FM 11-41

DEPARTMENT OF THE ARMY FIELD MANUAL

FILM AND EQUIPMENT EXCHANGE OPERATIONS

HEADQUARTERS, DEPARTMENT OF THE ARMY

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FILM AND EQUIPMENT EXCHANGE OPERATIONS

*** This manual supersedes so much of AR 108-30, 4 February 1955, including C 1, 9 September 1955, C 2, 4 February 1957, C 3, 3 March 1958, and C 4, 9 June 1958, as pertains to Film and Equipment Exchange Operations. (Administration, policy, and procedures will be published in revised AR 108-30.)**

CHAPTER 1

INTRODUCTION

1. General

a. Purpose. This manual provides information and guidance for all concerned with the operation, organization and administration of film and equipment exchanges.

b. Scope. This manual discusses the mission, organization, responsibilities and operations of film and equipment exchanges. The material presented herein applies to exchanges within the continental limits of the United States, and to exchanges in oversea commands and theaters of operations.

c. References. A list of references applicable to the operation of film and equipment exchanges is included as appendix I to this manual.

2. Mission

a. The mission of the U.S. Army Film and Equipment Exchange System is to provide direct support for the training of all elements of the Army. The film and equipment exchange system is directly alined with the training mission of the Army. The provision of film and equipment exchange support is integrated with doctrine, training plans, equipment introduction, and research and development.

b. To successfully accomplish their missions, film and equipment exchange personnel must be familiar with all phases of military training requirements. They must also be qualified to evaluate new ideas and developments in the educational and industrial fields for military applications to assure the timely introduction of new techniques and equipment into the audio-visual portion of Army training.

c. Each film and equipment exchange in the Army is a segment or part of the film and equipment exchange system, requiring specialized personnel and following special administrative and logistical channels in the distribution of films, transparencies, and other audio-visual aids. The specific missions of film and equipment exchanges can be defined in the following general categories:

(1) To advise and assist training personnel at all echelons in the utilization of motion pictures, transparencies, and related audio-visual aids.

(2) To maintain adequate stocks of motion picture prints and other pictorial materials to meet the training requirements of the parent installation and civilian component units within its area of responsibility.

(3) To maintain ready for issue, to units of the active Army, Reserve, and ROTC, the latest types of standard items of projection and other audio-visual equipment authorized by TA 11–12.

(4) To maintain facilities for training and licensing U.S. Army Projectionists and as appropriate, courses for Projectionist Instructors, and Transparency Preparation.

3. Responsibilities

a. The Chief Signal Officer is responsible for—

(1) Planning, directing and exercising technical supervision over all aspects of film and equipment exchange services at class I and class II Army installations in the continental United States and in oversea departments and commands.

(2) Authorizing the establishment, reclassification, or discontinuance of Army film and equipment exchanges.

(3) Exercising technical supervision over the distribution, storage, loan, exhibition, and maintenance of audio-visual projection equipment, film, and allied pictorial aids

b. Commanders of ZI armies, oversea commands, and the Commanding General, Military District of Washington are responsible for—

(1) Recommending establishment, reclassification, or discontinuance of film and equipment exchanges in compliance with AR 340–16.

(2) Storing, loaning, and maintaining audio-visual projection equipment, film, and allied pictorial aids.

(3) Training projectionists, projectionist instructors, and personnel required to prepare transparencies.

c. The Army signal officer is responsible for the technical operation of all film and equipment exchanges within the Army area. The Army signal officer is assisted in fulfilling this responsibility by a pictorial officer and a director of film and equipment exchange services.

d. Director of Army film and equipment exchange services, under the direction of the Army pictorial officer, is responsible for—

(1) Technical control of all exchanges in the command.

(2) Disseminating information to all exchanges in the command pertaining to audio-visual projection equipment, film, and allied pictorial aids.

(3) Conducting inspections of all exchanges in the command as prescribed by AR 108–30.

e. The post signal officer is responsible for the operation of the post film and equipment exchange. He is assisted in fulfilling this responsibility by a film and equipment exchange director who is responsible for the efficient operation of the exchange.

f. The film and equipment exchange director/film service supervisor is responsible for the—

(1) Efficient operation of the exchange.
(2) Training of individuals of the exchange in the performance of their duties and cross-training them to perform other duties.
(3) Requisitioning, receiving, and storing audio-visual projection equipment, film, and allied pictorial aids.
(4) Loaning of films, film strips, projection, and allied equipment to troop units, organizations, and individuals on an hourly, daily, or extended loan basis.
(5) Supervision of personnel engaged in training of projectionists of all using units and issuing official U.S. Army Projectionist Licenses.
(6) Supervision of personnel engaged in performance of organizational maintenance on exchange equipment and films.
(7) Advising training and other responsible personnel of available films, film strips, projection, and allied audio-visual equipment and their use.
(8) Producing transparencies.
(9) Maintaining necessary records and inventories required for the efficient operation of the exchange.

4. Organization

a. ZI Army Area of Oversea Command. The headquarters of each ZI army and oversea command has a central film and equipment exchange. These central exchanges supervise the activities of film and equipment exchanges within their areas of responsibility. They pass on information pertaining to film distribution and utilization to the other authorized class B, C, D or EX film and equipment exchanges within their areas. The central exchange may reallocate film and equipment from one exchange to another to fill specific requirements. When the situation warrants, regional film and equipment exchanges are established to assume some of the work load of a central film and equipment exchange. Regional exchanges are geographically located to serve military requirements in a several states area. Reserve and ROTC requirements represent a major factor to be considered when establishing regional exchanges. Regional exchanges also serve as post film and equipment exchanges. Post film and equipment exchanges are established, as required, to support the Army training mission.

b. Directors. The film and equipment exchange directors are assigned to Army headquarters and major installations to provide highly qualified audio-visual specialists to insure maximum and effective utilization of motion pictures, film strips, transparencies, and related audio-visual aids and equipments. A director, film and equipment exchange services (AR-ROTC) is assigned to the staff of each CONUS army signal officer to stimulate the improvement of military instructional practices in Army Reserve and ROTC programs. The film and equipment exchange director (AR-ROTC) is responsible for—

(1) Frequent staff visits to reserve training centers and ROTC units to provide direct technical audio-visual assistance to key advisory and reserve instructor personnel and to conduct evening group orientations based on observed local procedures.

(2) Technical supervision, including periodic inspection, of all phases of the army area film and equipment exchange reserve support program.

c. Personnel. Personnel who have had experience in commercial, industrial, or educational film exchanges are often desirable for training for assignments in Army film and equipment exchanges. Such personnel often have the specialized skills required for booking, issuing, inspection, and storage duties.

d. Types of Exchanges. Film and equipment exchanges are organized and designated by alphabetical classification according to the population and geographical areas to be served. Special assignments and unusual support functions must also be considered in determining the type of exchange to be established. Within the ZI army areas the following exchange designations are employed:

(1) *Class A.* The central film and equipment exchange for the Army area.

(2) *Class B.* A post film and equipment exchange to support the requirements for on-post training of the active Army, as well as loan to Reserve, ROTC, NG and authorized civilians within the immediate vicinity of the post. As the requirements for equipment and personnel are increased, increases in the size of the exchange are controlled by multiple designations. For example: Class B exchanges may be designated as class 2B, 3B, 4B, 5B, etc. Only Class B exchanges are assigned multiple designations. Class B exchanges are located at all service schools and major training installations.

(3) *Class C.* An exchange having less equipment authorized than is required by a class B exchange and which provides most of its support by mail or for off-post utilization.

(4) *Class D.* An exchange serving a small training installation or isolated activity, where only a small number of equipments and limited categories of films are required.

(5) *Class EX.* An exchange serving depots, arsenals, and similar installations where little or no training of military personnel is conducted but support is required for film and projectors for safety training, civilian personnel, and instruction programs.

5. Equipment

a. Projection and allied audio-visual equipment for all film and equipment exchanges are authorized by TA 11–12 or TOE 11–500. Equipment is allocated to CONUS and oversea command film and equipment exchanges on the basis of their classification and the equipment they are authorized by TA 11–12 or TOE 11–500. The Chief Signal Officer may authorize additional equipment to meet special operational requirements over and above the A to EX columnar allowances within the ZI, when justified under column F, TA 11–12. Upon the recommendation of the army or oversea commander, the Chief Signal Officer may authorize multiple letter classifications of class B exchanges to augment equipment allowances to meet increased requirements.

b. Some of the more commonly used audio-visual equipments authorized by TA 11–12 are shown in figures 1 through 10.

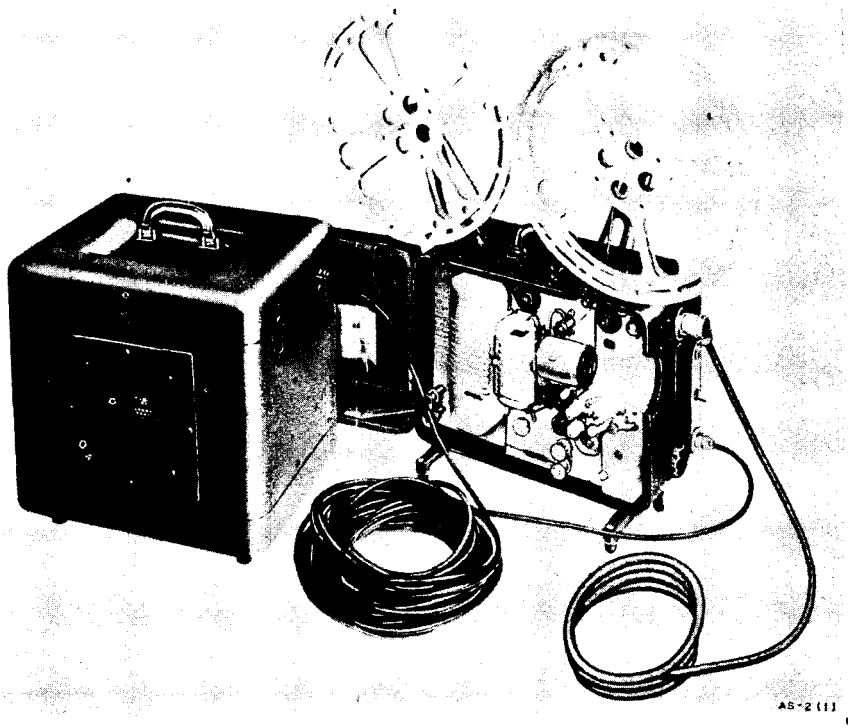


Figure 1. Projector Set, Motion Picture Sound AS–2(1).

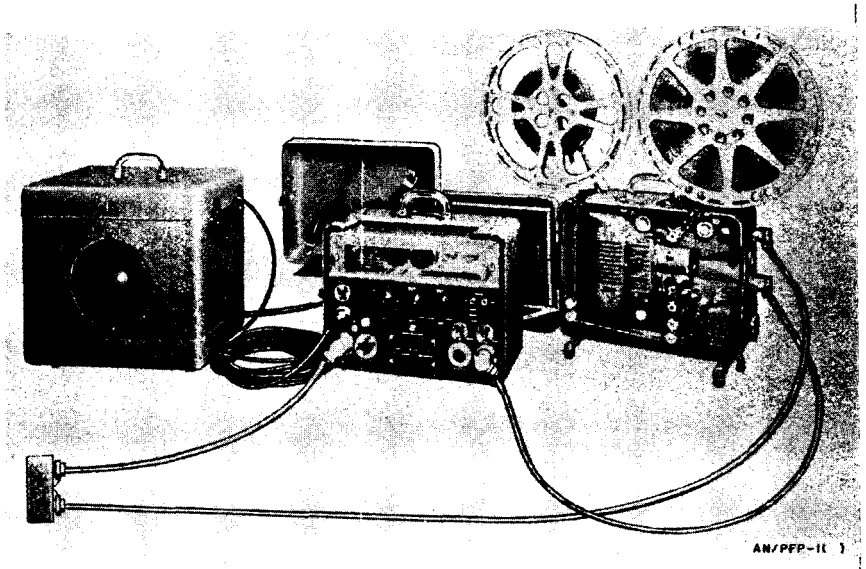


Figure 2. Projector Set, AN/PFP–1( ).

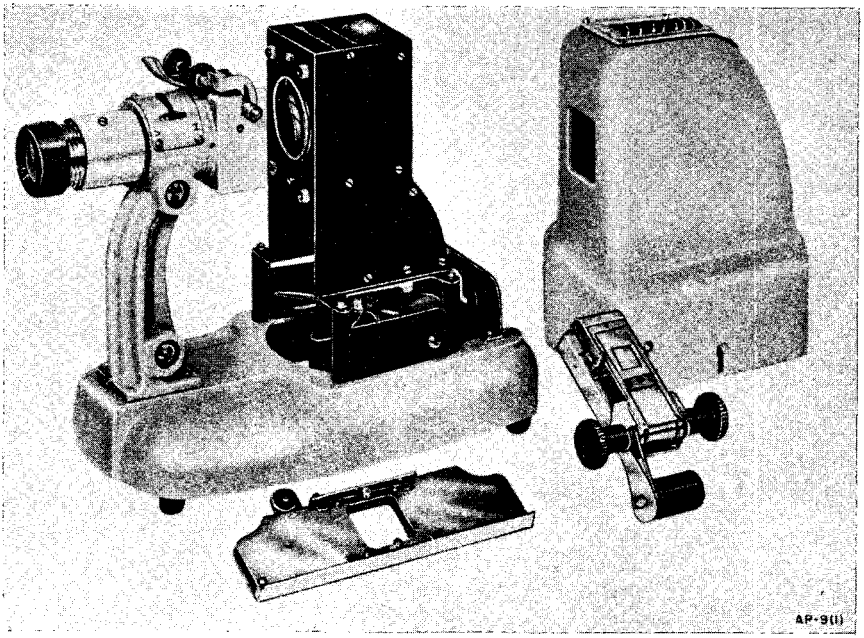


Figure 3. Projector, Still Picture AP–9(1).

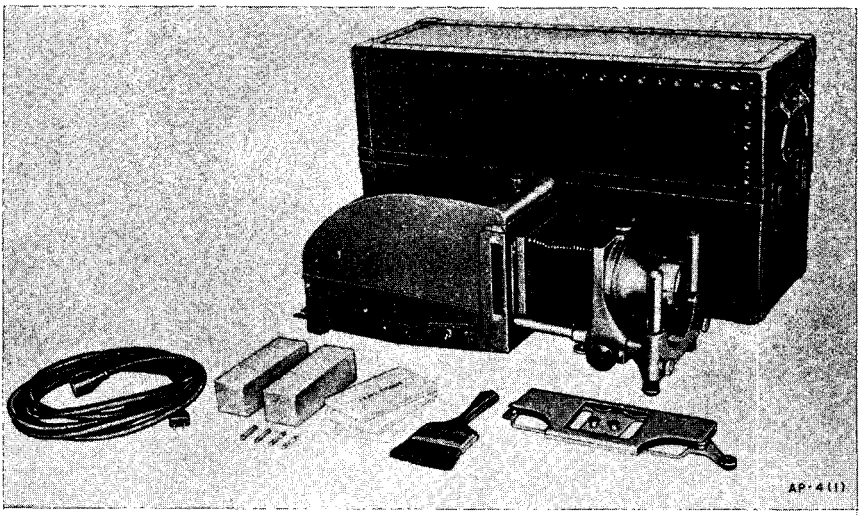


Figure 4. Projector, Still Picture AP–4(1).

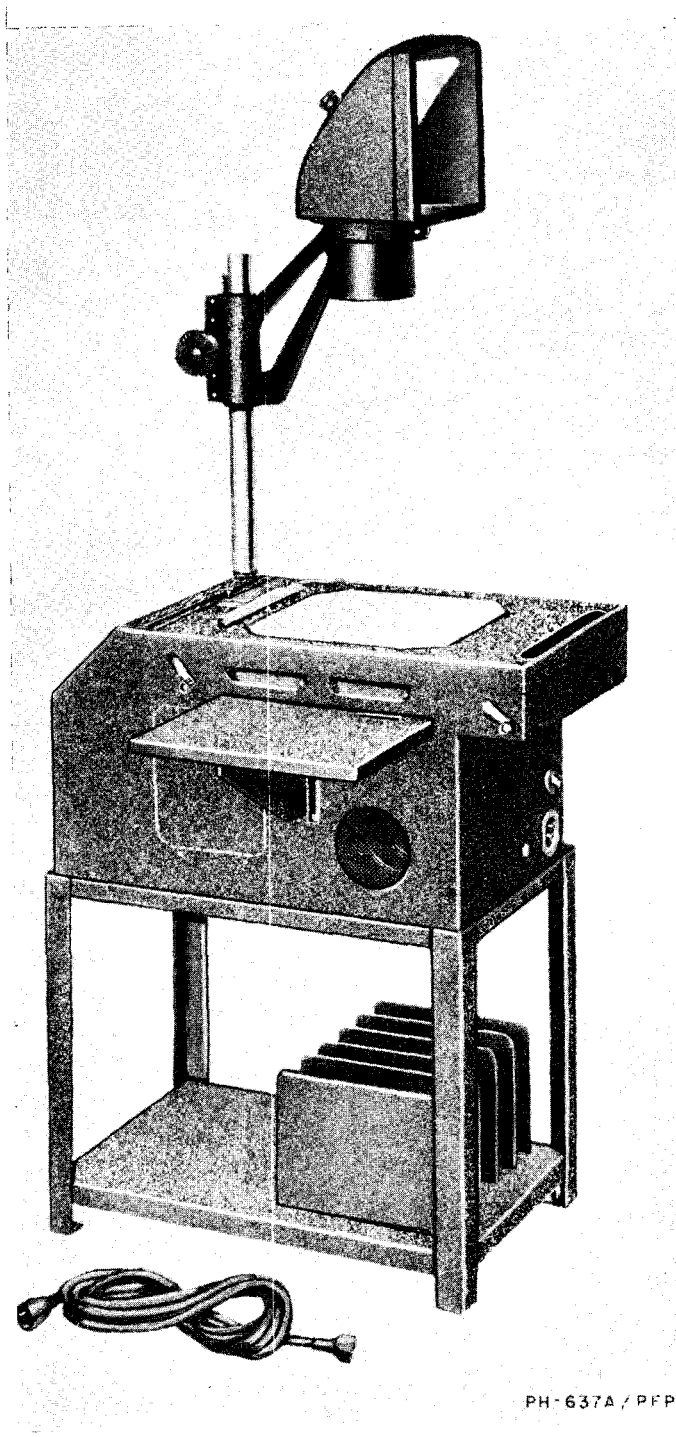


Figure 5. Projector, PH–637( )/PFP.

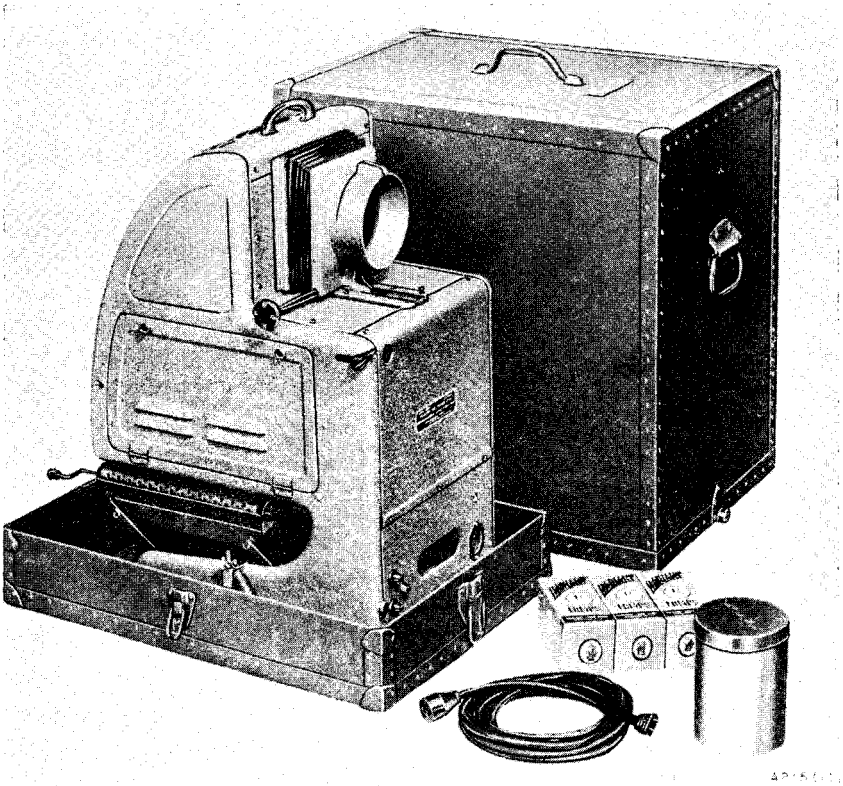


Figure 6. Projector, Still Picture AP–5(1).

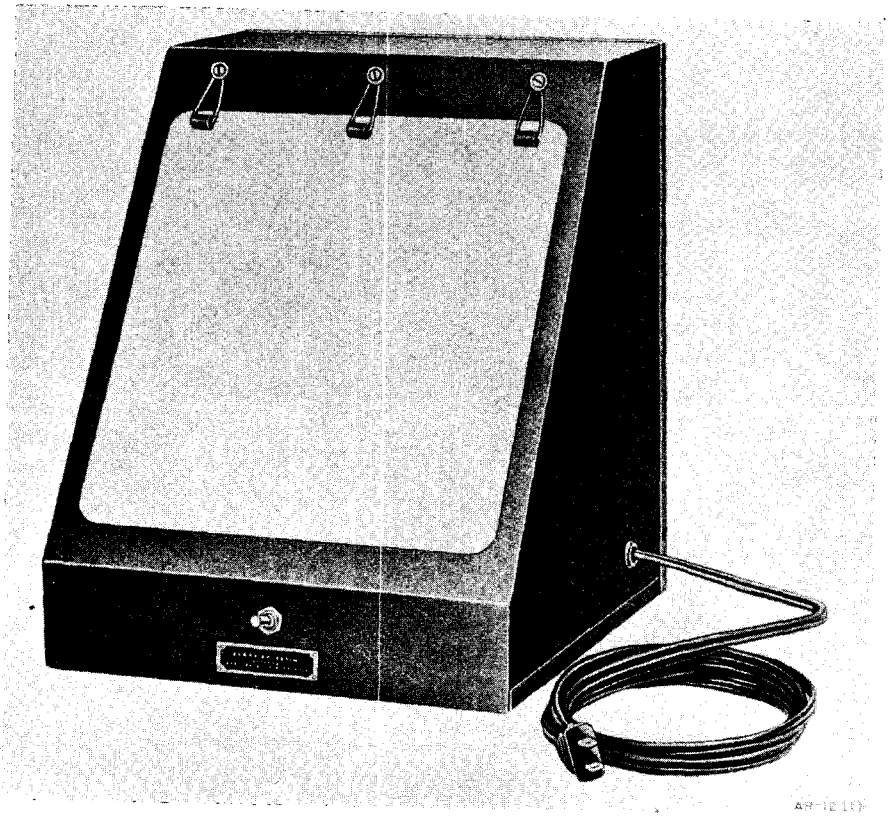


Figure 7. Viewer, Still Picture AR–12(1).

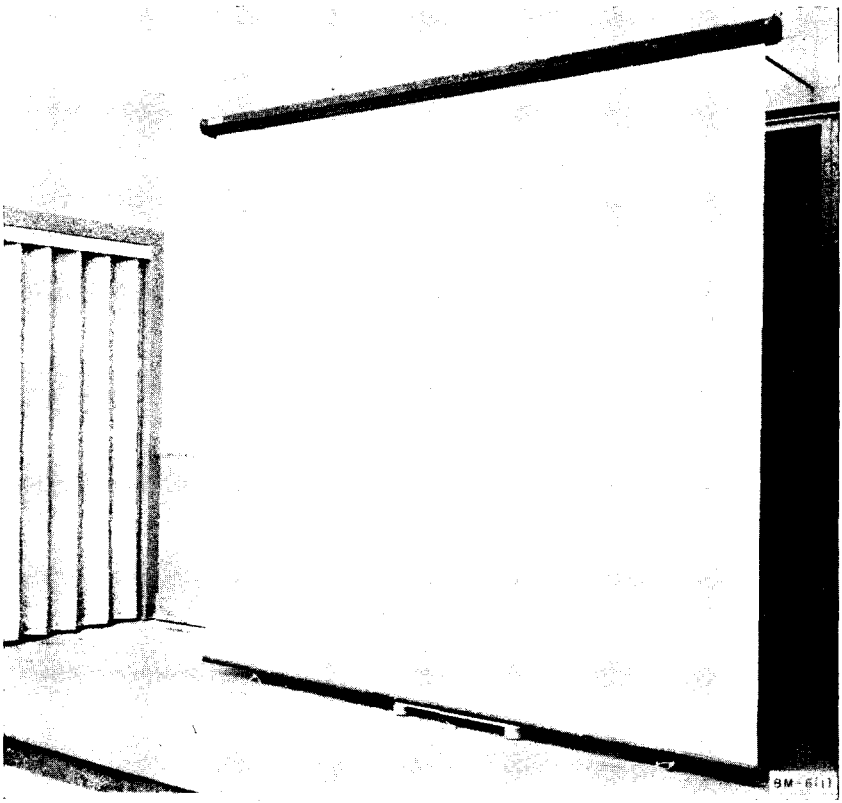


Figure 8. Screen, Projection BM–6(1).

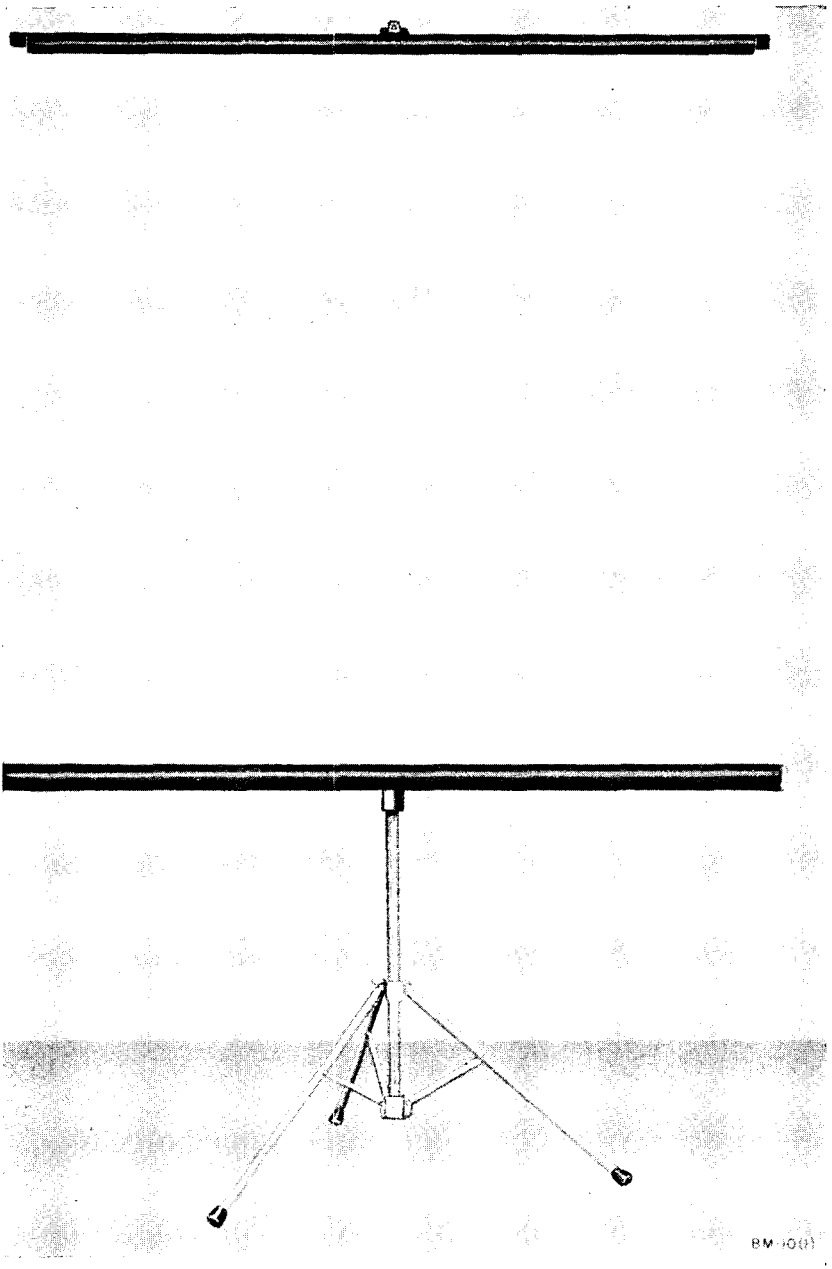


Figure 9. Screen, Projection BM–10(1).

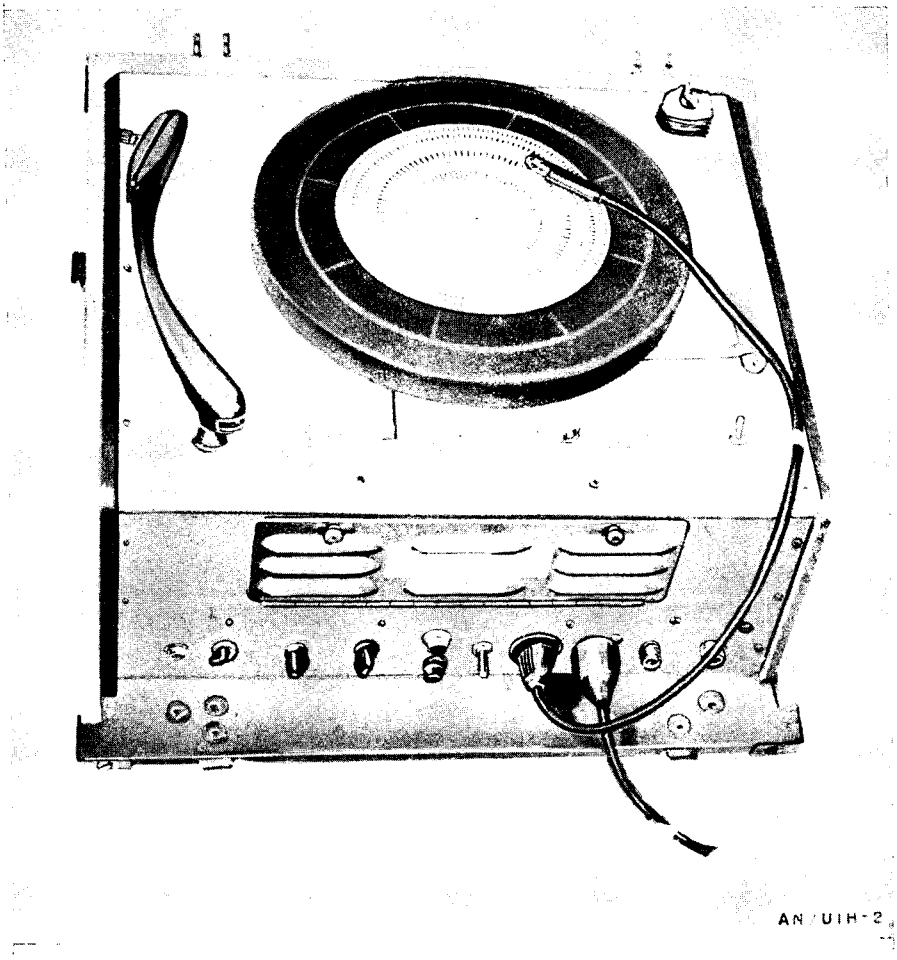


Figure 10. Public Address Set AN/UIH–2( ).

6. Auxiliary Film and Equipment Exchanges

a. Army signal officers may establish auxiliary exchanges. Such exchanges are established where training functions require a stock of films, projection, and related audio-visual equipment on a continuing basis. The establishment of the auxiliary exchange makes equipment readily available with a minimum of loss of time in drawing and returning material from and to the post film and equipment exchange. Major training installations and service schools may operate auxiliary exchanges. Auxiliary exchanges are extensions of the official post film and equipment exchange which supports it and are governed by the same directives and regulations. The post signal officer responsible for the operation of the

local post film and equipment exchange is authorized to establish auxiliary exchanges as necessary to support training requirements.

b. Except in most unusual circumstances the establishment of auxiliary exchanges are restricted to areas within the confines of the post where the local post film and equipment exchange is located. When circumstances warrant the establishment of an auxiliary exchange off post, the exchange must be under the same command as its supporting post film and equipment exchange.

7. Personnel Requirements

a. Personnel requirements for individual exchanges are computed on the basis of DA Pam 20–561. Local guides designed to authorize adequate personnel to permit efficient operations are also useful in determining personnel requirements. Special requirements such as may be imposed by major service schools or training facilities may necessitate an increase above normal personnel authorizations. Above normal requirements for Reserve and ROTC training units may require more booking or shipping personnel in some areas than in others to process booking requests and loans received or shipped by mail. The following types of personnel are considered to be essential to the operation of central exchanges and class B exchanges which support major service schools and training activities:

(1) Director/Film Service Supervisor.
(2) Assistant Director/Film Library Assistant.
(3) Secretary/Film Library Assistant.
(4) Administrative and clerical personnel, as required for maintenance of correspondence and records/Film Library Specialist.
(5) Chief Booker/Film Library Specialist.
(6) Assistant Bookers (as appropriate)/Film Library Specialist.
(7) Projectionist Instructor/Film Library Specialist.
(8) Transparency Preparation Instructor (at central exchanges and major service schools)/Film Library Specialist.
(9) Equipment Maintenance Supervisor/Film Library Specialist.
(10) Equipment Maintenance Technician/Film Library Specialist.
(11) Shipping and Receiving Supervisor/Film Library Specialist.
(12) Shipping and Receiving Clerks (as appropriate)/Film Library Specialist.

(13) Film Inspection Supervisor/Film Library Specialist.
(14) Film Inspectors (as required)/Film Library Specialist.

b. The functions of all exchanges in the Army's film distribution and utilization system are basically the same. In the smaller exchanges the duties of several of the above personnel may be combined and performed by one individual. The actual allocation of personnel must be based upon the size of the exchange and the scope of its activities.

c. Preview Personnel. When the volume of previews shown in a film and equipment exchange requires one or more individuals to devote full time to such screenings, preview projectionists should be made available to the exchange. When full time preview projectionists are not required such duties may be performed by graduates of the projectionist school of the previous week. By selecting the five highest graduates in the previous week's class to serve as preview projectionist one day each, students are given added incentive. The use of such students decreases the requirements for full time personnel assigned to the film and equipment exchange.

8. Major Duties of Film and Equipment Exchange Personnel

a. Director/Film Service Supervisor.

(1) Directors are assigned to film and equipment exchanges to provide coordination between film and related audio-visual production and their classroom use. Their major duties include—

(*a*) Supervising the operation of the film and equipment exchange.

(*b*) Providing advice and assistance in the preparation and use of motion pictures, film strips, transparencies, and related audio-visual aids and equipments.

(*c*) Supervising the training of personnel in the care and use of films and related audio-visual aids and equipments.

(*d*) Assisting Army training officials at all echelons in selecting, designing, and employing films, transparencies, and related audio-visual aids and equipments.

(*e*) Obtaining films and other related audio-visual aids to support changes to training programs or newly established programs.

(*f*) Assisting in the improvement of existing classroom facilities and the implementation of new presentation procedures or techniques.

(2) The ideal director is a combination audio-visual educational specialist and sales executive. He should have some experience in the employment of audio-visual devices and instructional aids, a knowledge of motion picture distribution procedures, and, if possible, some experience in the production field. He should have the conviction in the value of audio-visual instructional aids that a sales executive has in his products.

(3) The director must not become so involved in the day-to-day administrative details of the film and equipment exchange that he does not have time to fulfill his more important responsibilities such as—

(*a*) Maintaining continuous contact with the training officials of supported units or activities.

(*b*) Reviewing individual training programs and recommending the employment of audio-visual aids where appropriate.

(*c*) Assisting graphic arts personnel in determining requirements for and in the preparation of DA approved transparencies and charts.

(*d*) Screening all motion pictures and related audio-visual aids received by the film and equipment exchange. Screening of audio-visual aids is essential in the preparation of comprehensive recommendations as to their value and usage in support of training programs.

b. Administrative Assistant/Film Library Specialist.

(1) Supervises the actual operations of the film and equipment exchange.

(2) Implements policies and procedures as approved by the director.

(3) Performs such administrative functions as required by the director.

c. Secretary/Film Library Specialist. Responsible for the preparation of correspondence for the director, routing incoming and outgoing correspondence, and other appropriate administrative duties.

d. Administrative and Clerical Personnel/Film Library Specialist.

(1) Maintains records and inventories.

(2) Prepares reports.

(3) Processes routine correspondence, loan requests, management forms and reports.

(4) Performs other administrative and clerical functions as required to support the operations of the film and equipment exchange.

e. Chief Booker/Film Library Specialist. The importance of the chief booker, and the entire booking section or department, must not be underestimated. Here is where the success or failure of the efficient operation of a film and equipment exchange often hinges. The chief booker, and his assistants, must be familiar with the films and other materials in stock or available within the area or from the Army Pictorial Center. His duties include—

(1) Recommending substitute films, transparencies, or other materials, when the requested material is not available.
(2) Ordering additional prints of subjects receiving wide utilization to assure availability of required prints.
(3) Disposing of materials not used or out-of-date.
(4) Anticipating training requirements for audio-visual aids and making them readily available to supporting units and facilities.

f. Assistant Booker(s)/Film Library Specialist. The number of assistant bookers may vary from one to six depending upon the size and responsibility of the film and equipment exchange to which assigned. Their duties, as the name implies, is to assist the chief booker in the performance of the functions of the booking section or department.

g. Projectionist Instructor/Film Library Specialist. The value of the projectionist instructor is demonstrated by the fact that since World War II the film damaged in the Army has gradually diminished to the point where it is negligible. The major contributing factor to this elimination of damage is attributed to the fact that projectionists classes have been graduating proficient projectionists capable of operating the projection equipment in the proper manner. The duties of the projectionist instructor are to conduct—

(1) Projectionist training courses. (This course is outlined in appendix II.)
(2) Projectionists instructor courses. (This course is outlined in appendix II.)
(3) Transparency preparation classes. (Where transparency preparation instructors are not provided or authorized. This course is outlined in appendix III.)

h. Equipment Maintenance Man/Film Library Specialist. Using units may be penalized by equipment failure and the resulting loss of use of audio-visual aids. Proper maintenance of equipment is the best assurance that a successful classroom showing will result. It is the duty of the equipment maintenance chief and his assistants to inspect and repair those equipments allied with audio-visual aids.

i. Shipping and Receiving Clerk/Film Library Specialist. The number of shipping and receiving clerks required is determined by the size of the film and equipment exchange and the scope of its operations. The duties of shipping and receiving clerks are—

(1) Preparation of films for over-the-counter issue or shipment.
(2) Checking loan orders and films to assure requested films, or appropriate substitutes are issued.
(3) Checking material received from user to assure all items issued have been returned.
(4) Preparation and maintenance of records pertaining to the use of pictorial material.
(5) Assisting in the preparations of inventory reports, film review information and related data.

j. Chief Film Inspector/Film Library Specialist. The chief film inspector is responsible for supervising the film inspection section or department. His duties include—

(1) Maintaining a rigid film inspection and cleaning program.
(2) Assuring films are properly inspected and repaired.
(3) Assuring the standards for the evacuation of damaged and unserviceable prints from active use are maintained.

k. Assistant Film Inspector/Film Library Specialist. The assistant film inspector assists the chief film inspector in inspecting films and related materials as they are received from using units and activities and in maintaining records required by the film inspection section or department.

CHAPTER 2

LAYOUT OF FILM AND EQUIPMENT EXCHANGE

9. General

In selecting the location for the film and equipment exchange, its proximity to the training units of the installation should be considered as a major factor. The basic mission of the film and equipment exchange system is to provide direct support for the Army's training missions. The more conveniently it is located, with respect to the location of training personnel, the more effectively it may execute its mission. A general layout for a film and equipment exchange is shown in figure 11.

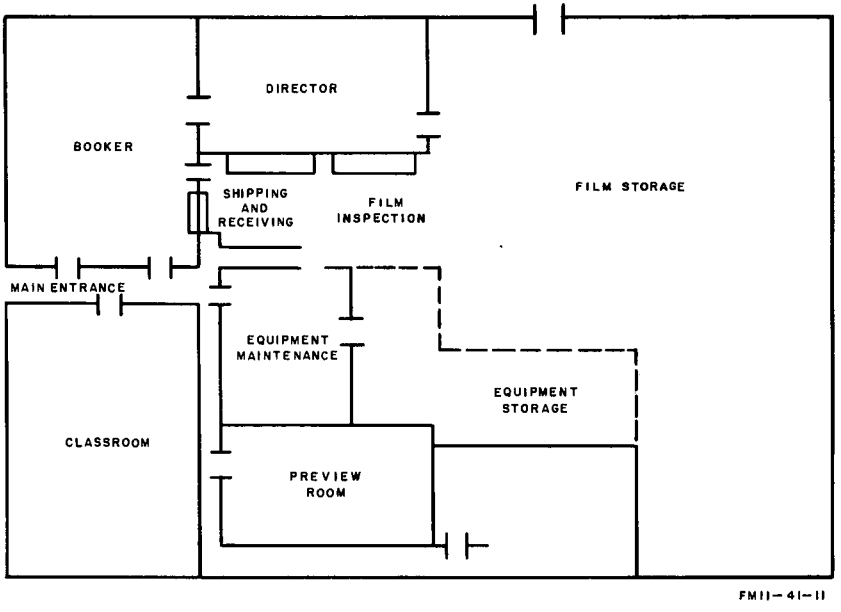


Figure 11. Type layout for a film and equipment exchange.

10. Space Requirements

Adequate space must be made available to house the different sections or departments of the film and equipment exchange. A sufficient number of screening rooms should be provided to permit training officials to screen motion pictures, film strips, transparencies, and related materials to determine their application to specific training programs. The area devoted to projectionist training classes should be so located that students will not interrupt or be interrupted by other film and equipment exchange operations. The

administrative offices, booking, shipping, inspection and storage, and equipment maintenance sections or departments must have adequate space to permit efficient operations. The following is considered as the minimum floor space, in square feet, required for the average exchange of the type indicated:

Class A (Central)	5500
Class B	3500
For each multiple add	2400
Class C	2000
Class D and EX	In proportion to mission and class C space requirements

11. Administrative Office

The administrative office should be large enough to accommodate the director, his assistant, and the secretarial and clerical staff of the administrative office. The director must have a private office which should be adjacent to a conference room to permit the director to conduct conferences with post training officials and other personnel.

12. Booking Department

The booking department should be near the main entrance to the building to be readily accessible to all representatives of the supported units. In addition, space and facilities such as tables and chairs must be provided for unit training personnel to compile information pertaining to films and related audio-visual aids which they may desire to use in future training programs. Space and facilities must be provided for—

a. Booking ledgers.
b. Quick reference files.
c. Sets of Instructors Film References.

13. Shipping and Receiving Department

The shipping and receiving department should have a convenient entrance to the building to facilitate the pick up and return of films in an efficient manner. Space allocations for the shipping and receiving department must provide for—

a. "Ready racks" for pictorial material to be picked up or shipped during the next 24-hour period.

b. Storage racks for all types of projection equipment to be issued or shipped during a 24-hour period. (Should the director determine that projectors and allied equipment can be more efficiently issued and received by the equipment maintenance department, because of personnel allocations, this space will be required by that department.)

c. Scales, shipping materials, and related equipment. The larger the volume of mail requests filled, the greater will be the space requirements.

14. Film Inspection and Storage Department

The film inspection and storage department should be located adjacent to the shipping and receiving department to permit returned films and related material to be transferred for inspection and storage with a minimum amount of lost motion. Space allocations for this department should provide for—

a. Film inspection machines.
b. Film viewers.
c. Film repair equipment.
d. Film cleaning equipment.
e. Storage racks and facilities for films and related equipments.

15. Equipment Maintenance Department

This department should be located close to the shipping and receiving department to facilitate the inspection and repair of equipments returned from using units. In addition to a sound proof area for testing audio equipments, space must be provided for—

a. Work benches.
b. Storage bins for equipments and repair parts.
c. Tools and test equipment.

16. Projectionist Training Facilities

The desirable arrangement for projectionist training facilities is—

a. An office for the projectionist instructor to be used in planning courses and completing administrative details connected therewith.

b. An assembly classroom equipped with blackboards, projection facilities, screens and other equipment essential to classroom instruction.

c. A room with stalls equipped with projectors and miniature screens. Where classes are conducted on a "buddy" basis one stall is required per two students. Normally six stalls will be adequate for most installations. Installations which conduct classes with more than 12 students per class will require a greater number of stalls.

d. Where transparency preparation courses are conducted space will also be required for the equipment required for preparing art work and for transparency processing and reproduction equipment and materials.

17. Projection Rooms

A minimum of one projection room must be available at all film and equipment exchanges. Additional screening facilities must be provided in the larger exchanges. The number of screening rooms will vary with the type activity being supported. Film and equipment exchanges at major service schools and training installations should have one large room and several small rooms. Screening rooms can be used most effectively by presenting scheduled screenings at one time to all training officials who may be interested in a particular subject. Where such one time scheduled screenings may be conducted, fewer small screening rooms will be required.

18. Reserve Stock Storage

Central film and equipment exchanges and other exchanges which maintain reserve stocks of films must be provided with adequate facilities for storing these prints.

CHAPTER 3
OPERATIONS

19. General

So far as is practicable all film and equipment exchanges should operate in the same manner. Such standardization of procedures will assure the efficient operation of the entire film and equipment exchange system which is comprised of many individual exchanges. When any exchange detects methods or techniques of improving their operation, the Army Pictorial Division, Office of the Chief Signal Officer, should be advised so it can pass on the pertinent information to other exchanges in the system.

20. Film Distribution—General

The distribution of films and related pictorial materials in the Army is made in the following categories:

a. Initial Distribution. When new films are produced at the Army Pictorial Center, or procured from other sources, they are assigned a release number and distributed throughout the film and equipment exchange system in accordance with their initial distribution requirements. Initial distribution requirements for each film are based upon troop strengths, training requirements and the specific recommendations of Headquarters, USCONARC and the heads of the technical services. Thus, the initial distribution of film does not follow a fixed formula. Instead, the content and utilization plans of each film and troop requirements determines its distribution. The directors of Army and command film and equipment exchanges are responsible for reallocating prints received on initial distribution as required to meet the demands of troop movements and training requirements within their areas or commands.

b. Reorder Distribution. When a film and equipment exchange requires additional prints of a film received on initial distribution or a film not previously stocked, it is necessary to initiate a reorder request. This request is submitted to the supporting central exchange which will fill the request by reallocation of prints within its area, or by requesting the desired prints from the Army Pictorial Center.

c. Circuit Distribution. Circuit distribution is employed where the number of prints of a given film are limited or are not readily available. Circuit booking is the distribution of a film print to exchanges in-turn according to a prearranged schedule established by the central film and equipment exchange. To be successful, all exchanges which are to receive a print on a circuit booking must

be provided the dates the print will be available to their exchanges several weeks in advance of its arrival. When notified that a print is to be made available on a circuit booking, the director of the film and equipment exchange must notify appropriate training and other officials to permit them to view the film in accordance with its prearranged schedule. Films which are circulated on circuit distribution must be shipped by the exchange to the next scheduled exchange on the scheduled shipping date. Failure to do so will result in the complete breakdown of the circuit. Because of the additional administrative problem involved in closely adhering to a prearranged schedule the circuiting of films should be avoided whenever possible and used only in those special situations when it is the only means of meeting the circulation requirements for the film.

21. Action by Exchange Upon Receipt of Films

a. Upon receipt of initial distribution of films and film strips by exchanges, the prints are recorded in a ledger listing the film number, title and date of receipt. Shipping receipts are signed and returned to the source.

b. The following records are prepared for each print:

(1) DA Form 11–41 (Film Booking Card).

(2) DA Form 11–77 (Film Print Inventory and Utilization Record).

c. The titles of new films and film strips, with a brief synopsis of each, are announced to all units served by the exchange in a film news letter. (See par. 33*d.*) Classified films are handled in accordance with AR 380–5.

22. Determining Print Requirements

To determine film requirements, directors of exchanges must maintain close coordination with training officials and be kept informed of the training applications which are available. Factors to be considered when estimating print requirements for reorder distribution are—

a. Number and type of troops served by the exchange.

b. Status of troop training.

c. Film requirements to support using unit's training programs.

d. Anticipated arrival of new units and their film requirements.

e. Departure of units and their film requirements.

f. Subject matter and planned usage of films to be requested on reorder distribution.

23. Availability of Films and Other Pictorial Material

A complete list of all DA films, film strips, phono-recordings, and related pictorial aids is contained in DA Pam 108–1. A listing of DA transparencies, both flat and operable, is contained in DA Pam 310–5. Cumulative supplements are issued periodically as new films and related pictorial aids become available. These publications are issued to troop units through AG publication supply channels. Film and equipment exchanges should maintain sufficient copies of these publications on hand for short term loan to units which have not received their copies through regular channels.

24. Restrictions on Film Showings

a. When films are distributed initially, they are accompanied by an initial distribution letter which contains the title of the film, its release number, running time, the type of film (black and white or color), a brief synopsis of the film if it is unclassified, clearances, its planned utilization, and any restrictions that should be imposed on its use. Directors are responsible for assuring films are used according to utilization instructions contained in initial distribution letter and that films are not used by nonauthorized persons or groups.

b. Monthly film information bulletins provide additional information and guidance to directors and other exchange personnel regarding any new restrictions or releases which pertain to pictorial material previously distributed. Both the ID letter and the monthly information bulletin contain information and instructions regarding films that are cleared for loan to the public for nonprofit exhibition, for TV or theatrical use and those films which are available for purchase from the holder of the Government Services Administration (GSA) contract for the sale of government films. The Army Pictorial Division, OCSigO, will keep the directors of the exchanges informed as to who is the holder of the current GSA contract for the sale of these films.

c. Only those films which have been cleared by ID letter or monthly information bulletin may be loaned to non-Army requestors. Certain films which are not cleared for showing to the general public are authorized for use by professionally interested groups such as law enforcement and medical organizations. Such films are clearly defined in the ID letter or monthly information bulletin.

25. Procedure for Booking Films

Users may book films, film strips, transparencies, phono-recordings, and related equipment in the following ways:

a. In Person. A training officer or his representative books the film directly with the booker at the film and equipment exchange. He may receive a written confirmation of the booking if required. Normally when arrangements for the booking are made in person such confirmation is not necessary.

b. In Writing. A using unit on the post may send its request through the distribution center. The exchange will confirm the booking by telephone or by sending a written confirmation to the unit. Units located off-post may forward their booking requests by mail and receive a written confirmation by return mail.

c. By Telephone. Both on-post and off-post units may book films by telephone. When bookings are made by telephone, the booker will give oral confirmation but will not furnish written confirmation except in special cases.

d. DA Form 11–44 (Films and Film Strips Loan Order). All written requests from active Army and civilian component units will be on DA Form 11–44.

e. Civilian Requests. Civilian organizations may request Army films, which are cleared for public nonprofit showing, to fill valid requirements either in person, by mail or by telephone. DA Form 11–44's are not required from civilian requestors and requests on post cards or letters will be honored.

f. Advanced Bookings. Film and equipment exchanges do not require any specified advanced booking time. However, training officials and other responsible representatives of using units should notify the film and equipment exchange as far in advance as possible to assure films will be available when required. When requests are received for films which are not readily available, and the requests are submitted in sufficient time, the film and equipment exchange may obtain the desired print from another exchange in the area or from the Army Pictorial Center. Although no mandatory advanced booking time is required, using units must cooperate with film and equipment exchanges and submit their booking requests as far in advance as possible. On occasion, films may be made available on a moments notice, but bookings should be made well in advance of the showing date. Such advanced bookings are necessary to assure the film will be available when and where required.

26. Procedures for Booking and Issuing Films and Other Pictorial Material

Using units submit DA Form 11–44 to the film and equipment exchange. Three copies of the request should be submitted to the exchange if a written confirmation of the booking is desired. Otherwise, only two copies are required by the exchange.

a. The Booker—

(1) Consults the film booking card file to determine whether the film is stocked by the exchange and if it will be available on the requested date.

(2) Enters the confirmation or nonavailability data on DA Form 11–44. If the film will be available on the date requested, the print number is recorded in the appropriate block on the form. The showing period is entered on the film booking card and the date and the bookers initials are entered in the block titled "Confirmation Mailed" and the form is returned to the unit.

(3) If the film will not be available on the requested date, the nonavailability is entered on DA Form 11–44 with suggested alternate dates when the film will be available or substitute films which may be used in lieu of the requested film.

(4) If the film is not to be issued immediately, two copies of DA Form 11–44 are placed in a suspense file. These copies are forwarded to the shipping department 1 day prior to the pickup or shipping date.

b. Shipping Clerk. The shipping clerk, upon receiving the forms from the booker, removes the prints from the storage racks and stacks them for pickup or shipping the following day.

(1) *Over-the-counter pickup.* The using unit picks up the film on the appropriate date.

(*a*) A careful check of print numbers is made to assure requested prints are being issued.

(*b*) Both copies of DA Form 11–44 are signed by the unit representative to receipt for the films and the films are issued.

(*c*) The duplicate copy of DA Form 11–44 accompanies the film. The original copy is placed in the suspense file according to the date the film is to be returned.

(2) *Mail.* Film is shipped to distant users by mail (parcel post).

(*a*) The film is packed in a shipping case with the duplicate copy of DA Form 11–44. The required information will be entered on this form by the projectionist and it will be returned with the film.

(*b*) The original copy of DA Form 11–44 is filed in the suspense file according to the return date.

(*c*) The film is shipped.

(3) *Courier pickup.* The procedure for courier pickup is the same as that for over-the-counter pickup contained in *b*(1) above.

27. Requesting Projection and Allied Audio-Visual Equipment

Requests should be submitted well in advance to assure the desired equipment will be available when required. To meet the needs of the users, such as USAR and ROTC, equipments will be loaned on a daily, monthly, or indefinite basis. Equipments on extended loan to USAR and ROTC need not be returned unless in need of repair or no longer required. Using units may request equipment as follows:

a. By Telephone. The requesting officer or his representative calls the exchange to determine if the equipment will be available on the date required. The equipment maintenance man (shipping clerk in some exchanges) records the request, verifies the availability of equipment for the date indicated, and gives the calling party an oral confirmation. The requesting officer prepares the necessary copies of DA Form 11–43 (Projection and Audio-Visual Equipment Loan Order) and forwards them to the exchange where they are completed. The forms may be forwarded to the exchange in advance of, or on the issue date as required by the exchange.

b. In Person. The responsible officer may visit the exchange in person, prepare the forms, and pass them directly to the equipment maintenance man.

28. Procedure for Issuing Projection and Allied Audio-Visual Equipment

Upon receiving a request in accordance with the procedure indicated in paragraph 27, the issue of equipment is completed as follows:

a. Upon receipt of DA Form 11–43 the confirmation of the request including the name of the unit, amount and type of equipment, and the issue period are recorded on a chart, ledger, or file used for this purpose by the maintenance man.

b. The maintenance man then completes DA Form 11–43 by entering the exchange number and serial number of each item of equipment in the appropriate block and by posting the date of issue and the date the equipment is to be returned.

c. The requesting unit representative signs the original copy of DA Form 11–43 for the receipt of the equipment and the equipment is issued along with the duplicate copy of DA Form 11–43 and the equipment maintenance forms.

d. The original copy of DA Form 11–43 is placed in the suspense file according to the date of return.

29. Procedure for Receiving Returned Equipment

a. When equipment is returned to the film and equipment exchange by the using unit on its scheduled return date, the maintenance man—

(1) Withdraws the original copy of DA Form 11–43 from the suspense file and checks the equipment to assure all items which were loaned have been returned.
(2) Inspects each item of equipment to assure all components have been returned in satisfactory condition.
(3) Receives and checks all maintenance forms for completeness.
(4) Determines that the projectionists report on DA Form 11–43 has been completed and signed.
(5) Signs both copies of DA Form 11–43 indicating he has received the listed equipment in satisfactory condition.
(6) Returns the original copy of DA Form 11–43 to the unit representative.
(7) Inspects and as needed, replaces necessary running spares, performs necessary maintenance on equipment, and returns equipment to storage.
(8) Files DA Form 11–43 and equipment maintenance forms.

b. When the equipment is not returned on or before its scheduled return date, the equipment maintenance man calls the using unit and requests the equipment be returned. If the equipment is not returned as requested, the matter is reported to the director for necessary followup action.

30. Procedure for Receiving Returned Films and Film Strips

The using unit returns films and film strips to the exchange on or before the due date indicated on the duplicate copy of DA Form 11–44. When films are not returned on schedule the shipping clerk notifies the using units to return the films promptly. Chronic cases of delinquency in returning films will be brought to the attention of the director for remedial action. Upon receipt of the returned films—

a. The Shipping Clerk—

(1) Checks the original copy of DA Form 11–44 to verify that all films issued have been returned.
(2) Checks the duplicate copy of DA Form 11–44 to assure the using unit has recorded all required information.
(3) Signs both copies of the form as the receiving clerk and returns the original to the using unit through its representative or by mail.

(4) Forwards the returned films to the inspection and storage department with the duplicate copy of DA Form 11–44.

b. The Film Inspector—

(1) Inspects, repairs, and rewinds the returned films.
(2) Sorts out and holds unserviceable prints for salvage.
(3) Returns serviceable prints to their proper storage racks.
(4) Initials DA Form 11–44, indicating he has inspected the films listed and forwards it to the booker.
(5) Reports excessive film damage to the director.

c. The Booker—

(1) Posts all required information on DA Form 11–77 (Film Print Inventory and Utilization Record) and indicates this on DA Form 11–44.
(2) Files DA Form 11–44 according to date of issue for later reference in compiling periodical reports.

31. Control of Classified Film and Film Strips

To assure classified films and film strips are made available to authorized persons the following measures are established to control their issue and use:

a. Identification of Unit Representatives. The film and equipment exchange must have on file the written authorization of the commander of each using unit listing those persons designated to pick up classified films and film strips. The authorization must include the name, grade, service number, security clearance, and specimen signature of those individuals authorized by their unit commander to receipt for classified items. Persons so authorized must properly identify themselves to the issuing clerk of the film and equipment exchange before being issued classified items.

b. Preparation of DA Form 11–44. Classified and unclassified films are requested on separate DA Form 11–44's. Forms requesting classified films will include—

(1) The correct film number and title (when title is unclassified). When corrections are made they will be initialed by the individual signing the request or the requesting officer.
(2) The following certificate which will be inserted on the face of the DA Form 11–44 by the film and equipment exchange and signed by the unit commander:

> I hereby certify that in accepting the loan of the film(s) listed hereon, which are classfied, I will comply with the provisions of AR 380–5 to insure its (their) safeguarding. I further certify that the person(s) to view the film are cleared to have access to _____ and have a "need-to-know" regarding the
> (insert classification)
> the information contained therein.

c. Classified Document Receipt. A classified document receipt is prepared, listing and identifying the classified items, and processed in accordance with AR 380–5.

d. Receiving Returned Classified Films and Film Strips. Before accepting the return of classified films and film strips, the receiving clerk will check the films to assure they are in their proper classified containers.

32. Training of Projectionists

a. To assure film and equipment exchange equipments are properly utilized and maintained only trained and licensed personnel are authorized to operate such equipments. Those courses required to train and license authorized personnel to operate equipments issued by the film and equipment exchanges are conducted by the exchanges. Courses conducted by the film and equipment exchange include—

(1) Projectionist Courses (40 hours).
(2) Projectionist Instructors Course (40 hours).
(3) Transparency Preparation Course (40 hours).

b. The director of the film and equipment exchange is responsible for monitoring all courses conducted by personnel of the film and equipment exchange. The purpose of the courses conducted by the film and equipment exchanges is to train operators and technicians in the operation and care of projection and audio-visual equipments and the techniques to be employed to improve audio-visual presentations. No compromise can be made in approved training programs if the efficiency of classroom use of audio-visual aids is to be maintained. The length of these courses have been determined as the minimum acceptable time in which operators and technicians may be trained to the required degree of proficiency. Only where limited licenses are required will shorter courses be conducted.

c. A Projectionist License (DA Form 11–78) is issued to all students who successfully complete the projectionist course. This license will be honored by all film and equipment exchanges throughout the Army. Both the projectionist instructor and the director must certify that the graduate has demonstrated proficiency in the operation and maintenance of all equipments for which the license is issued. The license contains notations indicating those equipments the licensee is authorized to operate and a photograph of the individual to whom it is issued. It will be laminated to prevent it being altered after issue. The projectionist license is not transferable and is subject to recall and cancellation upon evidence of incompetence by the holder. The director of any film and equipment exchange may revoke such licenses where

films or equipment have been damaged as a result of negligence on the part of the licensed projectionist. These licenses may also be revoked upon evidence of inefficiency, incompetence, or lack of proficiency on the part of the licensed projectionist.

d. To provide a means for the training of projectionists in remote locations, designated film and equipment exchanges are authorized to train and license projectionist instructors. Only licensed projectionists are eligible to attend projectionist instructor courses and only those persons considered qualified to act as instructors should be recommended.

33. Advisory Service

The advisory services offered by the director include but are not limited to—

a. Orientation Classes. Directors of film and equipment exchanges are responsible for conducting orientation classes on the proper use of motion pictures, transparencies, and related audio-visual aids. Such classes may be conducted in conjunction with the various officers classes that are held at each post. As a minimum the following subjects should be presented:

(1) Film and equipment exchange operating procedures.
(2) Consultation services offered by the director.
(3) Availability and scheduling of preview facilities.
(4) Selection, booking, and use of audio-visual training aids.
(5) Projectionist training.
(6) Transparency preparation and use.

b. Preview Facilities. Preview room facilities should be available at all times for the use of training officers and other authorized personnel. Where facilities are limited it may be necessary to conduct scheduled showings to assure the requirements of all units and training officials are adequately fulfilled. Officers should be urged to avail themselves of this facility and to attend scheduled showings of those prints on subjects they may require for training purposes.

c. Previews. Scheduled previews of new films are held at the film and equipment exchange weekly. Maximum attendance should be encouraged by widely advertising the subject, time and place of the showing. To accommodate all interested personnel, films should be shown several times during the day.

d. Film News Letter. A film news letter distributed to all units is the best means of keeping training officers and using units abreast of the latest developments in audio-visual training aids. This should include the following:

(1) A preview program, listing the new films received by the film and equipment exchange which will be shown on

a designated date. The starting times of each showing should be listed to permit officials to view the prints at their most convenient time.

(2) The title, running time, and a brief synopsis of each film to be shown.

(3) Information pertaining to obsolete films, changes in film classifications, changes in clearances of films for public showings, and other pertinent data concerning films and film strips.

(4) Information pertaining to new equipment, changes in procedures, or other notices of interest to using units and training officials.

34. Editing of Official Films

The cutting and editing of official Department of the Army films is a responsibility of the Chief Signal Officer. Film and equipment exchanges will not add or remove footage to such films. For further information see AR 108–6.

35. Disposition of Films

a. Serviceable Prints. Serviceable prints may be removed from stock and shipped from the film and equipment exchange for the following reasons:

(1) Upon receipt of a reallocation order from the central film and equipment exchange, the director transfers the prints to the designated exchange.

(2) When a director determines that he has prints in stock for which there is no longer a requirement, he reports the excess prints to the central exchange and requests disposition instructions.

b. Disposition of Obsolete, Damaged, and Unserviceable Prints. Directors of film and equipment exchanges are notified of obsolete subjects by higher authority. Damaged and unserviceable prints are sorted out during film inspection and disposed of in accordance with the following instructions.

(1) Classified prints are disposed of in accordance with AR 380–5.

(2) Unclassified prints are turned over to the local salvage officer as scrap and are accompanied by the required number of copies of DD Form 1150–1 (Request for Issue or Turn-In), or other approved property turn-in form, which contain the appropriate certificate signed by the director.

(*a*) *Obsolete Prints.*

Above listed positive prints have been determined to be obsolete. Because of legal encumbrances and privacy rights, all listed items will be so disposed of as to insure that no portion of the picture or sound track can be reused.

(*b*) *Damaged or Unserviceable Prints.*

Above listed positive prints have been inspected and found to be unserviceable and nonrepairable. Because of legal encumbrances and privacy rights, all listed items will be so disposed of as to insure that no portion of the picture or sound track can be reused.

(3) All usable reels and cans made available as the result of scrapped prints are returned to stock.

c. Supporting Documents. All supporting documents pertaining to the actions described above are filed and used for the preparation of the SIG–12 Film and Equipment Exchange Summary. Copies of the supporting documents are inclosed in the report.

36. Discontinuance of Film and Equipment Exchanges

When, under the provisions of AR 108–30, the Chief Signal Officer has approved the discontinuance of a film and equipment exchange, the following actions will be taken:

a. Equipment on hand will be reported to the central film and equipment exchange for disposition instructions. The central film and equipment exchange will advise the exchange to be discontinued as to which equipments are to be turned in to the local depot and which are to be shipped to the central exchange or other exchanges within the area.

b. All films on hand will be reported to the central film and equipment exchange for disposition instructions. Films so reported will either be reallocated to meet area requirements or returned to the Army Pictorial Center.

c. A final SIG–12 (R3) report will be rendered covering the activities of the discontinued film and equipment exchange from the date of the last semiannual report to the date of discontinuance.

CHAPTER 4
REPORTS, RECORDS AND FORMS

37. General

The purpose of the reports, records, and forms maintained or used by film and equipment exchanges is to facilitate the operation of these exchanges on an economical and efficient basis. The use of these reports, records, and forms is periodically reviewed to assure they are required and are serving their intended purposes.

38. Reports

a. Film and Equipment Exchange Report SIG–12 (R3). The requirements for the submission of the SIG–12 (R3) report are established by AR 108–39. This is a semiannual report which is submitted by all film and equipment exchanges. It is submitted on DA Forms 11–174, 11–174–1, and 11–174–2 (Film and Equipment Exchange Summary) (Reports Control Symbol SIG–12 (R3)). This report which summarizes the operations of the film and equipment exchanges provides—

(1) A current record of Department of the Army accountable exempted motion picture films, TV recordings, film strips, slides, phono-recordings, and flat and operable transparencies.
(2) Data pertaining to the utilization of films and film strips.
(3) Information to be used as the basis for the initial and redistribution of film and equipment exchange stocks.
(4) Data on the status and adequacy of film subjects which have been reviewed.
(5) Factual data on the field requirements for films which are used as the basis for production planning and determining annual budgetary requirements. These factual data are required to support the film production and distribution budget when it is presented to Congress.
(6) A summation of the comments made by film users regarding specific film subjects which must be considered for revision or to be declared obsolete.

b. Others. Film and equipment exchanges render other reports as required by command directives and regulations.

39. Records and Forms

The following records and forms are maintained by all film and equipment exchanges:

a. DA Form 11–41. This card is used by film bookers to record specific booking commitments and to determine the availability of a requested film for a designated date.

b. DA Form 11–43. This form is a request, issue and turn-in slip, and performance record for projectors and allied equipment.

c. DA Form 11–44. This form is used as a request, confirmation, and issue and turn-in slip for films and film strips. It also provides the film and equipment exchange data as to the number of times the film was shown, to whom the film was shown and the attendance figures, and the information required by the film review program. Comments received by using personnel, applying the film review code as required by AR 108–39, are used in determining which films are satisfactory for their intended purpose or which require revision or should be declared obsolete. Such information is essential in determining production and distribution requirements.

d. DA Form 11–77. This record provides an inventory of the films stocked by the exchange and shows their frequency of use and whether the users have indicated the print requires revision or is obsolete. By indicating which films are frequently used or never used at an exchange, this record provides information as to which films should be retained by the exchange and which should be reallocated or removed from stock. It provides a ready reference for preparing the film and equipment exchange report.

e. DA Form 11–78. This license is issued to all students successfully completing the projectionist course (par. 32*c*).

f. DA Form 11–172 (Permanent Retention Film Order) and DA Form 11–172A (Continuation Sheet For Permanent Retention Film Order). These forms are used by exchanges to order films and allied materials from central film and equipment exchanges on a permanent retention basis. They are also used by central exchanges to order film and allied materials from the Army Pictorial Center.

g. DA Form 11–256 (Maintenance Check List for Signal Equipment—Photographic Developer, Projector, Dryer, Contact and Projection Printer). This form is used to record all operator and organizational maintenance performed on the equipments to which it pertains.

h. DA Form 11–238 (Maintenance Check List for Signal Equipment—Sound Equipment, Radio, Direction Finding, Radar, Carrier, Radiosonde and Television). This form is used by film and equipment exchanges to record maintenance performed on recording equipment.

CHAPTER 5

MAINTENANCE OF FILMS AND EQUIPMENT

40. Supply

Directors are responsible for determining the quantity of audio-visual equipment needed to accomplish the training mission. These equipments and sufficient supplies to maintain them in operating condition are requisitioned through signal supply channels. TA 11–12 and TOE 11–500 ( ) are the authority to be used for requisitioning equipment, the technical manual for each item of equipment is the guide to be used for requisitioning spare parts and TA 11–100 ( ) is the guide to be used for requisitioning expendable supplies.

41. Care and Handling of Films

Films require the utmost care in handling. Neglect of a single maintenance factor may result in irreparable damage and complete loss of the film. Longer life of films can be achieved when they are properly handled at all times. Factors which shorten the service life of film prints are—

a. Improper projection of film (par. 42).
b. Scratches caused by emulsion deposits and dirt.
c. Cinching of film during rewinding.
d. Use of improperly alined rewinds and damaged reels.
e. Continuous projection in a warm or dry atmosphere.
f. Failure to place film in proper containers between periods of projection.
g. Projection of films in dusty rooms.
h. Careless fingering of films.

42. Film Care During Projection

Film can be damaged by any projector if improper threading procedure is used or if the projector is allowed to collect dirt and dust. Factors causing film damage during projection are—

a. Improper Threading. When the film is not correctly threaded, so that the sprockets engage the perforation, the film moves across the top of the sprocket teeth, causing dents or even new perforations in the film. Also, these perforations are punched in the sound track if the film is twisted in threading or if the print is run on a silent projector. This damage can be prevented by a careful check after each threading and by turning a few frames of the film through the projector by hand to make sure the film is properly engaged.

b. Bad Splices. Bad splices cause the film to jump and ride the sprockets. The projectionist must be near his machine at all times in order to detect any unusual noise and to stop the machine if the film fails to wind onto the takeup reel.

c. Improper Loops. Loops allow slack between moving claws and sprockets so that they do not pull, nick, tear, or completely destroy the sprocket hole. If the loops are too large, the moving film touches stationary parts of the projector, not intended to be used as a film guide, and it may be scratched or torn. Short loops cause damage to perforations.

d. Lack of Thorough Cleaning. Film running through a projector picks up static. Once charged, the film attracts particles of dust which lodge in the film chute or in the rollers and sprockets. This dust forms into hard lumps which scratch the film. The longer these lumps remain, the harder they become and the deeper the film is scratched. The film chute, aperture, and all parts of the film path must be cleaned with a brush after each reel is run.

43. Film Care in the Exchange

a. Inspection. All films returned to the film and equipment exchange should be inspected before being placed in storage racks or reissued. Special attention must be given to broken sprocket holes, rough edges, thick or damaged splices, and scratches. The film should be properly reeled and ready for projection, with a minimum leader of 8 feet on each end. To prevent scratching the films, inspectors wear cotton film inspection gloves.

b. Repairing. Bulky splices, loose splices, burned spots, torn sprocket holes, nicks, gouges, and creases should be repaired or removed by cutting and splicing. In order to assure a proper splice, strict attention must be paid to the instructions which accompany each splicer as correct splicing procedures vary with each type.

c. Rewinding. The same procedures are observed for hand and electric rewinding units. In each instance, the rewinding unit should be firmly secured to the inspection table. The reels must be in perfect alinement so that the edge of the film will not ride against any flange of the reel. Damage also results from the use of bent or damaged reels.

d. Cleaning. Film cleaning serves the dual purpose of cleaning and waxing in one operation. When using standard Army film cleaner adequate ventilation must be available. Carbon tetrachloride will not be used as a film cleaner. Exchanges must set up cleaning schedules which insure keeping films clean at all times.

e. Storage. After inspection, repairing, and cleaning, films should be placed, heads out, in metal film cans and stored on racks away from excessive heat. Ideally, the temperature should be between 70° and 80° F. and the relative humidity between 25 and 60 percent. When films are taken from storage and made ready for shipment, they should always be issued in the metal cans which are designed to keep the film free from dirt.

44. Maintenance of Equipment

Equipment must be properly maintained to give continuous service.

a. Directors of film and equipment exchanges are responsible for preventive maintenance of all equipment issued to the exchange. First and second echelon maintenance inspections are made in accordance with instructions from the army area or oversea commander. Units having equipment on an indefinite loan basis will perform 1st and 2d echelon maintenance in accordance with AR 750–625.

b. Equipment requiring higher echelon maintenance is sent to field maintenance shops designated by higher headquarters.

c. Within an exchange, a planned maintenance program is essential, based on instructions given in the technical manual for each item of equipment and on instructions issued by the army or oversea commander.

45. Care and Handling of Screens

The efficiency of a screen as a reflector of light is greatly affected by dirt. When the surface of the screen is dirty, the picture lacks brilliance. Following are some pointers which will improve the effectiveness of screens and give them longer service:

a. Keep screens rolled when not in use to prevent dust from settling on the surface.

b. When transporting a screen, never place it on the dusty bed of a vehicle nor permit it to become dirty or wet.

c. Never touch a screen surface with pointer or fingers.

d. At the end of a showing, remove dust and insects from the screen by brushing with a soft cloth. If insects are rolled into the screen, or if fingerprints are made on the surface, a chemical discoloration occurs.

e. Canvas screen covers are provided to keep screens clean while in transit or storage.

CHAPTER 6

FILM EXCHANGES IN A THEATER OF OPERATIONS

46. General

The operation of film and equipment exchanges in a theater of operations is similar to that described in the preceding chapters. Changes are made as required by the tactical situation.

47. Responsibilities

a. Theater Army Signal Officer. The theater army signal officer is responsible for the technical operation of all film and equipment exchanges in the theater. The signal officer is assisted in fulfilling this responsibility by a pictorial officer and a pictorial unit commander.

b. Pictorial Officer. When so delegated, the pictorial officer on the staff of the theater army signal officer is responsible for the technical control of all film and equipment exchanges in the theater.

c. Pictorial Unit Commander/Film Service Supervisor. Depending upon the classification of the exchange, the commander/film service supervisor will be an officer (MOS 8500) or noncommissioned officer (MOS 845.6).

48. Organization

The theater army pictorial unit will establish, operate and maintain film and equipment exchanges. Personnel and equipment authorized by TOE 11–500 ( ) will be utilized for this purpose. Following is a description of the teams authorized:

a. Team FJ. Two officers and eight enlisted men are authorized. This team is capable of establishing and maintaining a class A central film and equipment exchange to serve approximately 75,000 troops.

b. Team FK. One officer and six enlisted men are authorized. This team is capable of establishing and maintaining a class B exchange serving 10,000 to 60,000 troops.

c. Team FL. Three enlisted men are authorized. This team is capable of establishing and maintaining a class C exchange serving up to 10,000 troops.

49. Employment

Theater army has one central film and equipment exchange which is located at theater army or TALOG. Other exchanges will be located at lower echelons as required.

APPPENDIX I

REFERENCES

AR 108–30	Operation of Signal Corps Film and Equipment Exchanges.
AR 108–39	Film and Equipment Exchange Summary (Reports Control Symbol SIG–12 (R3)).
AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations and Brevity Codes.
AR 380–5	Safeguarding Defense Information.
AR 380–6	Automatic Time-Phased Downgrading and Declassification System.
AR 711–16	Installation Stock Control and Supply Procedures.
AR 750–625	Maintenance Inspections and Reports; Signal Equipment.
DA Pam 20–551	Staffing Guide for U.S. Army Garrisons.
DA Pam 20–561	Staffing Guide for U.S. Army Central Film and Equipment Exchanges.
DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310-series	Military Publications.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 11–40	Signal Corps Pictorial Operations.
SB 11–199	Supply Procedure for Diazo Materials used with Printing and Dry Developing Machine ES–19(1), FSN 3610–392–8781 for Army Field and Equipment Exchanges.
SB 11–278	Rear View Projection Kit and Rear Projection Screen.
SB 11–483	Supply Procedure for Visamatic and Technamation Treatment Materials.
SB 11–502	Supply Procedure for Planotype Materials.
TA 11–12	Army Photographic Facilities and Film and Equipment Exchanges.
TA 11–100(11–12)	Allowances of Signal Corps Expendable Supplies for Signal Corps Film and Equipment Exchanges.

APPENDIX II

PROJECTIONIST TRAINING COURSE

1. Purpose

To provide—

a. Regular Projectionist License. Qualify individuals as projectionists upon completion of the projectionist course (lesson outline part I, 40 hours).

b. Projectionist Instructor License. Qualify individuals as projectionist instructors upon completion of instructors course (lesson outline part I and part II, 80 hours).

2. Objective

a. To provide preliminary training and on-the-job working experience in all phases of projection work.

b. Using the approved technical manuals as a guide thoroughly cover the purpose and scope of projection training, covering such things as its limitations and shortcomings, a complete knowledge of assembling and repacking procedures, troubleshooting, component parts, operating parts, and the most efficient methods of employing the equipment.

3. Prerequisites

Requires good near vision to identify and catalog film. Requires hand-eye coordination and manual dexterity to operate and maintain film and equipment exchange equipment. Must have ability to understand and apply information in technical publications pertaining to film, and projection equipment. Must have mechanical ability to perform repairs on film projection and associated equipment. Must have at least six (6) months remaining in service.

Unit Training Schedule

Time	Subject or nature of training	Subcourse	Text reference	Training aids and equipment
2 hours	Motion Picture Film and Reels.	Projection screen	TM 11-2331A, par. 32 and TM 11-2329.	16mm film and splicer reels, screens Ph556/GF, BM 6, and BM 10.
20 hours	Sound Motion Picture Projector Set AN/PFP-1.	Introduction, purpose, and use.	TM 11-2331A, par. 3 and TM 11-6730-208-10, par. 3.	AN/PFP-1, screen, and 16mm film.
		Nomenclature	TM 11-2331A, pars. 4, 5, 6, and TM 11-6730-208-10, par. 4-7.	Do.
		Theory of motion picture reproduction.	TM 11-2331A, par. 37 *a-c*.	Do.
		Theory of optics	TM 11-2331A, par. 37 *i* and *j*	Do.
		Theory of sound	TM 11-2331A, par. 37 *d-h*	Do.
		Showmanship	TM 11-2331A, pars. 10 and 11	Do.
		Operation	TM 11-2331A, par. 12-19 and TM 11-6730-208-10, pars. 12-18.	Do.
		Maintenance	TM 11-2331A, pars. 26-30 and TM 11-6730-208-10, pars. 23-33.	DA Form 11-256 and TF 11-1752.
		Practical exercise	TM 11-2331A, TM 11-6730-208-10.	16mm film, AN/PFP-1, and screen, and TF 11-1574.
		Examination and film	All previous references.	
1 hour	Sound Motion Picture Projector AS-2.	Description	TM 11-2331A, pars. 122-124	AS-2, screen, and 16mm film.
		Operation	TM 11-2331A, pars. 131-138	Do.
		Examination	All previous references.	

Unit Training Schedule—Continued

Time	Subject or nature of training	Subcourse	Text reference	Training aids and equipment
3 hours	Projector Ph 222C With Remote Control Unit BP–1 and Still Picture Projector AP–6.	Introduction, purpose, and use.	TM 11–2332, pars. 3 and 4; TM 11–2332A, pars. 3 and 4.	Ph 222C, BP–1, AP–6, and screen.
		Nomenclature	TM 11–2332, par. 5 and TM 11–2332A, pars. 5 and 6.	Do.
		Operation	TM 11–2332, pars. 9–18 and TM 11–2332A, pars. 11–19.	Do. Film strip, and 2x2 slide.
		Maintenance	TM 11–2332, pars. 23–29 and TM 11–2332A, pars. 24–29.	DA Form 11–256.
		Practical exercise	TM 11–2332 and TM 11–2332A	Ph 222C, BP–1, AP–6, and screen.
		Examination	All previous references.	
2 hours	Still Picture Projector AP–4, Opaque Projector AP–5.	Introduction and nomenclature.	TM 11–2337, pars. 1–7	AP–4, screen and 3¼ slide.
		Operation and maintenance	TM 11–2337, pars. 11–14, and 17–21.	Do. DA Form 11–256.
		Introduction and nomenclature.	TM 11–2330A, pars. 3–8	AP–5, screen, and opaque objects.
		Operation and maintenance	TM 11–2330A, pars. 10–24	Do. DA Form 11–256.
2 hours	Overhead Projector Ph 637A.	Introduction and reference	TM 11–2323, pars. 1–9	Ph 637A, screen, and transp 8x10.
		Operation	TM 11–2323, pars. 12–14	Do.
		Maintenance	TM 11–2323, pars. 35–39	DA Form 11–256.
		Practical exercise	TM 11–2323	Ph 637A, screen, and transp.
		Examination	All previous references.	
3 hours	Public Address Set AN/UIH–2.	Introduction, purpose, and use.	TM 11–5830–200–10, pars. 1–3	AN/UIH–2 and recording.

		Nomenclature	TM 11-5830-200-10, pars. 4-6	Do.
		Operation	TM 11-5830-200-10, pars. 6-13	Do.
		Maintenance	TM 11-5830-200-10, pars. 18-21.	Ph 222C and SFS. Do.
		Practical exercise	TM 11-5830-200-10	DA Form 11-238. AN/UIH-2, Ph 222C, SFS, and recording.
		Examination	All previous references.	
3 hours	Sound-Recorder Reproducer RD 87/U or RD 173.	Introduction, purpose, and use.	TM 11-2584, par. 3	RD 87/U or RD 173 and magnetic tape.
		Nomenclature	TM 11-2584, pars. 4-9	Do.
		Operation	TM 11-2584, pars. 13-24	Do.
		Maintenance	TM 11-2584, pars. 29-37	Do.
		Practical exercise	TM 11-2584	DA Form 11-238. RD 87/U or RD 173 and magnetic tape.
		Examination	All previous references.	
2 hours	Projecto-Printer	Introduction and nomenclature.	Projecto-Printer Instruction Book.	Projecto-Printer and ES-19 W/Kit.
		Operation	TM 11-2323, pars. 25-31	Expendable supplies, Diazo material.
		Practical exercise	Do.	Transfer on material.
		Maintenance	Projecto-Printer. Instruction book	Bruning Multicolor Kit #100, ammonia 26%.
2 hours	Review (for projectionist license only).	Review all previous lesson outlines and film and equipment exchange operation.	All previous references AR 108-30.	All projection equipment. DA Pam 108-1, 310-5, DA Forms 11-43 and 11-44.
12 hours	Projecto-Printer	Practical exercise	All previous references; Bruning Instruction Book Kit #100.	Illustration kit plus material.

Unit Training Schedule—Continued

Time	Subject or nature of training	Subcourse	Text reference	Training aids and equipment
8 hours	Review	Review all previous lesson outlines.	All previous references	All audio-visual projection equipment.
5 hours	Military Instruction	Principles of Learning Part I.	FR TF 21-2301	Proj AN/PFP-1, TF 21-2301.
		The stages of Instruction Part II.	FR TF 21-2302	Proj AN/PFP-1, TF 21-2302.
		The stages of Instruction Part II.	FR TF 21-2304	Proj AN/PFP-1, TF 21-2304.
		Training Aids Part III	FR TF 21-2305	Proj AN/PFP-1, TF 21-2305.
		Speech Technique	FR TF 21-2306	Proj AN/PFP-1, TF 21-2306.
8 hours	Instruction Practice	Lesson	Text Reference	Training aids and equipment.
		Teaching ability of the students.	All previous references	All projection equipment.
2 hours	Classroom Layout	Lesson	Text reference	Training aids and equipment.
		Classroom site, classroom layout.		All audio-visual projection equipment and screen.
2 hours	Teaching Principle	Lesson	Text reference	Training aids and equipment.
		Visual aids for teacher training.		Transp Set Ph 637A, screen.
3 hours	Film and Equipment Exchange Procedures.	Lesson	Text reference	Training aids and equipment.
		Explain operation of film and equipment exchange.	AR 108-30	DA Form 11-44.
		Procedures for requesting training film.	AR 108-30	DA Form 11-44, DA Pam 108-1.
		Procedures for requesting projection equipment.	AR 108-30	DA Form 11-43, local F and E SOP.

		Procedures for requesting transparencies.	AR 108-30	DA Pam 310-5, DA Form 11-44.
		Conduct a tour of training aids subcenter.		Training aids subcenter.
		Conduct a tour of film and equipment exchange.		Film and equipment exchange.
		Graduation		Certificate DA Form 87.

LESSON OUTLINE

Part I

1. Motion Picture Film and Reel-Projection Screen (2 Hours)

a. Objective. To familiarize the students with the description and use of 16mm motion picture film and film reels.

b. Lesson Outline.

(1) Introduce the lesson by distributing pieces of 16mm motion picture film and describe its characteristics.
   (*a*) Emulsion.
   (*b*) Frames.
   (*c*) Sound track.
   (*d*) Silent and sound film.
(2) Explain and demonstrate the proper method of making a splice.
(3) Explain in detail the type and use of film reels.

c. Description and Use of Projection Screens.

d. Lesson Outline.

(1) Introduce the subject by displaying the standard Army screens and describing material and proper use.
(2) Discuss correct utilization of projection screens.
(3) Explain the proper maintenance and storage of projection screens.

Instructor's note. Miscellaneous films MF 11–7754 and MF 11–8634 may be shown, adjusting time as necessary.

2. Sound Motion Picture Projector Set AN/PFP–1 (20 Hours)

a. Objective. Description, purpose and use of the 16mm projector set AN/PFP–1.

b. Lesson Outline. Introduce the subject and outline material to be covered.

c. Nomenclature.

(1) Major components and their functions.
   (*a*) Projector PH 652A.
   (*b*) Amplifier AM 424.
   (*c*) Speaker LS 170.
(2) Summarize by conducting an oral quiz having students identify and describe the components as taught in this period.

d. Theory of Motion Picture Reproduction.

(1) *Objective.* To acquaint the students with the theory of motion picture reproduction.

(2) *Lesson outline.* Define the following definitions and the effect they have on projection of motion picture film.
(*a*) Picture continuity.
(*b*) Frame transport.
(*c*) Image regulation.

e. Theory of Optics.
(1) *Objective.* To acquaint the students with the theory of optics.
(2) *Lesson outline.*
(*a*) Discuss the optical sound track, variable area, and variable density.
(*b*) Discuss the scanning lens.
(*c*) Discuss the good sound reproduction, volume, pitch, and tone.

f. Showmanship.
(1) *Objective.* To acquaint the students with professional showmanship in showing a 16mm motion picture film.
(2) *Lesson outline.*
(*a*) Discuss proper threading.
(*b*) Discuss the proper procedure in beginning the show.
(*c*) Discuss the proper operation during the show.
(*d*) Discuss the proper procedures in ending the show.
(*e*) Summarize the lesson.

g. Operation of the 16mm Projector Set AN/PFP–1.
(1) *Objective.* To train the students to operate the 16mm projector set AN/PFP–1.
(2) *Lesson Outline.*
(*a*) Introduce the lesson by emphasizing the importance of the operator to becoming thoroughly familiar with all the controls and switches on the projector set AN/PFP–1.
(*b*) Explain and demonstrate the preliminary starting procedures performed before actual operation.
(*c*) Explain and demonstrate proper threading procedure.
(*d*) Explain and demonstrate the initial and final operating adjustment.
(*e*) Explain and demonstrate system operations.
1. Single equipment operation.
2. Dual equipment operation.
(*f*) Explain and demonstrate the proper stopping procedure, ending the show.
(*g*) Summarize the lesson, placing emphasis on equipment performance check.
1. Preparation check.

2. Operation check.
3. Stop check.

Instructor's note. Transparencies should be locally prepared for this period.

h. Maintenance.

(1) *Objective.* To acquaint the students with the necessary maintenance regulations, procedures and forms.

(2) *Lesson outline.*

(*a*) Introduce the lesson by distributing DA Form 11–256. Discuss the scope of operator's maintenance.

(*b*) Explain the use of DA Form 11–256.

(*c*) Explain and demonstrate preventive maintenance techniques. Point out specifically what to check, how to check, and precautions to be taken.

(*d*) Show Training Film TF 11–1752, How to Operate the Army 16mm Sound Projector Set AN/PFP–1.

(*e*) Summarize the lesson.

Instructor's note. Have students fill out maintenance form DA Form 11–256 as each step of preventive maintenance is discussed.

i. Practical Exercise.

(1) *Objective.* To provide a practical applicatory exercise in the operation of 16mm Projector Set AN/PFP–1.

(2) *Lesson outline.*

(*a*) Conduct a practical exercise in the operation of AN/PFP–1.

1. Setting up AN/PFP–1.
2. Operations AN/PFP–1.
3. Return to case AN/PFP–1.

(*b*) Conduct a critique of the practical exercise.

Instructor's note. Divide the students into equal groups, assign each group to a Projector AN/PFP–1. Require each group to set up and operate Projector AN/PFP–1 in accordance with procedures previously taught. During the practice session be sure that personnel are rotated and question each student to insure that the principles of operation are clearly understood.

j. Examination and Film.

(1) *Objective.* To conduct a written test to ascertain students knowledge of 16mm Sound Motion Picture Projector Set AN/PFP–1.

(2) *Lesson outline.*

(*a*) Accomplish test number 1.

(*b*) Critique.

1. Correct test papers.
2. Discussion of the test.

(*c*) Show Training Film TF 11–1574, The Technique of Good Projection.
(*d*) Summarize the lesson.

3. Sound Motion Picture Projector AS–2 (1 Hour)

a. Objective. To describe and point out items or parts which are different from similar parts contained in Projector PH 652A.

b. Lesson Outline.
(1) General description of Projector AS–2.
(2) Projector and Amplifier AQ–2A.
(3) Power cord.

c. Operation of Projector AS–2.
(1) *Objective.* To train the students to operate Projector AS–2.
(2) *Lesson outline.*
(*a*) Explain in detail and demonstrate the operation of Projector AS–2 emphasizing different procedures used, that are not similar to PH 652A.
(*b*) Summarize the lesson.

d. Examination.
(1) *Objective.* To conduct a written test to ascertain students knowledge of Projector Set AS–2.
(2) *Lesson outline.*
(*a*) Accomplish test number 2.
(*b*) Critique.
(*c*) Correct test paper and discussion.

Instructor's note. This lesson outline must be used in conjunction with lesson outline pertaining to Projector Set AN/PFP–1, if only Projector AS–2 is being taught increase the total time to eight (8) hours to include three (3) hours as practice time.

4. Projector Ph 222C With Remote Control Unit BP–1 and Still Picture Projector AP–6 (3 Hours)

a. Objective. To familiarize the students with the description, purpose, and use and proper application of the Projector Ph 222C with remote control unit BP–1 and still projector AP–6.

b. Lesson Outline.
(1) Introduce the lesson by displaying and generally describing the Ph 222C and BP–1.
(2) Explain in detail the purpose, use, and application of the Ph 222C and BP–1.

c. Nomenclature.
(1) To familiarize the students with the function, use, and controls on the Ph 222C with BP–1 and still projector AP–6.

(2) Major components and their functions.
(*a*) Base assembly.
(*b*) Turret assembly.
(*c*) Cover assembly.
(*d*) Lamphouse assembly.
(*e*) Film strip attachment assembly.
(*f*) Slide carrier assembly.
(3) Summarize by conducting an oral quiz having the students identify and describe the major components as taught during the foregoing period.

d. Operation.
(1) *Objective.* To train the students to operate the Projector Ph 222C with BP–1 and AP–6.
(2) *Lesson Outline.*
(*a*) Introduce the lesson by emphasizing the importance of operating the projector correctly.
(*b*) Discuss and demonstrate the preliminary starting procedures performed before actual operation.
1. Blackout windows.
2. Seating arrangements.
3. Electrical outlets.
(3) Explain in detail and demonstrate the following operating procedures:
(*a*) Use of 2 x 2 slides.
(*b*) Use of 35mm film strips.
(*c*) Use of remote control unit BP–1.
(4) Summarize the lesson.

Instructor's note. Employ transparencies applicable to the subject matter.

e. Maintenance.
(1) *Objective.* To acquaint the students in the operator's maintenance of Projector Ph 222C and remote control BP–1, and Projector AP–6.
(2) *Lesson outline.*
(*a*) Introduce the lesson by distributing DA Form 11–256 and discuss the scope of operator's maintenance.
(*b*) Explain the use of maintenance form DA 11–256.
(*c*) Have students fill out maintenance form as each step is discussed.

f. Practical Exercise.
(1) *Objective.* To provide a practical application exercise in the operation of Projector Ph 222C with remote control BP–1 and Projector AP–6.

(2) *Lesson outline.*

(*a*) Conduct a practical exercise in the operation of the projectors.

1. Setting up equipment.

2. Operation of equipment.

3. Return to carrying case.

(*b*) Conduct a critique of the practice exercise.

Instructor's note. If still picture projector AP–6 is not available, instructor will devote full time to Projector Ph 222C with remote control BP–1. Divide students into equal groups, assign each group to a projector. Require each group to set up and operate the projector according to procedures previously taught. During the practice be sure that the students are rotated and question each student to insure that the principles of operation are clearly understood.

g. Examination.

(1) *Objective.* To conduct a written test of the student's knowledge of projectors Ph 222C with BP–1 and AP–6.

(2) *Lesson outline.*

(*a*) Administer test No. 3.

(*b*) Critique.

1. Correct test papers.

2. Discussion of test papers.

5. Still Picture Projector AP–4 and Opaque Projector AP–5 (2 Hours)

a. Objective. To familiarize the students with the description, purpose, and use and function of the Projector AP–4.

b. Nomenclature.

(1) Subject and outline material to be covered.

(2) Explain in detail and demonstrate the function and use of the major component parts of Projector AP–4.

c. Operation.

(1) *Objective.* To train the students to operate the Projector AP–4 and to acquaint the individual with the necessary maintenance regulations, procedures, and forms.

(2) *Lesson outline.*

(*a*) Conduct a practical exercise in the operation of Projector AP–4.

1. Setting up projector.

2. Operation of projector.

3. Return to case.

(*b*) Distribute maintenance form DA 11–256, and discuss the scope of operator's maintenance.

d. Objective. To familiarize the students with the description, purpose, use, and function of the Projector AP–5.

e. Nomenclature.

(1) Subject and outline material to be covered.

(2) Explain in detail and demonstrate the function and use of the major component parts of Projector AP–5.

f. Operation.

(1) *Objective.* To train the students to operate the Projector AP–5 and to acquaint the individual with the necessary maintenance regulations, procedures, and forms.

(2) *Lesson outline.*

(*a*) Conduct a practical exercise in the operation of Projector AP–5.

1. Setting up projector.

2. Operation of projector.

3. Return to case.

(*b*) Distribute maintenance form DA 11–256, and discuss the scope of operator's maintenance.

Instructor's note. Transparencies should be prepared locally for this instruction.

6. Overhead Projector Ph 637A (Vu-Graph) (2 Hours)

a. Objective. To familiarize the students with the description, purpose, use, and function of overhead projector Ph 637A.

b. Lesson Outline.

(1) *Introduction.* Introduce the subject and outline material to be covered.

(2) *Reference.* Explain in detail and demonstrate the function and use of the major component parts of Projector Ph 637A.

c. Operation.

(1) *Objective.* To train the students to operate the Projector Ph 637A.

(2) *Lesson outline.*

(*a*) Introduce the lesson by discussing the importance of properly operating the Projector Ph 637A.

(*b*) Discuss the preliminary procedures performed before actual operation.

(*c*) Explain in detail and demonstrate the following types of operation:

1. Front-view projection.

2. Rear-view projection.

(*d*) Summarize the lesson.

Instructor's note. In demonstrating the use of Ph 637A, the following types of material will be used: single cell transparency, multicell transparency, operable transparency, projecto acetate carbon and chemical reaction of fluids using a Petri dish as a receptacle, the use of iron filings with a magnet, and plastic operable transparencies.

d. Maintenance.

(1) *Objective.* To acquaint the students with the necessary maintenance regulations, procedures, and forms.

(2) *Lesson outline.*

(*a*) Introduce the lesson by distributing maintenance form DA 11–256 and discuss the scope of operator's maintenance.

(*b*) Explain the use of DA Form 11–256 and as each step of preventive maintenance is discussed the students will complete forms accordingly.

e. Practical Exercise.

(1) *Objective.* To provide a practical application exercise in the operation of Projector Ph 637A.

(2) *Lesson outline.*

(*a*) Conduct a practical exercise in the operation of Ph 637A.

1. Setting up of projector.

2. Operations of projector.

3. Return to case.

(*b*) Conduct a critique of the practical exercise.

Instructor's note. Divide the students into equal groups. Assign each group to set up and operate according to procedures previously taught. During the practice be sure that personnel are rotated and question each student to insure that the principles of operation are clearly understood.

f. Examination.

(1) *Objective.* To conduct a written test to ascertain students knowledge of Projector Ph 637A.

(2) *Lesson Outline.*

(*a*) Administer test No. 4.

(*b*) Critique.

(*c*) Correct test papers and discuss results.

Instructor's note Transparencies should be locally prepared for this lesson plan.

7. Public Address Set AN/UIH–2 (3 Hours)

a. Objective. To familiarize the students with the description, purpose, and use of Public Address Set AN/UIH–2.

b. Nomenclature.

(1) *Objective.* To familiarize the students with the functions and use of the controls on the PA Set AN/UIH–2.

(2) *Lesson outline.*

(*a*) Introduce the lesson by emphasizing the importance of using the PA Set AN/UIH–2 controls properly and in correct sequence.

(*b*) Explain in detail and demonstrate the function and use of the following units and controls.

1. Sound Reproducer.

2. RP–104 UIH–2.

3. Microphone M–23/U.

4. Loudspeaker Assembly LS–148/U.

(*c*) Summarize this lesson.

c. Operation.

(1) *Objective.* To train the students to operate the Public Address Set AN/UIH–2.

(2) *Lesson outline.*

(*a*) Introduce the lesson by discussing the importance of operating the PA Set correctly when used to play back, for public address and as a mixer.

(*b*) Discuss the preliminary procedures performed before actual operation.

(*c*) Explain in detail and demonstrate the following operating procedures:

1. Playback used in conjunction with Ph 222C and sound film strip.

2. Used as a public address set.

3. Mixer using microphone and recording.

4. Summarize the lesson.

Instructor's note. Employ transparencies which relate to subject matter.

d. Maintenance.

(1) *Objective.* To acquaint the students with the necessary maintenance regulations, procedures, and forms.

(2) *Lesson outline.*

(*a*) Introduce the lesson by distributing DA Form 11–238 and discuss the scope of operator's maintenance.

(*b*) Explain the use of maintenance form.

(*c*) Have the students fill out maintenance form and discuss each step.

e. Practical Exercise.

(1) *Objective.* To provide a practical exercise in the operation of PA Set AN/UIH–2.

(2) *Lesson outline.*

(*a*) Conduct a practical exercise in the operation of PA Set AN/UIH–2.

1. Setting up.

2. Operations.

3. Return to case.

(*b*) Conduct a critique of the exercise.

Instructor's note. Divide the students into equal groups, assign each group to a PA Set AN/UIH–2. Require each group

to set up and operate PA Set AN/UIH–2 in accordance with procedures previously taught. During the practice session be sure that personnel are rotated and question each student to insure that the principles of operations are clearly understood.

f. Examination.

(1) *Objective.* To conduct a written test to ascertain students knowledge of PA Set AN/UIH–2.

(2) *Lesson outline.*

(*a*) Administer test No. 5.

(*b*) Critique.

1. Correct test papers.

2. Discussion of the test.

8. Sound-Recorder Reproducer RD 87/U or RD 173 (3 Hours)

a. Objective. To familiarize the students with the description, purpose, and use of Sound-Recorder Reproducer RD 87/U or RD 173.

b. Lesson Outline. Introduce the subject and outline material to be covered.

c. Nomenclature.

(1) *Objective.* To familiarize the students with the proper functions and use of the controls on the RD 87/U or RD 173.

(2) *Lesson outline.*

(*a*) Introduce the lesson by emphasizing the importance of using RD 87/U or RD 173 controls properly and in correct sequence.

(*b*) Explain in detail and demonstrate the function and use of the various controls that are provided for the proper operation of the RD 87/U or RD 173.

(*c*) Summarize.

d. Operation.

(1) *Objective.* To train the students to operate Sound-Recorder Reproducer RD 87/U or RD 173.

(2) *Lesson outline.*

(*a*) Introduce the lesson by discussing the importance of operating RD 87/U or RD 173 correctly.

(*b*) Discuss the preliminary procedures performed before actual operation.

(*c*) Explain in detail and demonstrate the following procedures:

1. Microphone recording.

2. Recording from line.

3. Reproducing.

4. Dual track.

5. Winding and rewinding.
6. Erasing.
7. Editing.
8. Stopping procedures.

(*d*) Summarize the lesson.

e. Maintenance.

(1) *Objective.* To acquaint the students with the necessary maintenance regulations, procedures, and forms.

(2) *Lesson outline.*

(*a*) Introduce the lesson by distributing maintenance form DA Form 11–238 and discuss the scope of operator's maintenance.

(*b*) Explain the use of maintenance form.

(*c*) Have the students fill out maintenance form and discuss each step.

f. Practical Exercise.

(1) *Objective.* To provide a practical exercise in the operation of RD 87/U or RD 173.

(2) *Lesson outline.*

(*a*) Conduct a practical exercise in the operation of RD 87/U or RD 173.

1. Setting up.
2. Operation.
3. Return to case.

(*b*) Conduct a critique of the practical exercise.

Instructor's note. Divide the students into equal groups, assign each group to a RD 87/U or RD 173. Require each group to set up and operate RD 87/U or RD 173 in accordance with procedures previously taught. During the practice session be sure that personnel are rotated and question each student to insure that the principles of operations are clearly understood.

g. Examination.

(1) *Objective.* To conduct a written test to ascertain the students knowledge of RD 87/U or RD 173.

(2) *Lesson outline.*

(*a*) Administer test No. 6.

(*b*) Critique.

1. Correct test papers.
2. Discussion of test papers and results.

Instructor's note. Using the appropriate TM's, this lesson outline can be used to instruct in any other type of tape recorder.

9. Projecto-Printer (2 Hours)

a. Objective. To familiarize the students with the description, use and purpose of the projecto-printer.

b. Lesson Outline.

(1) Introduce the lesson by displaying and generally describing the printer.

(2) Explain in detail the purpose and use of the printer.

c. Nomenclature.

(1) *Objective.* To familiarize the students with the function and capabilities of the projecto-printer in the printing and developing of the transparencies.

(2) *Lesson outline.*

(*a*) Describe the component parts and their functions.

(*b*) Describe the expendable supplies.

1. Diazo foils.

2. Transferon material.

3. Transferon chemical and ammonia (dry and aqueous).

(*c*) Preparation for making transparencies.

(*d*) Making a transparency.

1. Using a translucent master.

2. Using an opaque master.

(*e*) Explain how the ES–19 Printer w/Kit can be used in the same manner as the projecto-printer.

d. Operation.

(1) *Objective.* To provide a practical exercise in the operation of projecto-printer in making transparencies.

(2) *Lesson outline.* Conduct a practical exercise in the operation of printer.

(*a*) Making a translucent master.

(*b*) Making a transparency by diazo method.

(*c*) Making a transparency by transferon method.

e. Maintenance.

(1) *Objective.* To instruct the students in the operator's maintenance of projecto-printer.

(2) *Lesson outline.*

(*a*) Emphasize the importance of keeping the equipment clean and the effects it has on the transparency when the printer is dirty.

(*b*) Summarize the lesson.

Instructor's note. If this is a projectionist Instructors course extend this lesson outline to 4 hours and omit lesson outline (Review (2 hours)).

10. Review (2 Hours)

(This completes first 40 hours of instruction.)

a. Objective. To provide a review of the operational capabilities of all audio-visual projection equipment previously taught.

b. Lesson Outline. Conduct a review on all audio-visual projection equipment previously taught.

(1) Capabilities and uses.

(2) Operator's maintenance.

(3) Operator's responsibilities as a projectionist.

c. Film and Equipment Exchange Services, Operations, and Procedures.

(1) *Objective.* To familiarize the students with film and equipment exchange services, operations, and procedures.

(2) *Lesson outline.*

(*a*) Introduce the lesson by distributing the following:

1. AR 108–30.

2. DA Pam 108–1, w/C.

3. DA Pam 310–5.

4. DA Form 11–43.

5. DA Form 11–44.

6. Local film and equipment exchange SOP.

7. Local reproduction of film and equipment exchange bulletin.

(*b*) Discuss the proper and correct utilization and procedures when using the above mentioned AR's, Pamphlets, and forms.

(*c*) Distribute the projectionist license (DA Form 11–78) and certificate of training (DA Form 87).

LESSON OUTLINE

Part II

11. Projecto-Printer (12 Hours)

Practical exercise:

a. Objective. To provide a practical exercise in the fabrication of visual aids for use with still picture projectors.

b. Lesson Outline. Conduct a practical exercise using varied techniques and methods in the production of effective visual aids.

(1) Sketch transparency using china-marking pencils, magic-marker, etc.
(2) Cut-out visuals.
(3) "Lift" method (rubber cement-clay coating paper).
(4) Diazo method.
(5) Transferon method.
(6) Bruning multicolor method.
(7) Transparency mounting techniques.
(8) Transparency design.
(9) Special techniques.
  (*a*) Projection of liquids.
  (*b*) Opaque projection silhouette (Vu-graph).
  (*c*) Polarized light (Vu-graph).

c. Summarize the lesson.

12. Review (8 Hours)

a. Objective. To give the students practice in setting up and operating all audio-visual projection equipment previously taught.

b. Lesson Outline. Each student will practice setting up and operating all types of projection equipment in order to increase his individual efficiency.

Instructor's note. The instructor will rate the student on his operational ability as "Exceptional," "Good," "Average," or "Below Average." This rating will be indicated with the numerical grade achieved by the student in his academic test.

13. Military Instruction (5 Hours)

a. Objective. To familiarize the students with the six principles of learning.

b. Lesson Outline.

(1) Explain briefly the six principles of learning.
(2) Show training film TF 21–2301, Military Instruction Part 1, Principle of Learning.
(3) Discuss the film in detail.

c. Stages of Instruction "Preparation."

(1) *Objective.* To familiarize the students with the stages of instruction, "Preparation."

(2) *Lesson outline.*

(*a*) Define briefly "Preparation" and its importance in military instruction.

(*b*) Show Training Film TF 21–2302, Military Instruction Part IIa, The Stages of Instruction-Preparation.

(*c*) Discuss the film in detail.

d. Presentation.

(1) *Objective.* To familiarize the students with the importance of "Presentation."

(2) *Lesson outline.*

(*a*) Discuss briefly the elements involved in "Presentation."

(*b*) Show Training Film 21–2304, Military Instruction Part IIc, The Stages on Instruction-Presentation.

(*c*) Discuss the film in detail.

e. Application, Examination and Review of Critique.

(1) *Objective.* To familiarize the students with importance of "Application, Examination, and Review of Critique."

(2) *Lesson outline.*

(*a*) Discuss briefly the importance of stimulating the students interest by "Application, Examination, and Review of Critique."

(*b*) Show Training Film TF 21–2304, Military Instruction Part IIc, The Stages of Instruction-Application, Examination and Review of Critique.

(*c*) Discuss the film in detail.

f. Training Aids.

(1) *Objective.* To familiarize the students with the use of audio-visual aids in military instruction.

(2) *Lesson outline.*

(*a*) Discuss the types, characteristics, and use of simple and complex training aids.

(*b*) Show Training Film TF 21–2305, Military Instruction Part III, Training Aids.

(*c*) Discuss the film in detail.

g. Speech Technique.

(1) *Objective.* To familiarize the students with the proper speech techniques and poise.

(2) *Lesson outline.*

(*a*) Demonstrate the proper speech technique and poise required to gain the attention of the students.

(*b*) Show training film TF 21–2306, Military Instruction Part IV, Speech Techniques.

(*c*) Discuss the film in detail.

(*d*) Summarize the lesson outline on military instruction.

14. Instruction Practice (8 Hours)

a. Objective. To evaluate the students as instructors.

b. Lesson Outline.

(1) Assign a specific section of this lesson plan to each student to prepare a lesson outline and present it to the class.

(2) Discuss the good points and faults of each student instructor.

Instructor's note. The instructor will grade each student on his practical teaching ability, poise, diction, delivery, etc., as "Exceptional," "Good," "Average," or "Below Average." This grade will be indicated with the numerical grade achieved by the student in his academic test.

15. Classroom Layout (2 Hours)

a. Objective. The advantages of properly locating a classroom site.

b. Lesson Outline. Discuss the advantages of having a properly located classroom, i.e., centrally located, availability of equipment, training aids, and the elimination of excessive noise and distracting sights, etc.

c. Types of Classroom Layouts.

(1) *Objective.* To acquaint the students with various types of classroom layouts.

(2) *Lesson outline.*

(*a*) Explain and demonstrate the physical seating arrangement, projection equipment layout, and the instructor position in various types of classrooms to allow maximum visibility of the screen for every member of the class.

1. Square classroom.
2. Oblong classroom.
3. Extra large classrooms.
4. Front and rear view projection.
5. Acoustical layout.
6. Electrical outlets and arrangements of cords.

(*b*) Summarize the lesson.

16. Teaching Principle (2 Hours)

a. Objective. To familiarize the students of teaching principles and the relationship and responsibility between the teacher and the students.

b. Lesson Outline.

Instructor's note. Training Films TF 11–1572 and MF 21–8424 may be shown, adjusting time as necessary. Use locally prepared transparencies to explain teaching principles.

17. Film and Equipment Exchange Procedures (3 Hours)

a. Objective. To acquaint the students with the operation of a film and equipment exchange.

b. Lesson Outline. Introduce and explain briefly to the class, AR 108–30.

(1) Explain the operation of a central film and equipment exchange.

(2) Explain the operation of a post film and equipment exchange.

c. Requesting.

(1) *Objective.* Explain the procedures for requesting films and the responsibility of the requesting agency.

(2) *Lesson Outline.*

(*a*) Distribute DA Pam 108–1 and DA Form 11–44.

(*b*) Explain the contents and use of DA Pam 108–1.

(*c*) Explain the use of DA Form 11–44.
Have the students fill out DA Form 11–44.

(*d*) Explain in detail the responsibility of the requesting agency and the projectionist.

d. Requesting Projection Equipment and Responsibility of Requesting Agency.

(1) *Objective.* Explain the procedures for requesting projection equipment and the responsibility of the requesting agency.

(2) *Lesson outline.*

(*a*) Distribute to the class DA Form 11–43.

(*b*) Explain the use of the DA Form 11–43.
Have the students fill out DA Form 11–43.

(*c*) Explain in detail the responsibility of the requesting agency and the projectionist.

e. Requesting Transparencies.

(1) *Objective.* Explain the procedures for requesting transparencies.

(2) *Lesson outline.*

(*a*) Distribute to the students DA Pam 310–5.

(*b*) Explain the contents of DA Pam 310–5 and the procedures for ordering transparencies.

f. Training Aids Subcenter.

(1) *Objective.* To familiarize the students with the operation of a training aids subcenter.

(2) *Lesson outline.* Conduct a tour of training aids subcenter and explain its operation.

g. Operation of a Film and Equipment Exchange.

(1) *Objective.* To show and describe the operation of a film and equipment exchange.

(2) *Lesson outline.* Conduct a tour of a film and equipment exchange and explain in detail its operations and responsibilities.

h. Graduation.

(1) *Objective.* Graduation.

(2) *Lesson outline.* Summarize the course and the responsibilities and authority of the projectionist instructor. Issue DA Form 11–78 and DA Form 87.

18. Text References and Training Aids

a. The specific technical manuals and equipment training aids used in connection with this course are listed below.

b. Using these aids in each case as a guide, the instructor will thoroughly cover the purpose, scope, limitations, and shortcomings. Using the discussion format explain assembling, repacking, troubleshooting, component, and operating parts, and the most efficient methods of employing the equipment.

c. Throughout the course, it is recommended that the conference method, demonstration and group participation be utilized to the maximum.

19. Necessary Equipment

a. 16mm Sound Motion Picture Projector Sets AN/PFP–1 and AS–2.

b. Still Picture Projector PH 222C and Remote Control BP–1.

c. Still Picture Projector AP–4.

d. Still Picture Projector AP–6.

e. Overhead Projector PH 637A.

f. Opaque Projector AP–5.

g. Public Address Set AN/UIH–2.

h. Tape Recorder RD 87/U or RD 173.

i. Projecto-Printer.

j. Printer ES–19.

k. Obsolete 16mm film and film strips.

l. Diazo material and ammonia.

m. Bruning Multicolor Kit #100.

n. Transferon material.

o. Illustration kit.

20. Text References

a. Army Regulations (ARs).

108–30 Operation of Signal Corps Film and Equipment Exchanges.

b. Department of the Army Pamphlets (DA Pams).

(1) 108–1

Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.

(2) 310–5
Index of Graphic Training Aids and Devices.

c. Miscellaneous Publications.

(1) Projecto Printer Instruction Book.
(2) Bruning Instruction Book Kit #100.
(3) Signal Corps Procedure Guide.

d. Field Manuals (FMs).

(1) 21–5
Military Training.
(2) 21–6
Techniques of Military Instruction.

e. Technical Manuals (TMs).

(1) 11–2331A
Projection Set AN/PFP–1 and Sound Motion Picture Projection Set AS–2.
(2) 11–2332
Projector PH 222C and Still Picture Projector AP–9.
(3) 11–2332A
Still Picture Projector AP–6.
(4) 11–2337
Still Picture Projector AP–4.
(5) 11–2323
Projector Ph 637/PFP and Ph 637A/PFP.
(6) 11–2329
Screens.
(7) 11–6730–208–10
Operators Manual Projector Set AN/PFP–1.
(8) 11–5380–200–10
Operators Manual Public Address Set AN/UIH–2 Reproducing Equipment NC 364–D Turnstable MX 932/U.

f. Supply Bulletins (SBs).

(1) 11–190
Supply Procedures for Diazo Materials used with Printing and Dry Developing Machine ES–19 (1) for Army Film and Equipment Exchanges.
(2) 11–217
Supply Procedures for Diazo Materials used with Printing and Dry Developing Machine ES–19 (1) for the Army ROTC and USAR Units.
(3) 11–278
Rear View Projection Kit and Rear Projection Screen.

(4) 11–483
Supply Procedures for Visamatic and Technamation Treatment Materials.

21. Training Aids

a. Training Films (TFs).

(1) 11–1572
Film Tactics.

(2) 11–1574
The Technique of Good Projection.

(3) 11–1752
How to Operate the Army 16mm Sound Projector Set.

(4) 21–2301
Military Instruction—Part I—Principle of Learning.

(5) 21–2302
Military Instruction—Part IIa—The Stages of Instruction-Preparation.

(6) 21–2303
Military Instruction—Part IIb—The Stages of Instruction-Presentation.

(7) 21–2304
Military Instruction—Part IIc—The Stages of Instruction-Application Examination and Review Critique.

(8) 21–2305
Military Instruction—Part III—Training Aids.

(9) 21–2306
Military Instruction—Part IV—Speech Techniques.

b. Miscellaneous Films (MFs).

(1) 11–7754
Facts About Film.

(2) 11–8634
Origins of the Motion Picture.

(3) 21–8424
Accent of Learning.

c. Transparencies.

Locally prepared transparencies.

d. Department of the Army Forms (DA Forms).

(1) 11–43 Projection and Audio-Visual Equipment Loan Order.

(2) 11–44, Films and Film Strips Loan Order.

(3) 11–238 Maintenance Check List for Signal Equipment.

(4) 11–256 Maintenance Check List for Signal Equipment.

1. When giving a show, all spare parts and accessories must be near which piece of equipment?

---

2. What is the length of the following cords?
   a. Permanent speaker cord---
   b. Speaker cord extension---
3. How close to center of the screen must the speaker be placed?

---

4. Is the speaker allowed to be placed upon the ground or floor during a performance?
   a. Yes---
   b. No---
5. What is the purpose of hooking the speaker cord to the legs of the stand when setting up for a performance?

---

6. What are the principal reasons for using more than one speaker?
   a. ---
   b. ---
7. The projector should be placed at the side of the room so that no one will trip over the speaker cord.
   a. True---
   b. False---
8. The projector should be placed high as is practical to avoid shadows of the audience upon the screen.
   a. True---
   b. False---
9. When fastening the ends of spring belts the projectionist must first apply counter turns.
   a. True---
   b. False---
10. Is it necessary to stop a projector if the feed spring belt or the takeup spring belt breaks during a show?
    a. Yes---
    b. No---
11. How often must the projector PH-652 be oiled?

---

12. If a projector burns out the fuses at short intervals, what should the projectionist do?

---

13. Is it possible to receive an electrical shock if the equipment is not properly grounded?

a. Yes_____
b. No_____

14. How does the projectionist test for positive ground contact?

_____
_____
_____

15. Why does the projectionist allow the motor to run a few seconds after turning off the projection lamp?

_____
_____

16. Can damage occur to film if the rewind switch is used to run the film in reverse?

a. Yes_____
b. No_____

17. Will finger prints lessen the life of the projection lamp?

a. Yes_____
b. No_____

18. When must a projection lamp be replaced with a new one?

_____
_____

19. If the projection lamp is not twisted completely into position what will the results be upon the screen?

_____
_____

20. What will the results upon the screen be if the projection lamp adjustment levers are not properly alined?

_____
_____

21. What is the wattage of the standard size projection lamp used in the projector set AN/PFP–1?

_____

22. What is the wattage of the maximum size projection lamp used in the projector set AN/PFP–1?

_____

23. Give two occasions when the maximum watt projection lamp must be used.

1. _____
2. _____

24. What is the average life of the following?
    a. Standard watt projection lamp_____
    b. Maximum watt projection lamp_____

25. The condenser lenses are used to focus an image sharply on the screen.
    a. True_____
    b. False_____

26. Is it permissible for the projectionist to remove lenses from their mounts?
    a. Yes_____
    b. No_____

27. Is it permissible for the projectionist to remove the reflector from the projector?
    a. Yes_____
    b. No_____

28. How often are the condenser lenses and reflector cleaned by the projectionist?

_____

29. What must be used to clean reflectors and lenses?

_____

30. Is the cleaning brush used to clean lenses?
    a. Yes_____
    b. No_____

31. Will oil accumulation upon lenses cause damage to lenses?
    a. Yes_____
    b. No_____

32. How should hardened emulsion or dirt be removed from the aperture plate and pressure shoe?

_____

_____

33. What are the three ways to make the projected picture and screen equal in size?
    1. _____
    2. _____
    3. _____

34. May any part of the projector be cleaned while the motor is running?
    a. Yes_____
    b. No_____

35. When cleaning the apertures, which must be removed first?
    a. Film channel_____
    b. Pressure plate_____

36. When replacing the film channel and pressure plate, which is replaced first?

a. Film channel_____

b. Pressure plate_____

37. In what position must the image on the film be placed in the film channel?

a. Right side up_____

b. Up side down_____

38. To replace or connect anything of electrical contact what lines must be disconnected first?

---

39. How many frames per second are the following speeds?

a. Silent speed_____

b. Sound speed_____

40. Film passes through the film channel for motion picture reproduction intermittently.

a. True_____

b. False_____

41. A 1 inch focal length lens will project a larger picture than a 2 inch focal length lens.

a. True_____

b. False_____

42. What is the standard focal length size projection lens used in all 16mm motion picture projectors and why is it the standard size?

---

43. With any given projection lens, to make the picture on the screen larger, should the projector be moved closer to or farther from the screen?

a. Closer_____

b. Farther_____

44. Using a 6 foot screen and a 2 inch focal length lens, what is the distance necessary between projector and screen to fill the screen properly?

45. What causes the picture on the screen to be blurred?

---

46. What is the last connection to be made on the projection equipment when setting up for a performance?

---

47. What is the first disconnection to be made after a performance?

---

48. Projection equipment should be stored, transported, and operated in an upright position.

a. True_____

b. False_____

49. List 16 items the projectionist must check as spare parts and accessories which must accompany the projector set AN/PFP–1.

1. _____ 9. _____
2. _____ 10. _____
3. _____ 11. _____
4. _____ 12. _____
5. _____ 13. _____
6. _____ 14. _____
7. _____ 15. _____
8. _____ 16. _____

50. Should the projection equipment be obtained from the film and equipment exchanges by projectionists to avoid possible damage by improper handling?

a. Yes_____
b. No_____

51. When transporting projection equipment should it be secured to avoid bouncing?

a. Yes_____
b. No_____

52. What electrical current will the following operate by?

a. Projector PH–652 AC_____ DC_____
b. Amplifier AM–424 AC_____ DC_____

53. When using the standard size projection lamp, how many watts are required to operate the projector set AN/PFP–1?_____

_____

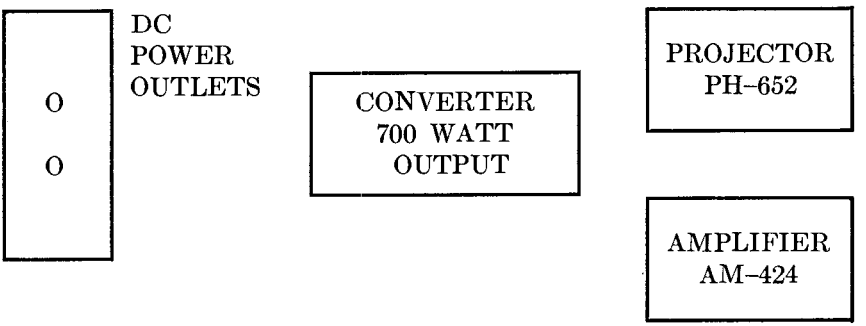
54. Which of the following may be used to operate the projector set AN/PFP–1?

a. 115 Volts_____230 Volts_____
b. 60 Cycles_____90 Cycles_____

55. What is the correct size fuse for the following?

a. Projector PH–652_____Amp.
b. Amplifier AM–424_____Amp.

56. Draw the connecting power lines only and mark each line AC or DC in the following diagram.



57. Name the two purposes for which the P. E. Cord is used.

1. ----------
2. ----------

58. Name the parts of the projector PH–652 that must be cleaned before each performance.

a. ----------
b. ----------
c. ----------

59. May silent film be projected with the projector PH–652?

a. Yes----------
b. No----------

60. Does silent film always show well when projected with the projector PH–652?

a. Yes----------
b. No----------

61. List the five ways by which a projectionist can be assured that the film has been wound upon the reel correctly.

1. ----------
2. ----------
3. ----------
4. ----------
5. ----------

62. At what parts of a reel of film does the greatest amount of damage occur?

a. ----------
b. ----------

63. If a projectionist discovers, while inspecting the film before a show, that the film is broken in the middle, should he tape the broken section or wind the film on separate reels? (Assuming no splicing machine is available).

---

64. If the projectionist forms an upper loop too large or too small, will damage occur during projection?

a. Yes----------
b. No----------

65. Why must film be threaded tightly at the sound head?

---

66. Is the threading knob used to test the film threading?

a. Yes----------
b. No----------

67. Which is the correct order of switches to be used when beginning a performance without the use of the douser?

a. ----------Amplifier switch, projector motor switch, projector lamp switch, gain control, house lights.

b. ----------Gain control, amplifier switch, house lights, projector motor switch, projector lamp switch.

c. ----------Projector motor switch, projector lamp switch, amplifier switch, house lights, gain control.

68. Should the projectionist stop the projector if the film breaks during a show?

a. Yes----------

b. No----------

69. Must the projector be stopped if the lower loop of the film at the film channel is lost?

a. Yes----------

b. No----------

70. Is the loop setter used to regain the lower loop of film?

a. Yes----------

b. No----------

71. Is the loop setter adjustment lever used to help eliminate picture jumping on the screen?

a. Yes----------

b. No----------

72. Is the loop setter adjustment lever used to eliminate travel ghosts upon the screen?

a. Yes----------

b. No----------

73. Must the projector be stopped if the upper loop of film at the film channel is lost?

a. Yes----------

b. No----------

74. What adjustment must be made after a show to rewind film on the projector PH-652?

---

75. To which part of the amplifier must the speaker cord be connected?

a. Output----------

b. Monitor----------

76. Name the three controls of the projector set AN/PFP-1 which must be at the "on" position before the exciter lamp will light.

1. ----------

2. ----------

3. ----------

76. Name the three controls of the projector set AN/PFP–1 which must be at the "on" position before the exciter lamp will light.

1. ----------
2. ----------
3. ----------

77. Will damage occur in the amplifier if the amplifier power is turned on while the speaker cord is not connected?

a. Yes----------
b. No----------

78. Before threading a projector how does the projectionist determine that there will be sound?

---

79. By what means is the variable light carried to the P. E. Cell?

a. Scanning lens----------
b. Prism----------
c. Exciter lamp----------

80. Name the immediate, on-the-spot checks a projectionist must make, should he discover there is not sound.

a. ---------- f. ----------
b. ---------- g. ----------
c. ---------- h. ----------
d. ---------- i. ----------
e. ---------- j. ----------

81. Film passes around the sound drum:

a. Intermittently----------
b. Constantly----------

82. Can a dirty sound drum cause a thumping sound in the speaker at regular intervals?

a. Yes----------
b. No----------

83. Who is responsible for producing the correct volume and tone quality in sound reproduction?

---

84. When is it permissible for the projectionist to change the tubes of the amplifier?

---

85. What are the two objects that produce the scanning beam?

a. ----------
b. ----------

86. Is the projectionist permitted to adjust the scanning lens assembly?

a. Yes_____
b. No_____

87. What intercepts the scanning beam to produce variable quantities of light?

_____

88. Will improper handling of film which may scratch the sound track produce unwanted sounds?

a. Yes_____
b. No_____

89. What two parts of the projector does the douser control?

1. _____
2. _____

90. Why must the lower loop of the threading at the film channel be the exact length as that formed by use of the loop setter?

_____
_____

91. When a silent projector must be used to screen a sound film, what two parts of the projector must be examined carefully before it can be declared safe to use?

1. _____
2. _____

92. What is the best manner by which damage to film by a projector can be determined during a show?

_____
_____

93. Is the framing knob used to frame the picture on the screen?

a. Yes_____
b. No_____

94. Should the projectionist step aside from the projector to listen to the sound in order to adjust the volume properly?

a. Yes_____
b. No_____

95. Once the volume is adjusted properly, is it necessary to be on the alert for possible increase or decrease in volume?

a. Yes_____
b. No_____

96. Should the douser be closed before the end of sound?

a. Yes_____
b. No_____

97. Without using the douser, which is the correct order of switches to be used when closing a show?

a. _____Projector lamp switch, house lights, projector motor switch, amplifier switch.

b. _____Amplifier switch, house lights, projector lamp switch, projector motor switch.

c. _____House lights, projector lamp switch, projector motor switch, amplifier switch.

d. _____House lights, projector lamp switch, amplifier switch, projector motor switch.

98. What adjustment must be made before beginning a show after rewinding film on the projector PH–652?

_____

_____

99. Is it permissible to splice film without using a splicing machine?

a. Yes_____

b. No_____

100. Which is the principal reason why film cement bottles must be closed tightly immediately after use?

a. _____To prevent evaporation.

b. _____To prevent loss of strength.

c. _____To prevent hardening.

Test No. 2 Projector AS–2

1. Check the type power that may be used to operate the AS–2.

a. AC_____ d. 60 Cycle_____
b. DC_____ e. 115 Volt_____
c. 20 Cycle_____ f. 230 Volt_____

2. What size fuse must be used in the following?

a. Projector, AQ–2_____
b. Amplifier, AQ–2_____

3. Will damage occur in the amplifier if the remote-local speaker switch is switched to the remote position without a remote speaker connection and power is put into the amplifier?

4. May the local speaker be used when giving a regular performance?

a. Yes_____
b. No_____

5. The pressure plate marked "For use with fixed lens carriage" is to be used with the AS–2.

a. True_____
b. False_____

6. Should the AS–2 be used for an audience of 150 personnel?

a. Yes_____
b. No_____

7. Check the following that are contained in the AS–2.

a. 15 Amp fuse_____ d. Change-over control_____
b. 1000 Watt lamp_____ e. Douser_____
c. P. E. Cord_____ f. Microphone hook-up_____

8. Can the speaker LS–170 of the projector set AN/PFP–1 used with the projector AS–2?

a. Yes_____
b. No_____

9. Can the local speaker be used simultaneously with the remote speaker?

a. Yes_____
b. No_____

10. Should the AS–2 be used in theaters?

a. Yes_____
b. No_____

Test No. 3 Projector Ph 222C and Remote Control BP–1

1. Check the type of power that may be used to operate the Ph 222C.
   a. AC_____ d. 60 Cycle_____
   b. DC_____ e. 115 Volt_____
   c. 50 Cycle_____ f. 230 Volt_____

2. What is the largest size lamp that may be used in projector Ph 222C?
_____

3. May the projectionist remove the condenser lenses from their mounts for cleaning purposes?
   a. Yes_____
   b. No_____

4. When framing a film strip is it necessary to unlock the operating knob?
   a. Yes_____
   b. No_____

5. What two sizes of film strip frames may be used with projector Ph 222C?
   a._____
   b._____

6. What are the four positions of the turret?
   a. _____
   b. _____
   c. _____
   d. _____

7. When setting the turret or glass apertures farther from the condenser lens which area will be covered by the condensed light?
   a. Larger area—for double frames_____
   b. Smaller area—for single frames_____

8. When projecting double frames must a mask be removed?
   a. Yes_____
   b. No_____

9. When must the index pin position be changed?
_____
_____

10. Check the type of power that may be used to operate the remote control assembly BP–1.
   a. AC_____ c. 20 Cycle_____ e. 115 Volt_____
   b. DC_____ d. 60 Cycle_____ f. 230 Volt_____

11. Check the masks included in the BP–1.
   a. Single frame_____
   b. Double frame_____

12. Must the position of the turret of the Ph 222C be changed to single or double in accordance with the use of single or double frame in the BP-1?

a. Yes_____
b. No_____

13. In what position must the glass apertures of the BP–1 be when projecting single frames?

a. Front_____
b. Rear_____

14. Does the BP–1 have a framing knob?

a. Yes_____
b. No_____

15. May Rear View projection with the Ph 222C be set up so that the instructor may change projected pictures from his position in the classroom?

a. Yes_____
b. No_____

16. What size slides may be used with the Ph 222C?

a. 2″ x 2″_____
b. 3¼″ x 4″_____

17. In what position must the cue mark of the slide be when placing the right thumb upon the cue for insertion when standing on the operator's side of the projector?

_____
_____

18. To typewrite on cellophane when fabricating slides which position must the emulsion side of the carbon be?

a. To the back of the cellophane_____
b. On top of the cellophane_____

19. May a smaller frame than the 35mm type be mounted and masked as a slide for use with the Ph 222C?

a. Yes_____
b. No_____

20. To place a cue mark in the correct position upon a slide, what two position steps must be taken?

a. _____
b. _____

1. Check the type of power that may be used to operate the PH 637A.
   a. AC_____ c. 50 Cylce_____ e. 115 Volt_____
   b. DC_____ d. 60 Cycle_____ f. 230 Volt_____

2. What size projection lamp is required?
   a. 500 watts_____
   b. 750 watts_____
   c. 1000 watts_____

3. Check the parts of the PH 637A that the projectionist must clean.
   a. Projector lamp_____ f. Fresnel lens_____
   b. Reflector_____ g. Glass projection stage_____
   c. Condenser lens_____ h. Projection lens_____
   d. Heat filter_____ i. Front surface mirror_____
   e. Rear surface mirror_____ j. Front window_____

4. Check the position in which the lamp cap cut out must be placed.
   a. Towards the reflector_____
   b. Towards the condenser lens_____

5. Should the copy holder be removed to use operable transparencies?
   a. Yes_____
   b. No_____

6. May grease pencil writings be removed from cellophane rolls and acetates?
   a. Yes_____
   b. No_____

7. How may a lucite pointer be obtained?

---

8. Which end of the cellophane holder must be engaged to the crank?
   a. Circular end_____
   b. Rectangular insert end_____

9. Which side of the Fresnel lens must face the projection lens?
   a. Concave side_____
   b. Convex side_____

10. Describe the procedure for elimination of a keystone picture.

Test No. 5 Public Address AN/UIH-2

1. The AN/UIH-2 operates on AC_____DC_____?

2. What size fuse is used in the AN/UIH-2? _____

3. The AN/UIH 2 may be operated with—

   a. 115 volts_____
   b. 230 volts_____
   c. 90 cycles_____
   d. 60 cycles_____

4. May the instructor or speaker superimpose his voice over the sound produced by a record?

   Yes_____ No_____

5. What are the three RPM speeds?

   a. _____ b. _____ c. _____

6. In what position must the stylus be set for microgroove recordings?

---

7. Does a change in power cycle affect the record sound reproduction?

   Yes_____ No_____

8. For what purpose is the neon lamp and stroboscope disc used?

---

9. Explain how syncronization of picture and picture change signal can be assured.

---

10. Explain the proper method of testing a microphone and how should a speaker be instructed to speak into the microphone.

Test No. 6 Sound Recorder-Reproducer RD 87/U or RD 173

1. RD 87/U or RD 173 operates on—
   a. 110–115 Volts Single Phase 60–70 CPS_____
   b. 108–122 Volts Single Phase 55–65 CPS_____
   c. 105–115 Volts Single Phase 50–60 CPS_____

2. What are the two speeds used in recording?
   a. _____ b. _____

3. On the RD 87/U or RD 173, the speed of recording is changed by changing—
   a. Speed control knob_____
   b. Using larger reels_____
   c. Size of the capstan_____

4. When recording voice what position must the microphone be?

---

5. Microphone recording, you must turn the master control to position marked record line?
   Yes_____ No_____

6. You are directed to record a speech, is it possible to use a previous recorded tape with orchestra music?
   Yes_____ Explain
   No_____

---

7. The RD 87/U or RD 173 requires lubrication monthly?
   Yes_____ No_____

8. What is the correct procedure in splicing tape?

---

9. What is the meaning of the letter LMH on the microphone impedance adjustment screw?
   L_____ M_____ H_____

10. When should the record level indicator eye just close?

APPENDIX III

TRANSPARENCY PREPARATION COURSE OUTLINE

Film and Equipment Exchanges using this outline will prepare transparencies to support this course or use existing transparencies where appropriate.

LESSON PLAN

Lesson Number: 1.

Lesson Title: Introduction and Orientation.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids: Film MN 6753C, "Preparation of Training Aids."

Objectives: To acquaint students with the course outline, facilities of the post, introduce students to Pictorial Officer and Director of Film and Equipment Exchange Services.

References: TM 11–2323, 11–2330A, Department of the Army Approved Transparencies Catalog.

Method of Instruction. Lecture.

Time: 1 hour, 30 minutes.

Introduction: Opening remarks by—

a. Pictorial Officer.
b. Director of Film and Equipment Exchange Services.
c. Instructor.

Orientation:

a. Course duration and hours.
b. Equipment and material covered.
c. Uniform requirement.
d. Smoking regulations.
e. Conduct while in class.
f. References.
g. Solicit questions.
h. Post automobile permits.
i. Quarters and mess facilities.
j. Location of Personnel and Finance Officer.
k. Recreation facilities:
(1) Type.
(2) Location.

Questions and Answers.

Summary: Dismiss men to attend to personal affairs.

1030–1200: Present film MN 6753C, Preparation of Training Aids.

Introduction: This film will show some of the techniques and processes we'll learn about. In general, most of the processes are designed for the production shop of a training aids center. Equipment shown in the film is one of the large type, while we will work with portable and field expedient type equipment.

LESSON PLAN

Lesson Number: 2.

Lesson Title: Overhead Projector PH–637/PFP and PH 637A/PFP, Nomenclature and Operation.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids: Overhead Projector PH–637/PFP, PH–637A/PFP, Fresnel Condenser, Transparencies; (1) PH–637, Functional Diagram; (2) Figure 7, TM 11–2323 Projection Lamp installed.

Objectives: To acquaint students with the PH–637, nomenclature, operation and maintenance.

References: TM 11–2323 (pars. 1–15, pages 3–9).

Method of Instruction. Demonstration and practical exercise.

Time: 1 hour, 15 minutes.

Introduction: 5 min. The Overhead Projector, PH–637/PFP and PH 637A/PFP is used to project transparencies on a screen. The transparency projected may be a slide, a sheet of acetate or plastic on which the operator may write or draw. The image is projected to a screen behind the operator so that he can face the audience while operating the equipment and lecturing. During this period you will become acquainted with this equipment, its nomenclature, principles of operation maintenance and care.

Body: 1 hr 10 min. The projector consists essentially of a housing that contains a projection lamp, an optical system, a projection stage, and a projection head assembly which includes a lens and a mirror. The head assembly is mounted on a supporting tube attached to the housing.

1. Show housing, point out the following:
   a. Switch and power receptacle (power cable, 15 ft).
   b. Open rear door of housing.
   Open lamp housing door.
   (1) Point out lamp (500 watts or 1000 watts) reflector, lamp cap, and condenser lens.
   (2) Have students remove and replace lamp, replacing lamp cap. Have students remove finger prints from lamp.
   (3) Close lamp housing door and rear door of housing.
   (4) Open side door on left side of housing, show condenser lens, filter (when using 1000 watt lamp) and rear surface mirror, blower, fresnel condenser. Allow students to examine extra fresnel condenser. Close door.
   (5) Show top of housing, point out—
   (*a*) Production stage 10″ x 10″ (fresnel condenser with plate glass cover).
   (*b*) Mounting hole for supporting tube and clamping knob used to lock tube in position.
   (*c*) Cellophane roll attachment. Install cellophane roll.
   (*d*) Show maskings.
2. Show supporting tube, point out—
   a. Rack.
   b. Place tube in mounting hole and lock in position.

3. Show projection head assembly, point out—
   a. Lens, 14", focal length.
   b. Front surface mirror, housing, and window.
   c. Supporting arm. Focusing knob and pinion.
   d. Place head assembly on supporting tube, point out—
      (1) Focus knob (have students focus projector).
      (2) Point out and demonstrate elevation knob.

(Have students adjust elevation—Warn against turning elevation knob too far, which will break mirror).

4. Show projector properly stored in case.

Summary: The overhead projector, PH–637/PFP, is designed to project transparencies on a screen. The operator may write or draw on the slide while it is being projected. The image is projected to a screen behind the operator so that he can face the audience while operating the equipment and lecturing. The projector is composed of three parts:

1. Housing.
2. Head supporting tube.
3. Projection head.

LESSON PLAN

Lesson Number: 3.

Lesson Title: Utilization Techniques and Training Potentials of PH–637, Overhead Projector.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids: Overhead Projector, PH–637; Filters; Red Carbon; Acetate Sheet; Plexiglass Blocks; small C-Clamp; Petridish; Carbon Coated Plastic; Chemical Dyes; Magnet; Iron Filings; Cellophane Roll; Grease Pencil; Cut-outs; Operable Transparencies.
(T) Advantages of Overhead Projector; (T) Summary of Special Advantages of PH–637; Transparency of DA Form 11–44 (blank 11–44); Overlays for Map Reading; Strip Tease Chart; Blank Form with overlays of material in colors; Organization Chart; Flow Chart; Table Chart; Graphs (a) Bar; (b) Pie; (c) Line; (d) Pictorial; (e) Area; Plastic Ink and Acetate Transparency; Typed Cellophane Transparency; Special Type Pencils; Grease Pencil on Acetate; Carbon-Coated Plastic; Diazo; Single Color; Multiple Color; Photographic Black and White; Color.

Objectives: To show special advantages, training techniques and potential of PH–637 Overhead Projector.

References: TM 11–2323 (pars. 15–25); Information Sheets.

Method of Instruction. Demonstration and Lecture.

Time: 1 hour, 45 minutes.

Introduction: 5 min. Use transparency covering advantages of overhead projector; cover with sheet of paper and disclose line by line. Point out that instructor can see through paper sheet.
1. The overhead projector is designed to be *instructor operated* in front of the training group.
2. Instructor faces group and maintains *eye contact.*
3. Page size transparencies are used.
4. Grease pencil may be used as a pointer. Key words or phrases may be circled or underscored.
5. Lecture notes may be attached to the margin of transparencies for ready reference.
6. Materials may be disclosed line by line as desired.
7. Overlays may be used to show progressive build-up or disclosure.
8. Cut-outs may be used to demonstrate tactical situations.
9. Operable transparencies show functioning and substitute for large make ups and cut-aways in many cases.

Body: 1 hr 35 min. 1. Fill in full size transparency of DA Form 11–44 while students follow step by step instructions with actual form.
2. Demonstrate how grease pencil is used as a pointer, and how pertinent points and key words can be underscored or circled.
3. Demonstrate how materials may be disclosed line by line. (Use cover sheets, point out that instructor can read through cover sheets—keeping ahead of students.)
4. Call attention to marginal notes.

5. Demonstrate overlays: Show how materials are developed. point by point.
   a. Map overlays.
   b. Form with color overlays.
   c. Strip tease chart.
6. Show types of charts:
   a. Organization.
   b. Flow or tree.
   c. Table chart.
   d. Cut-away.
   e. Diagram.
   f. Exploded view.
   g. Graphs:
      (1) Bar.
      (2) Pie
      (3) Line.
      (4) Pictorial.
      (5) Area.
7. Demonstrate use of cut-outs.
8. Demonstrate use of cellophane roll:
   a. For protection of photographic color transparencies.
   b. For extemporaneous drawings.
   c. Lesson notes prepared in advance with grease pencil.
9. Use of carbon coated plastic.

Summary: 5 min.

1. There are many types of transparencies and they may be prepared by a wide variety of methods:
   a. Pen and ink.
   b. Typed cellophane.
   c. Grease pencil on acetate.
   d. Carbon coated plastic.
   e. Special type pencils.
   f. Diazo, single color; multiple color.
   g. Photographic: Black and white and color.
2. Enumerate special advantages (show transparency of special advantages).

LESSON PLAN

Lesson Number: 4.

Lesson Title: Lay-Out Design.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids: AP–4, Tape Recorder, Slide Set, and Taped Commentary.

Objectives: To familiarize the student with basic fundamentals of design and layout needed for the production of effective graphic materials.

References: Instructors Notes.

Method of Instruction. Illustrated Lecture.

Time: 30 minutes.

Instruction: 5 min.

1. Graphics made possible the first recording and accumulation of experience other than through the memory of man. For example, as early as 20 to 25 thousand years B.C. in caves in France, primitive men with nontechnical vocabularies were communicating details of the hunt, travel and religious ceremonies.
2. Cave paintings illustrate the high degree of skill reached by early man in expressing himself pictorially.
3. Graphics speak a universal tongue surmounting language barriers. Temple carvings on the pylon of the temple of Ramessee III, Thebes, 1198–1167 B.C. depict a wild bull hunt, demonstrates the amount of information that can be communicated pictorially alone.
4. If our graphics are to have eye appeal and effectively communicate any ideas to others, we must consider some basic fundamentals of design and layout.

Body: 25 min.

1. Design is organization, the purposeful arrangement of the elements and details of a composition. Choosing and arranging constitute the process of designing. The elements of a graphic are lines, shapes, colors, copy (lettering), and space.
2. Before we begin the design of our visuals, we must consider the following:
   - *a.* Subject matter or use.
     - (1) What are we to communicate?
     - (2) What points, processes, operations, ideas need visualizing?
     - (3) How can material best be visualized: overlays, cutouts, animated devices, 2″ x 2″ or 3¼ ″x 4″ slides, transparencies, models, cutaways, specimens?
   - *b.* Audience.
     - (1) Background.
       - (*a*) Related experiences.
       - (*b*) Beliefs.
       - (*c*) Drives and anxieties.
       - (*d*) Prejudices.
       - (*e*) Vocabulary.
     - (2) Size (number).
   - *c.* Method of Production.
     - (1) Number needed.
     - (2) Time.
     - (3) Cost.

3. Composition is the arrangement of the elements of a design. Balance is one of the most important elements of design we will consider. We have a tendency to remain in balance. When we observe something out of balance it is disturbing or not pleasing; likewise, those visuals, unbalanced in composition, are not as pleasing as those with good arrangement. Balance is of two types: formal and informal.

a. Formal balance is illustrated here with equal figures or objects on each side of a composition as with equal figures on a see-saw.

b. Informal balance is where unequal figures or objects are balanced by their placements.

c. Figure C illustrates formal balance in nature. The equal tree masses on each side of the composition balance each other.

d. Figure D illustrates informal balance in landscape.

e. Figure E shows the formal balance in the division of space or areas.

f. Figure F illustrates informal balance in the division of space or areas. Here large areas are balanced by opposite small areas. This division is more interesting than the equal division in Figure E.

4. Scientific studies show the eye is attracted to the spot or line that is—

a. Most contrasting.

b. Largest.

c. Most irregular.

d. Nearest the margin.

e. Moves from left to right (this is due to our reading habits).

f. Warm colors (these attract more attention than cool colors).

5. The path the eye takes through or about a composition is called movement. We can direct the eye to points of emphasis by the use of lines, arrows, numbers, and colors. A conscious consideration of these factors in planning and layout will result in materials which have more impact, eye appeal, and communicate or ideas clearly to our audience. When we look at a visual our eye comes to rest at a point in the upper left hand corner and moves to the right and downward. Important points should fall along those lines.

a. Numbers and colors can be used to give emphasis and organize material.

b. Shaded areas can be used to represent key words or phases of copy in color. Attention from word or phrase at upper left is brought down to the word or phase at lower right by a red line and this illustrative matter represented by the blue rectangle.

c. Color and an arrow can be used to bring attention to the key point of the chart. Key statements, set off by red copy, can be represented by shaded areas. Key points can be emphasized by the red spots.

6. In general, our visuals will be more effective aud communicate our ideas clearly if we—

a. Make material as pictorial as possible.

b. Keep the visuals simple (avoid details); use simple stylized easily recognized symbols.

c. Say what we have to say with as few words as possible.

d. Make materials self-explanatory.

Discussion:

1. What is our first consideration before we design a visual? Use? Subject matter?

2. How does the audience affect our design? (Background: experiences, training, beliefs, motivations, fears, prejudices, vocabulary.)

3. What factors determine method of preparation?

4. In what ways can we emphasize a particular element of a composition?

Contrast: make it larger; different; place near margin; have it move from left to right; by use of warm colors.

LESSON PLAN

Lesson Number: 5.

Lesson Title: Lettering and Legibility Standards.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids: PH–637, Cellophane Roll, grease pencil, Lettering Set, Transparencies; Use of Guide Lines, Spacing; Legibility Chart, Chart of Art Work Standards, Drafting Equipment, Photographic Letters.

Objectives: To familiarize the student with the fundamentals of lettering, the use of guide lines, spacing and legibility standards.

References: Instructors Notes.

Method of Instruction. Demonstration and Practical Application.

Time: 1 hour.

Introduction: 5 min. Most visuals contain some copy. It is important that we consider some basic fundamentals and standards for producing legible attractive copy.

1. Stick to plain letters without serifs, avoid fancy variations.
2. Keep letters uniform in height.
3. Watch spacing both between letters and lines.
4. Make lettering large enough to be read by the audience.
5. Limit copy to as few words as possible. To ask the audience to read only increases our problem of communication.

Body: 25 min.

1. Stick to plain letters without serifs. For short statements, titles, and labels stick to upper case (capital) letters alone.

2. Keeping letters uniform in height is of foremost importance in the appearance of copy. This is accomplished by the use of guide lines. Both top and bottom of letters should stay on guide lines. When lettering on transparent or translucent material, place sheet with guide lines underneath material; then guide lines will not have to be erased from finished drawing.

3. Spacing of lettering is done mechanically or optically. It is the area between letters that must be kept equal and not the distance. Open or circular letters must be closed up to give a pleasing appearance, while straight letters are spaced farther apart. (Demonstrate how legibility and unity are destroyed by mechanical arrangement.) Using a "ruler" to measure the width or distance between letters seldom produces pleasing results and is generally detrimental to legibility. Line spacing is important to legibility. If lines are too close they will be hard to read. A good starting point in line spacing is a line spacing of 1½ times the height of letters.

4. Lettersize:

a. For black and white line subjects such as text, tables, graphs and outline sketches:

Viewing Distance	*Minimum Symbol Size*
128 feet	4 inches
64 feet	2 inches
32 feet	1 inch
16 feet	½ inch
8 feet	¼ inch

b. When upper and lower case letters are used it is the body height of the lower case characters that is used to determine the minimum size of the letters.

5. Legibility requirements for lettering:

a. Smallest number or letter symbols for satisfactory legibility when viewed from a distance of six times the horizontal width of the image (6″ wide, ⅛″ high):

(1) Use Lettering Pen Point No. B–6.

(2) Use Lettering Pen No. 2.

b. Smallest number or letter symbols for satisfactory legibility when viewed from a distance 12 times horizontal width of the projected image (12 width, ¼″ high):

(1) Use Lettering Pen Point No. B–4.

(2) Use Lettering Pen No. 5.

c. Lettering for projectable materials, transparencies, and slides: An image on the transparency is magnified five times at Projector-to-Screen distance of six feet. Thus at a minimum caption size of 1/10″, the screen image will be ½″ at six feet. The image grows larger in indicated ratio as the projector is moved away from the screen.

d. With 20x20 vision, you should read ⅜″ letters at 20 feet.

6. Art Work Size for Projected Visuals:

a. Size should be convenient for the artist.

(1) Too large work encourages treatment too delicate for good legibility.

(2) Too small calls for extreme care in reproduction.

(3) Size should be convenient for filing.

(4) The standard size should permit the same art work to be used for all types of projected visuals.

b. Overall size: all art work should be on 8″x10½″ stock.

c. Image size:

(1) For 2″x2″ and 3¼″x4″ slides, art work should be designed so that it presents a good and neat area, 6⅝″ x 9¼″ in size.

(2) The details of the art work to be seen by the audience must lie within an area 5¾″ x 8⅜″. This is called the safe area.

(3) For 8″x10″ transparencies for the overhead projector, the "safe area" should be 5¾″x7⅜″.

Individual Assignments: 30 min.

1. Letter name, using ½″ high letters. Space all letters ¼″ apart using ruler beneath first letter of name, spacing letters optically.

2. Letter name, rank, and organization on two lines, utilizing ½″ high letters.

3. Make name plate with ultra-foil, print on diazo paper.

4. Make name plate with photographic letters for book cover.

LESSON PLAN

Lesson Number:	6.
Lesson Title:	Work Shop, Preparation of Transparency Using Matte Surface Acetate and Special Pencils.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Material.	Acetate and Special Pencils (assorted colors); drawing board, 8″x10″ original to trace from, film print coater, T-Square, masking tape, triangle, and transparency mount.
Objective:	To teach students to prepare a ready-to-use color transparency without printing or photographic equipment.
References:	Instructors notes, Material Cost Data.
Method of Instruction.	Practical Application.
Time:	45 minutes.
Introduction: 5 min.	1. Explain process of using special pencils on matte surface acetate to produce art work and lettering in various colors. Second step is to apply film print coater to convert the matte to a smooth clear surface to produce a projectable transparency. 2. Give out materials.
Body: 35 min.	Instruct class to proceed in the following manner: 1. Place original on drafting board face up with tape. 2. Place acetate, matte surface up, on top of original, tape. 3. Trace in outline of subject with black pencil (#1 or #2). 4. Color details with special pencils. 5. Apply film print coater to acetate. 6. Mount transparency. 7. Project on PH-637/PFP or PH-637A/PFP.
Summary: 5 min.	Discussion of process.

LESSON PLAN

Lesson Number: 7.

Lesson Title: Work Shop, Preparation of Transparency using clear acetate, plastics, inks, felt tipped markers, carbon paper, and carbon coated plastic.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids and Materials. Clear acetate sheets (10"x10"), plastic inks (assorted colors), felt tipped markers (assorted colors), red carbon paper, carbon coated plastic, T-square, drawing board, ball pens (assorted), triangle, typewriter, transparency mounts, and original to trace from.

Objective: Teach students to prepare a ready-to-use transparency without printing or photographic equipment.

References: Instructors notes.

Method of Instruction. Practical application.

Time: 1 hour.

Introduction: 10 min

1. Explain process of using plastic inks, carbon paper with typewriter, and felt tip markers on clear acetate. Explain the use of carbon plastic for a negative approach to transparencies.
2. Give out materials.

Body: 45 min.

1. Instruct class to proceed as follows:
   a. For carbon paper and plastic method:
      (1) Place acetate sheet between two sheets of red carbon paper with carbon sides next to acetate.
      (2) Place sheet of black paper next to one of the carbon paper sheets.
      (3) Place in typewriter so that blank paper will be facing keys.
      (4) Type name and address or other material as desired.
      (5) Remove from typewriter.
      (6) Place on drawing board with blank paper up and draw or write with #3 pencil.
      (7) Remove acetate and project on overhead projector.
      (8) Show to mount this type transparency between two sheets of acetate if to be used as permanent slide.
   b. Carbon coated plastic method:
      (1) Place carbon coated plastic, carbon side up, on stage of overhead projector.
      (2) Turn on projector.
      (3) Write or draw as desired on plastic with ball point pen or hard pencil or stylus.
      (4) For color effect place colored acetate underneath carbon coated plastic on projector stage.
      (5) May be used as master for negative diazo print.
   c. Plastic ink on acetate method:
      (1) Tape original on drawing board.
      (2) Tape clear acetate on top of original.
      (3) Trace with black plastic ink, using speed ball pens.
      (4) After drying, remove acetate, turn over and color, using felt-tip marking pens.
      (5) Mount transparency.
      (6) Project on overhead projector.

Summary: 5 min. Discussion.

LESSON PLAN

Lesson Number:	8.
Lesson Title:	Work Shop, Cut-outs using colored acetate and masking tape.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	10″x10″ colored acetate, 1″ or wider; masking tape, scissors, drawing board, pencil #2, cut outs to trace from, plastic cement, colored transparent tapes, knife.
Objective:	To teach students to make cutouts for use with transparencies.
References:	Hand out sheet on cutouts.
Method of Instruction.	Practical application.
Time:	30 minutes.
Introduction: 5 min.	Explanation of methods and reason for using cutouts. Hand out materials.
Body: 20 min.	Instruct class to proceed as follows: 1. Cover colored acetate sheet with masking tape and place on drawing board. 2. Trace off patterns on masking tape. 3. Cut out patterns with scissors. 4. Remove masking tape from cutouts. 5. Make handles with scraps of clear acetate, attach to cutouts with plastic cement, allow to dry. 6. Place a transparency on stage of overhead projector. 7. Maneuver cutouts on transparency during projection. 8. Affix colored transparent tapes to transparency.
Summary: 5 min.	Discussion.

LESSON PLAN

Lesson Number: 9.

Lesson Title: Portable Transparency Printer ES–19, Nomenclature and Operation.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids: Transparency Printer ES–19; 3 sheets diazo film; ammonia; 1 sheet diazo paper; pen and ink tracings; transparentizing solution; original print suitable for transparency.

Objective: To familiarize students with the ES–19, nomenclature, operation, and maintenance.

References: Operation and Maintenance Guide to Portable Transparency Printer.

Method of Instruction. Demonstration and lecture.

Time: 45 minutes.

Introduction: 5 min.

1. The portable transparency printer, ES–19, is a device for making transparencies or slides by the diazo method. The ES–19 also can be used either for the exposure and dry development of diazo materials or for the exposure of photographic auto positive materials which require processing in trays of conventional photographic solutions.

2. Diazo materials:

a. The word "diazo" refers to a class of light-sensitive chemicals which, in the presence of ammonia, will form dyes. However, when these chemicals are exposed to ultraviolet light, they lose their capacity to form dyes.

b. Manufacturers of diazo materials coat such base materials as paper, clear plastic, and fabrics with a sensitized emulsion. Diazo paper may be used for making paper prints of letters, drawings, etc. Diazo materials coated on a base of clear plastic are used for producing transparencies in various colors.

Body: 35 min.

The portable transparency printer, ES–19, is composed of two units—Printing Unit and Developing Unit. Entire unit weighs 40 pounds.

1. Show ES–19 assembled for carrying.
2. Separate the printing unit from the developing unit.
   a. The printing unit consists of:
      (1) Housing—containing seven 15 watt "blue-light" fluorescent lamps, rich in ultra-violet, together with their starter and ballasts.
      (2) Momentary switch.
      (3) Master switch.
   b. Loosen fasteners and show how lamps and starters are removed and replaced. Point out switches.
   c. Close cover and fasten fasteners. Point out:
      (1) Printing glass.
      (2) Pressure plates and pressure springs.
      (3) Arm and latch.
      (4) Call attention to how momentary switch is closed when arm is latched down.

d. Show timer. Timer can be set up to 10 minutes; each minute of scale is divided into 15 second intervals. Materials should be single sheet and should make a good contact, or prints will not be sharp and clear. If springs have become sprung, they may need bending to insure sufficient pressure.

e. Demonstrate and point out components of the developing unit. The developing unit consists of—

(1) Housing. This consists of an upper and lower portion separated by an ammonia pan. The upper portion or ammonia chamber contains a window through which development can be observed. The lower portion contains a heating chamber which contains a heater, thermostat, and pilot light. Demonstrate how these are adjusted and pilot lamp replaced.

(2) Ammonia Storage and Dispensing System. This consists of a bottle mounted on a special bracket. The bottle is opened and closed by means of a bulb controlled by a pair of cam-activated shut-off clamps arranged to prevent simultaneous release of both clamps. The end of the bulb terminates in a stainless steel tube which projects through a hole into the wall of the ammonia chamber. Experience shows that the tube clogs where clamped. In practice, it has been found advisable to use the bottle without placing it in the bracket. Hold the bottle in hand, insert stainless steel tube in the ammonia chamber and squeeze bulb each time needed.

(3) Copy Tray. The film is placed, dye side up, under hold-down springs.

3. Operation—Demonstrate:

a. Place the printer on a table, connect the power cable of printer and the developing unit. The developing unit should be at least 5 feet away from the printing unit to prevent ammonia fumes from spoiling open packages of diazo materials.

b. Place the master to be copied on the printing glass, ink side up.

c. Place the diazo film, dye side down, on top of the master. (Show how to determine dye side.)

d. Set the timer for approximately 1 minute.

e. After exposure, place the film in the developing tray of the developing unit. Place the tray in the ammonia chamber, squirt ammonia into the chamber and watch the development through the window. If details are being lost, reduce exposure time. If there is background color, increase exposure time.

Summary: 5 min. A question and answer period.

LESSON PLAN

Lesson Number: 10.

Lesson Title: Projecto-Printer, Nomenclature, and Manipulation.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids: Projecto-Printer, Ammonia, 1 sheet diazo film or paper; to be reproduced.

Objective: To familiarize the student with the nomenclature and operating procedure of the Projecto-Printer.

References: Operating Instruction of Projecto-Printer; TM 11-2323; Instructors notes.

Method of Instruction. Demonstration.

Time: 1 hour.

Introduction: 5 min. The Projecto-Printer is designed for preparing transparencies for use on an overhead projector. Transparencies may be made from all types of materials—transparent, translucent, opaque, two-sides printed, bound or unbound. This unit is designed for 8½"x11". The Projecto-Printer, like the ES-19, uses both diazo materials and photo reflex materials. The photocopy process of the Projecto-Printer uses a single solution development process.

Body: 50 min.

1. The Projecto-Printer is composed of the Printer and Case; Diazo Developing Unit; and Photocopy Processor. Point out and demonstrate function of the following components:

a. Case.
b. Air pump.
c. Yellow or orange filter.
d. Air cushion.
e. Printer.
  (1) Blue light fluorescent tubes.
  (2) Printing glass.
  (3) Timer, 2 minutes, sealed, marked in seconds.
  (4) Two-case latches.
f. Diazo developer.
  (1) Plastic shell.
  (2) Metal insert circuit.
    (*a*) Lamp, switch.
    (*b*) Copy holding springs.
  (3) Sponge.
g. Photocopy Processor.
  (1) Rubber pressure rollers.
  (2) Crank.
  (3) Chutes.
  (4) Siphone and bottle assembly.
    (*a*) Plastic bottle and cap.
    (*b*) Rubber tubing.
    (*c*) Plastic tube.

2. Operation: The Projecto-Printer and ES-19 operate the same for exposing either diazo or photo reflex materials. We have discussed the diazo process in the preceding lesson.

a. Place material to be copied on plexiglass printing glass, ink side up.

b. Place diazo film, emulsion side down, on original. Show how emulsion side is determined by notch in film.

c. Set timer for approximately 2 minutes.

d. After exposure:

(1) Place diazo film, dye side out, around metal insert of developing unit secure with copy holding springs.

(2) Saturate sponge with 26% aqua ammonia.

(3) Return insert to plastic shell. Watch development. Allow unit to warm up before use. If details of design are being lost, decrease exposure time. If there is background color, increase exposure.

Summary: 5 min.

You will note that the Projecto-Printer and ES–19 operate the same in producing diazo prints or transparencies. The developing unit of the Projecto-Printer is simpler and more foolproof. In the following lesson we will discuss the Photo-Reflex process. After this, we will demonstrate the Photocopy Processor.

LESSON PLAN

Lesson Number:	11.
Lesson Title:	Lecture on Reflex Printing.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids:	PH–637, Transparencies.
Objective:	To familiarize students with the principles of reflex printing and why it is used.
References:	Manual for Portable Transparency Printer; Projecto-Printer Manual; TM 11–2323, par. 29; Instructors notes.
Method of Instruction.	Lecture.
Time:	30 minutes.

Introduction: 5 min.

1. Reflex printing is a method of copying in which we can copy materials printed on both sides or on opaque material. In the reflex method, light passes through the light sensitive material or film to the surface of the original being copied. Light is reflected back by the white areas of the original to the light sensitive film. The dark areas do not reflect light back. Only the additional exposure caused by the reflected light affects the film. The direct light has no appreciable affect.
2. There are two types of reflex materials that we will study:
   a. Those requiring wet development by conventional photographic chemicals.
   b. Those photo-copy materials processed by a semimoist one chemical process.
3. Both the ES–19 and the Projecto-Printer can be used for reflex printing. The Projecto-Printer is equipped with a special processing unit for one chemical material.

Body: 22 min.

1. With the two printers, the exposure process is the same. First we will consider the ES–19:
   a. Place yellow or orange filter on printer.
   b. Place reflex material, emulsion side up, on filter.
   c. Place original, image side down, on film.
   d. Expose (exposure varies with reflex material and reflective quality of surface of material to be copied).
   e. Develop exposed material, wash and dry.
2. Operation of Projecto-Printer, utilizing one solution materials (show transparency):
   a. Place yellow or orange filter on printing glass.
   b. Place negative paper, emulsion side up, on filter.
   c. Place original, image side down, on film (lift image from a TM without removing page from book).
   d. Expose approximately 15 seconds.
   e. Place photocopy film, emulsion side down, on right hand chute of processing unit.
   f. Place exposed negative paper, emulsion side down, on left hand chute of processing unit.
   g. Turn crank of unit clockwise slowly so that it takes 15 seconds for papers to go through unit.
   h. Observe image turn from white to dark brown. Peel apart and project.

3. If materials are too dark, they are underexposed—increase exposure time. If materials are too light, they are overexposed—decrease exposure time.

4. Reflex materials:

a. Materials requiring conventional photochemicals for processing (Show transparency listing materials).

b. Materials requiring one solution development (Show transparency listing materials).

c. Materials such as half-tones and continuous tone use autopositive film. For masters for line drawings use papers as they are cheaper than films and are satisfactory when transparentized. Highlight transparent paper does not require transparentizing.

5. We will take up each type of material during work shop periods.

Summary:
3 min.

Questions and answers. Discussion.

LESSON PLAN

Lesson Number:	12.
Lesson Title:	Demonstration, Mixing of Chemicals for Photo Reflex Process.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	4 photo processing trays, auto-positive paper, auto-positive film, originals, photographic paper, developer, short stop (acetic acid), acid fixer, water, 3 each gallon bottles, graduate (1 qt size), funnel, glass stirring rod, and blackboard.
Objective:	To familiarize students with chemicals to be used in subsequent lessons.
References:	Instructions on Chemical Containers.
Method of Instruction.	Demonstration.
Time:	30 minutes.
Introduction: 5 min.	Students copy formula from blackboard.
Body: 20 min.	Demonstrate mixing of chemicals as follows: 1. Developer: *a.* Prepare stock solution by pouring contents of developer can into 3 qts of warm water (100° F.) while stirring with sufficient agitation to keep chemicals suspended. Use 1 gallon bottle for mixing. *b.* Add water to make 1 gallon. Continue stirring until all chemicals are dissolved and a uniform solution is obtained. *c.* Pour 32 oz of stock solution in developer tray and add 64 oz of water. Stir. 2. Short Stop: *a.* Add 3 oz of acetic acid to 8 oz of water to prepare a stock solution. *b.* Pour 32 oz of water into photographic tray and add 1½ oz of stock solution of acetic acid and stir. 3. Acid Fixer: *a.* Pour contents of Fixer container into 3 qts of water (not above 80° F.) while stirring; stir until powder is dissolved completely. *b.* Add 1 qt water; stir. *c.* Pour desired amount into photographic tray. 4. Pour water into fourth tray. Water should be continuously replenished if possible.
Summary: 5 min.	Discussion.

LESSON PLAN

Lesson Number:	13.
Lesson Title:	Demonstration, Printing from Opaque Material on Auto-Positive Paper and Film, and Repro-Negative Paper.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	ES–19 Projecto-Printer, white light fluorescent tubes, filter, chemicals mixed in previous lesson, auto-positive paper and film, repro-negative paper and originals.
Objective:	To familiarize students with photo-reflex printing and developing.
References:	Instructors notes, Cost Data Sheet.
Method of Instruction.	Demonstration.
Time:	15 minutes.
Body:	1. Proceed according to paragraph 1 of body of lesson plan #11. 2. Print repro-negative paper in same manner. 3. Emphasize advantages of white light over blue in printing auto-positive film and paper. Film cannot be printed with blue light.
Summary:	Discussion, checking results.

LESSON PLAN

Lesson Number:	14.
Lesson Title:	Field Expedients, Photo-Reflex Process.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Printing Frame, No. 2 photoflood lamp, clamp socket and cord, 4 trays, photo chemicals mixed in lesson 12; yellow or orange filter, auto-positive paper and film, and repro-negative paper.
Objective:	To demonstrate how transparencies may be made by photo-reflex method without projecto-printer or ES–19.
References:	Instructors notes.
Method of Instruction.	Demonstration.
Time:	15 minutes.
Introduction: 2 min.	Explain why field expedients are used.
Body: 12 min.	1. Demonstrate exposure as follows: *a.* Load printing frame. (1) Place filter next to glass. (2) Place auto-positive film next to filter emulsion side away from glass. (3) Place original face down on auto-positive film. *b.* Close printing frame. *c.* Expose to No. 2 photoflood approximately 1 minute. 2. Remove film and develop in photo chemicals. 3. Repeat with auto-positive paper and with repro-negative paper. 4. Repeat demonstration using sunlight instead of photoflood with auto-positive paper, if weather will permit.
Summary: 1 min.	Observe results.

LESSON PLAN

Lesson Number:	15.
Lesson Title:	Work Shop, Photo Reflex Printing and Developing.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	As described in Lesson 13.
Objective:	To give students practical exercises in preparation of masters for transparencies by Photo Reflex method.
References:	Cost Data Sheet, Instructors notes.
Method of Instruction.	Practical applications.
Time:	1 hour 45 minutes.
Introduction: 10 min.	Hand out materials, explain handling of sensitized materials, and give instructions as to what students are to do and on utilization of equipment.
Body: 1 hr 35 min.	Supervised preparation of master by students in accordance with instructions in lesson plans 9 through 14. Check results as work progresses.
Summary:	1. Discussion. 2. Instructions as to future use of master made by photo-reflex process.

LESSON PLAN

Lesson Number: 16.

Lesson Title: Lecture-Demonstration on Transfer Process Reflex Printing.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids and Materials. Projecto-printer and associated equipment; ES–19; orange or yellow filter; negative standard paper and opaque positive paper, negative waterproof paper and translucent positive paper and transparent positive film (8½" x 11"); processing solution; original material to be reproduced.

Objective: To teach students the transfer reflex process.

References: Operating Instructions for Projecto-Printer; Instructors notes.

Method of Instruction. Lecture-Demonstration

Time: 1 hour.

Introduction: 5 min.

1. State that transfer process is used when projecto-printer is available or when ES–19 with transfer process kit is available.
2. Process uses one chemical and a mechanical processor to produce paper copies, masters, or transparencies from opaque originals.
3. This process is recommended for reproduction of line drawings and is not as reliable for half tones as the photo-reflex process.

Body: 50 min.

1. Mix chemicals.
   a. Read instructions on container.
   b. Follow instructions and mix chemicals.
2. Show materials and explain use and care.
3. Load paper safe with standard negative paper.
4. Pour chemicals in processor and describe operation of processor.
5. Print from an original on negative paper.
   a. Place filter on stage of projecto-printer.
   b. Place original face up on stage.
   c. Remove standard negative paper from paper safe.
   d. Place negative paper emulsion side down on original.
   e. Pick up original and negative paper and turn over and place on stage with negative paper next to light source.
   f. Close printer.
   g. Set timer (approximately 25 seconds).
   h. Print.
6. Develop positive.
   a. Place positive paper on short flap, and engage with roller, with emulsion side turned toward flap.
   b. Remove negative paper from printer and place on opposite flap with emulsion side next to flap.
   c. Insure that negative and positive are snug against respective rollers.
   d. Turn photocopy processor slowly in clockwise direction so that it takes about 15 seconds for papers to go through.
   e. Allow completion of development (10 seconds).
   f. Separate positive and negative.

7. Check results.
   a. If background is too dark, increase exposure.
   b. If image is too light or burned out, decrease exposure.
8. Repeat process using waterproof negative paper with translucent paper and with transparent film.
9. Check results as above.

Summary: 5 min. Discussion.

LESSON PLAN

Lesson Number:	17.
Lesson Title:	Work Shop on Reflex Printing with Negative and Positive Materials.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Same as Lesson 16.
Objective:	To give students practical exercise in producing reflex, copies, masters, and transparencies by transfer processes.
References:	Same as for Lesson 16.
Method of Instruction.	Practical application.
Time:	2 hours.
Introduction: 10 min.	1. Explain procedure and location of materials and equipment. 2. Describe work to be performed.
Body: 1 hr 45 min.	1. Direct students to proceed using procedures outlined in body of Lesson 16. 2. Supervise and observe results.
Summary: 5 min.	1. Discussion. 2. Instructions on use of materials produced.

LESSON PLAN

Lesson Number:	18.
Lesson Title:	Types of Masters.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Drawing Ink and tracing paper; Transparentized original (printed on one side only); Carbon coated plastic; typed carbon on tracing paper; photographic master; reflex masters; auto-positive film; auto-positive paper; transparent paper; positive film; special papers and foils; and material to be reproduced.
Objective:	To acquaint students with the different types of masters that may be used in making diazo prints.
References:	Instructors notes, TM 11-2323.
Method of Instruction.	Demonstration and Lecture.
Time:	30 minutes.
Introduction: 3 min.	Diazo prints can be made from a variety of masters. In this lesson we will try to cover the most common types. For diazo printing we need a strong master.
Body: 25 min.	Show different types of masters as shown in Training Aids above and demonstrate uses.
Summary: 2 min.	Question and answer period.

LESSON PLAN

Lesson Number:	19.
Lesson Title:	Work Shop on Preparation and Printing of a Simple Master.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Tracing paper, #2 pencil, india ink, speed ball pen, opaque tape, diazo film, projecto-printer or ES–19, ammonia developers, ammonia, and overhead projector.
Objective:	To teach the students the comparative effectiveness of transparencies made from masters prepared with pencil, india ink, and opaque tape. These comparisons may be referenced in future preparation of masters during the course.
References:	None.
Method of Instruction.	Practical application.
Time:	45 minutes.
Introduction: 5 min.	Explain objective.
Body: 35 min.	1. Instruct class to copy attached sketch from overhead projector on tracing paper, using pencil, india ink, and opaque tape. 2. Print on red film (expose 1 min on ES–19). 3. Develop in ammonia vapor.
Summary: 5 min.	Discuss results.

LESSON PLAN

Lesson Number:	20.
Lesson Title:	Lecture-Demonstration Principles of Diazo Printing.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Projecto-Printer, ES–19, printing frame, photoflood #2, ammonia developers (ES–19, projecto-printer, pickle jar), diazo paper and film, 26% ammonium hydroxide, overhead projector, masters.
Objective:	To introduce the principles of the diazo process.
References:	Instructors notes, TM 11–2323.
Method of Instruction.	Lecture-Demonstration.
Time:	1 hour.
Introduction: 5 min.	See introduction to lesson 9, paragraphs 2*a* and 2*b*.
Body: 50 min.	1. Introduce diazo papers and films. *a.* Show and teach identification of diazo materials as listed in cost data sheet, pages 1 and 2. *b.* Teach identification of dye side of diazo materials. (1) Notch method. (2) Sight (paper). (3) Taste. 2. Demonstrate principle of exposure. *a.* Demonstrate effect of ammonia vapor on unexposed diazo film. *b.* Demonstrate effect of ultra-violet light on diazo film (exposed) by placing in ammonia vapor. *c.* Demonstrate above effects with master using printing frame and pickle jar. *d.* Check results after developing. (1) If background appears, film is underexposed—increase exposure time. (2) If image is burned out or weak, film is overexposed. Decrease exposure time. 3. Demonstrate above process with ES–19 and projecto-printer.
Summary: 5 min.	Discussion.

LESSON PLAN

Lesson Number: 21.

Lesson Title: Work Shop, Preparation of Masters for Diazo Printing.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids and Materials. Drafting instruments, tracing paper, black drawing ink, speed ball pens, opaque tapes, orange and black carbon paper, special papers and foils, photographic letters, art letters, Transparentizing Solution, and transparent tape, absorbent cotton, paper towels, and Masters.

Objective: To give students practical exercise in preparation of masters for diazo printing.

References: TM 11–2323, Instructors notes and miscellaneous instructions prepared by manufacturers of materials.

Method of Instruction. Practical exercise.

Time: 2 hours, 15 minutes.

Introduction: Lesson includes preparation of several different types of masters. Instruction should be given to introduce each type as taken up.

Body: 2 hrs 10 min.

1. Pen and ink tracing.
   a. Hand out originals to trace from.
   b. Student mounts original on drawing board.
   c. Mount tracing paper over original.
   d. Trace with pen and black drawing ink.
   e. File for future use.
2. Multicolor (4) masters.
   a. Hand out originals to trace from.
   b. Student mounts original on drawing board.
   c. Place registration marks on original.
   d. Proceed to trace 4 color separation masters from original according to instructions on original.
   e. Mark each tracing as to color and exposure time.
   f. File for future use.
3. Masters for Flip-Over Transparencies.
   a. Hand out DA Form 11–44.
   b. Place following element on drawing board in order:
      (1) Orange carbon—carbon side up.
      (2) Tracing paper.
      (3) Orange carbon—carbon side down.
      (4) DA Form 11–44.
   c. Place above elements in typewriter so that type keys will strike face of form.
   d. Fill out form with typewriter as though requesting a film.
   e. Remove elements from typewriter, separate tracing paper and file for future printing with reflex master of DA Form 11–44 prepared in lesson 17.
   f. Using another sheet of tracing paper, proceed as in *b*, *c* and *d* above, using same form, and fill in showings and attendance.

g. Proceed as in *e* above.

h. Mark masters of DA Form 11–44 and typed overlays for color and time, and refile for future diazo printing.

4. Color separation masters using special paper and ultrafoil film.

a. Remove the master prepared in lesson 17 from folder and print two texray copies.

b. From same original print one ultrafoil film.

c. Cut out color separation elements from ultrafoil film.

d. Tape ultrafoil elements to the two sheets of special paper to coincide with respective images using transparent tape. This will achieve registration of colors.

e. Mark masters for color and exposure time and file together for future printing.

5. Using originals as desired prepare masters with superfoil red-brown foil, sepia film, and sepia paper. These materials may be used with special or tracing paper. Proceed as in paragraph 4 above.

6. Masters for book cover.

a. Using ultrafoil masters prepared from foto-type and art letters, other ultrafoil masters, tracing paper, transparent tape, and opaque tape, prepare master for book cover (instructor prepares ultrafoil originals in advance).

b. File master for future printing.

7. Using transparentizing solution, absorbent cotton and paper towels, transparentize auto-positive masters prepared in lesson 15.

Summary: 5 min.

Insure that students have properly marked and filed masters prepared in this lesson for future use.

LESSON PLAN

Lesson Number:	22.
Lesson Title:	Work Shop Enlarging Illustrations Using Opaque Projector AP–5(1).
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Opaque Projector AP–5(1), selected small illustrations, red pencil, black drawing ink, and speed ball pen.
Objective:	To give students practical exercise in enlarging material with projection for preparation of masters.
References:	Instructors notes on Opaque Projector, TM 11–2330A.
Method of Instruction.	Practical application.
Time:	1 hour.
Introduction: 5 min.	Demonstrate use of opaque projector and instruct class to select a small illustration from TM or other source for enlargement to 8″ x 10½″.
Body: 50 min.	Have students proceed as follows: 1. Select small illustration. 2. Place in stage of opaque projector. 3. Project on wall. 4. Tape tracing paper (8″ x 10½″) on wall in horizontal position. 5. Move projector until size of projected image fits the 8″ x 10½″ tracing paper. 6. Focus. 7. Trace outline with red pencil. 8. Remove tracing paper from wall, return to work table and fill in with black drawing ink. 9. Remove small illustration from projector.
Summary: 5 min.	Explain use of enlargement and give instructions to file for future use.

LESSON PLAN

Lesson Number:	23.
Lesson Title:	Work Shop, Reversing Positive Master to a Negative.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	ES-19 or Projecto-Printer, reversing film, ultrafoil, photo tray, water.
Objective:	To give students practical experience in reversing masters.
References:	Manufacturers Instructions and Instructors notes.
Method of Instruction.	Practical application.
Time:	45 minutes.
Introduction: 3 min.	Explain Reversal Process and materials and why ultrafoil is used for final master.
Body: 40 min.	Instruct students to proceed as follows: 1. Take out ultrafoil master of book cover made in lesson 21. 2. Place on stage of printer. 3. Set timer per marking on master. 4. Place copy film over master (either side up). 5. Close printer and expose. 6. Remove copy film from printer and develop in water. 7. Hang up to dry. 8. When dry mark for exposure. 9. Remove positive ultrafoil from printer and file. 10. Place reversed film on stage of printer. 11. Place ultrafoil film over it. 12. Set exposure and expose. 13. Remove ultrafoil from printer and develop in ammonia. 14. Remove master from printer and file master and ultrafoil negatives for future use after marking for exposure time and color.
Summary: 2 min.	Explain use of reversing film and that they may be used as masters for diazo printing if not used with ultrafoil.

LESSON PLAN

Lesson Number:	24.
Lesson Title:	Work Shop, Diazo Printing.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	ES–19 or Projecto-Printer with ammonia developers, assorted colors of diazo film, 26% aqua ammonia, masters made in previous lessons; mounts, marking tape, and tech hinges.
Objective:	To give students practical exercises in diazo printing, developing and transparency mounting.
References:	See lesson 20.
Method of Instruction.	Practical application.
Time:	4 hours, 15 minutes.
Introduction: 5 min.	1. Short review of diazo process and materials needed. 2. Instruct students in work to be performed.
Body: 4 hrs..	1. Supervise students in the preparation of diazo transparencies as set forth in lesson 20, using masters prepared in lessons 5, 7, 15, 17, 19, 21, 22 and 23. 2. Mount transparencies per instructions. *a.* One color transparencies. *b.* Multicolor transparencies. *c.* Flip-over transparencies. 3. Prepare book covers using aluminum diazo paper from master made in lessons 21 and 23.
Summary: 10 min.	1. Check results by projection. 2. Summarize process.

LESSON PLAN

Lesson Number:	25.
Lesson Title:	Work Shop, Diazo Printing using Field Expedients.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Printing frame, #2 photoflood lamp, plate glass, masonite or plywood, pickle jar, 26% aqua ammonia, assorted colors of diazochrome film.
Objective:	To give students practical exercise in the use of field expedients in producing diazo transparencies.
References:	Instructors notes, Field Expedients Diazo-Printing.
Method of Instruction.	Practical application.
Time:	45 minutes.
Introduction: 3 min.	1. Briefly review equipment and materials. 2. Instruct class on what is to be done.
Body: 40 min.	1. Instruct class to proceed to make transparencies in accordance with lesson 14. 2. Supervise and assist students.
Summary: 2 min.	Summarize advantages of knowing field expedients.

LESSON PLAN

Lesson Number:	26.
Lesson Title:	Preparing Diazo Transparencies for the AP–4 (3¼″ x 4″) Projector.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	AP–4, diazo foils, tracing of 6 slides, 20 sheets clear acetate, masking tape, negative and film, projecto-printers, reflex film with six 3¼″ x 4″ slides prepared in previous lesson.
Objective:	To familiarize students with preparation of slides for 3¼″ x 4″ slide projectors.
References:	Operating instructions for Projecto-Printer; Operating instructions for Portable Transparency Printer, Instructors notes on AP–4 projector.
Method of Instruction.	Demonstration and practical exercise.
Time:	30 minutes.
Introduction: 4 min.	In this lesson we will show you how to make 3¼″ x 4″ slides for the AP–4 projector. The projector is particularly suitable for large audiences and auditorium showings. Because of the smaller size of these transparencies they may be prepared easier and in less time. Six of these transparencies may be prepared at one time on an 8½″ x 11″ sheet of diazo foil or reflex material. Nomenclature, set up and demonstration of AP–4 projector.
Body: 22 min.	Preparing slides. Demonstrate mounting and binding. Practical exercise: Have each student mount a sheet of transparencies using reflex materials and diazo materials.
Individual Assignments.	1. Cut and bind one reflex slide. 2. Cut and bind one diazo slide.
Summary: 4 min.	Question and answer period.

LESSON PLAN

Lesson Number: 27.

Lesson Title: Special Methods of Producing Multicolor Transparencies.

Subject: Audio-Visuals.

Course: Transparency Preparation.

Training Aids and Materials. ES–19, Projecto-Printer, Overhead Projector, printing frame, photoflood lamp; color separation masters prepared in previous lessons, Special Films; Special Copying Paper; Special Developing Powders; multicolor dispenser cans.

Objective: To teach students special methods of multicolor transparencies and paper prints preparatory to following work shop lesson.

References: Instructors notes.

Method of Instruction. Lecture-Demonstration.

Time: 1 hour.

Introduction: 5 min. Multicolor transparencies may be prepared by—

1. Hand with colored inks;
2. With ammonia diazo process using a separate overlay for each color, which requires a separate master for each color as previously demonstrated; or
3. By the multicolor process which gives you all your colors on one film from one master.

Body: 50 min.

1. Identify and explain the use of—

   a. Copying films.
      (1) Colors applied to one side.
      (2) Colors applied to both sides.
      (3) For making masters only.
   b. Copying papers.
      (1) Colors applied—thin, for making quick copies.
      (2) Colors applied—heavy, glossy paper with white background, for copies.
      (3) Aluminum background for book cover.
   c. Developers.
      (1) Powders.
         (*a*) Black.
         (*b*) Blue.
         (*c*) Brown.
         (*d*) Red.
         (*e*) Yellow.
      (2) Dispenser Cans.
         (*a*) Black.
         (*b*) Blue.
         (*c*) Brown.
         (*d*) Red.
         (*e*) Yellow.

2. Demonstrate the application of developers to paper and film.

a. Apply developers to unexposed paper to show formation dyes before being exposed to ultra-violet light.

b. Expose paper to ultra-violet light in printer (1 min); apply developer to show that dye will not form after exposure to ultra-violet light.

c. Using masters make actual prints and develop using all papers and films with both types of developers. Demonstrate technique of applying chemicals to film over masters to get color separation.

3. Check results after developing.

a. If too dark a background appears, print is underexposed. Increase time of exposure.

b. If image is too light or burned out, print is over exposed. Reduce exposure time.

Summary: 5 min. — Discussion of process.

LESSON PLAN

Lesson Number:	28.
Lesson Title:	Mixing Developing Powders for Multicolor Process.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	32 oz graduate; stirring rod; 5 qt size brown glass bottles; developing powders; water.
Objective:	To teach students mixing techniques and prepare developing solutions for following work shop lesson.
References:	Instructions on powder packages.
Method of Instruction.	Lecture-Demonstration; practical application.
Time:	45 minutes.
Introduction: 5 min.	1. Give out packages of chemicals. 2. Instruct students to read instructions on package and follow.
Body: 35 min.	Students mix chemicals according to instructions, while instructor supervises. Pour in brown glass bottles as mixed.
Summary: 5 min.	Discussion and instructions for future use.

LESSON PLAN

Lesson Number:	29.
Lesson Title:	Work Shop, Printing Using Multicolor Process.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Same as in lesson 27, plus the following: 1. Five petrie dishes for each student. 2. Absorbent cotton on sticks. 3. Masters prepared in lessons 15, 17, 21 and 23. 4. Water and moist cheese cloth. 5. Sheet of white paper, 16″ x 20″. 6. Mounts and tape.
Objective:	To give students practical experience in printing multicolor transparencies and paper prints by the Bruning process.
References:	Same as lessons 27 and 28.
Method of Instruction.	Practical application.
Time:	2 hours, 45 minutes.
Introduction: 10 min.	Have students arrange following materials on tables: 1. Five petrie dishes. 2. Sheet of white paper 16″ x 20″. 3. Absorbent cotton on sticks. 4. Moist cheese cloth. 5. Masters. Pour chemicals from brown quart bottles into petrie dishes and mark dishes for color. Arrange materials in place near printers and instruct students to use as needed.
Body: 2 hrs 25 min.	1. Under supervision of instructor print and develop films and papers according to instructions in lesson 27. 2. Show students the use of the projecto-printer processor for developing where only one color is needed, or for final color. 3. Have students complete book covers with aluminum paper and dispenser cans, using masters prepared in lessons 21 and 23. 4. Mount transparencies.
Summary: 10 min.	Check results; question and answer period.

LESSON PLAN

Lesson Number:	30.
Lesson Title:	Prices of Materials and Sources.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Material Cost Data as hand out, other related manufacturers materials (Federal Supply Schedules).
Objective:	To familiarize students with prices of materials and where they may be procured.
References:	Instructors notes.
Method of Instruction.	Lecture-Discussion.
Time:	45 minutes.
Introduction: 5 min.	1. Have students take out material cost data sheet (students retain permanently). 2. Explain that entire data sheet will be covered.
Body: 35 min.	1. Instructor goes over the data sheet with students item-by-item, reviewing the nomenclatures and usages and spelling out prices and sources. 2. During course of going through the data sheet have questions and discussion, emphasizing the items most frequently used and associating them with lessons and practical exercises.
Summary: 5 min.	1. Review and summarize, instructing students to retain the data sheet for future reference at home station. 2. Emphasize importance of not overordering sensitized materials. Never order more than 3 months supply.

LESSON PLAN

Lesson Number:	31.
Lesson Title:	Display of Finished Transparencies and Other Materials.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Overhead Projector PH–637 and 3¼″ x 4″ Slide Projector, AP–4.
Objective:	To critique students' work and to compare results and review.
References:	None.
Method of Instruction.	Discussion by students.
Time:	30 minutes.
Introduction: 3 min.	Instruct students to select one or two transparencies for presentation to class.
Body: 25 min.	1. Have each student come forward in turn to display transparencies or slides. 2. Have each student explain the steps he took in making the transparencies. 3. Call for comments from other students as to their judgment of transparency and comments as to how it could be improved. 4. Add instructor's critique.
Summary: 2 min.	Point out exceptional examples.

LESSON PLAN

Lesson Number:	32.
Lesson Title:	Final Examination.
Subject:	Audio-Visuals.
Course:	Transparency Preparation.
Training Aids and Materials.	Test and pencils.
Objective:	To ascertain effectiveness of course and to qualify students for Certificate.
References:	None.
Method of Instruction.	Examination.
Time:	1 hour.
Introduction: 2 min.	1. Explain rules of examination. 2. Start examination.
Body: 45 min.	Take test.
Summary: 13 min.	1. Have students exchange papers. 2. Grade examinations. 3. Discussion.

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

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