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BELL & HOWELL

Filmosound

179

16MM PROJECTORS

PROJECTION LAMPS:

DFY	1000W	25 HOURS
DFK	1000W	10 HOURS
DEJ	750 W	25 HOURS

EXCITER LAMP:

BRD	4 VOLT,	.75 AMP

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You have purchased a promise with your Filmo—a Bell & Howell promise of professional "movies" with amateur ease for years to come.

Behind this promise and your Filmo stand years of Bell & Howell research, tireless craftsmanship of engineers and workmen, and the finest materials made. To be sure you get the perfect pictures your Bell & Howell equipment is made to give, study the following pages carefully with your Filmo in front of you. Then, when you put it to work, you'll get matchless performance from your very first try.

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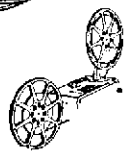
10 ACTIONS . . . of setup and operation

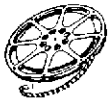
4 MINUTES . . . of pre-show time

for PICTURES OF PERFECTION


. . . Make electrical connections

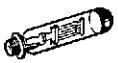

. . . Attach reel arms


. . . Set sound-silent switch


. . . Thread film


. . . Turn on amplifier


. . . Start film-moving mechanism


. . . Turn on lamp


. . . Focus lens


. . . Adjust volume


. . . and tone

Contents

Instructions for Operation and Maintenance of BELL & HOWELL FILMOSOUND AUDITORIUM Model 179-J

The information given in the following pages refers *specifically* to the Filmosound Model 179-J and *generally* to the Filmosound Models 179-H and -K. Differences in operation of the Models 179-H and -K are given on pages 33 through 39.

Setting Up

Positioning of Projection Units. Place the Filmosound at the rear of the room on a stand or table of a height which will permit projecting over the heads of the audience. Set up the projection screen, at the front of the room, according to the instructions accompanying the model to be used.

Unfasten two latches on rear door of power speaker and open door. Unsnap both fasteners of retaining band LE, Figure 1, and remove feed reel arm HR, Figure 1, and take-up reel arm JS, Figure 1, from carrying positions. Remove Y cord, speaker-to-projector cable, line cord and take-up reel from carrying positions. Carry the speaker, line cord, and speaker-to-projector cable to the front of the room. Place the speaker as nearly as possible at the center of the screen and above the floor, but not so high as to interfere with the picture. Locate the speaker at least 18 inches in front of any obstructing surface.

Electrical Connections — Speaker. With line switch ND, Figure 3, in the OFF position, insert female plug MG, Figure 2, of power speaker line cord into receptacle KR, Figure 2; plug other end of line cord into wall receptacle supplying 105- to 130-volt, 50- to 60-cycle alternating current. Connect plug AR, Figure 2, of speaker-to-projector cable to receptacle DP, Figure 2. For operation of power speaker on 115-volt direct current or 220-volt alternating current, see pages 17 and 18.

Draw cable out of slot in right side of case door and close door. Uncoil-

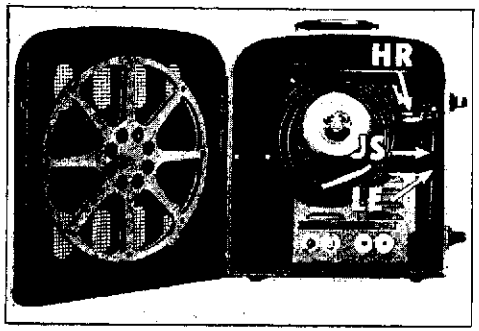


Figure 1

HR Feed reel arm
JS Take-up reel arm
LE Retaining band

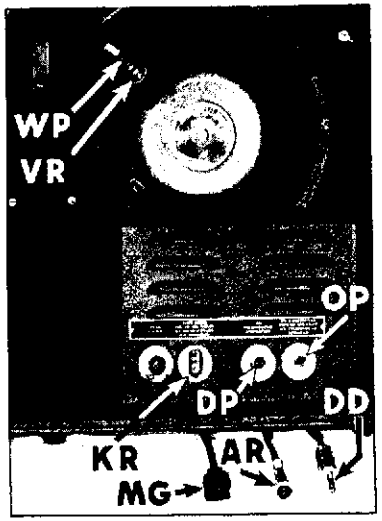


Figure 2

AR	**Female plug**
DD	**Extra speaker cable plug**
DP	**Receptacle**
JL	**Female receptacle**
KR	**Power supply receptacle**
MG	**Female plug**
OP	**Extra speaker jack**
VR	**Male plug**
WP	**Female plug**

ing speaker-to-projector cable as you walk toward projector, place cable where audience cannot trip over it. Figure 4a shows positions and connection of Filmosound and power speaker.

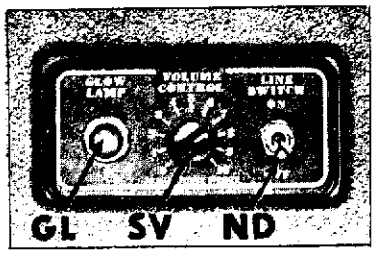
On those occasions when even greater sound volume is desired, add one or more extra power speakers. To connect two or more power speakers (see Figure 4b): Connect plug MG of second power speaker line cord to receptacle KR. Connect plug AR of speaker-to-speaker cable to receptacle DP. With connections for first power speaker made in the usual way, connect plug DD of speaker-to-speaker cable to jack OP on first speaker amplifier. Connect each additional power speaker to the one before it, using the speaker-to-speaker cable; since all connectors are polarized and speaker amplifier receptacles are clearly identified, connections can be made only correctly.

When desired, a regular speaker may be used with the power speaker or the power speaker itself may be used as a regular speaker. To use a regular speaker with the power speaker (see Figure 4c): Connect plug AR of speaker-to-speaker cable to receptacle VR of regular speaker. With connections for power speaker made in the usual way, connect plug DD of speaker-to-speaker cable to jack OP on power speaker amplifier. To use the power speaker as a regular speaker (see Figure 4d): Remove plug WP, Figure 2, from receptacle VR, Figure 2. Connect plug AR of speaker-to-projector cable to receptacle VR, Figure 2. No further electrical connections for speaker are necessary, since amplifier of speaker will not be used.

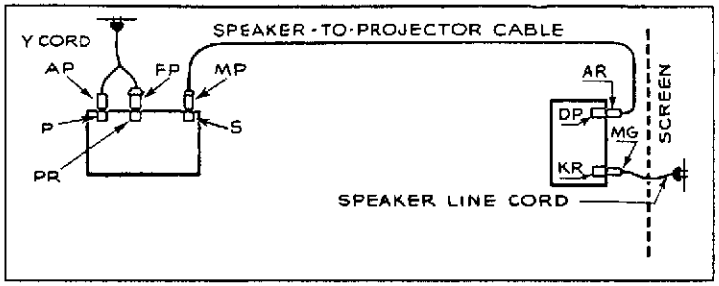
Electrical Connections — Projector. When speaker(s) has been set up and

Figure 3

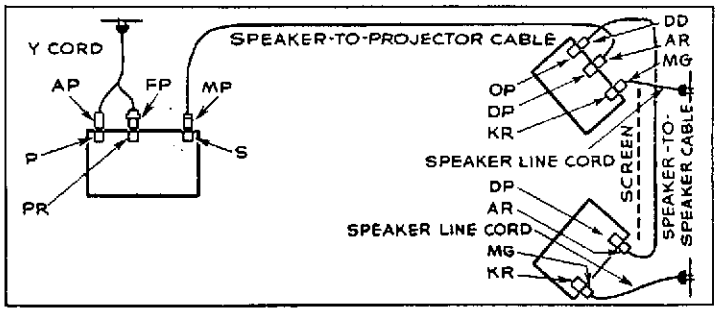
GL	**Glow lamp**
ND	**Line OFF-ON switch**
SV	**Volume control**



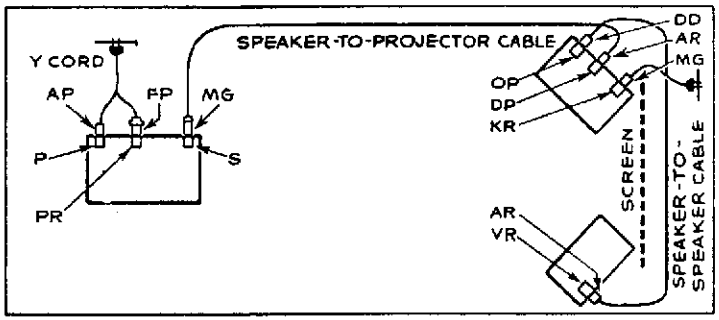
4a



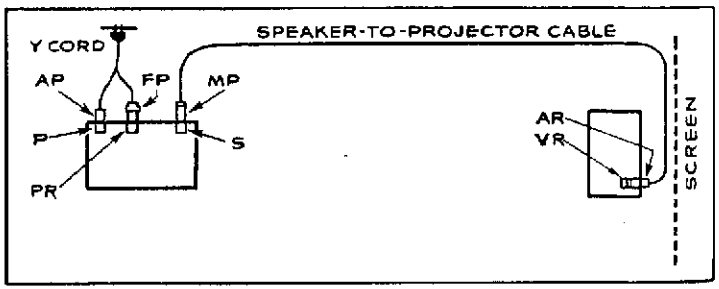
4b



4c



4d



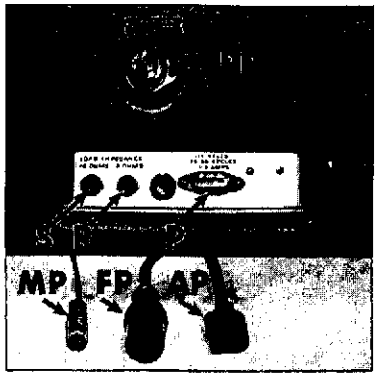


Figure 5

AP	**Female plug**
FP	**Female plug**
MP	**Male plug**
P	**Amplifier receptacle**
R	**8-ohms receptacle**
S	**16-ohms receptacle**
PR	**Projector receptacle**

connected, insert plug MP, Figure 5, of speaker-to-projector cable into 16-ohms receptacle S, Figure 5. With all controls on the Filmosound in the OFF position, insert plug FP (round plug of the Y cord), Figure 5, into projector receptacle PR, Figure 5. Insert plug AP (flat plug of Y cord), Figure 5, into amplifier receptacle P, Figure 5. Plug other end of Y cord into a wall or extension cord receptacle supplying *115-volt, 50- to 69-cycle alternating current.*

Since the Filmosound draws 11 amperes, it should be connected to a line fused at 15 amperes or more. If other appliances are connected on the same line and the total current drawn by appliances and Filmosound exceeds the rating of the fuse in that line, either connect Filmosound to another source, transfer some appliances to another line, or disconnect them while Filmosound is in use.

Preparing to Operate. Attach feed reel arm HR, Figure 6, at the top front of the projector case with the thumb screw on the inside of the case at that point. Attach take-up reel arm JS, Figure 6, at the upper rear of the projector case, using the thumb screw on the inside of the case at that position.

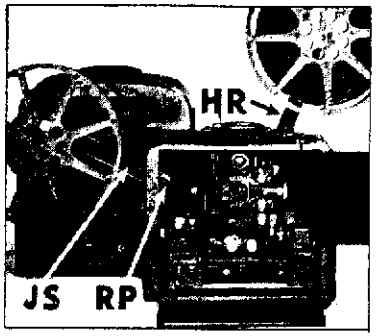
Loop the front spring belt, without a twist, over the feed reel arm pulley at the top of feed reel arm HR, Figure 6, on the side opposite the spindle. Loop rear spring belt, without a twist, from drive pulley RP, Figure 6, to take-up pulley Q, Figure 7.

Remove the projection lamp as instructed in the paragraph on "Projection Lamp Replacement" and check its voltage; if voltage of lamp does not match that of voltage to be used, replace the lamp with another of the correct voltage.

Set direction switch DS, Figure 8, at FORWARD; set sound-silent switch SS, Figure 8, at SOUND. If silent

Figure 6

HR	**Feed reel arm**
JS	**Take-up reel arm**
RP	**Take-up drive pulley**



film is to be projected, see paragraph on "Projecting Silent Film," page 15.

Open the small door in the case in front of the projection lens. Turn on projector switch PS, Figure 8, and lamp switch LS, Figure 8; turn clutch control X, Figure 8, to the extreme clockwise position. If the projector electrical connections have been correctly made, the film moving mechanism should now operate and a beam of light be projected on the screen.

Move the projector on its stand or table to such a position that the projected beam coincides with the screen. Tilt the projector up, if necessary, by turning tilt adjustment knob TN, Figure 8, in a clockwise direction.

If the projected image is larger than the screen, move the projector closer.

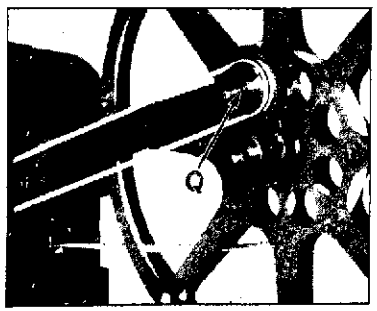
If the image is too small, move the projector farther from the screen.

If room size limits the throw, select the correct lens as indicated in the table of projected picture sizes on page 14.

With the projector operating and the lamp turned on, loosen lens locking screw LL, Figure 8, and slide the lens L, Figure 8, forward or backward in its carrier until the outlines of the aperture or frame are sharply defined. To further sharpen focus, revolve the lens first in one direction and then in the other. When the point of maximum sharpness is found, tighten lens locking screw LL, Figure 8, securely.

Figure 7

Q Take-up pulley



Place projector switch PS, Figure 8, in the OFF position. Set power speaker line switch ND, Figure 3, at ON. If the speaker electrical connections have been made correctly, glow lamp GL, Figure 3, will now light up to indicate that the amplifier is operating. Set volume control SV, Figure 3, midway between the 7 and 8 marks, for average acoustical conditions. The sound volume may now be controlled by the projector volume control. If more than one power speaker is being used, turn on each speaker and set the volume control as above.

Set amplifier switch G, Figure 8, at ON. Allow about one minute for the tubes to heat; then, move volume control V, Figure 8, in a clockwise direction until a hiss is heard in the speaker(s). At the same time a light should be seen from behind exciter lamp cover Z, Figure 8. If these conditions exist, electrical connections and other adjustments have been made correctly.

Since the power speaker volume control setting may require adjustment to give best coverage of the area, it is recommended that the Filmosound and power speaker(s) be set up and checked in advance of the actual showing.

At that time, with the Filmosound threaded with sound film and speaker and projector amplifiers operating,

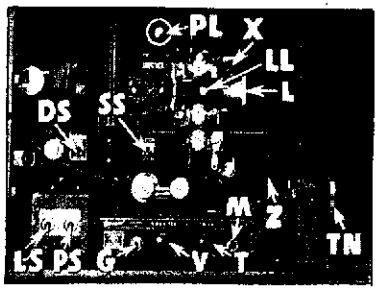


Figure 8

DS	Direction switch
G	Amplifier switch
L	Lens
LL	Lens locking screw
LS	Lamp switch
M	Microphone jack
PL	Pilot light
PS	Projector switch
SS	Sound-silent switch
T	Tone control
TN	Tilt adjustment knob
V	Volume control
X	Clutch control
Z	Exciter lamp compartment cover

the operator should check, by ear, the sound volume at various points in the room. If, with the speaker volume control set midway between the 7 and 8 marks and the projector volume control at or close to its minimum position, the sound volume is too great, set the speaker volume control at a lower point. Do not set the speaker volume control at a point lower than the 1 mark since the sound will then be almost inaudible even with the projector volume control at the maximum position. If, with the speaker volume control set midway between the 7 and 8 marks and the projector volume control at or close to its maximum position, the sound volume is not sufficient, set the speaker volume control at a higher point or the 10 position.

Once the best volume control setting of the speaker(s) has been found, adjustment of the projector volume control at the start of or during the show will handle any necessary compensation for acoustics altered by the presence of an audience.

When the projector has been set up and checked and the speaker volume adjusted, the Filmosound is ready for threading.

Threading the Film

With all projector and power speaker controls in the OFF position and clutch control X, Figure 8, turned to the extreme counter-clockwise position, place the first reel, or a practice reel, of film on the spindle of feed reel arm HR, Figure 6, and an empty reel on the spindle of take-up reel arm JS, Figure 6. Press each reel firmly on the spindle until the small retaining spring-balls lock the reels in position

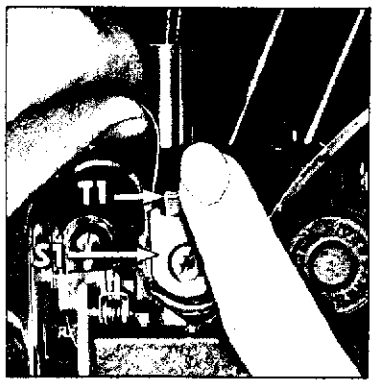


Figure 9

S1	Sprocket
T1	Sprocket tab

Figure 10

A	Gate lever
B	Hand setting knob

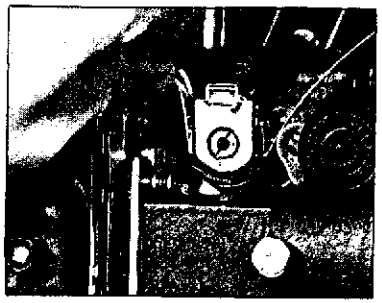


Figure 11

on the spindles. Pull off about four feet of leader film for threading.

NOTE: To provide illumination for threading film in a darkened room, pull pilot light cap PL, Figure 8, forward.

The film, if correctly wound, should feed from the front of the reel with the perforated edge toward the operator and the emulsion (dull) side out. (Exception: Duplicates from original reversal film, prints of 16mm negatives and Kodachrome films are wound and projected with emulsion side in.)

Slip the film into the slot at the base of feed reel arm HR, Figure 6, and between the two guide rollers. Lead the film over roller and below sprocket S1, Figure 9. Slide the film as far toward the machine as it will go. Holding the film snugly around the sprocket, press on tab T1, Figure 9, to open the guard. Pull gently on the film until the perforations seat over the sprocket teeth. Then release tab T1, locking the film on the sprocket.

Swing film gate lever A, Figure 10, upward to open the film gate. Form the first loop, following the outline on the side of the gear case, as shown in Figure 11. Pass the film through the channel behind the lens as in Figure 11, being certain that it is fully seated in this channel. Then close the film gate by pressing down film gate lever A, Figure 10, as far as it will go. Form the second loop, conforming to the outline on the gear case, and slip the film over sprocket S2, Figure 12. Slide the film as far toward the machine as it will go. Holding the film snugly around the sprocket, press on tab T2, Figure 12, to open the guard. Pull gently on the film until the perforations seat over the sprocket teeth. Then release tab T2, locking the film on the sprocket. Turn clutch control X, Figure 8, to the extreme clockwise position; then, turn hand setting knob B, Figure 10, several

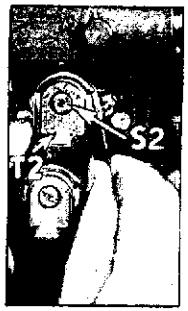


Figure 12

S2	Sprocket
T2	Sprocket tab

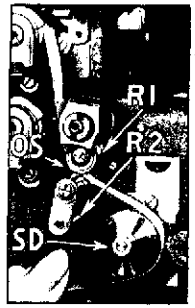


Figure 13

OS	Oscillatory Stabilizer
R1	Stabilizer roller
R2	Stabilizer roller
SD	Sound drum

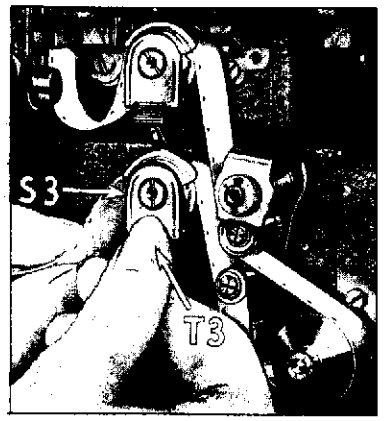
clockwise revolutions to engage the film with the shuttle teeth. Should the lower loop slide upward, open the gate and reset the loop to the outline on the gear case. Close the gate, and test the threading again by using the hand setting knob. Turn clutch control X, Figure 8, to the extreme counter-clockwise position.

Lead the film from under sprocket S2, Figure 12, under roller R1, Figure 13, around sound drum SD, Figure 13, under roller R2, Figure 13, and over sprocket S3, Figure 14. Press the film as far toward the projector as it will go, over the sprocket.

Pull down gently on the film as it passes over the sprocket until the Oscillatory Stabilizer OS, Figure 13, is moved to its extreme position by the tension on the film. Then, open the sprocket guard by pressing on tab T3, Figure 14. Free the film just sufficiently to permit the Oscillatory Stabilizer to pull it back to the first

Figure 14

S3 Sprocket
T3 Sprocket tab



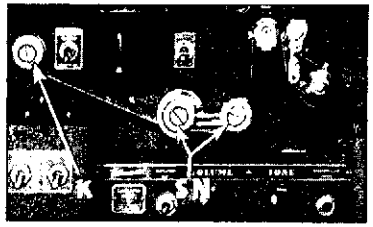


Figure 15

K Rear idler roller
SN Snubber

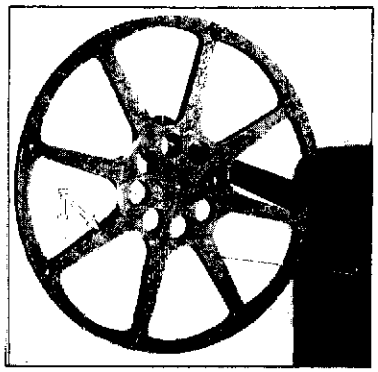
available set of perforations, and release tab T3 to lock film on sprocket. Pass the film under snubber SN and rear idler roller K, Figure 15, into the slot at the base of the take-up reel arm, and between the two guide rollers. Place the film around the bottom of the take-up reel I, Figure 16, and revolve reel to remove film slack.

No special precautions need be observed to synchronize the sound to the picture since adherence to the foregoing instructions will assure correct synchronization.

The mechanism on the take-up reel arm is a combination take-up and re-

Figure 16

I Take-up reel



wind device. Set it for take-up by pressing lever U, Figure 17, while the reel is on the spindle. No adjustment or compensation is necessary for various reel sizes, since the flat fabric belt between pulleys Q and Q1, Figure 17, provides complete and automatic compensation without any adjustments.

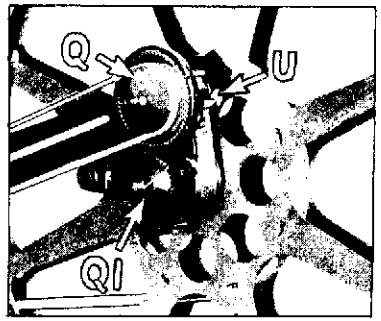


Figure 17

Q Take-up pulley
Q1 Spindle pulley
U Take-up lock lever

Before projecting, you must be able to answer "yes" to the following questions:

1. Have you read, and carefully followed, the preceding instructions?
2. Have you checked the aperture, removable gate shoe, and optical components to see if they need cleaning? (See pages 25-27.)
3. Are both film loops of the correct size?
4. Is the film properly engaged on sprockets S1, S2, and S3?
5. Have you tested the threading by turning the hand setting knob B or by *momentarily* turning on the motor?
6. Is the film gate closed?
7. Is the film properly started on take-up reel I, with all film slack removed?
8. Is the take-up reel arm mechanism set to *take up* film?
9. Is direction switch DS set at FORWARD?
10. Is sound-silent switch SS set for the type of film, sound or silent, to be projected?
11. Is the power supplied to Filmosound and power speaker 115-volt, 50- to 60-cycle alternating current? (Or have you correctly connected the polarity changers or converters for operation on direct current?)
12. If projecting sound film, are projector and speaker amplifier switches set at ON?
13. If using a microphone with silent film, is projector amplifier switch G set at ON?
14. Have you correctly adjusted the power speaker volume control setting?
15. Have you learned from the ensuing pages of this manual: How to use a microphone and turntable; how to use the still picture clutch and tone control; how to rewind film; how to operate the Filmosound in reverse?

(After you have become adept at threading the film through the mechanism, turn on projector and speaker amplifiers before threading. The amplifier tubes will then warm up to the proper operating temperature, so that sound projection can be started as soon as threading is completed.)

Projected Picture Sizes Obtained with Filmo Projection Lenses

LENS FOCAL LENGTH	DISTANCE IN FEET FROM SCREEN TO FILM														
16mm Projector	8′	10′	12′	15′	20′	25′	30′	35′	40′	45′	50′	60′	75′	100′	125′	150′
	WIDTH AND HEIGHT OF PICTURE															
	Upper Dimension is Width of Picture Lower Dimension is Height of Picture															
5/8″	4′9″ 3′6″	5′11″ 4′5″	7′2″ 5′4″	9′0″ 6′8″	12′0″ 8′11″											
3/4″	3′11″ 2′11″	4′11″ 3′8″	5′11″ 4′5″	7′6″ 5′7″	9′11″ 7′5″	12′6″ 9′3″										
1″	2′11″ 2′2″	3′8″ 2′9″	4′5″ 3′4″	5′7″ 4′2″	7′5″ 5′7″	9′4″ 6′11″	11′3″ 8′4″	13′1″ 9′9″								
1 1/2″	1′11″ 1′5″	2′5″ 1′10″	2′11″ 2′2″	3′8″ 2′9″	4′11″ 3′8″	6′2″ 4′7″	7′6″ 5′7″	8′9″ 6′6″	10′0″ 7′5″	11′3″ 8′4″	12′6″ 9′4″					
2″		1′10″ 1′4″	2′2″ 1′8″	2′9″ 2′1″	3′8″ 2′9″	4′8″ 3′5″	5′7″ 4′2″	6′6″ 4′10″	7′5″ 5′7″	8′5″ 6′3″	9′4″ 6′11″	11′3″ 8′4″	14′0″ 10′5″	18′9″ 13′11″	23′5″ 17′6″	28′2″ 21′0″
2 1/2″		1′5″ 1′1″	1′9″ 1′3″	2′2″ 1′8″	2′11″ 2′2″	3′8″ 2′9″	4′5″ 3′4″	5′3″ 3′11″	5′11″ 4′5″	6′8″ 5′0″	7′5″ 5′7″	9′0″ 6′8″	11′3″ 8′4″	15′0″ 11′2″	18′9″ 13′11″	22′6″ 16′9″
3″						3′1″ 2′3″	3′8″ 2′9″	4′4″ 3′3″	4′11″ 3′8″	5′7″ 4′2″	6′2″ 4′7″	7′5″ 5′7″	9′4″ 6′11″	12′6″ 9′3″	15′7″ 11′7″	18′9″ 14′0″
3 1/2″						2′7″ 1′11″	3′2″ 2′4″	3′8″ 2′9″	4′3″ 3′2″	4′9″ 3′7″	5′4″ 3′11″	6′5″ 4′9″	8′0″ 5′11″	10′8″ 7′11″	13′4″ 9′11″	16′1″ 12′0″
4″						2′3″ 1′8″	2′9″ 2′1″	3′3″ 2′5″	3′8″ 2′9″	4′2″ 3′1″	4′8″ 3′5″	5′7″ 4′2″	7′0″ 5′2″	9′4″ 6′11″	11′8″ 8′8″	14′0″ 10′5″

Operation

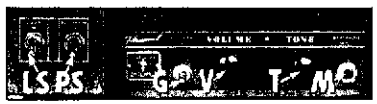
Projecting Sound Film. With projector and speaker amplifiers operating (or projector amplifier alone when using power speaker as regular speaker) and the volume control V, Figure 18, about one-quarter on, turn off pilot light PL, Figure 8, by pushing cap back and place projector switch PS, Figure 18, in the ON position. Immediately after the motor has started, place lamp switch LS, Figure 18, in the ON position and turn clutch control X, Figure 19, to extreme clockwise position.

With the projector operating and the lamp on, loosen lens locking screw LL, Figure 19, and slide lens L, Figure 19, forward or backward in its carrier until the outlines of the aperture or frame are sharply defined. To further sharpen focus, revolve the lens first in one direction and then in the other until the point of maximum sharpness is found. Lock lens in position by turning lens locking screw LL, Figure 19, in a clockwise direction until tight.

If the picture frame line shows on the screen, turn framer knob E, Figure 19, to make the frame line disappear. If framing moves the picture off the screen, readjust tilt adjustment knob TN, Figure 8.

Figure 18

G Amplifier switch
LS Lamp switch
M Microphone jack
PS Projector switch
T Tone control
V Volume control



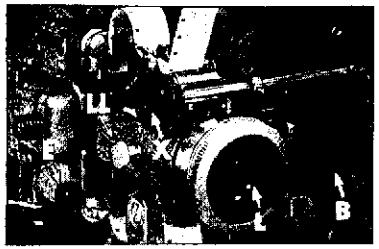


Figure 19

B Hand setting knob
E Framer control
L Lens
LL Lens locking screw
X Clutch control

The volume control V, Figure 18, operates similarly to volume controls on radio sets. Advance or retard it as necessary to produce the desired volume of sound. (See also the paragraphs on power speaker volume control setting, page 9.)

The tone control T, Figure 18, is also operated similarly to a tone control on a radio receiver. By means of this control, frequency range can be compensated for in accordance with the acoustical conditions under which the equipment is being used. At each showing set it for the most desirable reproduction.

Project the first reel, or the practice reel, in its entirety. Run it over again, as necessary, until you are thoroughly familiar with every phase of operation and threading.

As "The End" title appears on the screen, place lamp switch LS, Figure 18, in the OFF position and, as the end of the narration or music is reached, retard volume control V, Figure 18, until no sound is heard. Run the remaining trailer of film completely through the machine.

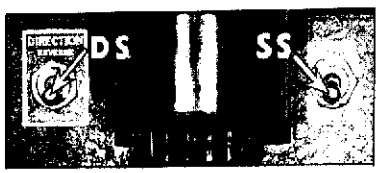
Projecting Silent Film. To project silent film, thread the machine in the usual way. Set sound-silent switch SS, Figure 20, at SILENT. Do not turn on projector or speaker amplifier unless oral comments are to be made through the speaker by means of a microphone, or musical accompaniment is to be reproduced by means of a turntable. Turn off pilot light. Set projector and lamp switches and adjust focus and framing as for sound film.

If using a microphone, adjust volume control V, Figure 18, until the most pleasing sound volume is attained. If using a B&H turntable, adjust turntable volume control for best results under existing acoustical conditions.

Still Picture Projection. To project a single film frame as a still picture, turn clutch control knob X, Figure 19, one full counter-clockwise revolution, which disengages the projector mechanism. If no picture appears on the screen, the closed section of the shutter is obscuring the light. Turn hand setting knob B, Figure 19, slightly to bring the open section of

Figure 20

DS Direction switch
SS Sound-silent switch



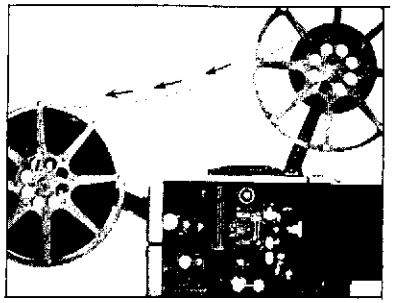


Figure 21

the shutter into correct position. Adjust the lens to focus the still picture; re-focus when motion is resumed.

Reversing. Retard volume control V, Figure 18, until the sound is inaudible. Stop the film by disengaging clutch control knob X, Figure 19, or by placing projector switch PS, Figure 18, in the OFF position. When the mechanism has stopped, set direction switch DS, Figure 20, at REVERSE. The lamp may be on or off, as desired.

NOTE: Always stop projector mechanism before changing film direction.

Rewinding. Remove the take-up reel, which has now received the entire film, and the empty feed reel from their spindles and interchange the two reels. Lead the end of the film over the top of the empty reel so that the film travel appears as in Figure 21. Press take-up lock lever U, Figure 17, and lift take-up reel as far as it will go to engage the rewind gears. Then, while still holding the reel in the lifted position, release pressure on lever U, to lock the assembly in rewind position. The take-up arm gears will then appear as in Figure 22.

Place direction switch DS, Figure 20, at FORWARD, place projector switch PS, Figure 18, in the ON position, disengage clutch control knob X, Figure 19, and allow the motor to run until all of the film has been rewound on the original reel.

Immediately after rewinding and before removing the loaded reel, press lever U, Figure 17, to restore the assembly to the take-up position.

When only a portion of a reel has been projected and must be rewound, unthread the projector and interchange the two reels. Then proceed with rewinding in the usual way.

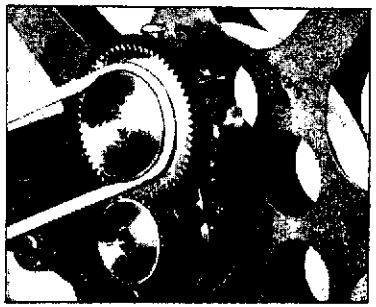
NOTE: No twisting, changing or removing of any belt is necessary when rewinding or taking up film.

Microphone. A high-grade crystal or high-impedance dynamic microphone may be used with your Filmosound. Slip the end of the microphone cable beneath the projector case into the opening between case and amplifier base, so that both case doors may be closed if desired.

Insert the microphone plug into jack M, Figure 18, and turn on projector and speaker amplifiers (or projector amplifier alone when using power speaker as a regular speaker); adjust the volume to the desired level

Figure 22

Gears on take-up arm locked in rewinding position



by means of projector volume control V, Figure 18. While the microphone remains connected to the Filmosound, the exciter lamp is automatically disconnected. Therefore, when the microphone is *not* in use, remove the microphone plug from jack M in order that sound from film may again be heard.

Phonograph Turntables or Transcription Players. Any phonograph turntable with a sapphire stylus, crystal pick-up, or a high-impedance magnetic pick-up arm may be used with the Filmosound provided that it has an independent volume control.

Set turntable volume control at the minimum position, insert turntable plug into jack M, Figure 18, and set projector volume control at the maximum position. Turn on projector and speaker amplifiers (or projector amplifier alone when using power speaker as a regular speaker). Adjust turntable volume control for the best results under existing acoustical conditions.

Polarity Changer. When a polarity changer is being used with the projector, plug the polarized flat arm of the Y cord into polarity changer receptacle W, Figure 23. Connect the male end of the Y cord to a current supply receptacle; either alternating or direct current may be supplied to the polarity changer through this cord *provided that current is 115-volt.* Plug the round arm of the cord into projector receptacle PR, Figure 23. The polarity changer is connected to the projector amplifier by a cable, one end of which is wired permanently into the polarity changer. Plug the other end, polarized flat plug VS, Figure 23, into amplifier receptacle P, Figure 23. When the above connections have been made, operation is the same as for Filmosounds not so equipped.

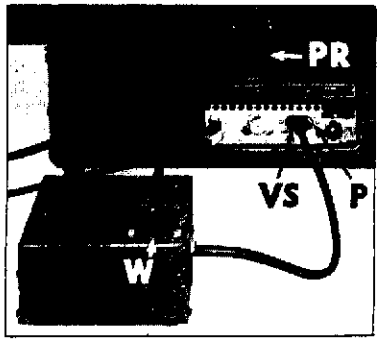


Figure 23

P Projector amplifier receptacle
PR Projector receptacle
VS Polarity changer plug
W Polarity changer receptacle

When a polarity changer is being used with the power speaker, insert the polarized flat plug VS, Figure 24, of the polarity changer cable into power speaker receptacle KR, Figure 24. Plug the polarized flat plug MG, Figure 24, of the power speaker line cord into polarity changer receptacle W, Figure 24; either alternating or direct current may be supplied to the polarity changer through this cord *provided that current is 115-volt.*

Operation on 115-volt Direct Current, without Polarity Changer. If the projector and/or power speaker amplifier is to be operated on direct current *without the use of a polarity changer(s)*, a DC to AC converter having a capacity of 100 watts is necessary for the operation of *each amplifier.* The film-moving mechanism will operate on either alternating or direct current without any changes.

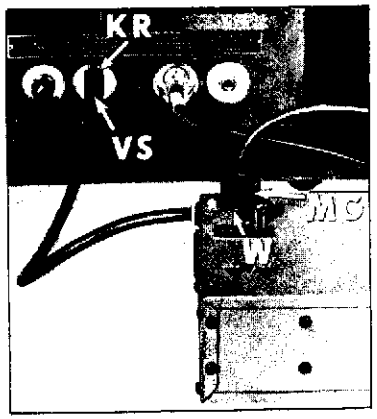


Figure 24

KR	**Power speaker receptacle**
MG	**Power speaker line cord plug**
VS	**Polarity changer plug**
W	**Polarity changer receptacle**

Connect the converter to the direct current outlet with a line cord. Connect the female end of a second line cord to projector receptacle PR, Figure 5, and the male end to one socket of the direct current outlet. Plug the male end of the Filmosound Y cord into the AC output of the converter and the flat arm AP, Figure 5, into amplifier receptacle P, Figure 5.

When using the power speaker amplifier, without polarity changer, on direct current, connect a second converter to the direct current outlet with a line cord. Connect the male end of the power speaker Y cord into the AC output of the converter and the flat arm of the Y cord into power speaker receptacle KR, Figure 2.

When correctly positioned and connected, the units will appear as in Figure 25. Operation is the same as for alternating current.

Operation on 220-volt, 50- to 60-cycle Alternating Current. When the Filmosound and/or its power speaker is to be operated on 220-volt alternating current, a 1500-watt, 220- to 115-volt transformer is required. Plug the 220-volt side of the transformer into the alternating current outlet. Connect the female ends (AP and FP, Figure 5) of the projector Y cord to the projector as for normal operation (see "Electrical Connections—Projector"). Connect power speaker line cord to speaker as for normal operation. Plug male ends of Y cord and speaker line cord into a double socket; plug double socket into 115-volt side of transformer. Operation is the same as for *115-volt alternating* current.

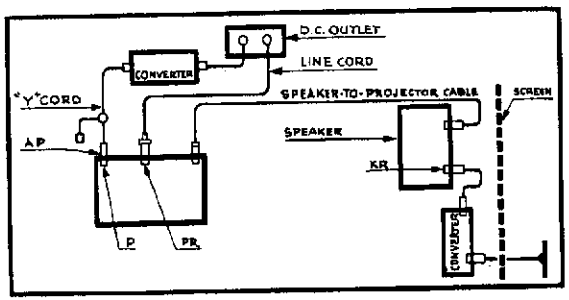


Figure 25
Arrangement and connection of Filmosound units without polarity changer for operation on 115-volt DC

Operation on 220-volt Direct Current. The Filmosound and/or power speaker may be operated on 220-volt, or varying, direct current by the addition of a special B&H 130-250 volt adjustable rheostat. Rheostat operating instructions are furnished with each unit.

Public Address System. To use the speaker and amplifier of your Filmosound, in conjunction with a microphone or turntable, as a public address system, remove the amplifier from the projector as instructed on page 29 under "Tube Replacement." Remove photocell PE, Figure 34, from the projector amplifier, place the B&H Amplifier Cover over the amplifier and fasten it to the amplifier base with the four screws which held the amplifier in the projector. Add the rubber feet supplied with each cover.

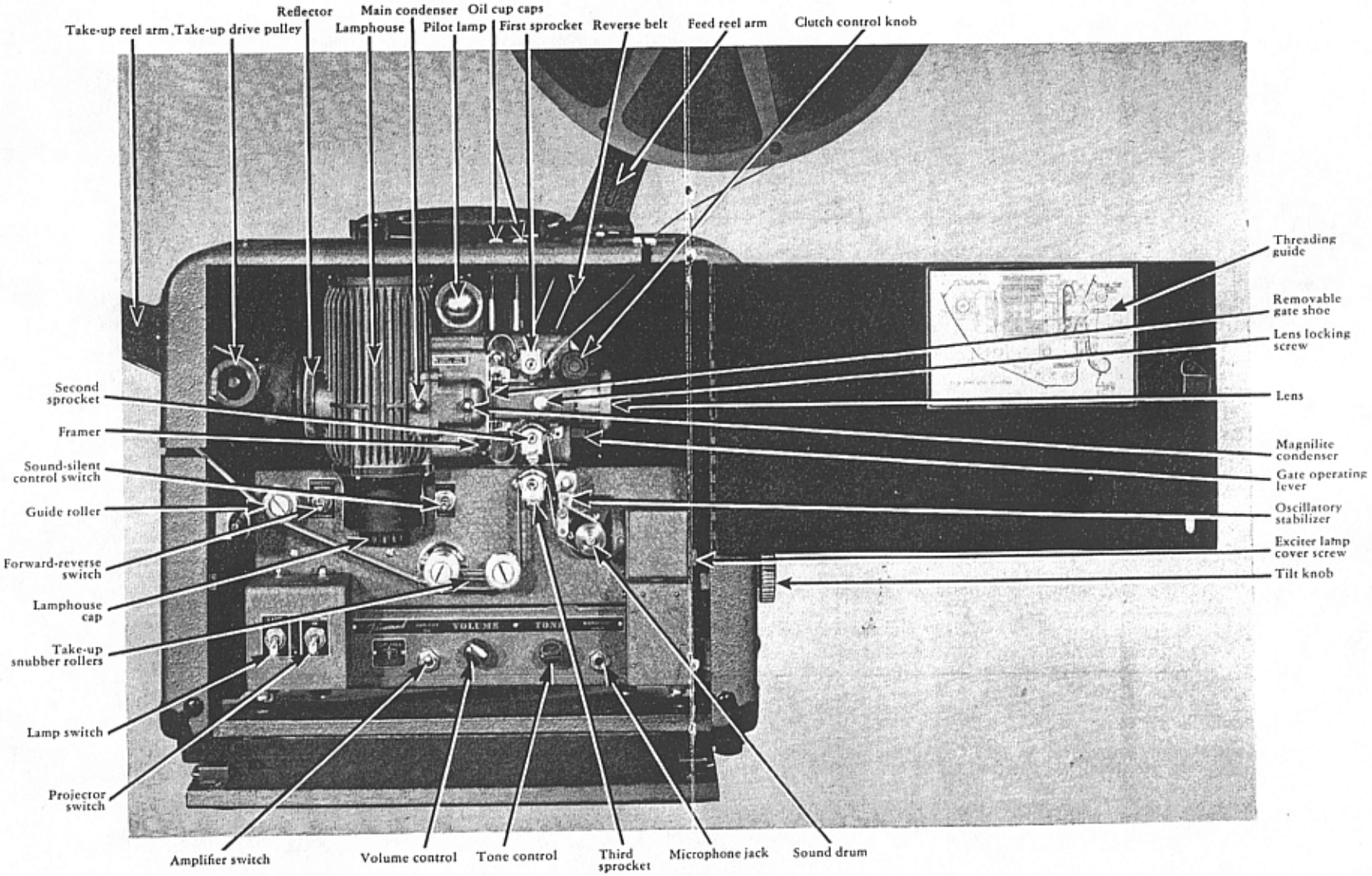
Connect speaker and microphone or turntable to projector amplifier in the usual way; connect projector and power speaker amplifiers (or projector amplifier alone when using power speaker as regular speaker) to power supply. Turn on projector and speaker amplifiers (or projector amplifier alone when using power speaker as a regular speaker). When using a microphone, adjust the sound to the most pleasing volume for the existing acoustical conditions by advancing or retarding the projector volume control. When using a turntable, connect the unit and adjust the sound volume as instructed on page 17 under "Phonograph Turntables or Transcription Players."

With either setup, it is recommended that the units be positioned and tested in advance of their use. It may be necessary at that time to adjust the tone control to eliminate frequency noises resulting from adverse acoustical conditions. Further slight adjustments of volume and tone control settings may be necessary when the program begins, since the presence of a large number of people will alter the acoustics somewhat, but the adjustments may be made without interrupting the program.

When the program is over, disconnect cables, remove amplifier cover, and return the photocell to position on the amplifier. Return amplifier to position in the projector; reconnect exciter lamp lead wire and tighten amplifier retaining screws securely.

Projection Defects and Remedies

Defect	Remedy
1. Filmosound will not operate.	1. a. Check to see that current supply cord is correctly connected to wall receptacle or extension cord outlet. b. Test current outlet with ordinary lamp or other device known to be in working order to see if current is supplied to outlet.


Take-up reel arm
Take-up drive pulley
Reflector
Lamphouse
Main condenser
Pilot lamp
Oil cup caps
First sprocket
Reverse belt
Feed reel arm
Clutch control knob
Threading guide
Removable gate shoe
Lens locking screw
Lens
Magnilite condenser
Gate operating lever
Oscillatory stabilizer
Exciter lamp cover screw
Tilt knob
Second sprocket
Framer
Sound-silent control switch
Guide roller
Forward-reverse switch
Lamphouse cap
Take-up snubber rollers
Lamp switch
Projector switch
Amplifier switch
Volume control
Tone control
Third sprocket
Microphone jack
Sound drum

2. Exciter lamp does not light and no sound is heard from speaker.	2. a. Check speaker cable connections at speaker and Filmosound. b. Check to see if projector amplifier switch is in the ON position. c. Check to see if fuse in projector amplifier is blown. d. Check to see that microphone plug has been removed from jack on Filmosound. e. Check to see that exciter lamp lead wire is connected. f. Check to see if exciter lamp is burned out. If so, replace lamp. g. Check to see that projector amplifier tubes are correctly seated in correct sockets. h. Replace projector amplifier tubes with a complete new set.
3. Exciter lamp lights but no sound is heard from speaker.	3. a. Advance volume control slightly. b. Check to see that power speaker has been connected to current supply and to Filmosound, or that power speaker has been correctly connected for use as a regular speaker and to Filmosound. c. Check to see that power speaker amplifier has been turned on and that speaker volume control has been set above the 0 position. d. Check to see if fuse in power speaker amplifier is blown. e. Check film threading. f. Check to see that grid clip is connected to cap on top of 6J7 tube in projector amplifier. g. Clean lens and mirror of sound optical system to remove dirt. h. Check position of exciter lamp damping shell. Opening in shell may not be opposite optical slit. i. Sound may be missing from film; to prove that defect lies in film and not with Filmosound, proceed as follows: Remove the film and turn on the amplifier. Turn volume control to maximum position. Pass a card swiftly back and forth between sound lens and sound drum. If a loud "thumping" noise is heard from the speaker, the Filmosound itself is operating properly and the sound is missing from the film. j. Replace projector amplifier tubes with a complete new set. k. Check to see that power speaker amplifier tubes are correctly positioned in correct sockets. l. Replace power speaker amplifier tubes with a complete new set.
4. Sound volume is not adequate.	4. a. Advance volume control toward maximum position. b. Change power speaker volume control setting. c. Check to see that line current supplied to projector and power speaker is of the correct voltage. d. Check to see if film is clean. Dirty or poorly made film will not give the full sound volume. e. Clean lens and mirror of sound optical system to remove any dirt or dust. f. Check exciter lamp. If defective, replace; if incorrectly positioned, remove and replace correctly, wiping off dirt or fingerprints.

	g. Replace tubes of projector and power speaker amplifiers with complete new sets.
5. Sound quality is unsatisfactory.	5. a. Check to see that sound-silent switch is set at SOUND. b. Check to see that amplifier is firmly fastened in projector. c. See other remedies given for defect No. 4 (see preceding page).
6. No picture appears on screen.	6. a. Open door in front of projection lens. b. Check to see that projector and lamp switches are in the ON position. c. Check to see that current supply cord is correctly connected at wall receptacle and Filmosound. d. Check to see if projection lamp is burned out. If so, replace with another of correct voltage.
7. Picture brilliance seems insufficient.	7. a. Check to see that all windows and other light sources are properly covered or extinguished. b. Check to see that current supply is of the correct voltage. c. Darken room until screened picture seems brighter. d. Clean projection lens, condensers, and reflector; remove any dirt from projection lamp. e. Check to see if projection lamp has become excessively blackened. Effective lamp life may terminate before lamp actually burns out. Replace lamp if necessary.

Maintenance

Projection Lamp Replacement. Your Filmosound is equipped with a lamp of the voltage common to most communities. The next lamp you buy should be rated at the voltage of your line current. Using a lamp at higher than its rated voltage gives increased brightness but shorter life; at lower than rated voltage, increased life but lower illumination.

To replace a projection lamp, with projector switch PS, Figure 18, in the OFF position, unscrew the cap at the bottom of the lamphouse and allow the burned-out lamp to slide out into the hand, as in Figure 26. If the lamp is being replaced during a show, be careful as the lamp slides down to grasp it by the relatively cool prealignment gauge ring. This operation should be performed quickly, since a moment or two after the lamp is disengaged from the socket, the prealignment gauge ring, acting as a cooling flange, becomes quite warm.

Insert the new lamp with the vertical tongue on the prealignment gauge ring toward the front of the projector and revolve it slightly one way or the other until the tongue settles into the prealignment gauge slot in the bottom of the lamphouse.

Replace the screw cap, making sure that it screws in squarely and tightly to lock the lamp in proper position.

Never attempt to change a lamp with the current on.

Since the lamp is designed to burn base down, the machine must not be turned upside down or laid on its side while the lamp is lighted.

Cleaning Optical and Film Handling Parts. At any time that seems necessary, clean: (1) projection lens, (2) removable gate shoe, (3) field flattener (if shoe is so equipped), (4) aperture, (5) film channel, (6) condensers, (7) lens and mirror of sound optical system, and (8) reflector.

To remove the projection lens L, Figure 27, for cleaning, loosen lens locking screw LL, Figure 27, and pull forward on the lens barrel. The front and rear elements are then accessible for cleaning. If only a slight amount of dust has accumulated, remove with

Figure 26
Lamp replacement

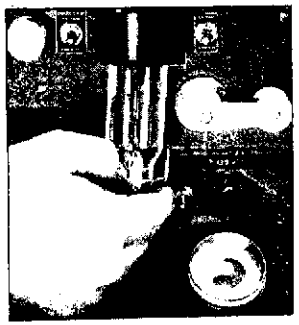
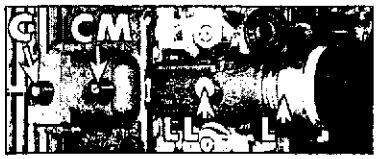


Figure 27

C Main condenser
CM Magnilite condenser
L Lens
LL Lens locking screw



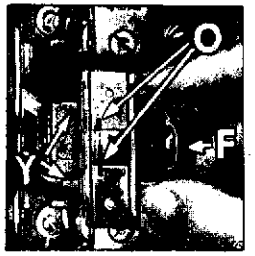


Figure 28

F Removable gate shoe frame
O Openings
Y Guides

Filmo lens cleaning tissue. If, however, fingerprints, oil, grease, or other accumulations of dirt are present, wipe B&H Lens Cleaning Fluid on the lens surfaces and follow with a thorough cleaning with lens cleaning tissue. *Use B&H Lens Cleaning Fluid only—use no other cleaning agent as it may damage the Filmocoted surfaces.*

While the lens is out of position, clean the removable gate shoe, field flattener (if shoe is so equipped), aperture, and film channel. To remove the gate shoe for cleaning, grasp the metal frame F, Figure 28, and withdraw. *Use no tools!* Clean and polish with a soft cloth. If dirt or emulsion has gathered and hardened on the shoe, remove by rubbing with a soft dampened cloth. To avoid scratching polished surface, *use no sharp tools.*

If the removable gate shoe is equipped with a field flattener (or optical element), clean the element in the same manner as the projection lens. *Do not remove the field flattener (or optical element) from the gate shoe.* Using the brush supplied with the projector, clean the small openings O, Figure 28, in the shoe, above and below the field flattener.

To clean the aperture, insert the brush supplied with the projector through the lens carrier and into the aperture, *being careful to stop forward motion of the brush at the first sign of contact with the safety shutter.* Slowly withdraw the brush, turning it in a clockwise and counter-clockwise direction to remove all dust and dirt.

Clean the film channel by opening the gate and inserting the brush into the channel in a vertical position. With the gate partially closed, move the brush up and down to remove all dirt and emulsion. *The machine must not be running.*

To return the removable gate shoe to position, place the guides Y, Figure 28, in the grooves formed by the metal plate attached to the back of the lens carrier and push the shoe inward. An audible click will be heard when the metal frame F, Figure 28, is correctly positioned.

Close film gate, return lens to position in carrier, and tighten lens locking screw LL, Figure 27, securely.

Remove the main condenser C, Figure 27, and the Magnilite condenser CM, Figure 27, from the projector for cleaning by pulling on the holder handle. Clean in the same manner as the lens and return to position.

To expose the lens and mirror of the sound optical system for cleaning, remove the exciter lamp compartment cover Z, Figure 8, as instructed in the paragraph, "Exciter Lamp Replacement." One face of the lens is exposed within the exciter lamp compartment and the other toward the sound drum; the mirror can be seen by looking down behind the sound drum from in front of and above the Filmosound. Clean both lens surfaces and the mirror with Filmo lens cleaning tissue wrapped around the end of a toothpick—*use no other materials. NEVER attempt to remove or adjust the lens of the sound optical system.*

To expose the reflector for cleaning, turn the holder BC. Figure 29,

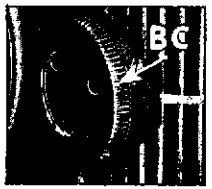


Figure 29

BC Reflector holder

counter-clockwise until it may be removed from the projector. Clean the reflector in the same manner as the projection lens and return holder to position; tighten securely. The reflector is factory-adjusted.

Projector Lubrication. Correct lubrication will assure long, trouble-free life of the Filmosound; lack of oil will result in serious damage.

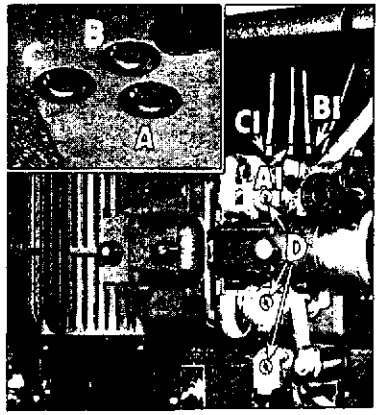


Figure 30

A B C Oil cup caps
A1 B1 C1 Matching oil cups
D Sprocket oil holes

The projector is properly lubricated when it leaves the factory.

For ease in lubrication as indicated in the chart below, your Filmosound is equipped with flexible tubes leading from oil cup caps A, B and C, Figure 30, on outside of projector case to oil cups A1, B1 and C1, Figure 30, on gear case assembly.

Lubrication Chart *(See Figure 30)*

	Silent Speed	*Sound Speed*
Oil Cup A1	One drop of Filmo Projector Oil after each 8 hours of operation.	One drop of Filmo Projector Oil after each 4 hours of operation.
Oil Cups B1 and C1	One drop of Filmo Projector Oil after each 32 hours of operation.	One drop of Filmo Projector Oil after each 16 hours of operation.
Oil Holes D	Saturate felt reservoirs every 6 months.	Saturate felt reservoirs every 3 months.

When preparing to remove projector from case, disconnect tubes by bending each tube toward you enough to permit pulling lower end out of oil cup. When projector has been returned to case, bend each tube as necessary to reinsert tube from oil cup cap A into oil cup A1, tube from B into B1, and tube from C into C1. To saturate the felt reservoirs within the sprocket shafts, disconnect the projector from the line current and speaker, and lay it on its side. Insert the tip of the Filmo oil can in the holes D, Figure 30, and squeeze the sides of the oil can 3 times.

After every 100 hours of use, remove thumb screw cap GG, Figure 31, and add Bell & Howell reel arm grease as necessary to grease cup EE, Figure 31. Replace cap and tighten securely. After every 100 hours of operation, place one drop of oil on shafts of snubber SN and roller K, Figure 15, and on the shafts of the rollers at base of each reel arm, where film enters and leaves projector case.

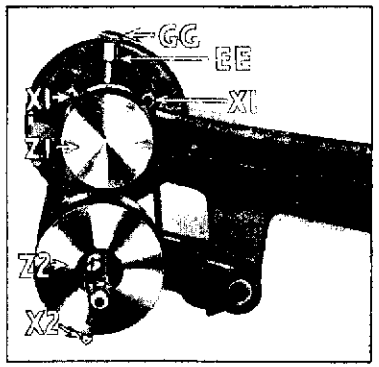
Spring Belt Replacement. To replace the belt on the feed reel arm HR, Figure 6, unhook the belt at the joining and draw it out of the projector and case. Insert one end of the new belt into the slot at the base of the feed reel arm and down into the feed drive pulley slot in the gear case. Push the belt into this slot until the end, having wound itself around the concealed pulley, reappears at the opposite edge of the slot. Pull the end up, lead it through the slot at the base of the feed reel arm, and hook the two ends together to form a continuous belt. Place the belt, without a twist, around the pulley on the feed reel arm.

To replace a spring belt on take-up reel arm JS, Figure 6, unhook the belt at the joining and draw it out of the projector and case. Insert one end of the new belt into the slot at the base of the take-up reel arm, place the belt around take-up drive pulley RP, Figure 6, and lead it out of the slot. Hook the two ends together to form a continuous belt and place the belt, without a twist, around pulley Q, Figure 17.

Fabric Take-up Belt Replacement. To replace a worn belt, with the take-up mechanism set to rewind film, remove the old belt by pulling it from over the two pulleys Z1 and Z2, Figure 31, and from under the three belt guide pins X1 and X2, Figure 31. *It is not necessary to disassemble the take-up mechanism to replace the belt.* Place the new belt over the upper pulley Z1, pressing it under the two upper guide pins X1, and place it around the lower pulley Z2 and

Figure 31

EE Grease cup
GG Thumb screw cap
X1 Upper belt guide pins
X2 Lower belt guide pin
Z1 Upper pulley
Z2 Lower pulley



under the lower belt guide pin X2. Set the take-up mechanism to take up film.

Exciter Lamp Replacement. The exciter lamp is beneath the three-sided metal cover Z, Figure 8. Unscrew the thumb nut which holds the cover in place, and remove the cover. Remove the metallic damping shell, which is in two parts held together by a spring belt, by pulling it up and off. Press the lamp down, turn it counter-clockwise slightly, and lift it out. Insert a new lamp, reversing the above procedure. Be sure when replacing the lamp to turn it as far to the right (clockwise) as it will go. The lamp will then be correctly aligned. Before the damping shell is replaced or the lamp lighted, wipe it (as a lens) to remove all finger marks. With the halves of the damping shell held as a unit by the small spring belt and with the opening in the shell side toward the optical slit, place the shell over the exciter lamp and press down gently. Adjust the shell's position until the line formed by the joining of the two halves is at a right angle to the sound head casting behind the lamp and the opening in shell is positioned at the level of the optical slit. Replace cover Z and tighten thumb nut securely.

Tube Replacement. All tubes should be tested at a B&H Authorized Service Station about once a month, if projector and power speaker are used frequently, and replaced if they are not up to standard. Gradual deterioration of the tubes before they actually stop functioning detracts from the amplifiers' effectiveness. A complete set of spare tubes should be carried with Filmosound and power speaker at all times.

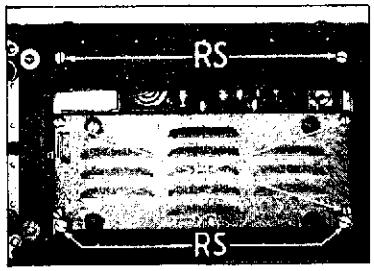


Figure 32

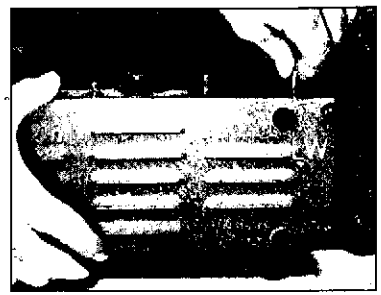
H Amplifier retaining screws
RS Projector retaining screws

If a defective tube in projector or power speaker amplifier is suspected, remove tubes and replace with a complete new set.

To replace tubes of projector amplifier, it is necessary to remove the amplifier from the Filmosound. To remove the amplifier, lay the projector on its side and, with a screw driver or a coin, remove the four screws H, Figure 32. Pull gently on lead wire LW, Figure 33, to disconnect the exciter lamp. Remove the amplifier by pulling straight out, being careful not to allow it to drop and damage the tubes.

Figure 33

LW Exciter lamp lead wire



Remove each tube, and replace it with another of the same type from the new set; the label on the tube will identify the tube type. Although tubes used in the Filmosound projector and power speaker may be obtained from most radio stores, it is advisable to use tubes tested by Bell & Howell and sold by your B&H dealer.

When all of the tubes have been replaced with new tubes and have been correctly seated in their sockets, replace the amplifier, reversing the removal procedure. *Be sure* to re-connect the exciter lamp lead wire LW, Figure 33.

NOTE: Before returning the amplifier to position, recheck the position of each tube and the connection of grid clip GC, Figure 34, on 6J7 tube.

To expose the amplifier (see Figure 35) of the power speaker for tube replacement, place one hand on either side of the amplifier cover, as shown in Figure 36, and pull forward on the cover until it slips from over the amplifier. It is not necessary to remove the amplifier from the speaker. Remove and replace the power speaker amplifier tubes in the same manner as for the projector amplifier tubes. When all of the tubes have been replaced with new tubes and have been correctly seated in their sockets, replace the amplifier cover, sliding the edges of the cover under the amplifier base plate. Press the cover firmly back into position.

Since only one of the tubes removed from either amplifier may be defective, have the complete set tested at a B&H Authorized Service Station.

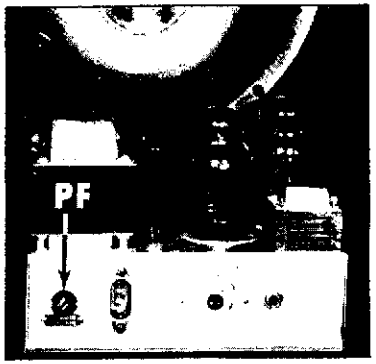


Figure 35
PF Fuse holder slot

Figure 34
GC Grid clip
PE Photocell

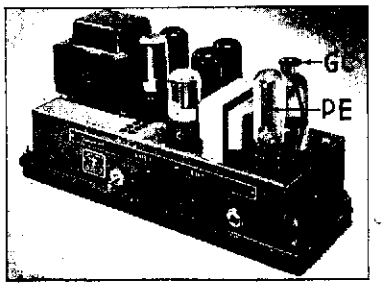
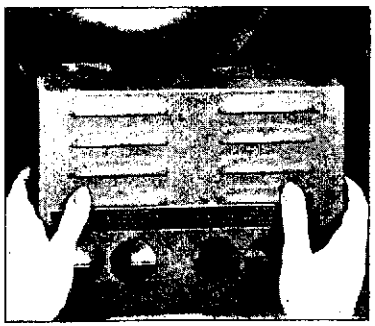


Figure 36
Removing cover of power speaker amplifier



The tubes found in good condition may be carried as spares; the tubes found defective should be replaced with new tubes of the same type in order to keep the spare set complete.

Fuse Replacement—Projector. A 2-ampere fuse is provided in the projector amplifier. Check it immediately if the exciter lamp fails to light. The fuse will burn out if direct current is fed into the amplifier supply receptacle.

To replace the fuse, disconnect the Filmosound line cord from the power source. Insert the edge of a coin into the slot FR, Figure 37, and turn coin in a counter-clockwise direction until the red portion of the fuse holder may be removed. Remove the fuse from the holder and replace it with another 2-ampere fuse; never use a fuse larger than the 2-ampere size.

Fuse Replacement—Power Speaker. A 3-ampere fuse is provided in the power speaker amplifier. Check it immediately if the glow lamp on speaker control panel fails to light or speaker does not operate. The fuse will burn out if direct current is fed into the amplifier supply receptacle.

To replace the fuse, disconnect the power speaker line cord from the power source. Insert the edge of a coin into the slot PF, Figure 35, and turn coin in a counter-clockwise direction until the red portion of the fuse holder may be removed. Remove the fuse from the holder and replace it with another 3-ampere fuse; never use a fuse larger than the 3-ampere size.

Glow Lamp Replacement. To replace glow lamp GL, Figure 3, unscrew the plastic shell; turn burned-out bulb counter-clockwise until it may be removed. Replace it with another ½-watt lamp (General Electric NE-51). Pressing lamp firmly into socket, turn clockwise as far as it will go. Replace plastic shell and tighten securely.

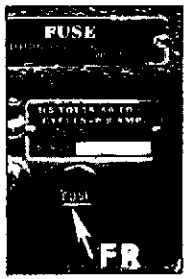
Pilot Light Replacement. To replace the pilot light, turn cap PL, Figure 8, in a counter-clockwise direction until it may be removed. Unscrew the burned-out lamp and replace it with another of the same voltage. Replace cap PL and tighten securely.

Removing the Projector from the Case. At any time it seems necessary to remove the projector from the case, proceed as follows:

Disconnect the line cord and speaker cable, remove the front and rear reel arms, and draw the two spring belts to the inside of the case. Disconnect the oil cup tubes as described in the paragraph on "Lubrication." Remove the amplifier from the projector as described in "Tube Replacement."

Lay the projector on its side and remove the four screws RS, Figure 32. Set the case on its feet. Pull the projector toward you, being sure that take-up drive pulley RP, Figure 6, clears the reel arm rack. Pull the front of the projector out of the case as in Figure 38.

Figure 37
FR Fuse holder slot



To replace, put the back of the projector into the case with the take-up drive pulley between the case and the reel arm rack. Push the front of the projector into position. Lay the projector on its side and replace the four screws RS, Figure 32. Replace the amplifier as described in "Tube Replacement." Re-connect the oil cup tubes as described in "Lubrication." Replace the reel arms, position the two spring belts, and make the electrical connections; the projector will then be ready for further use.

Figure 38

Special Instructions for Power Speaker or 12" Regular Speaker equipped with Cordomatic Speaker Cord Reel

If your power speaker or 12" regular speaker is equipped with a Cordomatic speaker cord reel, the speaker cable emerges from the case through the hole in the lower right side of the front panel. It is wound within the case on an automatic cable control reel.

Withdraw the cable from the speaker by exerting a steady, even pull, until the desired length has been reached. Release tension on the cable and allow it to rewind slightly until the locking mechanism holds it firmly in position. (Every other click of the ratchet mechanism will hold the reel.)

To rewind the speaker cable, disconnect the plug and pull (do not jerk) the cable until a click is heard, indicating that the locking mechanism has been released. Holding the plug, walk toward the speaker case, allowing the cable to wind compactly onto the reel within the speaker case. This insures longer wear, and, in addition, prevents the cable from winding up loosely and thereby bulking up and crowding the inside of the reel casing compartment before all of the cable has been taken up.

If, at any time, the rubber-covered cable becomes sticky, shake a generous amount of talcum powder into a soft cloth and allow the cable to pass through the cloth as it is being rewound.

Instructions for FILMOSOUND NEW ACADEMY Model 179-H

Operation of the Filmosound New Academy differs from that of the Filmosound Auditorium as follows:

Reel Arms. Open speaker case door; unsnap retaining bands NC and NR, Figure 39. Remove feed reel arm HR and take-up reel arm JS, Figure 39, from carrying positions. Remove Y cord and take-up reel from their carrying positions.

Electrical Connections — Speaker. When all necessary accessories have been removed from speaker case and it has been correctly positioned at the front of the room, remove plug CB, Figure 39, from receptacle MS, Figure 39.

Speaker cable is wound on reel N, Figure 39, and emerges through the hole in the lower right side of the front panel of the case. Holding plug on this end of speaker cable, withdraw the cable as you walk toward projector; place cable where audience cannot trip over it. Insert male plug MP, Figure 40, into 16-ohms receptacle S, Figure 40. Returning to speaker case, insert plug CB into receptacle MS, Figure 39, and close speaker case door.

When show is over, remove plug MP from receptacle S and plug CB from receptacle MS. Turning handle CH, Figure 39, in a clockwise direction, wind speaker cable evenly and compactly onto reel N.

Electrical Connections — Projector. Electrical connections for the Filmosound New Academy are the same as those for the Filmosound Auditorium with one exception: the New Academy can he connected to a power source supplying 115-volt, *25-cycle* alternating current, as well as 115-volt, *50- to 60-cycle* alternating current.

Preparing to Operate. Set up and check the Filmosound New Academy, following the instructions given on

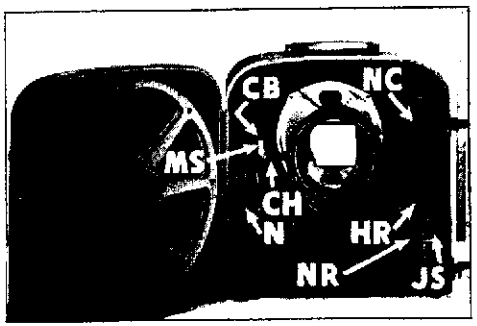


Figure 39

CB	Plug
CH	Handle
HR	Feed reel arm
JS	Take-up reel arm
MS	Receptacle
N	Speaker cord reel
NC	Retaining band
NR	Retaining band

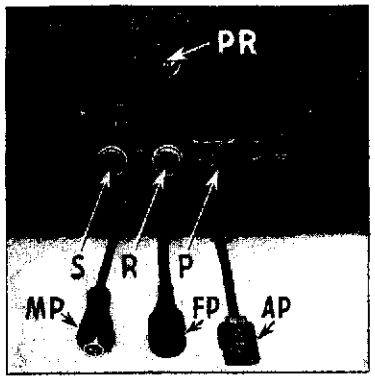


Figure 40

AP	**Female plug**
FP	**Female plug**
MP	**Male plug**
P	**Amplifier receptacle**
PR	**Projector receptacle**
R	**8-ohms receptacle**
S	**16-ohms receptacle**

page 8 under the above heading with two exceptions:

The controls on the front panel of the New Academy amplifier are slightly different in position; see Figure 41.

The New Academy speaker does not require a volume control setting; disregard these mentions.

Microphone. When using microphone with *silent* film, set sound-silent switch SS, Figure 41, at SILENT and insert microphone plug into jack M, Figure 41. Turn on Filmosound amplifier. Adjust the volume to the desired level by means of projector volume control. If there is a considerable lapse of time between broadcast comments, turn off the amplifier, to eliminate extraneous noises.

When commentary is over, turn off Filmosound amplifier and remove microphone plug from jack M.

When using microphone with *sound* film, before inserting plug into jack M, Figure 41, set sound-silent switch SS, Figure 41, at SILENT, to disconnect exciter lamp while microphone is in use. Adjust Filmosound volume control for best results under existing acoustical conditions.

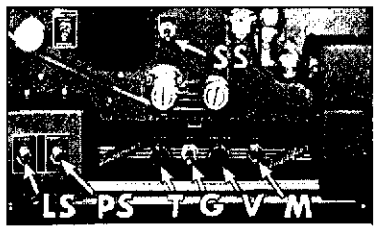
While it is possible to connect the microphone without disconnecting the exciter lamp, it is not possible to adjust the microphone volume without correspondingly affecting the film sound volume, since both are adjusted through the same control. It is, therefore, advisable to use the microphone as instructed above.

When microphone is *not* in use, remove plug from jack M and set sound-silent switch SS at SOUND in order that sound from film may again be heard.

Phonograph Turntables. When using phonograph turntable with silent film, with sound-silent switch SS, Figure 41, at SILENT and turntable volume control at minimum position, insert turntable plug into jack M, Figure 41. Set projector volume control at maximum position; set amplifier switch at ON and allow amplifier tubes to warm up. Then adjust turntable volume control for best results under existing acoustical conditions. When using phonograph turntable to provide background music for *sound* film, with turntable volume control set at minimum position, insert turntable plug into jack M. Adjust turntable volume control to desired sound level.

Figure 41

G	**Amplifier switch**
LS	**Lamp switch**
M	**Microphone jack**
PS	**Projector switch**
SS	**Sound-silent switch**
T	**Tone control**
V	**Volume control**

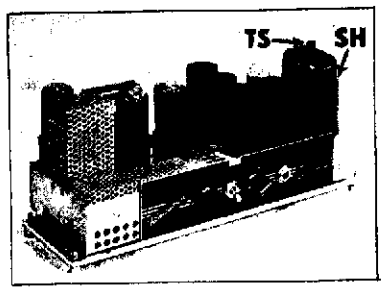


Polarity Changer. A polarity changer may *not* be used with the Filmosound New Academy. When it is necessary to operate the Filmosound amplifier on *direct* current, a DC to AC converter having a capacity of 100 watts must be used. At such times, follow the instructions given on page 17, under the heading, "Operation on 115-volt Direct Current, without Polarity Changer."

Public Address System. To expose photocell of Filmosound New Academy, remove the amplifier from projector in usual way; with Filmosound line cord disconnected, unscrew thumbscrew TS, Figure 42, and lift off shell SH, Figure 42. Remove photocell PE, Figure 43. Return shell to position, placing contact pins CO, Figure 43, on shell edge in holes PH, Figure 43, in amplifier chassis. Tighten thumbscrew TS to top of shell as firmly as possible *without the use of tools.*

Figure 42

SH	**Shell**
TS	**Thumb screw**



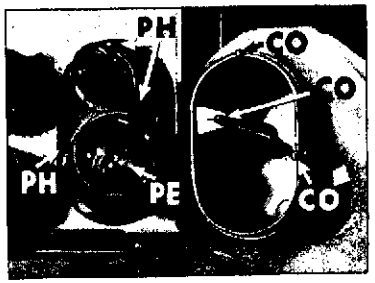


Figure 43

CO	**Contact pins**
PE	**Photocell**
PH	**Holes**

When program is over, return photocell to position, being sure to replace shell properly and to tighten firmly thumbscrew TS.

Projection Defects and Remedies. The remedies given for Filmosound Auditorium projection defects apply to the Filmosound New Academy with the following changes:

2. d.	Check to see that sound-silent switch is set at SOUND.
3. b., c., d., f., k., l.	Disregard.
3. m.	Photocell shell not firmly screwed down.
4. b.	Disregard.
4. c.	Check to see that line current supplied to projector is of the correct voltage.
4. g.	Replace amplifier tubes with a complete new set.

Tube Replacement. To replace the amplifier tubes, it is necessary to remove amplifier from Filmosound. To remove amplifier, lay the projector on its side and, with a screw driver or coin, remove four screws H, Figure 32. Pull amplifier out far enough to reach exciter lamp lead wire plug LP, Figure 44; remove plug from receptacle LR, Figure 44, before completely removing amplifier from projector.

Remove and replace tubes in the same manner as for the Filmosound Auditorium.

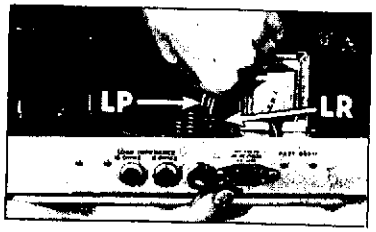
To expose the photocell, with Filmosound line cord disconnected, unscrew thumbscrew TS, Figure 42, and lift off shell SH, Figure 42. Remove photocell and replace with another. Return shell SH to position over photocell and first amplifier tube, placing contact pins CO, Figure 43, on shell edge in holes PH, Figure 43, in amplifier chassis. Tighten thumbscrew TS to top of shell as firmly as possible *without the use of tools.*

Fuse Replacement. A 1½-ampere fuse is provided in the Filmosound New Academy amplifier. Remove and replace it as instructed under "Fuse Replacement — Projector," page 31. Never use a fuse larger than the 1½-ampere size. Disregard paragraph on "Fuse Replacement—Power Speaker."

Maintenance — Speaker Cord. If, at any time, cord on hand-wound speaker cord reel becomes sticky, shake a generous amount of talcum powder into a soft cloth and pass the length of cord through cloth before rewinding.

Figure 44

LP **Lead wire plug**
LR **Receptacle**



Instructions for FILMOSOUND COMPACT Model 179-K

Operation of the Filmosound Compact differs from that of the Filmosound Auditorium as follows:

Positioning of Projection Units. Place the Filmosound at the rear of the room on a stand or table of a height which will permit projecting over the heads of the audience. Set up the projection screen, at the front of the room, according to the instructions accompanying the model to be used.

Open the upper door of the projector case, and then the lower door. The feed reel arm HR and take-up reel arm JS are transported as shown in Figure 45; the take-up reel I travels on the lower door; the Y cord is carried in the space before the projection lens. Remove the cords, reel arms, and all necessary accessories from their carrying positions in the case. Position reel arms and spring belts in the usual way.

The speaker is mounted on a door built into the far side of the projector case. It may be used in any one of three positions, as desired: within the case, in the position in which it travels; at a 90° angle to the case, by pulling the speaker door outward until it snaps into place at this angle; at the screen, by opening the speaker door and lifting it off the split hinges on which it is hung. See Figures 46a, b and c.

With the speaker positioned as desired, uncoil the necessary length of speaker cable from the storage brackets on the rear of the speaker; the storage brackets serve as a stand for the speaker when it is used apart from the projector case. Connect plug

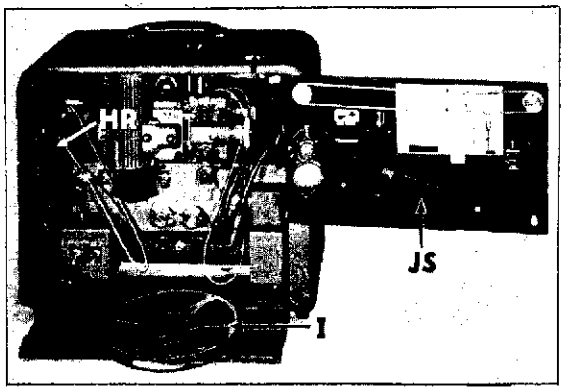


Figure 45

HR **Feed reel arm**
I **Take-up reel**
JS **Take-up reel arm**

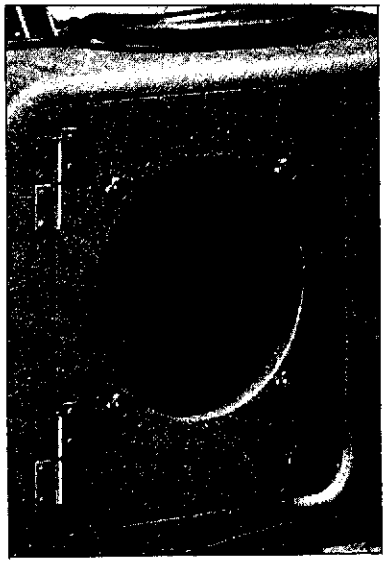


Figure 46a
Speaker used within case

Figure 46b
Speaker used at 90° angle to case
ML Storage brackets
MP Plug
S 8-ohms receptacle

MP, Figure 46b, of speaker cable to 8-ohms receptacle S, Figure 46b.

When show is over, remove plug MP from receptacle S and wind speaker cable evenly over brackets ML.

Electrical Connections — Projector. Electrical connections for the Filmosound Compact are the same as those for the Filmosound Auditorium with one exception: the Compact can be connected to a power source supplying 105- to 130-volt *25-cycle* alternating current as well as 105- to 130-volt *50- to 60-cycle* alternating current.

Preparing to Operate. Set up and check the Filmosound Compact, following the instructions given on page 8 under the above heading with two exceptions:

The controls on the front panel of the Compact amplifier are slightly different in position; see Figure 41.

The Compact speaker does not require a volume control setting; disregard these mentions.

Microphone. When using a microphone with the Filmosound Compact, follow the microphone instructions given for the New Academy on page 34 under the same heading.

Phonograph Turntables. When using a phonograph turntable with the Filmosound Compact, follow the instructions given for the New Academy under the above heading on page 34.

Polarity Changer. A polarity changer may *not* be used with the Filmosound Compact. When it is necessary to operate the Filmosound amplifier on *direct* current, a DC to AC converter having a capacity of 100 watts must be used. At such times, follow the instructions given on page 17, under the heading, "Operation on 115-volt Direct Current, without Polarity Changer."

Public Address System. To use the amplifier of the Filmosound Compact as part of a public address system, follow the instructions given for the New Academy under the above heading, on page 35. Remove the Compact speaker from the projector case.

Projection Defects and Remedies. The remedies given for Filmosound Auditorium projection defects apply to the Filmosound Compact with the following changes:

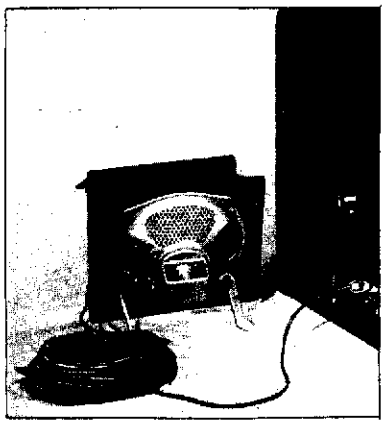
2. d.	Check to see that sound-silent switch is set at SOUND.
3. b., c., d., f., k., l.	Disregard.
3. m.	Photocell shell not firmly screwed down.
4. b.	Disregard.
4. c.	Check to see that line current supplied to projector is of the correct voltage.
4. g.	Replace amplifier tubes with a complete new set.

Tube Replacement. To replace the amplifier tubes of the Filmosound Compact, follow the instructions given for the New Academy under the above heading on page 36.

Fuse Replacement. A 1½-ampere fuse is provided in the Filmosound Compact amplifier. Remove and replace it as instructed under "Fuse Replacement — Projector," page 31. Never use a fuse larger than the 1½-ampere size. Disregard paragraph on "Fuse Replacement—Power Speaker."

Maintenance—Speaker Cord. If, at any time, cord sticks together during storage on brackets, shake a generous amount of talcum powder into a soft cloth and pass the length of cord through the cloth.

Figure 46c
Speaker removed from case



PROFESSIONAL SERVICING

Fine equipment that it is, your Bell & Howell camera and projector need only a minimum of expert care. You might think, because of their precision construction and efficient operation, that they need no servicing at all. *This is not true.* For, just as all fine equipment demands professional care, so Bell & Howell cameras and projectors must be serviced regularly to keep them in their original perfect condition.

The low service requirements of Bell & Howell equipment are due in part to excellent design, materials, and craftsmanship. Another reason for the long, trouble-free lives of B&H equipment lies in the fine service, advice, and operator training provided by B&H Special Representatives. Cue to your responsibility is the old saw, "An ounce of prevention is worth a pound of cure," for it's you who must see that your equipment gets the care it needs *before* it needs it.

To be sure this small but vital bit of service is correctly done, you will want to turn your equipment in to your local dealer to be taken to the nearest Authorized Service Station, Bell & Howell factory branch, or the B&H home plant in Chicago.

Many owners follow our suggestion that every projector, even though apparently in first-class condition, be serviced annually. The equipment is thoroughly cleaned, lubricated, and inspected. Any parts which show serious wear are replaced. Then, after careful testing, it is returned ready for another year of rigorous use. The cost of this preventive service is nominal, and results in dependable performance are more than satisfactory.

Supplement this yearly servicing with good, everyday care, proper storage and maintenance; the added appreciation of all who view your movies will be your reward.