Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

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

If you are not a qualified technician, please make no adjustments to anything you may read about in these Adobe manual downloads.

www.film-tech.com

1. ASSOCIATED DRAWINGS and PHOTOGRAPHS

ASK-931 - Threading Diagram
ASK-932 - Wiring Diagram
ASK-933 - Assembly and Parts List
ASK-934 - Front View, Penthouse Reproducer
ASK-935 - Rear View, Penthouse Reproducer

2. DESCRIPTION:

The AAA Magnetic Reproducer is a film driven soundhead designed to mount between the projector mechanism and the upper magazine. It consists of an aluminum housing with a hinged door on the operating side and a rear cover that can be easily removed. The film motion filtering equipment, guide rollers, pad rollers, magnetic pickup heads, etc., are assembled on a heavy base plate before mounting in the aluminum housing. The head was especially designed for operation with the Motiograph AA or AAA projectors, or with any other standard American made projector by using proper adapters.

Due to the fact that the picture projector pulls the film down through the magnetic reproducer, the performance of the latter will depend to a certain extent upon the condition of the picture projector. There should be a minimum of wear or backlash in the projector gear train, especially as far as the motion of the upper feed sprocket of the projector is concerned. Any irregular motion or flutter in the movement of this sprocket will increase the amount of flutter elimination to be done by the filter system. The use of a stroboscope is recommended if any unusual flutter condition exists.

A minimum of Magnetic material has been used in the film transport mechanism. All rollers and impedance drums are made of aluminum and mounted on ball bearings. The 32 tooth sprocket is of the "built up" type and only the sprocket discs are of magnetic material. The tooth shape is of special design and of the "fat" tooth type which has proven best for this type sprocket.

The filter mechanism uses the tight loop system having two impedance drums and fly wheels. The filtering effect is provided by two damping rollers on the ends of long arms which pivot on shafts and housing assemblies and which are especially fitted and lubricated with a low viscosity oil. This condition is capable of reducing the flutter content to a very low level.

The pad roller assemblies are unusual in design and will latch in both open and closed positions. When adjusted at the

factory, or when necessary to readjust in the field, spacing is adjusted with three thicknesses of film.

A pivoted idler roller is provided to reduce the danger of film breaking when starting the machine.

To provide synchronization between picture and sound the lower idler roller is adjustable, making it possible to obtain the necessary 28 frames separation.

The first AAA reproducers were coded 910-A and the housing did not provide sufficient clearance for some types of electric changeovers. The 910-B provided this clearance with no other changes. The 910-C has a modified filter system using longer damping roller arms. The 910-D is modified to provide a "pull away" plug for the magnetic head, and a changed position of the terminal strip to simplify wiring.

The design provides for a film wrap of approximately 14 degrees around the pickup head for best contact and minimum wear. Sufficient tension is exerted by the damping rollers to straighten out warped or edge curled film before it reaches the scanning point.

The four track magnetic head has a nominal impedance of 30 ohms for each section, an inductance of 35 millihenries per section, and is assembled in a mu-metal shield to prevent noise pickup.

The top of the main housing, at the point where the magazine is attached, is made at an angle to tilt the magazine away from the front wall. This is a very important feature especially when large magazines are used or in cases where the projection angle exceeds 10 degrees.

The reproducer weighs approximately 22 pounds. The overall length is 11-1/4 inches and the depth is 8 inches. Its height is 7-1/2 inches at the front and it tapers off to 5-1/4 inches at the rear.

3. INSTALLATION:

Each reproducer is carefully inspected and tested before leaving the factory and, unless subjected to severe handling during shipment, should be in perfect operating condition when received.

Adjustment of rollers and magnetic head assemblies should not be changed unless it is obvious that they have been disturbed during shipment.

Packed with each reproducer are the following items which are required for installation or operation:

2 - R-20117 studs, with hex nuts for mounting reproducer to projector.

2 - R-11641 flywheels, identical but marked "upper" and "lower"

1 - A-404 wrench

1 - A-406 wrench

1 - A-407 wrench

Plus adapters, as indicated on order.

Remove the upper magazine and fire trap assembly from the projector and mount the reproducer using the R-20117 studs and nuts, being careful to line up the film slots and sprockets. Install the fire trap assembly and magazine. If necessary file the threading slot in the reproducer wider to properly align with the slot in the top of the projector mechanism.

Check rollers, drums, and sprocket to see that they revolve freely. Check the filter arms to see that they move freely within their range.

Install the flywheels on their shafts making sure that the woodruff keys remain properly seated. The upper flywheel should be installed first with its hub on the outside. The lower flywheel is then installed with its hub on the inside. A hole is provided in the front of the housing to insert the hex head wrench. These set screws must be tight, otherwise the flutter will be increased beyond the normal limits. There should be just a trace of endplay in the impedance drum assembly after tightening flywheel.

The tension on the upper magazine spindle should be adjusted to provide a smooth rotation of the reel. Any uneven movements at this point could increase the flutter content of the reproducer. The exact tension is not too important but the reel movement should be steady.

At this point the projector and optical soundhead should be inspected to make sure that CinemaScope apertures, sprockets and rollers (where required) have been installed. The entire film path should be checked to detect any parts that may cause excessive wear on the magnetic sound tracks or the enlarged picture area of the CinemaScope frame.

A small compass can be used to detect the magnetization of any projector or soundhead parts that could cause trouble in the sound or damage the recording on the magnetic tracks.

The magnetic head is a four track assembly designed to scan one 29 mil and three 63 mil tracks. These tracks are numbered from the outside as follows: 1, 2, 4 and 3. Number 4 is the 29 mil or sound effects track and when used delivers its sound to the auditorium speakers.

4. THREADING and OPERATION:

The threading chart on Drawing ASK-931 shows the film path through the reproducer and the bypass threading when using standard film. Until one is thoroughly familiar with the threading operation it may be more satisfactory to first thread the film loosely over the sprockets and rollers of the reproducer, then properly on through the projector, optical soundhead and into the lower magazine. The reproducer can now be properly threaded by working back from the top projector sprocket to the upper magazine. Place the film over the teeth on the bottom of the large sprocket and lock the roller assembly. With one hand hold the top damping roller in its normal position (against its stop to the right) and push the lower damping roller to the left against its stop. With the other hand pull the film tight over the top of the sprocket being sure that the teeth fit the holes properly, and latch the upper pad roller assembly. With the machine in operation, the filter mechanism should stabalize in approximately five seconds. It is very important during operation that the centers of the two damping rollers be aligned vertically and that they can move freely in either direction. If the rollers do not line up properly in the vertical plane, the flywheels should be removed and the tension of the compensating spring should be adjusted by moving the brass spring holders, until this condition is reached. It is not necessary to replace the flywheels until the proper adjustment of the compensating springs is obtained.

5. ADJUSTMENT and MAINTENANCE

As received, the reproducer is ready for operation after installation of the flywheels. No lubrication is required as all rollers are mounted on specially selected sealed ball bearings. The top damper roller has flanges and is the indexing or position control with respect to film alignment over the magnetic head. When assembled on its shaft it is very important that a minimum of endplay exists, otherwise it cannot exert the proper control over the lateral movement of the film. During assembly it is sometimes necessary to use small spacing washers on the sprocket shaft to position the sprocket so that its teeth will fall exactly in the center of the sprocket holes.

The operation of the flutter filter unit depends upon the proper assembly and adjustment of the damping arm assemblies, especially the shaft and housing assemblies which allow the arms to pivot. During assembly these parts are honed together to insure proper surfaces and lubricated in such a manner as to exclude air from the assembly and keep the shaft reservoir permanently full of oil. No further attention should be required for at least a year, when the assembly should be cleaned, inspected and lubricated by the sound engineer. A specially selected oil, identified by Motiograph as Part No. LP-726, is required for this application.

6. MAGNETIC HEAD ADJUSTMENT

To provide proper output level, frequency response, balance between tracks and good contact between the head gaps and each magnetic track, it is very important that the position of the magnetic heads be adjusted to meet these requirements. Three separate adjustments are provided to obtain track placement, canter, and azimuth, and they are usually adjusted in that order.

After loosening the track placement locking screw, the head can be aligned visually by moving it to a point where it covers the center portion of the film. With an 8000 cycle azimuth test film loop and an output meter connected across the output of the #2 channel, loosen the canter locking screw and rotate the head mount on its axis until the highest meter reading is obtained. Tighten lock screws. Now slightly loosen azimuth locking screws and rotate the head mount back and forth for maximum meter reading.

To complete overall adjustment realign track placement and adjust for maximum meter deflection. When making the second adjustment of the Canter it will be noticed that the same high meter reading will be obtained for several degrees of rotation, and the final setting should be in the center of this rotation. Now complete the adjustment with a realignment of the azimuth.

If it is found that channels 1, 2 and 3 are not of equal levels at 8000 cycles, the canter adjustment should be repeated in an effort to balance the channel to within $\pm$ 1.5 db of each other. Any remaining differences can be compensated for in the preamplifiers. After the last canter adjustment it will be necessary to again realign the azimuth. It is important to have sufficient high frequency response from #4 channel to insure proper operation of the squelch amplifier circuit, when this equipment is used in connection with auditorium speakers.

It is possible that the magnetic head will sometimes become magnetized, possibly through inadvertent contact with magnetic tools or because some of the projector or magazine parts are highly magnetized. Normally a magnetized head will cause an increase of background noise, and in combination with certain conditions of the sound track may produce a background noise sounding like a swarm of "bees".

The projectionist should never "bloop" a magnetic head with a piece of metal that may be magnetized as this may transfer enough of the magnetic energy to the head to cause considerable trouble.

Perhaps the most satisfactory degausser for demagnetizing a pickup head is the Motiograph SE-7625 unit which will apply a voltage from zero to a maximum of .75 volts across the head by means of a potentiometer and then reduces the potential back to zero. This operation is repeated on each head and as it is unnecessary to disconnect the head leads from the rest of the circuit, it makes a very fast operation. The amplifier should be cold when this is being done. This demagnetizer will also supply considerable power to a coil to demagnetize projector or soundhead parts.

The following adapters are available for use with the AAA reproducer:

For Motiograph AA or AAA Mechanism, order the 11700 Assembly

For Motiograph H, HU, HK or K Mechanisms, order the 11701 assembly plus R-11854 Magazine Adapter.

For Simplex, Century and Brenkert mechanisms, order the 11702 assembly.

Simplex XL magazines are not adaptable to the Motiograph Penthouse Reproducer.

M O T I O G R A P H I N C.
4431 W. Lake Street
CHICAGO 24, ILL.

ASK-931

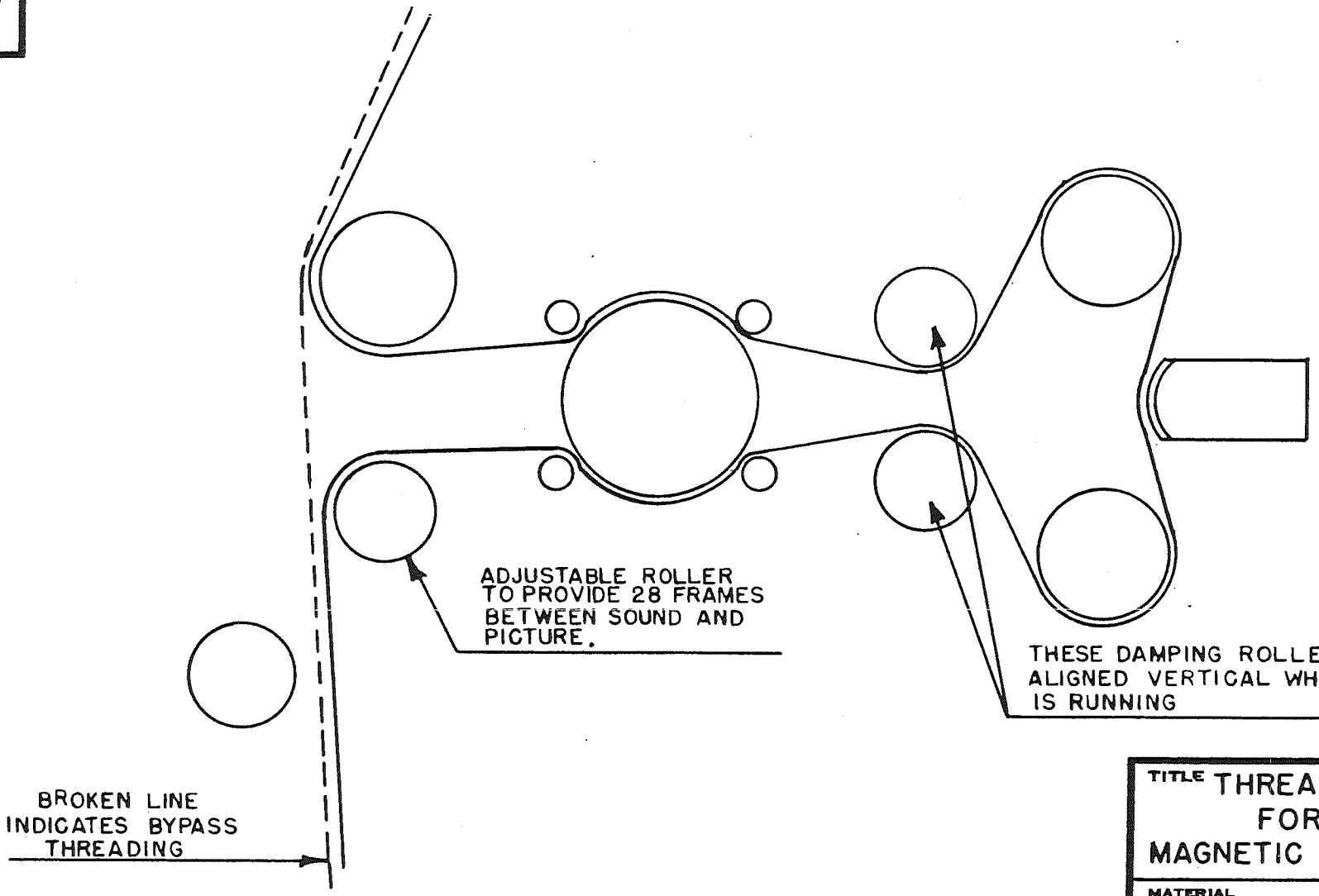
UNLESS OTHERWISE SPECIFIED

BASIC DIM.	FRAC.	DEC.
UP TO 1/4''	±1/128''	± .005''
ABOVE 1/4'' TO 6''	±1/64''	± .005''
ABOVE 6'' TO 24''	±1/32''	± .010''
ABOVE 24''	±1/16''	± .015''

ANGULAR DIMENSIONS ± 1°

CHANGES

ISSUE NO. 1



DO NOT SCALE DRAWING

TITLE THREADING PATH FOR AAA MAGNETIC REPRODUCER.

MATERIAL		FINISH	
DRAWN HUCK	CHKD.	APPVD.	DATE 2-25-54

DRWG. NO. ASK-931

MOTIOGRAPH
CHICAGO, ILL.

ASK-932

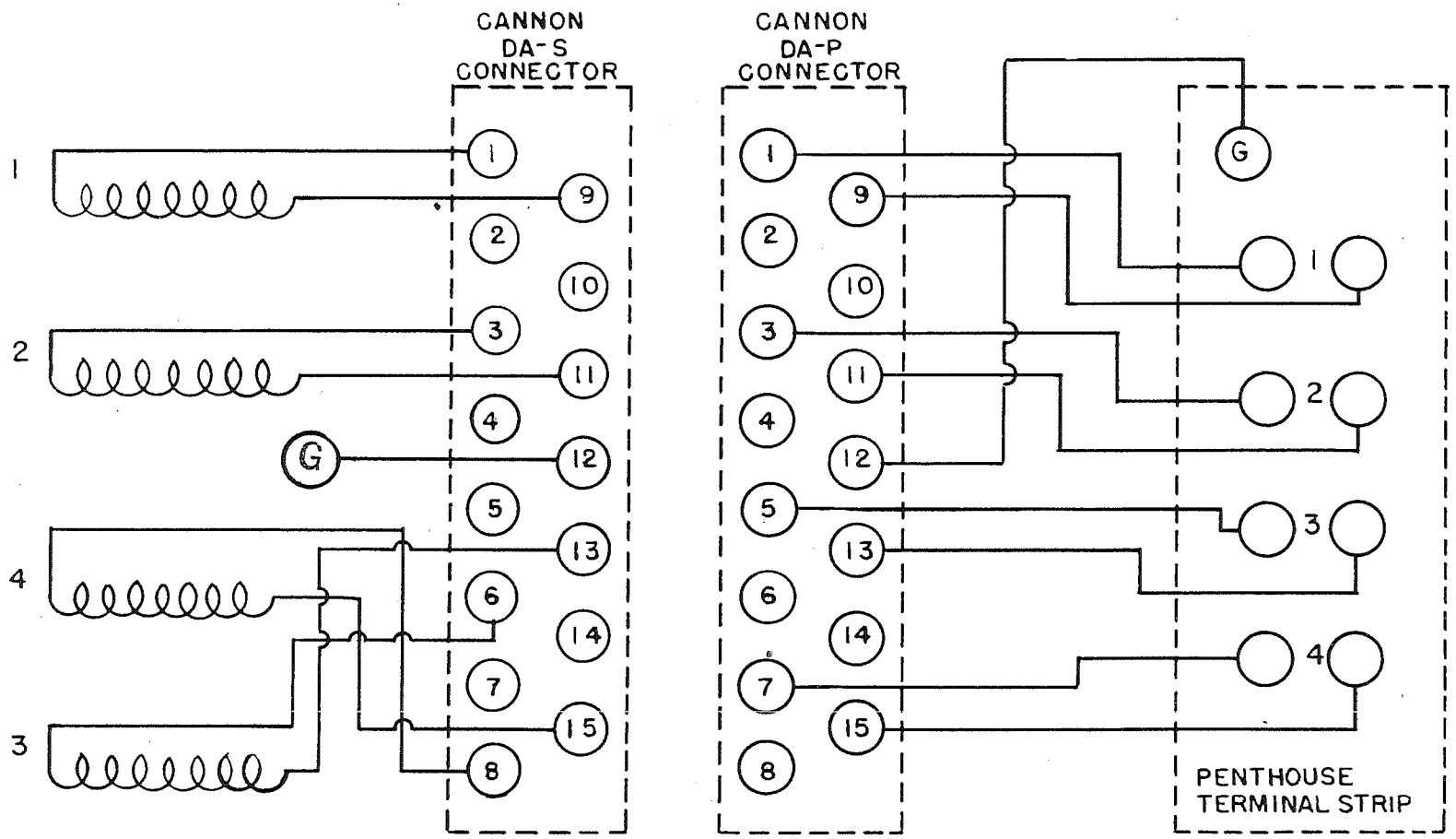
UNLESS OTHERWISE SPECIFIED

BASIC DIM.	FRAC.	DEC.
UP TO 1/4"	±1/128"	± .005"
ABOVE 1/4" TO 6"	±1/64"	± .005"
ABOVE 6" TO 24"	±1/32"	± .010"
ABOVE 24"	±1/16"	± .015"

ANGULAR DIMENSIONS ± 1°

CHANGES

ISSUE NO. 1



DO NOT SCALE DRAWING

TITLE: WIRING DIAGRAM AAA PENTHOUSE REPRODUCER			
MATERIAL		FINISH	
DRAWN: HUCK	CHKD.	APPVD.	DATE: 2-26-54
DRWG. NO. ASK-932			
MOTIOGRAPH CHICAGO, ILL.			

MOTIOGRAPH MODEL 910-D AAA MAGNETIC REPRODUCER

PARTS LIST

PART NO.	DESCRIPTION (Quan. per assembly)
RX-11700	Adapter Set for Model AA or AAA Projector
RX-11701	Adapter Set for Model HU, HK or K Projector
RX-11702	Adapter Set for Simplex Standard, Super or XL, RCA Brenkert or Century
RX-11704	Adapter Set for DeVry Projectors
RX-11705	Adapter Set for Simplex E-7

Above adapters are included in the price of complete magnetic reproducers except that when RX-11704 adapters are ordered there is an additional charge per set.

RX-11703 HOUSING ASSEMBLY

R-11809	Door Hinge (2)
R-11813	Connector Bracket
R-11817	Male Plug
R-11820	Nameplate
R-11822	Door Glass
RX-11828	Terminal Board Assembly (sold as unit only)
R-11833	Spacer
R-11850	Main Housing
R-11851	Film Side Door
R-11852	Rear Door
R-11853	Terminal Block Cover
A-236	Glass Retainer Clip (4)
A-295	Plug Button
SE-2623	Connector Nut
SH-2635	Door Strike
SH-2636	Door Knob
SH-2668	Door Strike Catch
SH-2884	90° Connector

RX-11725 PAD ROLLER ASSEMBLY (2)

* R-11541	Pad Roller Latch
* R-11549	Pad Roller (2)
* R-11551	Pad Roller Latch Guide
* R-11553	Pad Roller Latch Pin
* R-11556	Pad Roller Holder
* R-11560	Hinge Bracket
* R-11569	Pad Roller Shaft (2)
* R-11617	Keeper Spring
* R-11806	Ball Bearing (4)
* R-11831	Hinge Pin (2)

RX-11726 SPROCKET, SHAFT & BEARING ASSEMBLY

* R-11587	Sound Drum Housing
* R-11665	Sprocket Shaft
* R-11666	Sprocket Shaft Collar
* RX-11728	Sprocket Assembly (sold as unit only)
* R-11762	Shim Washer (as required)
* R-11805	Ball Bearing (2)

* Illustrated

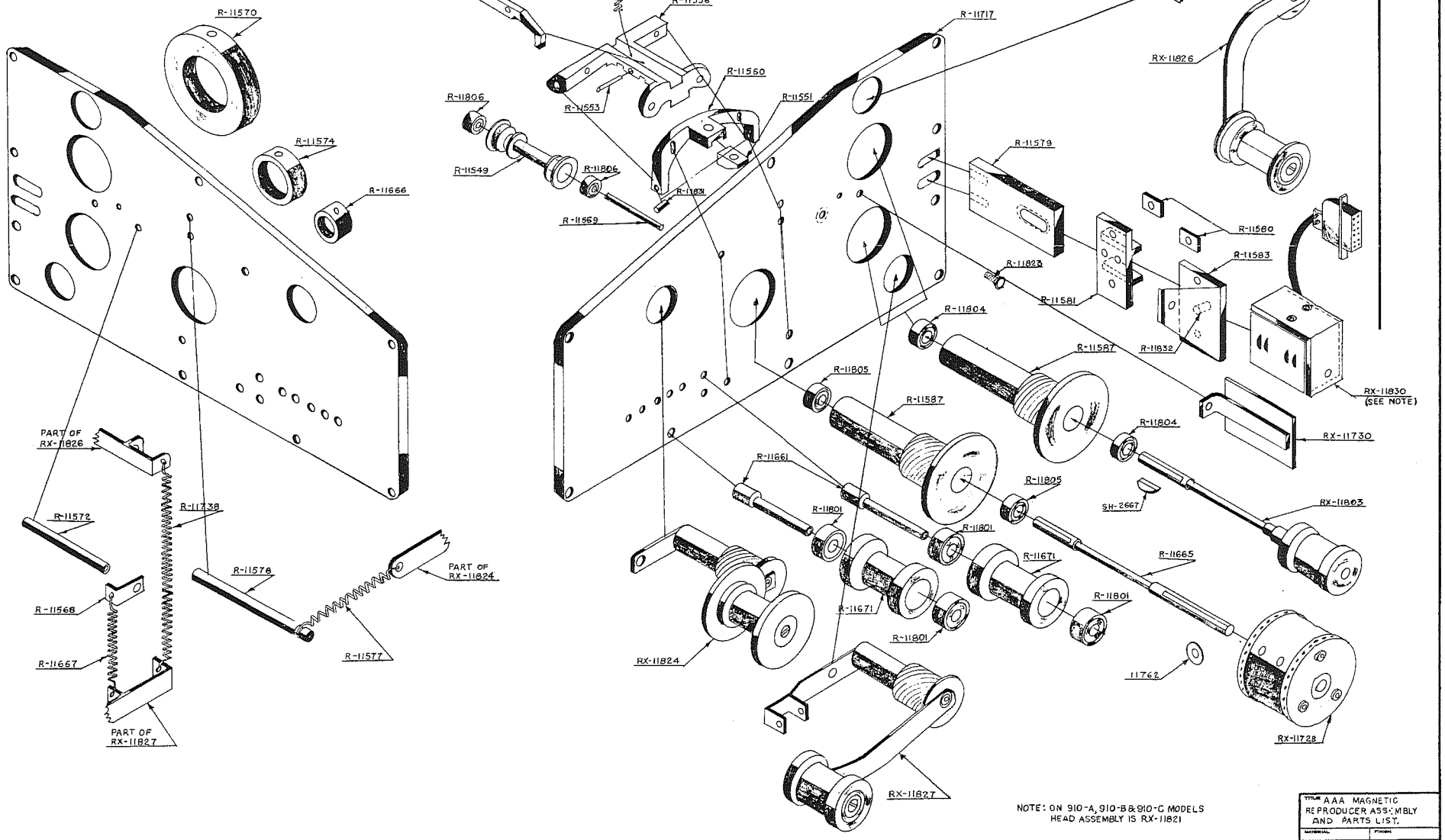
MOTIOGRAPH MODEL 910-D AAA MAGNETIC REPRODUCER

PARTS LIST

PART NO.	DESCRIPTION
	RX-11727 SOUND DRUM ASSEMBLY (2)
* R-11587	Sound Drum Housing
* RX-11803	Drum and Shaft Assembly (sold as unit only)
* R-11804	Ball Bearing (2)
* SH-2667	Key
	*** RX-11730 SHIELD ASSEMBLY (sold as unit only)**
	RX-11821 PICKUP HEAD ASSEMBLY (sold as unit only)
	For Models 910-A, B or C. Use RX-11830 for 910-D
	*** RX-11824 SNUBBER ROLLER ASSEMBLY (sold as unit only)**
	RX-11825 IDLER ROLLER ASSEMBLY (2)
* R-11661	Idler Shaft
* R-11671	Idler Roller
* R-11801	Ball Bearing (2)
	*** RX-11826 UPPER DWELL ROLLER ASSEMBLY (sold as unit only)**
	*** RX-11827 LOWER DWELL ROLLER ASSEMBLY (sold as unit only)**
	*** RX-11830 PICKUP HEAD and PLUG ASSEMBLY**
	For Model 910-D. Use RX-11821 for 910-A, B or C
* R-11818	Female Plug
* R-11819	Junction Shell
	RX-11910 FINAL ASSEMBLY
* R-11568	Damper Spring Adjusting Bracket
* R-11570	Sound Drum Housing Collar (3)
* R-11572	Adjusting Bracket Mounting Stud
* R-11574	Dwell Housing Collar (3)
* R-11577	Snubber Roller Spring
* R-11578	Spring Mount
* R-11579	Head Mount Way
* R-11580	Head Mount Rectangular Spacer (2)
* R-11581	Head Mount Slide
* RX-11583	Head Mount and Pin Assembly (sold as unit only)
R-11641	Flywheel (2)
* R-11667	Dwell Compensating Spring (short)
* R-11717	Main Plate
* R-11738	Dwell Roller Tension Spring (long)
* R-11823	8-32 x 1/2" Hollow Flat Head Screw
* R-11832	Dowel Pin

* Illustrated

SSK-933



NOTE: ON 910-A, 910-B & 910-C MODELS
HEAD ASSEMBLY IS RX-11821

DO NOT SCALE DRAWING

CHANGES

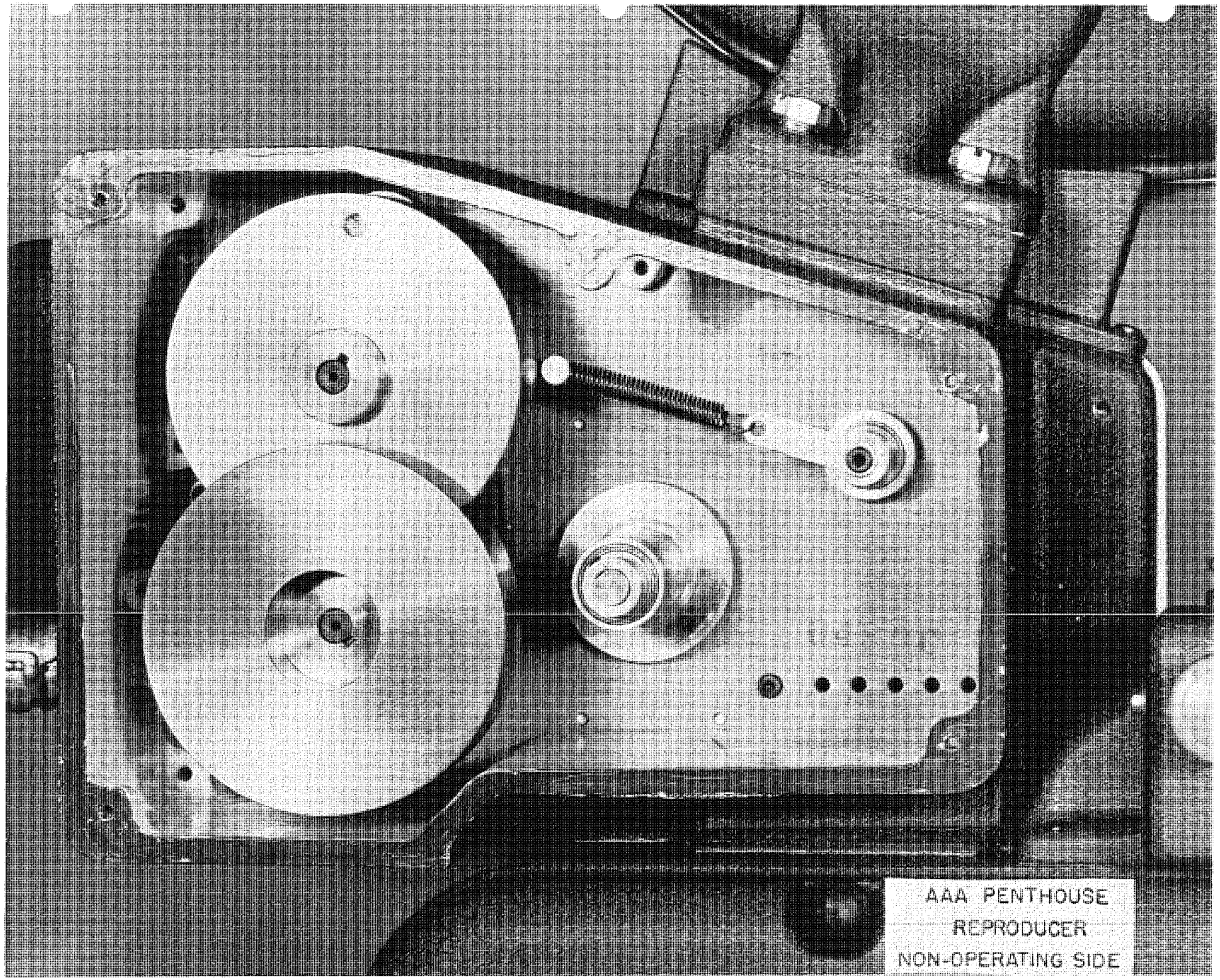
TITLE AAA MAGNETIC REPRODUCER ASSEMBLY AND PARTS LIST.

MATERIAL | FINISH

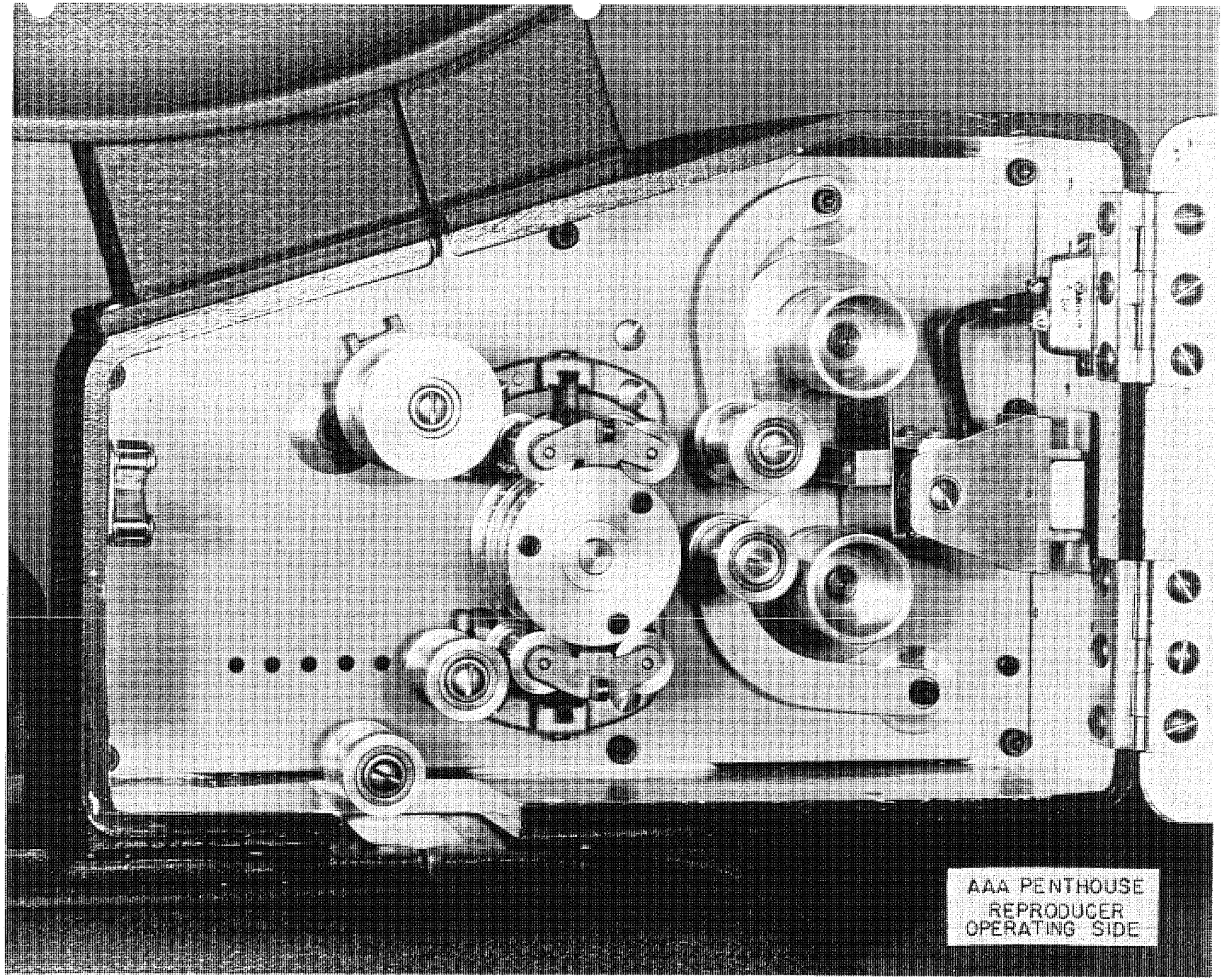
DRAWN HUCK | CHKD. | APPVD. | DATE 10-22-54

DRWG. NO. SSK-933

MOTIOGRAPH INC.
CHICAGO, ILL.



AAA PENTHOUSE
REPRODUCER
NON-OPERATING SIDE


AAA PENTHOUSE
REPRODUCER
OPERATING SIDE