Film-Tech

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CENTURY MASTER SOUND SYSTEM

INSTALLATION AND OPERATING INSTRUCTIONS

1. GENERAL

1.1 The amplifying system consists of the A2, A3, and A4 Amplifiers with the R4 Rectifier which are described in their respective sections, 4 and 5. The system is unique in that the high powered amplifiers have been separated from the rectifiers by placing them in separate cabinets. This has the advantage of free air circulation around the rectifier which is vitally important in hot projection rooms, and greatly simplifies trouble shooting since all terminals for the power supply are terminated in a convenient place where they can be quickly checked and emergency batteries substituted if necessary.

1.2 All the usual front wall apparatus such as pre-amplifiers and faders have been eliminated. (The sound from each machine is regulated by means of the volume control dial on that machine.) Thus a considerable amount of conduit and wiring is eliminated and the installation cost reduced accordingly.

1.3 The changeover is made, as described in section 6.6 for the R2 Reproducer, by pressing the changeover button on the incoming machine. This operates a relay in the C2 Cabinet which connects that machine to the amplifying and loudspeaker system. Successive operation of this button has no effect and sound will continue on that machine until the button on the other machine is pressed. A third machine is added merely by changing the strapping as specified on the schematic drawing and plugging in an additional relay.

1.4 The power for the monitor horn is obtained from a separate amplifier stage of the main amplifier so that its volume can be regulated at will. It can also be set on a selected step chosen by the operators for judging the volume that is being delivered to the loudspeakers. This design allows full power for the auditorium loudspeakers - a gain of two or three times in theatre volume.

1.5 The R2 Reproducer which forms the sound head for this system is described in section 6.

1.6 The loudspeaker system recommended is the Altec Lansing "The Voice of The Theatre" described in section 7.

2. INSTALLATION

2.1 The R2 Reproducer should be installed in accordance with section 6.5.

2.2 The Conduit Layout, E-1031, and the Schematic, E-1154, are intended to be self-explanatory and to convey all information for installing the amplifier system other than such general rules and local electrical wiring regulations which may be applicable.

2.3 The loudspeaker systems are the Altec Lansing Type and should be installed in accordance with section 7.

3. ADJUSTMENTS AND TUNE-UP

3.1 Tubes and exciter lamps should be inserted and the following adjustments made:

(a) Set the 110-125 volts taps of the R2 Power Supply for the voltage rating nearest the actual line voltage.

(b) With the exciter lamps lighted, adjust the R3 Power Supply until a voltage of between 8 and 8.5 volts is obtained across the exciter lamp terminals of each R2 Reproducer. This adjustment is performed on early systems by means of an adjustable resistor R2. On later systems, low voltage taps are provided, on the Transformer, T1.

(c) With the phototubes removed from the machines and with a 1000 ohms per volt (or higher) voltmeter, check the potential between contact 4 (count counter-clockwise direction from key-way in socket when looking at tube side of socket) of the phototube socket and ground. This potential should be 82.5 volts plus or minus 2.5 volts. A lower voltage will result in reduced sensitivity and high noise-to-signal ratio whereas a voltage higher than 85 volts may result in a breakdown between phototube elements. The voltage is adjusted as required by varying the setting of R2 in the R2 Power Supply.

(d) Re-insert the phototube, adjusting the socket if necessary to insure that the light does not strike the anode and does not spill over the lower edge of the cathode. (A shadow of the anode on the cathode or a spill-over on the lower edge of the cathode may cause machine noise pick-up.)

3.2 The tune-up procedure shall be as follows:

(a) A Power level indicator should be connected to output terminals 11 and 12 of A2 Amplifier. A 12 ohm load should be substituted for the horn load. Operate an approved multifrequency test film on the system. The curve obtained after applying the film corrections should be approximately that shown in drawing E-1155 - curve "A".

(b) If it is necessary to readjust the optical system, follow section 3.3.

(c) Run the Academy Standard Theatre Sound Test Reel ASTR-3 (New Edition) and follow out the regular listening tests - section 8.

(d) Make such changes in the curve as may be indicated, being guided by Drawing E-1155.

(e) The RT-107 retard coil in the A2 Amplifier is for use in equalizing the high end response. Either one of two types may be used depending on availability. One type consists of a coil in series with a tapped condensor giving three different resonant frequencies, and the other type consists of a coil in series with a small trimmer condensor which is factory adjusted to produce resonance at 8000 cycles. The adjustment is sealed by a snap button placed in the hole of the can over the trimmer condensor.

3.3 Adjusting the Sound Optical System:

3.31 Turn on the exciter lamp that is in the operating position behind the optical system. With no film in the machine a rectangular spot of light should be seen on the phototube cathode. Remove the phototube and hold a white card in the cathode plane. An image of the filament wire of the exciter lamp should be seen in the exact center of a subdued circle of light and the image should be more pronounced on the back wall of the amplifier compartment when it strikes the card at the hinge of the cover. Also, when the card is held near the collector lens a thin bright line of light should be seen and it should be exactly 90 degrees ffom the vertical axis of the film.

3.32 The optical system is now in approximate adjustment. Complete the adjustment for focus and azimuth with an 8000 cycle loop in the usual manner.

3.33 If the above does not apply the lens tube may be adjusted by loosening the clamping screws SC-140-A and SC-83-BB. The azimuth can be adjusted by turning eccentric EC-11-Sh and the focus by turning the knurled thumb screw on the lens tube. After adjusting be sure to tighten screws SC-140-A and SC-83-BB. If the exciter lamp requires vertical adjustment it can be accomplished by means of the two thumb nuts provided on the exciter lamp bracket.

4. AMPLIFIERS

4.1 The A2 Amplifier is a power amplifier designed to work from a 600 ohm line into 9, 20, or 600 ohms at an output level of 40 watts when using 6L6 tubes in the last stage, or 50 watts when using Western Electric 350-B tubes. Has not more than 1% RMS distortion at 1000 CPS and not more than 3% over the band from 50 to 7,500 CPS. It is equipped with a switching panel for film, non-sync and microphone inputs with a fourth position for transferring to a second A2 Amplifier for emergency operation. Three push-pull stages are employed giving a gain of 72 db. A monitor stage containing a single 6K6 vacuum tube is also provided.

4.2 The A3 Amplifier is a booster amplifier designed to work from a microphone or non-sync reproducer line of 600 ohms impedance into a 600 ohm load. It consists of two stages of amplification each employing a 6SJ7 tube.

4.3 The A4 Amplifier is mounted in the R2 Reproducer. It consists of 930 Phototube followed by one stage of resistance coupled amplification followed by a cathode follower stage, both stages employing a 6AK5 tube. It is designed to deliver an undistorted level of approximately o DB into a 600 ohm line. When used with a 4 Amp. 9 Volt Lamp operated at four amperes and an average lens tube, it will have a gain of 26.7 DB, as measured with a film calibrated in terms of "electrical film level".

5. RECTIFIERS

5.1 The R4 Rectifier is a complete assembly of an R2 and R3 power supply and "On-Off" switch with pilot light in a C3 Cabinet.

5.2 R2 Power Supply

5.21 The R2 Power Supply is a vacuum tube rectifier designed for delivering the plate and phototube voltage to the A2, A3, and A4 Amplifiers in the Century Master System. A winding is also provided on the power transformer for supplying the 6.3 volt vacuum tube heater currents to the amplifiers.

5.22 The R2 Power Supply mounts in the C3 Cabinet as a component part of the R4 Rectifier.

5.23 The R2 Power Supply consists of a low voltage rectifier (180 and 275 volts) employing a 5V4G type vacuum tube and associated double section rectifier and high voltage rectifier section (450 volts) employing a 5R4GY Vacuum Tube and associated double section filter. The a. c. voltages for both sections are taken from a single power transformer. A slide wire resistor is provided for adjusting the 180 volts potential.

5.24 The following ratings apply to this power supply:

Input voltage:	105, 110, 115, or 120 volts, 50-60 c. p. s.
Low voltage D.C.:	0 to 180 volts d.c. at 18 MA and 275 volts d.c. at 60 MA.
High voltage D.C.:	400* volts d.c. at 190 MA.
Heater voltage:	6.3 volts at 9.4 amperes

*400 volts d.c. can be changed to 450 volts d.c. by moving both plate connections from 540 volts to 615 volts terminals of power transformer, T1.

5.25 The no-load voltages delivered by the rectifier as checked with a meter having a resistance of 1000 ohms per volt are as follows:

400 volts terminal:	600 volts d. c.
275 volts terminal:	360 volts d. c.
180 volts terminal:	340 volts d. c. with R2 at maximum
6.3 volts terminal:	6.7 volts a. c.

5.3 R3 Power Supply.

5.31 The R3 Power Supply is a selenium rectifier designed for supplying current to two L2 exciter lamps and the change-over relay currents in the Century Master System.

5.32 The R3 Power Supply mounts in the C3 Cabinet as a component part of the R4 Rectifier.

5.33 The R3 Power Supply consists of a power transformer and a bridge type selenium rectifier stack and associated filter. Two one ohm slide wire resistors are provided for adjusting the current to each of two exciter lamps on early systems, and on later systems low voltage taps are provided on the transformer T1.

5.34 The following ratings apply to this power supply:

Input voltages:	115 volts, 50-60 c.p.s.
"Ex. Lamp" Output:	10.8 volts, D.C. at 9 amps. No-load voltage with high resistance meter, minimum 14 volts.
"Relay" Output:	Approximately 12 volts D.C.

6. R2 REPRODUCERS

6.1 The Century Master Reproducer embodies all the improvements and refinements indicated in a well considered evaluation of previous reproducers. It has a unique mechanical filter system, developed for minimizing the effect of both scanner bearing and film trouble. In this design the film path is arranged to take advantage of normal film compliance in order to obtain attenuation of high frequency mechanical disturbances and means are provided for greatly reducing the possibilities of film irregularities, setting up low rates of flutter sometimes referred to as "wows".

6.2 An unvarying tension is maintained on the film between scanner drum and sound sprocket by means of the eddy current drag produced in the flywheel. This is done by placing a copper ring in the flywheel, and causing it to rotate in a magnetic field produced by high coercive force magnets. The amount of drag and consequently the amount of film tension is adjusted at the factory by setting the air gap between the copper ring and the magnets. It is recommended that no change of this adjustment be made in the field.

6.3 A compliance damper assembly is provided in the form of an hydraulic flutter suppressor. It consists of a casting in which is mounted a pivoted arm supporting a ball bearing mounted roller over which the film rides. The roller is tensioned against the film by a spring attached to the pivoted arm. The spring tension is adjustable by means of a screw. Variations in the film tension as the film passes over the roller imparts irregular motions to the latter in the vertical plane. These motions are damped out by a viscous damper associated with the roller. The cup containing the damping fluid is readily removed by loosening a set screw. The damping fluid has been carefully chosen to have proper characteristics and to have a minimum of viscosity change with temperature. Only the specified type of Century Damping Fluid should be used.

6.4 A collector lens assembly is used between the film and the phototube. This design eliminates the difficulty of using mirrors or prisms and places the spot of light on the phototube cathode so that it does not vary in area. The spot on the phototube therefore will vary in intensity as the striations on the sound track modulate the light beam. This design of constant area-variable intensity spot insures that the variations in light are effective over the entire photosensitive surface of the phototube.

6.5 Installation of the R2 Reproducer

6.51 Read the following instructions in conjunction with the Assembly Drawing R2-3118, as it is important that the equipment be assembled in proper sequence. Doing so makes the job easier and will save time. The Reproducer is wired in accordance with Drawing E-1137.

(a) Place a washer (W-7047-L) on the two upper sound head mounting screws (SC-599-SHS) and start the screws in the rear of the sound head. Lift the sound head into position so that the screws fit into the slots at the top of the sound support. Insert the two lower screws with washers (SC-599-SHS) if an "L" type pedestal is used or SC-600-SHS if other pedestal is used and tighten all four screws so that the sound head is securely fastened.

(b) Mount the lower (take up) magazine using two SC-571-SH screws.

(c) Remove the CG-79-SH coupling from the motor shaft and fasten it to the motor driven shaft in the reproducer, lining up screw with flat on shaft.

(d) Mount take-up belt idler pulley assembly R2-140 on main frame with two SC-78-A screws and two WA-77-SHS washers.

(e) Mount the R2-150 motor and bracket assembly inserting the motor shaft in the flexible coupling, with four SC-532-SH steel screws, WA-68-SHS steel washers, WA-69-SHS rubber washers and TU-26-SHS rubber tubes. The steel washer should be next to the head of the screw and on top of the rubber washer. Three of the screws go in from above (1 on operating side and 2 on non-operating side of sound head) and one from below (on the operating side of sound head). Tighten the four screws securely. These are special screws which when tight provide correct pressure on the rubber washers. Line up motor shaft with motor driven

6.51 (Continued)

(e) Continued:

shaft in the sound head by loosening the four SC-503-SH motor fastening screws and shift the motor into line. Retighten the four SC-503-SH screws. Secure the coupling to the motor shaft, lining up set screw with flat on the shaft. Assemble the motor brake R2-151 on the motor bracket.

(f) Mount the motor housing assembly R2-250, using three SC-564-SH screws and WA-68-SHS washers.

(g) Mount projector on reproducer set using SC-564-SH screws. Four shall be used with a Century Projector and two with other projectors. Care should be taken that projector is mounted squarely and not at an angle.

(h) Assemble SK-518-SH chain sprocket on lower sprocket shaft making hub flush with end of shaft.

(i) Assemble the R2-220 gear and sprocket assembly in the projector. The 17 tooth pinion is held in place by two pivot screws in the PY-6-G pulley and the shaft is secured in the regular manner. The oil cup is necessary only with projectors other than Century models "C" and "CC". The silent chain CI-78-SH should be placed on the sprockets before the above assembly is put in place.

(j) Mount the Chain Idler Roller Assembly R2-210 leaving the chain fully slack.

(k) Install the impedance drum assembly R2-10 as follows:

Remove the collector lens assembly R2-13 and insert the scanner assembly in the sound head from the drive side of the reproducer. Secure with the three SC-143-G screws from the operating side of the reproducer. Replace the R2-13 collector lens assembly. Remove the three SC-75-A screws from the bearing cover plate RI-36-SH on the rear of the scanner housing, remove the chipboard gasket SA-524-SH and replace the cover plate. Remove the three SC-81-BB screws from the scanner housing cover which hold the flywheel in place for shipment (these screws are not in countersunk holes). Tighten the three screws in the bearing cover plate (RI-36-SH). This places the flywheel in its operating position.

(l) Adjust the chain idler R2-210 to take up most of the slack in the drive chain.

6.51 (Continued)

(m) Install take up belt BE-137-SHS cutting to proper length and adjust take-up belt idler R2-140 to provide proper tension of the belt.

(n) Remove the oil reservoir CU-69-SH in the damper R2-20 by loosening the screw SC-523-SH and fill with the special damping fluid supplied for this purpose to the groove on the inside of the reservoir. Replace the reservoir and tighten SC-523-SH screw.

(o) Install two exciter lamps in their sockets in the exciter lamp compartment, by pressing the lamp down and giving a slight clockwise twist to lock in position. Put one drop of oil on each gear and one drop of oil in the oil cups on the upper and lower sprocket shafts. Do not attempt to oil the motor as this is a ball bearing motor and does not require oil.

(p) The lens tube may be adjusted for azimuth and focus in accordance with section 3.3.

(q) If the exciter lamps require vertical adjustment, it can be accomplished with the two thumb nuts NU-31-SH and NU-32-SH.

(r) The impedance roller may be adjusted laterally for proper positioning of the film on the scanner drum by turning the knurled knob KN-17-SH. This roller should be set so that it will keep the film sound track in the correct lateral position with respect to the light beam. The knob for adjusting lateral movement or the sound track in the light beam is provided with an indexed head. This index permits returning the alignment quickly to normal after it has been offset to eliminate sprocket hole or frame line noise on the occasional film which has a misplaced sound track. This adjusting should be made with the film running.

(s) The film is threaded in the reproducer as follows: After passing the film over the impedance drum, close the impedance roller. Pass the film over the flutter suppressor to the sound sprocket, leaving one or two sprocket holes slack (excess film at this point will dispose of itself in the loop above the scanner when the machine is started, but too much film will, of course, throw the sound somewhat out of synchronization with the picture. When machine is running the red line on the hydro flutter suppressor will be approximately parallel with the cover plate.

6.6 The three-position switch on the exciter lamp compartment controls the exciter lamp and vacuum tube filaments of the A4 Amplifier. No. 1 position lights No. 1 lamp (the outside lamp) and the vacuum tube filaments and No. 2 position lights No. 2 lamp and the vacuum tube filaments. The center position is "OFF". The lamp that is on should be placed in position just behind the lens by a simple movement of the bracket. The other lamp serves as a spare in case of a filament burn-out. If it is desirable to have the vacuum tube filaments on at all times, strap the switch accordingly. See Drawing E-1137. The volume of the sound output is controlled by the potentiometer on the door of the phototube amplifier compartment. Advancing the potentiometer in a clockwise direction (i.e., toward the higher numbers) increases the volume.

The machine is connected into the system by operating the pushbutton located above the volume control potentiometer. Sucessive operation of the pushbutton has no effect, but operation of the pushbutton on another machine (on two and three machine installations) switches the sound to the other machine. Change-overs are therefore made by standing by the incoming machine and pressing the pushbutton when the proper cue appears on the screen.

The change-over pushbutton can be supplemented for remote control (at any part of the booth desired by the operators) by connecting another button or switch in parallel with the one on the machine.

6.7 MISCELLANEOUS

6.71 Replace the exciter lamps when they blacken to the extent of reducing the sound output by 3 db as determined by comparision with a new lamp.

6.72 Replace the vacuum tubes when they reduce the sound output by 1 or 2 db compared to a new tube with sound generated by permitting a small amount of light from an a. c. lamp to strike the phototube. Also replace them when they are microphonic. (Note: A tube found to be microphonic in the first stage may be satisfactory in the second stage.)

6.73 Replace the phototube when it differs by 3 db from a new one when checked with sound generated by permitting a small amount of light from an a. c. lamp to strike the phototube. (The actual phototube current with 8.6 volts on the exciter lamp, no film in the machine and a microammeter in series with contact 4 by means of a socket adaptor, should be approximately 3 microamperes.)

6.74 Keep all lenses clean. When cleaning use care not to scratch them. First remove as much dirt as possible with a soft brush. Then polish with lens cleaning fluid and lens tissue.

7. LOUDSPEAKER SYSTEM

7.1 GENERAL - The Altec Lansing "A" Series, Two Way Multicellular Loudspeaker Systems, represent the first major improvement in design since the two way system was introduced. In general, the advantages of the new Altec Lansing Loudspeaker Systems are as follows:

Higher Efficiency (2-- 6 db, with a general average of 3-- 4 db, over existing systems.)
Wider frequency range with a better transient response.
New permanent magnets.
Diaphragms that are easily replaceable.
No back-stage resonance.
A higher safety factor at increased power.
Improved presence.
Better definition.

7.2 DESCRIPTION - The A-1-X to A-5 Systems, inclusive, include separate HF and LF Horns, mounting 288 (HF) and 515 (LF) Speakers with an N-2000 - B Network.

7.21 288 HF Speaker - This Speaker incorporates a metallic diaphragm having tangential compliance. The voice coil is wound with rectangular aluminum ribbon to which are connected beryllium copper spot welded leads. The voice coil and diaphragm assembly is mounted in a cast bakelite ring doweled for alignment. An Alnico #5 permanent magnet is used which provides higher flux density, in the air gap, than that which has previously been obtainable in energized field types of units. Stray fields have been reduced to a minimum. The efficiency of this speaker, when mounted on a suitable multicellular horn, is such that a sound level of 98 db (ref. 10-16 watts per square centimeter) is produced at five feet distance with an electrical input of 0.1 watt at 1000 cycles. This represents an over-all efficiency of approximately 60%. Maximum impedance variation over transmitted range is less than 2 to 1, as used in the "A" type systems.

7.22 515 LF Speaker - This Speaker is mounted in a 15" die cast frame. It uses a seamless molded cone having an effective area of 123 square inches and is moisture resistant. The voice coil is 3" in diameter and is edgewise wound with copper ribbon. As in the case of the 288 HF Speaker, an Alnico #5 permanent magnet is used for field excitation. The maximum impedance variation over the transmitted range is not more than 2½ to 1, as used in the "A" type systems.

7.23 LF Horns - The LF Horns are straight exponential units. They are totally enclosed from the rear so that radiation from the back of the LF Speakers is dissipated in the enclosure. This reduces back stage resonance which has in

7.2 (CONTINUED)

7.23 (CONTINUED)

the past, caused detrimental hangover and masking of the auditorium sound. Acoustic ports or vents are provided in the front, which together with wings load the LF Speakers and increase the efficiency and output in the range below 80-100 cycles.

7.24 N-500-C Network - This network is a parallel type 180 deg., 12 ohm., constant resistance network, consisting essentially of a low and high pass filter designed to operate from a common source at their input ends. Insertion loss is less than ½ db. The crossover point is at 500 cycles, and at this point power is divided between the high and low frequency legs, such that each branch is down 3 db. The attenuation slope is approximately 23 db. per octave. Provision is made for attenuating the HF Speakers in 4 steps of 1 db. each. One HF and one LF Speaker Cable is furnished connected to each network, tagged to correspond to Terminals L-1 and L-2 on speakers. In the A-1 and A-3 Systems, HF lead L-1 should be connected to HF Speaker Terminal L-2 and HF lead L-2 to HF Speaker Terminal L-1.

7.25 604 Duplex Speaker - This Speaker is a combination HF and LF Speaker, and is similar in construction to, and incorporates the features of the 288 (HF) and 515 (LF) Speakers. The LF Diaphragm and Voice Coil Assembly is identical with that used in the 515 Speaker. The HF Horn is a six cell (2 x 3) multicellular unit mounted in the face of the LF Speaker. Power from the HF Speaker is fed through the pole piece of the LF Speaker. Refer to E. B. Duplex Loudspeaker Systems.

7.26 N-2000-B Network - This network is similar to the N-500-C Network. The crossover point is at 2000 cycles, and the input and output impedances 20 ohms. Provision is made for attenuating the HF Speaker in 4 steps of approximately 1 - 1.5 db. each.

7.3 INSTALLATION

7.31 Assemble LF Horn center sections, wings and stand (when supplied). Low frequency speakers are mounted from the rear, after removing rear panel covering speaker compartment. This panel should be replaced after speakers are mounted and wired.

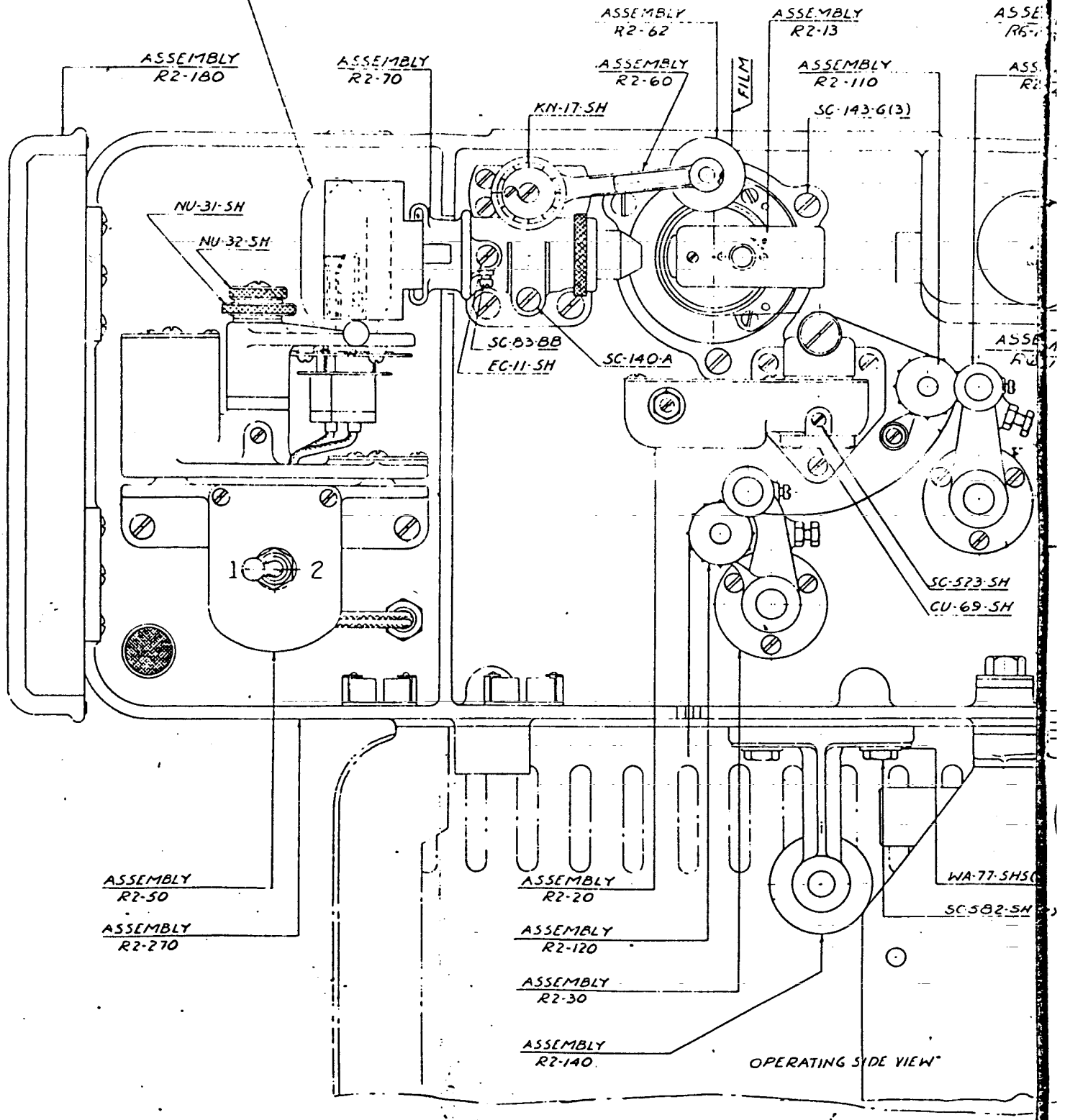
7.32 Assemble High Frequency Horn, Throat and Speakers, with mounting hardware, on the HF Horn Sled, positioning it by means of spotting holes or markings that appear thereon. Particular care should be exercised, when mounting the HF Speakers on the Horn Throats, that the Speakers and Throats line up, before tightening mounting stud nuts. Fasten the

NOTE 3- FOR "C" PEDESTAL
USE SOUNDHEAD SUPPORT # S-6255-L & THE FOLLOWING REPRODUCER MOUNTING SCREWS

PART NO	REQ'D
SC-599-SH	2
SC-600-SH	2
WA-105-SH	4

NOTE 2 F

NOTE 4-
WITH A.C. EXCITER LAMP POWER SUPPLY
USE 10 VOLT 7.5 AMP LAMP LP-18-SH
WITH D.C. POWER SUPPLY
USE 9 VOLT 4 AMP LAMP LP-15-SH



SCALE: 1:1

R "L" PEDESTAL USE SOUNDHEAD SUPPORT G250-L & THE FOLLOWING REPRODUCER MOUNTING SCREWS

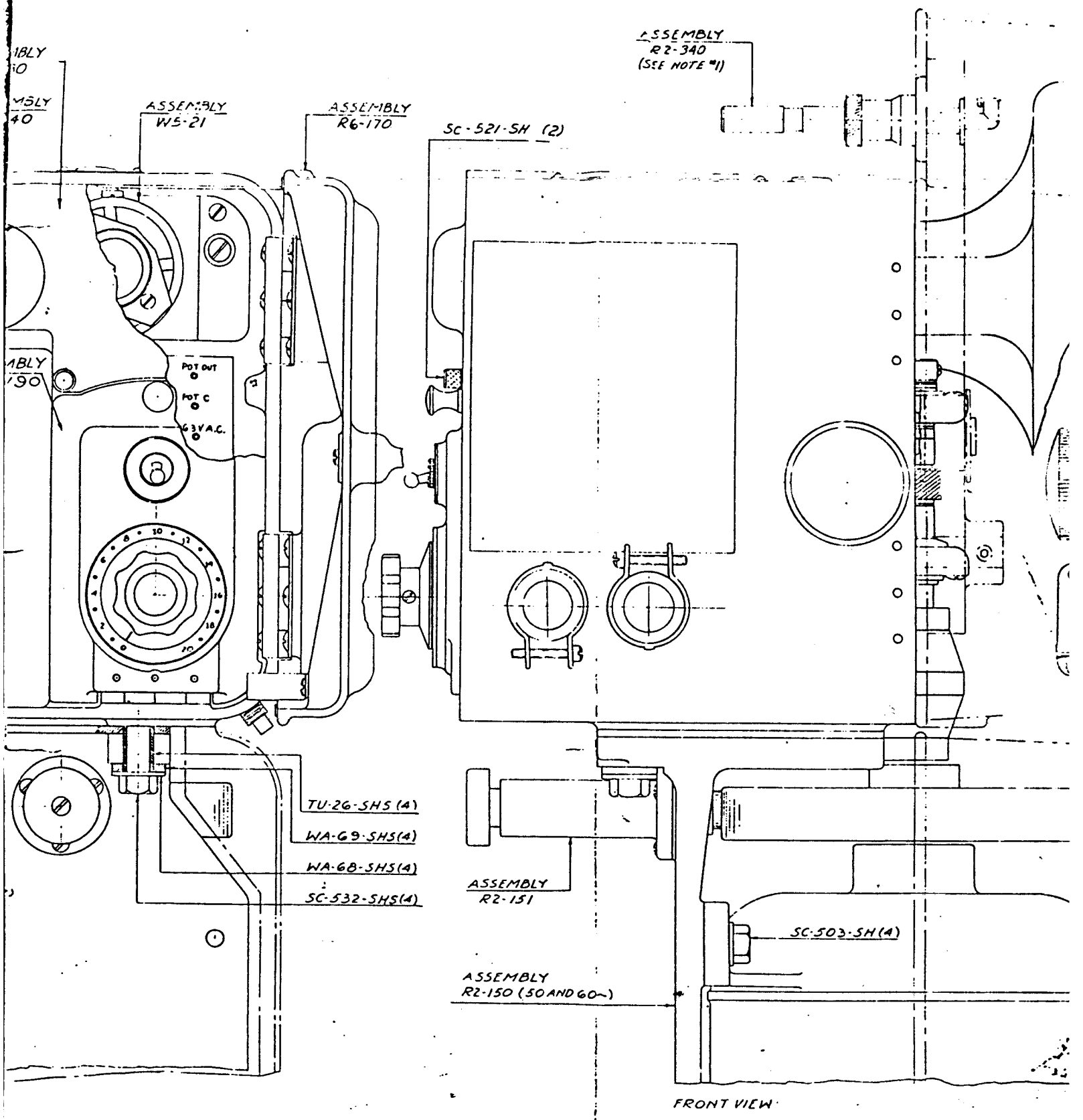
PART NO	REQ'D
SC-539-SH	4
WA-105-SH	4

NOTE:1 (A) FOR CENTURY "C" & "E" PROJECTORS WHICH ARE EQUIPPED WITH C1-110 (STYLE II) MAIN DRIVE SHAFT ASSEMBLY, USE SR-145-SH CHAIN SPROCKET ONLY IN PLACE OF R2-340 ASSEMBLY.

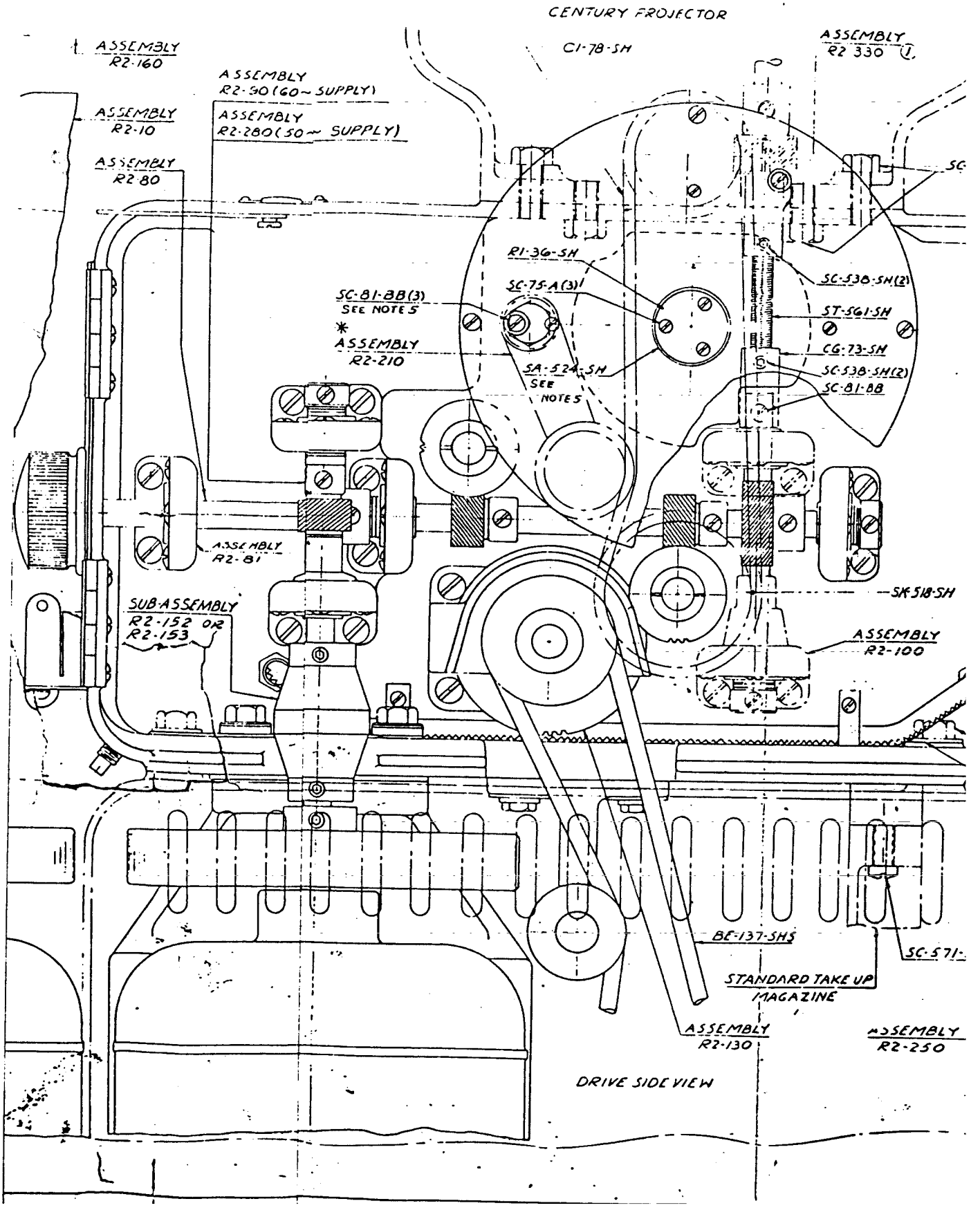
(B) FOR SIMPLEX E-7 PROJECTORS USE R2-320 ASSEMBLY IN PLACE OF R2-340 ASSEMBLY.

(C) FOR BRENKERT PROJECTORS USE R2-350 ASSEMBLY IN PLACE OF R2-340 ASSEMBLY.

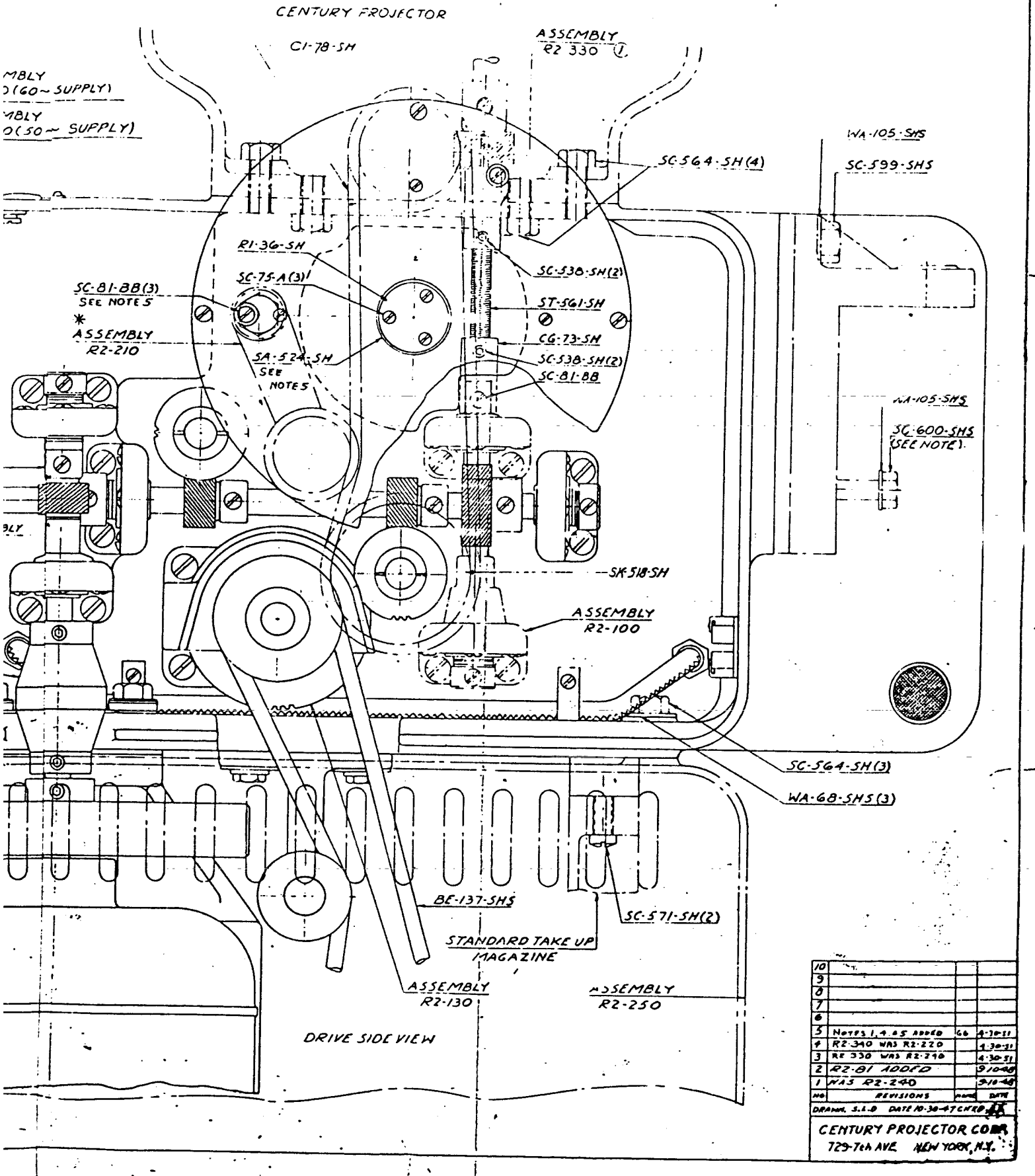
NOTE 5 - PARTS [illegible] SHIPPING [illegible] INSTALLATION



...SA-524-SH SEE FOR
...G PROTECTION, TO BE REMOVED AT
...LATION.



DWG. No. RG-3616
NAME ASSEMBLY
RG REPRODUCER WITH
IVS-20 PRE-AMPLIFIER



NO	REVISIONS	NAME	DATE
10			
9			
8			
7			
6			
5	NOTES 1, 4 & 5 ADDED	GG	4-30-51
4	R2-340 WAS R2-220		4-30-51
3	R2-330 WAS R2-240		4-30-51
2	R2-81 ADDED		9/10/48
1	WAS R2-240		9/10/48

DRAWN S.L.D DATE 10-30-47 CHKD

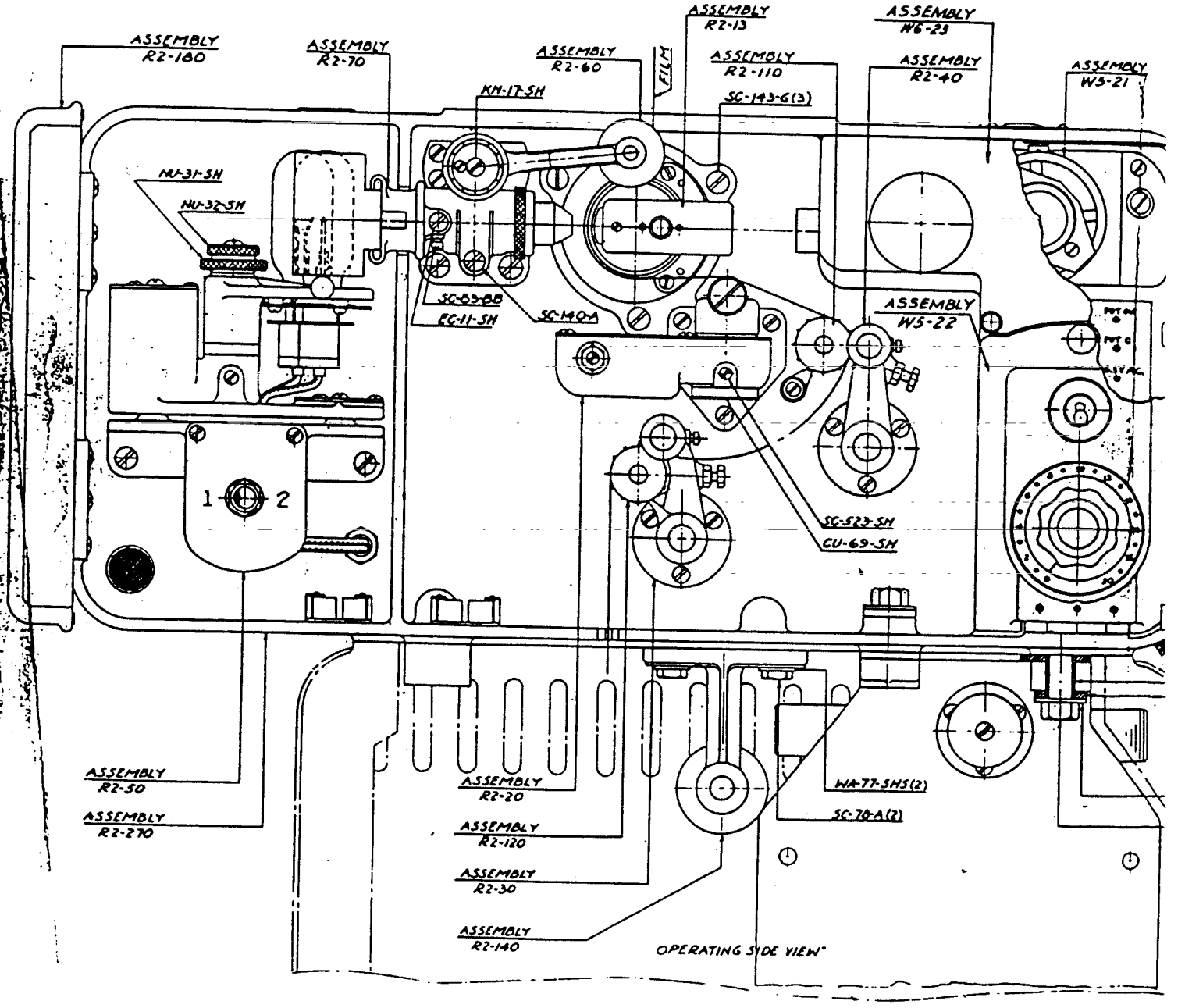
CENTURY PROJECTOR CORP.
729-7th AVE. NEW YORK, N.Y.

NOTE: * FOR "C" & FIVE POINT IMPROVED PEDESTALS USE SOUNDHEAD SUPPORT #S-6255-L & THE FOLLOWING REPRODUCER MOUNTING SCREWS

PART NO	REQ'D
SC-599-SHS	2
SC-600-SHS	2
WA-105-SHS	4

NOTE: * FOR "L" PEDESTAL USE SOUNDHEAD #S-6250-L & THE FOLLOWING REPRODUCER MOUNTING SCREWS

PART NO	REQ'D
SC-599-SHS	4
WA-108-SHS	4



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CENTURY PROJECTOR CORPORATION

MASTER REPRODUCER - MODEL R2

PART NO.	DESCRIPTION
R2-10	IMPEDANCE DRUM ASSEMBLY
R2-13	Collector Lens Holder Sub-Assembly
R2-14	Impedance Flywheel Cover Plate Sub-Assembly
R2-15	Collector Lens Holder Bracket Sub-Assembly
R2-17	Impedance Drum and Flywheel Shaft Assembly
BG-96-SH	Bearing, Impedance Flywheel Shaft Ball
HS-20-SH	Housing, Impedance Flywheel
PN-32-SH	Pin, Locating
RI-36-SH	Ring, Impedance Ball Bearing Retainer
SC-75-SH	Screw, Retainer Ring Fastening (3)
SC-527-SH	Screw, Ball Bearing Fastening
SC-143-SH	Screw, Impedance Drum Fastening
R2-11	IMPEDANCE DRUM FLYWHEEL AND RING ASSEMBLY
RI-37-SH	Ring, Impedance **
WH-62-SH	Flywheel, Impedance Drum **
R2-13	COLLECTOR LENS HOLDER SUB-ASSEMBLY
R2-12	Condenser Lens Sub-Assembly
HO-21-SH	Holder, Collector Lens
LS-14-SH	Lens, Relay
PG-144-SH	Plug, Condenser Lens Fastening Screw
PN-126-SH	Pin, Collector Lens Holder Locating (2)
RI-41-SH	Ring, Relay Lens Retainer
SC-291-SH	Screw, Collector Lens Holder Mounting
SC-603-SH	Screw, Condenser Lens Fastening
R2-14	IMPEDANCE FLYWHEEL COVER PLATE SUB-ASSEMBLY
MG-2-SH	Magnet, Impedance Flywheel (4)
PE-93-SH	Plate, Impedance Flywheel Cover
RI-35-SH	Ring, Outer Impedance
SC-75-SH	Screw, Outer Impedance Ring Fastening (4)
SC-601-SH	Screw, Magnet Fastening (4)
WA-75-SH	Washer, Magnet Fastening Screw (4)
SC-72-SH	Screw, Cover Plate Fastening (4)
R2-15	COLLECTOR LENS HOLDER BRACKET SUB-ASSEMBLY
BG-96-SH	Bearing, Impedance Flywheel Shaft Ball
BR-97-SH	Bracket, Collector Lens Holder
PN-127-SH	Pin, Collector Lens Bracket Locating (2)
SC-606-SH	Screw, Ball Bearing Fastening (3)
SC-72-SH	Screw, Ball Bearing Bracket Fastening (2)

** Parts Not Sold Separately

CENTURY PROJECTOR CORPORATION

PARTS LIST

FOR CENTURY MASTER REPRODUCER - MODEL R2

PART NO.	DESCRIPTION
R2-10	IMPEDANCE DRUM ASSEMBLY
R2-20	OIL DAMPER ASSEMBLY
R2-30	LOWER PAD ROLLER ARM ASSEMBLY
R2-40	UPPER PAD ROLLER ARM ASSEMBLY
R2-50	EXCITER LAMP ASSEMBLY
R2-60	IMPEDANCE ROLLER ASSEMBLY
R2-70	LENS TUBE BRACKET ASSEMBLY
R2-80	HORIZONTAL DRIVE SHAFT ASSEMBLY
R2-90	MOTOR DRIVE SHAFT ASSEMBLY (60 CYCLE)
R2-110	SOUND SPROCKET SHAFT ASSEMBLY
R2-120	TAKE-UP SPROCKET SHAFT ASSEMBLY
R2-130	TAKE-UP DRIVE ASSEMBLY
R2-140	BELT TAKE-UP IDLER ASSEMBLY
R2-150	MOTOR AND BRACKET ASSEMBLY (60 CYCLE 5/8" SHAFT)
R2-160	NON OPERATING SIDE DOOR ASSEMBLY
R2-170	RIGHT FRONT DOOR ASSEMBLY
R2-180	LEFT FRONT DOOR ASSEMBLY
R2-210	CHAIN IDLER ROLLER ASSEMBLY
R2-220	CHAIN DRIVE ASSEMBLY
R2-250	MOTOR HOUSING AND DOOR ASSEMBLY
R2-270	MAIN FRAME ASSEMBLY & MISCELLANEOUS PARTS
R2-T-10	CONVERSION PARTS FOR 60 CYCLE OPERATION 1/2" MOTOR SHAFT
R2-T-20	CONVERSION PARTS FOR DIRECT DRIVE OPERATION
R2-T-30	CONVERSION PARTS FOR 50 CYCLE OPERATION
R2-T-40	CONVERSION PARTS FOR 25 CYCLE OPERATION
R2-T-50	CONVERSION PARTS FOR CENTURY W-2 SOUND AMPLIFICATION SYSTEM

PART NO.	DESCRIPTION
R2-16	IMPEDANCE DRUM AND SHAFT ASSEMBLY
DR-10-SH	Drum, Impedance **
SC-81-SH	Screw, Impedance Flywheel and Drum Fastening (2)
ST-290-SH	Shaft, Impedance Drum **
R2-17	IMPEDANCE DRUM AND FLYWHEEL SHAFT ASSEMBLY
R2-11	Impedance Drum Flywheel and Ring Assembly
R2-16	Impedance Drum and Shaft Assembly
CL-71-SH	Collar, Impedance Flywheel Shaft
SC-526-SH	Screw, Impedance Flywheel Shaft Collar Fastening
R2-20	OIL DAMPER ASSEMBLY
AR-27-SH	Arm, Oil Damper
BG-98-SH	Bearing, Oil Damper Shaft Ball (2)
BG-99-SH	Bearing, Oil Damper Arm Ball (2)
CU-69-SH	Cup, Oil Damper
HS-19-SH	Housing, Oil Damper
NU-33-SH	Nut, Oil Damper Bearing Screw (2)
PE-91-SH	Plate, Oil Damper Cover
PN-94-SH	Pin, Oil Damper Tension Spring
PU-90-SH	Plunger, Oil Damper
RT-40-SH	Retainer, Oil
SC-103-SH	Screw, Oil Damper Bearing Shaft Fastening
SC-282-SH	Screw, Oil Damper Bearing
SC-284-SH	Screw, Spring Adjusting
SC-285-SH	Screw, Oil Damper Ball Bearing Fastening (2)
SC-523-SH	Screw, Oil Cup Fastening
SC-604-SH	Screw, Cover Plate Fastening (4)
SG-287-SH	Spring, Oil Damper Tension
ST-283-SH	Shaft, Oil Damper Bearing
SC-140-SH	Screw, Oil Damper Fastening (3)
FD-12-SH	Fluid, Damper
R2-30	LOWER PAD ROLLER ARM ASSEMBLY
R2-31	Lower Pad Roller Arm Stud and Flange Sub-Assembly
C1-C-21	Pad Roller Shaft and Knob Assembly
AR-29-SH	Arm, Lower Pad Roller
BL-18-SH	Ball, Pad Roller Arm (2)
NU-8-SH	Nut, Pad Roller Stop Screw
RO-15-SH	Roller, Pad
SC-87-SH	Screw, Pad Roller Stop
SC-89-SH	Screw, Pad Roller Shaft Fastening
SG-21-SH	Spring, Pad Roller (2)
SC-72-SH	Screw, Pad Roller Arm Fastening (3)
R2-31	LOWER PAD ROLLER STUD AND FLANGE SUB-ASSEMBLY
R2-32	Lower Pad Roller Stud and Knob
FL-8-SH	Flange, Lower Pad Roller Arm
PN-103-SH	Pin, Lower Pad Roller Arm Flange Taper

** Parts Not Sold Separately

PART NO.	DESCRIPTION
R2-52	EXCITER LAMP ADJUSTING STUD AND BUSHING SUB-ASSEMBLY
R2-53	EXCITER LAMP LEAD WIRE SUB-ASSEMBLY
LU-23-SH	Lug, Terminal (2)
WI-86-SH	Wire, Exciter Lamp Lead (2)
R2-60	IMPEDANCE ROLLER ASSEMBLY
R2-62	Impedance Roller and Bearing Sub-Assembly
R2-63	Impedance Roller Shaft and Knob Sub-Assembly
R2-64	Impedance Roller Stud and Bushing Sub-Assembly
AR-30-SH	Arm, Impedance Roller
BL-18-SH	Ball, Impedance Roller Bearing
KN-17-SH	Knob, Impedance Roller Adjusting
SC-82-SH	Screw, Impedance Roller Adjusting Stop
SC-103-SH	Screw, Shaft Fastening
SC-504-SH	Screw, Knob Clamp
SG-289-SH	Spring, Impedance Roller Adjusting
SG-295-SH	Spring, Impedance Roller Ball
SC-140-SH	Screw, Impedance Roller Fastening
R2-62	IMPEDANCE ROLLER AND BEARING SUB-ASSEMBLY
R2-61	Impedance Roller Sub-Assembly
BG-99-SH	Bearing, Impedance Roller Ball (2)
R2-63	IMPEDANCE ROLLER SHAFT AND KNOB SUB-ASSEMBLY
R2-64	IMPEDANCE ROLLER STUD AND BUSHING SUB-ASSEMBLY
R2-70	LENS TUBE BRACKET ASSEMBLY
R2-71	Exciter Lamp Shield and Pin Sub-Assembly
BR-136-SH	Bracket, Lens Tube
BU-135-SH	Bushing, Lens Tube
EC-11-SH	Eccentric, Lens Tube
SC-83-SH	Screw, Lens Tube Eccentric Fastening
SC-140-SH	Screw, Lens Tube Clamp
TU-27-SH	Tube, Lens
SC-79-SH	Screw, Lens Tube Bracket Fastening
R2-71	EXCITER LAMP SHIELD AND PIN SUB-ASSEMBLY

PART NO.	DESCRIPTION
R2-40	UPPER PAD ROLLER ARM ASSEMBLY
R2-41	Upper Pad Roller Arm Stud and Flange Sub-Assembly
C1-C-21	Pad Roller Shaft and Knob Assembly
AR-28-SH	Arm, Upper Pad Roller
BL-18-SH	Ball, Pad Roller Arm (2)
Nu-8-SH	Nut, Pad Roller Stop Screw
RO-15-SH	Roller, Pad (RO-100)
SC-88-SH	Screw, Pad Roller Shaft Fastening
SC-293-SH	Screw, Pad Roller Stop
SG-21-SH	Spring, Pad Roller (2)
SC-72-SH	Screw, Pad Roller Arm Fastening (3)
R2-41	UPPER PAD ROLLER ARM STUD AND FLANGE SUB-ASSEMBLY
R2-42	Upper Pad Roller Arm Stud and Knob Sub-Assembly
FL-8-SH	Flange, Upper Pad Roller Arm
PN-105-SH	Pin, Upper Pad Roller Arm Flange Taper
R2-42	UPPER PAD ROLLER ARM STUD AND KNOB SUB-ASSEMBLY
K2-50	EXCITER LAMP ASSEMBLY
-52	Exciter Lamp Adjusting Stud and Bushing Sub-Assembly
-53	Exciter Lamp Lead Wire Sub-Assembly
BA-102-SH	Base, Exciter Lamp
BL-18-SH	Ball, Exciter Lamp Stop (2)
BR-103-SH	Bracket, Exciter Lamp Base
BR-104-SH	Bracket, Exciter Lamp Mounting
BU-109-SH	Bushing, Vibration Absorbing (2)
KN-21-SH	Knob, Exciter Lamp Base
NU-51-SH	Nut, Exciter Lamp Adjusting
NU-52-SH	Nut, Exciter Lamp Jam
PS-50-SH	Plate, Switch Mounting
PE-125-SH	Plate, Exciter Lamp Retaining (3)
SC-82-SH	Screw, Retaining Plate Fastening (9)
SC-88-SH	Screw, Switch Plate Fastening (2)
SC-536-SH	Screw, Stop and Stud Fastening (2)
SC-539-SH	Screw, Socket Fastening (6)
SC-562-SH	Screw, Adjusting Bushing Fastening
SC-605-SH	Screw, Vibration Absorbing Bushing Fastening (2)
SF-643-SH	Socket, Exciter Lamp (2) (SF-647)
SG-21-SH	Spring, Exciter Base (2)
SU-510-SH	Stud, Vibration Absorbing
SW-541-SH	Switch, Exciter Lamp (SWJ96)
WA-63-SH	Washer, Vibration Absorbing (3)
WA-70-SH	Washer, Vibration Absorbing Stud (3)
LP-15-SH	Lamp, Exciter (2) (D.C. Power Supply)(As Required)
LP-18-SH	Lamp, Exciter (2) (A.C. Power Supply)
SC-566-SH	Screw, Exciter Lamp Bracket Fastening (2).

PART NO.	DESCRIPTION
R2-130	TAKE-UP DRIVE ASSEMBLY
BR-106-SH	Bracket, Take-Up Drive
BU-107-SH	Bushing, Take-Up Drive Shaft (2)
GR-44-SH	Gear, Take-Up Drive
PY-102-SH	Pulley, Take-Up Drive
SC-574-SH	Screw, Take Up Gear Fastening
ST-506-SH	Shaft, Take-Up Drive Gear
BE-137-SH	Belt, Take-Up
SC-79-SH	Screw, Take-Up Drive Bracket Fastening (2)
R2-140	BELT TAKE-UP IDLER ASSEMBLY
AR-31-SH	Arm, Belt Take-Up Pulley
PY-100-SH	Pulley, Belt Take-Up
SC-97-SH	Screw, Belt Take-Up Pulley Stud Fastening
SU-511-SH	Stud, Belt Take-Up Pulley
SC-78-SH	Screw, Belt Take-Up Arm Fastening (2)
WA-77-SH	Washer, Blet Take-Up Arm Fastening Screw (2)
R2-150	MOTOR AND BRACKET ASSEMBLY (60 CYCLE-5/8" Shaft)
R2-151	Motor Brake Assembly
R2-153	Motor, Flywheel & Coupling Assembly (With 5/8" Motor Shaft)
BR-101-SH	Bracket, Motor
[illegible]	[illegible]
SC-503-SH	Screw, Motor Fastening (4)
SC-532-SH	Screw, Motor Bracket Fastening (4)
TU-26-SH	Tubing, Motor Bracket Fastening Screw Rubber (4)
WA-68-SH	Washer, Motor & Motor Bracket Fastening Screw (4)
WA-69-SH	Washer, Motor Bracket Fastening Screw Rubber (4)
WR-82-SH	Wrench, Allen (1/4")
R2-151	MOTOR BRAKE SUB-ASSEMBLY
HS-22-SH	Housing, Motor Brake
KN-22-SH	Knob, Motor Brake
PU-97-SH	Plunger, Motor Brake
PG-124-SH	Plug, Motor Brake Felt
RD-39-SH	Rod, Motor Brake Plunger
SC-127-SH	Screw, Motor Brake Knob Fastening
SG-531-SH	Spring, Motor Brake Compression
SC-72-SH	Screw, Motor Brake Fastening (3)
R2-153	MOTOR, FLYWHEEL & COUPLING ASSEMBLY (WITH 5/8" MOTOR SHAFT)
R2-155	Motor Flywheel Assembly
CG-96-SH	Coupling, Motor
MO-5-SH	Motor, Drive
SC-502-SH	Screw, Motor Coupling Fastening (Upper)
SC-620-SH	Screw, Motor Coupling Fastening (Lower)

PART NO.	DESCRIPTION
R2-80	HORIZONTAL DRIVE SHAFT ASSEMBLY
C1-G-31	Ball bearing Bracket Sub-Assembly (2)
CL-13-SH	Collar, Horizontal Drive Shaft Thrust
GR-40-SH	Gear, Vertical Shaft Drive
GR-43-SH	Gear, Sprocket Drive (2)
GR-58-SH	Gear, Motor Driven (Sold in Pairs Only With GR-57-SH)
SC-81-SH	Screw, Collar and Sprocket Drive Gear Fastening (3)
SC-641-SH	Screw, Motor Driven and Vertical Shaft Drive Gear Fastening (2)
ST-297-SH	Shaft, Horizontal Drive
WA-3-SH	Washer, Horizontal Drive Shaft B.B. Thrust Collar (Fibre)
WA-10-SH	Washer, Collar and Motor Driven Gear Thrust (Steel) (2)
WA-14-SH	Washer, Collar and Motor Driven Gear Spring Thrust
SC-143-SH	Screw, B.B. Bracket Fastening (4)
KN-20-SH	Knob, Horizontal Drive Shaft
SC-502-SH	Screw, Horizontal Drive Shaft Knob Fastening
C1-G-31	BALL BEARING BRACKET SUB-ASSEMBLY (2)
BG-9-SH	Bearing, Ball
BR-20-SH	Bracket, Ball Bearing
SC-127-SH	Screw, Ball Bearing Retaining (3)
R2-90	MOTOR DRIVE SHAFT ASSEMBLY (60 CYCLE)
C1-G-31	Ball Bearing Bracket Sub-Assembly (2)
CL-13-SH	Collar, Motor Drive Shaft Thrust
CL-28-SH	Collar, Lower Motor Drive Shaft Ball Bearing Oil Protection
GR-57-SH	Gear, Motor Drive (Sold in Pairs Only With GR-58-SH)
SC-81-SH	Screw, Collar and Motor Drive Gear Fastening (2)
SA-508-SH	Spacer, Motor Drive Gear
ST-298-SH	Shaft, Motor Drive
WA-3-SH	Washer, Motor Drive Shaft B.B. Thrust Collar (Fibre) (3)
WA-10-SH	Washer, Motor Drive Shaft B.B. Thrust Collar & Gear Thrust (Steel)
WA-14-SH	Washer, Motor Drive Shaft Gear Spring Thrust
SC-143-SH	Screw, Ball Bearing Bracket Fastening (4)
R2-110	SOUND SPROCKET SHAFT ASSEMBLY
GR-45-SH	Gear, Sound Sprocket
SC-89-SH	Screw, Sound Sprocket Fastening
SC-641-SH	Screw, Sound Sprocket Gear Fastening
SK967 ~~SK-560-SH~~	Sprocket, Sound
ST-505-SH	Shaft, Sound Sprocket
R2-120	TAKE-UP SPROCKET SHAFT ASSEMBLY
GR-45-SH	Gear, Take-Up Sprocket
SC-89-SH	Screw, Take-Up Sprocket
SC-641-SH	Screw, Take-Up Sprocket Gear Fastening
SK968 ~~SK-560-SH~~	Sprocket, Take-Up
ST-516-SH	Shaft, Take-Up Sprocket Drive
SC-502-SH	Screw, Chain Sprocket Fastening (2)
SK-518-SH	Sprocket Chain

PART NO.	DESCRIPTION
R2-220	CHAIN DRIVE ASSEMBLY
R2-221	Pinion & Chain Sprocket Sub-Assembly
CU-80-SH	Cup, Oil
ST-507-SH	Shaft, Main Drive
CI-78 -SH	Chain, Drive
R2-221	PINION & CHAIN SPROCKET SUB-ASSEMBLY
PI-96-SH	Pinion, Main Drive
SC-81-SH	Screw, Chain Sprocket Fastening (6)
SK-517-SH	Sprocket, Upper Chain
WA-64-SH	Washer, Chain Sprocket Fastening Screw, Lock (6)
R2-250	MOTOR HOUSING AND DOOR ASSEMBLY
CT-86-SH	Catch, Motor Housing Door
DO-14-SH	Door, Motor Housing
HI-26-SH	Hinge, Motor Housing Door (2)
HS-23-SH	Housing, Motor
KN-8-SH	Knob, Door
SR-60A-SH	Stop, Door Closing Felt (2)
SC-70-SH	Screw, Door Hinge Fastening (12)
SC-123-SH	Screw, Door Catch and Strike Fastening (4)
SC-568-SH	Screw, Door Knob Fastening (2)
SS-529-SH	Strike, Door
SC-564-SH	Screw, Motor Housing Fastening (3)
WA-68-SH	Washer, Motor Housing Fastening Screw (3)
R2-270	MAIN FRAME ASSEMBLY & MISCELLANEOUS PARTS
R2-272	Exciter Lamp Lead Wire Sub-Assembly
CI-A-11	Door Hinge and Pin Sub-Assembly (6)
BK-110-SH	Block, Take Up Magazine Mounting (2)
BU-126-SH	Bushing, Lower Take-Up and Sound Sprocket (4)
CN-87-SH	Connector, Squeeze (3/4") (2)
CP-21-SH	Clamp, Exciter Lamp Lead Wire (2)
CT-86-SH	Catch, Door (3)
CU-22-SH	Cup, Upper and Lower Sprocket Oil (2)
NU-6-SH	Nut, Exciter Lamp Nipple Fastening (2)
PE-99-SH	Plate, Cover
PG-128-SH	Plug, Oil Drain
PG-138-SH	Plug, Oil Tray
PN-28-SH	Pin, Bracket Locating (8)
SC-70-SH	Screw, Door Hinge & Cover Plate Fastening (22)
SC-110-SH	Screw, Door Stop Link (2)
SC-112-SH	Screw, Wire Clamp Fastening (2)
SC-565-SH	Screw, Door Catch Fastening (6)
SC-567-SH	Screw, Stripper Fastening
SC-594-SH	Screw, Name Plate Fastening (4)
SC-602-SH	Screw, Magazine Block Fastening (4)
SP-537-SH	Stripper, Sound Sprocket
VE-1-SH	Ventilator, Main Frame (2)
WA-78-SH	Washer, Stripper Fastening Screw

PART NO.	DESCRIPTION
R2-155	MOTOR FLYWHEEL ASSEMBLY (FOR 5/8" MOTOR SHAFT)
BU-142-SH	Bushing, Motor Flywheel**
SC-502-SH	Screw, Motor Flywheel Fastening (3)
WH-108-SH	Flywheel, Motor
R2-160	NON OPERATING SIDE DOOR ASSEMBLY
DO-11-SH	Door, Non-Operating Side
KN-8-SH	Knob, Door
LI-7-SH	Link, Door Stop
SB-60-SH	Stop, Door Closing Felt (2)
SC-70-SH	Screw, Door Hinge Fastening (6)
SC-110-SH	Screw, Door Stop Link
SC-123-SH	Screw, Door Strike Fastening (2)
SC-568-SH	Screw, Door Knob Fastening (2)
SS-528-SH	Strike, Door
R2-170	RIGHT FRONT DOOR ASSEMBLY
CP-20-SH	Clamp, Door Glass (4)
DO-13-SH	Door, Right Front
GL-48-SH	Glass, Door
KN-8-SH	Knob, Door
LI-7-SH	Link, Door Stop
SB-60-SH	Stop Door Closing Felt (2)
SC-70-SH	Screw, Door Hinge Fastening (6)
SC-110-SH	Screw, Door Stop Link
SC-540-SH	Screw, Door Knob Fastening (2)
SS-528-SH	Strike, Door
SC-123-SH	Screw, Glass Clamp & Strike Fastening (6)
R2-180	LEFT FRONT DOOR ASSEMBLY
DO-12-SH	Door, Left Front
SB-60-SH	Stop, Door Closing Felt (2)
SC-70-SH	Screw, Door Hinge Fastening (6)
SC-123-SH	Screw, Door Strike Fastening (2)
SS-528-SH	Strike, Door
R2-210	CHAIN IDLER ROLLER ASSEMBLY
AR-32-SH	Arm, Chain Idler Roller
RO-38-SH	Roller, Chain Idler
SC-97-SH	Screw, Chain Idler Roller Stud Fastening
SU-513-SH	Stud, Chain Idler Roller
SC-512-SH	Screw, Chain Idler Roller Fastening
WA-68-SH	Washer, Chain Idler Roller Fastening Screw

**Parts not sold separately

PART NO.	DESCRIPTION
SC-564-SH	Screw, Projector Fastening (4)
SC-571-SH	Screw, Take-Up Magazine Mounting (2)
SC-599-SH	Screw, Soundhead Mounting (Short) (4)
SC-600-SH	Screw, Soundhead Mounting (Long) (2)
TA-38-SH	Tray, Oil (Optional-Extra)
WA-105-SH	Washer, Soundhead Mounting Screw (4)
BK-159-SH	Block, Lower Magazine Spacer (Mass. Requirement) (2)
CR-113-SH	Cover, P. E. C.
SC-521-SH	Screw, P. E. C. Cover Fastening
R2-272	EXCITER LAMP LEAD WIRE SUB-ASSEMBLY
LU-17-SH	Lug, Wire
NI-35-SH	Nipple, Exciter Lamp (Short)
NI-36-SH	Nipple, Exciter Lamp (Long)
NU-6-SH	Nut, Exciter Lamp Lead Wire (2)
TU-29-SH	Tube, Exciter Lamp
WI-74-SH	Wire, Exciter Lamp Lead
WI-92-SH	Wire, Exciter Lamp Ground

SPECIAL PARTS

R2-80	HORIZONTAL DRIVE SHAFT ASSEMBLY (Export)
C1-G-31	Ball Bearing Bracket Sub-Assembly (2)
CL-13-SH	Collar, Horizontal Drive Shaft Thrust
GR-40-SH	Gear, Vertical Shaft Drive
GR-43-SH	Gear, Sprocket Drive (2)
GR-42-SH	Gear, Motor Driven (Sold in Pairs Only with GR-43-SH)
SC-81-SH	Screw, Collar and Sprocket Drive Gear Fastening (3)
SC-641-SH	Screw, Motor Driven and Vertical Shaft Drive Gear Fastening (2)
ST-297-SH	Shaft, Horizontal Drive
WA-3-SH	Washer, Horizontal Drive Shaft Ball Bearing Thrust Collar (Fibre)
WA-10-SH	Washer, Collar and Motor Driven Gear Thrust (Steel) (2)
WA-14-SH	Washer, Collar and Motor Driven Gear Spring Thrust
R2-90	MOTOR DRIVE SHAFT ASSEMBLY (60 CYCLE) (Export)
C1-G-31	Ball Bearing Bracket Sub-Assembly (2)
CL-13-SH	Collar, Motor Drive Shaft Thrust
CL-28-SH	Collar, Lower Motor Drive Shaft Ball Bearing Oil Protection
GR-43-SH	Gear, Motor Drive (Sold in Pairs Only with GR-42-SH)
SC-81-SH	Screw, Collar and Motor Drive Gear Fastening (2)
SA-508-SH	Spacer, Motor Drive Gear
ST-298-SH	Shaft, Motor Drive
WA-3-SH	Washer, Motor Drive Shaft Ball Bearing Thrust Collar (Fibre) (3)
WA-10-SH	Washer, Motor Drive Shaft Ball Bearing Thrust Collar and Gear (3)
WA-14-SH	Washer, Motor Drive Shaft Gear Spring Thrust
R2-190	ATTENUATOR COVER ASSEMBLY (Export)
CR-75-SH	Cover, Attenuator
HI-25-SH	Hinge, Attenuator Cover
KN-25-SH	Knob, Attenuator Cover
SC-94-SH	Screw, Hinge Fastening (3)
SC-116-SH	Screw, Knob Fastening
SC-123-SH	Screw, Cover Fastening (3)
R2-230	P. E. C. COMPARTMENT COVER UNIT (Export)
CR-76-SH	Cover, P. E. C. Compartment
CT-37-SH	Catch, P. E. C. Cover
SC-521-SH	Screw, Cover Fastening (2)

PART NO.	DESCRIPTION
R2-271	EXCITER LAMP LEAD WIRE SUB-ASSEMBLY (Export)
LU-17-SH	Lug, Wire (2)
NI-35-SH	Nipple, Exciter Lamp (Short)
NI-36-SH	Nipple, Exciter Lamp (Long)
NU-6-SH	Nut, Exciter Lamp Lead Wire (2)
TU-29-SH	Tube, Exciter Lamp
WI-74-SH	Wire, Exciter Lamp Lead
WI-76-SH	Wire, Exciter Lamp Lead
WI-90-SH	Wire, Exciter Lamp Shunt
WI-91-SH	Wire, Exciter Lamp Lead
WI-92-SH	Wire, Exciter Lamp Ground
R2-290	LENS TUBE BRACKET ASSEMBLY (Export)
R2-71	Exciter Lamp Shield and Pin
BR-105-SH	Bracket, Lens Tube
SC-140-SH	Screw, Lens Tube Clamp
SC-79-SH	Screw, Lens Tube Bracket Fastening (2)
R2-320	CHAIN DRIVE PINION AND SPROCKET ASSEMBLY (FOR MODEL E-7 MECHANISM DRIVE)

CONVERSION PARTS

R2-T-10	CONVERSION PARTS FOR 60 CYCLE OPERATION (1/2" MOTOR SHAFT)
R2-152	Motor, Flywheel and Coupling Assembly (with 1/2" Motor Shaft)
R2-152	MOTOR, FLYWHEEL & COUPLING ASSEMBLY (1/2" MOTOR SHAFT)(Not Available)
R2-154	Motor Flywheel Assembly (for 1/2" Motor Shaft)
CG-79-SH	Coupling, Motor
MO-3-SH	Motor, Drive (Not Available)
SC-502-SH	Screw, Motor Coupling Fastening(2)
R2-T-20	CONVERSION PARTS FOR DIRECT DRIVE OPERATION (STYLE I)
R2-100	Vertical Drive Shaft Assembly
R2-240	Flexible Drive Shaft and Coupling Assembly
GR-40-SH	Gear, Vertical Shaft Drive
SC-641-SH	Screw, Vertical Shaft Drive Gear Fastening
R2-100	VERTICAL DRIVE SHAFT ASSEMBLY
C1-G-31	Ball Bearing Bracket Sub-Assembly (2)
CL-13-SH	Collar, Vertical Drive Shaft Thrust (2)
CL-77-SH	Collar, Lower Vertical Drive Shaft Ball Bearing Oil Protecting
GR-41-SH	Gear, Vertical Shaft Driven
SC-81-SH	Screw, Collar and Vertical Shaft Driven Gear Fastening(3)
ST-299-SH	Shaft, Vertical Drive
WA-3-SH	Washer, Collar and Vertical Shaft Driven Gear Thrust Fibre (3)
WA-10-SH	Washer, Vertical Drive Shaft B. B. Thrust Collar (Steel) (2)
WA-14-SH	Washer, Vertical Drive Shaft B. B. Thrust Collar Spring
SC-143-SH	Screw, Ball Bearing Bracket Fastening (4)
R2-240	FLEXIBLE DRIVE SHAFT AND COUPLING ASSEMBLY (STYLE I)
CG-72-SH	Coupling, Vertical Shaft
CG-73-SH	Coupling, Flexible Drive Shaft
SC-81-SH	Screw, Coupling Fastening (2)
SC-535-SH	Screw, Flexible Drive Shaft Fastening (4)
ST-561-SH	Shaft, Flexible Drive

AMPLIFICATION EQUIPMENT MOUNTED IN THE REPRODUCER (DOMESTIC)

PART NO.	DESCRIPTION
W3-20	PHOTOELECTRIC CELL, PANEL AND TERMINAL STRIP ASSEMBLY COMPLETE
W3-21	Photoelectric Cell Panel Assembly Complete
W3-25	Terminal Strip and Changeover Switch Assembly Complete
TU-39-SA	Photoelectric Cell #930
W3-21	PHOTOELECTRIC CELL PANEL ASSEMBLY COMPLETE
BU-139-SA	Bushing, P.E.C. Plate (2)
GM-53-SA	Grommet, P.E.C. Plate (2)
NU-34-SA	Nut, P.E.C. Mounting Plate Fastening Screw (2)
PE-148-SA	Plate, P.E.C. Socket Mounting
PE-149-SA	Plate, P.E.C. Mounting
SA-607-SA	Spacer, P.E.C. Panel (2)
SC-570-SA	Screw, P.E.C. Panel Fastening (2)
SC-606-SA	Screw, P.E.C. Mounting Plate Fastening (2)
SF-609-SA	Socket, Photoelectric Cell
TE-28-SA	Terminal, Wire (5)
WA-79-SA	Washer, P.E.C. Panel Fastening Screw (4)
WA-94-SA	Washer, P.E.C. Mounting Panel Fastening Screw Lock (2)
[illegible]	Wire, P.E.C. Lead
WI-96-SA	Wire, P.E.C. Lead
W3-25	TERMINAL STRIP AND CHANGEOVER SWITCH ASSEMBLY
W3-26	Terminal Strip Sub-Assembly
CP-21-SA	Clamp, Wire
LU-30-SA	Lug, Terminal (8)
SA-612-SA	Spacer, Terminal Strip Mounting
SC-112-SA	Screw, Wire Clamp Fastening
SC-569-SA	Screw, Terminal Strip Mounting (Short)
SC-613-SA	Screw, Terminal Strip Mounting (Long)
SW-689-SA	Switch, Exciter Lamp Changeover
WI-99-SA	Wire, Changeover Switch
WI-101-SA	Wire, Changeover Switch Ground
WI-102-SA	Wire, Changeover Switch Lead
WI-103-SA	Wire, Changeover Switch Lead
WI-104-SA	Wire, Changeover Switch Lead
WI-123-SA	Wire, Changeover Shunt (2)

PART NO.	DESCRIPTION
R2-T-30	CONVERSION PARTS FOR 50 CYCLE OPERATION
R2-280	Motor Drive Shaft (50 Cycle)
SM-590-SH	Shim, Motor (4)
R2-280	MOTOR DRIVE SHAFT ASSEMBLY (50 CYCLE)
R2-281	Ball Bearing Bracket Sub-Assembly (2)
CL-13-SH	Collar, Motor Drive Shaft Thrust
CL-28-SH	Collar, Ball Bearing Protecting
GR-46-SH	Gear, Motor Drive
SA-508-SH	Spacer, Motor Drive Gear
SC-81-SH	Screw, Collar and Motor Drive Gear Fastening (2)
SC-143-SH	Screw, Ball Bearing Bracket Fastening (4)
ST-298-SH	Shaft, Motor Drive
WA-3-SH	Washer, Motor Drive Shaft B. B. Thrust Collar (Fibre) (3)
WA-10-SH	Washer, Motor Drive Shaft Gear and B. B. Thrust Collar (Steel)(3)
WA-14-SH	Washer, Motor Drive Shaft Gear Spring Thrust
R2-281	BALL BEARING BRACKET SUB-ASSEMBLY (50 CYCLE)
BG-9-SH	Bearing, Ball
BR-130-SH	Bracket, Motor Drive Shaft Ball Bearing
SC-127-SH	Screw, Ball Bearing Fastening (3)
R2-T-40	CONVERSION PARTS FOR 25 CYCLE OPERATION
R2-T-60	CONVERSION PARTS FOR DIRECT DRIVE OPERATION (STYLE II)
R2-100	Vertical Drive Shaft Assembly
R2-330	Flexible Drive Shaft and Coupling Assembly
GR-40-SH	Gear, Vertical Shaft Drive
SC-641-SH	Screw, Vertical Shaft Drive Gear Fastening
R2-330	FLEXIBLE DRIVE SHAFT AND COUPLING ASSEMBLY (STYLE II)
CG-73-SH	Coupling, Flexible Drive Shaft
CG-112-SH	Coupling, Vertical Shaft
SC-81-SH	Screw, Coupling Fastening (2)
SC-538-SH	Screw, Flexible Drive Shaft Fastening (4)
ST-361 ST-651-SH	Shaft, Flexible Drive
R2-T-70	CONVERSION PARTS FOR 1200 R.P.M. DRIVE OPERATION
GR-61-SH	Gear, Motor Drive (Steel)
GR-62-SH	Gear, Motor Driven (Bronze)
GR-67-SH	Gear, Take-Up Sprocket Shaft (Cast Iron)
SA-716-SH	Spacer, Ball Bearing Bracket (Includes PN-28-SH) (2)
SC-81-SH	Screw, Motor Drive Gear Fastening
SC-641-SH	Screw, Motor Driven and Sprocket Gear Fastening (2)
SC-713-SH	Screw, Ball Bearing Bracket Spacer (4)
R2-T-100	CONVERSION PART CHAIN DRIVE OPERATION
R2-210	Chain Idler Roller Assembly
R2-220	Chain Drive Assembly
SC-502-SH	Screw, Chain Sprocket Fastening (2)
SK-518-SH	Sprocket, Chain
C1-78-SH	Chain, Drive