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SOUNDHEAD

OPERATING INSTRUCTIONS

MI-9030 (60 cycle) MI-9031 (50 cycle)

DESCRIPTION

The RCA MI-9030 soundhead is designed for the reproduction of sound from a standard sound track on 35-mm motion-picture film. A push-pull adaptor can be added to the soundhead to permit reproduction from either standard or push-pull recordings.

The RCA rotary stabilizer is incorporated in this soundhead to assure constant film speed at the sound take-off; thus preventing wows and rasp in the reproduction. A motor is connected directly to the soundhead through a flexible coupling, and drives both the projector and the soundhead, at the standard film speed of 90 ft. per minute.

A streamlined cover placed over the motor gives the soundhead a sleek ultra-modern appearance, symbolic of its advanced features. Finished with black wrinkle and chromium on the exterior; a glossy white finish is applied to the interior of the soundhead. The bright interior enables the projectionist to quickly determine the position of the film, and to observe the presence of dirt and oil.

Brackets and drive gears can be furnished to adapt this soundhead to all standard projectors and bases. The standard MI-9030 soundhead is used where 110 volt 60 cycle power is available. The MI-9031 soundhead is designed for operation on 50 cycle power. Soundheads for operation from 25 cycle power sources, and 115 volt d-c sources, are also available.

OPERATION

1. Before threading the film through the soundbead, move the lateral guide and pressure roller assembly, and the two film pad roller assemblies to the open position. Pull out the latch knob on the guide roller assembly to unlock it. This operation is not necessary when the instruction below is observed.

2. Thread the film through the soundhead as shown in figure 1, but leaving approximately the same amount of slack as shown in the drawing. 3. Start the soundhead motor by turning ON the motor switch.

IMPORTANT: After the end of the day's performance the lateral guide and pressure roller assembly should be left in the OPEN position.

CARE OF SOUNDHEAD

Always keep the soundhead scrupulously clean and well oiled. The continuous good performance of the soundhead will repay any effort spent in its care.

Oiling

The oil gauge on the non-operating side of the soundhead should be checked each day before attempting to operate the machines to make sure the oil level in the gear box is at the point shown by the mark on the glass. During operation the oil level should drop below the mark. RCA STOCK No. 25551 oil is recommended for use in the gear box, but a good grade of S.A.E. No. 30 oil may be used.

The oil cup on the projector drive gear shaft should receive two drops of the same oil used in the gear box, at least once each day.

The soundhead drive motor is equipped with special sealed grease-packed bearings and requires no oiling.

During the winter months, where the projection room temperature may drop considerably below normal room temperature between performances, each machine should be run, without film, for about 15 minutes before a regular performance.

Exciter Lamps

The exciter lamps used are of the prefocused type which require no further adjustment after insertion in the exciter lamp socket. A spare lamp should always be kept focused in the extra socket of the exciter lamp holder. It will then only be necessary to reverse the holder to place the spare exciter lamp in operation.



Figure 1—Operating Side of Soundhead



Figure 2—Cross Section of Soundhead

Optical System

The optical unit, photocell lens, photocell, and exciter lamps should be cleaned with lens tissue or a soft piece of linen before each day's performance. Never use ordinary tissues for cleaning lens parts because lint from the tissues may be left on the lens surface.

Sound Take-Off Drum

The sound take-off drum should be kept thoroughly clean. Foreign material on the drum such as dirt, lint, or film emulsion may cause poor quality sound. Use a lint-free cleaning cloth or a soft rag for eleaning the drum. Never use any metallic instrument such as a knife, screwdriver, etc., for cleaning purposes as any scratches made on the drum may cause scratches on the film.

REPLACEMENT PARTS

The following parts list is included to provide identification when ordering replacement parts. Order from RCA Replacement Parts Department, Camden, New Jersey, giving the stock number and description of the part wanted. Replacement parts supplied may be slightly different in form or size from the original parts but will be completely interchangeable with them.



Figure 3—Lateral Guide and Pressure Roller

LIST OF PARTS

Description	Stock No.
GEAR BOX	
Bearing, ball; C.S.S., H.B.S., and motor drive shafts*	25514
Collar and setscrew, sprocket adjustment	27923
Cover, drive shaft rear bearing	23683
Cover, gear box; upper, with screws	27917



Figure 4-Cross Section of Gear Box

Description	Stock No.	Description	Stoc k No.
GEAR BOX (Cont'd)		GEAR BOX (Cont'd)	
Cover, gear box; lower, with plug and screws Deflector, oil; on C.S.S. shaft bearing (pulley end) Deflector, oil; on H.B.S. shaft (sprocket end) Deflector, oil; on C.S.S. shaft (sprocket end), H.B.S. shaft (rear) and main drive shaft (front) Gasket, lower cover Gasket, upper cover Gasket, vellumoid, #23678 retainer Gasket, vellutex, #45067 retainer Gear, 37-tooth bronze drive; C.S.S. shaft and H.B.S. shaft (50 cycle) Gear, 49-tooth bronze drive; C.S.S. shaft and	27911 45069 45071 23676 27910 27918 23679 45068 26246 26241	Shaft, H.B.S. Shaft and pinion, main drive; 50 cycles 9- tooth Shaft and pinion, main drive; 60 cycles 10- tooth Spacer, metal; between C.S.S. drive gear and bearing Spring, gear retaining coil; end of shafts Spring, pad roller arm Sprocket, constant speed Sprocket, hold back Stripper, film Washer, "C"; end of shaft Washer, cup; end of shaft	45070 26245 26243 27916 20321 23681 21432 23691 20322 20323
H.B.S. shaft (60 cycle) Plug, pipe, lower gear box cap Retainer, ball bearing; C.S.S. shaft rear Retainer, ball bearing; C.S.S. shaft front, H.B.S. shaft front and rear bearing Shaft, C.S.S.	26532 46067 23678 45066	Washer, spring; used between bearing and oil retainer on C.S.S. shaft or H.B.S. shaft Washer, thrust; end of shaft *NOTE: C.S.S.—Constant Speed Sprocket H.B.S.—Hold Back Sprocket	20325 20324

Description	Stock No.
MOTOR	.
Bearing, (13 mm); framing knob end	28058
Bearing, (17 mm); flywheel end	28057
Brake	27943
Coupling, flexible	23677
Governor, centrifugal	47085
Knob, hand	27942
Lining, brake	27944
Motor, 1480/1763 R.P.M., 1/4 HP, 50/60 cy-	
cle; 115 volt, single phase; with flywheel	54044
Pin and washer; brake lever bearing	27946
Ring, bakelite contact	47086
Ring, clamping; enclosing motor mounting	
washers	28538
Rotating section of 50 cycle centrifugal switch	26374
Spring, re-loading motor bearing	28060
Spring, spiral; brake handle release	27947
Stationary section of centrifugal switch	26260
Switch, tumbler, DPST motor starting	25765
Washer, rubber mounting; motor shaft	26936
Washers, shim, armature end play; set	28061

MAIN CASE

:	
Catch, female section; gear cover or sound- head doors	21446
Catch, male section; gear cover or soundhead	
doors	23094
Clamps, window support, set of two	26623
Cushion, rubber; sound bracket mounting	23674
Cover, transformer compartment	27948
Door, operating compartment	54515
Door, exciter lamp housing	54516
Handle, door	45187
Nipple, oil gauge	28069
Oil collector	27950
Oil gauge	28068
Screw, thumb; terminal board cover	28072
Screw and metal washer; sound bracket lower	
mounting	28065
Screw and metal washer; sound bracket upper	1
mounting	28066
Shield, static	27949
Stop, door	23690
Stud, door-stop	28073
Tube, oil drain	28059
Window, glass, operating compartment door	27940

OPTICAL SYSTEM AND EXCITER LAMP SECTION

	1
Base; double exciter lamp socket	27959
Board, mounting; exciter lamp	27956
Contact and lead; with washers and coil spring	27963
Contact, flat spring; with mounting bushings,	
screw and washer	27962
Lamp, prefocused exciter, 10 v, 5 amp	28050
Lamp, prefocused exciter, 10 v, 71/2 amp	28153
Nut, knurled, locking pin	27952
Optical unit, 1¼ mil	26398

Description

Stock No.

OPTICAL SYSTEM AND EXCITER LAMP SECTION (Cont'd)

SOCKEL, EACHEL IMMP BOCKEL IMM STOR	Pin, locking Retainer, adjusting nut Screws (3), lamp mounting board Setscrew, optical sleeve adjustment Shield, light; exciter lamp Socket; exciter lamp socket assembly complete Socket; exciter lamp socket less base	27953 27954 27955 28166 27961 27958 27960
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PHOTOTUBE

Bracket	28049
Cover	25559
Gasket, socket	23106
Holder, lens	25539
Lens	25538
Ring, socket spacer	27805
Shield, light; phototube lens	28052
Shim, light shield; set of 4	28149
Socket	28045

ROTARY STABILIZER

Bearing, ball; drum shaft	23948
Cover, shaft bearing	27785
Drum and shaft	27919
Spacer; between wheel and ball bearing	27783
Spacer; between ball bearings	27784
Spring driver	23913
Wheel, damping	27806

LATERAL GUIDE AND PRESSURE ROLLER

······································	
Arm, lower	28100
Arm, upper	45565
Ball, arm locking mechanism	10194
Bearing, ball	23673
Bushing, mounting	27083
Cover, inner; inner ball bearing	23669
Cover, outer; inner ball bearing	45563
Cover, outer; outer ball bearing	23668
Flange, inner guide; has extended hub	28525
Flange, outer guide	28522
Knob, guide roller latch	28101
Latch, guide roller	25493
Nut and screw, adjusting	20135
Pin, upper arm pivot, with taper pin	20137
Ring, guide roller retaining	28524
Roller, pressure	51961
Screw, inner bearing cover, No. 2-56x1/2	45564
Screw, outer bearing cover, No. 2-56x3/8	26620
Shaft, roller; one retaining ring and two "C"	
washers	28521
Spacer, under spring No. 28526	28527
Spring, roller tension	28526
	23088
Spring, lower arm pivot	23087
Spring, pressure roller latch	23089
Spring, tension, pressure roller arm mechanism	23991
Stud, lateral guide roller assembly mounting	

Description	Stock No.
LATERAL GUIDE AND PRESSURE ROLLER (Cont'd)	
Washer, "C"; for roller shaft ends	71143
Washer; pivot tension spring retaining	20136
Washer, spring; between roller and flange	46809
Washer, upper arm end play	20185
Washer, shim; .010 thick, between "C" washer	
and inner ball bearing	28315
Washer, shim; .002 thick, same use as #28315	28373
Washer, shim; .003 thick, same use as #28315	28374

DOUBLE PAD ROLLER

Arm, H.B.S. pad roller Roller, pad	27909 28519
	27798
Screw, arm bearing	2//70
Screw, 8-32x ⁵ / ₁₆ Allen head steel set screw;	
roller shaft	27794
Screw, 8-32x3/8 Allen head steel set screw;	
roller shaft	27922
Screw, 8-32x3/4 Allen head steel set screw and	
nut; pad roller arm adjustment	27795
Shaft, roller	23917
Shaft, roller; with knurled knob	25489
	27921
Spring, pad roller arm position	2/941

SINGLE PAD ROLLER

Arm, C.S.S. pad roller	27920
Roller, pad	28519
Screw, arm bearing	27798
Setscrew, No. 8-32x5/18 sq. hd. steel; roller shaft	27794
Setscrew, No. 8-32x3/4 sq. hd. steel; with nut	
for arm adjustment	27795
Shaft, roller; with knurled knob	25489
Spring, roller arm position	27921
	1

PHOTOTUBE TRANSFORMER, MI-9181

Transformer, XT-2874-B	28794
Cushions, phototube transformer mounting; six	28070
NOTE: These parts are used only in sound- heads which are NOT low capacity coupled.	

PROJECTOR DRIVE GEAR ASSEMBLIES

Brenkert BX-40, -80, MI-9129-A

28661
22490
28666
28667
28673
22235
28674

Description	Stock No.
PROJECTOR DRIVE GEAR ASSI (Cont'd)	MBLIES
Motiograph K, MI-9124	•
Gear, textolite; pinion drive	28661
Nut, drive shaft	28446
Oil cup; with nut	22490
Pinion, steel drive	28664
Screws, drive gear, 8-32x1/2", six	28667
Shaft	28447
Washer, bronze thrust; gear end	23984
Washer, steel thrust; gear end	26811
Washer, steel thrust; pinion end	22235

1

*Simplex Standard, MI-9127

Gear, textolite, pinion drive	28661
Nut, drive shaft	20012
Oil cup; with nut	22490
Pinion, steel drive	28664
Screws, drive gear, 8-32x1/2", six	28667
Shaft, complete	27819
Washer, bronze thrust; gear end	23984
Washer, spacing	22235
Washer, steel thrust; gear end	26811
* Also for Century R-2, Gardner, Kaplan, Motiograph AA, Simplex Super, Simplex SI, Superior A, and Wenzel.	

Simplex E-7, MI-9128

Gear, textolite, pinion drive	28661
Oil cup; with nut	22490
Pinion, steel drive	28665
Screws, drive gear, 8-32x1/2", six	28667
Shaft, complete	26627
Washer, bronze thrust; gear end	23984
Washer, spacing	22235
	26811
Washer, steel thrust; gear end	20011

Superior X, MI-1096

Gear and pinion	26544
Oil cup; with nut	22490
Shaft	26543

PROJECTOR ACCESSORIES

Motiograph HU, MI-9136

27943
26197
23094
51964
23688
27944
51963
51962

EDW. H. WOLK, INC., CHICAGO, ILLINOIS 60605, U.S.A. PRINTED IN U.S.A.

Description	Stock No.
PROJECTOR ACCESSORIES	(Cont'd)

Motiograph K, MI-9168

1	7943
k 26	5197
23	3094
26	5604
1	3688
27	7944
23	3986

*All Simplex Models, MI-9160 All Brenkert Models, MI-9161-A

Belt, take-up, 44 inches long; with belt hook	26197
Brake lever assembly	27943
Catch, gear cover	23094
Gear, 66-tooth; take up drive	26604
Knob, gear cover	23688
Lining, brake	27944
Nut, mounting plate adjusting	28041
Pulley, take-up drive	23986
Ring, snap ring for adjusting nut	28042
Screw, projector mounting, 3/8-16x3/4 lg. flat	
head	28043
Spacer, take-up shaft, .376 ID	28081
Spacer, take-up shaft, .750 ID	28044
* Also for Century R-2, Gardner, Kaplan,	
Motiograph AA, Superior A and X, and	
	1
Wenzel.	1

Powers 6-B Projector with Simplex 3-Point Base, MI-9164

Brake lever assembly	27943
Belt, take-up, 44 inches long; with belt hook	26197
Bracket, bearing	45057
Bushing, shaft	20384
Catch, gear cover	23094
Gear. drive	45633
Gear and hub assembly	26283
Knob, gear cover	23688
Lining, brake	27944
Nut, mounting plate adjusting	28041
Oil cup	25563
Pinion, drive shaft	20382
Pulley, take-up	23986
Ring, snap ring for adjusting nut	28042
Shaft, drive	20383

Description	Stock No.
PROJECTOR ACCESSORIES (Cont'd)	
Powers 6-B Projector with Sim Base, MI-9164 (Cent	
Shims, drive shaft bracket, four	28692
Spacer, take-up shaft, .376 ID	28081
Spacer, take-up shaft, .750 ID	28044
Powers 6-B Pedestal Parts (F Soundhead), MI-91	
	27944
Lining, brake	2/741

ACCESSORIES AND SUB-ASSEMBLIES

The following accessories and sub-assemblies are also available. Order from RCA Theatre Equipment Section, Camden, New Jorsey, giving MI Number and Description of item wanted.

Description	Reference
Bracket motor; for MI-9030-A or MI-9031-A	MI-9142
Cover, gear; for MI-9160 (Simplex), MI-9161-A (Brenkert) or MI-9168	
(Motiograph K)	MI-9 176
Gear Box; for MI-9030-A only	MI-9159
Hardware, set of; for MI-9160 (Simplex) or MI-9161-A (Brenkert)	MI-9 177
Hardware, soundhead bracket; for MI-9104, 9106, 9107, 9140 or 9141 types of soundhead mounting brackets	MI-9149
Plate, projector mounting; for MI-9161-A (Brenkert)	MI-9174
Plate, projector mounting; for MI-9160 (Simplex)	MI-9175
Plate, projector mounting; for MI-9136 (Motiograph HU) or MI-9168 (Motiograph K)	MI-9178
Push-Pull Kit; for MI-9030-A or MI-9031-A	MI-9 137
Trim, set of chrome; for MI-9030-A or MI-9031-A	MI-9172-A

-	-	770 A
FUR		220-1

INSTALLATION AND SERVICE DIVISION

MI-9030 MI-9031

RCA MANUFACTURING CO., INC.

CANDEN, N. J.

CLASSIFICATION Technical - Photophone - Soundheads	DATE	March 5, 1942
SUBJECT: MI-9030 SOUNDHEAD INSTALLATION INSTRUCTIONS (Simplex)	NUNDER	SL-2CI-9.01

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GENERAL DESCRIPTION

The MI-9030 type soundheads are of the latest streamline construction combining such features as rotary stabilizer, built-in oil collection and drainage system, twin-socket, exciter lamp holder, using prefocused exciter lamps, accurately machined and easily adjustable projector mounting plate assembly, and a complete gear box assembly which is readily removable from the soundhead.

Electrical & Mechanical Specifications

Installation

DISMANTLE EXISTING EQUIPMENT AS FOLLOWS:

- (a) Remove projector head, lamphouse, lamphouse bracket.
- (b) Remove lower door from drive side of projector head.
- (c) Remove main bearing (tilting) bracket and discard.
- 2. ASSEMBLY OF SOUNDHEAD AND PROJECTOR.
 - (a) Mount the new main bearing bracket on the pedestal, attach lamphouse bracket and lock tilting device.
 - (b) Start the two upper $1/2^{\mu} 13 \times 1 1/2$ cap screws in the main soundhead assembly and lift the soundhead into position so that these screws fit into the slotted holes in the top of the main bearing bracket. Install the two lower mounting $1/2^{\mu} 13 \times 1 1/4$ cap screws and tighten all four screws (see Figure 1).
 - (c) Remove all shipping guards from the soundhead, and carefully clean off all excess grease and oil using clean lint-free cloth. Do not use any cleaning fluid.
 - (d) Mount the motor mounting bracket securely to the front of the soundhead by means of the $5/16^{\circ}$ 18 x 1 screws and lockwasher provided.
 - (e) Mount the flywheel on the motor shaft so that it matches the taper of the shaft, and lock in place with the nut provided.
 - (f) Slide the spacer and flexible coupling on to the soundhead drive shaft. Push the flexible coupling tightly against the spacer and fasten it securely to the soundhead drive shaft.
 - (g) Place the motor and motor cradle on the motor mounting bracket, guide the motor shaft into the flexible coupling, then fasten the motor cradle loosely to the mounting bracket by means of the four 5/16" - 18 x 3/4 screws provided (see Figure 2).
 - (h) Shift the motor cradle until the motor drive shaft and soundhead drive shaft are lined up laterally as well as can be seen by the eye.

Tighten the motor cradle mounting screws. If the shafts do not line up vertically, loosen the motor bracket mounting screws and shift the motor mounting bracket up or down, to line up the shafts. Secure the flexible coupling to the motor shaft, and check the shaft alignment by rotating the motor by hand, checking to see if there 2CI-0.01 Issue 1 Page 2 of 11 pages 3/5/42

- 2. ASSEMBLY OF SOUNDHEAD AND PROJECTOR (Contid.)
 - (h) is any eccentricity in the flexible coupling. This alignment should be checked later. with the motor running. Excessive vibration of the motor will indicate misalignment.

Lock the flexible coupling set screws securely in place on the flat spots provided on the motor and soundhead drive shafts, then use the second set of set screws to lock the first set in place.

- (1) Mount the flywheel brake and brake spring on the shaft provided on the motor bracket as shown in Figure 9.
- (j) Mount the combination oil pan and projector mounting plate to the bottom of the projector using the two $3/8 16 \ge 3/4$ " flathead screws provided (see Figure 3).
- (k) Hount the projector and projector plate on to the soundhead making sure that the dowel pins fit in the slotted holes on the soundhead casting. Install the four $1/4 20 \times 5/8^{\circ}$ Allen set screws to hold the projector mounting plate loosely in place.
- (1) Install the Simpler projector drive gear in the projector head as shown in Figure 1. Install the drive gear on the soundhead as shown in Figures 4 and 8. Using the two washers, spring and *C* washer to hold the gear on its shaft. The take-up belt or take-up chain should be installed at this time, depending on which is used. Adjust the mesh between the projector drive gear and the upper soundhead drive gear by means of the eccentric nut, using this nut to move the projector toward or away from the drive gears, until the proper gear mesh of 0.001* to 0.002* is obtained. (Common practice is to insert a thin piece of paper, such as cigarette papers, between the meshing teeth to obtain the proper clearance.) Tighten the four Allen set screws holding the projector plate to the soundhead, and check the gear mesh.
- (m) Install the conduit anchor plate under the phototube terminal board using two #10 24 X 3/8* and install Greenfield cable and make connections to the soundhead terminal board as shown in Figure 5 or 6. (Phototube transformer is MI-9181.) Mount the cover over the terminal board.
- (n) Install rotary stabilizer using the spring, lockwasher, and nut provided.
- (c) Remove the plug at the bottom of the gear box and install the oil guage in this hole. Fill the gear box with Stock No. 25551 oil until the oil reaches a final level in the gear box as indicated by the mark on the glass of the oil guage.
- (D) Install the oil drain container at the bottom of the soundhead as shown in Figure 2.
- (c) Make electrical connections to the motor.
- (r) Install the motor cover using the two $1/4^{n} 20 \ge 1-1/4$ machine screws and lockwashers provided.
- (s) Connect the exciter lamp supply leads to the exciter lamp mounting board.
- (t) Mount the upper and lower magazines. Two 5/16" 16 x 1-1/4 supplied for lower magazine. When the spacers used to line up the take-up pulleys are inserted on the lower take-up shaft, as shown in Figure 1, it will be found that the take-up shaft housing holding screw does not enter either of the holes in the take-up shaft housing. It will be necessary to file a flat spot on this housing between the two holes already there, to hold the shaft against slipping, and to allow oil to penetrate from the outer oiling hole to the take-up shaft. Adjust the tension of the take-up belt or take-up chain according to which is used.
- (u) Mount the gear guard on the drive side of the soundhead.
- (v) Remove the lateral guide and pressure roller assembly (see section No. 11 under "SERVICE DATA"), disassemble, using naphtha, clean off any heavy grease or oil found on the parts, reassemble and oil with a light grade of Pyroil.
- (w) Oil the pad rollers with Simplex oil.
- (X) Install the film guide in the projector head (not used with Super-Simplex or Simplex E-7 and Brenkert Projectors). (See Figure 1).
- (y) Mount the lamphouse on the lamphouse carriage and line up with the film aperture.
- (2) Check thoroughly all screws, huts, etc., to make sure all are properly secured. When all oiling points on the projector and soundhead have been properly oiled, turn on the motor and run the machine, feeling all bearings at frequent intervals to be sure that they run cool. It is desirable to run-in each soundhead and projector at least two hours before attempting to run a performance.

Service Data

Type MI-9030 Soundhead

5. EXCITER LAMP ADJUSTMENT.

- (a) The exciter lamps used with this soundhead are of a pre-focused type. The exciter lamp mounting bracket has been properly adjusted to give the correct light on the photocell, and new exciter lamps may be installed without any adjustment being necessary.
- (b) To install an exciter lamp, insert lamp in the exciter lamp holder socket so that the pins on the socket enter the holes in the circular lamp base, then twist the lamp to lock it in position.
- 4. ADJUSTMENT OF LATERAL GUIDE AND PRESSURE ROLLER.

The lateral-guide roller should be set so that it will keep the film sound track in the correct lateral position with respect to the light beam. A buzz-track test film (Stock No. 26251) should be run through the machine with the exciter lamp on and the amplifier in operation, so that sound can be heard. Loosen the knurled adjusting-nut lock-screw, start the projector, and turn the adjusting nut so that the recording on each side of the buzz track cannot be heard. Lock the adjusting screw in the position of correct adjustment. It is recommended that the assembly remain in the "open" position after the end of day's performance.

5. FOCUSING LIGHT BEAM OF SOUND OPTICAL SYSTEM.

Two methods can be used to obtain correct focal adjustment of the optical unit. An output meter, such as a thermo-galvanometer, or power-level indicator, connected across the loudspeaker voice coil circuit, and a 7,000-cycle test recording such as that on the Stock No. 26251 test film running through the projector, will indicate when the correct focal adjustment has been obtained, while turning the focal adjustment ring.

In using the test film, Stock No. 28251, it is suggested that a portion of the film be made into a loop approximately 26 inches in length. The loop can then be easily threaded in the soundhead.

BOINT In some systems where a low-pass filter is used, the output method does not give satisfactory results. If the low-pass filter cannot easily be removed from the circuit, the flicher method, while not as accurate as the meter method, may be used with fairly good results.

For the flicker method of obtaining focal adjustment proceed as follows: Place a white card between the photocell lens and the photocell. Thread the machine with a 7,000 cycle test film (Stock No. 28251). Pull the film very slowly downward by turning the framing handle or flywheel on the motor shaft by hand. Note the direction of movement of the frequency lines as they travel across the light image on the card. If the lines move downward on the card, move the optical unit closer to the film. If the lines move upward, move the optical unit away from the film. Note the film is pulled tightly against the drum.

The correct focal adjustment is obtained when the lines move meither upward nor downward, but make a definite flicker of light on the card.

4. ADJUSTMENT OF THE TAKE-UP MECHANISM.

To make the adjustment, thread the projector with a 2,000 foot reel of film. Start the projector and watch the action of the film as it is wound on the take-up reel. If a loose loop forms stop the projector, loosen the set acrew in the knurled nut at the end of the take-up spindle, and increase the tension by acrewing the adjustment nut against the spring. If the take-up reel pulls the film taut, the tension of the spring should be decreased by backing off on the adjustment nut.

7. PAD ROLLER ADJUSTMENT.

To obtain proper clearance between a pad roller and its associated sprocket. proceed as follows:

Thread two thicknesses of film in the soundhead and adjust each pad roller by means of the set screw in the arm, so that when closed, the pad rollers rest lightly against the film.

Adjusting the double pad rollers, one roller may come into contact with the film before the other roller. In such a case the pad roller closest to the sprocket should be adjusted for the proper clearance.

8. ADJUSTMENT OF FILM STRIPPERS.

Each film stripper should be set so that the lip of the stripper is below the outer surface of the film-guide flange, but should not be close enough for the stripper to touch the sprocket at any point. A stripper is adjusted by loosening the lock screws, shifting the stripper to the correct position and securely locking it.

S. WIRING DRAWING OF BOUNDREAD SHOWN IN FIGURE S.

Figure 6 shows connections when MI-9181 photocell transformer is used.

10. REMOVAL OF GEAR BOX.

The gear box can be completely removed from the main soundhead casting, and a new one in-stalled in a very short time.

Remove motor cover, gear guard, and rotary stabilizer.

Remove drive gear and take-up pulley from the drive side of soundhead.

Loosen the Allen set screws in the motor and drive shaft flexible coupling. It will be necessary to remove the upper locking set screws, before the lower set screws can be loosened.

Slide the flexible coupling on to the motor shaft so that the soundhead drive shaft iS completely clear.

Loosen the lower take-up magazine mounting screws so that the fire trap is below the level of the bottom of the soundhead.

From the operating side of the soundhead remove the four machine screws holding the gear box to the main casting. Carefully remove the gear box from the operating side of sound-head.

Replace in the opposite order.

11. REMOVAL OF LATERAL GUIDE AND PRESSURE ROLLER ASSEMBLY

The lateral guide and pressure roller assembly may be removed without disturbing the eptical system adjustment. This may be done as follows:

Remove the partition that forms the exciter lamp compartment.

Remove the exciter lamp holder

Disconnect leads from exciter lamp mounting bracket.

Remove the three screws holding the optical system bracket to the main sound bracket, and remove the optical system bracket. As the optical system bracket is located by a set of dowel pins, it may be replaced in exactly its former position, with no adjustment being Becessary.

Remove the lateral guide and pressure roller assembly.

12. REPLACEMENT OF PROTOCELL CONDENSER LENS.

There should be no need for making any adjustments on the condenser lena. However, should the lens be removed from its holder, it should be replaced so that the flat surface of the lens is toward the photocell and so that the notch in the lens is aligned with the notch in the holder.

The light shield mounted on the condenser lens bracket should be re-installed when the photocell condenser lens is replaced.

18. EXCITER LAMP BOLDER.

Care must be taken in the assembly of the exciter lamp holder, because both lamps will light simultaneously if the insulating washers under the heads of the bottom contact holding screws are omitted, or misplaced.

14. A-C PROJECTOR DRIVE MOTOR.

The a-c motor is of the split-phase-starting, induction type, rated at 1/4 h.p. The motor incorporates an automatic starting switch which opens to remove the starting winding from the motor circuit when normal running speed has been reached. The motor

The motor is equipped with scaled grease-packed bearings and does not require oiling. The bearings should be removed, cleaned, and repacked with a good grade of bearing grease, twice a year or after approximately 2000 hours of operation.

REPLACEMENT LIST

NI-9030 Soundhead (110 volt, 60 cycle, Std.) NI-9031 Soundhead (110 volt, 50 cycle, Std.)

DESCRIPTION

STOCK NO.

Gear Box**

23948 27911 COVER - Upper cover for gear box complete Collar - Sprocket adjustment collar with set screw Set SCTER - Bearing cover for drive shaft (sprockst end) 45071 GASKET - Vellumoid gasket for #23678 23679 GEAR - 66-tooth steel gear for projector 26804 bearing and oil retainer on H.B.S. . 20325 at end of shaft 20324

** JOIE: B.B.S. Bold Back Sprochet; C.S.S. Constant Speed Sprochet DESCRIPTION

STOCK NO.

pouble Pad Roller

ARM - H.B.S. pad roller arm	27909
ROLLER - Pad roller	28519
CODEL - DAA POILAR AND DEATINE SCIEW **	27798
SCREW - 8-32 I 5/16 sq. hd. steel set screw for roller shaft	27794
SCREW - 8-32 I 3/8 aq. hd. steel set roller shaft	27922
$a_{ABSU} = a_{AS} + \pi \pi / A = a_{A} = a_{A} = a_{C} $	27795
with nut for pad roller shaft	23917
ANALY - STA POILER STAIL AIGUANALIAN	25459
knob SPRING - Pad roller arm position spring	27921

Single Pad Roller

ARM - C.S.S. pad roller arm	27920 28519
BATTED - DAA PAILAPALAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	27798
ANNEL - DAA PAILAP ATA DESTING SUFEW	21700
SCREW - 8-32 X 5/16 sq. hd. steel set screw for roller shaft.	27794
SCREW - 5-52 I 5/4 sq. hd. set screw with nut for ped roller arm edjust-	27795
SHAFT - Pad roller shaft with knurled	21190
Knob	25489
SPRING - Pad relier arm position spring	27921

Lateral Guide & Pressure Roller Assembly

ARM - LOWET ATE	28100
	45565
ARM - Upper fin arm locking mechanism. BALL - Ball for arm locking mechanism.	10194
BALL - Ball IOF AFA LOCALDS ACCORDENTS	
BALL BEARING - Ball bearing for lateral	25673
guide roller	
AMITE - INSAF COVER IOF LEVERAL BUILT	23669
	2000
CONTRA - MITAR COVER IOT ILLETEL BUILLE	
	23668
outer ball bearing COVER - Outer cover for lateral guide	
inner ball bearing	45563
inner Dell Dearing	
FLANGE - Inner guide flange - (has er-	28525
tended hub)	28522
tended hub)	28101
	28102
	20135
NUT - Adjusting het upper arm complete	
pin - pivot pin tor upper ern competent	20137
	28524
	28785
	20100
	45564
COVET BARTING COVET SCIEW -	
SCREW - Inner bearing cover screw - (2-56 X 1/2) SCREW - Outer bearing cover screw - (2-56 X 3/8)	26220
(2-56 I 3/8) SHAFT - Roller shaft complete with one	
SHAFT - ROLLET SHALL COMPLETE	28521
	28527
	28526
	20020
	07 00 0
	23088
sure roller latch	23087
BALA LOTTEL THROW COLLECTED	

201-0.00 Tasus 1 Page 30 42 11 pages 8/8/42

DESCRIPTION

BTOCK NO-

DESCRIPTION

STOCK NO.

Lateral Guide & Pressure Roller Assembly (Cont'd.)

SPRING - Tension spring for pressure	25089
Poller arm mechanism	23991
WASHER - *C* washer for roller shaft ends	20165
WASHER - Pivot tension spring retaining	
WESDER ASSASSASSASSASSASSASSASSASSASSASSASSASS	20136
WASHER - Spring masher between roller and flange	28523
WASHER - Upper arm and play washer	28573

Optical System

BASE - Double exciter lamp socket base BOARD - Exciter lamp mounting board com- plute	27969 27966
plete with mashers and coll spring CONTACT - Flat spring contact with mount-	27963
ing bushings, screw, and washer LAMP - 10 volt. 5 ampere, single contact	27962
prefocused exciter lamp	28050 28153
MUT - Enurled adjusting nut on optical berrel	20316 27962
OPTICAL SYSTEN - 1-1/4 mll. optical System PIN - Locking Dim for optical system	26396 27953
RETAINER - Adjusting nut retainer BCREW - Sealed-in set screw for optical	27954
sleeve adjustment	28166
land mounting board	27955 27961
SHIELD - Exciter lamp light shield BOCHET - Double exciter lamp socket se-	27958
sembly complete	
D484 ***********************************	27960

Rotary Stabilizer

BEARING - Ball bearing for drum shaft	23948
COVER - Stabilizer shaft bearing cover SHAFT - Stabilizer drum and shaft	23683 27919
SPACER - Spacer between wheel and Dall	
BPACER - Spacer sleeve for drum shaft	27783 27784
SPRING DRIVER	23915
WHEEL - Damping wheel	£78V0

Phototube

BRACKET - Phototube bracket	28049
COVER - Phototube cover	25559
GASKET - Phototube socket gasket	23108
HOLDER - Phototube lens holder	25539
LENS - Phototube lens	25588
RING - Phototube socket spacer ring	27805
SHIELD - Phototube lens light shield	28052
SOCKET - Phototube socket	28045
TURE - Phototube standard	CA-868
TUBE - Phototube Push Pull	CA-920

Hotor

BEARING - Hotor bearing (13 mm) framing	
knob end	28058
	28057

BRAKE - Hotop brake	27943
COUPLING - Flexible coupling	25677
ENOB - Moter hand knob	27942
LINING - Brake lining	27944
LINING - DIGTE TTUTTE	6/944
HOTOR - BO cycle, 110 volt, single	
phase drive motor complete with	
flywheel	45075
HOTOR - 60 cycle, 110 volt, single	
phase drive notor complete with	
	45074
NOUNTING - Rubber mounting washers	
for motor shaft	26956
PIN - Brake lever bearing pin and	
	27948
W68107	27800
AING - Steel clamping ring enclosing	
MALAR MANALINE WARRARS	28538
BOTATING SECTION of centrifugal switch	
for 50 cycles	26374
for 50 cycles	
	26259
for 60 sycles	
	27945
SPRING - Re-loading spring for motor	
SAKING - WA-Insging shime in mana	28060
SPRING - Spiral spring for braks	20000
SPRING - Spiral spring for oraks	
handle release	27947
STATIONARY SECTION of Contribugal	
SWITCH - D.P.S.T. tumbler motor start-	26260
SUITCH - D. P.S.T. tumbler motor start-	
1800 AW1701	25765
WASHERS - Set of shim washers to ad-	
just ermature and play	28061
imme streams and hash consistent	

Hain Case

CATCH - Female section catch for sound	•
head or gear cover doors	21446
CATCH - Male section catch for gear	
gover or soundhead doors	23094
CLAMP - Set of 2 window support	
clamps	26623
COVER - Transformer compartment cover	27948
CUSHION - Complete set of cushions	2
for Photo-tube transformer	28070
CUSRICH - Rubber mounting cushion for	
COSHION - REDDEL MOUNTINE COSTOR for	23674
sound bracket	45187
HANDLE - Door handle	23688
KNOB - Gear cover knob	28069
NIPPLE - 011 gauge nipple	27950
OIL COLLECTOR	
OIL GAUGE	26068
AAARU - RANAA BREEKEL LOWER BOUNLINK	00005
Screw and metal washer	28065
SCREW - Sound bracket upper mounting	
	28066
SCREW - Thumb screw for terminal	
	28072
ANTEIN - Static shield	27949
AMAD - RAAD STAR	23690
AND - BAAR STAR STUD	28073
PRINCEASHER - PHOTOLUDE LIGHTSIDIMOL	
· · · · · · · · · · · · · · · · · · ·	28071
anar - All Arain tube	28059
WINDOW - Door window glass	27940
WTWDDM - MAAI - THTAM Branch Attend	

DESCRIPTION	STOCK NO.	Description	STOCK NO.
NI-9160 Simplex Parts MI-9161 Brenkert Part for MI-9030 Series BELT - 42° long take-up belt	26197	NI-9128 Simplex E-7 Projector Drive Assembly	Shaft
CATCH - Female catch for gear GOW GEAR - 6G tooth steel take-up driv gear FNOB - Gear cover knob PULLEY - Take-up drive pulley SCREW - 3/8-16 x 3/4 lg. flat head projector mounting screw (Brenk STACEW - 3/6-16 x 1* lg. flat head projector mounting screw (Brenk STA hold mounting) SPACER - Take-up shaft spacer (.5 SPACER - Take-up shaft spacer (.7)	2604 23688 23966 23966 23966 23966 24043 26043 270 26043 76 ID) 28061	GEAR - Textolite drive gear for pinion 28665	20012 20012 22490 22490 28665 screws 28667 28667 26627 22235 3
NI-9127 Standard or Super Simplex Projector Orive Shaf	t Assembly	MI-9129-A Brenkert Projector Driv Assembly	e Shaft
GEAR - Textolite drive gear for Dimion 28564	20012 22490 28664 ws 28667 27619 22236 23064	GEAR - Textolite drive gear for pinion 28666 OIL CUP - Oil CUD without nut PINION - Steel drive pinion of SCREWS - 48-52 x 1/2" machine for drive gear SHAFT - Shaft complete WASHER - Spacing washer WASHER - Thrust washer (Ball)	28661 22490 aly 28666 screws 28675 28675 28675 28675

Reverse Scan retro-fit kit is available from Component Engineering.



Figure 1 - Assembly of Soundhead and Simplex Projector



Figure 2 - Drive Side Assembly

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TAKE-UP SEAR

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PLUG FOR

Pass'









Figure 8 - Cross Section of Gear Box



Figure 9 - Cross Section of Soundhead



Figure 10 - Lateral Guide and Pressure Roller Assembly