Film-Tech

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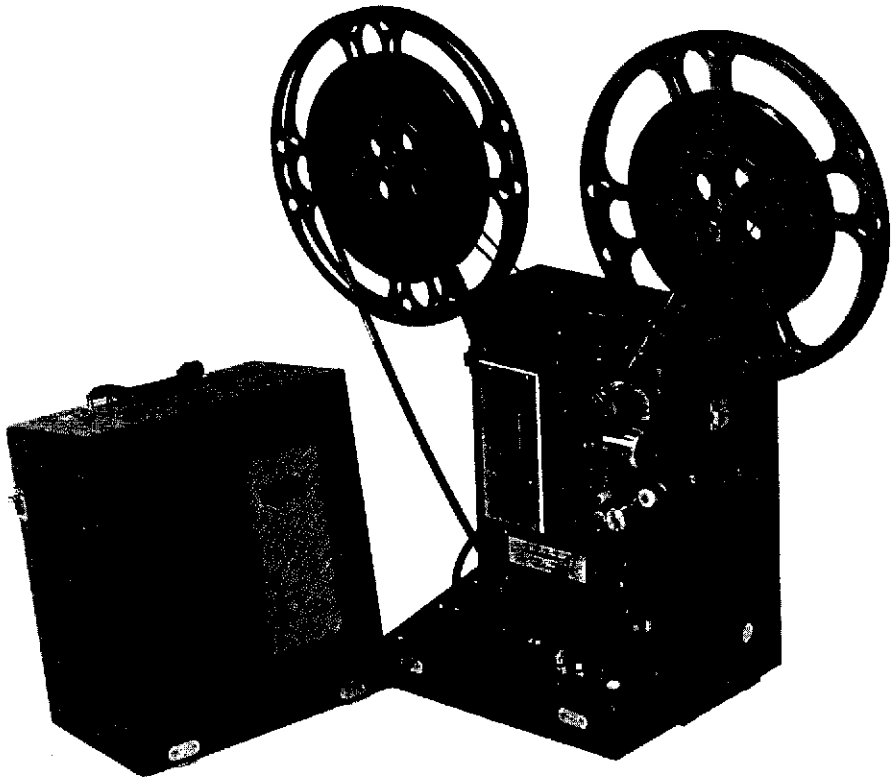
APRIL 1963 NO. 768376

Servicing the

Kodak Pageant Sound Projector, Model AV-126-TR



EASTMAN KODAK COMPANY
Apparatus Service Department
ROCHESTER 4, NEW YORK

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KODAK PAGEANT SOUND PROJECTOR, MODEL AV-126-TR

1. GENERAL SPECIFICATIONS

1.1 ELECTRICAL

Power service required: 105 to 125 volt, 60 cycle ac only

Power consumed: with 750 watt lamp - 950 watts
with 1000 watt lamp - 1200 watts
with 1200 watt lamp - 1400 watts

Projection lamps: 750 watt, ASA Code DDB
1000 watt, ASA Code DFD
1200 watt, ASA Code DHT

1.2 MECHANISM

Claw protrusion: .030" - .045" (Section 5.18.3).
Pull-through tension: 1½ - 2½ ounces (Section 5.3.4).
Side guide tension: 1 - 1½ ounces (Section 5.3.2).
Flywheel torque: 3 - 4½ ounce-inches (Section 5.15.3).
Pressure roller tension: 12 - 18 ounces.
Shutter shaft RPM, Sound Speed: 1440 ± 75
Shutter shaft RPM, Silent Speed: between 1020 and 1140

1.3 SOUND SYSTEM

Transistors: 5-2N109 or 2N1370, 2-2N307 or T1-370, 1-2N35 or 2N1304
Exciter lamp: 6 volt 1.0 ampere, ASA Code BSK
Input impedances: Microphone, 5,000 ohms; Phono, 0.5 megohms
Output impedance: 6 ohms
Frequency response: 30 to 20,000 cycles ± 3 db

2. SERVICE HINTS WITH SUGGESTED CHECK POINTS

2.1 MECHANISM

Projector will not run forward

Motor drive pulley belt slippage caused by oil on belt.
Clean oil off pulleys and replace belt.
Direction shifting adjustment (Section 5.22.5).
Shutter drive belt slippage.

Projector will not run in reverse

Motor drive pulley slippage caused by oil on rubber drive. Replace pulley.
Direction shifting adjustment (Section 5.22.5).
Shutter drive belt slippage.

Speed shifting operates improperly

Speed shifting adjustment (Section 5.22.3).
Speed shifting lever assembly (Section 5.22). If Type I, II, or III as described in Section 5.17 - replace parts as described.

Supply spindle binds - "A" serial number projectors

Replace complete supply reel arm assembly with late style #160722.

Streaks on screen - no film in projector

Projection lamp seating and adjustments (Section 5.29.1).
Condenser mount assembly.
Reflector.

Picture does not focus properly

Free movement of projection lens field flattener element.
Alignment of the aperture plate and pressure pad assembly (Section 5.3.2).

Picture cannot be framed properly

Stripped threads on framing shaft.
Framing shaft retaining ring missing.

Picture unsteady

Claw clearance in aperture plate slot (Section 5.3.4).
Pull-through tension (Section 5.3.4).
Free movement of side guides.
Side guide pressure (Section 5.3.2).
Cam follower.
Shutter shaft ball bearing.

Projector loses lower loop and tears film perforations

Claw clearance in aperture plate slot (Section 5.3.4).
Claw protrusion (Section 5.18.3).
Alignment of pressure pad rails with aperture plate rails (Section 5.3.2).
Pull-through tension (Section 5.3.4).
Sound drum pressure roller tension (Section 5.16.3).
In-and-out cam wear.
Cam follower wear.

Breaks splices

Condition of splices.
Excessive amount of pull-through tension (Section 5.3.4).
Sprocket clamp adjustment (Section 5.7.3 upper; Section 5.8.3 lower).

Does not take-up film

Take-up pulley pawl binds (Section 5.25.1).
Take-up belt.

Super-40 shutter fails to shift or shifts slowly

Locking lever action.
Blades bind (Section 5.19.2).
Shutter weight return spring tension.

Take-up (rear) reel spills film while projector is running in reverse

Take-up pulley assembly binds (Section 5.25.1).
Clean and lubricate the pulley pawl.

Spills film off supply (front) reel while projector is running in reverse

Supply spindle torque. Correct torque is between 7 and 14 ounce-inches. If torque is low, replace the tension adjusting spring #131363.

Film does not stay on sound drum when projector is running in reverse

Damping roller arm adjustment (Section 5.9.3).

Rewind does not function

Rewind belt.
Rewind mechanism.
Take-up and rewind spindles bind.
"A" serial number projectors - replace complete supply reel arm assembly with late style #160722.

Scratches film

Damper roller or sound drum pressure roller binds.
Rough or worn rails on pressure pad.
Alignment of pressure pad rails with aperture plate rails (Section 5.3.2).
Burrs, nicks, or abrasions on all surfaces over which film passes.

Supply (front) spindle rotates while projector is running forward, without film

Clearance between the sun gear and sprocket and the reversing mechanism internal gear (Section 5.12.3).

Film noise in gate

Excessive amount of pull-through tension (Section 5.3.4).
Clearance of claw in aperture plate slot (Section 5.3.4).

Mechanism noisy - no film in projector

Claw clearance in aperture plate slot (Section 5.3.4).
Claw protrusion (Section 5.18.3).
Claw return spring.
Claw retaining spring.
Pull-down cam.
In-and-out spring.
Shutter shaft bearings and ball bearing retaining screws.
Worm secure on shutter shaft.
Fan clearance in fan housing.
Tightness of fan housing-to-mechanism mounting screws.
Tightness of mechanism-to-case mounting screws.
Speed shifting adjustment (Section 5.22.3).
Motor bearings worn.
Belt damping rollers - "A" serial number projectors - modify projector using Kit #K-1655 (Section 5.17).

Pinging sound in mechanism, especially at silent speed

Drive belt operation.
Speed shifting adjustment (Section 5.22.3).

Motor noisy

Worn motor bearing.

Projector speed incorrect

Motor drive pulley belt and rubber drive slippage caused by oil on belt and/or rubber drive. Replace pulley and/or belt.
"A" serial number projector fit oil catcher #165193 and clip #164853 on end of motor shaft.

2.2 SOUND SYSTEM

No film sound (exciter lamp not lighted)

Exciter lamp connection to power supply.
Power supply.
Exciter lamp.

No film sound (exciter lamp lighted)

Plug in microphone and

1. If no sound through microphone, check amplifier.
2. If sound satisfactory through microphone, check following:
   - Threading of projector
   - Speaker plug contact
   - Speaker cable continuity
   - Sound optics adjustment (Section 5.30.1)
   - Solar cell cable and connection

Excessive hum

Solar cell cable plug connection.

Noise in speaker

Sound drum reverse drive chain (Section 5.11.3).
Projector electrical connections.
Electrical leakage between motor frame and projector or between amplifier and projector.
Fan clearance.
Motor grounding connection.

Microphonics

Seating of the exciter lamp in the socket.
Sound optics adjustment (Section 5.30.1).

Microphonics (microphone plugged in)

Microphone.
Microphone connector.

Weak or distorted sound

Fidelity control adjustment, (see projector instruction book).
Seating of exciter lamp in the socket.
Sound optics assembly and sound optics adjustment, (Section 5.30.1).

Speaker rattles at high sound volume

Speaker coil bottoming.
Speaker cone.

Sound unsteady

Threading of projector.
Damping roller action (Section 5.9.3).
Sound drum binds.
Sound drum reverse drive chain (Section 5.11.3).
Pressure roller action (Section 5.16.3).
Pressure roller tension (Section 5.16.3).
Lower sprocket.
Damping roller spring tension (Section 5.9.3).
Damping fluid in damping bearing cup (Section 5.9.2).

Sound still unsteady after above checks

Sound drum ball bearing roughness.
Binds in sound drum sprocket and pawl assembly.

Fidelity control does not peak

Positioning and adjustment of sound optics assembly - (Section 5.30.1).
Sound optics.

3. SERVICE LUBRICANTS

Available from:

EASTMAN KODAK COMPANY
APPARATUS PARTS SERVICE
ROCHESTER 4, NEW YORK

Or others as indicated:

A&O10-592 - Special Formula Lubricant

A&O61-3619 (CW6782) - Special Formula Lubricant

EK1150 Oil equivalent to:

Sunvis No. 916 (Sun Oil Co.)
Teresso No. 43 (Esso)
Pacemaker 150T (Cities Service)
Harmony "A" (Gulf Oil Co.)
Turbo No. 27 (Shell Oil Co.)

A&O61-3655 (CW8362) - Grease

Plastilube No. 1 (Warren Refining and Chemical Co., Cleveland, Ohio).

A&O61-3664 (CW6092) - Grease

Texaco Unitemp (Texas Co.)

A&O61-3778 - Lubricant - Microfine Molykote

A&O61-3834 - Oil - Lubriplate No. 1 Oil

EK110882 - Fluid

DC No. 200 - 100,000 centistokes (Dow Corning)

NOTE: Lubrication is normally required only when projector is serviced, periodic lubrication is not necessary. For details refer to installation instruction in the section for the particular part or assembly.

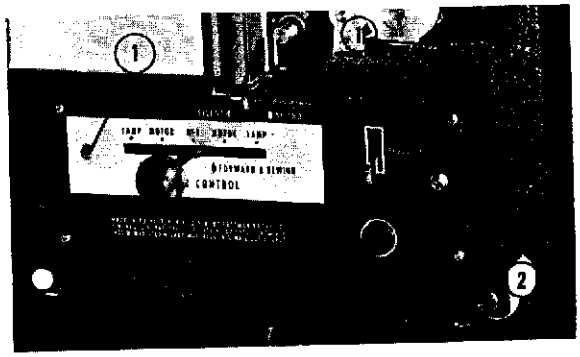
4. SPECIAL TOOLS & TEST FILM

No. 260	-	Spring Tension Scale
No. 1007	-	Claw Depth Gauge
No. 1034	-	Power Supply
No. 760079	-	SMPTE "JIFFY" Test Film
No. 760382	-	6 foot loop - SMPTE 5,000 Cycle Sound Focusing Test Film
No. 760383	-	SMPTE Buzz Track Test Film
No. 760386	-	6 foot loop - SMPTE 400 Cycle Signal Level Test Film
No. 761715	-	25 feet SMPTE Registration Test Film

5. HOW TO

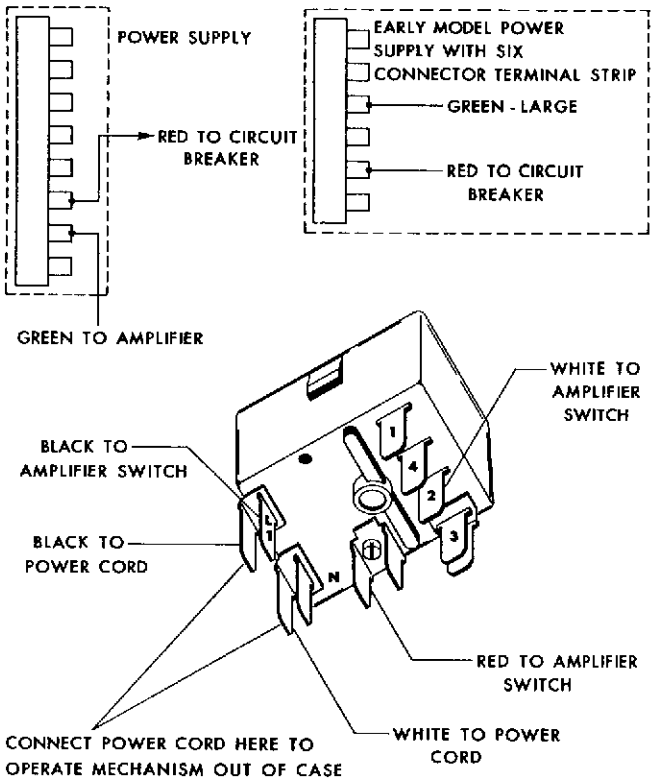
5.1 MECHANISM

5.1.1 Remove

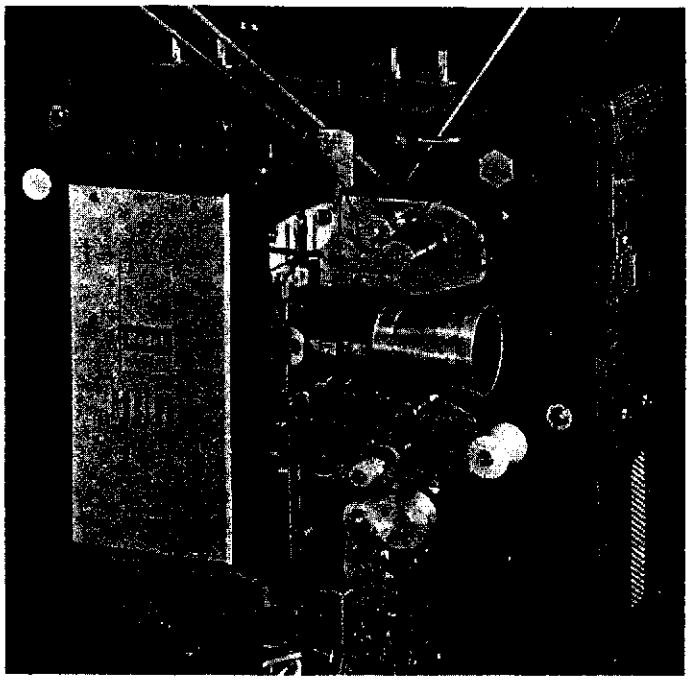


a) Two screws (1), screw and spacer (2), control knob (setscrew), than take off exciter lamp cover.
b) Cord compartment baffle (2 screws).
c) Meohanism support bracket located beneath the baffle (2 screws in case back). - (continued)

5.1.1 Remove Mechanism (continued)



d) Leads shown in drawing.
e) Screw on bottom of case.



f) Four screws (arrows) and lift mechanism out of case.
g) Support post, to stand mechanism upright.

5.1.2 Install

Mechanism in reverse order of removal. Lubricate the film guide roller shafts on the exciter lamp cover with EK1150 Oil as required.

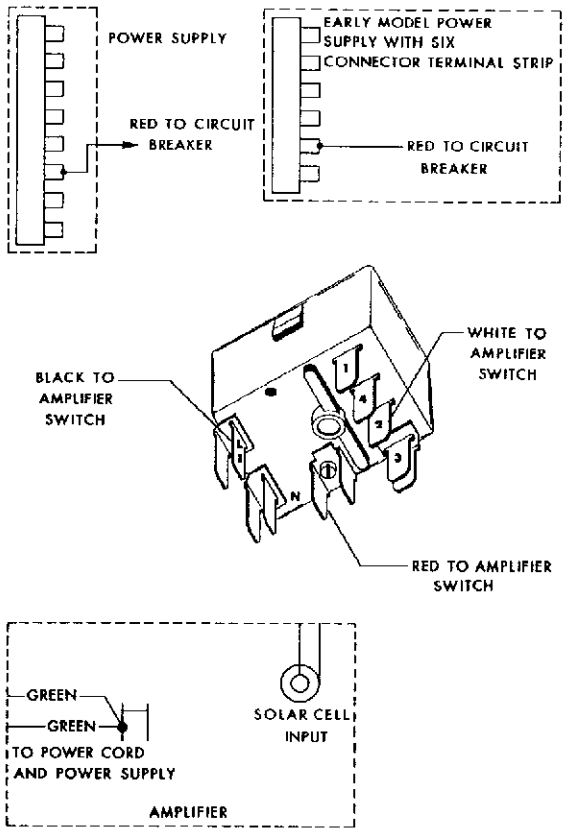
5.2 AMPLIFIER

5.2.1 Remove

a) Exciter lamp cover and cord compartment baffle, (Section 5.1.1).
b) Solar cell plug from jack.

c) Four amplifier mounting screws (arrows).
d) Amplifier from case - manipulate wires as needed.

NOTE: Amplifier can now be operated and tested.



e) Leads shown in drawing to completely remove amplifier from case.

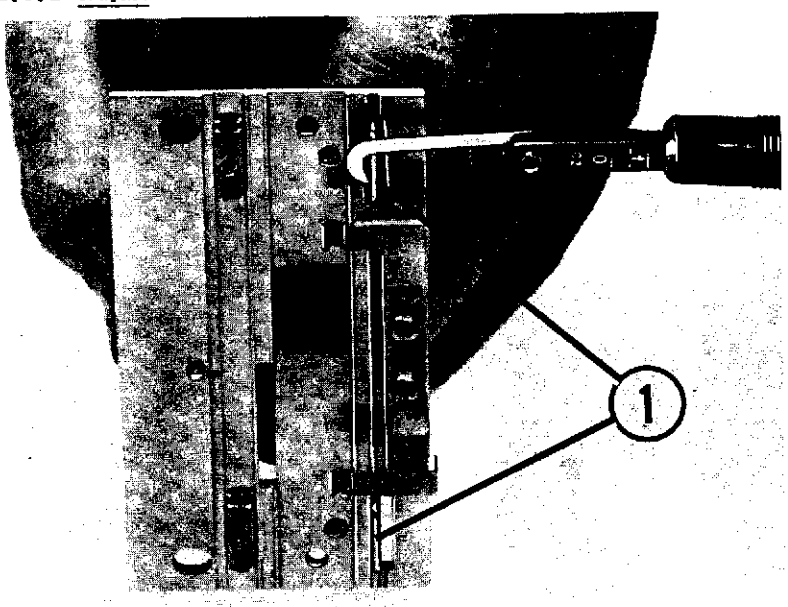
5.2.2 Install - amplifier in reverse order of removal.

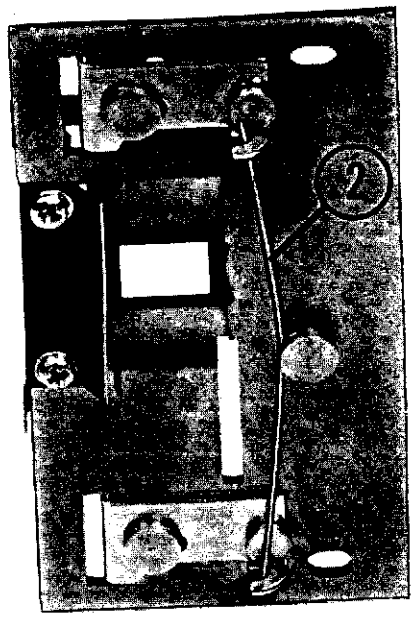
5.3 APERTURE PLATE AND PRESSURE PAD ASSEMBLY

5.3.1 Remove

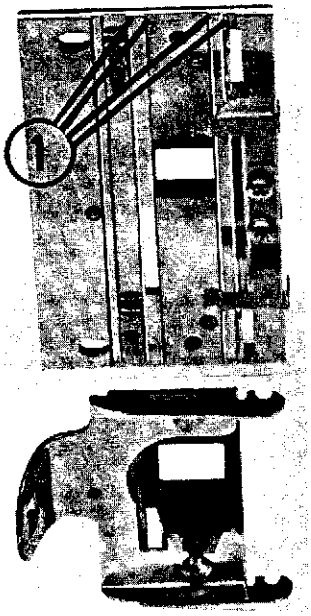
a) Pressure pad.
b) Aperture plate (2 screws).

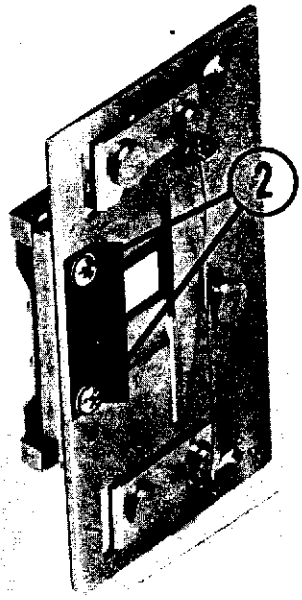
5.3.2 Adjust





a) Pressure of movable side guides (1) between 1 and 1½ ounces by bending spring (2).





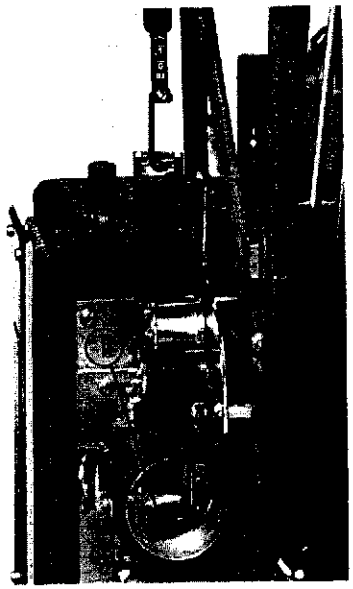
b) Pressure pad rails to align with aperture plate rails (1); if necessary, loosen screws (2) to re-position pressure pad.

5.3.3 Install - parts in reverse order of removal.

5.3.4 Adjust

a) Clearance of pull-down claw in aperture plate slot as follows:

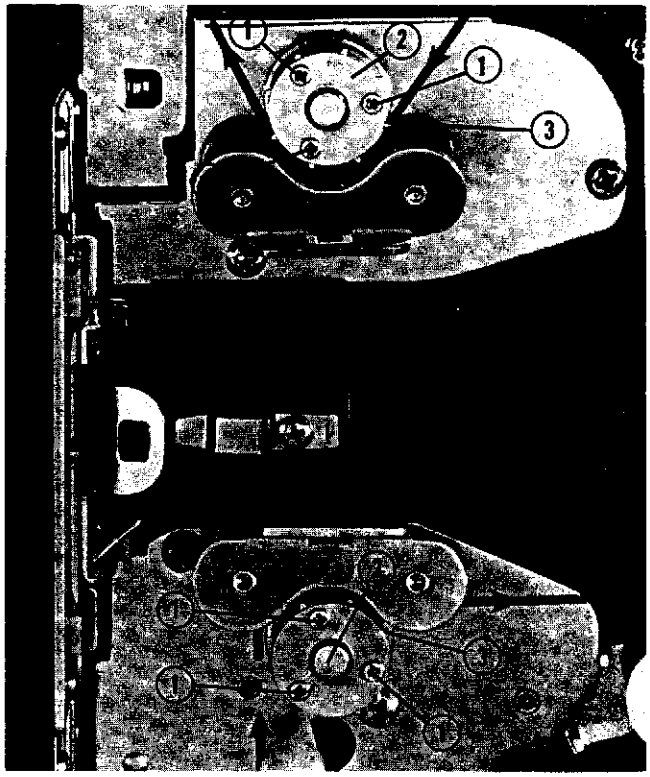
Place a strip of film in the gate. Turn the threading knob and observe the claw action with the framing knob turned to the extreme clockwise position and then to the extreme counterclockwise position. If either claw point strikes either side of the film perforations or the claw slot, loosen the two aperture plate screws and re-position the plate.



b) Pull-through tension (between 1½ and 2½ ounces) with claw retracted, using a strip of processed black-and-white film in the gate. Turn screw (1) clockwise to increase and counterclockwise to decrease. Apply a small amount of air-drying cement to the screw.

5.4 SPROCKETS

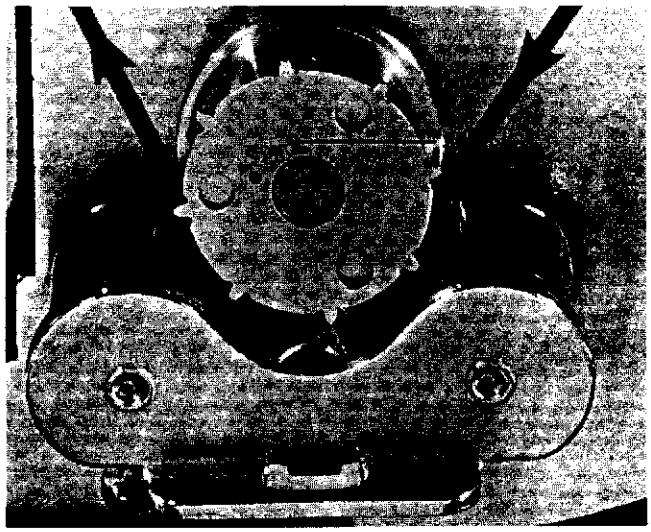
5.4.1 Remove



End plate screws (1), end plate (2), and sprocket (3), note spring behind upper sprocket.

5.4.2 Install (lubricate outside diameter of upper sprocket drive collar with A&O61-3834 Oil).

a) Spring in upper hub with point of spring in the hole of the collar then rotate hub clockwise to the stop and hold in this position

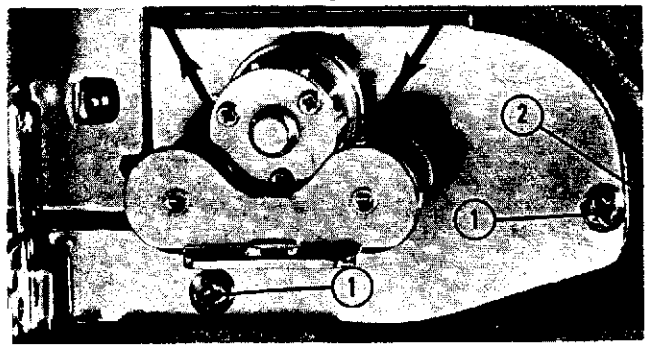


b) Upper sprocket in the hub with the end of the spring engaging hole in sprocket, then rotate sprocket counterclockwise to align screw holes.
c) End plate and screws - end plate should be centered for appearance.
d) Lower sprocket, end plate and screws.

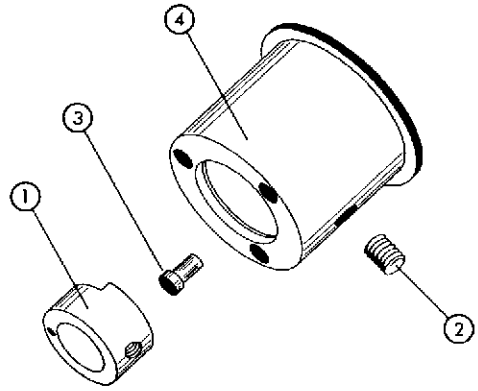
5.5 UPPER SPROCKET HUB

5.5.1 Remove

a) Upper sprocket and spring (Section 5.4.1).



b) The two upper sprocket plate retaining screws (1) and the spacer (2), then lift off the assembly.



c) Collar (1) (by removing setscrew (2) through hub) stud (3) and hub (4).

NOTE: It may be necessary to drive the shaft out in order to remove the collar (1) and hub (4).

5.5.2 Install

a) Hub on shaft, then the stud and collar in the hub so that the cut-out of collar is over the stud.
b) Setscrew in collar and tighten setscrew on cut-out of shaft; no end play.
c) Upper sprocket plate assembly on projector. Be sure belt is in place. Hold assembly firmly in a downward position while installing spacer and screw to insure that take-up belt is properly engaged.
d) Sprocket and spring (Section 5.4.2).

5.6 LOWER SPROCKET HUB

5.6.1 Remove

a) Mechanism from case (Section 5.1.1).
b) Lower sprocket (Section 5.4.1).
c) Hub by removing setscrew and shaft.

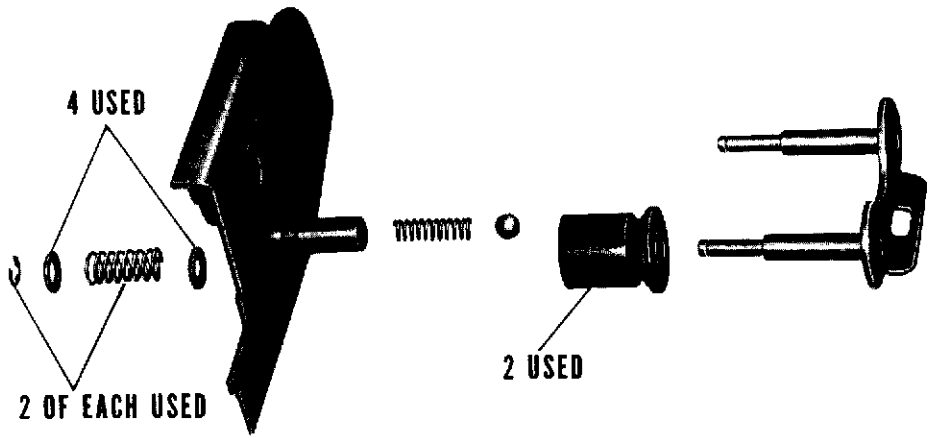
5.6.2 Install

a) Hub on shaft and tighten setscrew on cutout of shaft; no end play.
b) Lower sprocket (Section 5.4.2).
c) Mechanism in case (Section 5.1.2).

5.7 UPPER SPROCKET CLAMP

5.7.1 Remove

a) Upper sprocket clamp (Section 5.5.1.b).



b) Sprocket clamp parts as required.

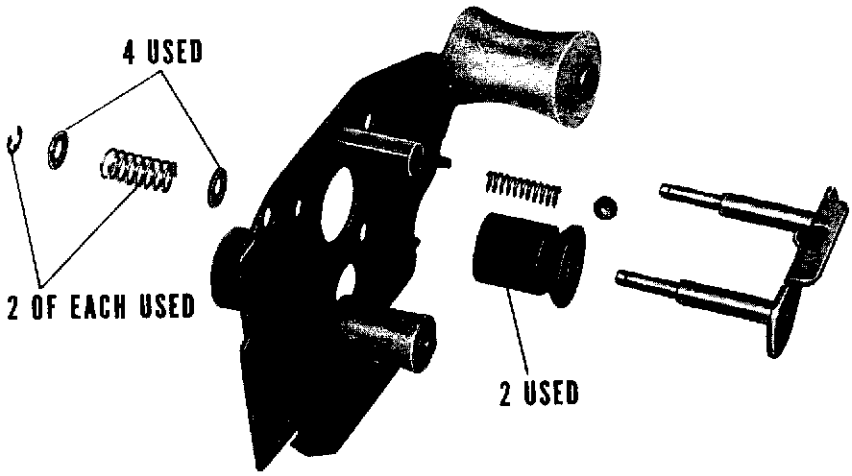
5.7.2 Install parts in reverse order of removal. Lubricate the sprocket guard stop pin ball with EK1150 Oil; the roller shafts with A&O61-3664 Grease and the sprocket shaft with A&O61-3834 Oil.

5.7.3 Adjust sprocket clamp, using two and three thicknesses of film. With clamp closed, rollers should turn freely with two thicknesses of film, but should be snug with three. Carefully bend post on plate to accomplish this.

5.8 LOWER SPROCKET CLAMP

5.8.1 Remove

a) Lower sprocket hub (Section 5.6.1).
b) Lower sprocket plate assembly (2 screws).



c) Sprocket clamp assembly parts as required.

5.8.2 Install parts in reverse order of removal - (Section 5.6.2 for hub installation). Lubricate as follows:

a) Sprocket guard stop ball and idler roller shaft with EK1150 Oil.
b) Sprocket roller shafts and idler arm pivot pin with A&O61-3664 Grease.

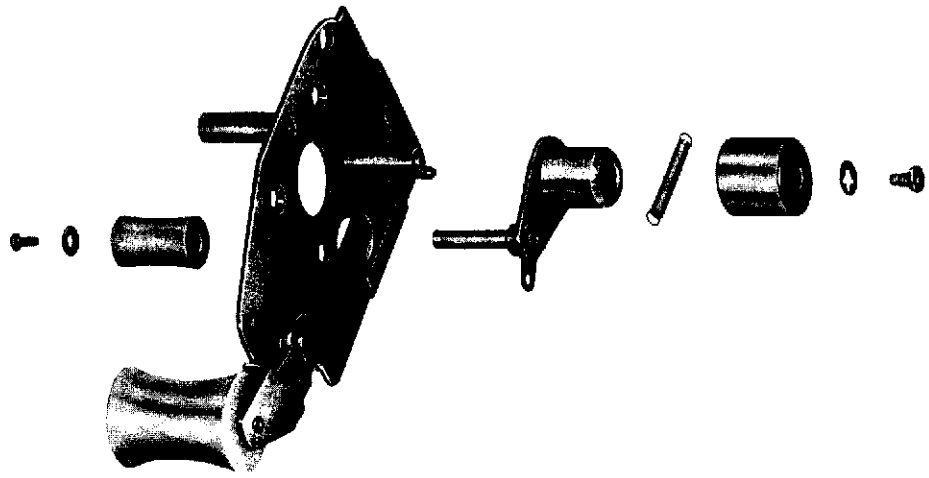
5.8.3 Adjust

Sprocket clamp using two and three thicknesses of film. With clamp closed, rollers should turn freely with two thicknesses of film, but should be snug with three. Loosen screws and move plate assembly to make this adjustment.

5.9 DAMPER ROLLER ARM AND SPRING

5.9.1 Remove

a) Lower sprocket clamp (Section 5.8.1).



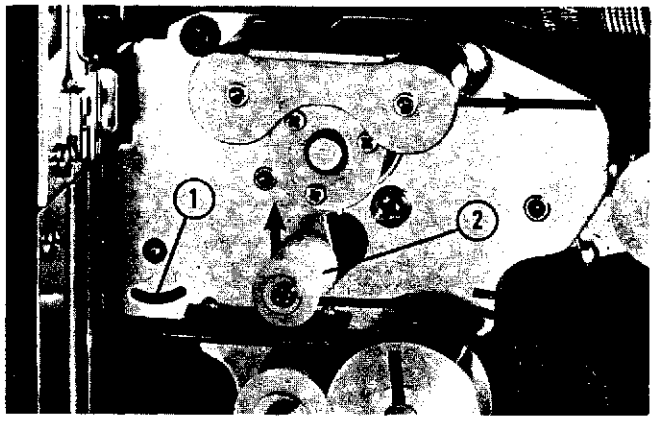
b) Damper roller parts as required.

5.9.2 Install (lubricate roller shaft and bearing with EK1150 Oil, and use EK110882 Fluid as required in bearing cup.)

a) Parts in reverse order of removal - adjustment (Section 5.9.3a) can be made at this point.

b) Lower sprocket clamp on projector (Section 5.8.2) and adjust clamp (Section 5.8.3).

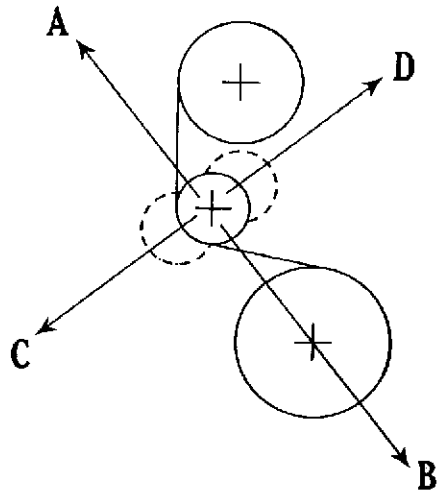
5.9.3 Adjust



a) Tension on damping roller arm, using a small blade screwdriver or scriber through slot (1) to move spring lever. When the damping roller (2) is in the relaxed position, there should be no tension on the damping roller spring.

b) Damping roller arm as follows:

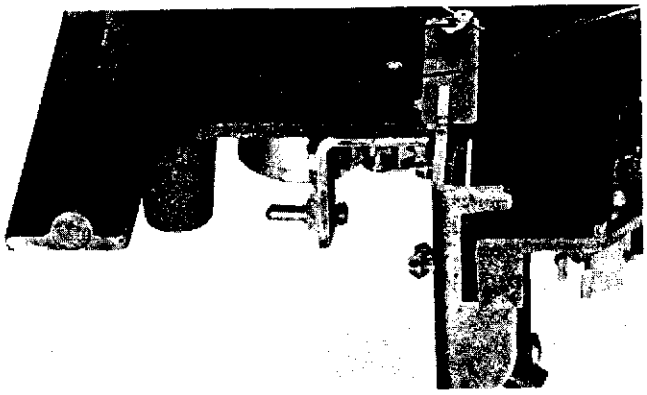
Remove the damping roller retaining screw. Thread the projector for sound, using processed film; turn on the motor and observe the action of the damping roller. A correctly adjusted roller arm will cause the damping roller to work its way off the shaft slowly when the projector is running forward and cause it to work its way on the shaft slowly (toward the sprocket plate) when the projector is running in reverse. If the roller motion is rapid in either direction, it indicates that the roller arm is bent too much and should be straightened till the IN and OUT movement of the roller is slow. Do not bend the roller arm in the direction "C-D"; bend as indicated by "A-B". Replace the damping roller retaining screw.



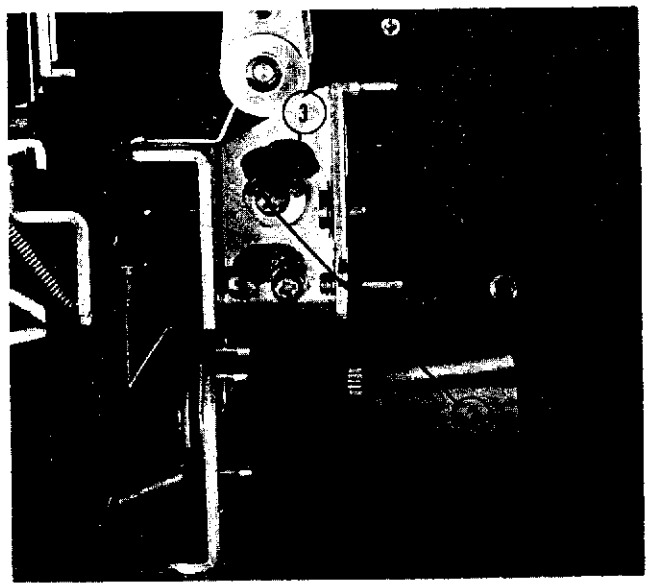
5.10 EXCITER LAMP BRACKET

5.10.1 Remove

a) Mechanism from case (Section 5.1.1).
b) Sound optics by unhooking the mount spring from the bracket assembly.



c) The exciter lamp wire (blue) from the power supply terminal strip. Loosen the sound optics bracket spring screw (1) and move the bracket spring (2) to the side far enough to allow removal of the bracket.



d) Bracket by removing clamp screw (1), eccentric screw (2) and eccentric (3).

5.10.2 Install parts in reverse order of removal.

5.10.3 Adjust centering of scanning beam - see sound system "Optics and Related Area" (Section 5.30.1).

5.11 CHAIN

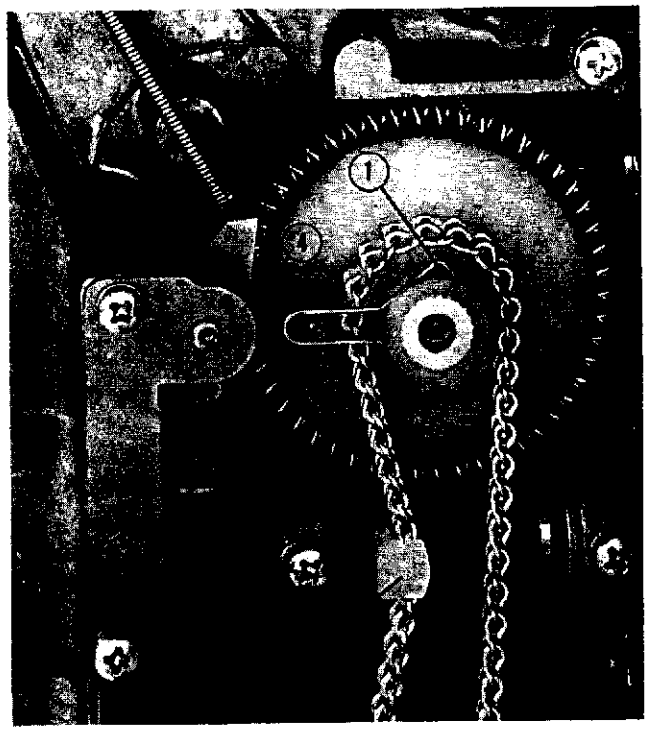
5.11.1 Remove

a) Mechanism from case (Section 5.1.1).
b) Reverse take-up clutch actuator (1).
c) Chain after loosening screw (2) and moving tension adjustment stud (3) to allow sufficient slack in chain to bring it over the sprocket teeth.

5.11.2 Install parts in reverse order of removal. To install a new chain, carefully open a link, place chain on sprockets, close link and replace adjustment stud (3) if previously removed. Lubricate the chain, tension adjusting stud, and reverse take-up clutch bushing (4) with EK1150 Oil.

5.11.3 Adjust

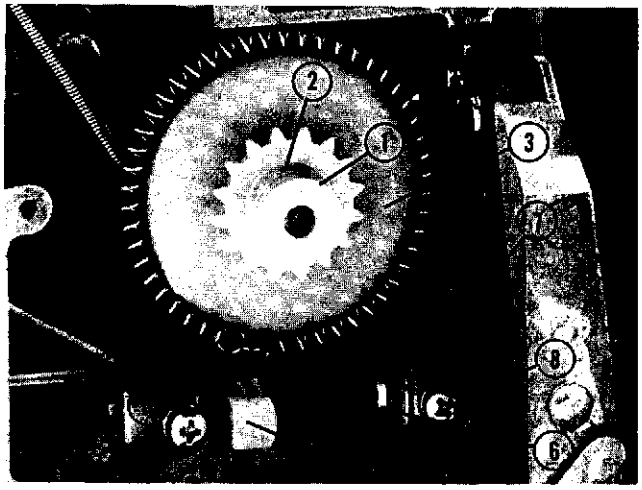
Tension adjustment stud (3) so that there is a slight amount of slack in the chain. Too tight an adjustment will result in "wows" in the sound; too loose a chain will allow it to strike the pivot shaft (5) when the projector is elevated, causing static in the sound.

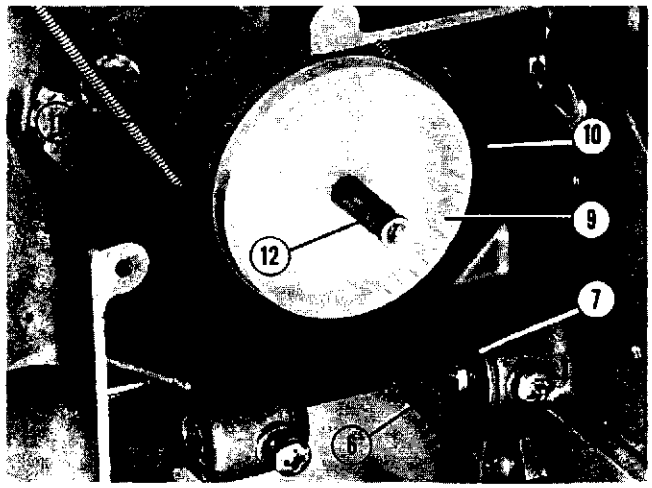


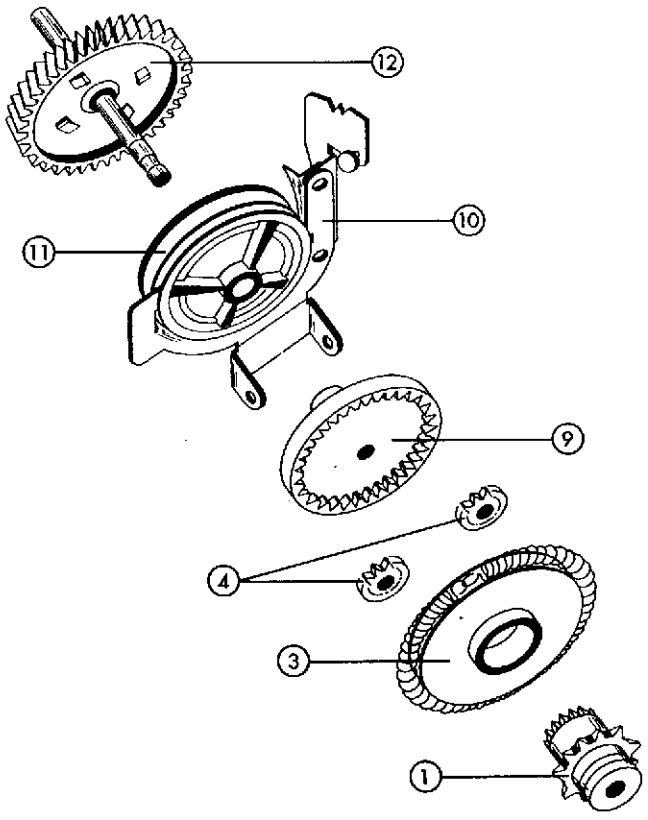
5.12 PLANETARY GEAR ASSEMBLY AND REWIND MECHANISM

5.12.1 Remove

a) Chain (Section 5.11.1).







b) Sun gear (1) by loosening setscrew (2), then spider (3) and planetary gears (4).
c) Adjustment stud (5).
d) Shift plate shaft (6) and spacing washer (7) by loosening screw (8).
e) Reverse mechanism gear (9), shift plate (10) and pulley (11).
f) Sprocket shaft and gear assembly (12), if necessary, by removing sprocket hub (Section 5.5.1).

5.12.2 Install parts in reverse order of removal; lubricate as follows:

a) All gear teeth, and actuator groove on the sun gear (1) with EK1150 Oil.
b) Upper sprocket drive shaft with A&O61-3834 Oil.
c) Rewind shaft lever detent spring and shift plate pivot with A&O61-3619 Lubricant.
d) Tension clutch groove on spider (3) with A&O10-592 Lubricant.

5.12.3 Adjust

Clearance between sun gear and sprocket (1) and the reversing mechanism internal gear (9); this should be established by setting the sun gear and sprocket tightly against the internal gear and then backing the gear off the shaft .015" to .020".

NOTE: Adjust chain (Section 5.11.3) and sprocket clamp (if previously removed Section 5.7.3).

5.13 LOWER SPROCKET GEAR

5.13.1 Remove

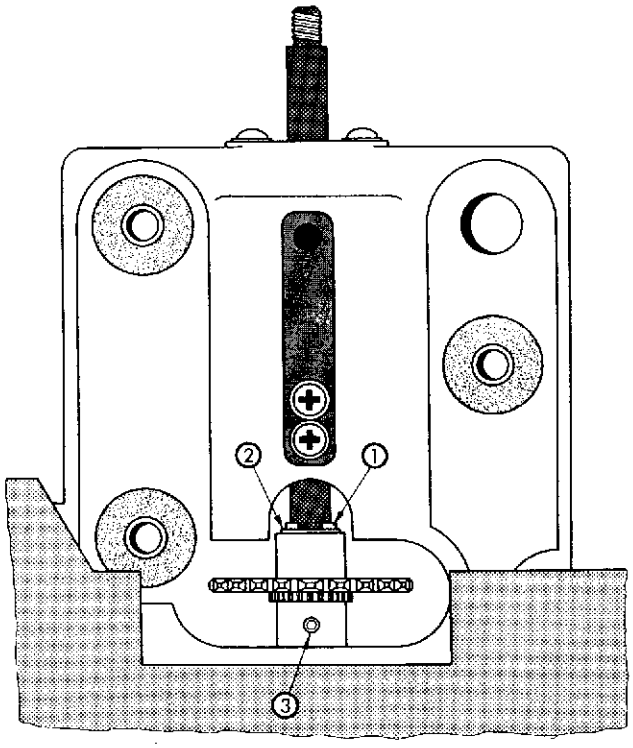
a) Chain (Section 5.11.1).
b) Lower sprocket hub (Section 5.6.1).
c) Lower sprocket gear and shaft.

5.13.2 Install parts in reverse order of removal. Lubricate gear teeth with EK1150 Oil.

5.14 SOUND DRUM AND SPROCKET & PAWL ASSEMBLY

5.14.1 Remove

a) Flywheel and spacer behind flywheel - (Section 5.15.1).



b) Retaining ring (1), note washer (2) between the ring and the sprocket.
c) Sound drum shaft by:

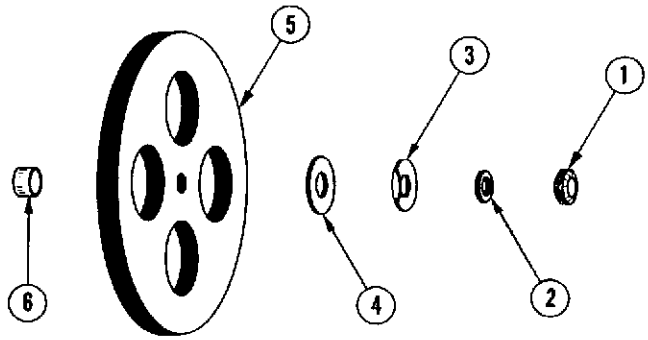
1. Loosening setscrew (3) in ratchet.
2. Holding back on pressure roller while shaft is withdrawn to the second retaining ring.
3. Removing second retaining ring and withdrawing shaft.

5.14.2 Install parts in reverse order of removal. Lubricate the shaft, pawl, and ratchet with EK1150 Oil. Make necessary adjustments to chain (Section 5.11.3) and flywheel (Section 5.15.3).

5.15 FLYWHEEL

5.15.1 Remove

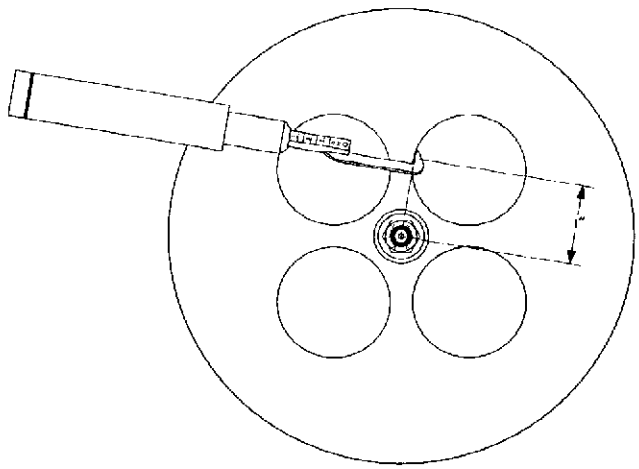
a) Mechanism from case (Section 5.1.1).



b) Flywheel nut (1), (left hand thread), spacer washer (2), spring washer (3) and phenolic washer (4).
c) Flywheel (5) and spacer (6).

5.15.2 Install (lubricate the shaft at the flywheel with A&O61-3619 Lubricant).

a) Spacer (6) and flywheel (5).
b) Phenolic washer (4).
c) Spring washer (3), concave side next to flywheel, spacer washer (2) and nut (1), (left hand thread).



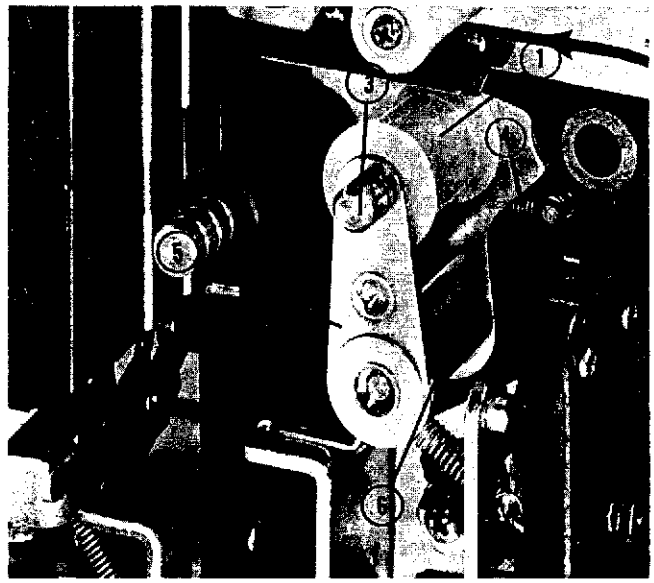
5.15.3 Adjust

Flywheel slipping torque; between 3 and 4 ½ ounce inches. Check by hooking a pull-type spring scale in one of the holes in the flywheel. Keep the axis of the scale at a right angle to a radial line from the center of the flywheel to the point of the contact of the spring scale. Hold the sound drum firmly to prevent shaft from turning and note the tension required to start the flywheel rotating. A correctly adjusted flywheel will require between 3 and 4½ ounces of tension when the torque is measured in this way.

5.16 PRESSURE ROLLER ASSEMBLY

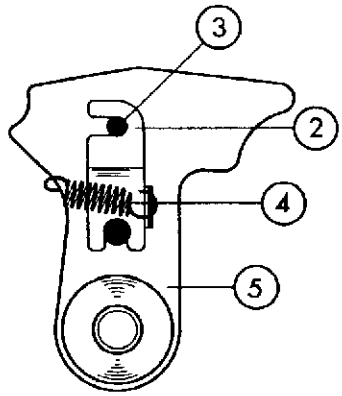
5.16.1 Remove

a) Sound drum (Section 5.14.1).
b) Pressure roller (1) by pushing back on the equalizing link (2) and removing the shaft (3). See illustration of rear view of assembly showing relative position of arm, link, and spring (4).
c) Arm assembly (5) by turning the hexagon spacer (6) counterclockwise.



5.16.2 Install

a) Arm assembly and pressure roller. Apply a light film of A&O61-3664 Grease to the roller shaft and the pivot.
b) Sound drum shaft (temporarily).

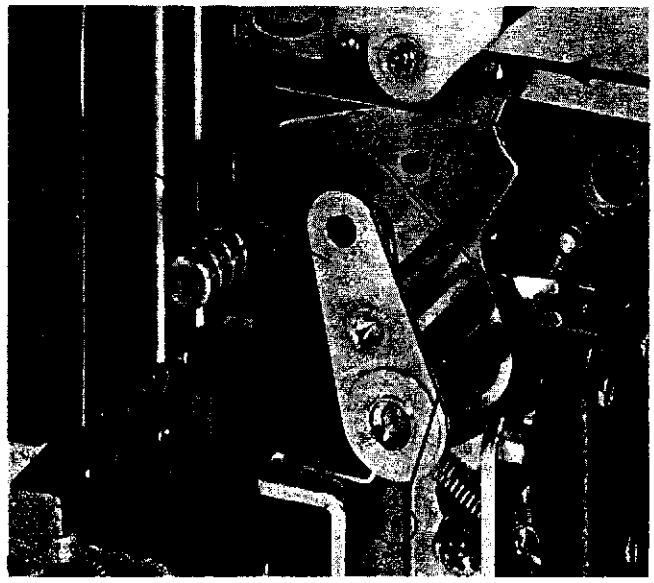


5.16.3 Adjust

Pressure of roller against sound drum, if necessary. The pressure should be 12 to 18 ounces. If too great, stretch spring (4) on equalizing link.

5.16.4 Install

Sound drum shaft, ratchet, sprocket and pawl, and balance of parts in reverse order of removal. Apply a light film of EK1150 Oil to sound drum shaft, ratchet and pawl. Make necessary adjustments to chain (Section 5.11.3) and to flywheel (Section 5.15.3).

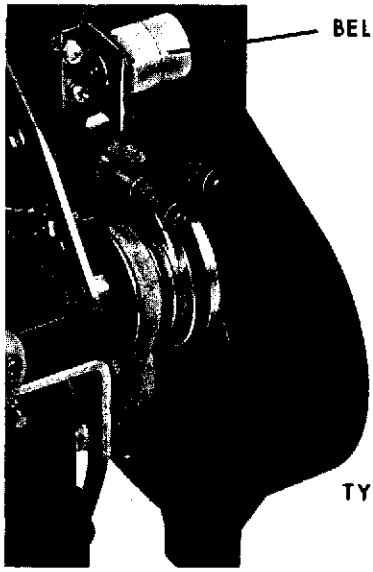


5.16.5 Adjust

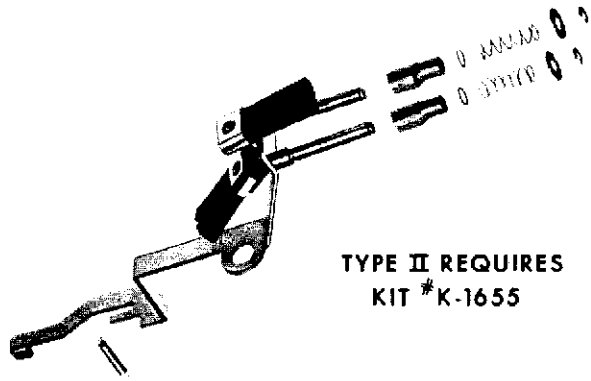
Position of pressure roller, using buzz track test film, (Section 5.30.1 b).

5.17 SHUTTER DRIVE BELT

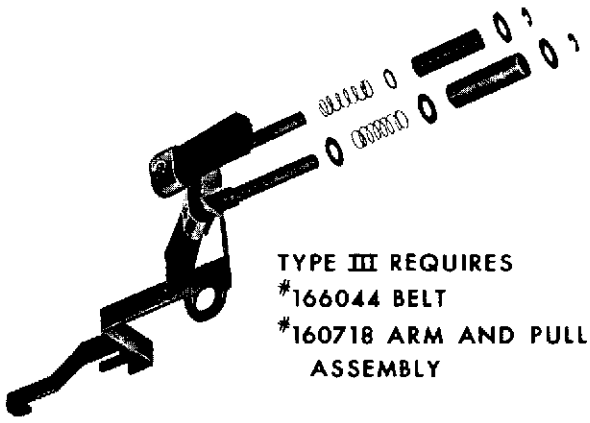
The belt shifting rollers and belt damping systems vary on these projectors and since the new belt requires a different shutter drive pulley and no damping it is necessary to modify the older style projectors. This modification, as well as the parts required, varies depending upon the style used in the projector.



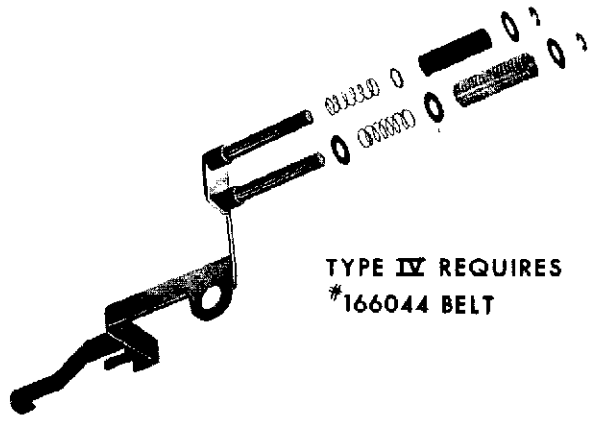
TYPE I REQUIRES
KIT #K-1655



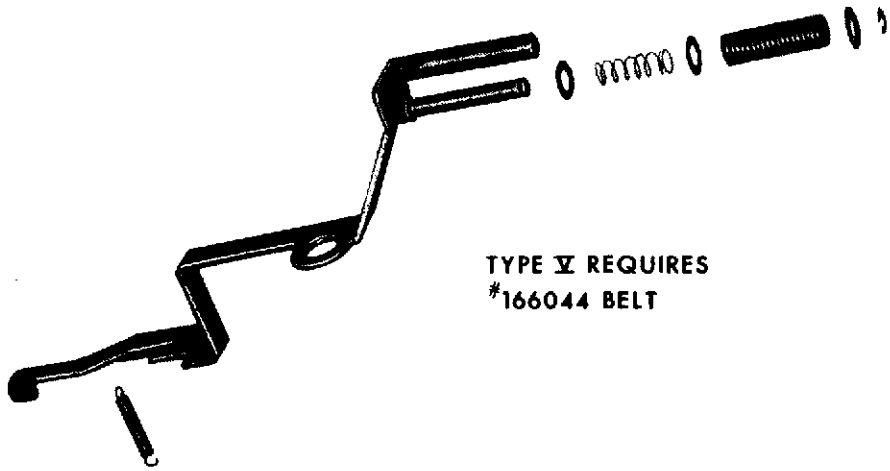
TYPE II REQUIRES
KIT #K-1655



TYPE III REQUIRES
#166044 BELT
#160718 ARM AND PULLEY
ASSEMBLY



TYPE IV REQUIRES
#166044 BELT



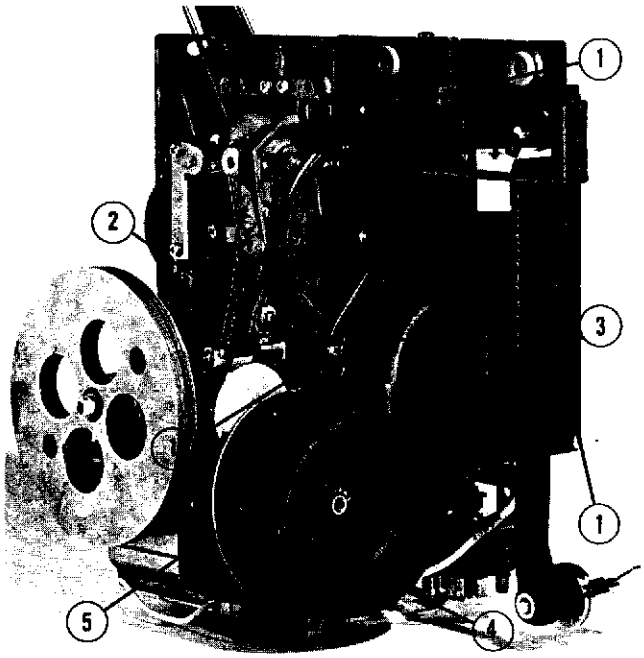
TYPE V REQUIRES
#166044 BELT

(continued)

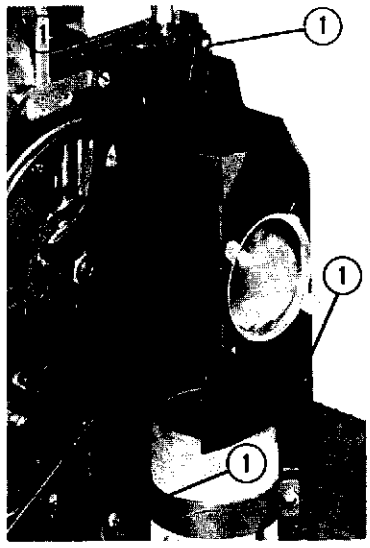
5.17 SHUTTER DRIVE BELT (Continued)

5.17.1 Remove

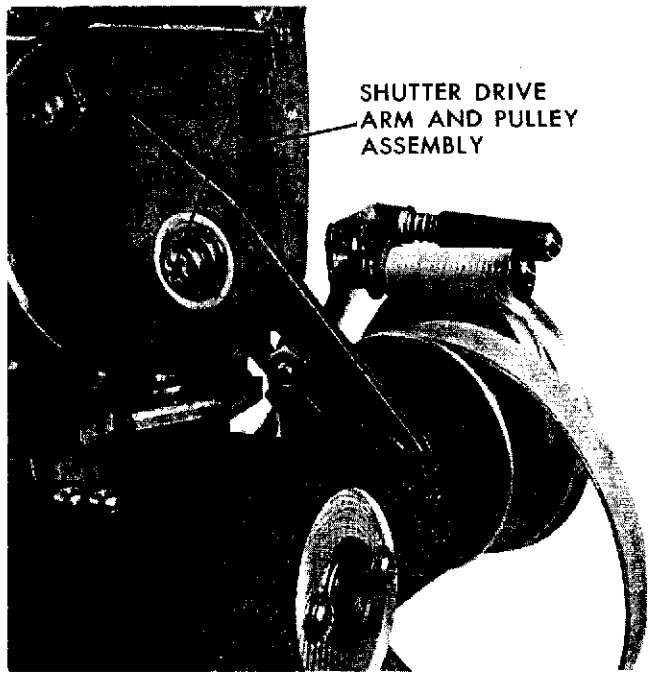
a) Mechanism from case (Section 5.1.1).
b) Lamphouse cover and projection lamp.



c) Three fan housing screws (1), the spacer (2), and lockwasher. (Power supply has been removed for illustration only).
d) Fan housing (4) and fan by loosening fan setscrew through access hole (5).



e) Lamp chimney by removing the four screws (1).
f) Drive belt.



g) Type I

1. Remove and discard the shutter drive arm and pulley assembly by disconnecting the link (1) and removing the two mounting screws (2).
2. Remove and discard the two eccentric belt shifting rollers.
3. Remove and discard the two belt damping rollers. One located on the fan housing cover plate, the other on the mechanism casting.

h) Type II

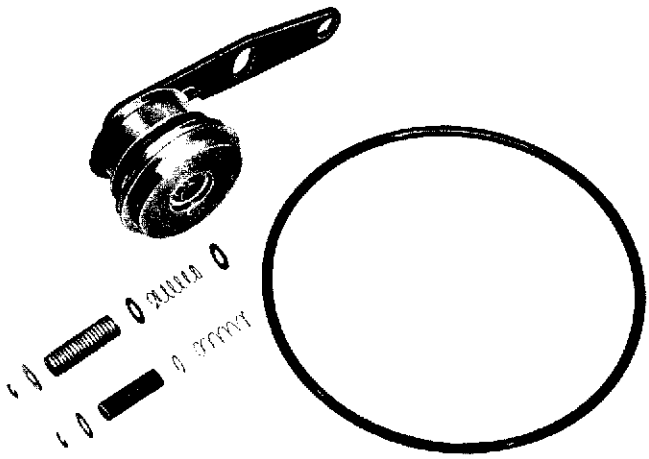
1. Remove and discard the shutter drive arm and pulley assembly by disconnecting the link (1) and removing the two mounting screws (2).
2. Remove and discard the two eccentric belt shifting rollers.
3. Remove and discard the two belt damping brushes. Some of the brushes are held on with screws; others are riveted and will have to be broken off without damaging the roller shafts.

i) Type III

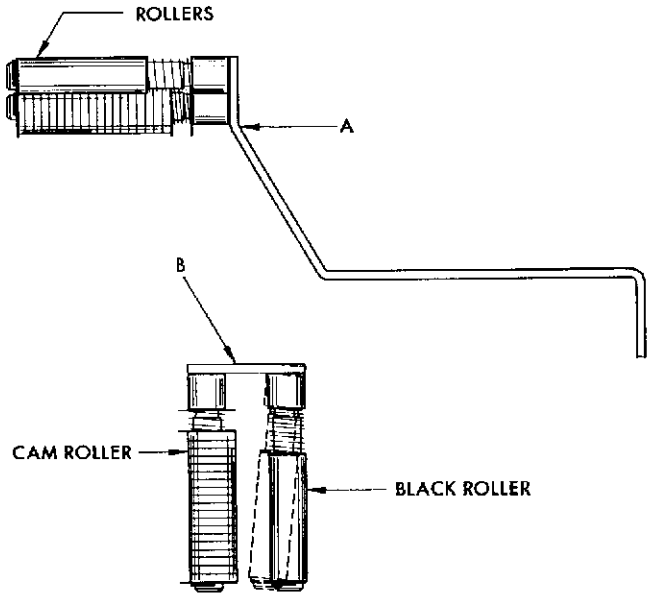
1. Remove and discard the shutter drive arm and pulley assembly by disconnecting the link (1) and removing the two mounting screws (2).
2. Remove and discard the two belt damping brushes. Some of the brushes are held on with screws, others are riveted and will have to be broken off without damaging the roller shafts.

j) Types IV and V

No further disassembly necessary.



KIT #K-1655 SHUTTER DRIVE BELT AND SHIFTING ROLLER KIT



USE WITH STRAIGHT ROLLER 126200

USE WITH ECCENTRIC ROLLER 153360

5.17.2 Install

a) Types I, II, and III - new shutter drive arm and pulley assembly #160718.
b) Types I and II - new rollers #153360 and #126200. (Extra springs and washers provided in Kit #K-1655, in case of loss or damage while removing original parts). Note coil direction of springs.
c) All Types - new shutter drive belt.

5.17.3 Adjust speed shifting, Types I, II, and III as follows:

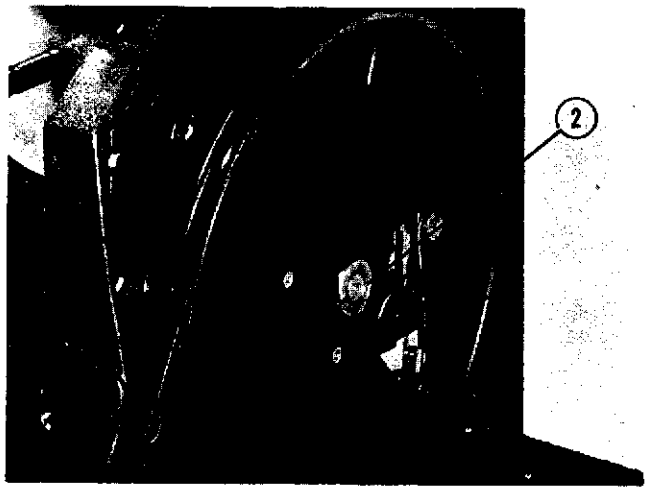
a) Bend bracket down at "A" so that rollers just clear pulley.
b) With shifting lever in sound speed and belt on high side of pulley, bend bracket at "B" so that black roller barely clears the belt.
c) With shifting lever in silent position and belt on low side of pulley, bend bracket at "B" so that eccentric roller clears belt by .010"-.020" when high side of eccentric is away from belt.
d) When adjusted correctly, shifting can be accomplished while rotating the mechanism by hand.
e) Types IV and V should normally require no adjustments, but if required, follow the above procedure.

5.17.4 Install

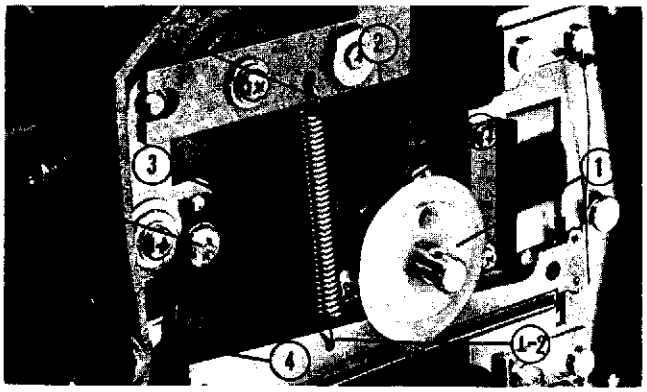
Balance of parts to projector and fit into the case.

5.18 PULL DOWN MECHANISM

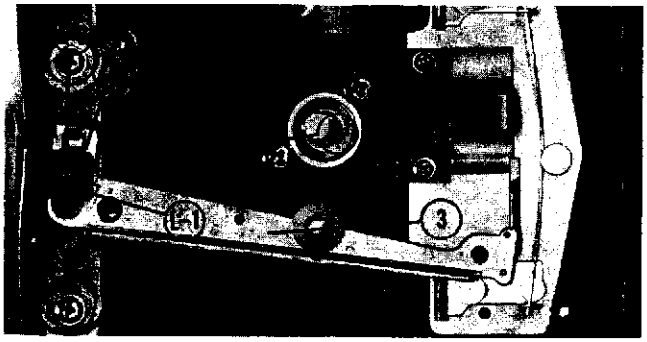
5.18.1 Remove



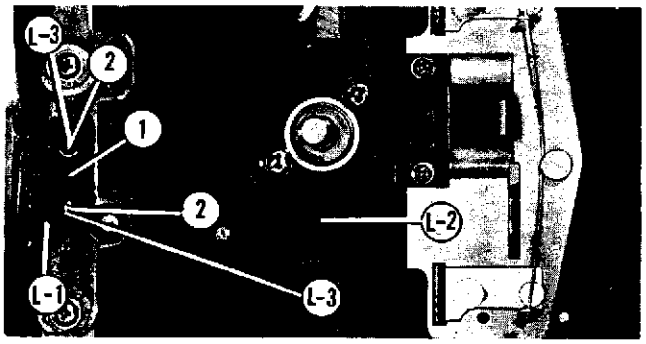
a) Drive belt (1) (Section 5.17.1 a thru f), shutter shaft nut (2) (left hand thread), and washer.
b) Super-40 shutter - see Section 5.19 for detailed service information.



c) In-and-out cam (1), and up-and-down cam (2) - note shim washers behind the up-and-down cam.
d) Claw return spring (3).
e) Retaining spring (4) by removing screw (5).



f) Pad (1), ball (2), and pull-down claw (3).



g) Pad (1), balls (2).

5.18.2 Install

a) Pull-down parts in reverse order of removal, applying lubricants as follows (see preceding illustrations):

L-1 EK1150 Oil - moisten both pads - light film on surface of up-and-down cam.

L-2 A&O61-3655 Grease - contact points of return spring with framing lever and claw assembly. Little on in-and-out spring, where small button on claw assembly bears against the spring.

L-3 A&O61-3619 Lubricant - small amount on three pivot balls and in ball recesses.

b) Super-40 shutter temporarily. Make sure that timing lug of shutter is in the aligned holes of the cam. (See Section 5.19 for detailed service information on Super-40 Shutter).

5.18.3 Adjust

a) Claw clearance (Section 5.3.4a).
b) Claw protrusion. The top claw should extend through the film perforation, but not so far that it strikes the frame of the pressure pad assembly on the pull-down stroke or touches the film on the return stroke. (Factory adjustment is .030" - .045" beyond aperture plate rails.) Correct, if necessary, by changing the total thickness of claw shim washers.

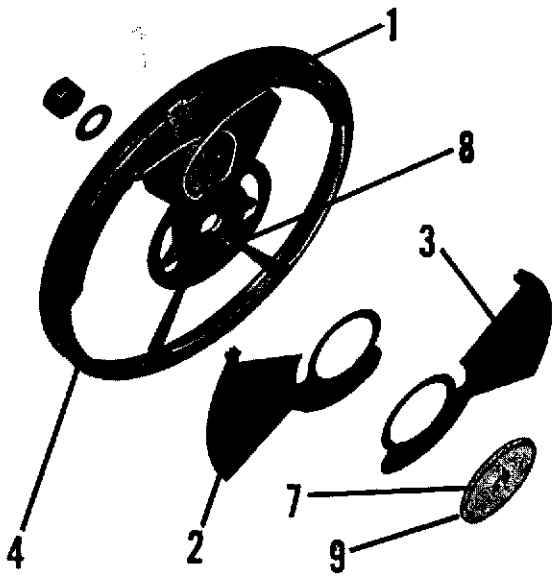
5.18.4 Install

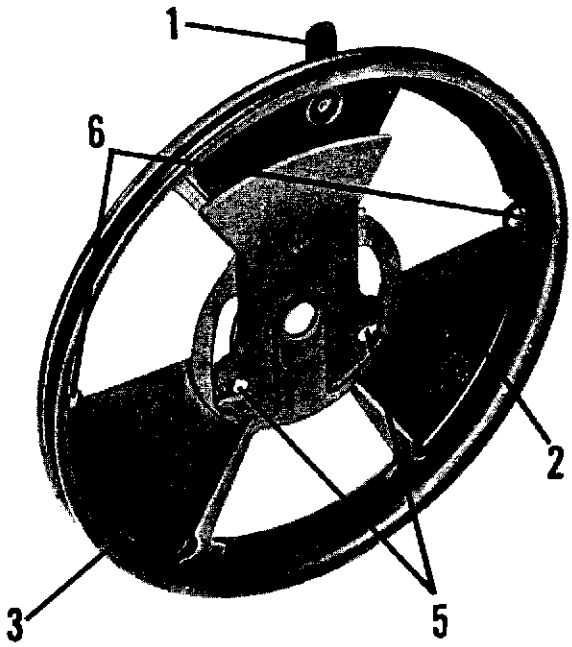
a) Super-40 shutter finally. The fixed blade of the shutter should be away from the aperture when the line on the threading knob is towards the operator. (See Section 5.19 for detailed service information on Super-40 Shutter).
b) Balance of components in reverse order of removal.

5.19 SUPER-40 SHUTTER

5.19.1 Remove

Super-40 shutter from projector -(Section 5.18.1 a thru c). Shutter can now be disassembled as required.

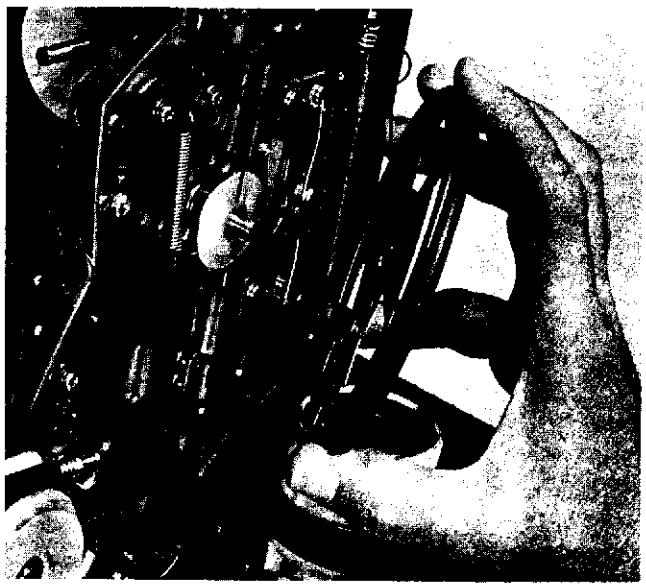




5.19.2 Install as follows:

a) Place the locking lever (1) in the lock position and assemble the inner (2) and outer (3) blades to the shutter frame (4). The inner blade can be identified by the small bumps around the center.

b) Make sure that the actuating studs (5) and stop studs (6) are positioned as shown. Assemble the cam (7) to the shutter, with the timing lug (8) engaging the timing hole (9).



c) Rotate the cam to position the timing hole at the top. Tilt the mechanism slightly back and holding the assembled shutter as shown, sneak up on the shutter shaft, making sure that the timing lug (1) of the shutter engages the timing holes (2) of the cams. Replace the washer and shutter shaft nut (left hand thread). Do not tighten the nut.

d) Move the lever to the unlocked position and manually check the shutter blades for freedom of movement. If there is any binding, recheck for proper assembly of the various parts. If shutter action is satisfactory, proceed with final orientation.

e) Final orientation - remove the threading knob. The flat side of the shutter shaft should face away from the lens holder casting when the shutter timing lug is toward the aperture. If it is not, hold the shutter to keep it from moving and turn the shutter shaft until the flat side of the shaft is correctly positioned. Hold the shaft with a suitable wrench and tighten the shutter nut (left hand thread).

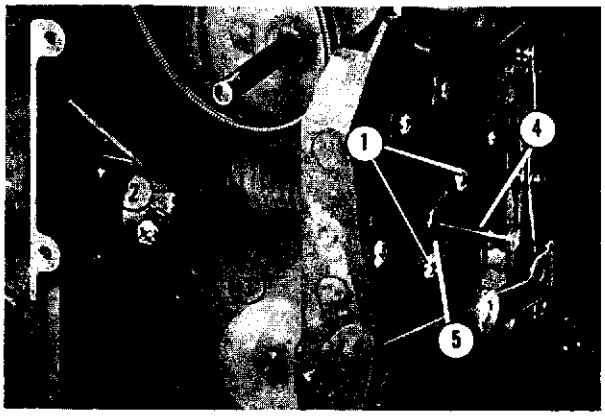
f) Recheck the shutter blades for freedom of movement. Replace the threading knob.

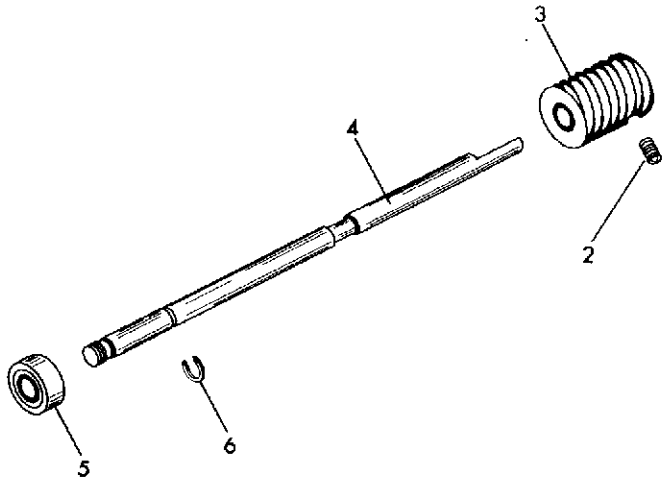
g) Lubricate weight and blades with small amount of A&O61-3778 Lubricant as required.

5.20 SHUTTER SHAFT AND BALL BEARING

5.20.1 Remove

a) Planetary gear assembly (Section 5.12.1 a thru e).
b) Pull-down parts (Section 5.18.1 a thru d).
c) Shim washers





d) Ball bearing retaining screws and lockwashers (1). Loosen 2 setscrews (2) 180 degrees apart, in worm (3).
e) Shutter shaft (4) and ball bearing (5) by pulling shaft from pull-down side. (Exploded view shows worm, shutter, shaft, retaining ring (6), and ball bearing).

5.20.2 Install

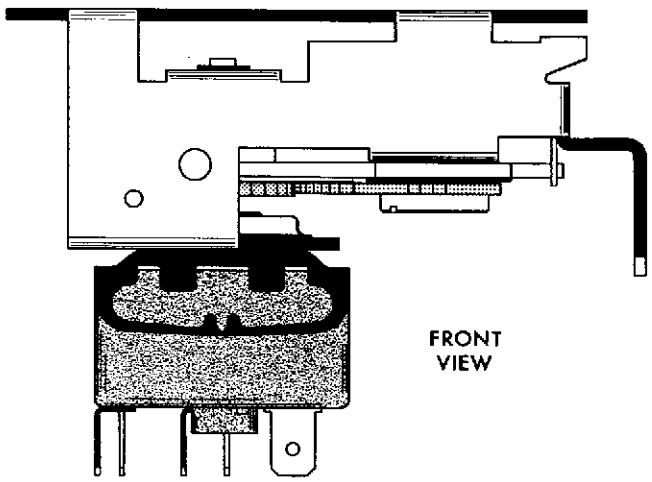
Parts in reverse order of removal, making sure that worm is centered (see also Section 5.18.2 and 5.18.4). Make necessary adjustments to planetary gear assembly (Section 5.12.3), and chain (Section 5.11.3).

5.21 CONTROL SWITCH

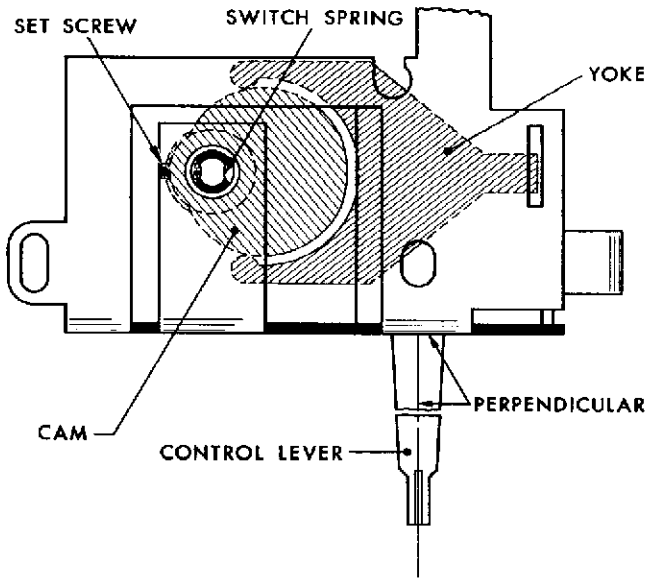
5.21.1 Remove

a) Exciter lamp cover (Section 5.1.1a).
b) All wire connections from switch.
c) Switch by loosening setscrew in cam, sliding cam up (out of mesh), loosening switch retaining nut, and sliding switch down and out.

5.21.2 Install



a) Switch and nut in bracket and tighten nut.



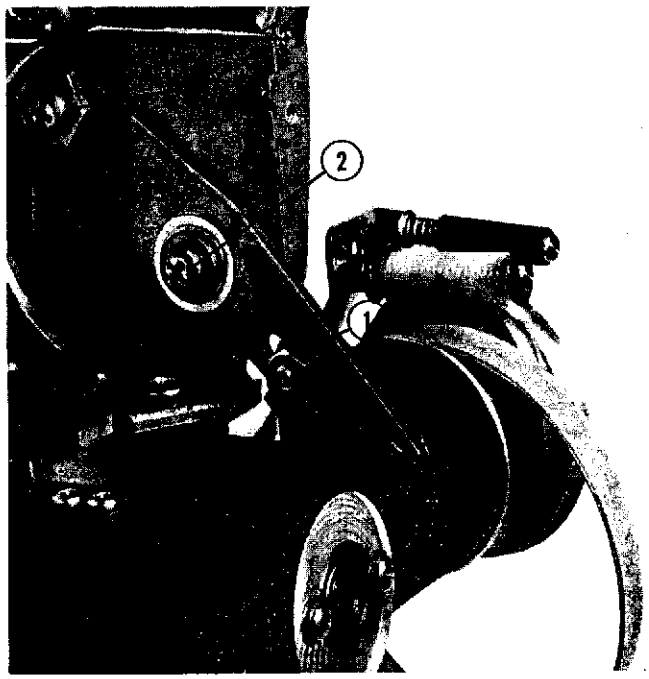
b) Cam in mesh with control lever so that conditions in drawing are met.
c) Switch connections (see Master Control Switch - page 30), and reassemble projector.
d) Lubricate following points with A&O61-3655 Grease:
Teeth and cam of switch cam and pinion.
Pivot area of projector control lever.
Pivot area of projector switch cam yoke.
Shifting arm stud.
Contact points of interlock lever.

5.22 SPEED AND DIRECTION CONTROL MECHANISM

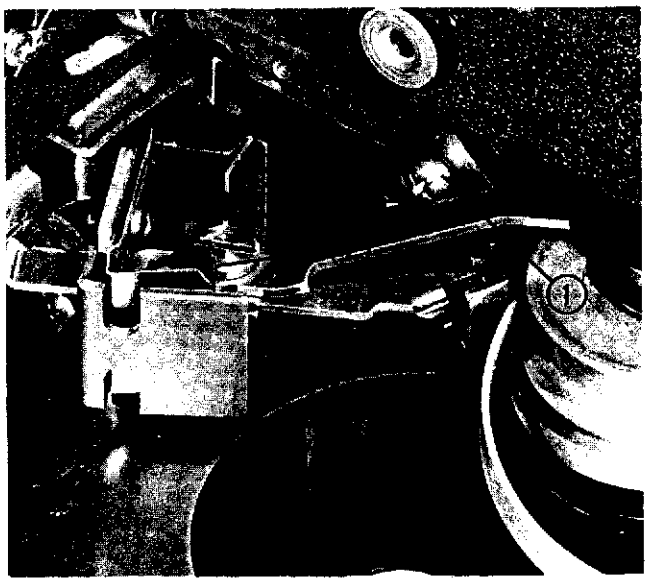
See Section 5.17 for illustrations of the various types of speed shifting lever assemblies.

5.22.1 Remove

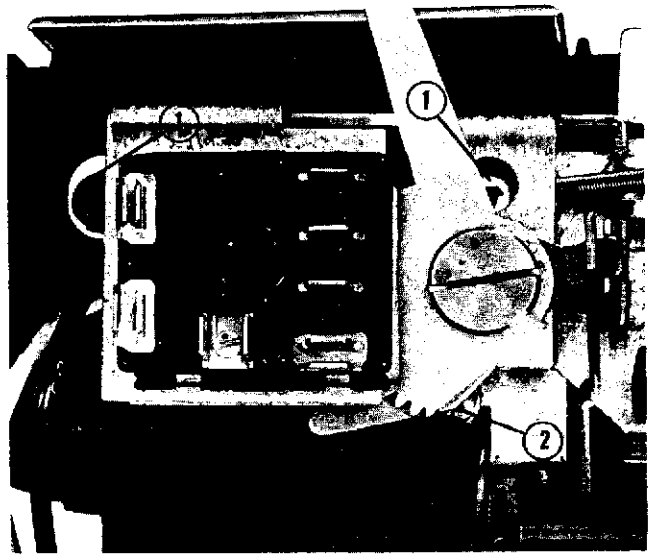
a) Motor (Section 5.23).
b) Switch connections.



c) Stud holding pulley shifting lever to pulley arm by removing nut and lockwasher (1).
d) Pulley assembly by removing screws (2) and eccentric (3).



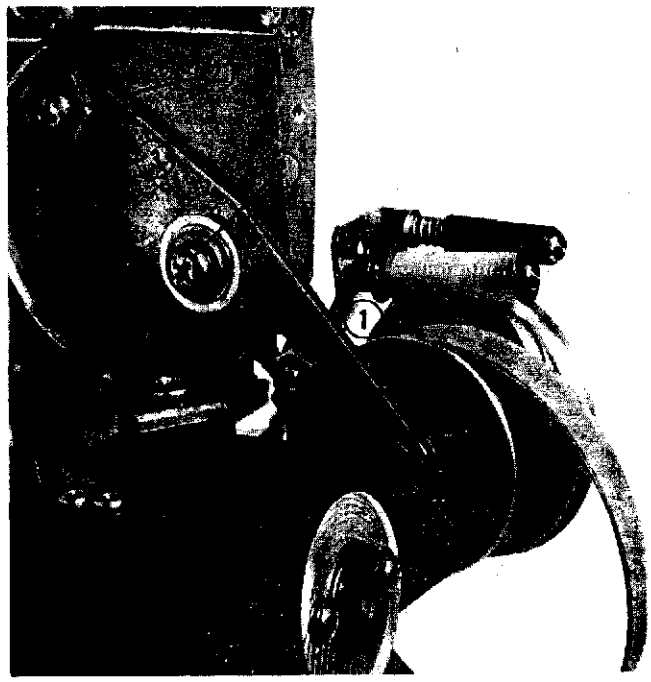
e) Belt shifting lever eccentric by removing screw and lockwasher (1).
f) Toggle levers (2).



g) Two hex socket head cap screws (1) holding shifting assembly to casting.
h) Shifting assembly by loosening screw (2) and manipulating assembly.
i) Parts from assembly as required.

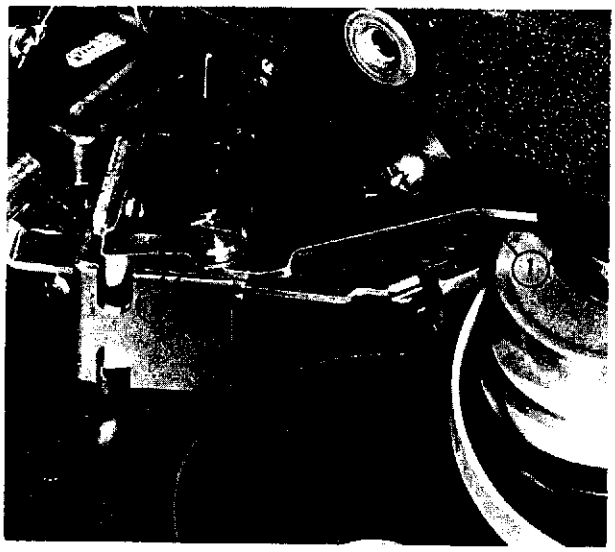
5.22.2 Install

a) Shifting assembly on projector.
b) Mounting screws (1) and (2) loosely.



c) Pulley assembly eccentric and screws (2 & 3).
d) Stud holding pulley shifting lever to pulley arm, nut, and lockwasher (1). (continued)

5.22.2 Install (continued)

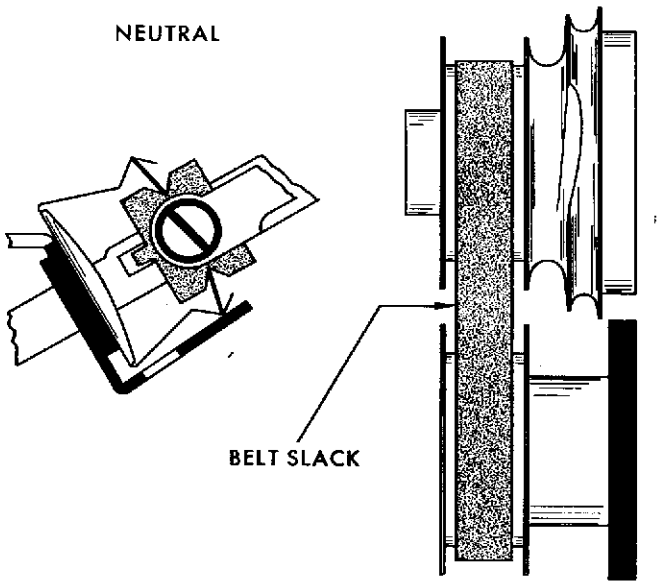


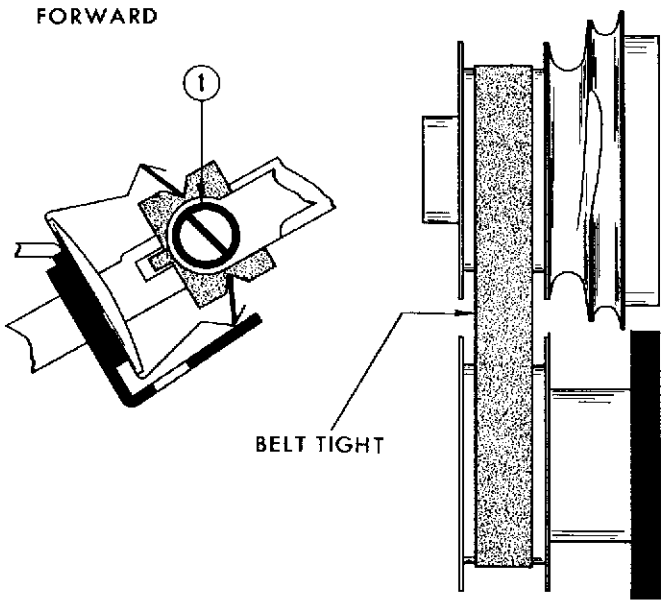
e) Belt shifting lever eccentric (1) (screw and lockwasher) and toggle levers (2).

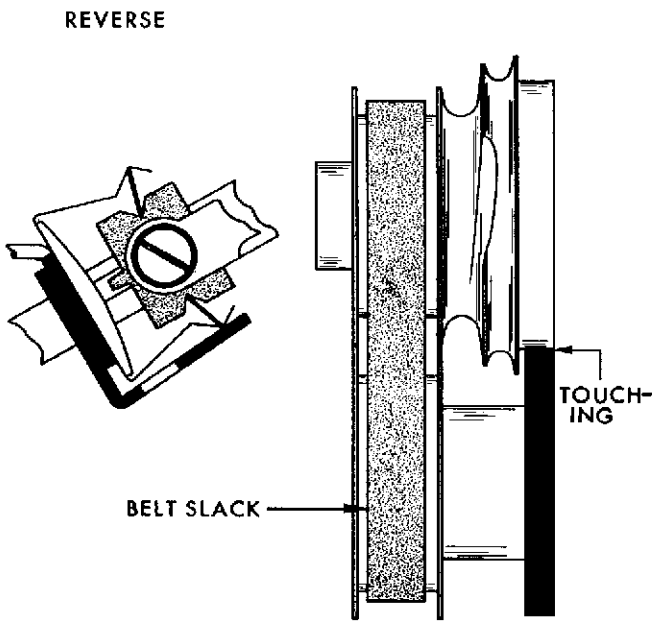
5.22.3 Adjust speed shifting assembly by positioning the assembly and rotating lever eccentric so that:

a) Shifting can be accomplished only in the forward position of the control lever.
b) Drive belt does not touch either shifting roller in sound or silent speed.
c) Shifting rollers do not touch pulley.
d) Speed shifting can be accomplished while rotating mechanism by hand.

5.22.4 Install motor and switch connections.







5.22.5 Adjust forward and reverse shifting by moving toggle lever (loosen screw (1)) and rotate drive pulley eccentric so that:

a) Belt drives mechanism in forward direction.
b) Rubber drive on motor pulley drives mechanism in reverse direction.
c) Drive belt is slack and rubber drive does not contact pulley in "OFF" position.
d) Above three conditions are met under any operating situation. Lubricate speed shifting rollers with A&O61-3778 Lubricant.

5.23 MOTOR

5.23.1 Remove

a) Mechanism from case (Section 5.1.1).
b) Motor by loosening setscrews in pulley and fan, and by removing three motor mounting screws. Note grounding spring on one of the screws.

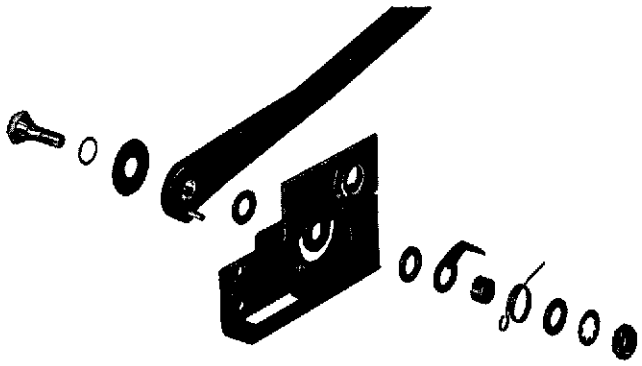
5.23.2 Install parts in reverse order of removal - be sure setscrews are on flat of motor shaft and the pulleys are centered.

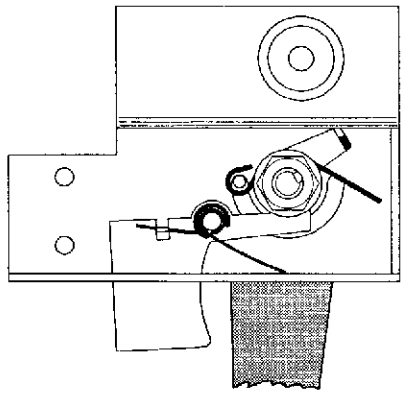
5.24 TAKE-UP ARM

5.24.1 Remove

a) Mechanism from case (Section 5.1.1).
b) Arm assembly by removing two screws holding it to the casting.
c) Parts as required, (see breakdown below).

5.24.2 Install parts in reverse order of removal. Lubricate the arm spindle, pivot, and release lever pivot with A&O61-3834 Oil.

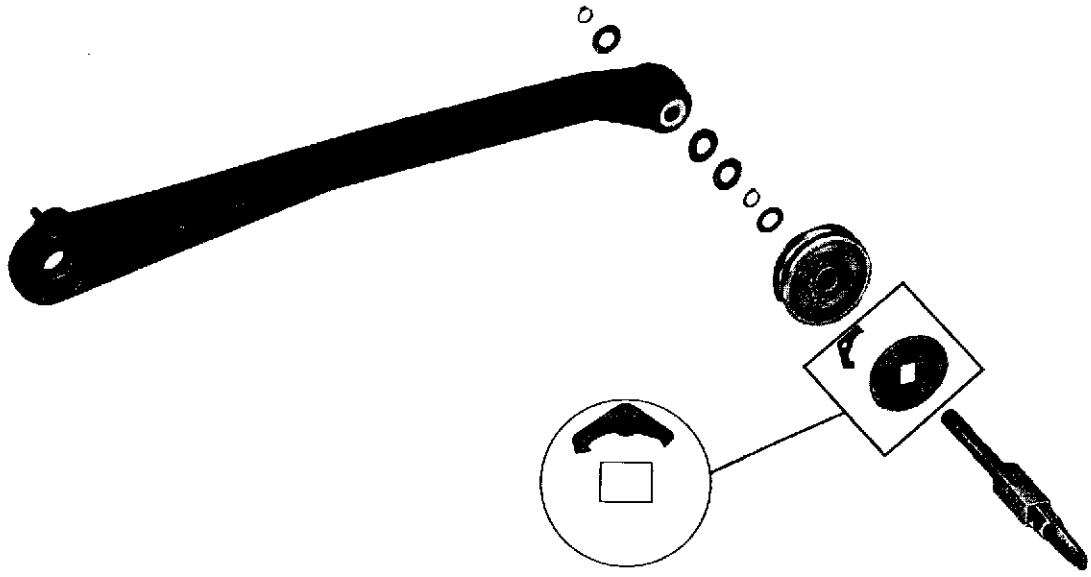




5.25 TAKE-UP SPINDLE

5.25.1 Install (see breakdown below).

Lubricate the following points with A&O61-3834 Oil:
Spindle pawl pivot.
Inside diameter of pulley ratchet.
Spindle.



5.26 SUPPLY SPINDLE AND PULLEY

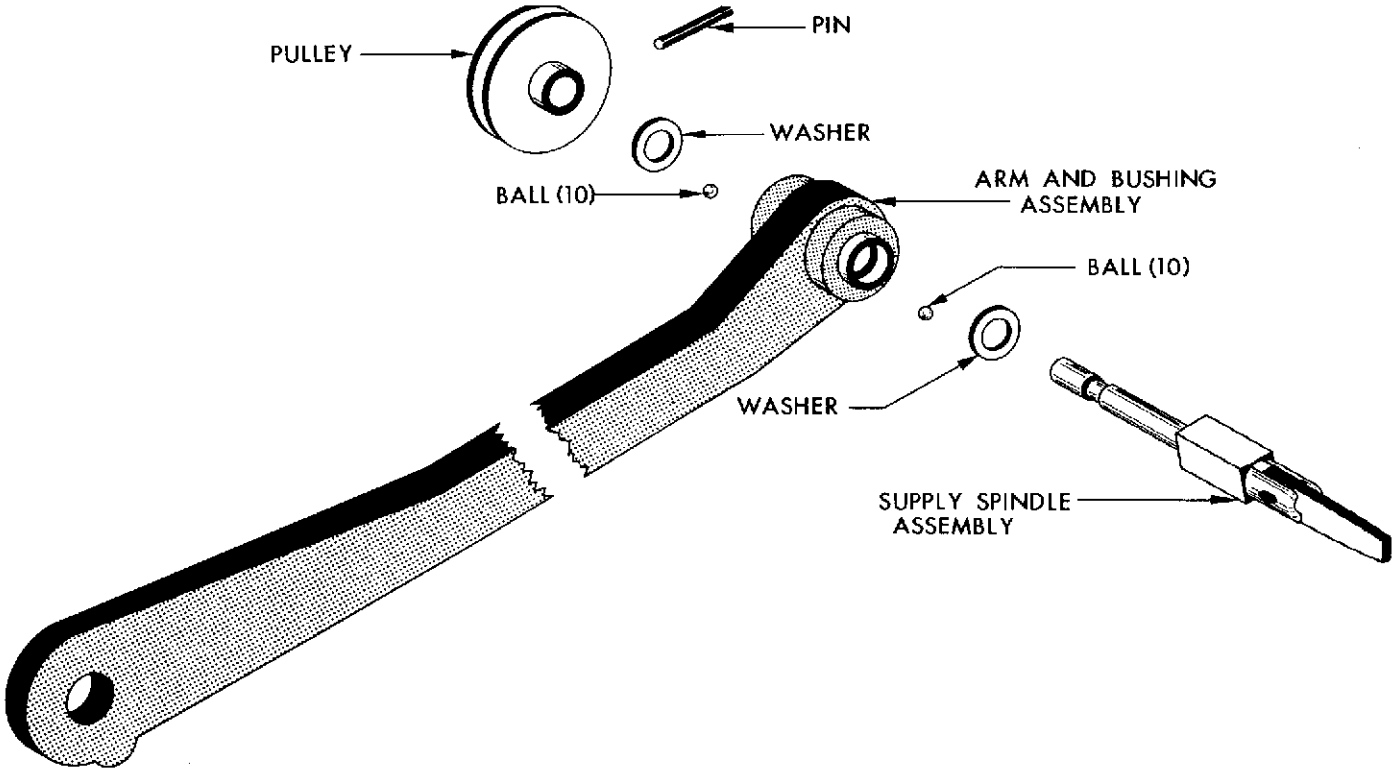
5.26.1 Remove

a) Belt from pulley.
b) Pulley from spindle by driving out pin.
c) Spindle by carefully withdrawing it from the arm.

NOTE: The spindle bearing of later model projectors is a steel bushing with ten loose bearing balls on each side of the bushing instead of a bronze sleeve bearing.

5.26.2 Install spindle and pulley in supply arm assembly with bronze sleeve bearing as follows:

a) Insert spindle assembly in bearing, then place pulley on shaft, hub toward bearing.
b) Insert .005-inch thickness gage between hub and bearing.
c) Clamp the pulley and spindle together and using the hole in one side of the hub as a guide, drill (1/16") through shaft and other side of the pulley hub.
d) Fasten pulley on shaft with the pin and remove gage.



5.26.3 Install spindle and pulley in supply arm assembly with steel bushing and bearing balls as follows:

a) Using a small vise or similar means to hold the spindle assembly firmly in a vertical position, place washer on the shaft.
b) Apply a light coating of Grease A&O61-3655 to the upper surface of the washer and place ten bearing balls around the shaft; the grease will retain the balls in position.
c) Place the bushed end of the arm assembly over the end of the shaft - support the free end of the arm assembly with a block of wood of suitable height - and carefully lower the arm so that the bearing balls go into the recess.
d) Apply a small amount of grease to the upper recess and place ten bearing balls in position.
e) Add the other washer and place the pulley on the shaft, hub toward the washer.
f) Insert a .005-inch thickness gage between hub and washer.
g) Clamp the pulley and spindle together and using the hole in one side of the hub as a guide, drill (1/16") through the shaft and through the other side of the hub.
h) Fasten pulley on shaft with the pin and remove gage.

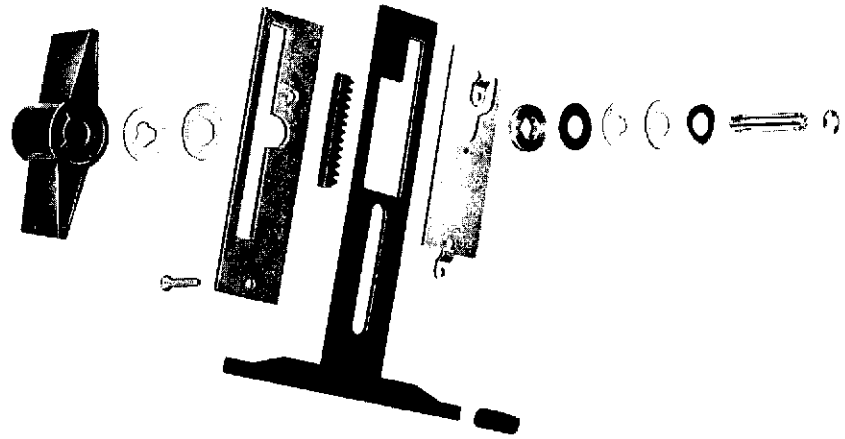
5.27 ELEVATING MECHANISM

5.27.1 Remove

a) Mechanism from case (Section 5.1.1).
b) Parts from mechanism as required.

5.27.2 Install

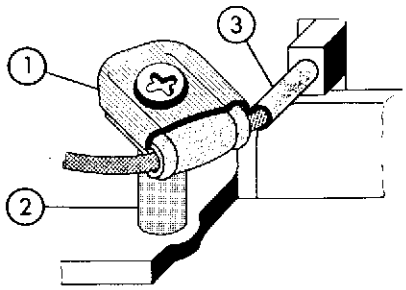
Parts in reverse order of removal so that knob is vertical when elevation is fully retracted. Lubricate the rack teeth, pinion teeth, and both sides of the bracket with A&O61-3619 Lubricant as required.



5.28 SOLAR CELL MOUNT AND CABLE ASSEMBLY

5.28.1 Remove

a) Sound optics by unhooking the mount spring from the exciter lamp bracket.
b) Mechanism from case (Section 5.1.1).
c) Flywheel (Section 5.15.1) and retaining rings from sound drum shaft so sound drum can be slide out far enough to remove the solar cell mount screw.



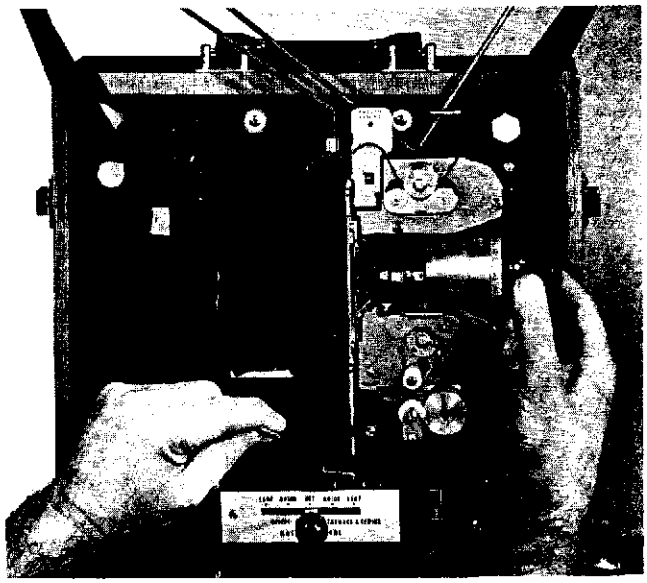
d) Screw holding the cable clamp (1) and standoff (2) in place and discard these parts, (later models do not use these parts).
e) Rubber sleeving (3) from cable and discard, then the cable plug by desoldering, and the mount and cable assembly.

5.28.2 Install

Parts in reverse order of removal. Do not use cable clamp (1), standoff (2), or rubber sleeve (3): late style cables are shorter and have a strain relief within the mount.

5.29 LAMP SOCKET

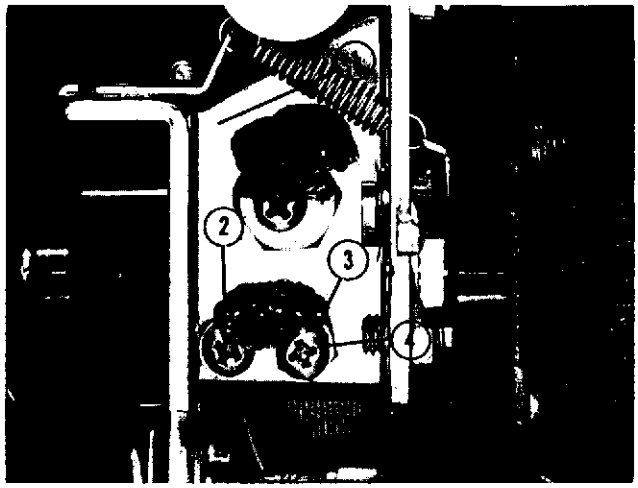
5.29.1 Adjust



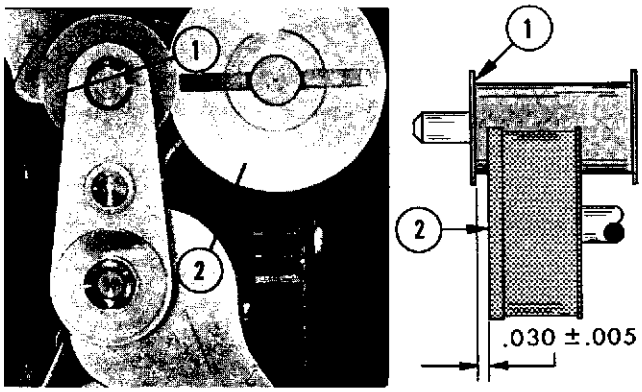
Lamp socket position by turning screw while observing projected filament image using a loupe in front of the lens; filament image should be centered.

5.30 SOUND SYSTEM (Optics and Related Area)

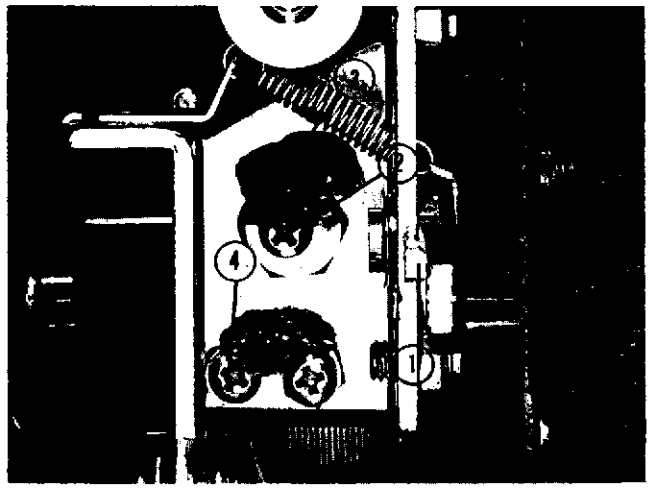
5.30.1 Adjust



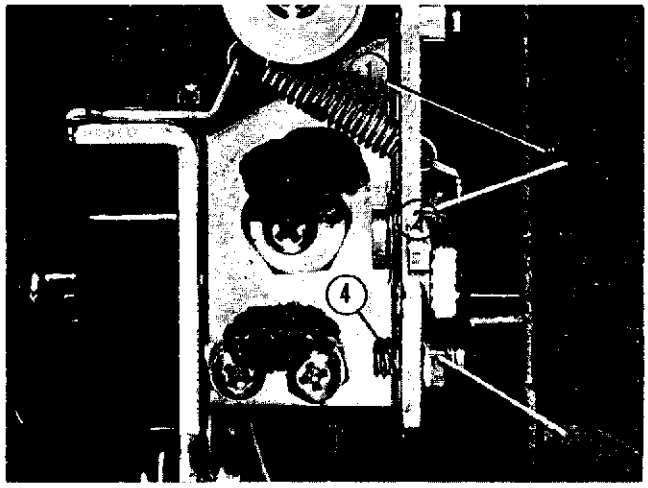
a) Sound optics bracket assembly (1) to center the scanning beam. Observe the beam in reference to the lower edge of sound drum and center of solar cell. The edge of the scanning beam should clear the rim of the sound drum by .012" and the light from the scanning beam should strike the solar cell in the center. Loosen lockscrew (2) and locknut (3), then turn adjusting screw (4) as needed. Tighten locknut (3) and apply a small amount of air-drying cement to screw and locknut.



b) Position of pressure roller for proper overhang of sound track beyond the sound drum. The distance between the inner surface of flange (1) on pressure roller and the flat surface of the sound drum (2) should be .030" ± .005". Roller position must insure that inner raised surface of sound drum contacts the film only in area between picture and sound track. Use Buzz Track Test Film (760383) and turn hexagonal spacer to move pressure roller assembly in or out, as required, so that neither tone is heard or both tones can be heard at the same level.



c) Sound optics bracket assembly to focus the sound optics using 5,000 cycle test film (760382). With the fidelity control lever (1) in the center of its travel, loosen the lock screw (2) and turn the eccentric (3) until the sound output is at maximum. Tighten lock screws (2 and 4) and apply a small amount of air-drying cement to them.



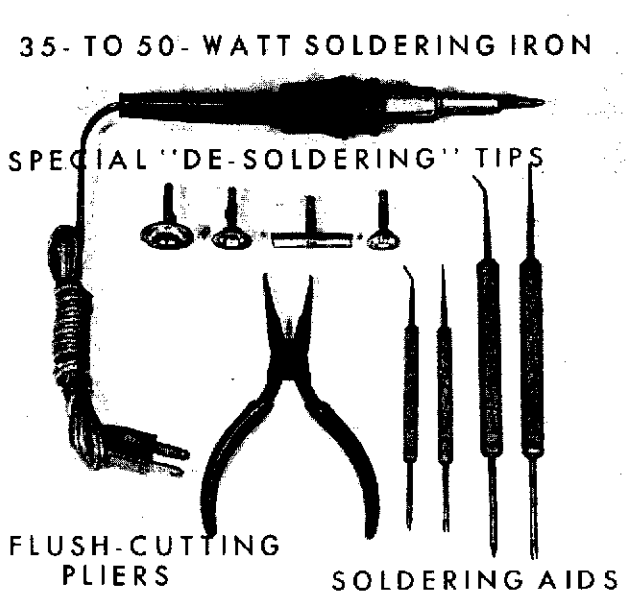
d) Sound optics for azimuth alignment and for minimum microphonics. Loosen lock nut (1) and turn screw (2) to adjust sound optics for maximum response, using 5,000 cycle test film (760382). Loosen lock nut (3), turn the volume up to maximum and, while tapping the sound head casting, turn screw (4) to adjust for minimum microphonics. Tighten lock nut (3) and apply a small amount of air-drying cement to screw and nut. Repeat azimuth adjustment. Tighten lock nut (1) and apply a small amount of air-drying cement to screw and nut.
Lubricate the two recesses of the sound optics with A&O61-3655 Grease.

6. AMPLIFIER SERVICING

A technical write-up giving details of the all-transistor amplifier for the Kodak Pageant Sound Projector, Model AV-126-TR, is available from Eastman Kodak Company, Apparatus Service Department, Rochester 4, New York.

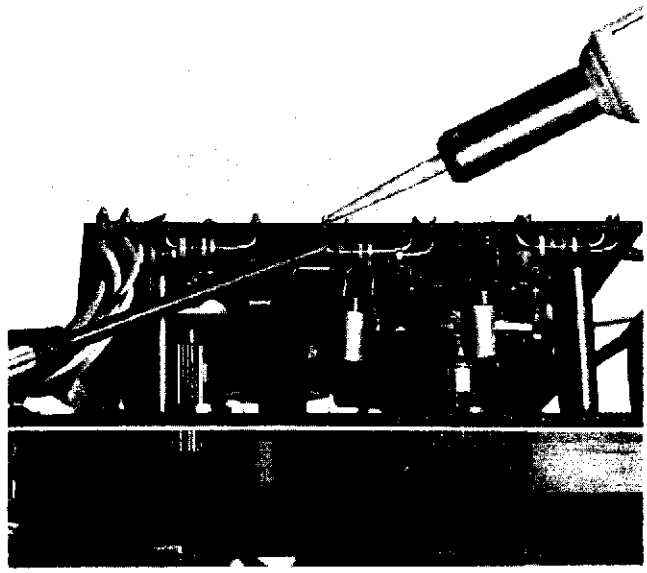
6.1 PRINTED CIRCUITS - GENERAL

Servicing of printed circuit boards requires somewhat different techniques than those employed in trouble-shooting wired amplifiers. For one thing, more care is necessary in desoldering and soldering. Because excessive heat applied to a component board may cause permanent damage to it, a 30-to-50 watt, pencil-type soldering iron is recommended.



Generally, it will be found that removal of components is easier if flush cutting pliers are used to clip off the ends of the leads and some of the solder at the joint before the iron is applied to heat the joint. Hold the tip of the iron to the soldered joint only, not to the pattern near the joint. Avoid prolonged heating of the joint; remove the component as quickly as possible, using pliers, the forked end of a soldering aid, etc. Very often, the forked end of a soldering aid can be used to reach in on the underside of a printed circuit board and remove a component located in an area that might be difficult to get to with some other tool. The reamer tip can be used to open up the holes in the board for the component leads.

Although a replacement component can usually be installed on the pattern side of the board without affecting amplifier performance, the AV-126-TR amplifier is designed so that most components can be easily installed in the original position. Again, avoid prolonged heating of the "printed" pattern at the joint when installing the component.



If a "printed" conductor is cracked, a simple repair can be made by first scraping the conductor about 1/4" on either side of the break to clean the copper and then applying a small piece of bare hookup wire over the break. The wire should be tinned before placing it in position. Hold the tip of the iron on the wire just long enough to allow the applied solder to flow across the break so that the wire is imbeded.

For detailed information on design and construction and additional hints on servicing printed circuits, refer to Printed Circuit Diagnosis Made Easy (a Howard W. Sams publication), to Rider's Introduction to Printed Circuits, and other books; also, to bulletins available from the various tube manufacturers.

6.2 TRANSISTORIZED CIRCUITS - GENERAL

Basic trouble shooting of a transistorized circuit is similar to tube circuitry except that the operating voltages are generally much lower. Voltmeter checks are done in exactly the same manner but care should be used in making ohmeter checks since component damage can result from the applied current. Although the transistor is probably the most reliable component in the circuit and should be the last component to be suspected, a transistor tester is a good investment and several good inexpensive models are available.

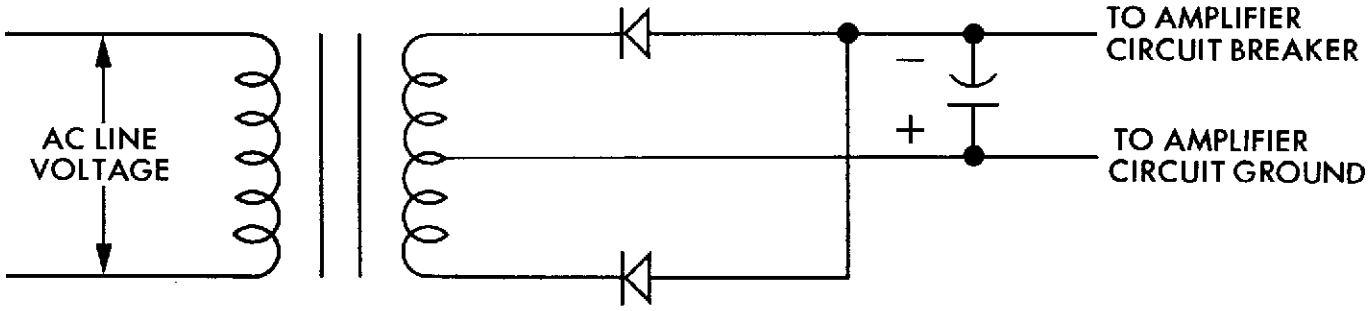
A certain amount of care is needed when handling a transistor; they are sensitive to heat and since the leads are generally quite small, proper orientation in the socket is important. A basic understanding of transistor operation and theory is very important to the serviceman and many sources of this information are available. Articles appear in nearly every issue of the various technical magazines and several manufacturers publish transistor manuals which contain a discussion on theory, construction, servicing, etc. More detailed information can be found in various books such as: "Basic Electronics Volume 6" (A Rider Publication), "Transistors - Theory and Practice" (a Gernsback Publication), and many others.

6.3 SERVICING THE AV-126-TR AMPLIFIER

To remove amplifier from the case see Section 5.2.

6.3.1 Power Supply

Since it is necessary to disconnect only the solar cell lead when removing the amplifier from the case, the amplifier can still be operated and tested. It may sometimes be necessary to use extension leads to allow easier accessibility to the amplifier. If a separate power supply is required, use a source of DC voltage that will supply a negative 25 to 30 volts measured across the amplifier filter capacitor C-13. Tool #1034 is available for this purpose, or one can be made as shown below, using parts from the amplifier power supply.

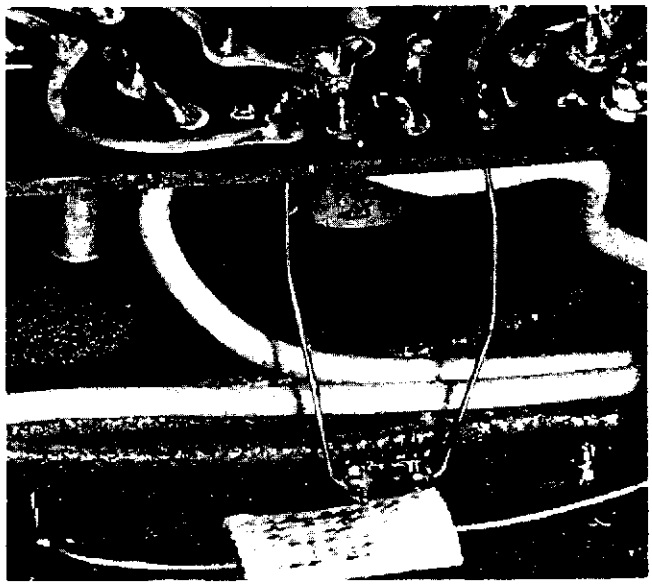


1 -#159637 TRANSFORMER
2 -#164193 SILICON RECTIFIER (RCA TYPE IN 3253 200 PIV, 750 ma)
1 -#159416 - 1500 MFD 5VDC ELECTROLYTIC CAPACITOR

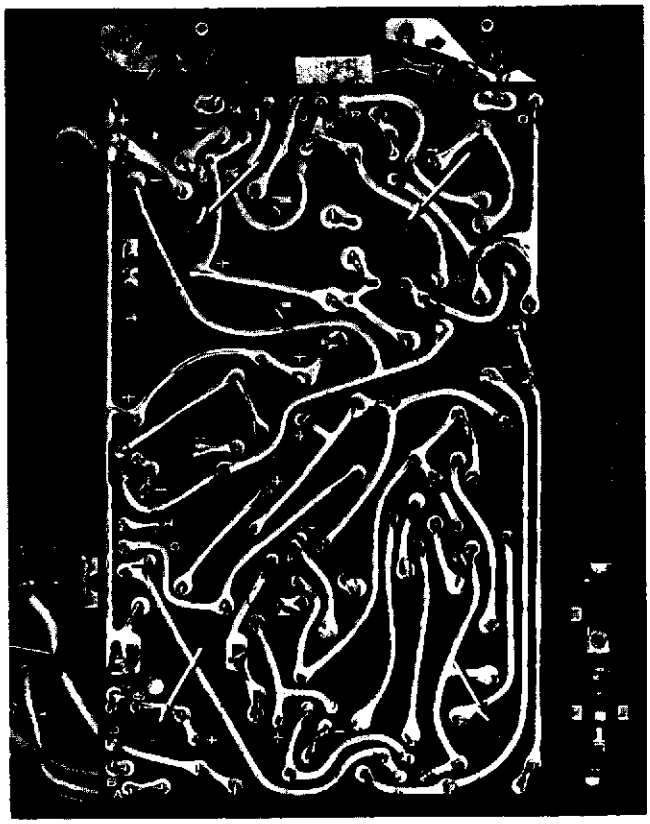
6.3.2 SERVICE HINTS

a) Although many of the components can be removed and replaced without separating the printed circuit board from the amplifier plate, these operations can be more easily performed if the amplifier is "opened-up". To do this, proceed as follows:

1. Remove the control knobs (tone control - friction fit, volume control - setscrew).



2. Unsolder the two leads of the Diode Stabistor (CR-5) that is cemented to the amplifier plate.



3. Remove the four circuit board mounting screws (arrows) and swing board over.

b) The 500K bias control (R-28) is variable so that the exact value of correct bias may be selected for any given set of transistors. If any of the transistors are replaced, it may be necessary to adjust R-28 to obtain the proper undistorted output (Section 6.3.3a).

c) The 25K potentiometer (R-34) is used to compensate for the slight variations in the sensitivity of different solar cells. It will require adjusting only if the solar cell, exciter lamp, or transistors Q1 or Q2 are changed. Adjust to obtain the proper undistorted output (Section 6.3.3a).

d) When replacing either Q7 or Q8 (2N307 or T1-370 Transistor) apply a moderate amount of Transistor Z-5 Silicon Compound No.8101 (General Cement Electronics Company) to both sides of the insulating washers.

6.3.3 Specification (input voltage to amplifier, 117)

a) Output: *6.7 volts minimum 400 cycle test film as signal source, no visible distortion on an oscilliscope (a slight amount of "filling-in" will be visible in the lower half of the signal which does not affect the undistorted output).

b) Sensitivity: (Tone Control full counterclockwise)

1. Film Channel - 8 watts (*6.9 volts) output, 1000 cycle signal of 0.66 millivolts ± 4 db applied directly to the photocell input socket.

2. Microphone Channel - 8 watts (*6.9 volts) output, 100 cycle signal of 22 millivolts ± 3 db applied directly to the microphone input receptacle.

3. Phonograph Channel - 8 watts (*6.9 volts) output, 1000 cycle signal of 220 millivolts ± 3 db applied directly to the phonograph input receptacle.

c) Power supply

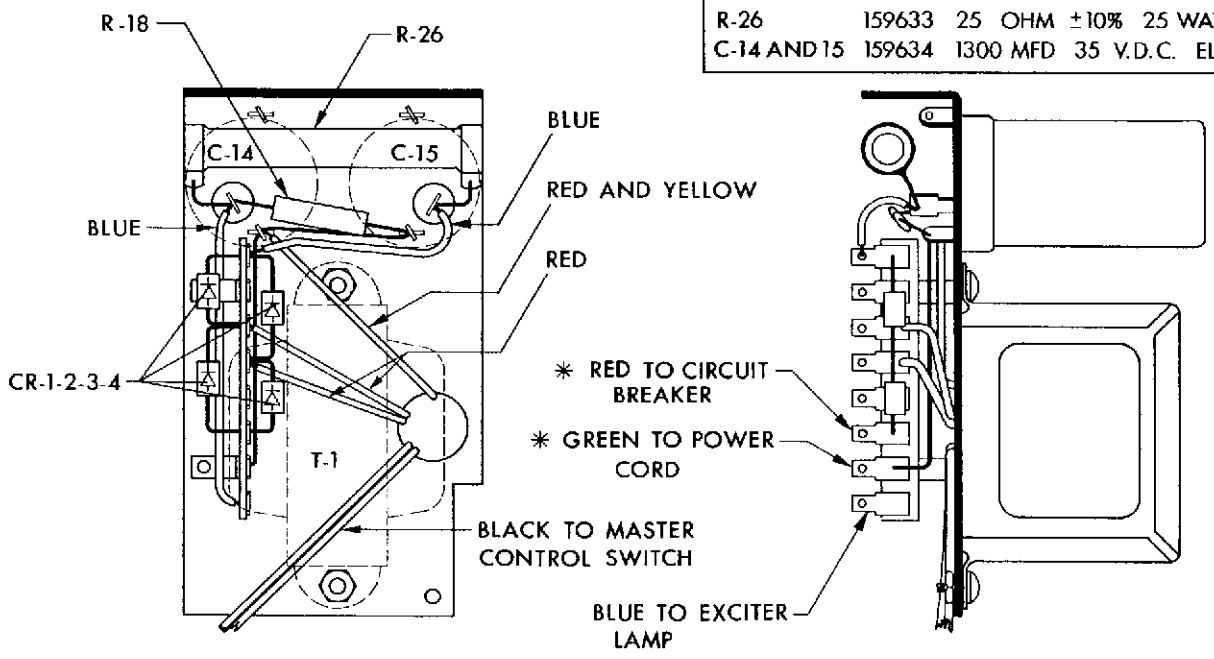
1. DC voltage to the amplifier: 25 to 30 volts (no load), measured across the filter capacitor C-13 at line voltage.

2. DC voltage to the exciter lamp: 4.0 ± 0.2 volts with ripple content not exceeding 150 millivolts, measured across a resistor load of 5 ohms ± 1%, 5 watts (in place of the exciter lamp) at a line voltage of 117.

* Measured across a 6 ohm, 25 watt, dummy speaker load.

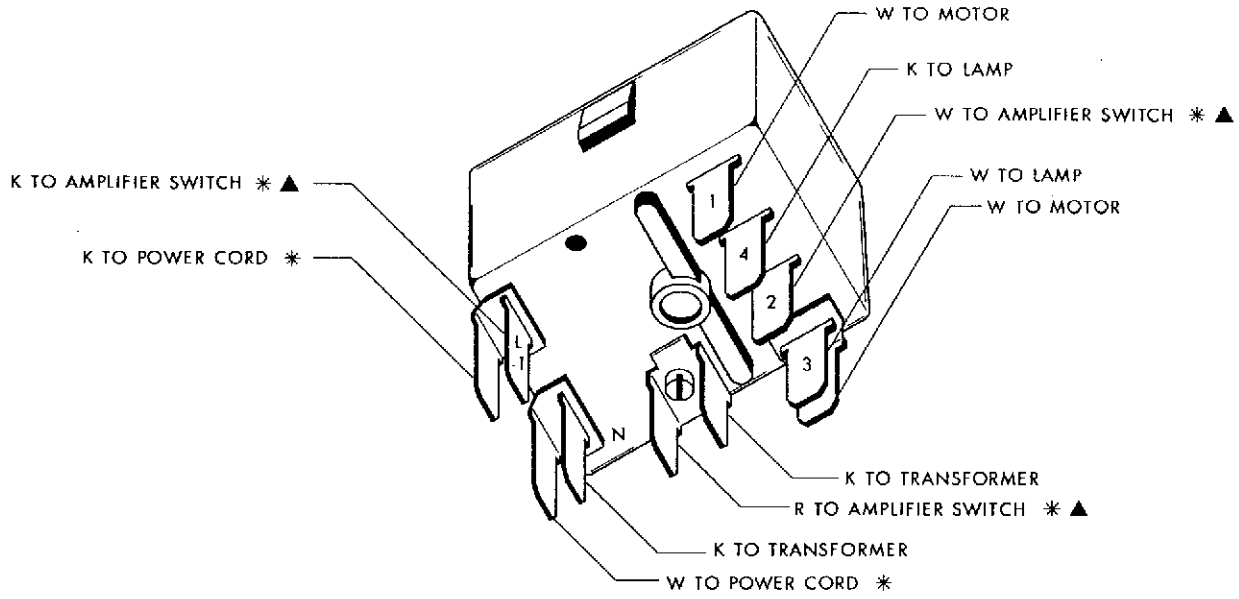
7.1 POWER SUPPLY AND MASTER CONTROL SWITCH

T-1	159637	POWER TRANSFORMER
CR-1-2-3-4	164193	750 MA 200V. PIV. DIODE
R-18	154868	500 OHM ±10% 2 WATT W.W.
R-26	159633	25 OHM ±10% 25 WATT
C-14 AND 15	159634	1300 MFD 35 V.D.C. ELEC.



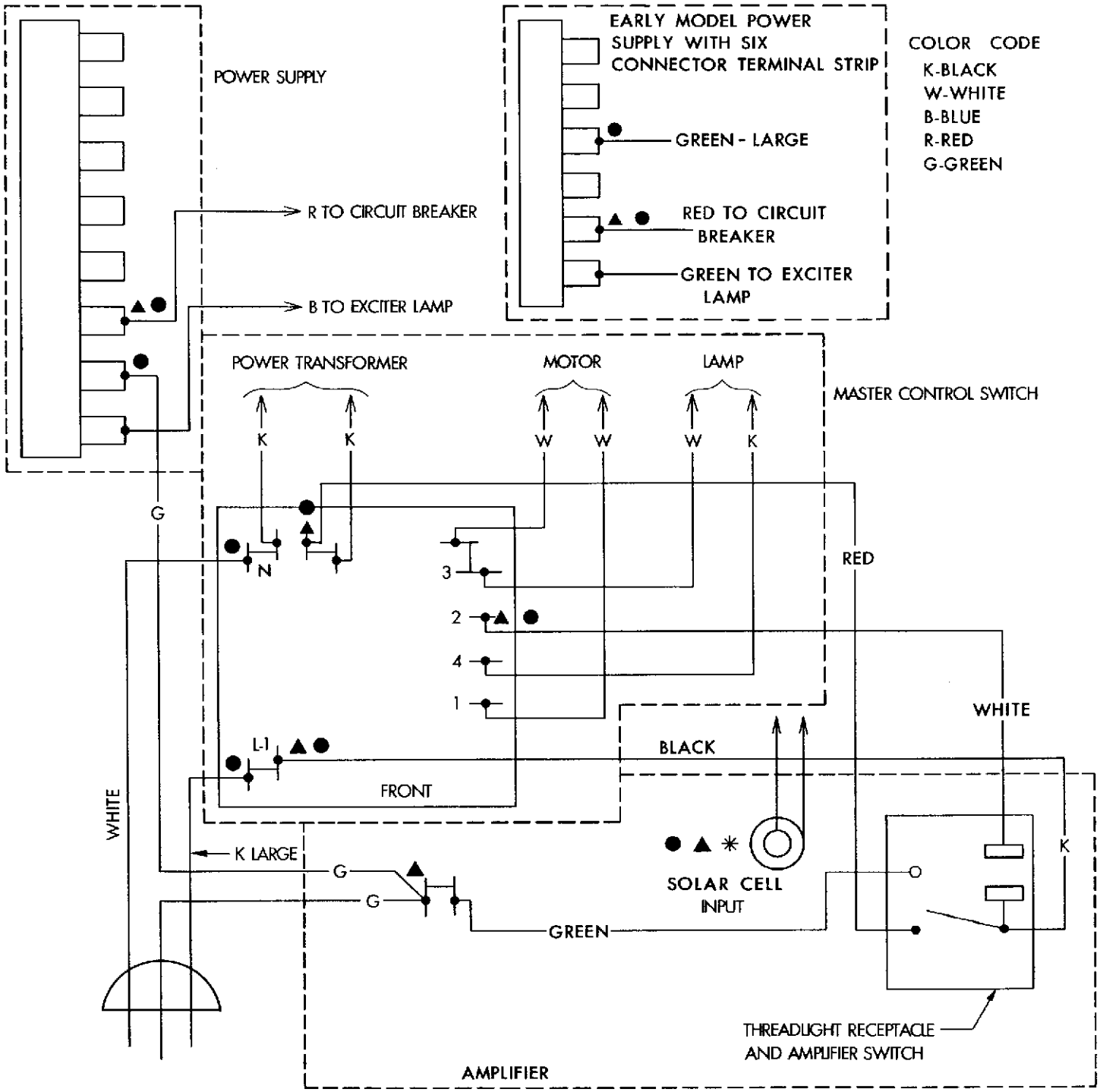
✳ DISCONNECT TO REMOVE MECHANISM

POWER SUPPLY



✳ DISCONNECT TO REMOVE MECHANISM
▲ DISCONNECT TO REMOVE AMPLIFIER COMPLETE

MASTER CONTROL SWITCH



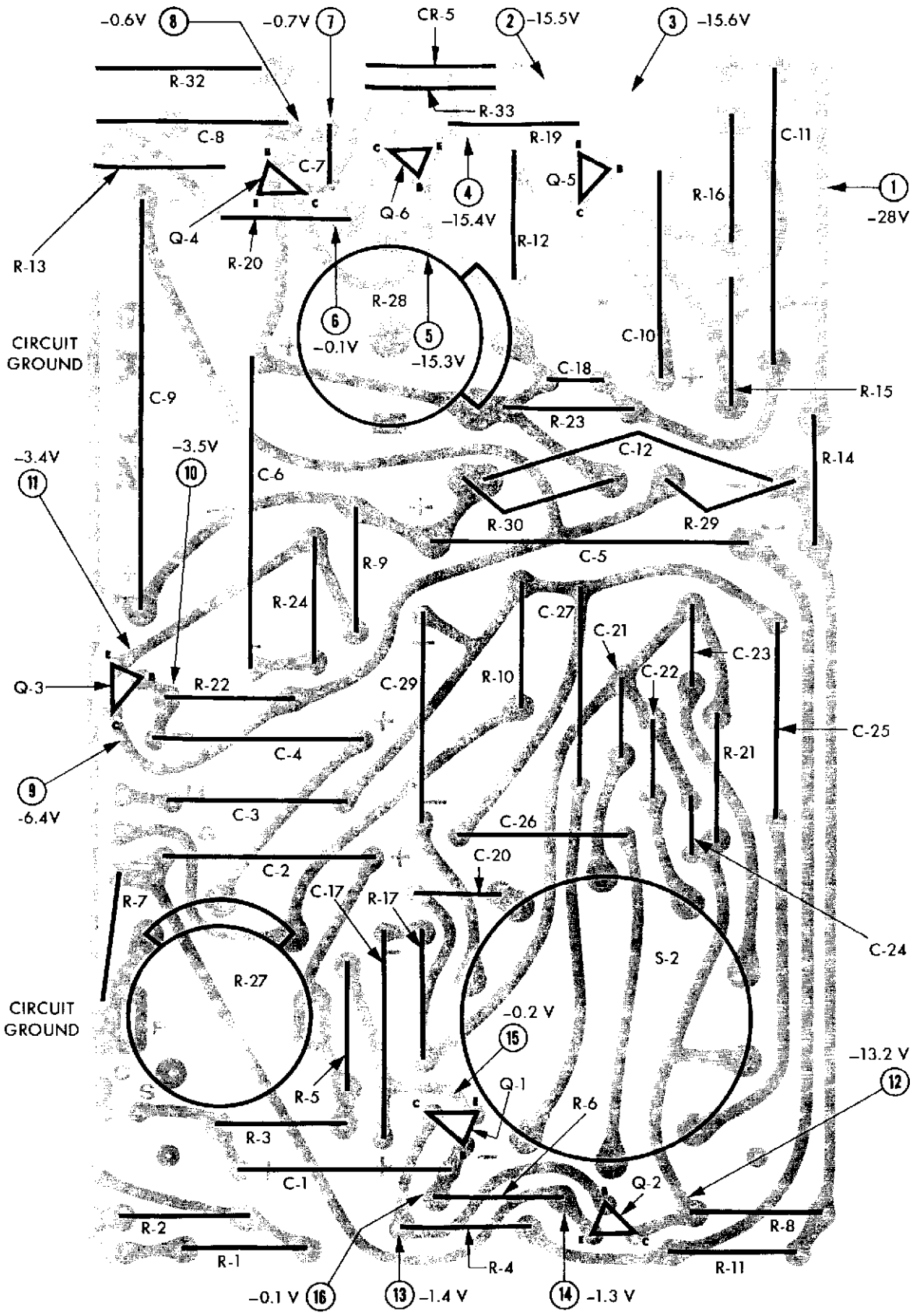
✳ DISCONNECT TO REMOVE AMPLIFIER (AMPLIFIER WILL STILL OPERATE)

▲ DISCONNECT TO REMOVE AMPLIFIER COMPLETELY

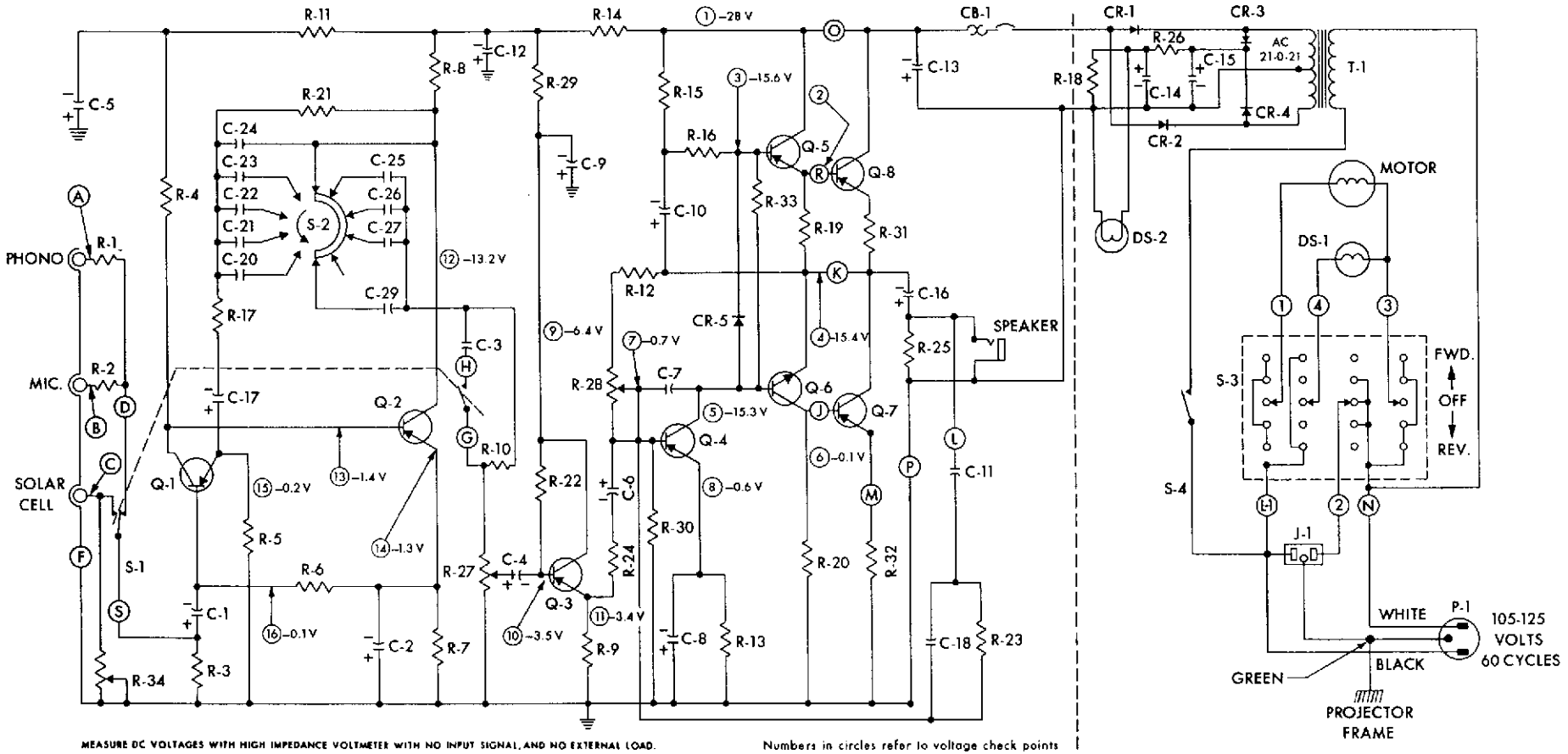
● DISCONNECT TO REMOVE MECHANISM

SWITCH AND TERMINAL CONNECTIONS

AV-126-TR



VOLTAGE - CHECK AND COMPONENT LOCATING DIAGRAM



MEASURE DC VOLTAGES WITH HIGH IMPEDANCE VOLTMETER WITH NO INPUT SIGNAL, AND NO EXTERNAL LOAD.

Numbers in circles refer to voltage check points

NOMENCLATURE FOR AMPLIFIER COMPONENTS

R-1	126101	470K±10% 1/2 WATT	R-22	120508	68K±10% 1/2 WATT	C-9	159410	125MFD 50V.D.C. ELEC.	CR-1	164193	750MA 200V.PIV. DIODE
R-2	126398	47K±10% 1/2 WATT	R-23	126903	22K±10% 1/2 WATT	C-10	159413	10MFD 50V.D.C. ELEC.	CR-2	164193	750MA 200V.PIV.DIODE
R-3	160558	3.6K±5% 1/2 WATT	R-24	159406	220ohm±10% 1/2 WATT	C-11	160673	0.68MFD±10%100V.D.C.	CR-3	164193	750MA 200V.PIV.DIODE
R-4	126900	10K±10% 1/2 WATT	R-25	159407	47ohm±10% 2 WATT	C-12	162883	60MFD 50V.D.C. ELEC.	CR-4	164193	750MA 200V.PIV.DIODE
R-5	136709	47ohm±10% 1/2 WATT	R-26	159633	25ohm±10% 25 WATT	C-13	159416	1500MFD 50V.D.C. ELEC.	Q-1	159424	PNP TRANSISTOR 2N109 OR 2N1370
R-6	126398	47K±10% 1/2 WATT	R-27	159427	5K VOLUME CONTROL	C-14	159634	1300MFD 35V.D.C. ELEC.	Q-2	159424	PNP TRANSISTOR 2N109 OR 2N1370
R-7	119816	1K±10% 1/2 WATT	R-28	159428	500K BIAS CONTROL	C-15	159634	1300MFD 35V.D.C. ELEC.	Q-3	159424	PNP TRANSISTOR 2N109 OR 2N1370
R-8	126900	10K±10% 1/2 WATT	R-29	154866	5.6K±10% 1/2 WATT	C-16	159416	1500MFD 50V.D.C. ELEC.	Q-4	159424	PNP TRANSISTOR 2N109 OR 2N1370
R-9	119816	1K±10% 1/2 WATT	R-30	120504	33K±10% 1/2 WATT	C-17	161022	25MFD 10V.D.C. ELEC.	Q-5	159424	PNP TRANSISTOR 2N109 OR 2N1370
R-10	152753	7.5K±5% 1/2 WATT	R-31	160672	0.25ohm±5% 1/2 WATT	C-18	159418	100MMFD 50 V. MIN.	Q-6	159425	NPN TRANSISTOR 2N35 OR 2N1304
R-11	126394	4.7K±10% 1/2 WATT	R-32	160672	0.25ohm±5% 1/2 WATT	C-20	161020	.005MFD 50V. MIN.	Q-7	159426	PNP TRANSISTOR 2N307 OR TI-370
R-12	143223	150K±10% 1/2 WATT	R-33	872378	100ohm±10% 1/2 WATT	C-21	159420	.004MFD 50V. MIN.	Q-8	159426	PNP TRANSISTOR 2N307 OR TI-370
R-13	126401	150ohm±10% 1/2 WATT	*R-34	164603	25K POT.	C-22	161021	.0018MFD 50V. MIN.	S-1	154870	DPDT SLIDE SWITCH
R-14	159406	220ohm±10% 1/2 WATT	C-1	161022	25MFD 10V.D.C. ELEC.	C-23	161021	.0018MFD 50V. MIN.	S-2	159435	5 POS. ROTARY-TONE CONTROL
R-15	119816	1K±10% 1/2 WATT	C-2	161022	25MFD 10V.D.C. ELEC.	C-24	159418	100MMFD 50V. MIN.	S-3	159533	PROJ. CONTROL SWITCH
R-16	870569	2.7K±10% 1/2 WATT	C-3	159649	.022MFD 100 V.D.C.	C-25	159409	.027MFD 100V. MIN.	S-4	159445	AMP. SWITCH &
R-17	872379	1.2K±10% 1/2 WATT	C-4	161022	25MFD 10V.D.C. ELEC.	C-26	159414	.033MFD 100V. MIN.	J-1		TH'D'L'T SOCKET ASS'Y
R-18	154868	500ohm±10% 2 WATT W.W.	C-5	159408	75MFD 25V.D.C. ELEC.	C-27	159419	.047MFD 100V. MIN.	DS-1		PROJECTION LAMP
R-19	153447	200ohm±5% 1/2 WATT	C-6	159408	75MFD 25V.D.C. ELEC.	C-29	159413	10MFD 50V.D.C. ELEC.	DS-2		EXCITER LAMP
R-20	153447	200ohm±5% 1/2 WATT	C-7	159411	50MMFD 50V.MIN.	CR-5	159444	DIODE STABISTOR S320G	P-1	159551	POWER CORD
R-21	120506	15K±10% 1/2 WATT	C-8	159412	60MFD 6V.D.C. ELEC.	CB-1	151383	CIRCUIT BREAKER	T-1	159637	POWER TRANSFORMER

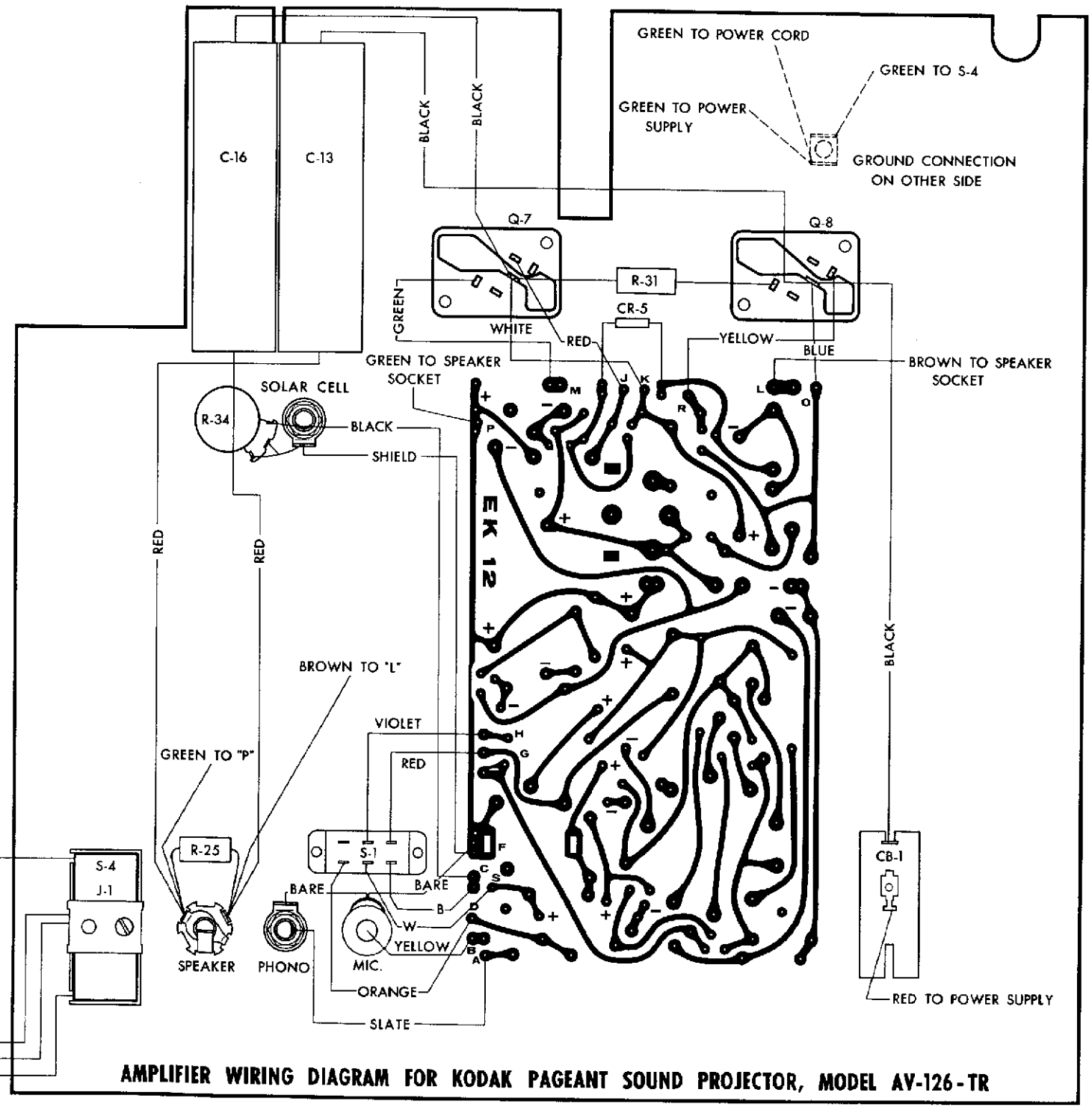
*ADDED BEGINNING WITH "B" SERIAL NUMBERS

AMPLIFIER SCHEMATIC CIRCUIT FOR KODAK PAGEANT SOUND PROJECTOR, MODEL AV-126-TR

NOMENCLATURE FOR AMPLIFIER COMPONENTS

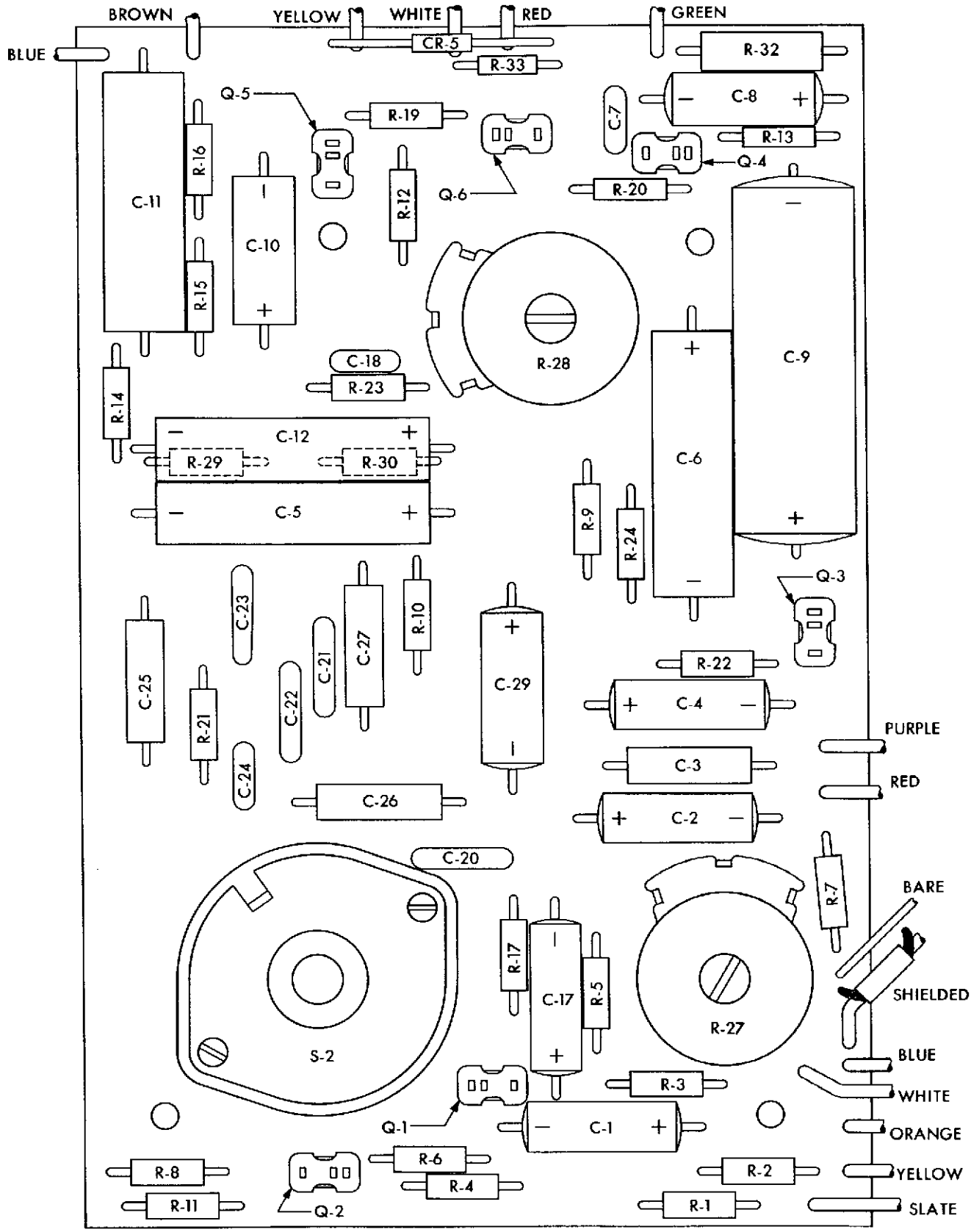
R-1	126101	470K± 10% 1/2 WATT
R-2	126398	47K± 10% 1/2 WATT
R-3	160558	3.6K± 5% 1/2 WATT
R-4	126900	10K± 10% 1/2 WATT
R-5	136709	47ohm± 10% 1/2 WATT
R-6	126398	47K± 10% 1/2 WATT
R-7	119816	1K± 10% 1/2 WATT
R-8	126900	10K± 10% 1/2 WATT
R-9	119816	1K± 10% 1/2 WATT
R-10	152753	7.5K± 5% 1/2 WATT
R-11	126394	4.7K± 10% 1/2 WATT
R-12	143223	150K± 10% 1/2 WATT
R-13	126401	150ohm± 10% 1/2 WATT
R-14	159406	220ohm± 10% 1/2 WATT
R-15	119816	1K± 10% 1/2 WATT
R-16	870569	2.7K± 10% 1/2 WATT
R-17	872379	1.2K± 10% 1/2 WATT
R-18	154868	500ohm± 10% 2 WATT W.W.
R-19	153447	200ohm± 5% 1/2 WATT
R-20	153447	200ohm± 5% 1/2 WATT
R-21	120506	15K± 10% 1/2 WATT
R-22	120508	68K± 10% 1/2 WATT
R-23	126903	22K± 10% 1/2 WATT
R-24	159406	220ohm± 10% 1/2 WATT
R-25	159407	47ohm± 10% 2 WATT
R-26	159633	25ohm± 10% 25 WATT
R-27	159427	5K VOLUME CONTROL
R-28	159428	500K BIAS CONTROL
R-29	154866	5.6K± 10% 1/2 WATT
R-30	120504	33K± 10% 1/2 WATT
R-31	160672	0.25ohm± 5% 1/2 WATT
R-32	160672	0.25ohm± 5% 1/2 WATT
R-33	872378	100ohm± 10% 1/2 WATT
* R-34	164603	25K POT.
C-1	161022	25MFD 10V.D.C. ELEC.
C-2	161022	25MFD 10V.D.C. ELEC.
C-3	159649	.022MFD 100 V.D.C.
C-4	161022	25MFD 10V.D.C. ELEC.
C-5	159408	75MFD 25V.D.C. ELEC.
C-6	159408	75MFD 25V.D.C. ELEC.
C-7	159411	50MMFD 50V.MIN.
C-8	159412	60MFD 6V.D.C. ELEC.
C-9	159410	125MFD 50V.D.C. ELEC.
C-10	159413	10MFD 50V.D.C. ELEC.
C-11	160673	0.68MFD± 10% 100V.D.C.
C-12	162883	60MFD 50V.D.C. ELEC.
C-13	159416	1500MFD 50V.D.C. ELEC.
C-14	159634	1300MFD 35V.D.C. ELEC.
C-15	159634	1300MFD 35V.D.C. ELEC.
C-16	159416	1500MFD 50V.D.C. ELEC.
C-17	161022	25MFD 10V.D.C. ELEC.
C-18	159418	100MMFD 50 V. MIN.
C-20	161020	.005MFD 50V. MIN.
C-21	159420	.004MFD 50V. MIN.
C-22	161021	.0018 MFD 50V. MIN.
C-23	161021	.0018MFD 50V. MIN.
C-24	159418	100MMFD 50V. MIN.
C-25	159409	.027MFD 100V. MIN.
C-26	159414	.033MFD 100V. MIN.
C-27	159419	.047MFD 100V. MIN.
C-29	159413	10MFD 50V.D.C. ELEC.
CR-5	159444	DIODE STABISTOR S320G
CB-1	151383	CIRCUIT BREAKER
CR-1	164193	750MA 200V.PIV. DIODE
CR-2	164193	750MA 200V.PIV.DIODE
CR-3	164193	750MA 200V.PIV.DIODE
CR-4	164193	750MA 200V.PIV.DIODE
Q-1	159424	PNP TRANSISTOR 2N109 OR 2N1370
Q-2	159424	PNP TRANSISTOR 2N109 OR 2N1370
Q-3	159424	PNP TRANSISTOR 2N109 OR 2N1370
Q-4	159424	PNP TRANSISTOR 2N109 OR 2N1370
Q-5	159424	PNP TRANSISTOR 2N109 OR 2N1370
Q-6	159425	NPN TRANSISTOR 2N35 OR 2N1304
Q-7	159426	PNP TRANSISTOR 2N307 OR TI-370
Q-8	159426	PNP TRANSISTOR 2N307 OR TI-370
S-1	154870	DPDT SLIDE SWITCH
S-2	159435	5 POS. ROTARY-TONE CONTR
S-3	159533	PROJ. CONTROL SWITCH
S-4	159445	AMP. SWITCH & TH'D'L'T SOCKET ASS'Y
J-1		
DS-1		PROJECTION LAMP
DS-2		EXCITER LAMP
P-1	159551	POWER CORD
T-1	159637	POWER TRANSFORMER

* ADDED BEGINNING WITH "B" SERIAL NUMBERS

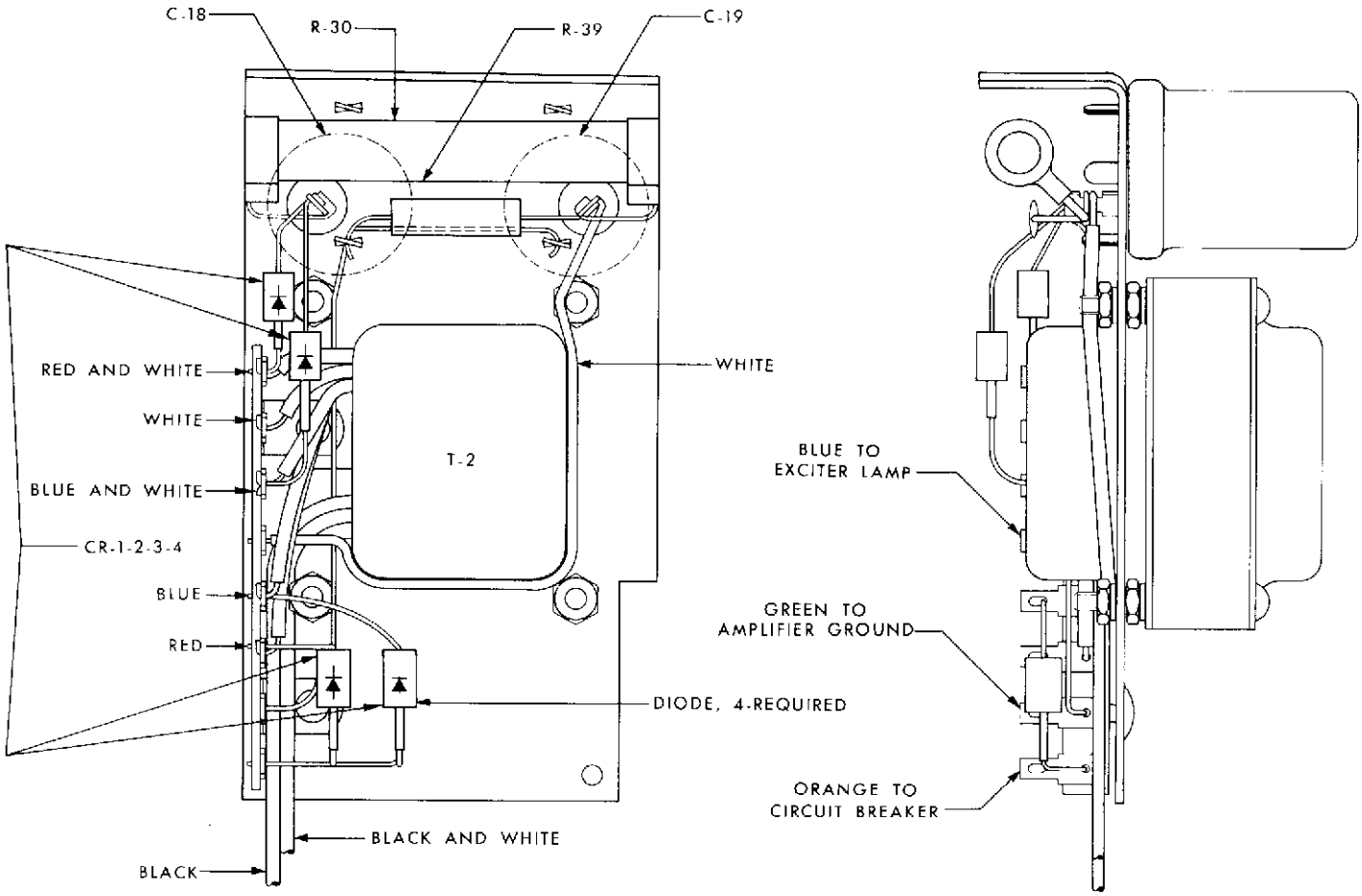


AMPLIFIER WIRING DIAGRAM FOR KODAK PAGEANT SOUND PROJECTOR, MODEL AV-126-TR

7.6 COMPONENT BOARD



COMPONENT BOARD

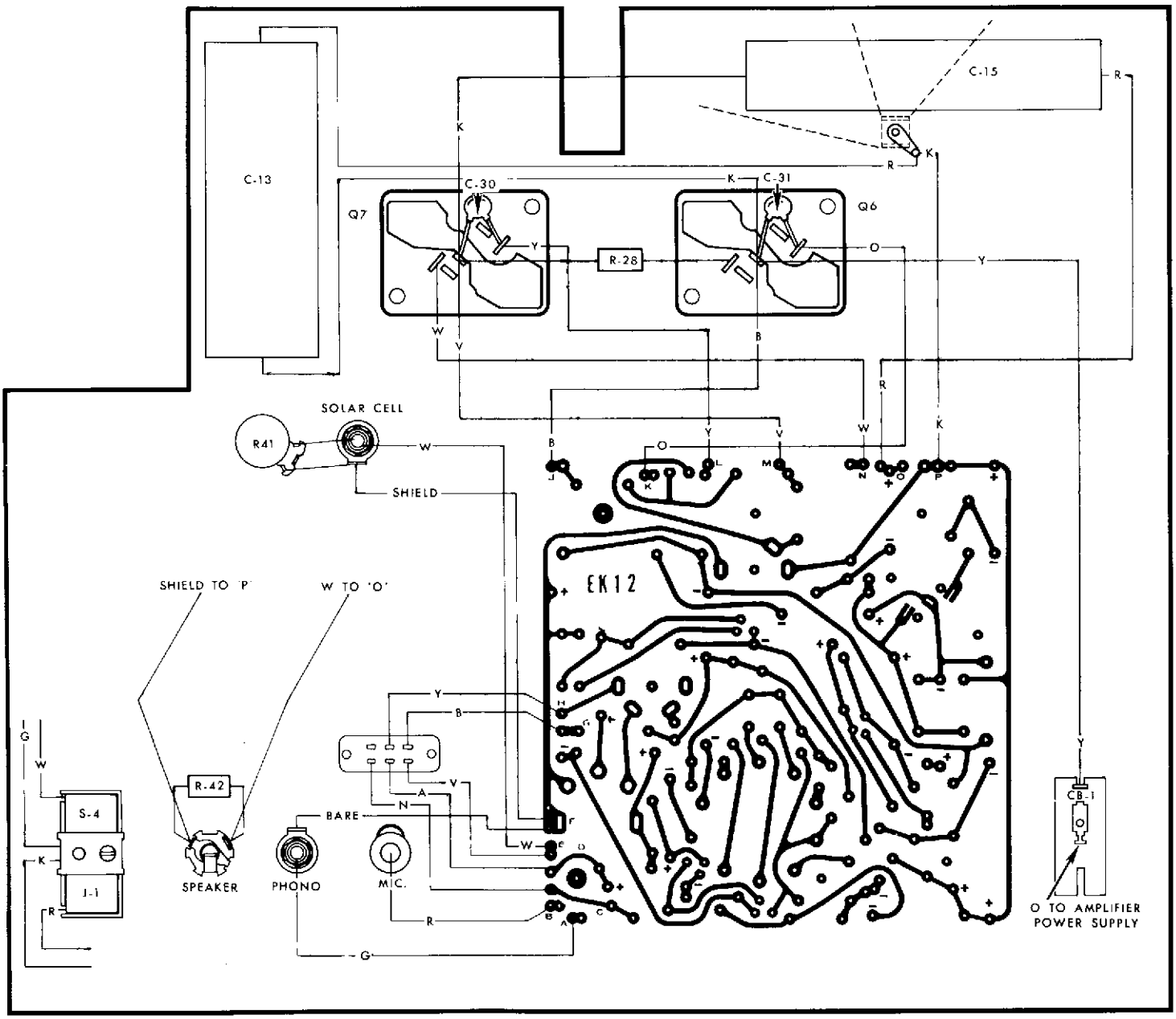


WIRING DIAGRAM FOR AMPLIFIER AND EXCITER LAMP
POWER SUPPLY ASSEMBLY - 161845

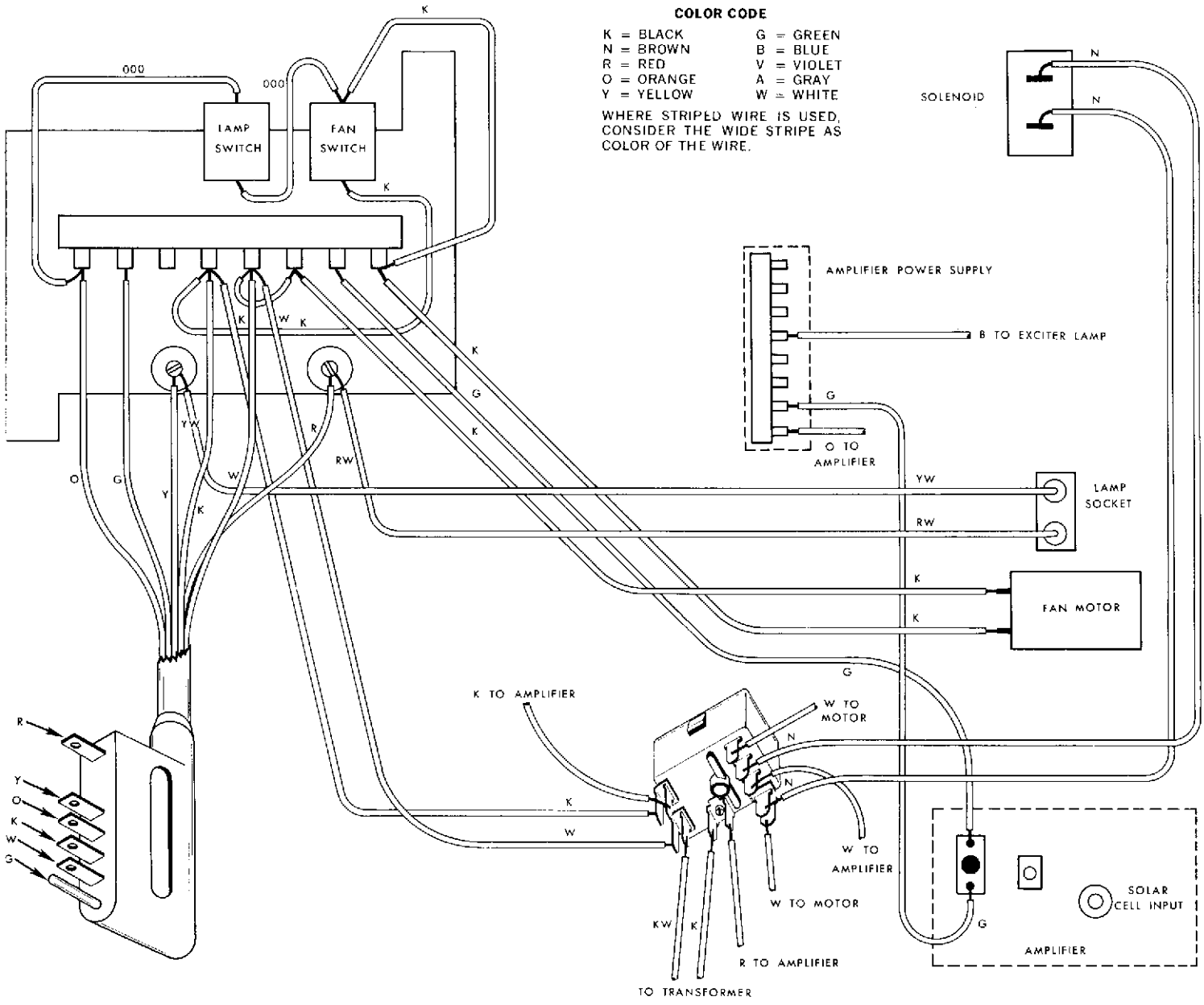
COLOR CODE

K = BLACK	G = GREEN
N = BROWN	B = BLUE
R = RED	V = VIOLET
O = ORANGE	A = GRAY
Y = YELLOW	W = WHITE

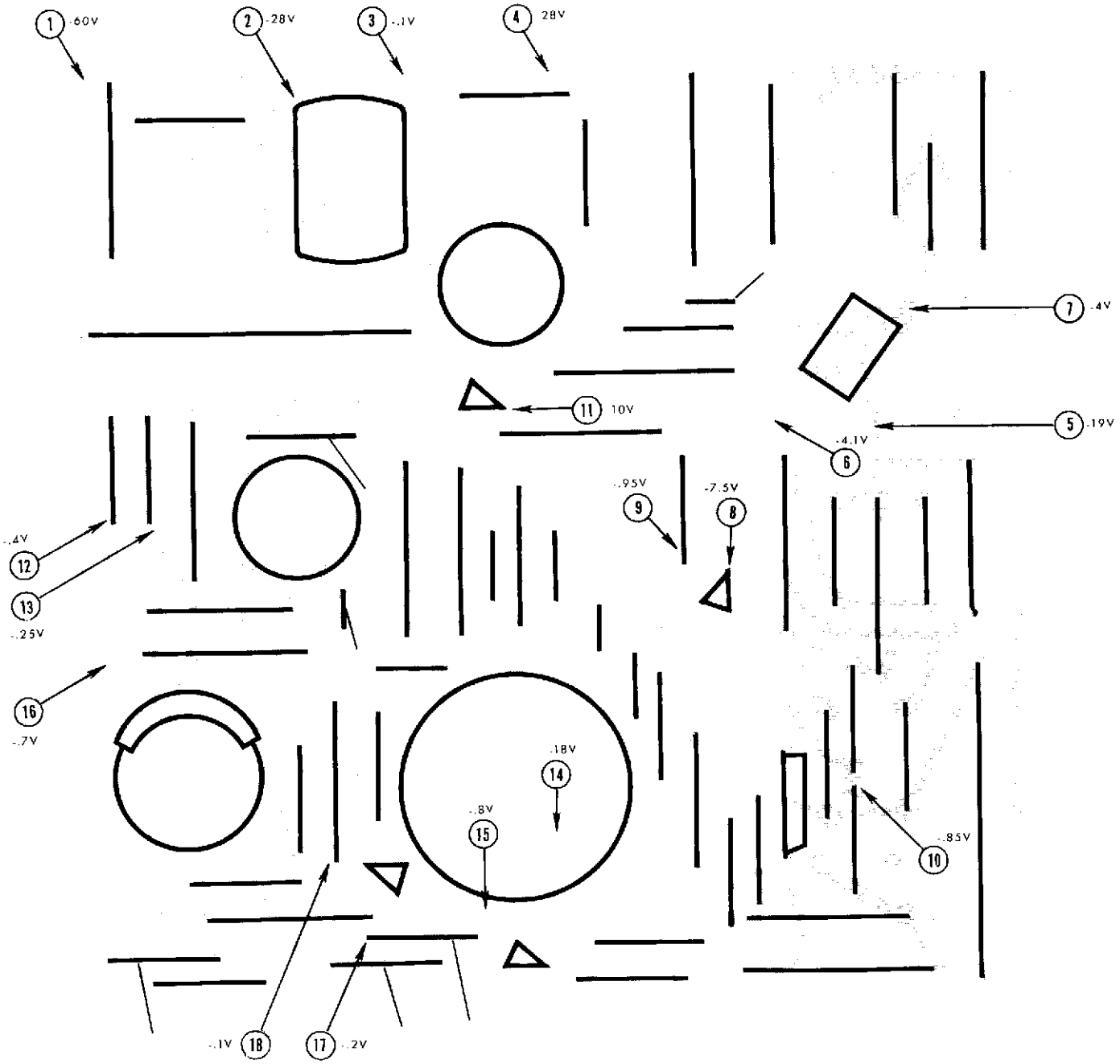
WHERE STRIPED WIRE IS USED, CONSIDER THE WIDE STRIPE AS COLOR OF THE WIRE.



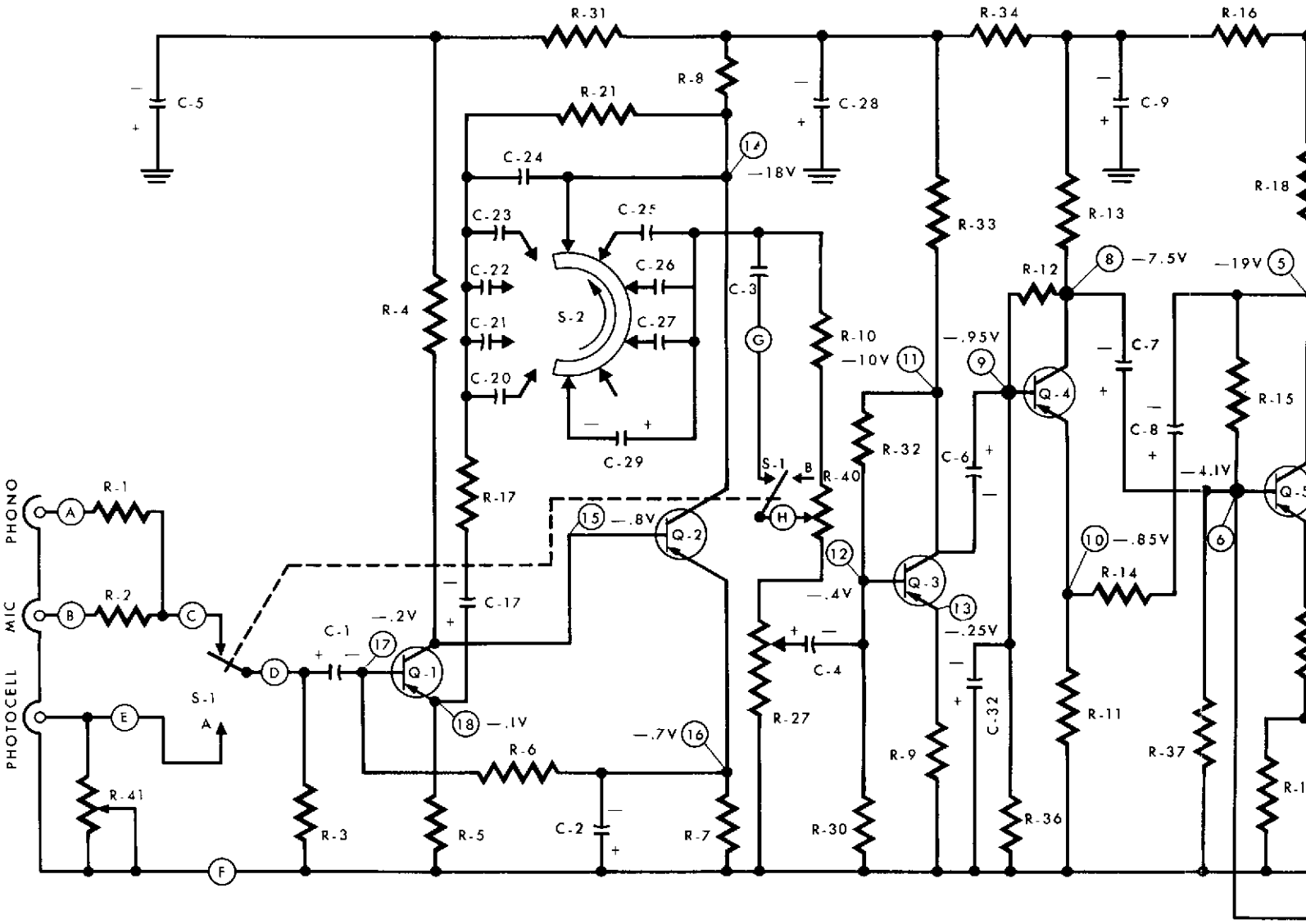
AMPLIFIER WIRING DIAGRAM
***KODAK PAGEANT* ARC PROJECTOR**



WIRING DIAGRAM
***KODAK PAGEANT* ARC PROJECTOR**

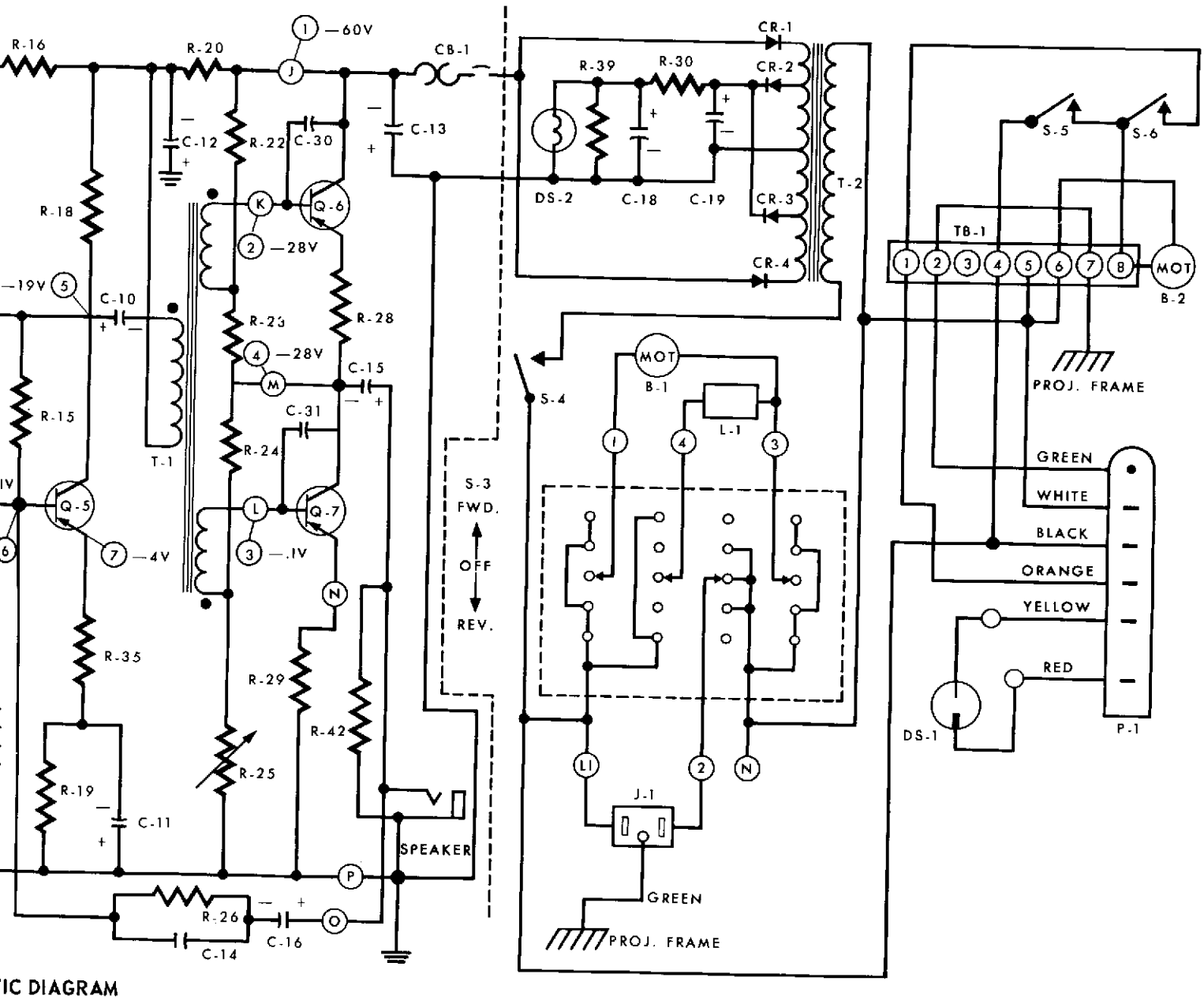


VOLTAGE-CHECK AND COMPONENT LOCATING DIAGRAM
KODAK PAGEANT ARC PROJECTOR



SCHEMATIC DIAGR
***KODAK PAGEANT* ARC P**

R-1	126101	470K ½ WATT ± 10%	R-26	147756	1.8K ½ WATT ± 10%	C-10	
R-2	78671	47K ½ WATT ± 10%	R-27	178372	VOLUME CONTROL	C-11	
R-3	147756	1.8K ½ WATT ± 10%	R-28	161830	1Ω 2 WATT ± 5% WIREWOUND	C-12	
R-4	126900	10K ½ WATT ± 10%	R-29	161830	1Ω 2 WATT ± 5% WIREWOUND	C-13	
R-5	136709	47Ω ½ WATT ± 10%	R-30	159633	25Ω 25 WATT ± 10%	C-14	
R-6	78671	47K ½ WATT ± 10%	R-31	126394	4.7K ½ WATT ± 10%	C-15	
R-7	119816	1K ½ WATT ± 10%	R-32	78671	47K ½ WATT ± 10%	C-16	
R-8	126900	10K ½ WATT ± 10%	R-33	147756	1.8K ½ WATT ± 10%	C-17	
R-9	162891	27Ω ½ WATT ± 5%	R-34	872378	100Ω ½ WATT ± 10%	C-18	
R-10	112546	27Ω ½ WATT ± 10%	R-35	161828	18Ω ½ WATT ± 10%	C-19	
R-11	162892	33Ω ½ WATT ± 5%	R-36	126901	6.8K ½ WATT ± 10%	C-20	
R-12	168066	39K ½ WATT ± 5%	R-37	872443	12K ½ WATT ± 10%	C-21	
R-13	160123	680Ω ½ WATT ± 5%	R-38	112546	2.7K ½ WATT ± 10%	C-22	
R-14	123301	1.1K ½ WATT ± 5%	R-39	154868	500Ω 2 WATT ± 10%	C-23	
R-15	126905	27K ½ WATT ± 10%	R-40	161857	CONTROL-FREQUENCY RESPONSE 2.5K	C-24	
R-16	866521	390Ω ½ WATT ± 10%	C-32	152129	.01 MFD 50VDC MYLAR	C-25	
R-17	872379	1.2K ½ WATT ± 10%	C-1	161022	25 MFD 10VDC ELECTROLYTIC	C-26	
R-18	165557	600Ω 5 WATTS ± 5%	C-2	161022	25 MFD 10VDC ELECTROLYTIC	C-27	
R-19	161827	91Ω 1 WATT ± 5%	C-3	161858	.015 MFD 50 VDC MYLAR	C-28	
R-20	127852	300Ω 5 WATT ± 10%	C-4	161022	25 MFD 10VDC ELECTROLYTIC	C-29	
R-21	872443	12K ½ WATT ± 10%	C-5	164758	40 MFD 25 VDC ELECTROLYTIC	C-30	
R-22	126900	10K ½ WATT ± 10%	C-6	161022	25 MFD 10 VDC ELECTROLYTIC	C-31	
R-23	161828	18Ω ½ WATT ± 10%	C-7	159413	10 MFD 50 VDC ELECTROLYTIC	CR-1	
R-24	126900	10K ½ WATT ± 10%	C-8	159413	10 MFD 50 VDC ELECTROLYTIC	CR-2	
R-25	161829	BIAS CONTROL 50Ω ± 20%	C-9	159410	125 MFD 50 VDC ELECTROLYTIC	CR-3	



TIC DIAGRAM
NT ARC PROJECTOR

C-10	165556	25 MFD 50 VDC ELECTROLYTIC
C-11	161831	75 MFD 6 VDC ELECTROLYTIC
C-12	159410	125 MFD 50 VDC ELECTROLYTIC
C-13	161832	1500 MFD 70 VDC ELECTROLYTIC
C-14	143229	.0015 MFD ± 10% 450 VDC DISC
C-15	159416	1500 MFD 50 VDC ELECTROLYTIC
C-16	161022	25 MFD 10 VDC ELECTROLYTIC
C-17	161022	25 MFD 10 VDC ELECTROLYTIC
C-18	159634	1300 MFD 35 VDC ELECTROLYTIC
C-19	159634	1300 MFD 35 VDC ELECTROLYTIC
C-20	161020	.005 MFD 50 VDC MIN. CERAMIC
C-21	159420	.004 MFD 50 VDC MIN. CERAMIC
C-22	161021	.0018 MFD 50 VDC MIN. CERAMIC
C-23	161021	.0018 MFD 50 VDC MIN. CERAMIC
C-24	159418	100 MMFD 50 VDC MIN. CERAMIC
C-25	159409	.027 MFD 100 VDC MIN. MYLAR
C-26	159414	.033 MFD 100 VDC MIN. MYLAR
C-27	159419	.047 MFD 100 VDC MIN. MYLAR
C-28	164758	40 MFD 25 VDC ELECTROLYTIC
C-29	159413	10 MFD 50 VDC ELECTROLYTIC
C-30	164757	.001 MFD ± 10% 50 VDC MIN. CERAMIC
C-31	164757	.001 MFD ± 10% 50 VDC MIN. CERAMIC
CR-1	164193	750 MA 200 PIV DIODE
CR-2	164193	750 MA 200 PIV DIODE
CR-3	164193	750 MA 200 PIV DIODE
CR-4	164193	750 MA 200 PIV DIODE
Q-1	184574	TRANSISTOR 2N5366 ECG-159
Q-2	184574	TRANSISTOR 2N5366
Q-3	184574	TRANSISTOR 2N5366
Q-4	162893	TRANSISTOR 2N1038 PNP ECG-176
Q-5	161849	TRANSISTOR 2N1136 PNP ECG-106
Q-6	161835	TRANSISTOR 2N1136A PNP
Q-7	161835	TRANSISTOR 2N1136A PNP
DS-1		PROJECTION LAMP
DS-2	BSK	PHOTOCELL EXCITER LAMP
S-1	186949	INPUT SELECTOR SWITCH
S-2	159435	TONE CONTROL SWITCH
S-3	159533	PROJECTOR CONTROL SWITCH
S-4	159445	AMPLIFIER CONTROL SWITCH
J-1		THREADLAMP SOCKET
CB-1	151383	CIRCUIT BREAKER
T-1	161836	DRIVER TRANSFORMER
T-2	161837	POWER TRANSFORMER
P-1	181912	POWER CORD
R-41	164603	25K POTENTIOMETER
R-42	154868	500 Ω 2 WATT ± 10%
S-5	181910	BLOWER MOTOR SWITCH
S-6	181910	LAMP SWITCH
B-1	181881	MECH. DRIVE MOTOR
B-2	184476	BLOWER MOTOR
L-1	181905	SOLENOID
TB-1	163267	TERMINAL STRIP

KODAK AV EQUIPMENT MEMO

TECHNICAL INFORMATION ABOUT AUDIOVISUAL EQUIPMENT

S-80-25

AUTOMATIC CHANGEOVER FOR *KODAK PAGEANT* PROJECTORS

(NOTE: *Eastman Kodak Company does not manufacture or distribute changeover devices.)*

INTRODUCTION

Automatic changeover allows you to switch from one motion picture projector to another without interrupting the picture or sound.

For the changeover, a dowser (metal disc) is used to block the light beam leaving the projector. *KODAK PAGEANT* 250A Sound Projectors (as well as previously manufactured *PAGEANT* Arc Projectors) have built-in dowsers; however, for other *PAGEANT* Projector Models, a dowser must be provided.

This equipment memo describes how you can build a changeover for use with *PAGEANT* 250A (and Arc) Projectors—plus, with modifications, other *PAGEANT* Projector Models.

The parts needed for both the changeover circuitry and the dowsers are as follows:

PARTS LIST

CODE	DESCRIPTION	QUANTITY	
		Changeover	Dowsers
DS-1	Pilot lamp assembly, 115 V	1	
J-1	Phone jack—1/4-inch (6.3-millimetre*) diameter for current *PAGEANT* Projectors (SWITCHCRAFT 11) —0.206-inch (5.2-millimetre) diameter for older *PAGEANT* Projectors (SWITCHCRAFT 5-11)	1	
J-2, J-3, J-4, J-5	Receptacle—2-conductor, 125 V, 1 A rating or greater, to mate with P-2, P-3, P-4, P-5 (Jones S-302-CCT-K or equiv)	2	2
K-1	Relay—4PDT, 115 V ac continuous-duty coil (Potter and Brumfield GA17, Guardian 500-CG115 ac, or equiv) 5 AMP CONTACTS	1	
L-1	Solenoid—115 V ac continuous duty (Kodak Part No. 181905,† Guardian No. 11, Dormeyer B221A1, or equiv). This solenoid has approximately 1 inch (25 millimetres) of travel		2 (for external use only)
P-1, P-6, P-7	Phone plug—1/4-inch diameter (Switchcraft 250, 270, or 280) —0.206-inch diameter (Switchcraft S-250 or S-280)	3	
P-2, P-3, P-4, P-5	Plug—2-conductor, 125 V, 1 A rating or greater, to mate with J-2, J-3, J-4, J-5 (Jones *P*-302-CCT-L or equiv)	4	
P-8	Power plug—standard 2-conductor	1	
R-1, R-2	L or T pads—to correspond to speaker output (permit setting monitor-cue levels for judging program level)	2	

* For ease in reading, the metric equivalent is given once per dimension.

† These parts can be purchased from Eastman Kodak Company, Parts Services, Rochester, NY 14650. Parts not available from Kodak can be purchased from an electronics supplier.

PARTS LIST (continued)

CODE	DESCRIPTION	QUANTITY	
		Changeover	Dowsers
S-1, S-2	Switch—SPST, 125 V, 1 A rating or greater	2	
S-3, S-4	Switch—SPDT, lever- or roller-actuated, 125 V, 1 A rating or greater (Micro BA-2RL2 or equiv)	2	
S-5	Switch—SPDT, center-off	1	
S-6, S-7	Switch—SPST, toggle, 125 V, 1 A rating or greater	2	
	Spring—closes dowser (Kodak Part No. 181870†)		2
	Spring—opens dowser (Kodak Part No. 182962†)		2
	Dowser—metal disc and bushing (Kodak Part No. 183091†)		2 (for external use only)
A-MP 42474-1 or 121204-Kent	Faston connectors—to connect to the solenoid or master-control switch		4 (or as required)
	Control box, grommets, wire		

NOTE: The monitor-cue speaker, the VU meter, and the circuit indicated by the dotted lines on the wiring diagram for the changeover, page 4, are not essential. If these are omitted, S-5, R-1, and R-2 are unnecessary, and K-1 can be 3PDT instead of 4PDT.

For a permanent installation, direct connections can be made to the program speaker, the dowsers, and switches S-3 and S-4. In this case, parts S-6, S-7, J-1, J-2, J-3, J-4, J-5, P-1, P-2, P-3, P-4, and P-5 will not be needed.

WIRING

Basic wiring diagrams shown. Modification may be necessary. Wiring must conform to local electrical codes.

Internal Dowser

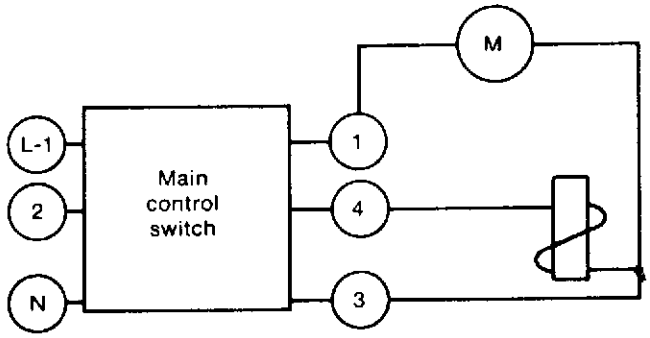


FIGURE 1 Existing wiring of the *Internal* dowser of a *KODAK PAGEANT* 250A Projector

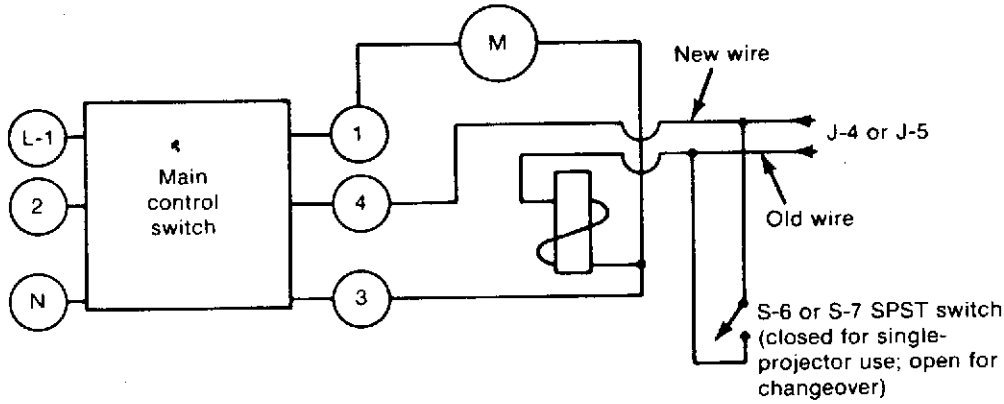


FIGURE 2 Modified wiring of the internal dowser

Internal Dowser Control Switch

The SPDT switch (S-3 or S-4) is mounted under the control lever so that it will be actuated when the lever is moved to PROJECT or LAMP (Figure 3).

To wire the internal dowser and the switch, proceed as follows for each projector (designate one projector *A* and the other *B*):

1. Disconnect the wire from terminal 4 of the main control switch (Figure 1).
2. Connect or solder a 6-inch (152-millimetre) length of new wire to terminal 4.
3. Connect the other end of the new wire and the end of the old wire (step 1) to the new receptacle J-4 or J-5 (Figure 2). This receptacle will hold the P-4 or P-5 plug from the changeover. This switch is used to restore the projector to its original wiring when it is used without the changeover.
4. Wire the S-6 or S-7 switch as shown in Figure 2. (A shorting plug in J-4 or J-5 can substitute for this switch.)
5. Mount switch S-3 or S-4 on the projector (Figure 3), making sure the mounting screws do not interfere with any internal parts. Connect the plug P-2 or P-3 to the switch.

   NOTE: On S-3, P-2 (projector *A*), use the common and normally *closed* contacts; on S-4, P-3 (projector *B*), use the common and normally *open* contacts.
6. Label the connectors properly for projectors *A* and *B*.

Any exposed connections or bare wires must be properly insulated.

For projectors that do not have a control lever, mount the switch so that it will be actuated when the rotary or toggle switch is in the LAMP position.

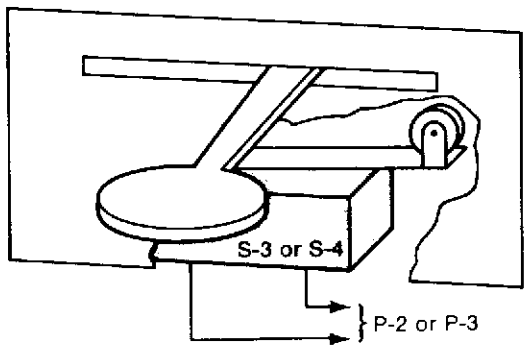


FIGURE 3 Internal dowser control switch

External Dowser

For wiring of the *external* dowser for use with *PAGEANT* Projectors other than the Model 250A, follow Figure 4.

The dowser shutter can be made of any lightweight metal. It should be circular and large enough to cover the end of the lens. For proper functioning, it should be located in front of the projector lens and positioned so that when the solenoid (L-1) is actuated, the shutter will open; and when the solenoid is off, the shutter will close, either by gravity or spring tension.

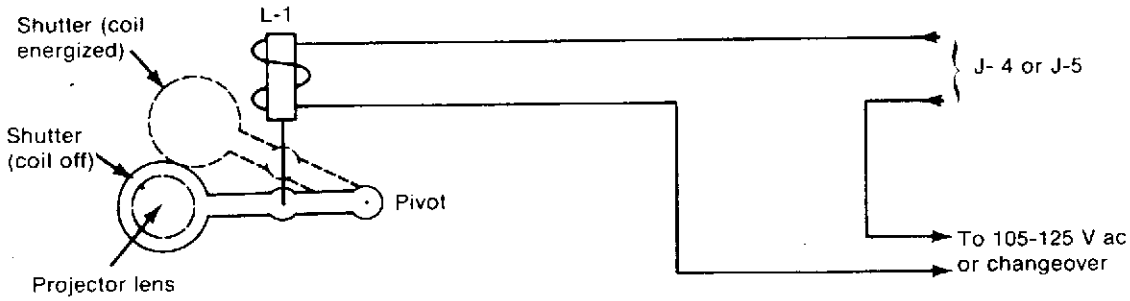
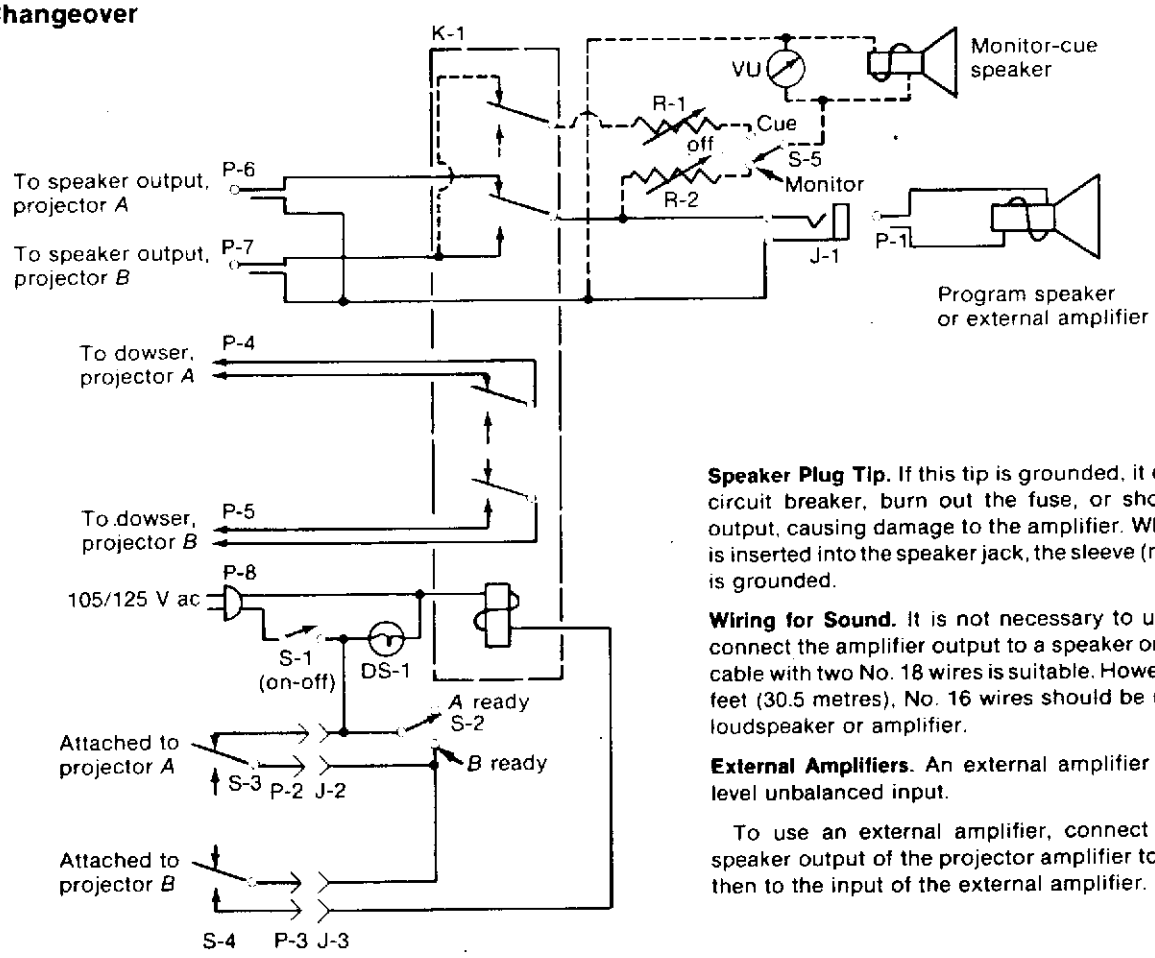


FIGURE 4 External dowser wiring

Changeover



Speaker Plug Tip. If this tip is grounded, it can trip the amplifier circuit breaker, burn out the fuse, or short out the amplifier output, causing damage to the amplifier. When the speaker plug is inserted into the speaker jack, the sleeve (not the tip) of the plug is grounded.

Wiring for Sound. It is not necessary to use shielded cable to connect the amplifier output to a speaker or another amplifier. A cable with two No. 18 wires is suitable. However, for runs over 100 feet (30.5 metres), No. 16 wires should be used to connect to a loudspeaker or amplifier.

External Amplifiers. An external amplifier should have a high-level unbalanced input.

To use an external amplifier, connect it directly from the speaker output of the projector amplifier to the changeover and then to the input of the external amplifier.

FIGURE 5 Wiring for projector changeover

SPEAKER REQUIREMENTS

PAGEANT Projectors should be used with high-efficiency speakers, such as the one supplied with the projector. However, in some situations you may find it advantageous to use larger auxiliary speakers to improve the sound output.

Current *PAGEANT* Projectors have a speaker output jack that accepts a 1/4-inch-diameter phone plug. On the other hand, the jacks on older *PAGEANT* Projectors require a 0.206-inch-diameter plug. (Suitable phone plugs for 1/4-inch speaker jacks include Switchcraft 250, 270, or 280; use Switchcraft S-250 or S-280 plugs for 0.206-inch jacks. These plugs are available from most electronics dealers, or directly from Switchcraft, Inc., 5527 North Elston Avenue, Chicago, IL 60630.)

The amplifier in the current *PAGEANT* 250A and 250S Sound Projectors is designed for use with an 8-ohm speaker that has a maximum rating of 25 W. (Previously manufactured 25 W *PAGEANT* Projectors — Models 256-TR and Arc—are designed for a 16-ohm speaker system.) Phased speakers of higher impedances may be used but this approach will result in reduced power delivered to the sound system. Note that using a speaker system with an impedance *less* than the minimum impedance for which the amplifier was designed may overload and damage the amplifier.

POWER AND VENTILATION REQUIREMENTS

During operation, a *PAGEANT* 250A Projector and *KODAK* Arc Power Supply draw about 9 A from a 105 to 125 V, single-phase, 60 Hz ac line. However, when the lamp (General Electric Marc 300/16A) is first turned on, the projector can draw up to 13 A. Thus, a 26 A line is a *minimum* requirement for two projectors and power supplies.

A *PAGEANT* 250S Projector using a 200 W tungsten-halogen lamp (EJL) requires approximately 100 W plus the lamp wattage. Two projectors with 200 W lamps require a maximum of 600 W.

The maximum heat generated by two *PAGEANT* 250A Projectors and power supplies is approximately 4800 Btu. For two *PAGEANT* 250S Projectors with 200 W tungsten lamps, the maximum heat generated is about 2050 Btu or approximately 1370 Btu in normal changeover (one lamp off).

In ordinary room temperatures with two projectors running in a small projection room or booth, a minimum airflow of 100 ft^3/min (2.8 m^3/min) is suggested. Additional allowance must be made for other heat-producing elements in the room and also for the operator.

PROJECTOR OPERATION

Setting Up

In the following procedure, the wording assumes that the projectors are equipped with control *levers*. If your projectors are equipped with rotary or toggle switches, substitute *rotary switch* or *toggle switch* whenever "control lever" is mentioned.

Arrange the projectors side by side. Then proceed as follows:

1. Connect the projectors and the changeover to a 105 to 125 V, 60 Hz power supply.
2. Insert the speaker plugs into the changeover speaker receptacles; then insert the changeover phone plugs into the projector speaker jacks (1/4 inch for current *PAGEANT* Projectors or 0.206 inch for older models).
3. Connect the dowser plugs (from the changeover) to the dowser receptacles.
4. Turn the selector switch on the changeover to "*A* ready." Thread projector *A*, turn it on, align it, and adjust it as you normally would. Project the film to its starting point (if using cued leader, to the cue mark; if not, to the first picture frame); then move the control lever to the OFF position. (The life of the arc lamp in the *PAGEANT* 250A Projector will be reduced by excessive switching on and off. Leave the lamp on if the projector will be used again in 5 or 10 minutes; otherwise, turn it off.)
5. Turn the changeover selector switch to "*B* ready," and repeat step 4 for the second film segment and projector *B*.
6. Return the changeover selector switch to "*A* ready."

Starting the Show

With a *PAGEANT* 250A Projector, turn on its lamp about 1 minute before the projector is to be run.

1. Turn on the amplifier.
2. Move the control lever of projector *A* as follows:
   a. If the film has been cued *ahead* of the first image position, move the control lever to the MOTOR position. When the film reaches the starting point, move the control lever to the PROJECT or LAMP position.
   b. If the film has been cued *at* the first image position, move the control lever to the PROJECT or LAMP position.
3. Recheck the focus, image framing, and sound level as you would for a single-projector showing.

Performing the First Changeover

If projector *B* has an arc lamp, turn it on at least 1 minute before the first changeover is to be made.

1. Turn on the amplifier.
2. Move the changeover selector switch to "*B* ready."
3. Move the control lever of projector *B* as follows:
   a. If the film has been cued *ahead* of the starting point, move the control lever to the MOTOR position. When the film reaches the starting point, move the control lever to the PROJECT or LAMP position.

b. If the film has been cued *at* the starting point, move the control lever to the PROJECT or LAMP position.

NOTE: When the control lever of projector *B* is moved to the PROJECT or LAMP position, the dowser of projector *A* will close, the dowser of projector *B* will open, and at the same time the sound track will switch to projector *B*. Projector *A* can continue to run (it will not interfere with the program) until its entire film is on the take-up reel.

4. Recheck the focus, image framing, and sound level.
5. The first reel of film can be rewound, or it can be removed for rewinding at a later time. Install an empty take-up reel for a third film segment.

Preparing for the Second Changeover

Thread projector *A* with the third reel of film. With the changeover selector in the "*B* ready" position, projector *A* can be operated with its control in any position without having the dowser open and without the sound going to the program speaker. Thus if a monitor-cue speaker and switch are used, sound level can be adjusted and the film can be cued at the starting point.

Performing the Second Changeover

Use the procedure described in Performing the First Changeover, except that references to "projector *B*" should read projector *A*.

Repeat this procedure for each film segment.

After the Final Changeover

1. The projector not in use can be turned off.
2. When the last reel of film has been projected, turn off all equipment.
3. Rewind the film, if necessary.

Nonchangeover Operation

Without disconnecting the changeover, either projector can be used for single-projector operation if the changeover switch is in the proper "ready" position.

The changeover can be disconnected, if necessary, in this way:

1. Disconnect the changeover plugs from the projectors.
2. If internal dowsers are in use, close the SPST dowser switches, or insert shorting plugs into the dowser receptacles. When external dowsers are being used, pull out their connecting plugs. Move the dowsers away from the lenses.
3. Insert the speaker plugs into the speaker jacks on the projectors.

Either projector can now be operated without changeover.

The "off" projector can be operated without interfering with the sound or picture of the "on" projector if the changeover selector switch is set in the "ready" position for the "on" projector.

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