Film-Tech

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These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

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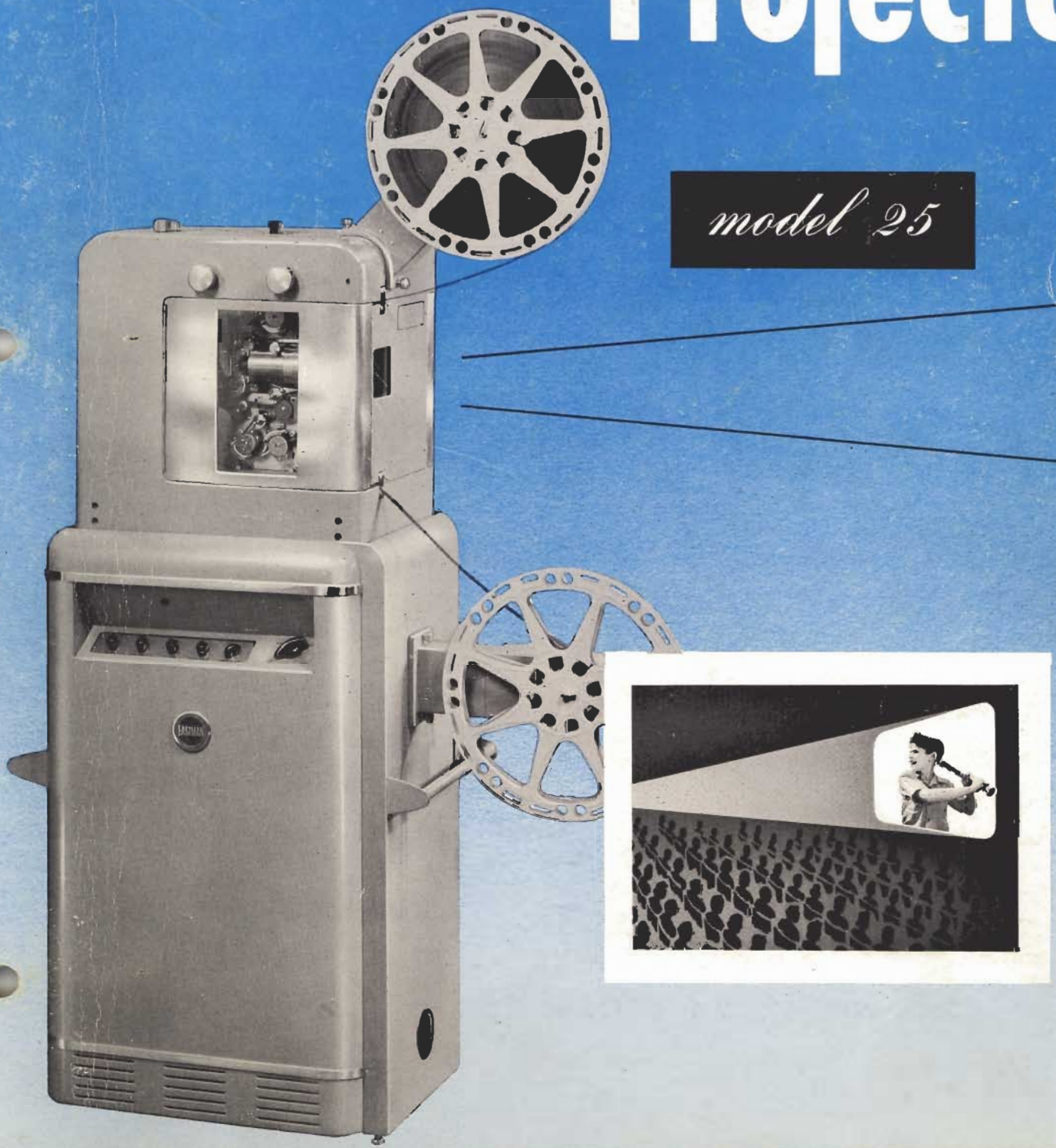
Eastman 16mm Projector

model 25



contents

supervised installation and repair service

• Correct installation and adjustment of the Eastman 16mm Projector Model 25 are essential for satisfactory performance of the equipment. For this reason the Eastman Kodak Company has contracted for the services of Altec Service Corporation to supervise all installations of this projector and to provide repair service free of charge to the purchaser for a period of thirty (30) days from the date of the completion of installation. The Altec Service Corporation is a national organization engaged in the business of supervising the installation of motion-picture sound and projection equipment and of servicing and repairing such equipment. The preliminary structural and wiring facilities should be prepared by a local contractor before requesting the supervisional services of the Altec Service Corporation for installation of the equipment.

Figures 1, 2, and 3 provide the necessary information for the preparation of a projection room for permanent installation of a single tungsten unit.

When facilities for permanent installation have been prepared, use the card provided to notify the Eastman Kodak Company when the services of the Altec Service Corporation will be needed.

Repair and maintenance service following the 30-day free service period is available by individual contract between the user and the Altec Service Corporation.

Local ordinances, regulations, and other rules governing wiring codes, structural changes, and operation of motion-picture film projectors are not the same in all communities. The customer assumes the sole responsibility for complying with such regulations and should consult local authorities and contractors.

specifications

POWER SERVICE REQUIRED: 115- to 120-volt, 60-cycle, a-c

POWER CONSUMED BY PROJECTOR AND AMPLIFIER: 1400 watts

INPUT TO MODEL 800 SPEAKER: 20 watts

INPUT TO MODEL SS-25 SPEAKER: 30 watts

PROJECTION LAMP: 1000-watt, 115-volt, T-12 clear bulb, C-13 filament, base-up, double contact medium ring base (Part No. 120274)

PANEL LAMP: 120-volt, 25-watt, GE code 25T8DC (Part No. 119540)

THREADING LAMP: 120-volt, 15-watt, GE code 15T 7DC/IF (Part No. 119541)

SOUND PRODUCER LAMP: 6-volt, 1-amp, T-5 clear bulb, C-6 filament, single contact prefocus base (Part No. 120359)

FUSE: 1.5 amp, Littlefuse Inc. Cat. No. 31301.5 (Part No. 119841)

Warranty

Eastman Kodak Company warrants each new Eastman 16mm Projector Model 25 to be free from defects in material and workmanship under normal use and service for a period of thirty (30) days from the date of the completion of installation; our obligation under this warranty being expressly limited to providing repair service to the projector through Altec Service Corporation free of charge during such 30-day period and to the replacement of any part or parts thereof found to have been so defective. This warranty is in lieu of all other warranties, express or implied, and shall not apply to any projector which shall not have been installed and operated in accordance with the instructions contained herein and installed under the supervision of Altec Service Corporation.

unpacking

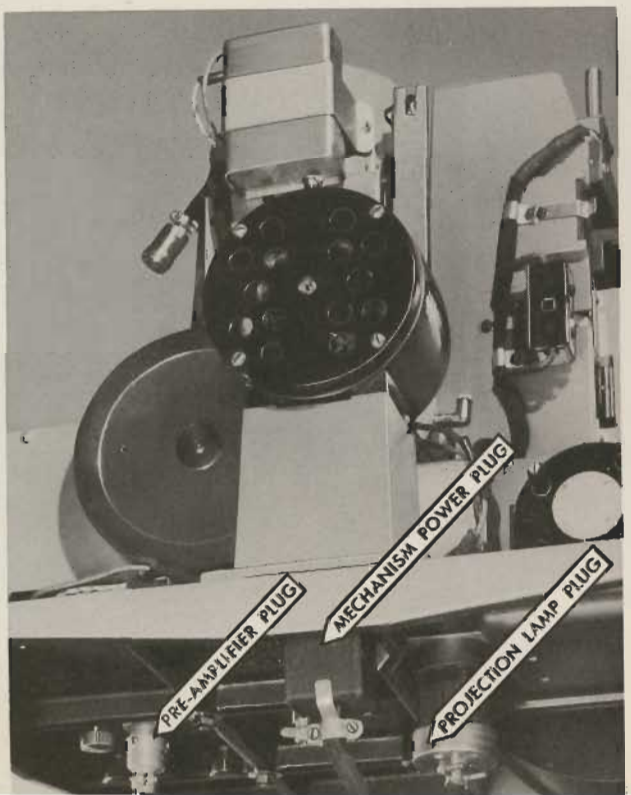
• The following units of the assembly are individually packaged:

- Pedestal assembly
- Projector head assembly
- Amplifier
- Flywheel
- Carrying bars
- Condenser lens assembly
- Projection lens
- Projection lamps
- Speaker
- Speaker cabinet
- Spare tubes and exciter lamp
- Take-up reel (Kodascope Reel, 2000 ft)

CAUTION:
The mechanism and intermittent assemblies have been shipped dry. Do not attempt to operate the machine until these units have been properly oiled. See page 7.

FIGURE 4

FIGURE 5



Attach the two CARRYING BARS, figure 4, with the screws supplied. Locate the pedestal assembly in approximately the permanent position for the projector. Unscrew the two locking screws (located on the sides of the tilting platform) until the cone-shaped ends of the screws are flush with the sides of the tilting platform. Place the projector head assembly on the pedestal assembly as shown in figure 4. HAND HOLDS for lifting the assembly are shown in the same illustration. The projector head assembly has four dowels that fit into the holes in the tilting platform. Lock the projector head assembly to the tilting platform by tightening the two lock screws until they are snug against the inner sides of the apron on the projector head assembly.

Connect the MECHANISM POWER PLUG, figure 5, the PROJECTION LAMP PLUG, and the PRE-AMPLIFIER PLUG to the three receptacles in the base plate of the projector head. The cords can also be reached through the amplifier door.

preparation for use

INSTALLING AMPLIFIER

1. Open the amplifier door of the lower cabinet.
2. With the control panel of the AMPLIFIER, figure 6, toward the operator's side of the projector, slide the amplifier into place on the two supporting side rails. It may be necessary to raise the rear of the amplifier slightly so that the controls will slip into the opening at the side of the projector.
3. Locate the two holes in the base of the amplifier over corresponding holes in the amplifier support rails. Attach the amplifier to the rails with the two screws provided for this purpose.
4. Connect the amplifier as shown in figure 7.

ATTACHING REEL ARMS

1. Remove the REEL ARMS, figure 6, from the pedestal.
2. Hold the supply reel arm with the reel shaft toward the operator's side of the projector.
3. Plug the electrical input plug that is attached to the reel arm into the receptacle at the front edge of the upper cabinet.
4. Attach the arm with the two knurled screws.
5. Attach the take-up reel arm in a similar manner.

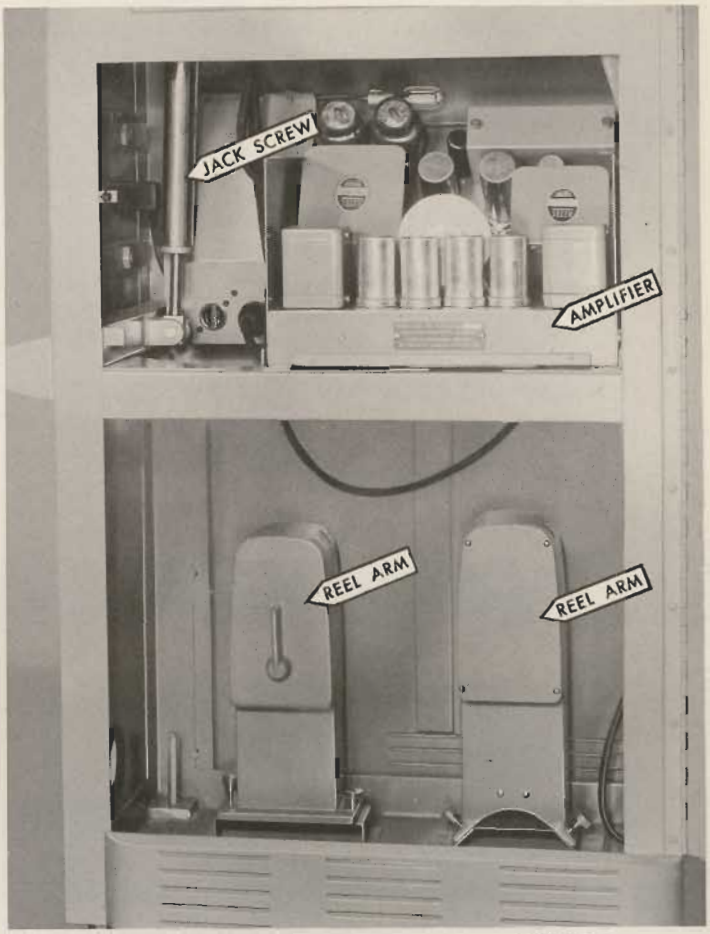


FIGURE 6

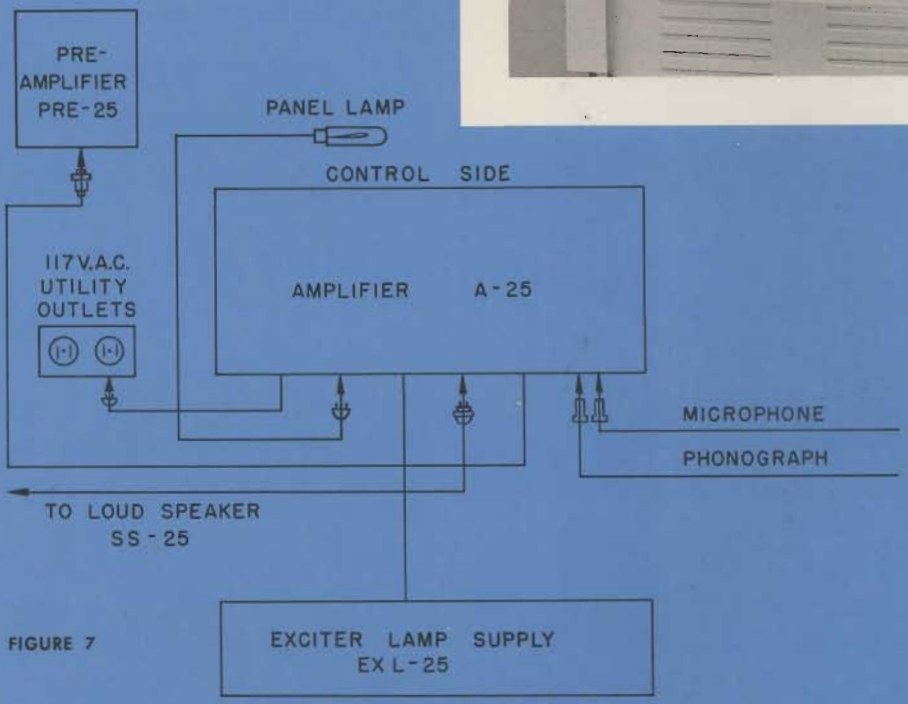


FIGURE 7

INSTALLING PROJECTION LAMPS

1. Open the LAMP CHANGE DOOR, figure 8.
2. Place a lamp in the lamp holder as shown in the illustration.
3. Turn the LAMP CHANGER LEVER one-half turn to bring the other lamp holder into position. Place another lamp in this lamp holder.
4. A projection lamp is in position for projection when the lamp changer lever is at either stop position. The operator can change lamps without interrupting projection by quickly moving the lever from one stop position to the other.

INSTALLING PROJECTION LENS

1. Loosen the LENS CLAMP SCREW, figure 9, and insert the lens in the clamp as far as it will go.
2. Tighten the clamp screw.

INSTALLING CONDENSER LENS ASSEMBLY

Clean the condenser lenses and place the CONDENSER LENS HOLDER, figure 9, in the opening behind the gate.

CONNECTING SPEAKER

Locate the speaker unit in a convenient position as close as possible to the screen. Run the speaker cord through the opening in the front of the pedestal and connect the cord to the amplifier as shown in figure 7. For permanent installations, see figures 1, 2, and 3.

INSTALLING FLYWHEEL

1. Remove the four screws and the back acoustical case cover plate.
2. Remove the four screws and the front acoustical case cover plate.
3. Remove the three screws from the hub of the FLYWHEEL, figure 10.
4. Slide the flywheel between the flywheel shaft and the intermittent motor; then lift the flywheel slightly and place the flywheel disc in the opening in the drag magnet. Be very careful not to displace the magnet.

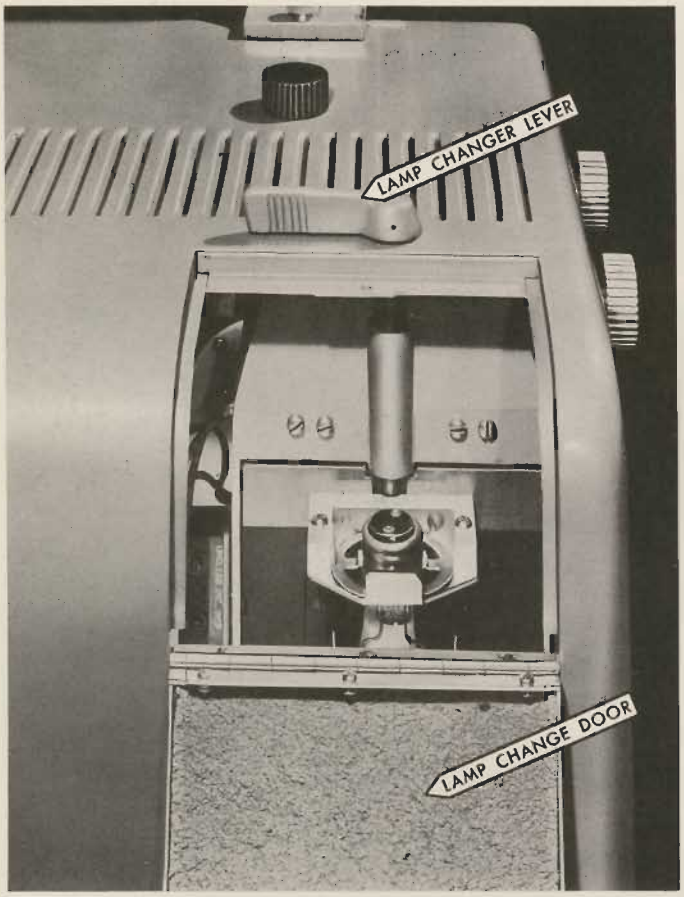


FIGURE 8

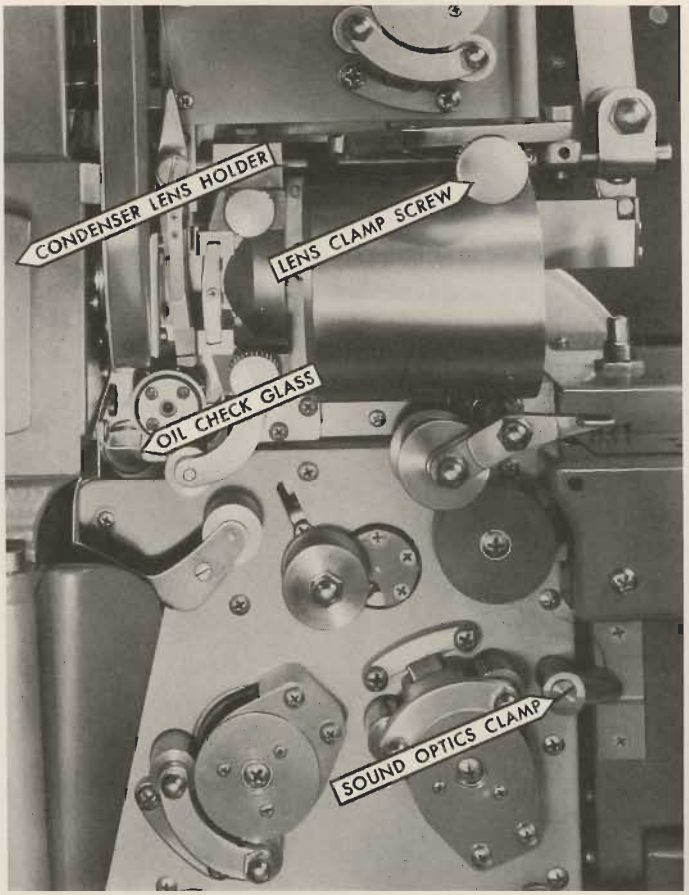


FIGURE 9

5. Place the flywheel over the end of the shaft and attach the flywheel with the three screws.
6. Before replacing the acoustical case cover plates, see "Oiling" below.

OILING

Fill the MECHANISM OIL CUP, figure 10, with the *special* oil until the oil level reaches approximately halfway up the glass tube marked OIL LEVEL GAGE. Approximately 1/3 pint will be required.

Check the oil level of the intermittent by means of the OIL CHECK GLASS, figure 9. If the oil level does not cover half the window, raise the cap and add oil to the INTERMITTENT OIL CUP, figure 10.

CAUTION:

Do not overfill. When properly filled, the meniscus will appear in the center of the window. The lower part of the window will be amber in color while the upper part will be clear.

CONNECTING POWER CORD

Attach the power cord to the receptacle in the rear of the pedestal and to a 115- to 120-volt, 60-cycle, a-c power outlet, fused for at least 15 amperes. For permanent installation, see figures 1, 2, and 3.

PRELIMINARY ADJUSTMENT FOR PROJECTION

1. Turn the CONTROL SWITCH clockwise, figure 11, to LAMP.
2. Turn the FOCUSING KNOB until the margins of the lighted area on the screen are sharp. It is advisable to use a screen with a black border. If such a screen is used, the margins of the illuminated area should fall on the black border.
3. Turn the FRAMING KNOB until the red line on the knob is at the top and center of the knob.
4. Adjust the leveling screws in the corners of the pedestal base until the projected frame margins are plumb and level. See that all screws are snug to prevent rocking of the projector.
5. For vertical adjustment, turn the pedestal JACK SCREW, figure 6.

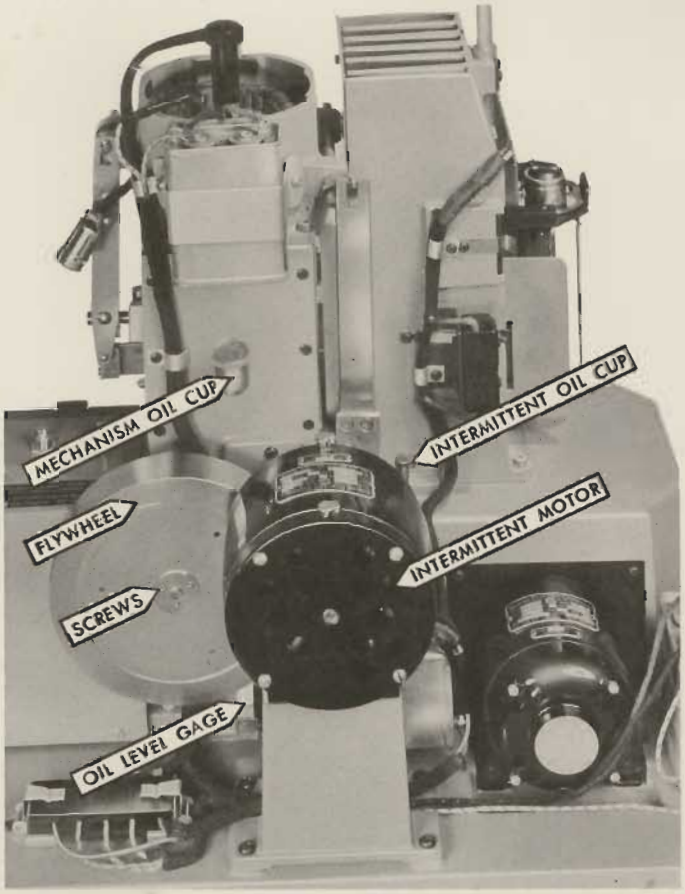


FIGURE 10

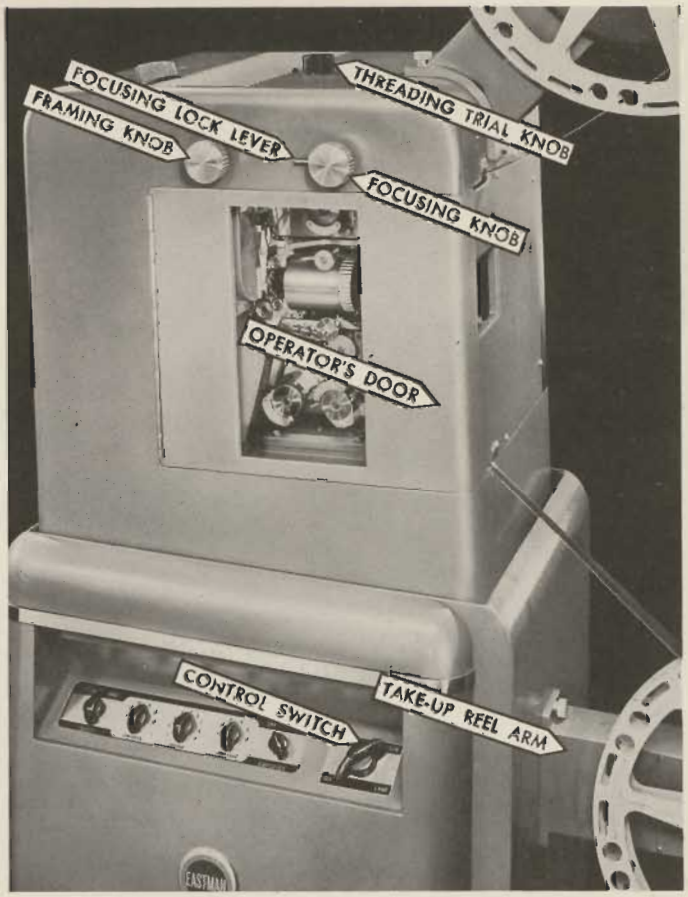


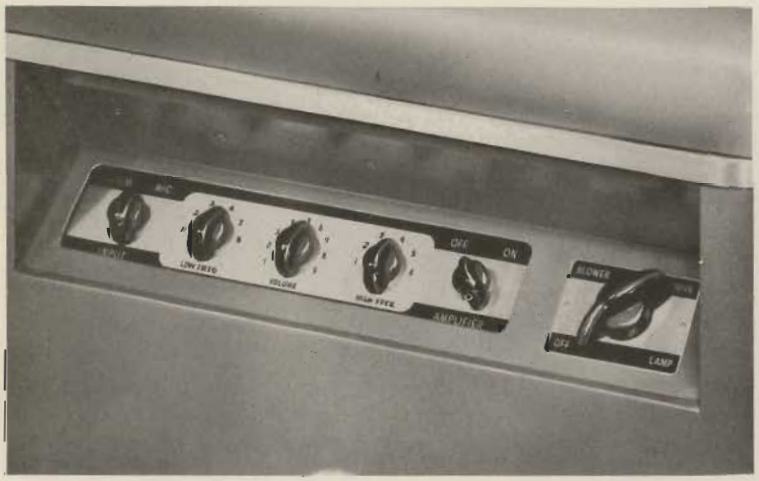
FIGURE 11

operation

position of controls

• The threading lamp will come on as soon as the power cord is attached to the power outlet. There is no switch in this circuit.

1. Set the INPUT switch on the amplifier at FILM.
2. Set the high frequency (HIGH FREQ) and low frequency (LOW FREQ) controls at the No. 3 stop. At this position, the high and low frequencies are balanced for normal reproduction. Adjustment of these two controls and the volume control can be made during projection so that the individual requirements of the sound on the film and the acoustics of the room can be met.
3. Turn the AMPLIFIER switch to ON. The panel lamp will then light. Because it takes the amplifier some time to warm up, it is advisable to leave it turned on during rewinding.
4. Leave the CONTROL SWITCH at OFF.



Projector Control Panel

threading

(See figure 12.)

• 1. Place the reel of film on the supply spindle with the film coming clockwise from the bottom of the reel and with the perforations toward the operator. Lock the reel on the spindle, with the latch. Draw off approximately five feet of film. Pull open the operator's door.
2. Slide the film through the guide slot and beneath the guide roller in the front of the case.
3. Open the FEED SPROCKET CLAMP, the INTERMITTENT SPROCKET CLAMP (by pulling out on the GATE OPENING LEVER), the SOUND SPROCKET CLAMP, and the HOLDBACK SPROCKET CLAMP.
4. Place the film between the feed sprocket and the feed sprocket clamp, in the gate, and between the intermittent sprocket (opened by the gate lever) and the intermittent sprocket clamp. Engage the film perforations with the teeth on the intermittent sprocket.
5. Close the gate by pushing the gate opening lever.
6. Adjust the upper loop to the size shown in the illustration, engage the film perforations with the teeth in the feed sprocket, and close the feed sprocket clamp.
7. Raise the PRESSURE ROLLER and hold it open.
8. Thread the film over the idler roller and between the pressure roller and SOUND DRUM. Lower the pressure roller.
9. Pull the film around the sound drum and over the DAMPER ROLLER.
10. Place the film between the sound clamp and sound sprocket and between the holdback clamp and holdback sprocket. Close the sound sprocket clamp.
11. Turn the sound drum counterclockwise until the damper roller is in the center of its arc. The film slack between the intermittent sprocket clamp and the pressure roller should be as shown in the illustration. If the size of the loop must be changed, open the sound sprocket clamp and adjust the film. Form a loop between the sound and holdback sprockets as shown in figure 12, and close both clamps.
12. Place the film in the slot and between the guide rollers at the front of the case.
13. Insert the end of the film in the slot in the core of the take-up reel. Wind on the slack film. There should be at least one turn around the core.

Check the position of the rewind control. For taking up film, the lever must be toward the screen (PROJECT position); see figure 14.

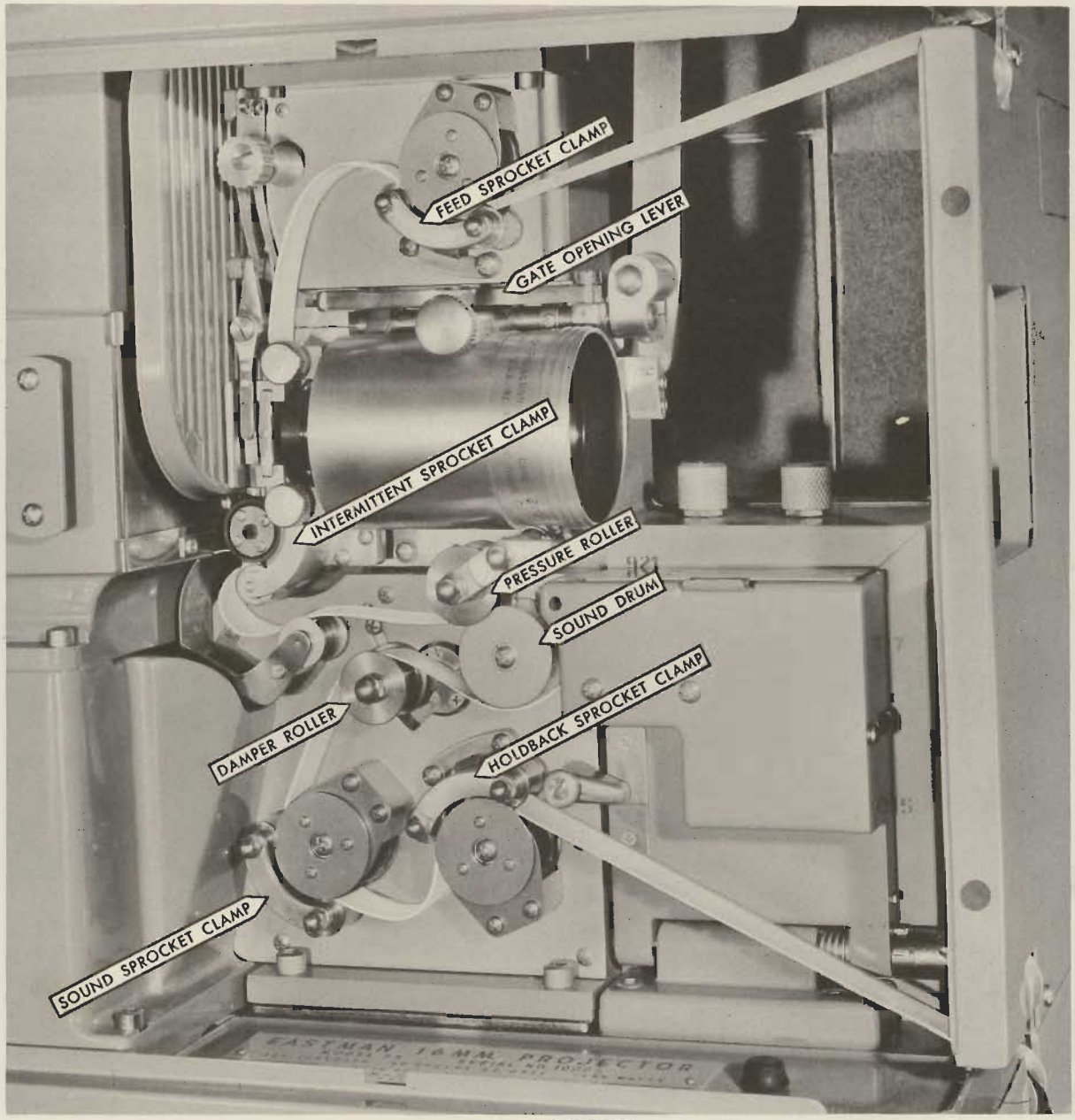


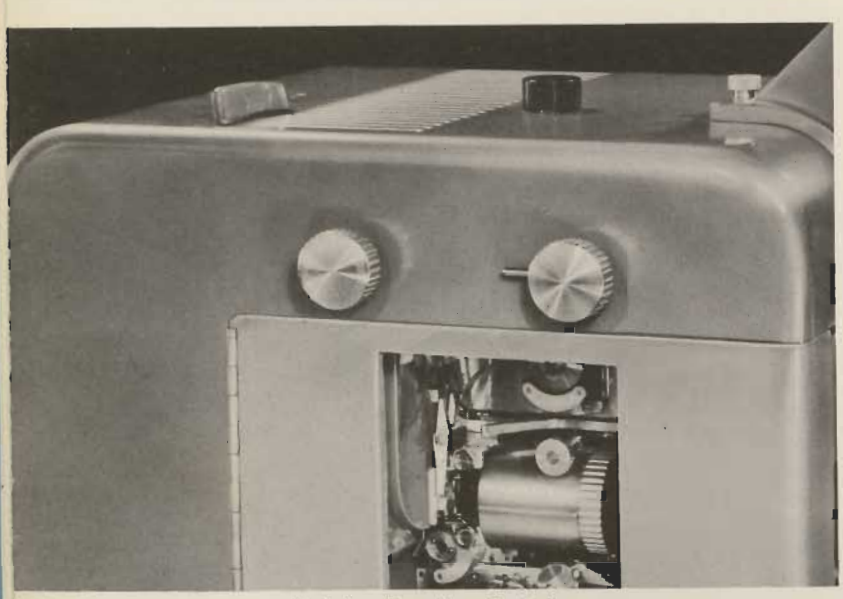
FIGURE 12

after threading

• 1. Turn the control switch to BLOWER. The take-up reel will turn until the film is taut.

2. Turn the THREADING TRIAL KNOB, figure 11, clockwise a few times to be sure that the film is properly threaded, that the teeth of the intermittent engage the film perforations, that the loop sizes are maintained, and that film slack is taken up at both reels.

3. Turn the control switch to DRIVE and run off the leader.



Projector Operating Controls.

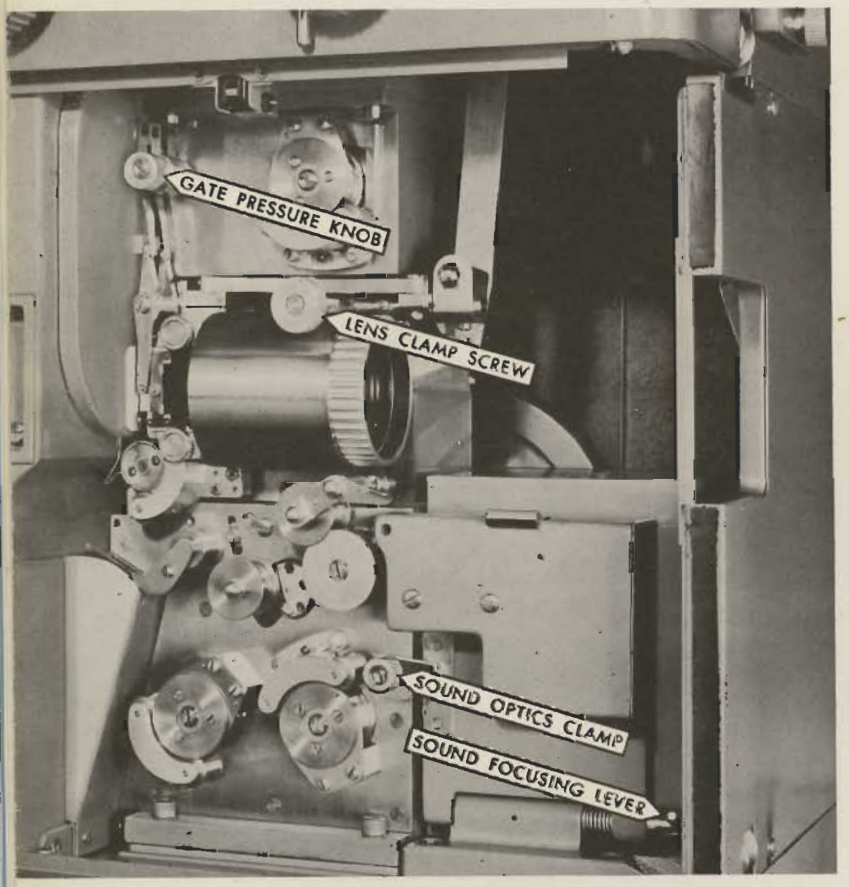


FIGURE 13

TO FOCUS

Raise the FOCUSING LOCK LEVER until there is a slight binding action at the focusing knob.

Turn the control switch to LAMP, and focus the lens by turning the focusing knob back and forth until the image on the screen is sharp. Raise the focusing lock lever further to lock the lens more securely.

TO FRAME

If the picture shows a blank strip or the edge of the next frame at the top or bottom of the projected picture, turn the framing knob.

SOUND

Focusing the beam from the exciter lamp onto the sound track of the film is extremely important and is accomplished by moving the SOUND FOCUSING LEVER, figure 13, up or down. The side of the film on which the sound track is placed will depend upon whether you are using (a) 16mm sound-on-film originals, 16mm prints from 35mm originals, or (b) 16mm duplicates of 16mm originals, black-and-white or Kodachrome.

It is not necessary to know which type of film is being used since the operator can set the sound focusing lever in accordance with the position of the emulsion in relationship to the projection lens. When the emulsion of the film is *toward* the projection lens, move the sound focusing lever so that it points toward the operator, and the letter "F" on the sound lever focusing sleeve is opposite the stop pin. If the emulsion side of the film is away from the projection lens, move the lever so that it points toward the top of the projector, and the letter "R" on the sound lever focusing sleeve is opposite the stop pin.

FILM TENSION

Adjust the GATE PRESSURE KNOB, figure 13, to produce the *minimum* tension on the film that will give steady pictures.

It is seldom necessary to readjust the gate pressure once the initial setting has been made. However, if at any time there is unsteadiness in the projected pictures, variation of the gate pressure may improve steadiness.

REWINDING

At the completion of projection, turn the control switch to OFF and move the REWIND lever, figure 14, to the NEUTRAL (vertical) position.

Attach the film to the upper reel by inserting the end of the film in the reel slot. Give the reel a few turns counterclockwise to make sure that the end of the film is secure. See that the film is not twisted between the two reels; then remove one convolution of film from the lower reel. This will make a 360 degree twist in the film and cause the film to feed from lower reel to upper reel with a minimum of slap and friction between the film and the reels.

Move the rewind lever toward the projector. When rewinding is completed, move the rewind lever to the

neutral (vertical) position, push in the rewind lever and move it to the projection position (pointing toward the screen).

The rewind lever can be moved directly from the project position to the rewind position, but it clicks into a locked position at neutral when it is moved from rewind toward project.

MICROPHONE AND PHONOGRAPH INPUT

Separate input receptacles for microphone and phonograph are provided on the amplifier. The two inputs are mixed and connected to the amplifier when the input selector switch is set at microphone (MIC). The volume control on the main panel controls both input signals. An external volume control at the phonograph should be used to adjust the phonograph level relative to the microphone level.

TONE CONTROL

Regulation of the tone of the Eastman 16mm Projector Model 25 is attained by two separate controls marked HIGH FREQ and LOW FREQ. Thus high and low frequencies can be adjusted independently of each other.

Tone is usually a matter of individual preference; that is, the adjustment is made to make the recorded program pleasing to the ear. With the dual control provided on the projector, it is possible and sometimes necessary to adjust the tone to the mood of the picture and also to the acoustics of the room.

The controls are step controls with six fixed positions.

CAUTION:
As a guard against damage to the gears, do not try to move the lever directly from rewind to project. The take-up reel must be stopped before the lever is turned to project.

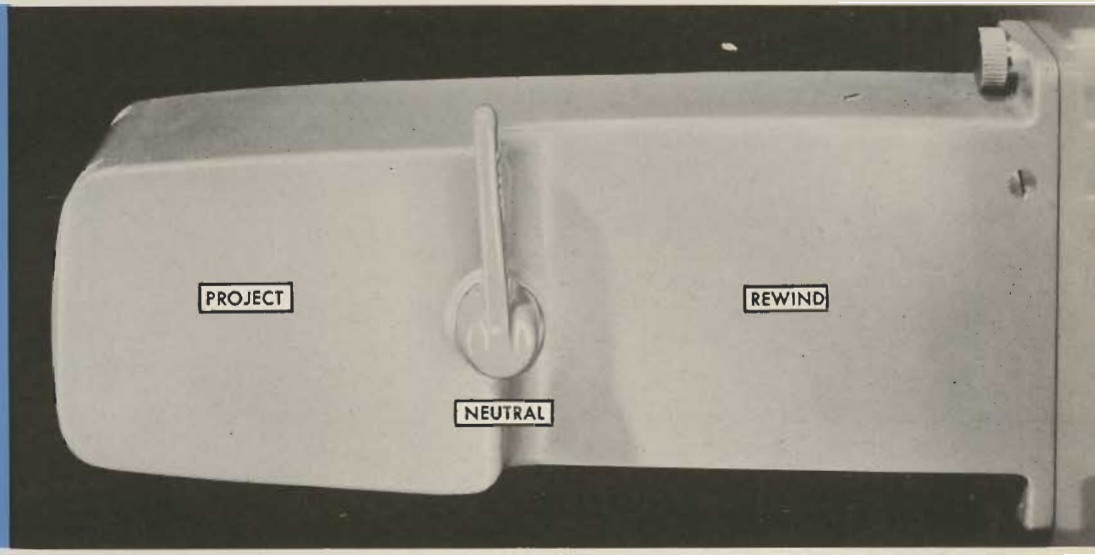


FIGURE 14

OPERATING SUGGESTIONS

No sound will be heard if any of the following conditions exist:

- **Speaker and projector not connected by speaker cord**
- **Cable from main amplifier not connected to pre-amplifier**
- **Volume control not turned on**
- **Amplifier switch not turned to ON**
- **Input switch not turned to FILM**
- **Fuse blown in exciter lamp supply**
- **Fuse blown in main amplifier**
- **Exciter lamp burned out**
- **Photocell in pre-amplifier or tubes in pre-amplifier or main amplifier need replacing**

maintenance

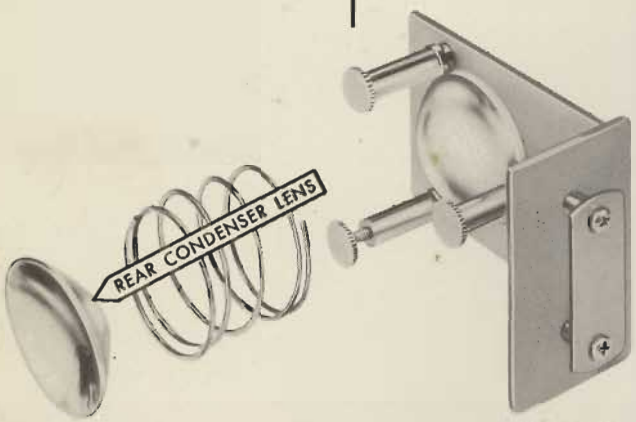


FIGURE 15

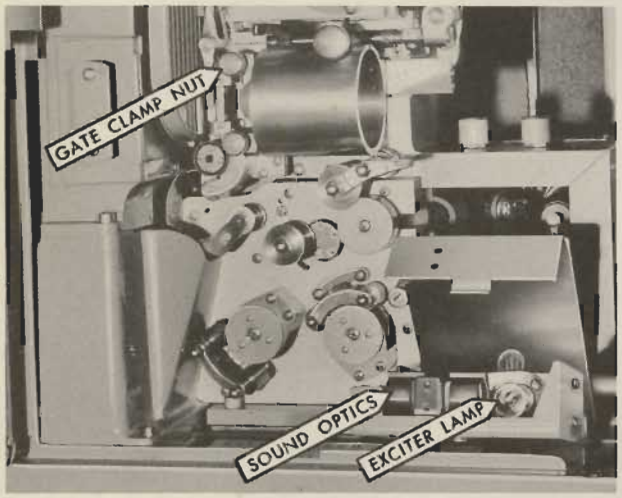


FIGURE 16

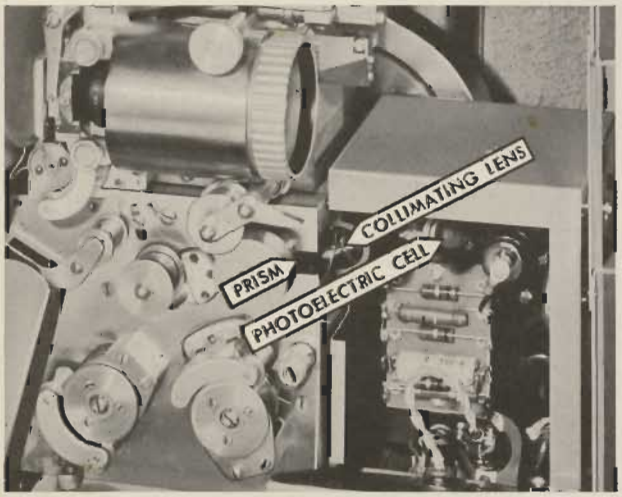


FIGURE 17

cleaning

Cleaning Lenses — The condensing lenses and the projection lens are Lumenized; that is, a special hard coating has been applied to all the air-glass surfaces. The tinted appearance of the lenses is due to this treatment, which increases the amount of light transmitted, thus increasing the brilliance of the image on the screen.

Like any fine lens, the projection lens on your projector should be cleaned with extreme care. Loosen the LENS CLAMP SCREW, figure 13, and withdraw the lens from the clamp. With a soft, lintless cloth or Kodak Lens Cleaning Paper, carefully wipe the two lens surfaces.

To clean the condenser lenses, pull the CONDENSER LENS HOLDER, figure 9, from the lamphouse. Loosen one of the knurled screws on the support posts, tip the REAR CONDENSER LENS, figure 15, and remove the lens and spring. When replacing the lens, be sure that the convex side of the element is toward the spring and that the lens is properly seated.

Cleaning the Gate — Open the gate with the gate opening lever. Loosen the two GATE CLAMP NUTS, figure 16, and withdraw the gate. Use a clean cloth to clean the gate. If film emulsion or dirt is encrusted, use the fingernail or an orange stick — do not use a sharp instrument that will scratch the surface. Clean between the spring-loaded sapphire edge guides and the gate. A piece of film cut to about 3/16 inch in width can be used for pushing out dirt which may collect under the edge guides.

While the gate is removed, clean the surface of the pressure pad and use a camel's-hair brush to clean the aperture.

Cleaning the Sound Optics — Turn the SOUND OPTICS CLAMP, figure 9, lower the sound optics assembly, and open the sound optics cover. Remove the EXCITER LAMP, figure 16, and clean both ends of the SOUND OPTICS with a camel's-hair brush or soft cloth. Clean and replace the exciter lamp. Be careful to keep the glass free of fingerprints.

Cleaning the Collecting Optics — Turn the SOUND OPTICS CLAMP, figure 9, and lower the sound optics assembly. Open the sound optics cover. Clean both surfaces of the PRISM, figure 17, and the COLLIMATING LENS with a camel's-hair brush or a soft, lintless cloth.

replacing lamps

CAUTION:
Before replacing the burned-out lamp, allow it to cool for several minutes.

Projection Lamp – There should be two projection lamps in the projector at all times. The lamp shown in figure 8 is the spare lamp which can be put into projection position instantly by turning the lamp change handle. To remove the burned-out lamp, lift it from the holder by the socket.

Place the new lamp in the lamp holder as shown in figure 8.

Exciter Lamp – Turn the SOUND OPTICS CLAMP, figure 9, lower the sound optics assembly, and open the sound optics cover. Turn the exciter lamp, figure 16, counterclockwise to remove it from the socket. The exciter lamp has a prefocus base and can be inserted in the socket in the correct position only.

Panel Lamp – The panel lamp reflects light to the control panel and can be reached through the amplifier door on the rear of the projector. Push the lamp in and turn it counterclockwise until it is released from the socket. Insert the pins on the bayonet base of the new lamp in the slots of the socket, push the lamp in, and turn it clockwise as far as it will go.

Threading Lamp – The threading lamp is located above the gate pressure knob. Push the lamp in and turn it counterclockwise until it is released from the socket. Insert the pins on the bayonet base of the new lamp in the slots of the socket, push the lamp in, and turn it clockwise as far as it will go.

oiling

• For continued and trouble-free operation it is essential that the recommended oiling routine be followed. Use only No. CW6229-A Lubricant, the kind that is supplied with the projector.

EVERY MONTH OR AFTER 100 HOURS OF OPERATION

Mechanism – Remove the four screws and the panel on the side of the machine away from the operator. Check the oil level in the OIL LEVEL GAGE, figure 10. If the level is not at the mid-point of the glass tube, add oil to the MECHANISM OIL CUP until the proper level is reached.

Intermittent – Check the oil level of the intermittent by means of the glass window indicated as OIL CHECK GLASS, figure 9. If the oil does not cover half the window, add lubricant to the INTERMITTENT OIL CUP, figure 10.

Intermittent Motor – Place several drops of oil in the oil cups of the INTERMITTENT MOTOR, figure 10.

Supply Reel Arm – Remove the four screws and the PLATE, figure 18. Slip the belt from the motor pulley. Remove the four screws from the CAP and lift off the cap. Place several drops of oil in the oil holes of the rewind motor.

Take-up Reel Arm – Remove the reel arm from the machine by loosening the two knurled screws. Remove the six screws and the PLATE, figure 19. Remove the four screws and the CAP. Place several drops of oil at the points marked OIL.

Be sure to wipe all excess oil from the machine.

FIGURE 18

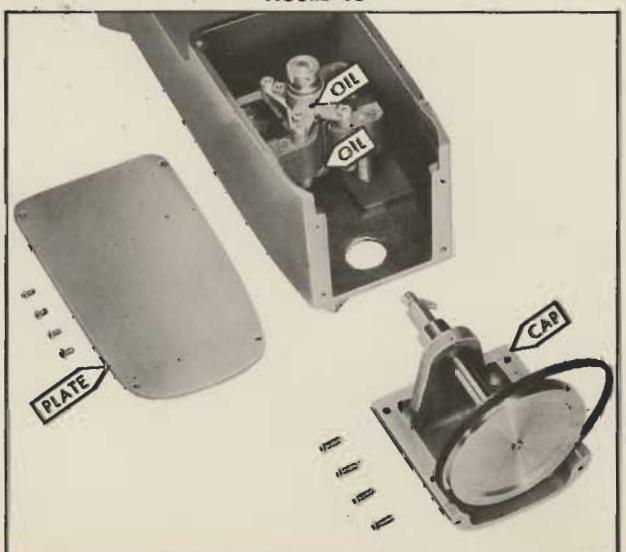
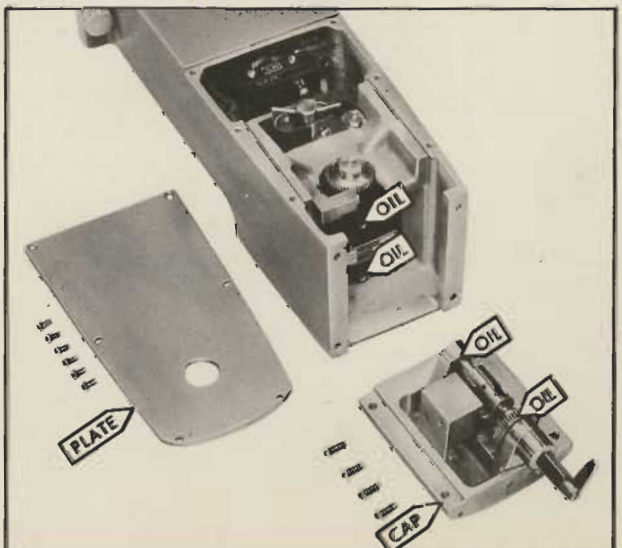


FIGURE 19



amplifier service

• Servicing the amplifier, other than tube or fuse replacement, should be done by an experienced electrical or radio repairman.

CAUTION:
Always disconnect the power cord when working on any of the electrical parts of the machine.

REPLACING FUSES

Failure of the exciter lamp to light may indicate that the fuse in the exciter lamp supply is blown. To replace the fuse, which is located on the chassis of the exciter lamp supply, disconnect the power cord, press in the fuse extractor post, turn it counterclockwise, and withdraw the post. Insert a new fuse (1½ amperes, part No. 119841) in the extractor post and replace the post in the exciter lamp supply.

A similar type of fuse is located at the rear of the amplifier. This fuse (1½ amperes, part No. 119841) can be replaced in the same manner as the fuse for the exciter lamp supply.

REPLACING TUBES AND PHOTOELECTRIC CELL

There are six tubes in the main amplifier and they can be replaced without removal of the amplifier from the cabinet. The location is indicated by the numbers stenciled near the sockets. Amplifier tubes are: two 6J7, one 6J5, two 6L6G, and one 5U4G.

The pre-amplifier has the following four tubes: 0B2, 6J7, 6J5, and 921 (photocell). To reach the tubes, turn the SOUND OPTICS CLAMP, figure 9, and lower the sound optics assembly. The location of the tubes is stenciled on the edge of the pre-amplifier opposite the tube sockets.

REMOVING THE AMPLIFIER

Disconnect the cords and plugs shown in figure 7. Remove the two screws holding the amplifier to the rails. Raise the rear end of the amplifier and slide it carefully from the cabinet.

replacing belt

Supply Reel Arm — Remove the four screws and the PLATE, figure 18. Slip the belt from the motor pully first; then remove it from the spindle pulley. Place the new belt on the spindle pulley first; then on the motor pulley.

▶ servicing

• The information given in this section of the manual will make it possible for an *experienced* radio serviceman to make repairs or replacements quickly. The very nature of sound projection equipment is such that the services and tools of a skilled mechanic are necessary if satisfactory repairs are to be made. Therefore, be sure of the ability of your repairman before you permit him to work on your projector.

CAUTION:
Always disconnect the power cord when working on any of the electrical parts of the machine.

sound system

• The Sound System of the Eastman 16mm Projector Model 25 is made up of the following four units:

The Model PRE-25 Pre-amplifier circuit contains the following electron tubes with their associated electrical components:

A type 921 gas photocell, which converts the modulated light beam into a similarly modulated electrical signal.

A type 0B2 voltage regulator, which regulates the 85 volts applied to the type 921 photocell. This insures a more uniform output level and prevents a glow discharge from occurring, which would greatly reduce the life of the photocell.

A type 6J7 tube and a type 6J5 tube is a two-stage highly stable voltage amplifier that employs selective negative feedback to equalize for sound-track scanning losses. In addition, the negative feedback, by reducing the output impedance of the pre-amplifier, insures a low hum pick-up in the circuit coupling the pre-amplifier to the amplifier. The pre-amplifier is coupled to the amplifier by a 5-conductor cable.

The Model A-25 Amplifier consists of:

A type 6J7 tube as a voltage amplifier in the microphone-phonograph channel.

A six-step, low-frequency equalizer.

A six-step, high-frequency equalizer.

A power-amplifier circuit consisting of a type 6J7 voltage amplifier, a type 6J5 phase inverter, two type 6L6 push-pull output tubes, and an output transformer that couples the output tubes to the speaker system. Negative feedback is employed to obtain the proper amount of loudspeaker damping for high-fidelity reproduction.

A power supply consisting of a plate-filament transformer, a type 5U4G high-voltage rectifier, and a resistance-capacitance filter.

The Model EXL-25 Exciter Lamp Supply consists of:

A step-down power transformer with a center-tapped secondary winding.

A full-wave selenium disk rectifier and filter.

The exciter lamp supply furnishes 6 volts dc to the exciter lamp and the heaters of the pre-amplifier tubes.

A 4-conductor cable connects the exciter lamp supply to the A-25 Amplifier. Two of the conductors carry 117 volts ac to the exciter lamp supply while the remaining two carry 6 volts dc to the A-25 Amplifier.

The Loud-Speaker System consists of:

A bass-reflex speaker enclosure.

A type 604-B Duplex Speaker.

A type N-1000B dividing network.

test procedure

• The following test procedure is recommended if the sound system fails to perform properly.

If the Fuse is Blown in the A-25 Amplifier and new fuses blow repeatedly:

1. Test the rectifier tube and output tubes. Before replacing a defective rectifier tube, measure the resistance between pin No. 8 on 5U4G socket and ground. If this resistance is 6000 ohms or less, at least one of the condensers in the dual units C25 and C26 is shorted and must be replaced before substituting a new 5U4G rectifier tube.
2. Check for short circuits across the primary and secondary windings of the power transformer.
3. Check amplifier generally for shorts and broken leads.

Six volts dc for the heaters of the pre-amplifier tubes and the exciter lamp are supplied by the exciter lamp supply EXL-25. The fuse is located in the EXL-25 chassis.

If the Fuse is Not Blown in the A-25 Amplifier but no sound comes from film although amplifier tubes glow, exciter lamp is lighted, and the control switch is set at FILM, and if:

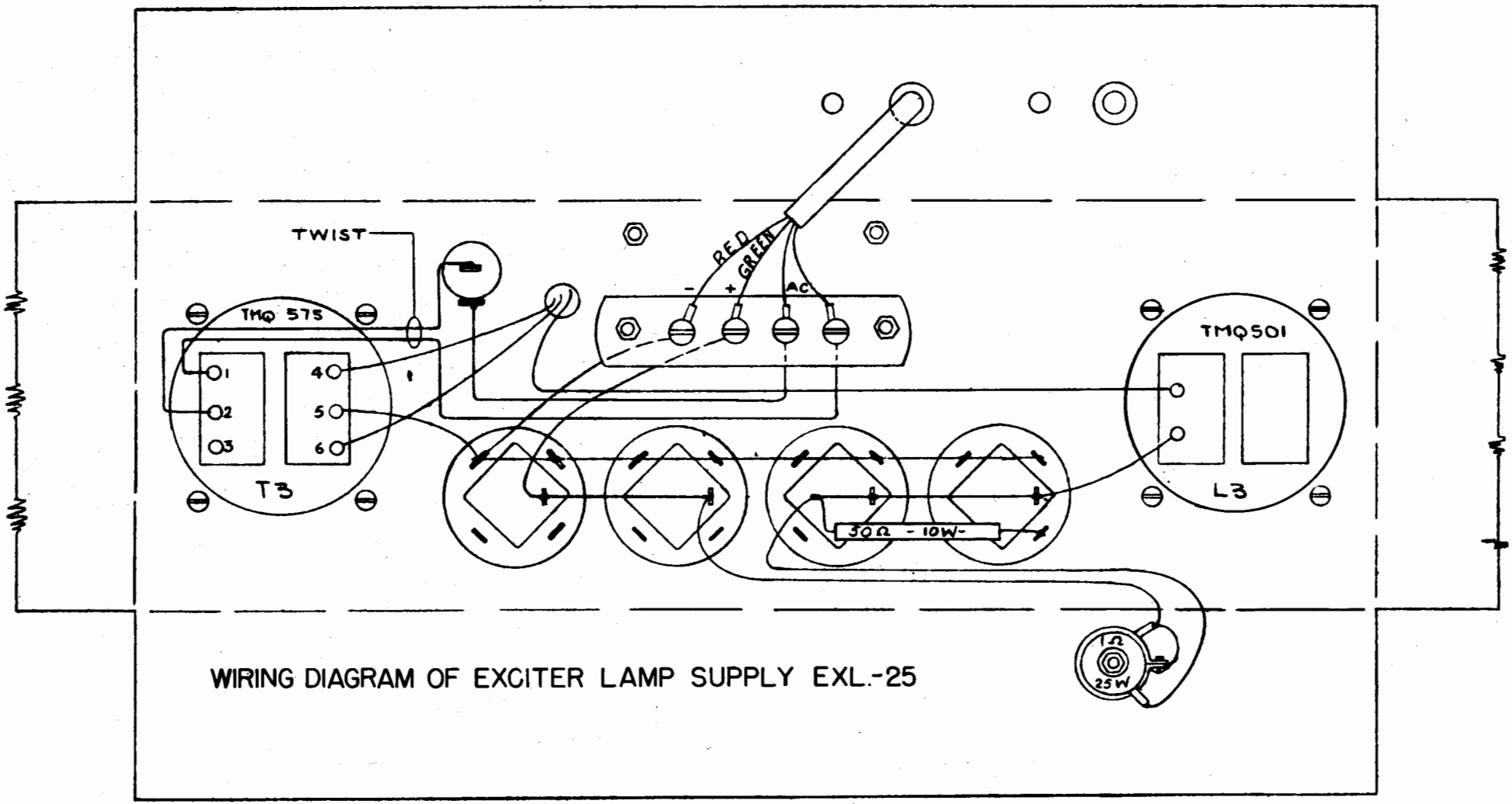
1. No background noise is heard on the film or microphone channel although the volume control is fully advanced:
   a. Speaker circuit may be open. Test speaker voice coil, speaker cord, and secondary of output transformer.
   b. Test all amplifier tubes.
   c. Remove the amplifier and check all voltages.
2. Background noise is heard on microphone channel:
   a. Connect a microphone to the microphone input receptacle, set control switch at MIC and listen for sound reproduction. If sound is now heard, reset control switch at FILM. Unlatch the sound optics-exciter lamp assembly and swing it away from the pre-amplifier. Connect an audio oscillator to the grid cap of 6J7 and listen for sound reproduction. (If an audio oscillator is not available, touching the grid cap with a screwdriver will furnish enough signal to be heard through the speaker.)
      (1) If sound is heard:
         (a) Inspect the photocell for proper position and good contact in mounting bracket.
         (b) Measure the voltage on the power supply side of the one megohm photocell load resistor.
         (c) Check the alignment of the collecting prism.
      (2) If no sound is heard:
         (a) Test the pre-amplifier tubes.
         (b) Remove the pre-amplifier from the projector and with the pre-amplifier connected to the A-25 Amplifier, check all pre-amplifier voltages.
         (c) Check the continuity between the pre-amplifier output potentiometer and the film input terminal of the control switch in the A-25 Amplifier.
   b. If sound is not heard:
      (1) Check the continuity of microphone input circuit.
      (2) Check the continuity of the control switch.

Low Amplifier Output on Film and Microphone Channels

1. Measure the line voltage.
2. Test all tubes in the A-25 Amplifier.
3. Check all voltages in the A-25 Amplifier.

Low Amplifier Output on Film Channel Only

1. Test all tubes in the pre-amplifier.
2. Check all voltages in the pre-amplifier.
3. Substitute another type 921 photocell.



WIRING DIAGRAM OF EXCITER LAMP SUPPLY EXL.-25

#11954/ THREADING LAMP GENERAL ELECTRIC CODE # 15 T 7DC/IF

MA-10

BL-18

#119538 LAMP SOCKET

WH-17

BL:Y.TR.-60

BL-52

GN-13

BU-59

#119284 VERTICAL SHAFT MOTOR

#119553 CAPACITER 3.75 MFD. 330 VAC.

#119392 INNER CONTACT

#119391 OUTER CONTACT

#119390 INSULATOR BLOCK

#120274 BASE-UP PROJECTION LAMP 1000 WATT 115 VOLT

BL-44

WH-43

#119220 REWIND ARM PLUG

#119536 SERVICE DISCONNECT PLUG

BL-48 BL-48 BU-8

WH-49 WH-49 R-16

#119525 REWIND ARM SOCKET

#119537 SERVICE DISCONNECT SOCKET

#119030 INTERMITTENT MOTOR

#119036 BLOWER MOTOR

BL-44

BL-45

#119359 PROJECTION LAMP MICROSWITCH

WIRE #119042

BL-50

#119218 REWIND MOTOR

BL-50

REWIND ARM DIAGRAM

BL:Y.TR.-53

BU-55

BU-19

#119554 CAPACITOR 4 MFD. 330 VAC.

BL-54

BR-14

GY-15

BL-58

BU-57

BL:Y.TR-11

WH-43 BL-45

WIDE BLADE.

#119549 PROJECTION LAMP POWER RECEPTACLE-POLARIZED

LAMPHOUSE WIRING DIAGRAM

#119552 SHORTING SCREWS

GN-13 WH-17 R-16 BL-18

BR-14 GY-15 Y-7 BU-19

#119551 CONNECTOR BLOCK

GN-13
BL-18
WH-17
R-16

BU-19
BR-14
GY-15
OR-9
Y-7

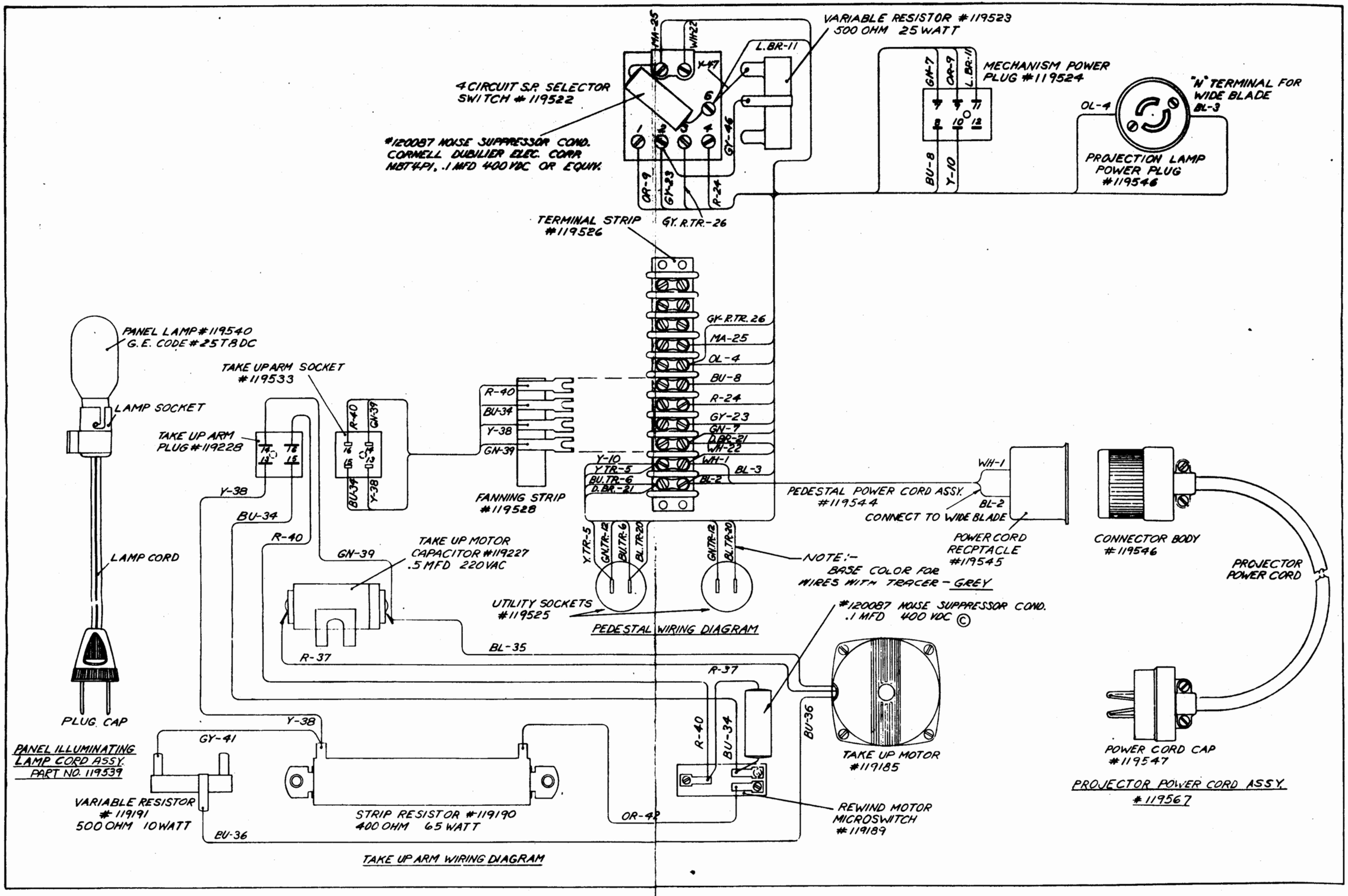
#119535 MECHANISM POWER RECEPTACLE

BU-8 MA-10

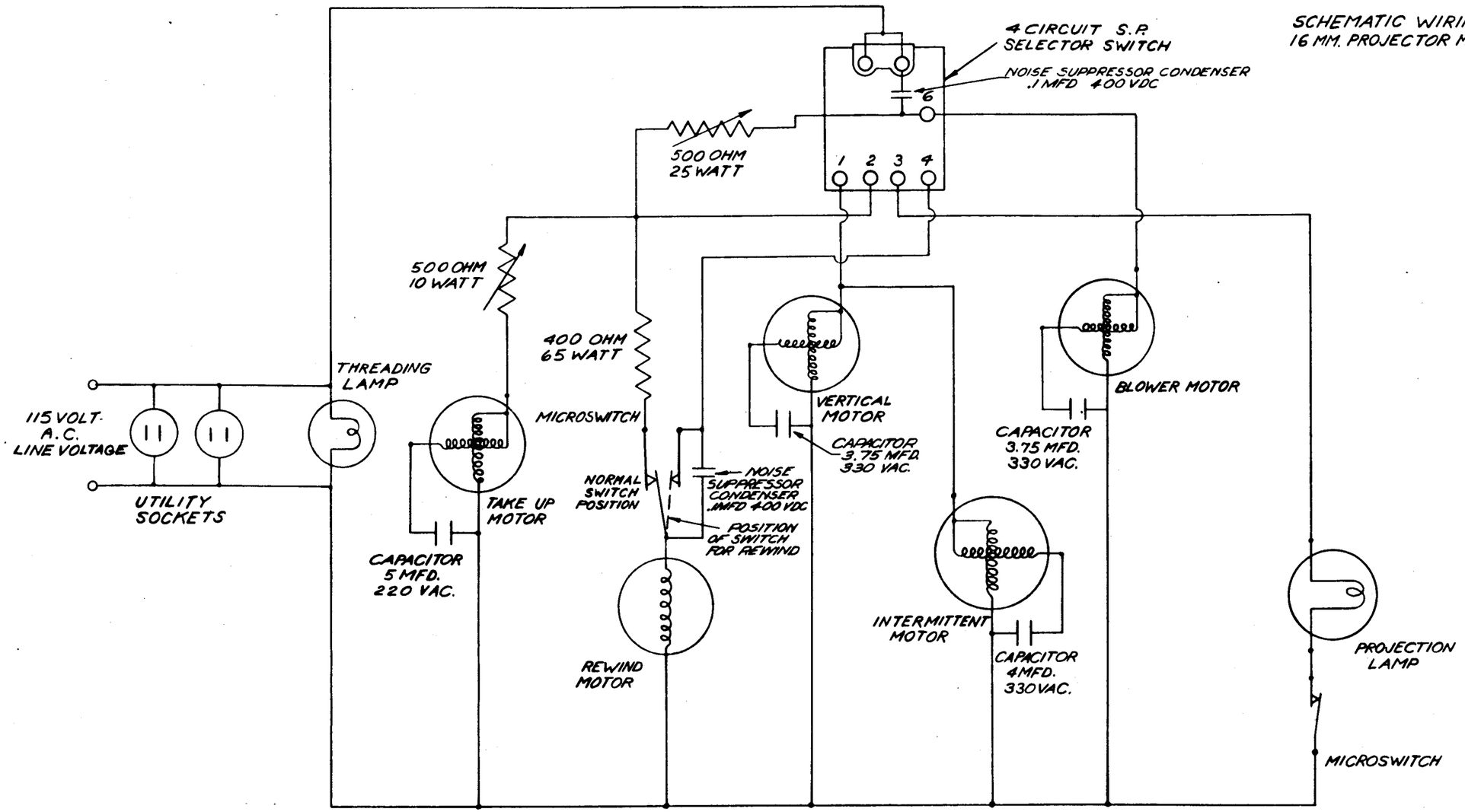
Y-7 OR-9 BL:Y.TR-11

MECHANISM CASE WIRING DIAGRAM

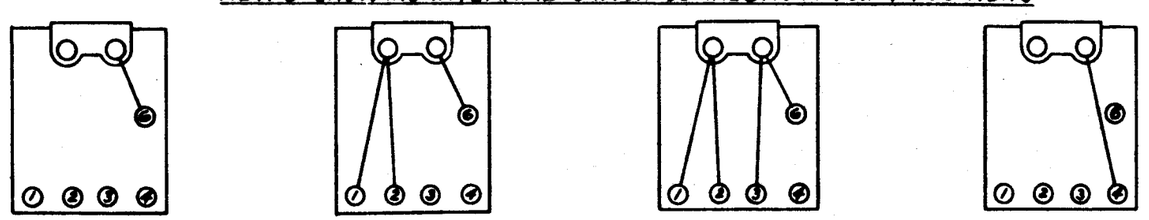
#119553 CAPACITOR 3.75 MFD. 330 VAC.

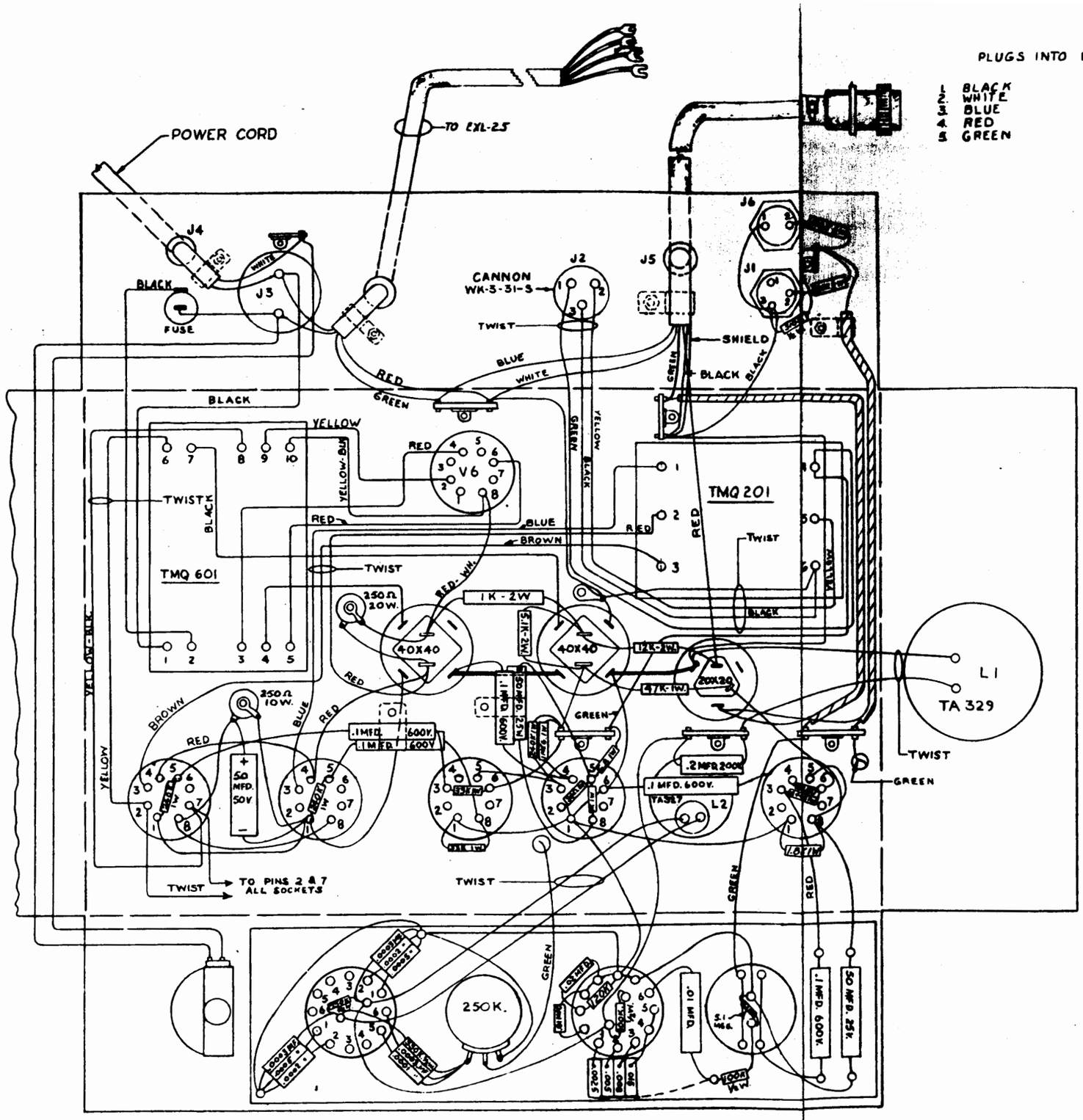

VARIABLE RESISTOR #119523
500 OHM 25 WATT
4 CIRCUIT S.P. SELECTOR SWITCH #119522
#120087 NOISE SUPPRESSOR COND. CORNELL DUBILIER ELEC. CORP. MBT4P1, .1 MFD 400 VDC OR EQUIV.
MECHANISM POWER PLUG #119524
"N" TERMINAL FOR WIDE BLADE BL-3
PROJECTION LAMP POWER PLUG #119546
TERMINAL STRIP #119526
PANEL LAMP #119540 G.E. CODE #25T8DC
LAMP SOCKET
LAMP CORD
PLUG CAP
PANEL ILLUMINATING LAMP CORD ASSY. PART NO. 119539
TAKE UP ARM SOCKET #119533
TAKE UP ARM PLUG #119228
FANNING STRIP #119528
TAKE UP MOTOR CAPACITOR #119227 .5 MFD 220 VAC
UTILITY SOCKETS #119525
PEDESTAL WIRING DIAGRAM
PEDESTAL POWER CORD ASSY. #119544
CONNECT TO WIDE BLADE
POWER CORD RECPTACLE #119545
CONNECTOR BODY #119546
PROJECTOR POWER CORD
POWER CORD CAP #119547
PROJECTOR POWER CORD ASSY. #119567
NOTE:- BASE COLOR FOR WIRES WITH TRACER - GREY
#120087 NOISE SUPPRESSOR COND. .1 MFD 400 VDC ©
TAKE UP MOTOR #119185
REWIND MOTOR MICROSWITCH #119189
VARIABLE RESISTOR #119191 500 OHM 10 WATT
STRIP RESISTOR #119190 400 OHM 65 WATT
TAKE UP ARM WIRING DIAGRAM

SCHEMATIC WIRING DIAGRAM FOR 16 MM. PROJECTOR MODEL 25

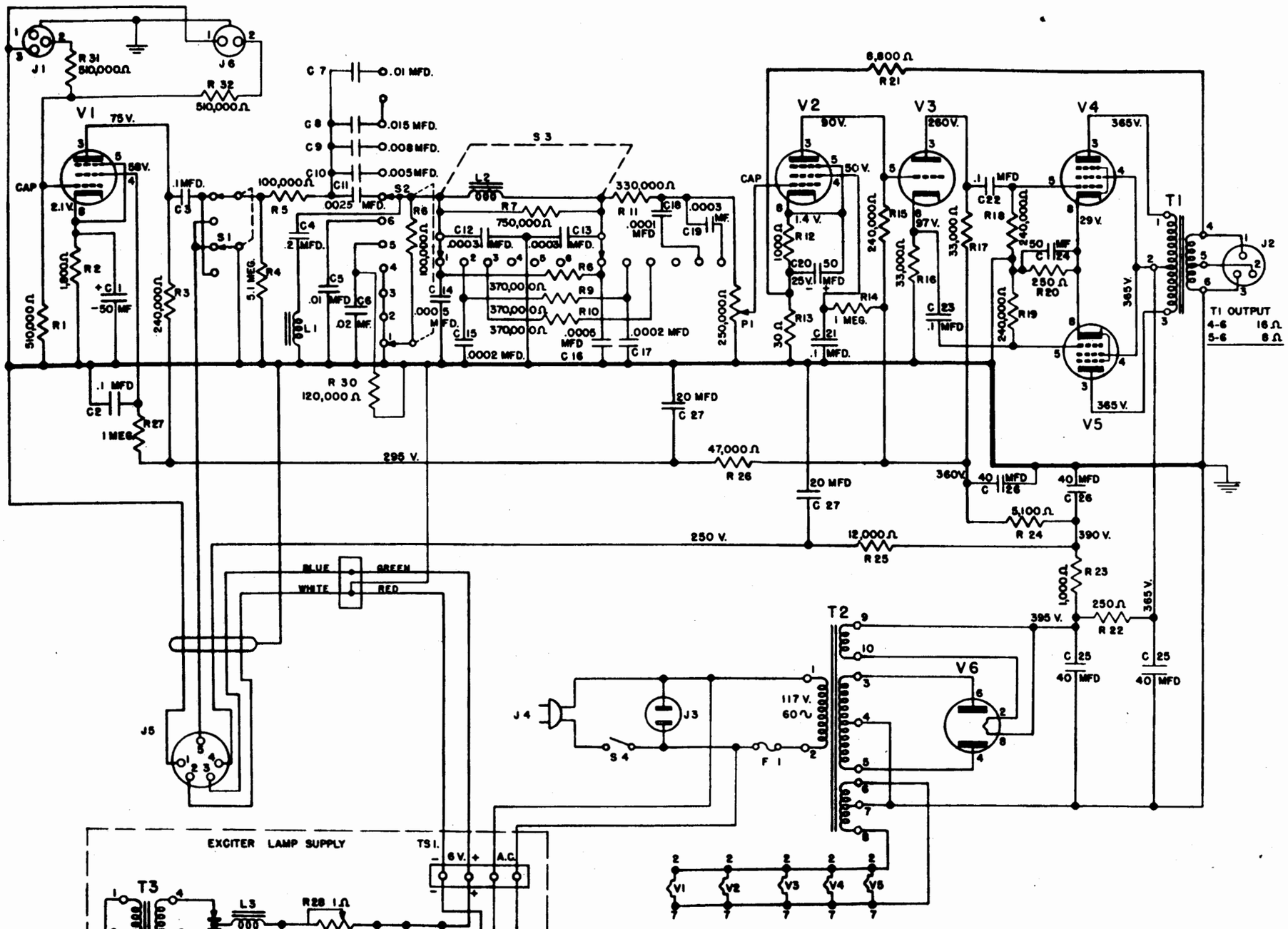


VIEWS SHOWING INTERNAL SWITCH CONNECTIONS FOR 4 POSITIONS





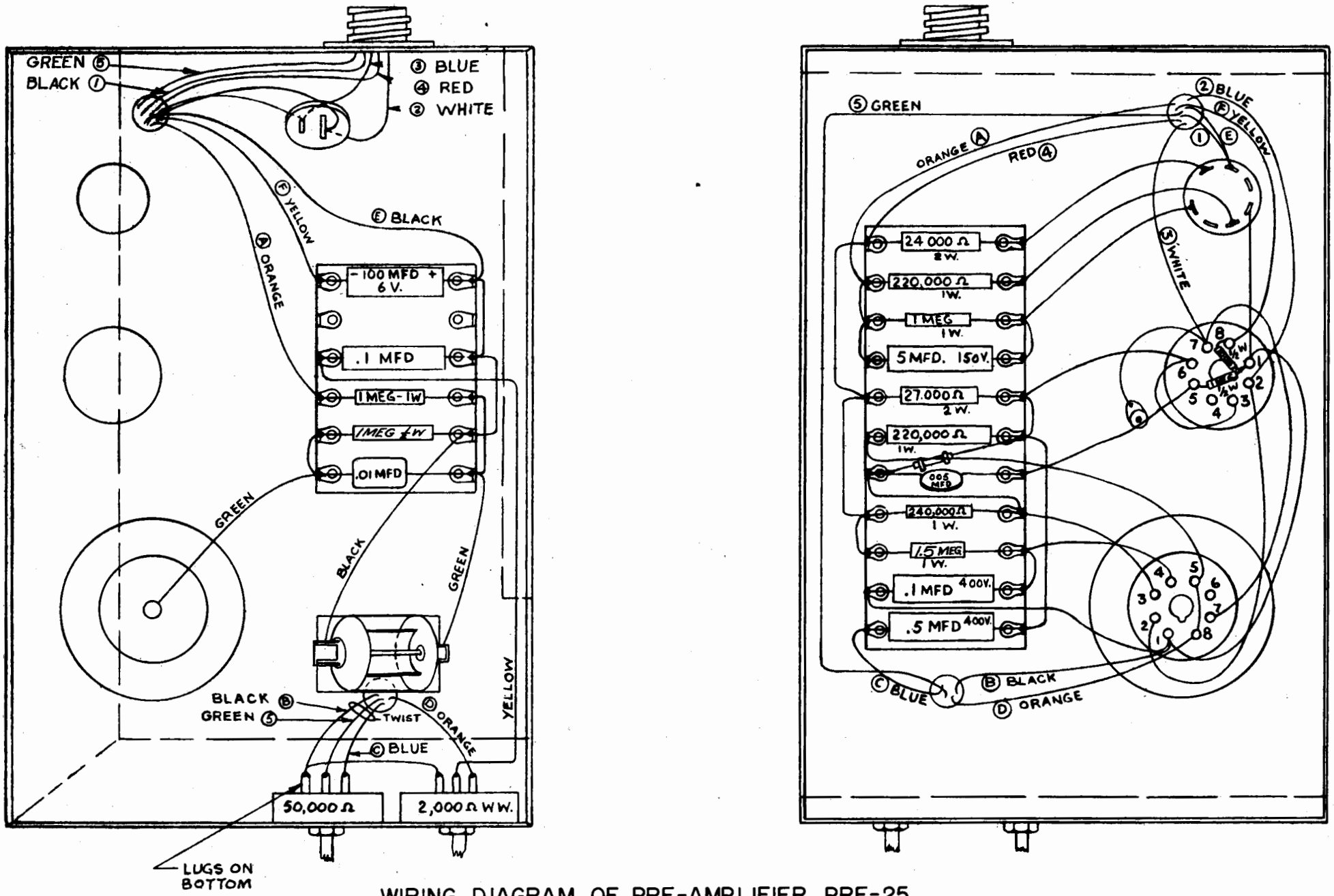
WIRING DIAGRAM OF AMPLIFIER A-25



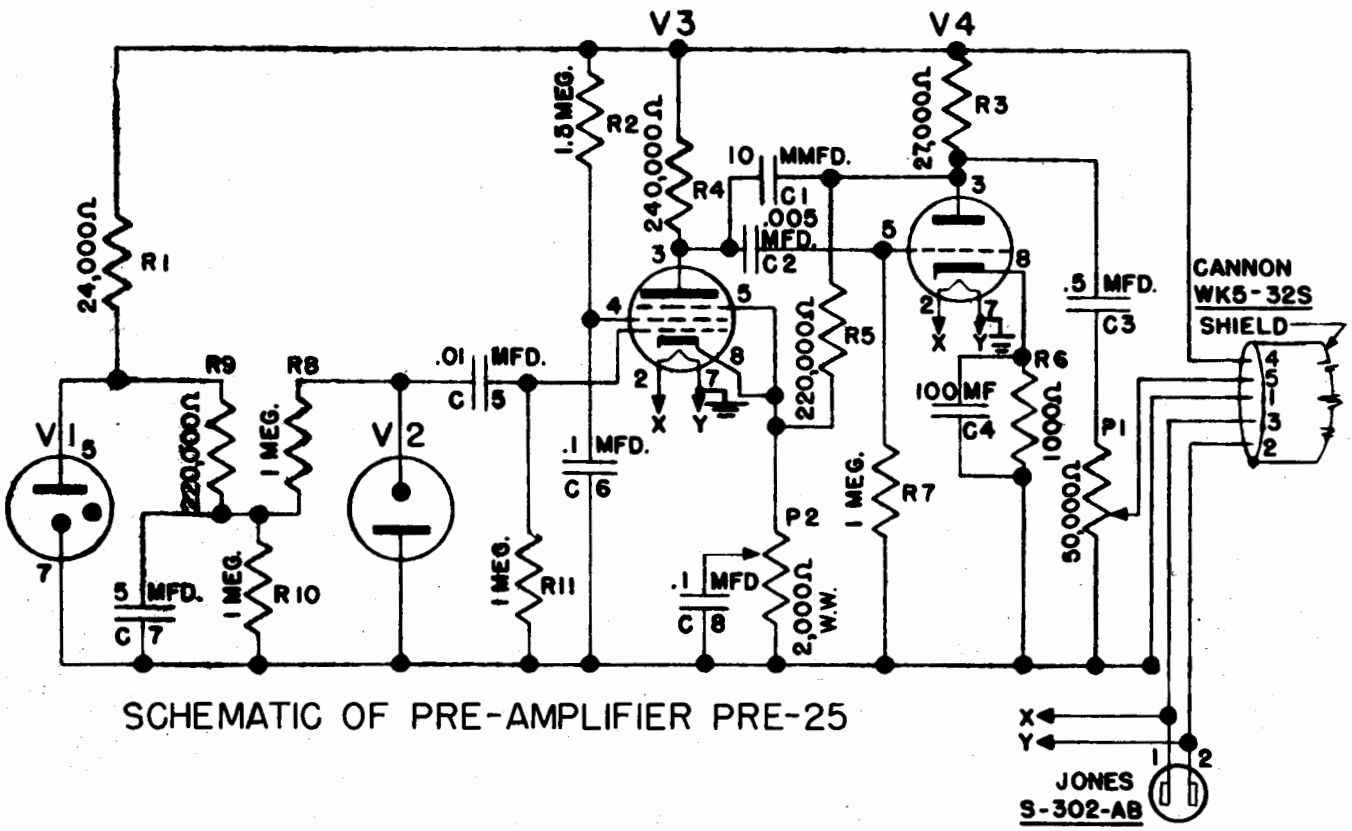
SCHEMATIC OF AMPLIFIER A-25 & EXCITER LAMP SUPPLY EXL-25

CODE	PART	EK No.
C1	50 MFD, 25 V.D.C., (CD) BR502	119848
C2,3	.1 MFD, 600 V.D.C., Sprague	120501
C4	.2 MFD ± 10%, 400 V.D.C., (Mallory) TP429	119850
C5	.01 MFD ± 5%, 300 V.D.C., (CD) ID3S1	119851
C6	.02 MFD ± 10%, 400 V.D.C., (Mallory) TP423	119852
C7	.01 MFD ± 5%, 300 V.D.C., (CD) ID3S1	119851
C8	.015 MFD ± 10%, 400 V.D.C., (Mallory) TP400	119853
C9	.008 MFD ± 5%, 300 V.D.C., (CD) ID3D8	119854
C10	.005 MFD ± 5%, 500 V.D.C., (CD) ID5D5	119855
C11	.0025 MFD ± 5%, 500 V.D.C., (CD) IW5D2	119856
C12,13	.0003 MFD ± 5%, 500 V.D.C., (CD) 5W5T3	119857
C14	.0005 MFD ± 5%, 500 V.D.C., (CD) 5W5T5	119858
C15	.0002 MFD ± 5%, 500 V.D.C., (CD) 5W5T2	119859
C16	.0005 MFD ± 5%, 500 V.D.C., (CD) 5W5T5	119858
C17	.0002 MFD ± 5%, 500 V.D.C., (CD) 5W5T2	119859
C18	.0001 MFD ± 5%, 500 V.D.C., (CD) 5W5T1	119860
C19	.0003 MFD ± 5%, 500 V.D.C., (CD) 5W5T3	119857
C20	50 MFD, 25 V.D.C., (CD) BR502	119848
C21,22, 23	.1 MFD, 600 V.D.C., (Mallory) TP418	119849
C24	50 MFD, 50 V.D.C., (CD) BR505	119861
C25,26	40x40 MFD, 500 V.D.C., (CD) 4450	119862
C27	20x20 MFD, 450 V.D.C., (Mallory) FP234	119863
C28,29 30,31	3,000 MFD, 10 V.D.C., (Mallory) WP032	119839
F1,2	1.5 Amp. Littlefuse No. 31201.5	119841
J1	Amphenol, 91-PC3F	119889
J1 Plug	Microphone Plug Amphenol 91-MC3M	105324
J2	Cannon No. WK3-31-S	119891
J3	Cannon No. WK-3-22-C-5/16	119892
J4	Belden H-1047	119893
J5	Cannon No. WK5-21-C-5/16	119894
J6	Amphenol 80-PC2F	119895
J6 Plug	Phonograph Plug Amphenol 80-MC2M	119896
L1	TA-329 Altec Lansing, 450 HY, 6,000 Ohms	119883
L2	TA-327 Altec Lansing	119884
L3	TMQ-501 Altec Lansing	119835
P1	250,000 Ohms (Mallory) MR44-250M-1 (No Excp)	119885
R1	510,000 Ohms, 1/2W (IRC) B.T.S.	120511
R2	1,800 Ohms, 1W (IRC) B.T.A.	119865
R3	240,000 Ohms, 1W (IRC) B.T.A.	119814
R4	5.1 Megohms, 1/2W (IRC) B.T.S.	119866
R5,6	100,000 Ohms, 1/2W (IRC) B.T.S.	74939
R7	750,000 Ohms, 1/2W (IRC) B.T.S.	119868
R8,9,10	370,000 Ohms, 1/2W (IRC) B.T.S.	119869
R11	330,000 Ohms, 1/2W (IRC) B.T.S.	119870
R12	1,000 Ohms, 1W (IRC) B.T.A.	119871
R13	30 Ohms, 1W (IRC) B.W.I.	119872
R14	1 Megohm, 1W (IRC) B.T.A.	119818
R15	240,000 Ohms, 1W (IRC) B.T.A.	119814
R16,17	33,000 Ohms, 1W (IRC) B.T.A.	119873
R18,19	240,000 Ohms, 1W (IRC) B.T.A.	119814
R20	250 Ohms, 10W Ohmite Brown Devil	119874
R21	6,800 Ohms, 1W (IRC) B.T.A.	119875
R22	250 Ohms, 20W Ohmite Brown Devil	119876
R23	1,000 Ohms, 2W (IRC) B.W.2	119877
R24	5,100 Ohms, 2W (IRC) B.T.2	119878
R25	12,000 Ohms, 2w (IRC) B.T.2	119879
R26	47,000 Ohms, 1W (IRC) B.T.A.	119880
R27	1 Megohm, 1W (IRC) B.T.A.	119818
R28	1 Ohm, 25W Ohmite Dividohm	119837
R29	50 Ohms, 10W Ohmite Brown Devil	119838
R30	120,000 Ohms, 1/2W (IRC) B.T.S.	119849
R31,32	510,000 Ohms, 1/2W (IRC) B.T.S.	120511
S1	(Mallory) 3122-J	119886
S2,3	(Mallory) 3126-J	119887
S4	S.P.S.T. Rotary, H & H 1561, 3/8 Shaft	119888
T1	TMQ-301A Altec Lansing	119881
T2	TMQ-601 Altec Lansing	119882
T3	TMQ-575 Altec Lansing	119834
TS1	(ARH) 1059	119844
V1,2	6J7, R.C.A. or Equivalent	56300
V3	6J5, R.C.A. or Equivalent	119803
V4,5	6L6G, R.C.A. or Sylvania	119846
V6	5U4G, R.C.A. or Sylvania	119847
Rect.	Fansteel BM-0041M	119836
	Base Type BKP Fuse Extractor Post	119840
Speaker Cord Plug		
	Amplifier End Cannon No. WK3-22-C-5/16	119802
	Speaker End Cannon No. WK3-21-C-5/16	119803

CD-Cornell Dubilier
IRC-International Resistor Corporation



WIRING DIAGRAM OF PRE-AMPLIFIER PRE-25



SCHEMATIC OF PRE-AMPLIFIER PRE-25

Code	Part	EK No.	Code	Part	EK No.
C1	10 MMFD, Centralab Hicap BC-20	119804	R5	220,000 Ohms, 1W (IRC) B.T.A.	119815
C2	.005 MFD, Centralab Hicap Disc DA-048	119805	R6	1,000 Ohms, 1/2W " B.T.S.	119816
C3	.5 MFD, Solite 400V	119806	R7	1 Megohm, 1/2W " B.T.S.	74940
C4	100 MFD, 6V Aerovox TYPE P.R.S.	119807	R8	1 Megohm, 1W " B.T.A.	119818
C5	.01 MFD, MC475 (Mallory)	119808	R9	220,000 Ohms, 1W " B.T.A.	119815
C6	.1 MFD, 400V (Mallory) TP-428	120087	R10	1 Megohm, 1W " B.T.A.	119818
C7	5 MFD, 150V (Mallory) TC-40	119810	R11	1 Megohm, 1/2W " B.T.S.	74940
C8	.1 MFD, 400V (Mallory) TP-428	120087	V1	OB2 R.C.A. or Equivalent	119800
P1	50,000 Ohms, (Mallory) MR-33	119819	V2	921 R.C.A. or Equivalent	58525
P2	2,000 Ohms, (Mallory WW) V131	119820	V3	6J7 R.C.A. or Equivalent	58300
R1	24,000 Ohms, 2W Ohmite Little Devil	119811	V4	6J5 R.C.A. or Equivalent	119803
R2	1.5 Megohms, 1W (IRC) B.T.A.	119812		Jones S-302-AB	119821
R3	27,000 Ohms, 2W Ohmite Little Devil	119813		Cannon WK5-32-S	119822
R4	240,000 Ohms, 1W (IRC) B.T.A.	119814			

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

11-50-GLP-B

Lithographed in the United States of America

Kodak