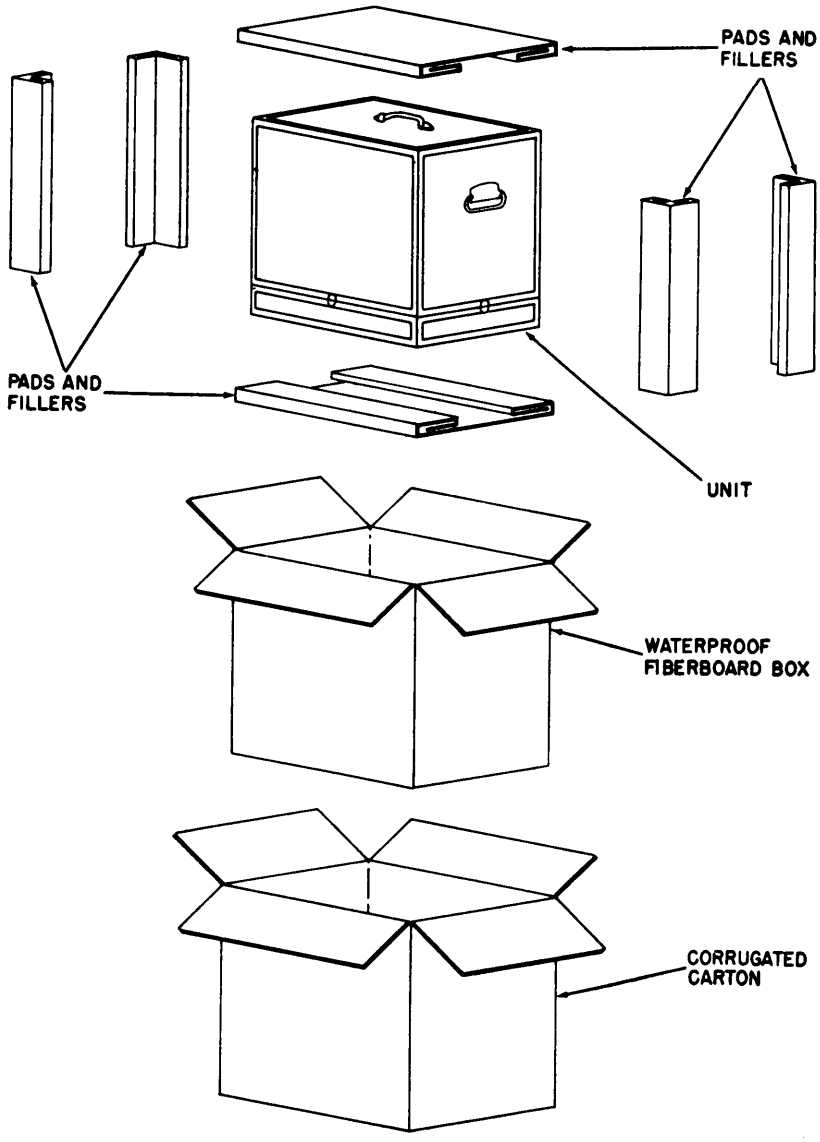


Figure 3. Packaging diagram.

10. Installation

a. Place a stand, table, or other sturdy, level support in the location where the projector is to be set up. The stand or table should be approximately 36 inches high if the operator stands when operating the equipment. The necessary projection distance to obtain a specific size screen image is indicated in the following table:

Project ion distance (ft.)	size of screen image for 10 by 10 in. aperture (in.)
7.5	34 by 34
8	36 by 36
10	48 by 48
12	60 by 60
14	72 by 72
16	83 by 83
18	94 by 94
20	105 by 105
22	117 by 117
22.5	120 by 120

b. Place the carrying case on a flat surface with the shallow bottom section down. Open the four trunk latches and carefully lift the deep top cover off. Remove the power cable from the fiber pocket in the cover, and place it in a convenient location. Unhook the two retaining springs from the two wing nuts, on the projector clamp assemblies, that hold the projector in the carrying case base. Unscrew the wing nuts until the clamps can be unhooked from the unit. Lift the projector housing out of the base; use the carrying handle located on the top of the housing. Set the projector on the support (subpar. *a* above) so that the front of the projector faces the screen.

c. Remove one 1,000-watt projection lamp and the projection lens from the compartments in the lower section of the carrying case and place them in a convenient location.

d. Loosen the clamping screw in the lens mount and insert the lens so that approximately 2 inches project out of the mount. Tighten the clamping screw until the lens is held securely. Do not overtighten this screw.

Note. In this position, the projector will have a range of projection distances approximately as shown in the projection table (subpar. a *above)* . If desired, the lens can be clamped further in (or out of) the lens mount to obtain longer (or shorter) projection distances. This permits maximum versatility in projection.

e. Open the door on the side of the projector by loosening the two knurled captive screws. Open the light shield by loosening the knurled captive screw. The lamp holder is now accessible. Remove the projection lamp from the container. Note that the base of the lamp has two ears, one wider than the other. Set the base of the lamp into the lamp holder so that the wide ear of the lamp enters the wide slot of the holder. Push the lamp *gently* downward until the cars are below the rim of the holder, and rotate the lamp clockwise 90° until it comes to a positive stop. Close the shield and tighten the knurled captive screw. Close the access door and tighten the two knurled captive screws.

f. Place the switch in the OFF position. Connect the female connector of the power cable to the male receptacle on the front of the projector. Connect the male connector of the power cable to a 115-volt, alternating current (ac), 60-cycle source.

Caution: The projector is designed to operate on ac only. Do not connect to direct current.

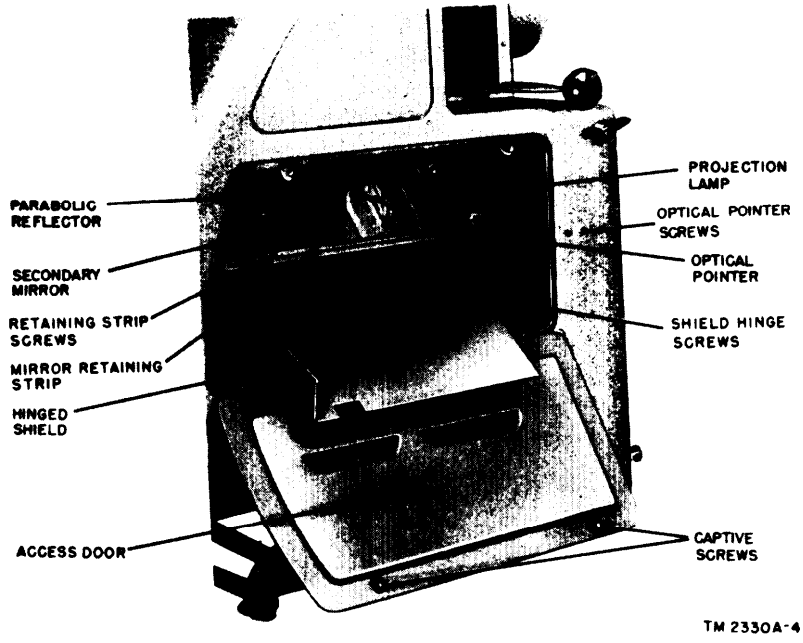


Figure 4. Projection lamp installed.

Section II.
OPERATION UNDER USUAL CONDITIONS

11., Controls
(fig. 5)

Note. This paragraph describes, locates and furnishes the operator with all the information pertaining to the various controls provided for proper operation of the equipment. Do not attempt the operation of this equipment until the use of all operating controls is fully understood.

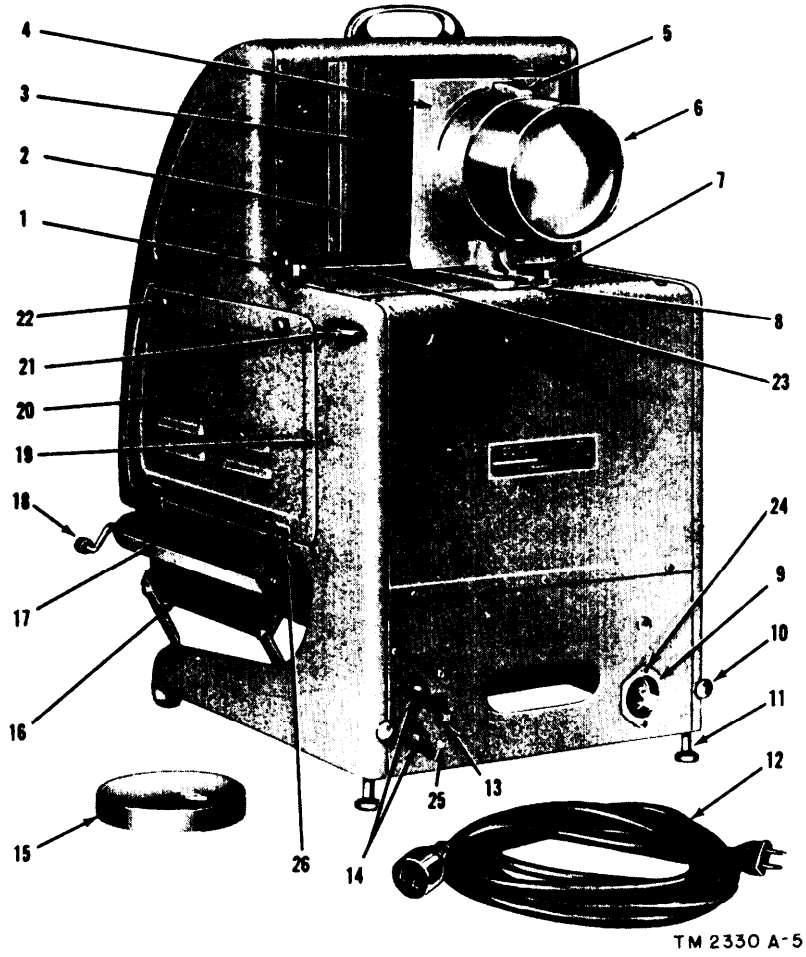
a. ON-OFF Switch. The ON-OFF switch is used to turn projector power on or off. When the switch is turned to the ON position, the projector lamp lights and the fan motor operates.

b. Focusing Knob. The focusing knob is located on the end of the focusing shaft on the side of the lens mount assembly. It is used to **move the lens mount assembly, containing the projection lens, in or** out to permit focusing of the image on the projection screen.

c. Pointer Control Knob, The pointer control knob is located on the side of the housing to the right of the side access door. It is used to position the arrow on the illuminated projection screen.

d. Copy Feeding *Crank.* The copy feeding crank is located on the copy feeding unit, mounted on the undercarriage assembly. This crank is used to rotate the endless perforated neoprene belt, moving copy into position under the 10 by 10-inch aperture for projection, and out of the projector after projection.

e. Elevating Legs. The two elevating legs are mounted inside the front of the housing. They are provided to elevate the front of the **projector housing to raise the projected image. The legs are fixed in position by their leg clamp screws.**



LEGEND

1. Focusing knob.
2. Channel.
3. Bellows.
4. Lens mount.
5. Lens clamp screw.
6. Projection lens.
7. Stop screw.
8. Rack.
9. Male receptacle.
10. Leg clamp screw.
11. Elevating leg.
12. Power cable.
13. ON-OFF switch.
14. Fuse holders
15. Lens cap.
16. Undercarriage
17. Copy feeding unit.
18. Hand crank.
19. Pointer assembly screws.
20. Access door.
21. Pointer control knob.
22. Captive screw.
23. Pinion shaft.
24 Male plug screw.
25 Switch screw.
26. Hinge screw..

Figure 5. Still Picture Projector A P-5 (1) , *assembled.*

12. Placement of Projector

Because the reflective qualities of opaque copy is poor, it is difficult to obtain brilliant screen images from an opaque projector. It is not necessary for the room to be absolutely dark, but it is important that the room be made as dark as possible and that the screen be shielded from direct light, particularly sunlight. If the room cannot be adequately darkened, then the screen image should be kept as small as practical; this will increase the intensity of illumination on the screen The size of the image on the screen should be suited to the distance from which it is viewed. The relationship should be such that the entire screen can be seen without moving the eyes excessively from side to side. The use of a large screen image and short viewing distance is bad practice and results in eye fatigue.

a. Set the projector on a suitable table, at the required projection distance, with the front of the projector facing the screen. The exact placement of the projector and the screen depends on the following:

(1) Size of screen image desired (par. 10a).
(2) Height of screen.
(3) Height of projector from floor.
(4) Best viewing angle for audience.

b. Adjust the position of the screen so that viewing will not be obstructed by either the operator or the projector.

13. Operation

When the projector has been set up as desired, proceed as follows:

a. Remove the lens cap, and throw the ON-OFF switch to the ON position.

b. Place a piece of opaque copy on the projection stage, raise the undercarriage assembly, and move the projector to left or right until the image is laterally centered on the screen. Turn the focusing knob until the image on the screen is in focus, and then loosen the two elevating rod knurled clamping screws located on the front of the housing. The elevating rods are spring loaded so that the projector will be raised automatically to its most elevated position. Adjust the projector downward until the screen image is vertically centered on the projection screen; tighten the clamping screws. Now turn the focusing knob again until the image is brought into sharp focus.

Note. As the line of projection is raised above a horizontal position, the picture becomes wider at the top than at the bottom. This {Distortion (keystoning) is not ordinarily objectionable, but it may be corrected by using a screen that can be tilted forward at the top.

c. Project material as desired in accordance with paragraph 14.

d. When the presentation has been completed, throw the ON-OFF switch to the OFF position. Replace the lens cap.

Section III. METHODS OF PRESENTATION

14. General

a. Planning Presentation.

(1) Determine the prime objectives of the presentation.

(2) Consider the objectives in determining what type of copy is to be used and how it is to be used.

(3) Carefully plan and organize the entire presentation. When timing the presentation, allow for audience participation, if desired.

(4) Rehearse a sufficient number of times so that brief notes may be used rather than verbatim commentary.

b. Types of Copy.

(1) Single sheets of copy, mounted photographs, colored pictures, graphs, blueprints, etc.

(2) Special animated devices.

(3) Opaque sheets on which material is written or drawn.

(4) Books, magazines, or other thick copy.

15. Projection with Copy Feeding Unit

(figs. 1, 5, and 10)

The projection opening is 10- by 10-inches, permitting the projection of 81/$_2$- by 1l-inch pages either horizontally or vertically. The copy feeding unit provides a means for inserting and removing copy Up to 3/32 -inch thick without lowering the undercarriage assembly. To operate the copy feeding unit, stand behind the projector and hold the crank handle in the right hand. Take the copy in the left hand, with the face side up and the bottom edge toward the screen, and feed it into the left side of the projector; let it rest on the copy feeding unit belt. When the material has been inserted approximately 1 ½ inches, turn **the crank toward the right (clockwise). The vacuum created by the** motor fan will hold the material down on the conveyor belt, and the conveyor belt will carry it into projection position. When the material has been centered laterally, stop turning the crank. When the next copy is inserted and the crank is turned, the previous projected copy is carried out of the projector.

Note. The copy feeding unit attachment eliminates the delay in projection time between removing one piece of copy and inserting the next since the new material is inserted as the old is removed. Long strips of material can be fed into the projector to obtain a panoramic effect. The smooth motion of the copy across the screen into projection position creates a very pleasing effect and helps make the presentation dynamic.

16. Projecting Thick Copy and Physical Objects

Thick objects (up to 1½ inches thick) are projected by lowering the

undercarriage, placing the object upon the copy feeding unit belt, and raising the undercarriage as far as it will go.

a. Grasp the crossbar and swing the undercarriage down (16, fig. 5). When completely lowered, the undercarriage will automatically lock and will slant slightly toward the back of the projector to be more convenient for the insertion of the copy. The vacuum will still operate in this position.

b. Place the copy or object on the copy feeding unit belt. Grasp the crossbar and lilt the undercarriage above the locking position. Do not let it fly upward because it will strike the bottom of the **projector and may damage the equiptment The undercarriage will be** held in the projection position by the springs which are attached to the forward parallel arms. When one object has been projected and the next is ready to be insertred, lower the undercarriage again, lift the old copy off the projection stage, and replace it with the new material to be projected.

Note. Thick physical objects (not lying in one plane) can be projected, hut theoretically only one particular plane of the object can he brought to an exact focus. However. from a practical angle. a good degree of definition can be obtained over its entire thickness it the object is not too thick.

17. Operating the Pointer
(figs. 5 and 8)

The pointer is operated by a single pointer control knob. To operate the pointer, (21, fig. 5) move the control knob in the direction that you want the arrow to go. When the knob is moved forward or backward, the arrow' will move left and right; when the knob is turned, the arrow wiill move up or down. The image of the pointer is projected through the small opening in the front of the projector (fig. 2) .

Section IV.
OPERATION UNDER UNUSUAL CONDITIONS

18. Arctic Areas

Still Picture projector AP-5 (1) is not designed for operation at low temperatures. When the equipment has been stored outdoors or in an unheated shelter- where extreme temperatures arc encountered, proceed as follows before operating it:

a. Move the equipment into the room in which it is to be operated and let it remain at room temperature for approximately 6 hours before removeing the protective covering. If the cover is removed sooner, water may condense on the equipment and cause permanent

damage. Whenever possible, inclose the covered equipment in water-repellent material before transferring it from the cold storage area to room temperature. The water-repellent material over the protective covering should decrease the possibility of water condensing" on the equipment.

b. Before operating the equipment, clean and dry the glass projection lens in accordance with the procedure described in paragraph 22. Then turn the projection lamp and blower on for 10 or 15 minutes to evaporate any remaining moisture.

19. Tropic and Desert Areas

a. If it is necessary to store the projector outdoors in very high temperatures, cover it with a shelter cloth to protect it from dust.

b. Before using the equipment in desert regions, use a soft bristle brush to clean any sand or dust from the housing. Open the side access door and brush dirt and sand from the inside of the projector, the rear surface mirrors, the reflector, and the projection lamp. Use a soft camel's-hair brush and carefully dust the projection lens, the front surface mirror, and the pointer assembly lenses and mirrors.

c. Under conditions of high humidity, inspect th~ equipment for traces of fungus, mold, and metallic corrosion. Remove all traces immediately. Refer to TB SIG 149, Tropicalization of Photographic Equipment, for further information on this subject.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE

Section I.

PREVENTIVE MAINTENANCE SERVICES

20. Tools and Materials Required for Organizational Maintenance

The following tools and materials are required for organizational maintenance of Still Picture Projector AP-5(1):

Item	*Signal Corps stock No.*
Camel's-hair brush	6Z1372
Cleaner, liquid, lens	8A319
Cloth, lint-free	6Z1989
Screw. driver, ¼-inch	6R15626-1
Screw driver, Phillips, PL-469/U	6R15487
Tissue, lens	8A2559

Caution: Do not use emery cloth, sandpaper, crocus cloth, or similar abrasive to clean the equipment. Use only the cleaning agents specified.

21. Definition of Preventive Maintenance

Preventive maintenance means making systematic checks and adjustments at regular intervals to keep equipment operating at top efficiency. It is not the same as trouble shooting or repair. The purpose of preventive maintenance is to *prevent breakdowns* and the need for repair. The purpose of trouble shooting and repair is to *locate and correct existing defects.* The importance of preventive maintenance cannot be overemphasized. Failure or inefficient operation of one component of the equipment may cause the failure of the entire unit. lt is vitally important, therefore, that operators and repairmen maintain their equipment properly.

22. Preventive Maintenance Techniques

The following table shows preventive maintenance procedures for Still Picture Projector AP-5 (1) . This list contains information on what to check, when to check, how to check, and precautions to be taken before, during, and after checking.

22. Preventive Maintenance Checklist

Item No.	What to check	When to check	How to check	Precautions
1	Projector, case, and accessories.	Daily	Check for completeness. See that power cable, projection lens, and lamp are either attached to projector or stored in case.	
2	Outer surfaces of projector, case, and accessories.	Daily	Check for cracks, chipped paint, rust, mildew, fungi, loose or missing screws, dents, and moisture. Clean metal surfaces by wiping them with a clean, lint-free cloth. Dry thoroughly. Dust projection lens with a camel's-hair brush. If fingerprints or foreign matter remains, clean lens with lens tissue moistened with lens cleaner. Tighten loose screws, and replace missing screws.	Be careful not to scratch glass surfaces. Never clean lens with anything but camel's-hair brush and lens tissue. Do not touch lens surfaces with the fingers. Tighten screws only hand-tight.

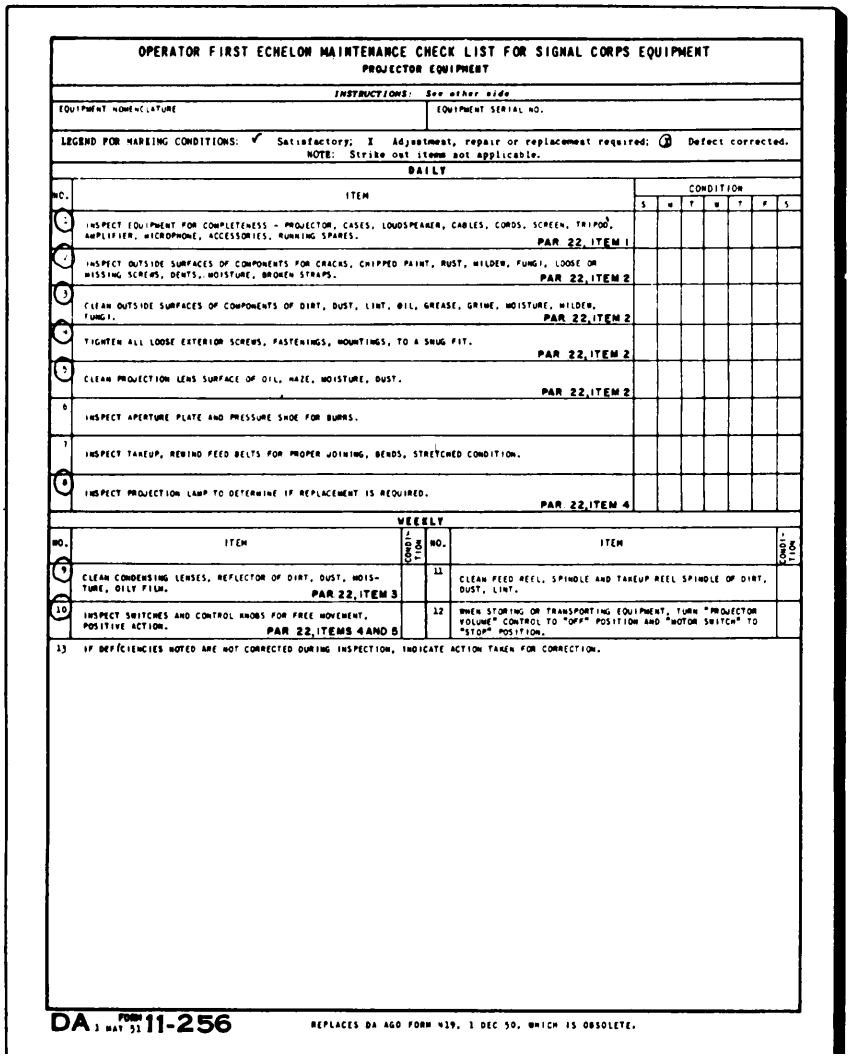
22. Preventive Maintenance Checklist (contd)

Item No.	What to check	When to check	How to check	Precautions
3	Interior of projector.	Daily	Open side access door of housing and open shield. Remove projection lamp and wipe it clean with a lint-free cloth. Use a camel's-hair brush and then lens tissue (with lens cleaner, if necessary) to clean the parabolic reflector surface and the three secondary mirror surfaces. Remove dust from front surface mirror by gently brushing with a camel's-hair brush. Replace lamp, and close shield and door.	Be careful not to scratch or break the reflector or the mirror surfaces. Use extreme caution when cleaning front surface mirror. Do not allow the fingers or rough objects to touch the reflecting surface of this mirror.
4	Projection lamp and blower motor.	Weekly	Turn power switch to the ON position to be sure that projection lamp and blower motor operate satisfactorily. Replace lamp if it is defective.	If the projector is not used daily, the projection lamp and blower should be turned on for about 10 minutes every day to prevent moisture from accumulating in the equipment.
5	Control knobs.	Weekly	Turn the focusing knob and the pointer knob back and forth to be sure that they operate smoothly and without binding and that they hold the position at which they are set.	Be sure that set screws in knobs are tight.

23, Use of Preventive Maintenance Forms (figs. 6 and 7)

a. The decision as to which items on DA Forms 11-256 and 11-237 are applicable to this equipment is a decision to be made in the case 01 first echelon maintenance by the **signal** officer or his designated representative, and in the case of second and third echelon maintenance, by the individual making the inspection. Instructions for the use of each form appear on the reverse side of the form.

b. Circled items in figures 6 and 7 arc partially or totally applicable to Still Picture Projector AP-5 (1) . References in the ITEM block refer to paragraphs in the text which contain additional maintenance information.



OPERATOR FIRST ECHELON MAINTENANCE CHECK LIST FOR SIGNAL CORPS EQUIPMENT
PROJECTOR EQUIPMENT

INSTRUCTIONS: See other side

EQUIPMENT NOMENCLATURE | EQUIPMENT SERIAL NO.

LEGEND FOR MARKING CONDITIONS: ✓ Satisfactory; X Adjustment, repair or replacement required; ⓓ Defect corrected.
NOTE: Strike out items not applicable.

DAILY

NO.	ITEM	CONDITION S	M	T	W	T	F	S
(1)	INSPECT EQUIPMENT FOR COMPLETENESS - PROJECTOR, CASES, LOUDSPEAKER, CABLES, CORDS, SCREEN, TRIPOD, AMPLIFIER, MICROPHONE, ACCESSORIES, RUNNING SPARES. PAR 22, ITEM 1							
(2)	INSPECT OUTSIDE SURFACES OF COMPONENTS FOR CRACKS, CHIPPED PAINT, RUST, MILDEW, FUNGI, LOOSE OR MISSING SCREWS, DENTS, MOISTURE, BROKEN STRAPS. PAR 22, ITEM 2							
(3)	CLEAN OUTSIDE SURFACES OF COMPONENTS OF DIRT, DUST, LINT, OIL, GREASE, GRIME, MOISTURE, MILDEW, FUNGI. PAR 22, ITEM 2							
(4)	TIGHTEN ALL LOOSE EXTERIOR SCREWS, FASTENINGS, MOUNTINGS, TO A SNUG FIT. PAR 22, ITEM 2							
(5)	CLEAN PROJECTION LENS SURFACE OF OIL, HAZE, MOISTURE, DUST. PAR 22, ITEM 2							
6	INSPECT APERTURE PLATE AND PRESSURE SHOE FOR BURRS.							
7	INSPECT TAKEUP, REWIND FEED BELTS FOR PROPER JOINING, BENDS, STRETCHED CONDITION.							
(8)	INSPECT PROJECTION LAMP TO DETERMINE IF REPLACEMENT IS REQUIRED. PAR 22, ITEM 4							

WEEKLY

NO.	ITEM	CONDITION	NO.	ITEM	CONDITION
(9)	CLEAN CONDENSING LENSES, REFLECTOR OF DIRT, DUST, MOISTURE, OILY FILM. PAR 22, ITEM 3		11	CLEAN FEED REEL, SPINDLE AND TAKEUP REEL SPINDLE OF DIRT, DUST, LINT.	
(10)	INSPECT SWITCHES AND CONTROL KNOBS FOR FREE MOVEMENT, POSITIVE ACTION. PAR 22, ITEMS 4 AND 5		12	WHEN STORING OR TRANSPORTING EQUIPMENT, TURN "PROJECTOR VOLUME" CONTROL TO "OFF" POSITION AND "MOTOR SWITCH" TO "STOP" POSITION.	

13 IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

DA FORM 1 MAY 51 11-256 REPLACES DA AGO FORM 419, 1 DEC 50, WHICH IS OBSOLETE.

Figure 6. DA Form 11-256.

SECOND AND THIRD ECHELON MAINTENANCE CHECK LIST FOR SIGNAL CORPS EQUIPMENT
PROJECTOR EQUIPMENT

INSTRUCTIONS: See other side

EQUIPMENT NOMENCLATURE	EQUIPMENT SERIAL NO.

LEGEND FOR MARKING CONDITIONS: ✓ Satisfactory; X Adjustment, repair or replacement required; (X) Defect corrected.
NOTE: Strike out items not applicable.

NO.	ITEM	CONDITION	NO.	ITEM	CONDITION
1	INSPECT EQUIPMENT FOR COMPLETENESS - PROJECTOR, CASES, LOUDSPEAKER, CABLES, CORDS, SCREEN, TRIPOD, AMPLIFIER, MICROPHONE, ACCESSORIES, RUNNING SPARES. PAR 22, ITEM 1		11	CLEAN FEED REEL, SPINDLE AND TAKEUP REEL SPINDLE OF DIRT, DUST, LINT.	
2	INSPECT OUTSIDE SURFACES OF COMPONENTS FOR CRACKS, CHIPPED PAINT, RUST, MILDEW, FUNGI, LOOSE OR MISSING SCREWS, DENTS, MOISTURE, BROKEN STRAPS. PAR 22, ITEM 2		12	WHEN STORING OR TRANSPORTING EQUIPMENT, TURN "PROJECTOR VOLUME" CONTROL TO "OFF" POSITION AND "MOTOR SWITCH" TO "STOP" POSITION.	
3	CLEAN OUTSIDE SURFACES OF COMPONENTS OF DIRT, DUST, LINT, OIL, GREASE, GRIME, MOISTURE, MILDEW, FUNGI. PAR 22, ITEM 2		13	CLEAN APERTURE PLATE ASSEMBLY, FILM PRESSURE SHOE ASSEMBLY, SPROCKET SHOE ASSEMBLY, GUIDEWAYS, SOUND DRUM, OF DIRT, OIL, DUST, CAKED EMULSION.	
4	TIGHTEN ALL LOOSE EXTERIOR SCREWS, FASTENINGS, MOUNTINGS, TO A SNUG FIT. PAR 22, ITEM 2		14	LUBRICATE IN ACCORDANCE WITH LATEST DEPARTMENT OF THE ARMY LUBRICATION ORDER.	
5	CLEAN PROJECTION LENS SURFACE OF OIL, HAZE, MOISTURE, DUST. PAR 22, ITEM 2		15	INSPECT DRIVE PULLEY FOR SLIPPAGE.	
6	INSPECT APERTURE PLATE AND PRESSURE SHOE FOR BURRS.		16	INSPECT DRIVE CLUTCH FOR SLIPPAGE.	
7	INSPECT TAKEUP, REWIND FEED BELTS FOR PROPER JOINING, BENDS, STRETCHED CONDITION.		17	INSPECT FOR PROPER FILM SPEED.	
8	INSPECT PROJECTION LAMP TO DETERMINE IF REPLACEMENT IS REQUIRED. PAR 22, ITEM 4		18	CLEAN INTERMITTENT MECHANISM AND LAMP HOUSE OF DIRT, DUST, LINT, EXCESS OIL.	
9	CLEAN CONDENSING LENSES, REFLECTOR OF DIRT, DUST, MOISTURE, OILY FILM. PAR 22, ITEM 3		19	INSPECT FOR FILM JUMP, FILM SLAP, FILM PICKING, FILM SCRATCH.	
10	INSPECT SWITCHES AND CONTROL KNOBS FOR FREE MOVEMENT, POSITIVE ACTION. PAR 22, ITEMS 4 AND 5		20	OPERATE PROJECTOR AND CHECK FOR OVERHEATING, SMOOTHNESS OF OPERATION, UNUSUAL NOISES, SQUEAKS, RATTLES, VIBRATIONS, SATISFACTORY OPERATION. PAR 22, ITEMS 4 AND 5	

21 IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

DA FORM 1 MAY 51 11-257 REPLACES DA AGO FORM 419, 1 DEC 50, WHICH IS OBSOLETE.

Figure 7. DA Form 11-237.

24. Lubrication

At six mouth Intervals, lubricate the fan motor top and botttom bearings. Each bearing is covered by a brass cap containing a felt disk which holds the oil. The brass cap has a hole through which the oil is applied to the felt (fig. 10) . Use a small oil can and apply 3 or 4 drops of LO, Oil, lubricating, light, to each bearing. Once a month apply a few drops of Oil (LO) to the lens mount pinion shaft and pinion gear (figs. 13 and 14) . The rack and pinion should be free from dirt or ‘foreign matter when the oil is applied.

Section II WEATHERPROOFING

25. General

Signal Corps equipment, when operated under severe climatic conditions such as prevail in tropical, arctic, and desert regions, requires special treatment and maintenance. Fungus growth, insects, dust, corrosion, salt spray, excessive moisture, and extreme temperatures are harmful to most materials.

26. Tropical Maintenance

A special rnoistureproofing and fungiproofing treatment has been devised which, if properly applied, provides a reasonable degree of protection. This treatment is fully explained in TB SIG 13, Moistureproofing and Fungiproofing Signal Corps Equipment, and in TB SIG 72, Tropical Maintenance of Ground Signal Equipment.

27. Winter Maintenance

Special precautions are necessary to prevent poor performance or total operational failure of equipment in extremely low temperatures. These precautions are fully explained in TB SIG 66, Winter Maintenance of Signal Equipment, and in TB SIG 219, Operation of Signal Equipment at Low Temperatures.

28. Desert Maintenance

Special precautions are necessary to prevent equipment failure in areas subject to extremely high temperatures, low humidity, and excessive sand and dust. These precautions are fully explained in TB SIG 75, Desert Maintenance of Ground Signal Equipment.

29. Lubrication at Extreme Temperatures

The effects of extreme heat or cold on materials and lubricants are explained in TB SIG 69, Lubrication of Ground Signal Equipment. Observe all “precautions outlined in TB SIG 69 when operating equipment under conditions of extreme heat or cold.

Section III. TROUBLE SHOOTING AT ORGANIZATIONAL MAINTENANCE LEVEL

30. General

The trouble shooting and repair that can be performed at the organizational maintenance level are limited in scope by the tools and replaceable parts available and by the existing tactical situation. Paragraphs 31 and 32 will help the repairman to determine the cause of trouble and will suggest corrective action. A reference to paragraph **43** indicates that the required repairs or adjustments should be made by field personnel and not by personnel at the organizational maintenance level.

31. Trouble Shooting Using Equipment Performance Check List

a. General. The equipment performance check list (par. 32) will help to locate trouble in the equipment. The list gives the item to be checked, the normal indications of correct operation, and corrective measures that can be taken by the operator. *To use the list cffectively, always follow the items in numerical sequence.*

b. Action or Condition. For some items, the information given in the *Action or condition* column consists of switch or control settings under which the item is to be checked. For other items, it represents an action that must be taken to check the normal indication given in the Normal indication column.

c. Normal lndications. The normal indications listed include visible indications and audible sounds that the operator should note when he checks the item. If these signs are not normal. the operator should apply the recommended corrective measures.

d. Corrective Measures. The corrective measures listed are those which the operator can make without turning the equipment in for repairs. .A reference in the table to paragraph 42 indicates that trouble shooting by an experieneced repairman is necessary. However, it the tactical situation requires that operation be maintained, and it the equipment is not completely imoperative, the operator must keep the projector in operation as long as it is possible to do so.

32. Equipment Performance Check List

	Item No.	Item	Action or condition	Normal indication	Corrective measures
S	1	Power cable	Connect to projector and to power source.	Power cable terminals fit securely in power receptacle and on projector receptacle.	Check all connectors. Straighten contacts, or bend them to increase tension, as necessary.
START	2	ON-OFF switch	Throw to ON position.	Projection lamp lights and, after a few seconds, blower motor can be heard to operate.	Check power cable connections. Check the two fuses on the front of the housing to see that they are in good condition. If blower motor operates but lamp does not light, open the access door, and check to see that the lamp is secure in its socket. Refer to paragraph 43.
EQUIPPER	3	Opaque copy	Place on copy feeding belt and center under 10- by 10-inch aperture.	Image is projected on screen.	Be sure that projection lamp is lighted.
FORMANCE	4	Screen image	Bring into focus by turning focusing knob.	Image is accurately focused.	Be sure opaque copy is held flat on copy feeding belt.
	5	Projector	Move laterally to center screen image.	Image is centered laterally.	
	6	Elevating legs	Adjust to center screen image vertically.	Image is centered vertically.	Be sure knurled clamping screws are handtight.

32. Equipment Performance Check List (contd)

	Item No.	Item	Action or condition	Normal indication	Corrective measures
EQUIPMENT PERFORMANCE	7	Focusing knob	Turn until image is brought into sharp focus.	Screen image is sharp and clear.	Examine opaque copy to be sure that it is satisfactory for projection. Clean all glass surfaces (par. 22). Refer to paragraph 43.
	8	Pointer	Turn pointer control knob to position pointer laterally and vertically across face of projection screen.	Pointer travels to all positions of projection screen.	Be sure that pointer control knob is free of binding. It should remain fixed in position as set. Clean all glass surfaces (par. 22). Refer to paragraph 43.
STOP	9	ON-OFF switch	Turn to OFF position.	Projection lamp is turned off and blower motor ceases to operate.	Refer to paragraph 43.

CHAPTER 4

AUXILIARY EQUIPMENT

Note. The equipment described in paragraphs 33 and 34 is not supplied as a part of Still Picture Projector AP-5 (1) . It is recommended that a standard projection screen and a firm support for the projector be available for use.

33. Projection Screen

An 8- by 8-foot semimatte projection screen is recommended. The semimatte screen is less bright than a beaded screen when viewed head on, but it will maintain a uniform brightness when viewed from any angle. If no screen is available, any flat, light-colored wall or surface may be used with fair results.

34. Projector Support

A solidly built table or other support with a minimum top surface of 18- by 24-inches is recommended for mounting the projector. For convenience, the table should be approximately 36 inches high when the operator is in a standing position.

CHAPTER 5

THEORY

35. General

(fig. 8)

Still Picture Projector AP-5 (1) iS a device for the projection of the image of an opaque object onto a projection screen. projection stage on an undercarriage assembly is used as a support for opaque objects and as a feeding mechanism for copy to be projected. The light is rellected from the surface of the object to be projected. Printed material, a page of a magazine or book, photographs, pictures in full color, charts, and diagrams, can be projected with this device. Relatively fiat physical objects such as small machine parts, cams, gears, coins, etc., can also be projected. The projector uses a l,000-watt projection lamp and has a projection opening of 10- by 10-inches. It is equipped with a 41 $\frac{1}{16}$ -inch diameter, 22-inch focal length objectile lens. A vacuum operated copy holding device and a conveyor belt-type loading mechanism permit uninterrupted projection. The projector also includes a built-in optical pointer by meanss of which details anywhere on the screen can be pointed out by a projected arrow.

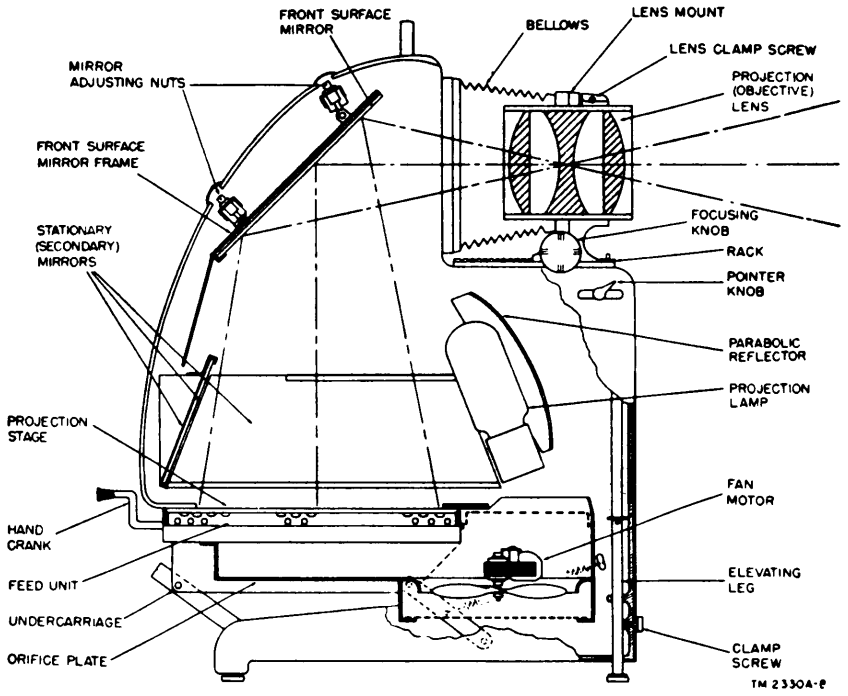


Figure 8. Still Picture Projector AP-5(1) functional Diagram

I l l

36. Opaque Object Projection System

(fig. 8)

The opaque object projection system consists of a projection lamp, a parabolic reflector, three secondary mirrors, a front surface mirror, and a projection lens. The opaque material to be projected is placed on the undercarriage assembly projected stage. The projection lamp and parabolic reflector are placed so that light is projected onto the copy. Three secondary mirror reflectors insure uniform illumination over the entire projection surface. The light reflected from the copy falls on the front surface mirror at an angle of approximately 45° The image reflected from the front surface mirror passes through the objective (projection) lens along a horizontal axis and falls onto the projection screen. The design of the optical system is such that the screen image is a true picture of the object, right side up and correctly positioned right to left.

37. Copy Feeding Unit

(figs. 10 and 11)

The copy feeding unit consists of an endless perforated neoprene conveyor belt supported on two rollers, one of which is crank operated. **The unit acts as a projection stage for the rapid presentation of** opaque material. The entire assembly is located on the undercarriage assembly behind the exhaust fan so that air, moving downward and out of the projector, tends to create a vacuum at the top of the copy feeding unit belt. Material placed on the belt is thus held down upon it and, as the crank is operated, the material is carried into the projector and on out as the cranking is continued. The copy feeding unit will handle material up to $\frac{3}{32}$ inch thick.

38. Optical Pointer System

(fig. 16)

The optical pointer system consists of a condenser lens, a projection lens, and a series of small mirrors. Stray light from the side of the projection lamp is picked up by the condenser lens. The light strikes a rear surface mirror which directs the light forward through an aperture plate which has the image of the arrow cut out on it. The light then strikes a front surface mirror which directs it upward through a projection lens, mounted in a lens tube, which rotates about a vertical axis. Light leaving the projection lens strikes a pointer mirror which is mounted so that it can pivot about a horizontal axis. The light leaving this pointer mirror is directed forward to fall onto the projection screen. The pointer is controlled by means of the control knob. Moving the control knob forward or backward rotates

the pointer mirror about a vertical axis and swings the image left or right. Rotating the control knob about its own shaft pivots the pointer mirror about a horizontal axis, thus moving the image up or down.

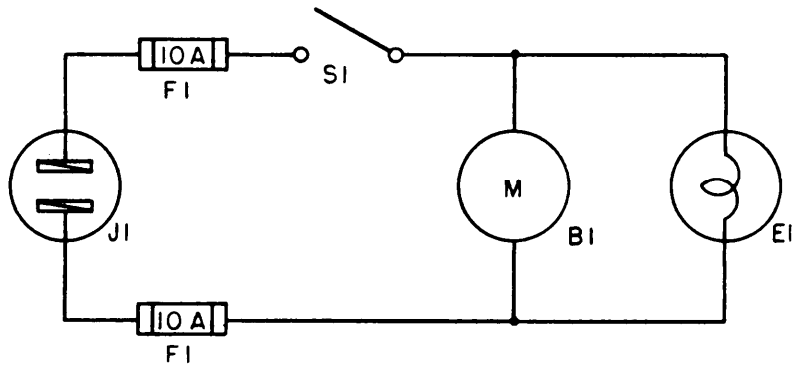
39. Ventilation

(figs. 10 and 12)

A ventilation system consisting of a motor, a fan, and a vacuum box, provides cooling for the projection lamp, the copy, and the housing. It also provides a vacuum for holding copy on the copy feeding unit. The motor and fan are mounted in the undercarriage assembly and located under the projection lamp.

40. Power Some (fig. 9)

The projector operates from 115-volt, 60 cycle ac power source. On the front of the projector are a two-way ON-OFF switch, two fuse holder mounted fuses, and a male receptacle connector for the power cable.



EI	PROJECTION LAMP
FI	FUSE, IO AMPS
BI	FAN MOTOR
JI	MALE RECEPTACLE
SI	ON-OFF SWITCH

TM 2330A-9

Figure 9. Schematic diagram.

CHAPTER 6

FIELD MAINTENANCE

Note. This chapter contains information for field maintenance. The amount of repair that can be performed by units having field maintenance responsibility is limited only by the tools and test equipment available and by the skill of the repairman.

Section I. TROUBLE SHOOTING

41. Tools, Test Equipment, and Material Required for Field Maintenance

The following tools and materials are required for field maintenance 01 Still Picture Projector AP-5 (1) .

Item	*Signal Corps Stock No.*
Brush, stiff bristle	6Z1415.8
Brush; camel's-hair	6Z1372
Cleaner, liquid, lens	8A319
Cloth, lint-free	6Z1989
Screw driver, ¼-inch	6R15626-1
Screw driver, Phillips, PL-469/U	6R15487
Tissue, lens	8A-2559
Wrench, Allen	6R57400-10
Wrench, PL-111, adjustable	6R55006

42. Preliminary Procedures

Before attempting repair of the equipment at the field maintenance level, carefully follow the procedures outlined in paragraphs 22 and 32. If the equipment still fails to perform satisfactorily, refer to the trouble-shooting chart (par. 43) to correct the difficulty.

43. Trouble-shooting Chart

Symptom	Probable trouble	Correction
Projection lamp will not light.	Defective lamp.	Replace lamp (par. 46b).
	Lamp leads not securely connected at socket or switch terminals.	Secure connections.
	Open or short circuit.	Locate and repair.
	Defective lamp socket.	Replace socket (par. 46h).
Blower motor will not operate.	Motor leads not securely connected at motor or switch terminals.	Locate and repair.
	Open or short circuit in wiring leads.	Locate and repair.
	Defective motor.	Replace motor (par. 45c).
Lamp will not light and blower motor will not operate.	Defective fuses.	Replace fuses (par. 46k).
	Defective power cable.	Repair or replace power cable.
	Switch leads not securely connected to projector receptacle connector.	Tighten leads.
	Open or short circuit in wiring leads.	Locate and repair.
	Defective receptacle connector.	Replace connector (par. 46i).
	Defective switch.	Replace switch (par. 46j).

43. Trouble-shooting Chart (contd)

Symptom	Probable trouble	Correction
Projection lamp and motor continue to operate after switch is turned to the OFF position.	Defective switch.	Replace switch (par. 46j).
Image cannot be focused sharply.	Optical system improperly aligned, or optical elements scratched or broken.	Realign optical system as necessary (par. 49). Replace broken or scratched elements (par. 44).
Image is not sufficiently bright.	Dirt or dust in optical system.	Clean optical system thoroughly (par. 22).
Blower motor causes excessive vibration.	Motor not satisfactorily mounted.	Tighten or repair motor mountings (par. 45c).
	Defective motor or fan.	Replace motor or fan, as necessary (par. 45c).

Section II.
DISASSEMBLY AND REASSEMBLY

44. Lens and Lens Mount Assembly
(fig. 5)

a. Projection Lens.

(1) To remove the projection lens (6) from the lens mount (4), loosen the clamping screw (5) in the lens mount. Then carefully remove the lens.

(2) To replace the lens, reverse the disassembly instructions given in subparagraph (1) above.

b. Lens Mount

(1) Follow the instructions in subparagraph *a* (1) above.

(2) To remove the lens mount (4) , first rcmove the stop screw (7) from the front of the rack (8) . Then rotate the focusing knob (1) , advancing the lens mount forward until the pinion is disengaged from the rack. Slide the lens mount off its guide. Then release the bellows (3) from the mounting channels (2) on the housing by sliding the rear end of the bellows up and out of the channels.

(3) To replace the lens mount reverse the disassembly instructions given in subparagraphs (1) and (2) .

c. *Bellows.*

(1) Follow the instructions in subparagraphs *b* (1) and (2) above.

(2) To remove the bellows (3) from the lens mount (4) , remove the four wood screws that hold the bellows to the lens mount.

(3) To replace the bellows reverse the disassembly instructions given in subparagraphs (1) and (2) above.

d. Focusing Knob.

(1) To remove the focusing knob (1) from the pinion shaft, loosen the two set screws in the collar of the knob and slide the knob off the shalt.

(2) To replace the knob, slide it back on the shaft and tighten the set screws securely.

45. Undercarriage Assembly
(figs. 10, 11, and 15)

a. Copy Feeding unit and Conveyor Belt.

(1) To remove the copy feeding unit from the undercarriage

assembly, first remove the two screws (fig. 10) that hold the unit to the undercarriage. Lift the copy feeding unit out of the undercarriage.

(2) To remove the conveyor belt (fig. 11) , first remove the two sheet metal screws and speed nuts that hold the end strip opposite the crank handle of the copy feeding unit. Remove the end strip and slide the conveyor belt off the unit.

(3) To replace the conveyor belt and copy feeding unit, reverse the disassembly instructions given in subparagraphs (1) and (2) above.

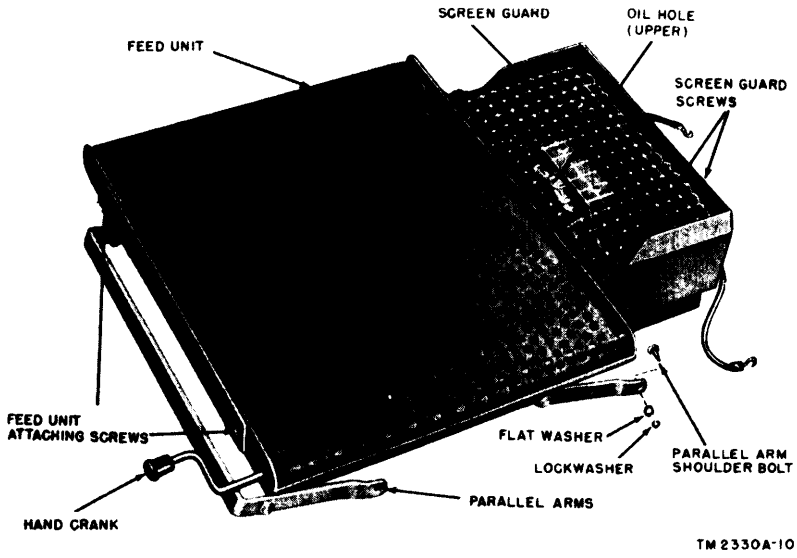


Figure 10. *Undercarriage assembly.*

b. Undercarriage.

(1) Turn the projector on its front and remove the two parallel arm springs (fig. 15) which hold the undercarriage up in position for projection. Disconnect the wires from the receptacle and the ON-OFF switch.

(2) Remove the four parallel arm shoulder bolts (fig. 10), flat washers, and lock washers that hold the parallel arms to the housing. Lift the undercarriage out of the unit.

(3) To replace the undercarriage reverse the disassembly instructions given in subparagraphs (1) and (2) above.

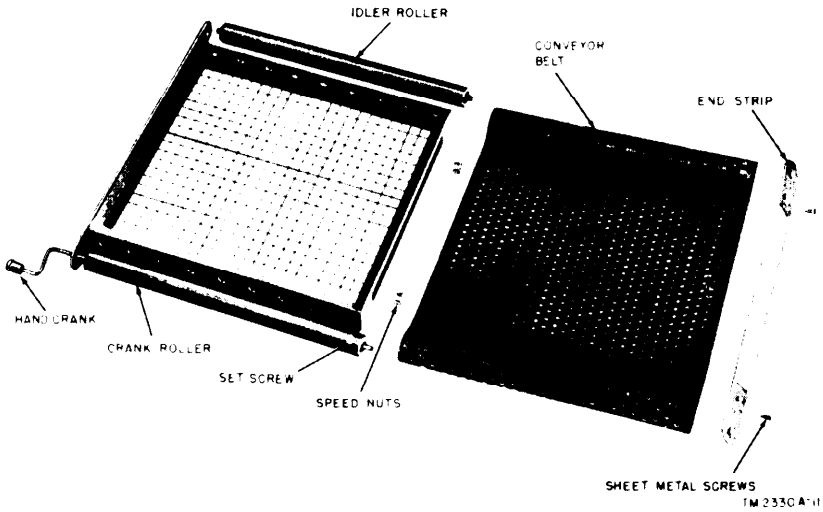


Figure 11. *Copy holding unit, disassembled.*

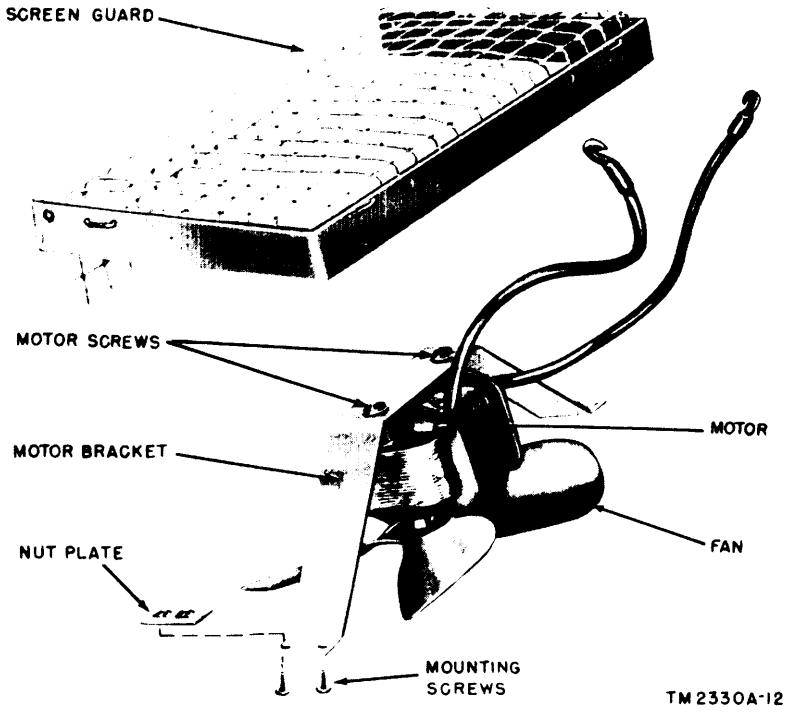


Figure 12. *Motor, fan and screen.*

c. *Fan and Motor Assembly (figs.* 10 and 12).

(1) Follow the instructions in subparagraphs *b* (1) and (2) above.

(2) To remove the fan and motor assembly from the undercarriage, first remove the four screws (fig. 10) that hold the upper screen guard. Then lift the screen guard out.

(3) Remove the four mounting screws and two speed nut plates that hold the motor bracket (fig. 12) to the orifice plate, and lift the motor and fan assembly out; be careful to feed the lead wires through the two holes in the vacuum box. Remove the two screws that hold the motor bracket to the motor, and lift the motor bracket off.

(4) To remove the fan from the motor shaft, loosen the set screw and slide the fan off.

(5) To replace the fan and motor assembly, reverse the disassembly instructions given in subparagraphs (1) through (4) above.

46. Projector Housing

a. Rack Assembly (figs. 5 and 13) .

(1) Follow the instructions irr paragraph 44 *b* (1) and (2).

(2) To remove the rack assembly remove the seven rack screws (fig. 13) , lock washers and nuts that hold the assembly to the shelf on the housing. Then lift the rack assembly off.

(3) To replace the rack assembly, reverse the disassembly instructions given in subparagraphs (1) and (2) above.

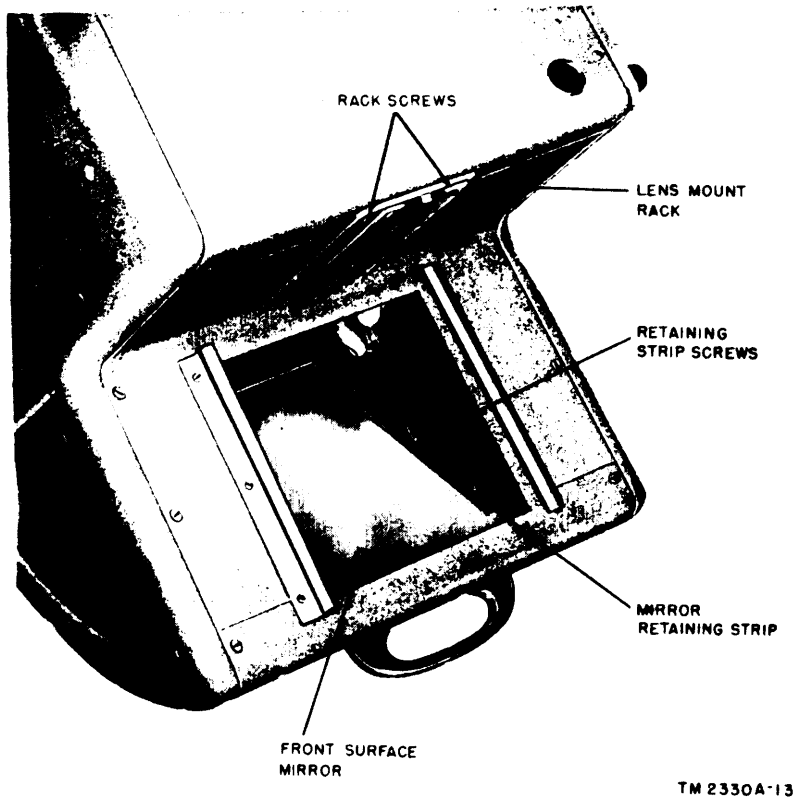


Figure 13. *Lens mount removed, showing front surface mirror removal.*

b. Projection Lamp (fig. 4).

(1) To remove the projection lamp from the projector housing, first open the side access door of the projector by loosening the two knurled captive screws. Then open the shield by loosen the one knurled captive screw that holds it in place.

(2) Push downward on the lamp and carefully rotate the lamp 90° counterclockwise. Lilt it out of the socket and remove it from the projector housing.

(3) To replace the projection lamp, reverse the disassembly instructions given in subparagraphs (1) and (2) above.

c. Parabolic Reflector (fig. 14) .

(1) Follow the instructions in subparagraph *b* (1) and (2) above.

(2) To remove the parabolic reflector, remove the five screws (fig. 5) that hold the front panel to the housing. Remove the one screw (fig. 13) and nut that hold the rack to this panel,

and loosen the other six screws (fig. 13) that hold the rack assembly. Remove the panel.

(3) Remove the two screws that hold the reflector retaining straps to the frame (fig. 14) , and spring lhese straps back. Carefully lift the reflector out of the frame.

(4) To replace the reflector, reverse the disassembly instructions given in subparagraphs (1) through (3) above.

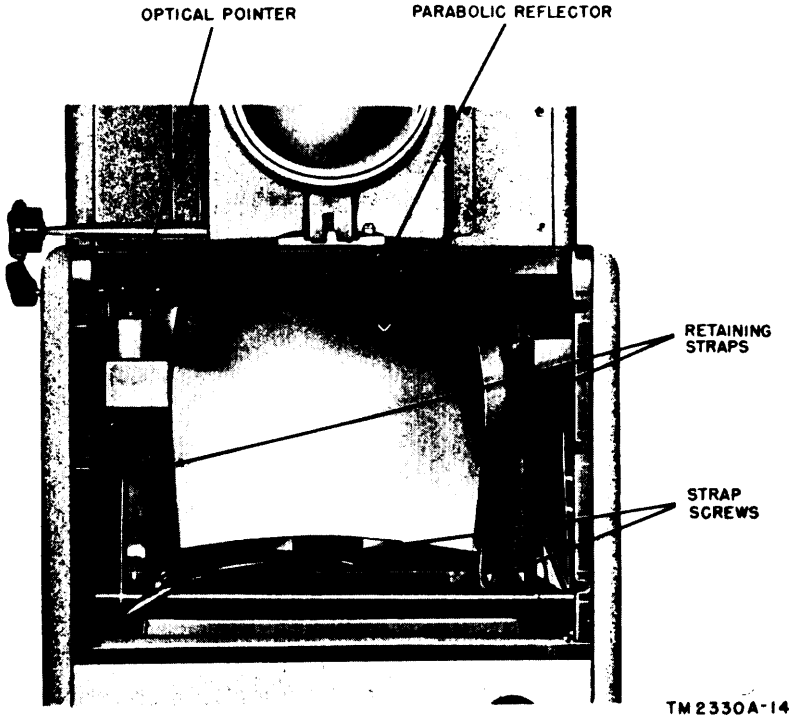


Figure 14. *Front panel removed.*

d. Side Access Door (figs. 4 and 5).

(1) To remove the door, first loosen the two knurled captive screws that hold the door closed, and swing it open. Then remove the four screws (fig. 5) and speed nuts that hold the door and hinges to the projector housing.

(2) To replace the side access door, reverse the disassembly instructions given in subparagraph (1) above.

e. *Secondary Mirrors (figs.* 4 and 15) .

(I) To remove the three secondary mirrors (fig. 15), first open the

side access door by loosening the two knurled captive screws that hold the door closed, and swing it open. Loosen the knurled screw on the light shield and- swing the shield open,

(2) Remove the mirror retaining strips (fig. 4) by removing the two screws that hold each bracket to the second mirror frame assembly. Carefully lift the three secondary mirrors out of the frame assembly and remove from the projector.

(3) To replace the secondary mirrors, reverse the disassembly instructions given in subparagraphs (1) and (2) above.

f. Shield (fig. 4).

(1) Follow the instructions in subparagraph *e* (1) and (2) above for the left-hand mirror only.

(2) To remove the shield, first remove the two screws (fig. 1) and speed nuts that hold the shield hinges to the secondary mirror frame assembly. Lift the shield off.

(3) 'I-o replace the shield, reverse the disassembly instructions given in subparagraphs (1) and (2) above.

g. Front Surface Mirror and Mirror, Frame Assembly (figs. 13 and 15)

(1) Follow the instructions in paragraph in paragraph 44 *b* (1) and (2).

(2) To remove the front surface mirror, turn the projector on its back (fig. 15) . Then loosen the three screws which secure the front surface mirror retaining strip (fig. 13) . Slide the strip back away from the mirror and carefully lift the mirror out of the projector.

Caution: Extreme care should be used when handling the front surface mirror. Do not touch the front reflecting surface with the hands, allows tools or coarse cloth to come into contact with it. This surface is very delicate and easily scratched or married.

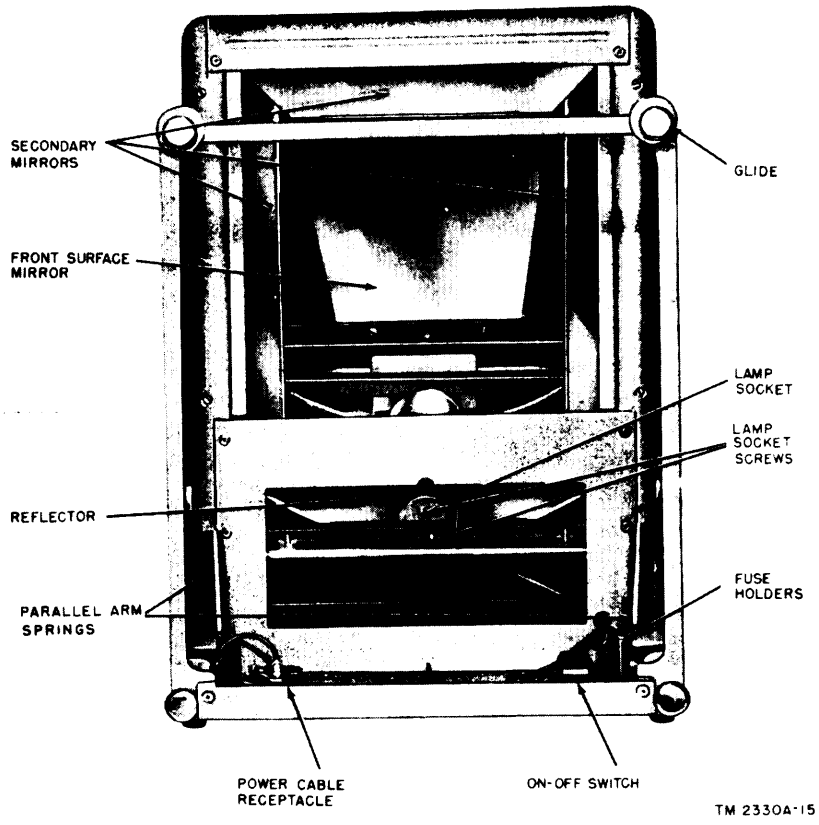


Figure 15. Projector housing, undercarriage removed, bottom view.

(3) To remove the mirror frame assembly, first remove the three mirror adjusing buttons mounted in the back of the housing (fig. 1). Then turn the three from surface mirror adjusting nuts couterclockwise until they disengage the mirror adjusting screws mounted on the mirror frame. Carefully lift tthe mirror frame assembly out of the projector housing.

(4) To replace (he front surface mirror and mirror frame assembly, reverse the disassembly instructions given in Subparagraphs (1) through (3) above.

h. Lamp Socket (fig. 15).

(1) Follow the instuctions in paragraph 45 *b* (1) and (2).

(2) To remove the lamp socket, remove the two screws (fig. 15) that hold the socket to the reflector assembly frame. Remove the fiber insulator from the bottom of the socket. Loosen the two terminal screws that hold the wires to the socket, release the wires, and lift the socket out of the housing.

(3) To replace the lamp socket, reverse the disassembly instructions given in subparagraphs (1) and (2) above.

i. Male Receptacle (figs. 5 and 15).

(1) To remove the male receptacle from the front panel of the housing, remove the two screws (24, fig. 5) and nuts that hold the receptacle to the panel and lift the receptacle out as far as the wires will permit. Loosen the screws that hold the wire terminals to the receptacle. Remove the receptacle.

(2) To replace the male receptacle, reverse the disassembly instructions given in subparagraph (1) above.

j. ON-OFF Switch (figs. 5 and 15).

(1) To remove the ON-OFF switch from the front panel of the housing, remove the two screws (13, fig. 5) that hold the switch to the panel. The terminal screws will then be accessible through the front hand-hole. Loosen the terminal screws and release the wires. Remove the switch.

(2) To replace the ON-OFF switch, reverse the disassembly instructions given in subparagraph (1) above.

k. Fuses and Fuse Holders (figs. 5 and 15).

(1) To remove the fuses. turn the fuse cap (14, fig. 5) counterclockwise; the fuse will come out when the cap is released.

(2) To remove the fuse holders, first unsolder the two wires, then unscrew the hexagonal nut behind the panel; withdraw the fuse holders from the panel.

(3) To replace the fuses and fuse holders, reverse the disassembly instructions in subparagraphs (1) and (2) above.

l. Elevating Legs (figs. 5 and 15) .

(1) To remove an elevating leg (11, fig, 5) and leg tension spring, first loosen the clamping screw (10, fig. 5) on the front of the panel which clamps the leg in position. Adjust the leg so that it protrudes from the housing to about half the distance of its travel. Tighten the clamping screw.

(2) Use a small hammer and drift pin and carefully tap the split pin that holds the leg in the housing until the pin is forced out of the hole in the leg. Loosen the clamping screw and slide the leg out of the housing.

(3) Pry the leg tension spring out of the U-shaped hole in the housing, and remove it from the housing.

(4) To replace the elevating leg and spring, reverse the disassembly instructions given in subparagraphs (1) through (3) above.

m. Glide (fig. 15) . To remove a rear glide, unscrew the nut located inside the channel cross brace on the housing base, and pull the glide from the base. To replace the glide, slide the threaded glide shaft

through the hole at the end of the projector base and the channel, and replace the nut on the shaft from inside the channel.

n. Optical Pointer Assembly (figs. 4, 14, and 16) .

(1) To remove the pointer assembly (fig. 16) from the projector housing, first loosen the set screw on the pointer control knob (fig. 14) and rcmove the knob. Open the side access door and the hinged light shield.

(2) Remove the two screws (fig. 4) located on the side of the projector and the nut plate from inside. A rectangular spacer plate (fig. 16) is located between the assembly bracket and the housing. Remove the pointer assembly and the plate (fig. 16) .

(3) Remove the screw (fig. 16) that holds the retaining spring to the lens tube and remove the control shaft, spring, and front surface mirror. The front surface mirror can be removed by straightening the top retaining ear.

(4) Remove the lens from the lens tube by pushing upward from the bottom. The lens retaining ring will slide upward with the lens.

(5) Remove the arrow aperture plate by removing the screw that holds the plate to the bracket.

(6) To replace the optical pointer parts and assembly, reverse the disassembly instructions in subparagraphs (1) through (5) above. When the pointer control knob is replaced, tighten the set screw to the flat land on the Control knob shaft.

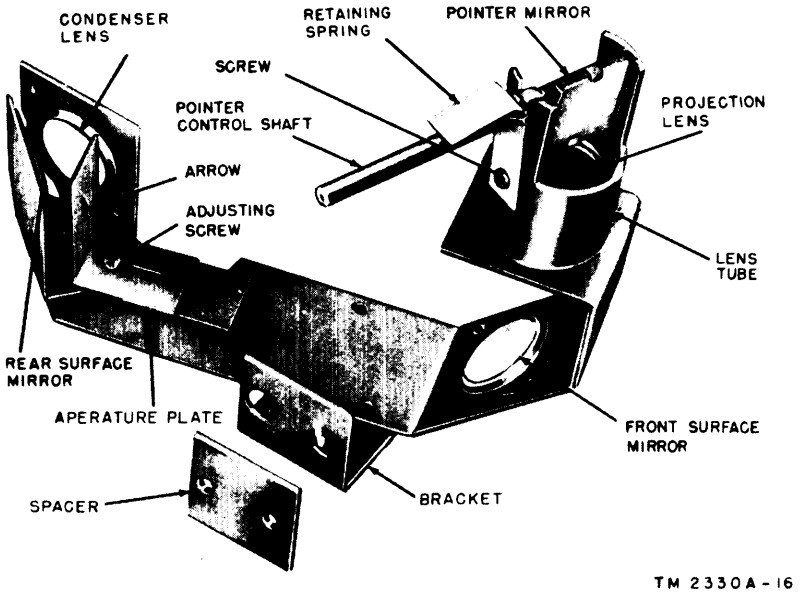


Figure 16. *Optical pointer assembly and spacer.*

Section III. ADJUSTMENTS AND ALIGNMENT

Caution: *Be* careful when adjusting and aligning the projector. The interior is *hot* when the projection lamp is turned on. Wear gloves or use a thick cloth to cover the the hands when handling components inside the unit.

47. General

Operate the projector. If a good, clear image appears on the screen, the projector is satisfactorily adjusted and alignment should not be disturbed. If the projected image is not satisfactory. adjust the projector in accordance with paragraphs 48 and 49.

48. Minor Adjustments

a. Keystone Effect. Refer to paragraph 13 *b*.

b. Lopsided Screen Image. The screen image will be lopsided when the projector faces the screen at an angle instead of straight on. Move the projector until it faces thescreen squarely. if the image is still lop-sided, adjust the front surface mirror in accordance with paragraph 49 *a*.

49. Optical Alignment

a. Front Surface Mirror. Correct adjustment of the front surface mirror is necessary for the proper performance of any opaque projector. "I-he front surface mirror forms a part of the optical system. If it is not properly adjusted, it will be impossible to obtain good resolution all over the field, and the screen image will not be square but will exhibit keystone effect. When the mirror is in proper adjustment, a horizontal line on the surface of the mirror will be parallel with the front of the projector. "I-he line of intersection of the mirror, with a vertical plane through the center line of the projector, will form equal angles with the axis of the lens and the perpendicular to the copy opening. If the first condition is not met, it means that one side of the mirror is further away from the front of the projector than the othcr side, and one vertical edge of the screen image will be longer than the other. If the second condition is not met, then the two hori-zontal edges of the screen image will not be of the same length. In either case, when one portion of the screen is brought to a sharp focus, other- portions will not be in focus. To adjust the front surface mirror, it is necessary to turn the mounting screws and keep refocusing the projection lens until the proper adjustment is obtained, judging by the squareness of the screen image and the over-all sharpness of focus. Set up the projector and insert copy, such as a printed page of a magazine. Turn on the switch and focus the copy as sharply as possible.

(1) If the copy can be focused sharply over the entire screen area, the mirror- is properly adjusted. Do not attempt to readjust it.

(2) If the copy can be focused sharply across a horizonal area, but at the same time is not sharp from top to bottom, then the lateral adjustment is satis factory and only vertical adjustment is necessary. Proceed as follows:

(a) Remove the three plug buttons which cover the slotted mirror adjusting nuts (figs. 1 and 8) . The plug buttons are readily removable by prying them off with a screw driver.

(b) Focus the bottom portion of the screen sharply.

(c) Turn the bottom adjusting nut clockwise and observe the screen. The portion of the screen not in focus will either get better or worse. If it gets better, continue the adjustment, continually refocusing the lens, until the screen is sharp all over. If the nut reaches the end of its travel before the screen image is completely corrected, begin turning the top nuts countcrclockwise (½ turn at a time), working first one and then the other until the correct adjustment is reached.

Caution: If any of the nuts arc turned counterclockwise too far, the mounting screws will become completely disengaged, and the mirror frame will no longer be supported. From the completely tightened position, the nut can be backed off (turned counterclockwise) 3/8 inch safely. This represents 12 complete turns. In this position, the screw is engaged in the nut approximately 3/8 inch.

(d) Replace the plug buttons.

(3) If the screen image is out of adjustment laterally as well as vertically (that is, if a narrow . horizontal strip across the entire screen cannot be brought to sharp focus all at once) , the first step is to restore the lateral adjustment as follows:

(a) Focus the bottom portion of the screen so that the lower right-hand corner is sharp.

(b) Turn the upper right nut clockwise and observe the lower left corner of the screen. If the sharpness is not improved (but actually gets worse) , stop turning the right-hand nut and begin turning the left-hand nut clockwise until the strip is sharp all across. If the end of its travel is reached before the entire strip is sharp, begin turning the right-hand nut counterclockwise until the entire strip is sharp.

(c) The mirror is now in correct lateral adjustment. Proceed to make the vertical adjustment as described in subparagraph (2) above.

b. Pointer (fig. 16) . The pointer system is designed to project an illuminated arrow which will be visible on the screen during projection

of opaque material. The arrow can be moved to any position on the screen. Improper alignment of the optical path of the pointer system may result in the operator not being able to project the arrow to all parts of the screen. Incorrect focus of the aperture plate will result in a fuzzy, indistinct image.

(1) Set the projector up (par. 10) about 15 feet from the projection screen, so that it faces the screen squarely.

(2) Turn the ON-OFF switch to the ON position. Insert copy and focus the image on the screen.

(3) Position the pointer control knob until the arrow appears on the screen. Swing the knob so that the arrow moves to all portions of the projected picture area.

(a) If the arrow can be moved to all portions of the projection area, optical alignment of the pointer system is correct. Do not attempt to readjust it.

(b) If the arrow can be seen over only a portion of the picture area, optical alignment is necessary. Open the side access door by loosening the two knurled captive screws. Loosen the screw that holds the rear mirror and aperture plate bracket in adjustment, and swing the bracket (fig. 16) from one side to the other until the light strikes the front surface mirror as centrally as possible. Tighten the screw when the correct adjustment is obtained.

Note. When adjusting the optical alignment of the pointer system, do not change the adjustment of the aperture plate. Conversely, when adjusting the focus of the arrow, do not change the adjustment of the rear surface mirror.

(c) Close the side access door and tighten the two knurled captive screws.

(4) Examine the projected arrow on the screen.

(a) If it is in sharp focus, do not attempt to refocus it.

(b) If the arrow is fuzzy or indistinct, focusing of the aperture plate is necessary. Open the side access door by loosening the two knurled captive screws. Loosen the screw that holds the rear surface mirror and aperture plate in adjustment and move the aperture plate forward or backward until the arrow is focused sharply on the screen. Tighten the screw when the correct adjustment it obtained.

(c) **Close the side access door and tighten the two knurled** captive screws.

SECTION IV. FINAL TESTING

50. Test Conditions

a. Conduct tests in a darkened room at normal room temperature.

b. Use 115 volts, 60-cycle ac line voltage.

c. Project all screen images on a suitable, white, matte screen.

d. Use a 1,000-wvatt, T-20 projection lamp when making the tests.

e. Place the projector on a table or stand that will insure minimum vibration.

51. Mechanical and Optical Requirements

a. Focusing knob. When turned, the focusing knob should move the lens mount assembly smoothly and continuously through its range.

b. Pointer Control Knob. When moved, the pointer control knob, should position the lens mounting tube and the pointer mirror smoothly and continuously through its range. The knob should remain in whatever position it is set.

c. Undcrcarriage Assembly. The undercarriage assembly should raise or lower the copy feeding unit as required. In the raised position, the undercarriage assembly should remain against the underside of the housing. In the lowered position, the undercarriage assembly should remain in place, tilted slightly to the rear of the projector.

d. Copy *Feeding Unit.* When the crank is operated, the belt should rotate smoothly. Single sheets of copy placed on the unit for projection should be advanced into the aperture area. The vacuum from the fan should keep the copy flat on the projection stage. When further advanced, the copy feeding unit should pass the copy out of the aperture area.

e. Fan and Motor Assembly. The fan and motor assembly must be securely mounted to insure minimum vibration when in operation.

52. Electrical Requirements

When the power switch is turned to the ON position, the lamp should light and the fan motor operate. Connect the projector only to an ac power source.

53. Operational Tests

a. Focusing Test. With the power switch turned to the ON position, place a sharply defined piece of opaque copy on the projection stage, and focus the image sharply. There should be no blur anywhere within the image area. A blur indicates defective components or misalignment of the optical system. There should be no longitudinal or lateral chromatic aberration when the screen image is viewed from a distance equal to twice the width of the screen.

b. Optical Pointer. The arrow should be movable to any portion of the projected picture area by operating the pointer control knob. It also should be in sharp focus.

CHAPTER 7

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

54. Disassembly for Storage or Shipment

When the equipment is to be stored or reshipped, proceed as follows:

a. Place the dust cap on the objective lens and remove the lens from the lens mount.

b. Remove the projection lamp from the socket, pushing down gently on the lamp and griving it at 90° turn counterclockwise. Lift the lamp out of the socket and close the shield and slide access doors Tighten the captive screws.

c. Remove the power cord from the receptacle and form it into a coil approximately 7 inches in diameter

55. Repackaging for Storage or Shipment

a. Place the projector and its components (fig. 2) in the carrying case as follows:

(1) Open the four carrying case latches, and lift the case top off the base

(2) Place the coiled power cable in the pocket provided insided the case top

(3) Place the projection lamp in one of the three lamp cartons. Place the three cartoned lamps in the compartment provided in the base. Secure it with the strap.

(4) Place the projectionlens in the compartment provided in the base. Secure them with the strap.

(5) Rack the lens mount back, and place the projector on the base shock mount. Hook the two clamps over the projector housing base, and secure them by tighten ing the wing nuts. Hook the retaining springs on the wing nuts

(6) Put the upper section ofvthe case inplace on the base, and close the four latches.

b. Repackage the equipment (fig. 3); use the original packaging material as follows:

(1) Place the bottom pad in the waterproof filterboard box. Then insert the unit, the corner fillers and the top pad. Close the flaps and seal them with waterproof tape.

(2) Place the waterproof fiberboard box inside the corrugated carton, close the flaps, and seal with gummed tape.

Section II

DEMOLITION TO PREVENT ENEMY USE

56. Destruction of Components

The demolition procedures outlined in paragraph 57 will be used to prevent the enemy from using or salvaging the equipment. Demolition of the equipment will be accomplished only upon order of the commander.

57. Methods of Destruction

a. Small. Smash the carrying case, housing, lens, reflector, mirrors, and projection lamps; use sledges, axes, handaxes, pickaxes or other heavy tools.

b. Cut. Cut the power cable and all inside wiring; use axes, handaxes, or machetes.

c. Bend. Bend all metal parts.

d. Burn. Burn case, technical manuals; use gasoline, kerosene, oil, flame throwers, or incendiary ‘grenades.

e. Disposal. Bury or scatter the destroyed parts in slit trenches, fox holes, or other holes, or throw them into streams.

f. Destroy. Destroy everything.

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[AG 413.53 (7 Dec 54)]

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Chief of Staff.

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