

A 83

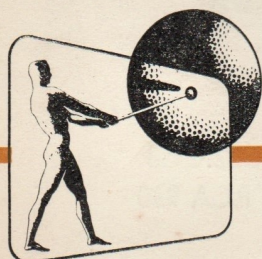
Issue 2/956

**GAUMONT-KALEE**

**OPTICAL SOUNDHEADS**

**TYPES** 83  
845

**MANUAL  
and  
SPARES LIST**



**RANK PRECISION INDUSTRIES LTD.**

**GAUMONT-KALEE DIVISION**

37-41 Mortimer Street, London W.1, England

Telephone : Museum 5432

Cables : 'RANKALEE LONDON'



# GAUMONT-KALEE

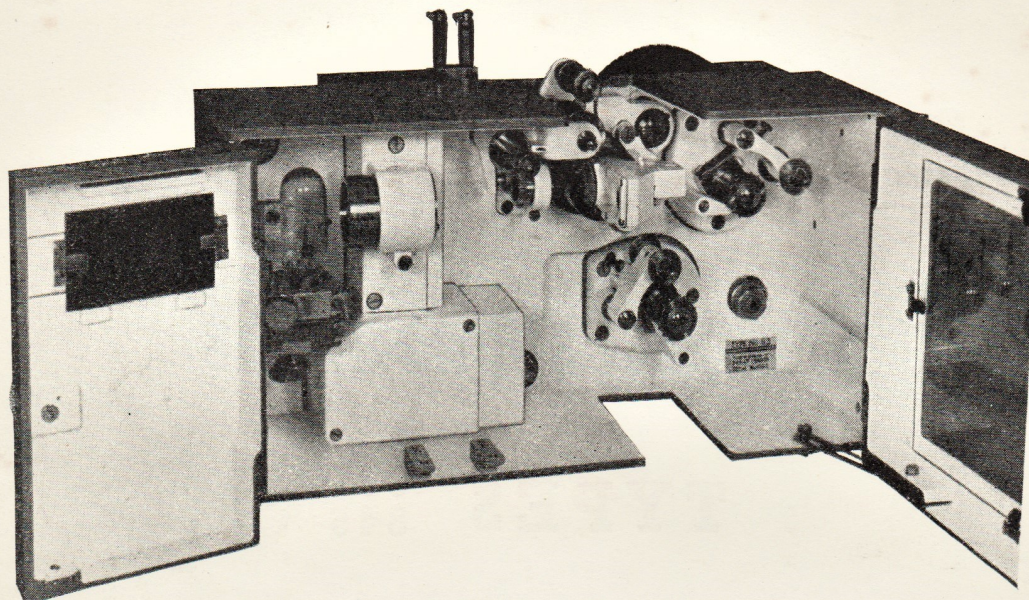


FIGURE 1. 83 SOUNDHEAD

## OPTICAL SOUNDHEAD

### SPECIFICATION

Front Projection Soundhead. Fluid Flywheel scanning.

Enlarged Image Optical system.

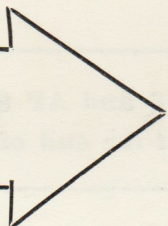
Exciter Lamp	...	...	...	...	8 volt, 32 watt
Sprocket Shaft speed	...	...	...	...	360 r.p.m.
Lower Spoolbox drive	...	...	...	...	Chain
Number of Sprockets	...	...	...	...	Two
Photocell type (83 Soundhead)	...	...	...	...	GS16.CMG22.CG8
(845 Soundhead)	...	...	...	...	American RCA 930



# ENGINEERS' MANUAL

(Including Manual for Operators)

Where PLATE Numbers are given, other than in the SPARE PARTS LIST, these are to facilitate cross-reference between a certain section and the appropriate Spare Parts List and Illustrations.


**TYPE 83  
845**

## CONTENTS

### DESCRIPTION

MOTORS FOR SOUNDHEADS	...	...	...	...	...	SHEET
SOUNDHEAD MECHANISM	...	...	...	...	...	<b>AT 83/5a</b>
Layshaft	...	...	...	...	...	
Sprocket Shafts	...	...	...	...	...	<b>AT 83/5b</b>
Sprockets	...	...	...	...	...	
Gear Train	...	...	...	...	...	
Scanning Unit	...	...	...	...	...	<b>AT 83/6a</b>
Layon Roller	...	...	...	...	...	
ENLARGED IMAGE OPTICAL SYSTEM	...	...	...	...	...	
Focus	...	...	...	...	...	
Slit	...	...	...	...	...	<b>AT 83/6b</b>
Electrical	...	...	...	...	...	<b>AT 83/7a</b>
...	...	...	...	...	...	<b>AT 83/7b</b>
SCANNING UNIT ASSEMBLY	...	...	...	...	...	
PHOTOCELL AND HOLDER	...	...	...	...	...	
SLIT UNIT ASSEMBLY	...	...	...	...	...	<b>AT 83/8a</b>
To remove Slit Unit	...	...	...	...	...	
Adjusting Slit Azimuth	...	...	...	...	...	
Dismantling	...	...	...	...	...	<b>AT 83/8b</b>
LAYON ROLLER ASSEMBLY	...	...	...	...	...	<b>AT 83/9a</b>
FLYWHEEL	...	...	...	...	...	
SCANNING DRUM SHAFT	...	...	...	...	...	<b>AT 83/9b</b>

### DISMANTLING

**Plate 2**  
**Plate 3**

**Plate 4**  
**On Plate 2**



# GAUMONT-KALEE

## SHEET

<b>Plate 5</b>	LARGE PRISM AND AUXILIARY CONDENSER	...	...	<b>AT 83/10a</b>
<b>Plate 6</b>	OBJECTIVE LENS AND PLUNGER	...	...	<b>AT 83/10b</b>
	GUIDE ROLLER	...	...	<b>AT 83/11a</b>
<b>Plate 7</b>	EXCITER LAMPHOLDER	...	...	<b>AT 83/11b</b>
	To remove Lamp	...	...	
	To remove Lampholder	...	...	
	To dismantle Lampholder	...	...	
<b>Plate 8</b>	LAYSHAFT ASSEMBLY	...	...	<b>AT 83/12a</b>
	To remove Pulleys	...	...	
	To remove Layshaft	...	...	
	To separate Pulley and Gear	...	...	<b>AT 83/12b</b>
<b>Plate 9</b>	SPROCKET SHAFT	...	...	<b>AT 83/13a</b>
	To remove Sprocket	...	...	<b>AT 83/13b</b>
	SPROCKET ROLLER AND ARM	...	...	<b>AT 83/14a</b>
<b>Plate 10</b>	MAIN DRIVE GEARING	...	...	<b>AT 83/14a</b>
	HOLDBACK SPROCKET GEARING	...	...	
<b>Plate F</b>	SCREENED TERMINAL BLOCK	...	...	<b>AT 83/14b</b>
	Unscreened Terminal Blocks	...	...	
	TOOLS REQUIRED	...	...	
<b>REPLACEMENT</b>	Wiring	...	...	<b>AT 83/15a</b>
<b>and REASSEMBLY</b>	REASSEMBLY	...	...	<b>AT 83/15b</b>
	Before Operating	...	...	

**OPERATORS' MANUAL (SHEETS AP 83/3 and AP 83/4) comes before  
'DESCRIPTION' and SPARE PARTS LIST at the end of the complete Manual.**

## ILLUSTRATIONS

## FIGURE

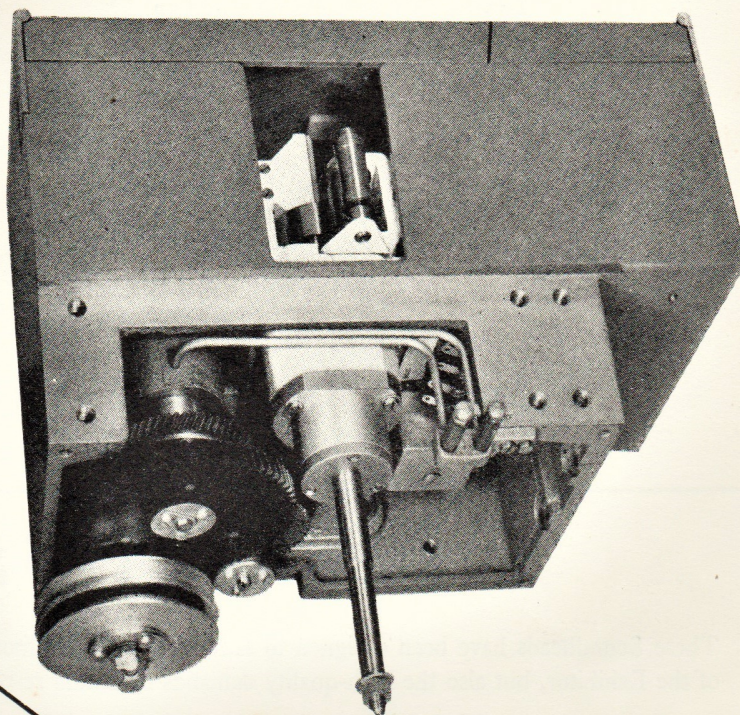
Removing large Condenser Lens	...	...	...	...	<b>T1</b>
Removing Slit assembly	...	...	...	...	<b>T2</b>
Adjusting Slit Azimuth	...	...	...	...	<b>T3</b>
Scanning Plate	...	...	...	...	<b>T4</b>
Layon Roller and Arm	...	...	...	...	<b>T5</b>
Unscrewing Flywheel Retaining Nut	...	...	...	...	<b>T6</b>
Take great care when removing Flywheel	...	...	...	...	<b>T7</b>
Scanning Plate and Drum	...	...	...	...	<b>T8</b>
Freeing Small Condenser Lens	...	...	...	...	<b>T9</b>
Prism and Mount dismantled	...	...	...	...	<b>T10</b>
Removing Objective Lens	...	...	...	...	<b>T11</b>
Objective Lens Assembly	...	...	...	...	<b>T12</b>
Guide Roller, Spindle, and Plate	...	...	...	...	<b>T13</b>
Exciter Lampholder and Bracket	...	...	...	...	<b>T14</b>
Exciter Lampholder dismantled	...	...	...	...	<b>T15</b>
Unscrewing Layshaft Nut	...	...	...	...	<b>T16</b>
Unscrewing Main Drive Pulley	...	...	...	...	<b>T17</b>
Removing Sprocket End-Screw	...	...	...	...	<b>T18</b>
Alternative Sprocket Stripper positions	...	...	...	...	<b>T19</b>
Sprocket Shaft Gearing and Shafts	...	...	...	...	<b>T20</b>
Sprockets and Shafts	...	...	...	...	<b>T21</b>
Sprocket Shaft dismantled	...	...	...	...	<b>T22</b>
Upper Sprocket Shaft Gearing	...	...	...	...	<b>T23</b>
Oil Pipes assembly	...	...	...	...	<b>T24</b>
Wiring Diagram	...	...	...	...	<b>T25</b>



# OPERATORS' MANUAL

FIGURE 2.

REAR VIEW OF  
TYPE 83 SOUNDHEAD,  
WITH FLYWHEEL REMOVED  
TO SHOW GEARING



**TYPE 83**  
**845**

## CONTENTS

											SHEET
<b>INTRODUCTION</b>	...	...	...	...	...	...	...	...	...	...	<b>AP 83/2b</b>
<b>OPERATING INSTRUCTIONS</b>	LACING	...	...	...	...	...	...	...	...	...	<b>AP 83/3a</b>
	MAINTENANCE	...	...	...	...	...	...	...	...	...	<b>AP 83/3b</b>
	Mechanical	...	...	...	...	...	...	...	...	...	
	Cleaning	...	...	...	...	...	...	...	...	...	
	Lubrication	...	...	...	...	...	...	...	...	...	
	Photocell	...	...	...	...	...	...	...	...	...	<b>AP 83/4a</b>
	Exciter Lamp	...	...	...	...	...	...	...	...	...	
	Faults	...	...	...	...	...	...	...	...	...	<b>AP 83/4b</b>
<b>SPARE PARTS</b>	Introduction	...	...	...	...	...	...	...	...	...	<b>AP 83/16a</b>
<b>Plate F</b>	KEYPLATE	...	...	...	...	...	...	...	...	...	<b>AP 83/16b</b>
	FINAL ASSEMBLY	...	...	...	...	...	...	...	...	...	<b>AP 83/17b</b>
	Screened Terminal Block	...	...	...	...	...	...	...	...	...	
	Oilier and Pipes assembly	...	...	...	...	...	...	...	...	...	
<b>Plate 1</b>	DOORS—Large	...	...	...	...	...	...	...	...	...	<b>AP 83/18b</b>
	Small	...	...	...	...	...	...	...	...	...	
<b>Plate 2</b>	SCANNING UNIT	...	...	...	...	...	...	...	...	...	<b>AP 83/19b</b>
	Flywheel Shaft and Drum	...	...	...	...	...	...	...	...	...	
	Guide Roller	...	...	...	...	...	...	...	...	...	



<b>Plate 3</b>	CONDENSER LENS ... ..	<b>AP 83/20b</b>
	CELL HOLDER & COVER ... ..	
	SLIT UNIT ... ..	
	No. 2 PRISM ... ..	
<b>Plate 4</b>	ARTICULATED LAYON ROLLER ... ..	<b>AP 83/21b</b>
<b>Plate 5</b>	No. 1 PRISM MOUNT ... ..	<b>AP 83/22a</b>
<b>Plate 6</b>	PLUNGER AND OBJECTIVE LENS ... ..	<b>AP 83/23a</b>
<b>Plate 7</b>	EXCITER LAMPHOLDER ... ..	<b>AP 83/23b</b>
<b>Plate 8</b>	LAYSHAFT ... ..	<b>AP 83/24b</b>
<b>Plate 9</b>	SPROCKET SHAFT ... ..	<b>AP 83/26a</b>
	SPROCKET ROLLER AND ARM ... ..	
<b>Plate 10</b>	SPROCKET SHAFT GEARING ... ..	<b>AP 83/26b</b>
	LOWER SPROCKET SHAFT GEARING ... ..	

## INTRODUCTION

These Soundheads have been designed to satisfy not only the most exacting demands of the Exhibitor, but also the high-quality demands of Studio re-recording.

The Type 845 differs from the Type 83 Soundhead only in being fitted for an American type Photocell, instead of having the normal British four-pin base.

## ILLUSTRATIONS

	FIGURE
Laced Soundhead ... ..	<b>3</b>
Lubrication Chart ... ..	<b>4</b>
Alignment of Slit Image ... ..	<b>5</b>
<b>SPARE PARTS LIST</b>	
KEYPLATE ... ..	<b>6-7</b>
FINAL ASSEMBLY ... ..	<b>8</b>
Large and Small Doors ... ..	<b>9</b>
Scanning Unit ... ..	<b>10</b>
Large Condenser, Cell and Slit ... ..	<b>11</b>
Layon Roller and Arm ... ..	<b>12</b>
No. 1 Prism with Small Condenser ... ..	<b>13</b>
Plunger and Objective Lens ... ..	<b>14</b>
Exciter Lampholder ... ..	<b>15</b>
Layshaft ... ..	<b>16</b>
Sprocket Shaft and Roller ... ..	<b>17</b>
Sprocket Shaft Gearing ... ..	<b>18</b>



# OPERATING INSTRUCTIONS

## LACING

These Soundheads should be laced as shown in FIGURE 3. The film should be carried from the Bottom Sprocket of the Projector Mechanism to the left of the top Guide Roller on the Soundhead, to the right of and under the Layon Roller, and round the left of the Scanning Drum. From the Scanning Drum it runs over the Feed Sprocket,

round and back over the Holdback Sprocket, and down to the Lower Spoolbox.

The film should be laced to leave two loops, one between the bottom Projector Sprocket and the Feed Sprocket of a single additional Sprocket hole, the other between the Feed Sprocket and the Holdback Sprocket of three or four Sprocket holes.

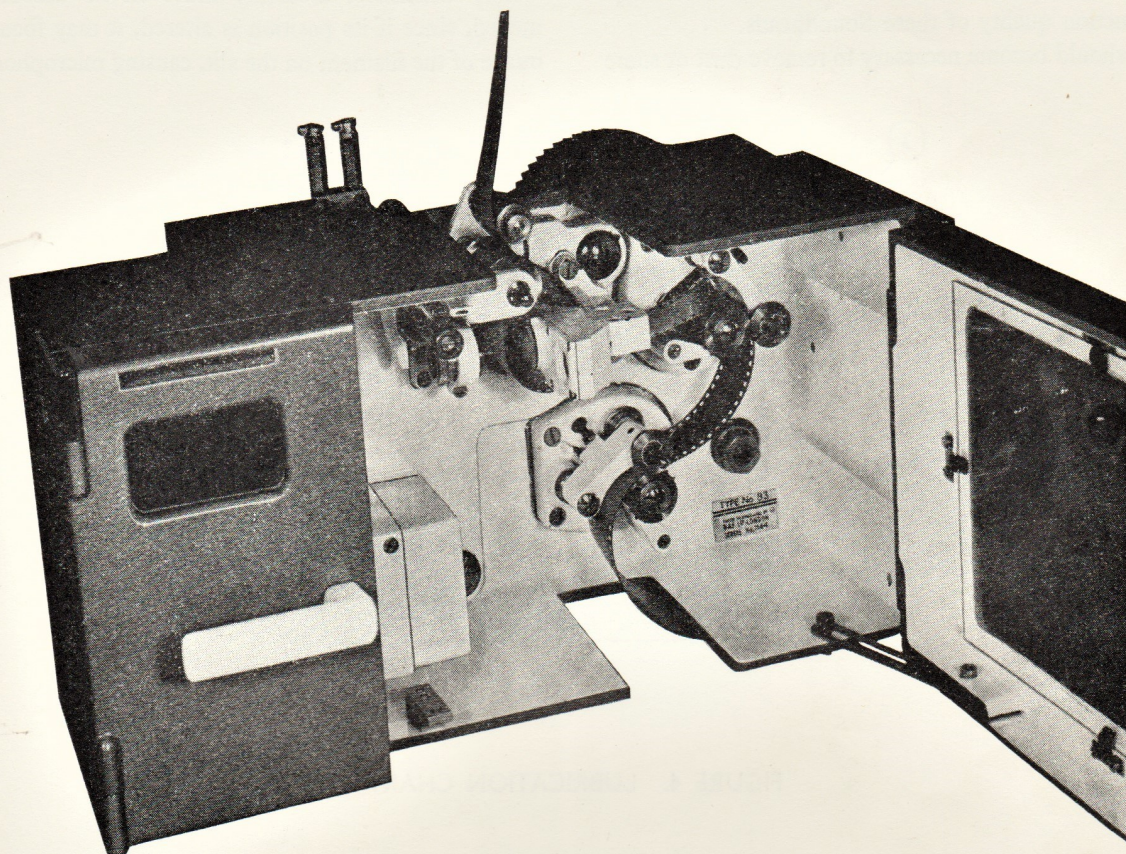


FIGURE 3. 83 SOUNDHEAD LACED



## MAINTENANCE

### Mechanical

The mechanical parts of these Soundheads are precision machined for their delicate task. Inaccurate adjustment, insufficient lubrication, or the lack of proper maintenance can all help to shorten the life of each moving part, in addition to causing deterioration of the sound reproducing qualities of the system.

With the near perfection of modern projection equipment, the majority of faults which occur are the result of inefficient or inadequate maintenance. This means that most of them can be prevented by daily cleaning and lubrication, and by taking care to ensure that all bearings and moving parts are correctly adjusted.

### Cleaning

These Soundheads should be wiped out periodically with a cloth saturated in Carbon Tetrachloride, or some other similar grease solvent.

All rollers and surfaces on which the film runs should be kept perfectly clean, since any accumulation of dirt, dust or emulsion will cause deterioration of the high reproduction quality of these Soundheads.

If it should become necessary to remove dust or some

slight deposit from the Lens surfaces, either special Lens Tissues or the softest of cloths should be used. The same care must be taken with the Lenses in the Soundhead as is taken with the Projection Lenses, so that the bloomed optical surfaces do not get scratched.

The Condenser assembly must on no account be moved, since if its position is altered, it may focus the image of the filament on the slit, causing microphony.

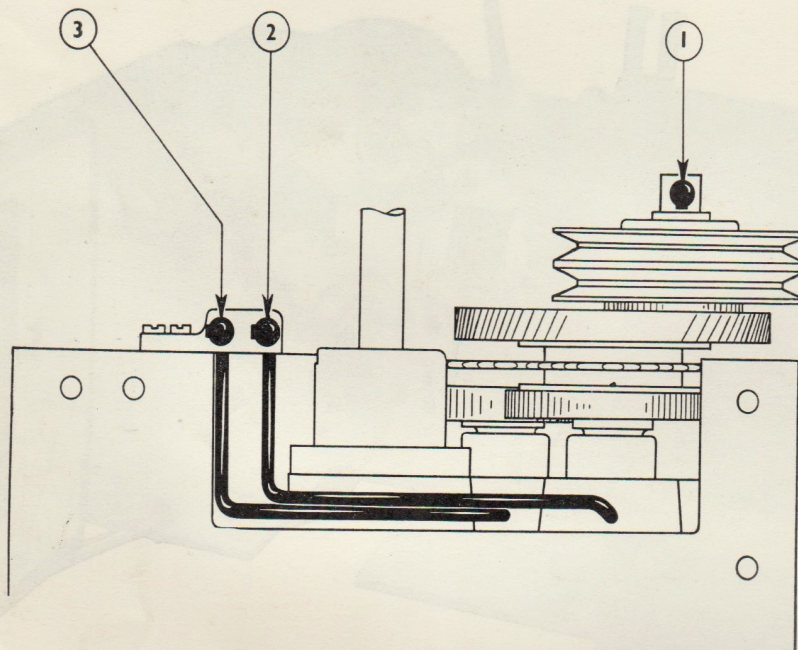


FIGURE 4. LUBRICATION CHART

### Lubrication

The points shown in Figure 4 above should be sparingly lubricated with Projector Oil as supplied by Gaumont-Kalee. All surplus oil must be wiped off with a soft cloth.

All roller bearings must be lubricated daily with a very fine film of oil.



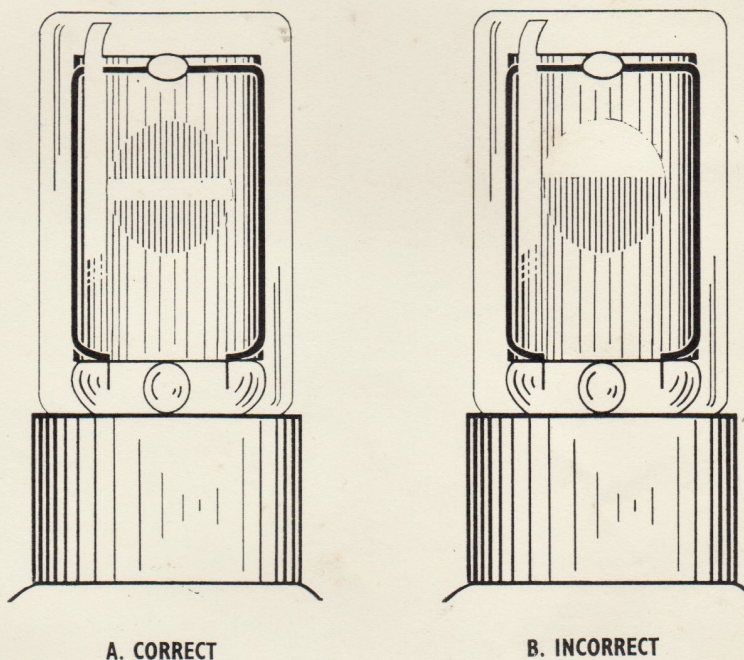
## Photocell

Spare Photocells should be stored in a cool dark place. Exposure of Photocells to direct sunlight, or to strong artificial light, may cause loss of sensitivity.

Great care must be taken not to operate Photocells at anode voltages above those specified for the type in use. Over running may cause the tubes to ionise, causing

permanent damage. No artificial light, other than that scanning the Soundtrack, should be permitted to fall on to the Photocell while it is operating, or any modulation of the light source will be reproduced through the sound system.

FIGURE 5.  
ALIGNMENT OF SLIT IMAGE



## Exciter Lamp

Spare Exciter Lamps should be stored in the Spare Parts Box until required. Great care must be taken not to drop or jar new Exciter Lamps, as this may damage the filament or bend it out of alignment. Exciter Lamps should be replaced as soon as blackening of the glass or sagging of the filament becomes visible; lamps left in service in this condition will impair the quality of the sound. When fitting new Exciter Lamps, do not over

tighten the Lamp Clamping Screw, since this may crack the glass bulb.

Exciter Lamps may vary slightly from one to another, and for the best results they should be aligned and focused when they are fitted. This focusing and alignment should ensure that the bar of light projected through the Condenser assembly lies across the Lens in front of the Large Prism, in such a way that an equal amount of image lies on either side of this Lens.

### Important

*Never move the Condenser assembly where the correct focus can be obtained by moving the Lamp.*

#### NOTE:

Adjustment of the Exciter Lamp should also provide that, on removing the Photocell Cover and looking at the Cell Cathode, the bar of light should be in the position shown in Figure 5A.

Exciter Lamps must never be run at a higher voltage than the eight volts for which they are designed. Where possible, it is recommended that they should run at about seven volts, to give longer life and greater reliability.



## Faults

Faults which commonly originate at the Soundhead, and have not already been mentioned, are loss of H.F. response, flutter and wow.

Loss of H.F. response can be caused by dirty film, dirty lenses or by an optical system out of alignment or focus. Flutter and wow are mechanical faults, caused

by uneven running of moving parts due to wear, insufficient lubrication, or a defective Fluid Flywheel. Incorrect lacing can also produce flutter or wow; flutter from loops that are too tight, and wow from loops that are too loose.



# DESCRIPTION

## MOTORS FOR SOUNDHEADS

By correct selection of motors from the different types available, these Soundheads can be operated from a wide range of varying electrical supplies. Motors available from stock cover the following ranges:

50 cycles at 200-220 volts.

50 cycles at 230-250 volts.

50 cycles at 105-115 volts.

For 60 cycle supplies, the standard 50 cycle motors in this range can be provided with special pulleys which have an increased reduction ratio to give the required speed at the Soundhead.

All the motors supplied above are  $\frac{1}{4}$  h.p. capacitor start types, identical in their external dimensions and in the size and spacing of their fixing holes.

Motors for operation on most voltages and/or periodicities not listed above can usually be supplied, but delivery of these motors may be subject to some delay. Adaptor brackets for these motors can be supplied where their dimensions and fixing differ from those of the standard motors.

Belt drive, with twin vee-belts, is employed in normal Theatre practice to give long-life, silent running and ease of replacement. For special requirements, where the Soundhead is to be synchronised with other equipment, either a three phase synchronous motor or an

interlock motor can be supplied. In these cases, the belt drive is replaced either by gear drive, or by a special toothed belt drive.

The Motor is resiliently mounted in front of the Soundhead. It is attached to the Projector Stand by four screws which pass through elongated holes in the motor base, allowing adjustment of the belt tension. The Motor Drive Shaft is horizontal, and parallel to the Sprocket Shafts of the Soundhead. Both the Motor and the belt drive are protected by a ventilated cover, fitted so as to be quickly detachable. An inching handle projects through the Cover on the operating side.

**When ordering** Soundheads and Motors, information should be given on the following:

Type of Stand, with details of facilities for fixing Soundhead and Motor.

Voltage and periodicities of electrical supplies to be used.

Takeup drive: belt or chain.

If these details are given, the equipment provided will be correct for the installation required. This will include pulleys of the correct size and belts of the correct length, together with the correct Adaptor Brackets where necessary.

## SOUNDHEAD MECHANISM

Mechanically, these Soundheads consist of an aluminium Body casting with four Shafts, one of the four being a Layshaft mounted in the casting, while two of the others are Sprocket Shafts, running in Oilite bearings in Housings fitted into the Body casting. The fourth Shaft, carrying the Scanning Drum and Fluid Flywheel,

runs in ball-bearings in a housing fitted to the Scanning Plate.

The housings carrying the Sprocket Shafts are of circular cross-section, and fit into machined bores in the casting.

## Layshaft

The Layshaft is securely held for  $1\frac{1}{2}$  in. of its length in a bore machined to  $\frac{5}{8}$  in. diameter in the casting. It is inserted from the non-operating side, and located accurately by means of a shoulder on the Shaft. It is retained in position by a nut on the operating side of the Soundhead, into which the threaded end of the Shaft

just projects. On the Layshaft, both the Driven Pulley and the Main Driving Pinion rotate; they are held together by three screws, and held on to the Layshaft by a washer and a large hexagonal retaining screw, which is bored and tapped for a Rotherham type Oiler.



The Pulley and Pinion, running on the hardened and ground Layshaft, are Oilite bushed; the Oilite Bearing is  $1\frac{3}{4}$  in. long with a diameter of  $\frac{9}{16}$  in. Oil reaches the bearings from an annular groove in the shaft, fed from the Rotherham Oiler. Also carried on the Layshaft is a

guiding Idle Sprocket for the Drive Chain to the Bottom Takeup. Additional gearing is carried on the two Sprocket Shafts, and includes the Gear to drive the Projector, and the Chain Sprocket for the Takeup assembly.

## Sprocket Shafts

The bearings of the two Sprocket Shafts are carried in the housings mentioned above. The  $\frac{9}{16}$  in. diameter Shafts are hardened and ground, and run in 3 in. long Oilite bearings with a central annular Oil Reservoir. The housings for the Sprocket Shafts,  $3\frac{1}{2}$  in. long by  $1\frac{3}{8}$  in. diameter, both have large "D" shaped flanges on the operating side. These flanges carry the retaining Roller, with its Spindle and Bracket, and the Film Stripper.

The complete Housing is inserted into its bore from the operating side of the Soundhead, and secured by three screws, passing through the flange into tapped holes in the Soundhead casting. The spacing of the

three screws makes it impossible to fit the Housing in any but the correct position, while the method of fitting Retaining Roller and Stripper to the flange ensures permanent alignment of these components with the Sprocket.

The two Sprocket Shafts are identical and interchangeable, though the Stripper is fitted in one of two alternative positions, on the Upper or Lower Sprocket Shaft. In either position, the Stripper is held at the correct angle by an integral key, which engages with one of two keyways when the screw retaining the Stripper is tightened.

## Sprockets

The diameters of the two Sprockets differ at the film face; the upper, acting as a Feed Sprocket, has a diameter of 0.943 in., while the lower Holdback Sprocket has a diameter of 0.930 in. Apart from this difference in diameter, the two Sprockets are identical, and they are

therefore marked to prevent confusion. Great care must be taken to fit them in their correct positions. The Sprockets are held to their Shafts by keywashers and end screws.

## Gear Train

On the non-operating side of the Upper Sprocket Shaft is a large fibre gear, screwed to the Driving Chainwheel of the Bottom Takeup, so that they rotate together. They are keyed to the slotted end of the Shaft by a keywasher integral with the large Gearwheel. The complete assembly is held to the shaft by an end screw.

The Main Driving Pinion on the Layshaft engages with the large fibre gear on the Upper Sprocket Shaft, the gear ratio being such that the 990 r.p.m. of the Driving Pinion is reduced to 360 r.p.m. at the Sprocket

Shaft. The large gear is of such diameter that its upper edge is just proud of the top face of the Soundhead; it is this gear which drives the Projector.

The Lower Sprocket Shaft has, on its non-operating side, only a single small steel gear with an idler Guide-Sprocket for the Chain Drive to the Bottom Takeup. The small gear is driven by a similar sized fibre gear on the Upper Sprocket Shaft, giving a 1:1 gear ratio. It is keyed to the slotted Spindle by a keywasher integral with the Gearwheel, and retained by an end-screw.



## Scanning Unit

The Scanning Drum Shaft, with optical system, Photocell, and Exciter Lampholder which make up the Scanning Unit, are all carried on a plate resiliently mounted on the Soundhead casting. The housing carrying the Scanning Drum and the Flywheel Shaft is fitted into the plate on the non-operating side, and is attached by three screws passing through the flange of

the Housing into tapped holes in the Plate. The Fluid Flywheel is held on to the Shaft by a hexagonal nut and a standard  $\frac{3}{8}$  in. washer; its bore is parallel, as is the Shaft. The Flywheel on current models of these Soundheads is of cast aluminium. The Scanning Drum is of stainless steel, machined integral with the Shaft.

## Layon Roller

The Layon Roller, which holds the Film against the Drum, also runs on ball bearings, and a predetermined thrust is applied to the Layon Roller Bracket by an enclosed spring-loaded Plunger. A calibrated adjustment allows the Layon Roller to be tracked with respect to the Scanning Drum.

The complete Soundhead assembly is rust resistant. The Soundhead casting and the Scanning Plate are of aluminium, the Layon Roller is of nitrided steel, while the smaller Rollers and all retaining screws are chromium plated or of stainless steel.

## ENLARGED IMAGE OPTICAL SYSTEM

One of the most interesting features of these Soundheads is the Enlarged Image Optical System. In this, the Exciter Lamp is mounted on the extreme left (from the operating side); immediately in front of the lamp is a large condenser, which projects a beam of light horizontally forward to a prism mounted partly within the Scanning Drum. This prism reverses the light path, and directs it through the Soundtrack, back through the Objective Lens, and on to the window carrying the Slit Mask. This window is in the Housing carrying a further

prism, which directs the received light vertically downwards on to the Cathode of the Photocell.

The magnification of this Optical System is six times, so that a six-times enlarged image of the Soundtrack is projected on to the Slit Mask.

Due to the use of components of large effective aperture, and to the blooming of lenses and prisms, the efficiency of the Optical System is high.

## Focus

With the Film stationary, and in correct contact with the Scanning Drum, it is immediately possible to check whether the focus of the Optical System is approximately correct. When the Film is running, if either Sprocket

Holes or the edge of the Picture are projected on to the Slit, this will be obvious.

## Slit

The Window has fixed Slit Masking of width 0.084 in. to accept the Internationally agreed scanned width at the Soundtrack. The adjustable tracking of the Layon Roller can be used to centre the Soundtrack on the Slit, if it does not already line up. The angle at which the Slit lies is correctly adjusted at the Works, and is then locked with an Allen screw.

For normal reproduction, quite a wide Slit is employed, since the overall Frequency Response Curve recommended by the Academy of Motion Picture Arts and Sciences stipulates predetermined attenuation above 8,000 cycles. The standard reproducing Slit used in these Soundheads to give the Academy curve has an effective width at the Film of 0.0018 in.



## Electrical

The Exciter Lamp is an 8 volt 4 amp. type. The design of the Optical system is such that the filament structure is not projected even with maximum light output. The Photocell of the 83 Soundhead is a gasfilled type, on a standard British four-pin base. (Photocell GS16, CMG22 or CG8.) The Photocell of the 845 Soundhead is an American RCA 930 or equivalent, with an American UX base.

The Photocells of these Soundheads are Cathode

coupled, irrespective of the type of Amplifier with which they are to be used. Low capacity co-axial cable is used for the connection between Cell and Amplifier. The high tension for the Cell Anode is carried in a separate unscreened cable.

The Scanning Plate assembly has no direct electrical connection to the Soundhead Body casting. Its earth connection is made through the screen of the cell lead to an earthy point in the pre-amplifier.



## DISMANTLING

### For Inspection or Replacement of Parts

Where it is necessary to remove any assembly or part, for inspection or replacement, the following instructions should be followed:

The sections which follow are numbered, to correspond with the Plate Numbers in the Spare Parts List which follows Sheet AP 83/16. The appropriate Plates in the Spare Parts List should be consulted when dismantling, to allow easy reference to the Parts described.

PLATE	DESCRIPTION
2	SCANNING UNIT ASSEMBLY
3	Slit Unit assembly Photocell and Holder
4	Layon Roller
2	Flywheel
	Scanning Shaft and Housing
5	Large Prism assembly
6	Objective Lens and Plunger assemblies
2	Guide Roller
7	Exciter Lampholder
8	LAYSHAFT
9	SPROCKET SHAFTS
	Sprocket Roller and Arm
10	Main Drive Gearing
	Holdback Sprocket Gearing
F	Screened Terminal Block
	Oil Pipes

#### Important

In these instructions, to describe positions, the side of the Soundhead covered by the doors is called the "OPERATING SIDE", the opposite side is called the "NON-OPERATING SIDE", the end to the right, when looking at the Soundhead from the Operating Side will be known as the "FRONT" of the Soundhead, and the opposite end as the "REAR".



## Plate 2

### SCANNING UNIT ASSEMBLY

- (a) Remove the Flywheel as in Sheet AT83/9a.
- (b) Disconnect the Exciter Lamp and Photocell cableforms, using a screwdriver and soldering iron.
- (c) With a large-bladed screwdriver, unscrew the three broad-headed screws 83022 (see Figure T4), which hold the Scanning Plate to the Soundhead casting.

NOTE:

- (i) When replacing, reconnect cableforms according to Wiring Diagram Figure T25 and the "Wiring" section under "REASSEMBLY" below.
- (ii) When replacing the large fixing screws, take care also to fit the three rubber shock absorber Pads, part 83023, which are fitted round the fixing screws.

## Plate 3

### PHOTOCELL AND HOLDER

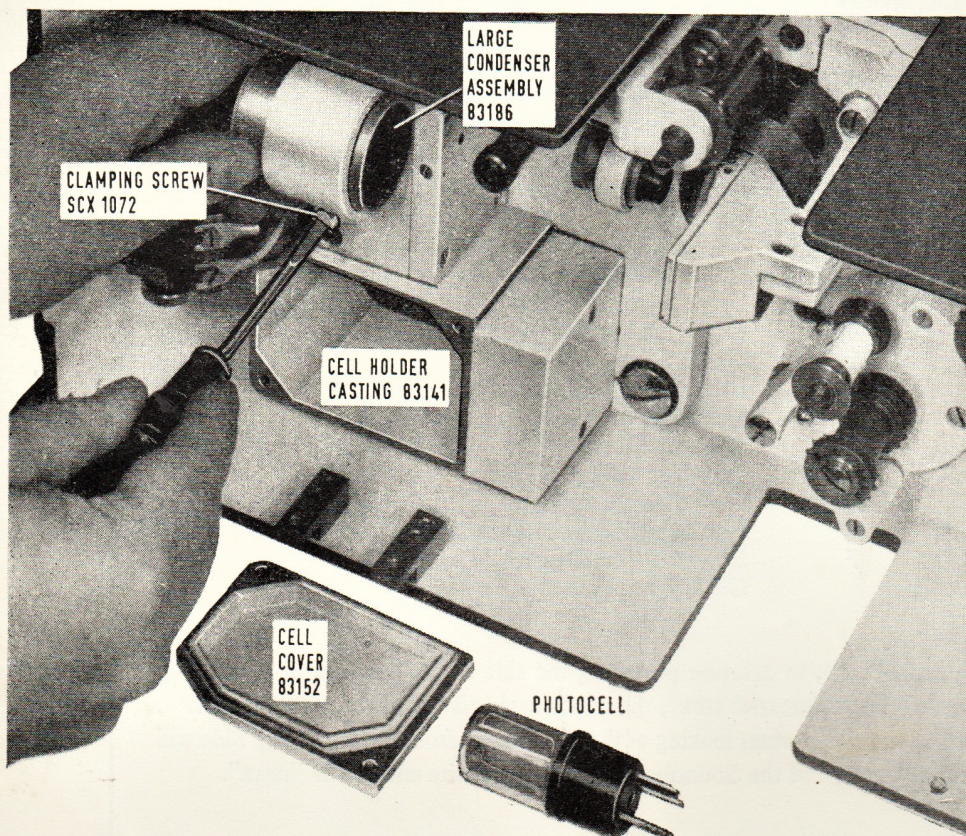


FIGURE T1.  
REMOVING LARGE  
CONDENSER FROM  
CASTING, SHOWING  
PHOTOCELL AND  
COVER REMOVED

- (a) Remove the Cell Cover 83152, by withdrawing the two retaining screws SCX 1066.
- (b) Carefully withdraw the Photocell.
- (c) If it is necessary to replace the Cell-Holder, first unscrew the two retaining screws SCX 1045 with washer WAS 506, then unsolder the leads from the base

of the Holder. (See Spare Parts List for alternative Cell bases.)

NOTE:

On reassembly, take care to connect the wiring correctly according to Figure T25 and "WIRING" under "RE-ASSEMBLY". Sheet AT 83/15a.



## SLIT UNIT ASSEMBLY

### (To remove large Condenser Lens assembly)

- (a) Unscrew the clamping screw SCX 1072, until the Condenser Lens assembly is freed (See Fig. T1).
- (b) Remove the Condenser Lens assembly from the Condenser Mount casting 83132.

#### NOTE:

- (i) This Condenser Lens assembly **MUST NOT BE DISMANTLED**, but should be replaced if defective, since it is set up with special equipment.
- (ii) When refitting this assembly, make sure that it is inserted with the retaining screw towards the rear of the Soundhead. Make sure also that the Condenser assembly is fitted with its Slit Aperture horizontal, so that it does not cut off any of the image falling on the Slit Mask in the Slit Unit assembly.
- (iii) To focus the image of this slit correctly, this assembly should be inserted so that it projects for  $\frac{1}{16}$  in. in front of the Condenser Mount casting.

FIGURE T2. REMOVING THE SLIT ASSEMBLY FROM THE SLIT UNIT FRONT PLATE, SHOWING THE FRONT PLATE AND THE CONDENSER MOUNT CASTING DISMANTLED

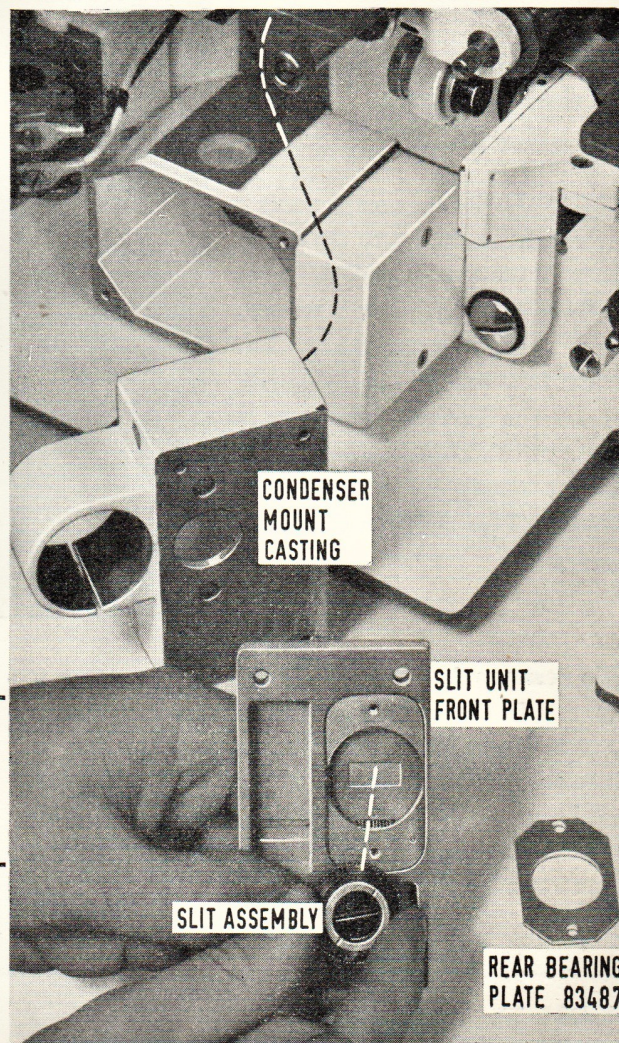
### (To remove Slit Unit)

- (c) Unscrew and remove the four screws SCX 1059, retaining the Slit Unit Front Plate.
- (d) Remove the Front Plate.
- (e) To remove the Slit assembly, first loosen the 4BA. socket head grub screw GRU 21, and make sure that both the screw and the cork slug beneath it are kept in a safe place.
- (f) Withdraw the two retaining screws SCX 1032, and remove the Rear Bearing Plate 83487. Carefully withdraw the Slit assembly, disengaging the Worm Wheel rim from the thread of Azimuth Setting Worm 83490.

#### NOTE:

On reassembly, the Azimuth must be set as follows:

- (i) When reassembling, with the Soundhead fitted to the Projector, thread a long length or endless loop of 5,000 cycle Focussing Film.
- (ii) Connect a meter with a 12 volt A.C. range across the output terminals of the Power Amplifier.
- (iii) Release the 4BA. Allen locking screw, if this has been re-tightened.



- (iv) Switch on Pre- and Power Amplifiers, Exciter supply and Projector Motor. Switch the Sound change-over switch to the Soundhead being tested.
- (v) If the Large Condenser assembly has been moved during overhaul or maintenance; loosen the Large Condenser clamping screw, and slide the Large Condenser assembly until the light from the Exciter Lamp forms an illuminated bar on the enamelled face of the Large Prism assembly.
- (vi) With a screwdriver, turn the head of the Azimuth Setting Worm until the signal output, measured on the Meter across the Power Amplifier output, reads the maximum obtainable.
- (vii) Loosen the Objective Lens clamping screw, and adjust the Objective Lens, by screwing it in or out, to obtain a maximum Meter reading.

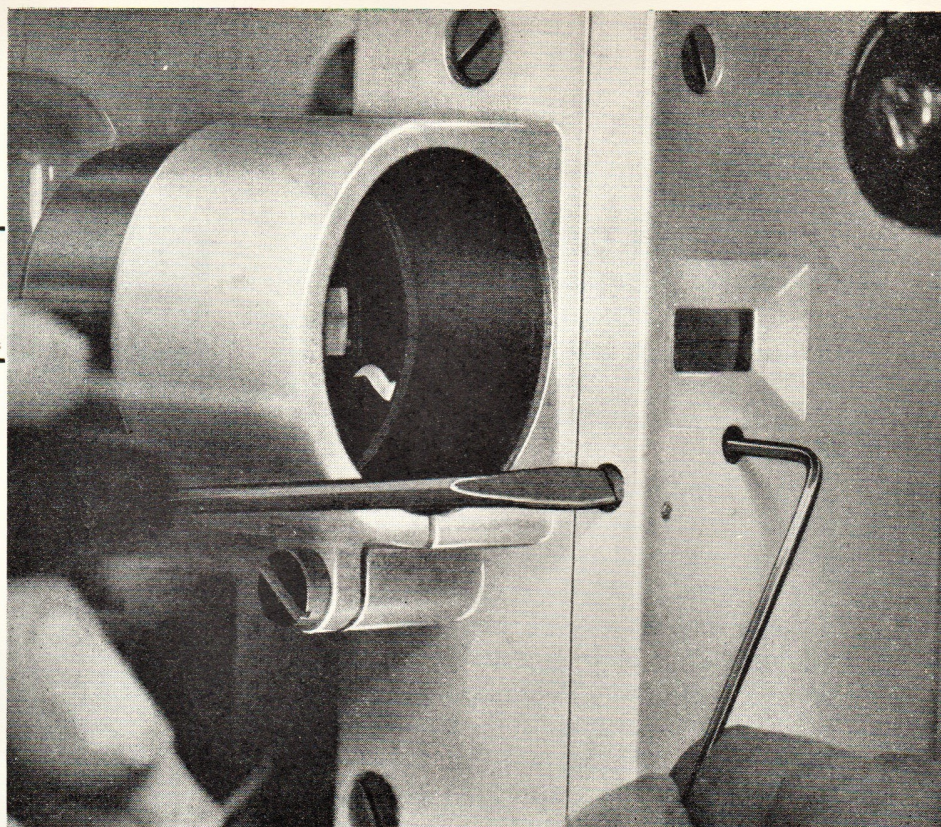


FIGURE T3.  
SETTING THE AZIMUTH

(viii) Loosen the clamping socket screw GRU 1, and turn the milled flange of the Small Condenser Lens to obtain a maximum Meter reading.

(ix) ONLY if the Small Condenser Lens had to be moved to give a maximum Meter reading, re-focus the Objective Lens.

(x) Clamp the Slit Azimuth, Objective Lens and both Condenser Lenses.



**(To remove Azimuth Worm)**

(g) In the unlikely case of damage to Azimuth Driving Worm 83490, a small punch should be used to drive out Pin 83491. This must be driven from the end just below the Slit Unit, which is normally covered by its position between the Slit Unit and the rear Bearing Plate 83487.

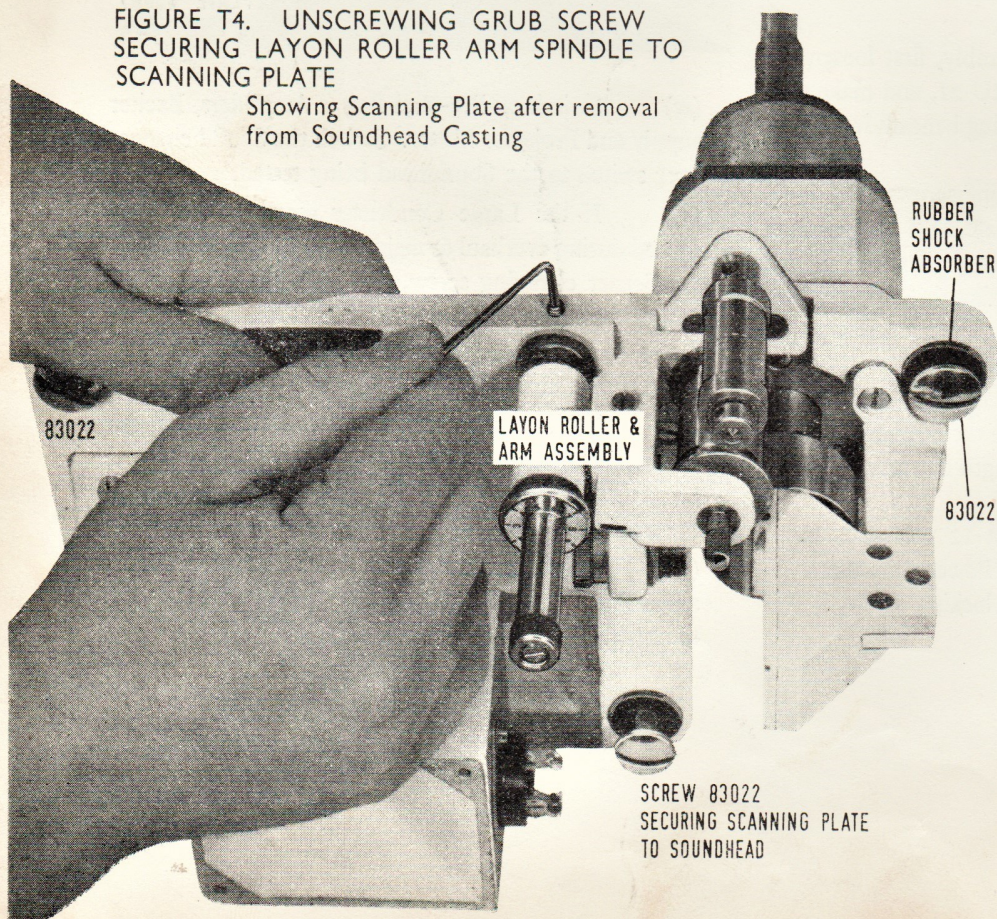
(h) Withdraw the Worm.

**NOTE:**

When fitting the Worm, the Pin should be driven in from the front of the Soundhead, and MUST NOT project beyond the rear surface of the Front Plate.

FIGURE T4. UNSCREWING GRUB SCREW  
SECURING LAYON ROLLER ARM SPINDLE TO  
SCANNING PLATE

Showing Scanning Plate after removal  
from Soundhead Casting



**(Dismantling Slit  
assembly)**

(a) Unscrew the Locking Ring 83485, taking care not to damage the Worm Teeth on Slit Mounting Gear 83484.

(b) Remove the Slit Mask.

**NOTE:**

On reassembly, re-focus as above.



# Plate 4

## LAYON ROLLER ASSEMBLY

(a) Free the socket set screw in the top of the Scanning Unit casting, above the Roller Arm Pivot Spindle. (See Figure T4.)

(b) Withdraw the Layon Roller and Arm assembly from the Scanning Unit.

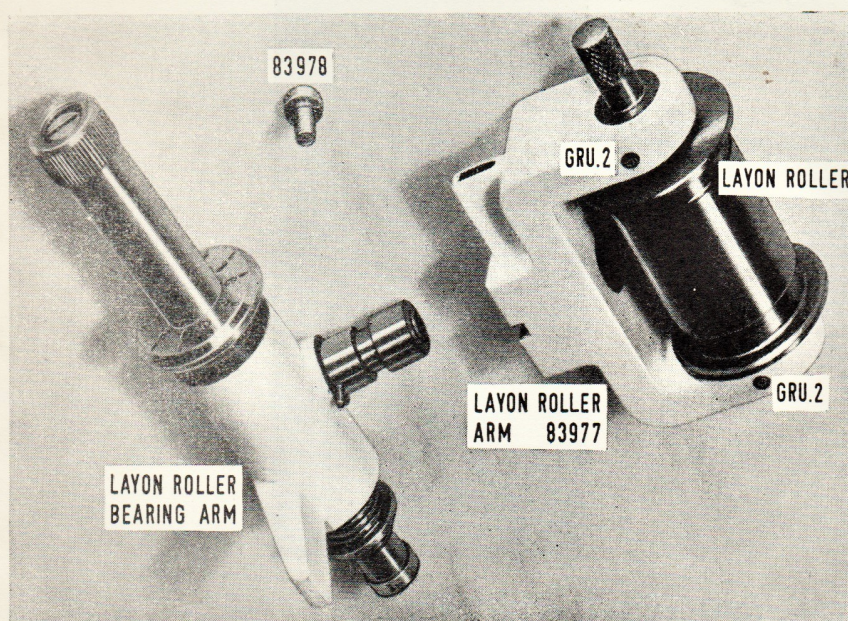


FIGURE T5. LAYON ROLLER AND ARM PART DISMANTLED

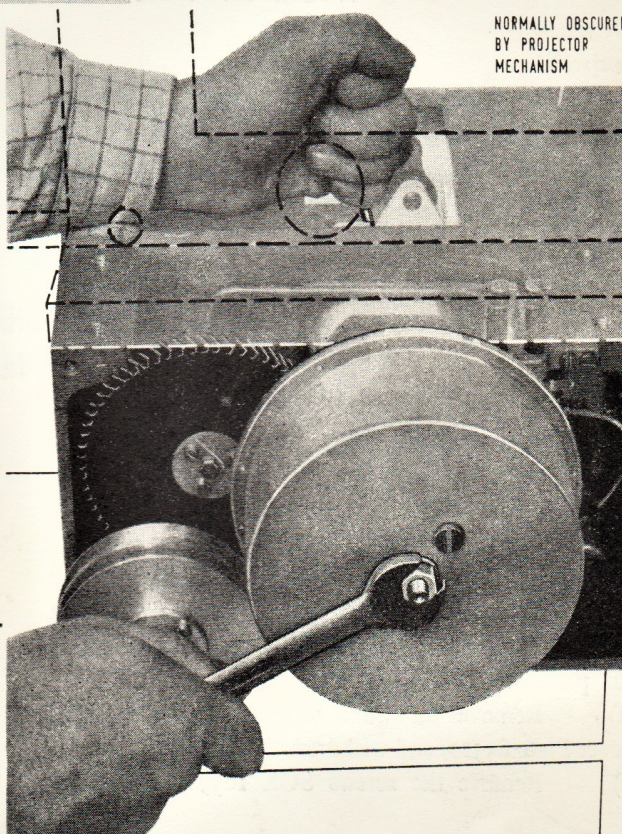
## FLYWHEEL (on Plate 2)

(a) Insert a Tommy Bar in the hole in the Scanning Drum Shaft, between the Drum and the Shaft Bearings, and prevent the Shaft turning.

(b) Remove the nut from the Flywheel end of the Scanning Drum Shaft, as shown in Figure T6. Remove washer WAS 2/425.

(c) Grasp the Flywheel in both hands, and remove from the Shaft. N.B.—Particular care must be taken when removing the older spun aluminium types of Flywheels (Part numbers 83071 or 428000). See notes on Sheet AP 83/19a.

FIGURE T6. UNSCREWING FLYWHEEL RETAINING NUT. The Operating side of the Soundhead is normally obscured by the Projector, a second person may be required to steady the Shaft with a tommy bar, as shown.



### (To remove the Layon Roller)

(c) First remove the two 6BA. socket screws GRU 2.

(d) Withdraw the Layon Roller Spindle. Free the Roller assembly and the Locating Collar.

### (To remove Layon Roller Arm)

(e) Remove special screw 83978, holding the Layon Roller Arm 83977 to the Bearing Arm 83978.

(f) Slide the Layon Roller Arm off the sleeved dowel cast integral with the Bearing Arm.

### NOTE:

When re-fitting, make sure that the screw 83979 locates correctly in the groove cut in the sleeve.

NORMALLY OBSCURED  
BY PROJECTOR  
MECHANISM



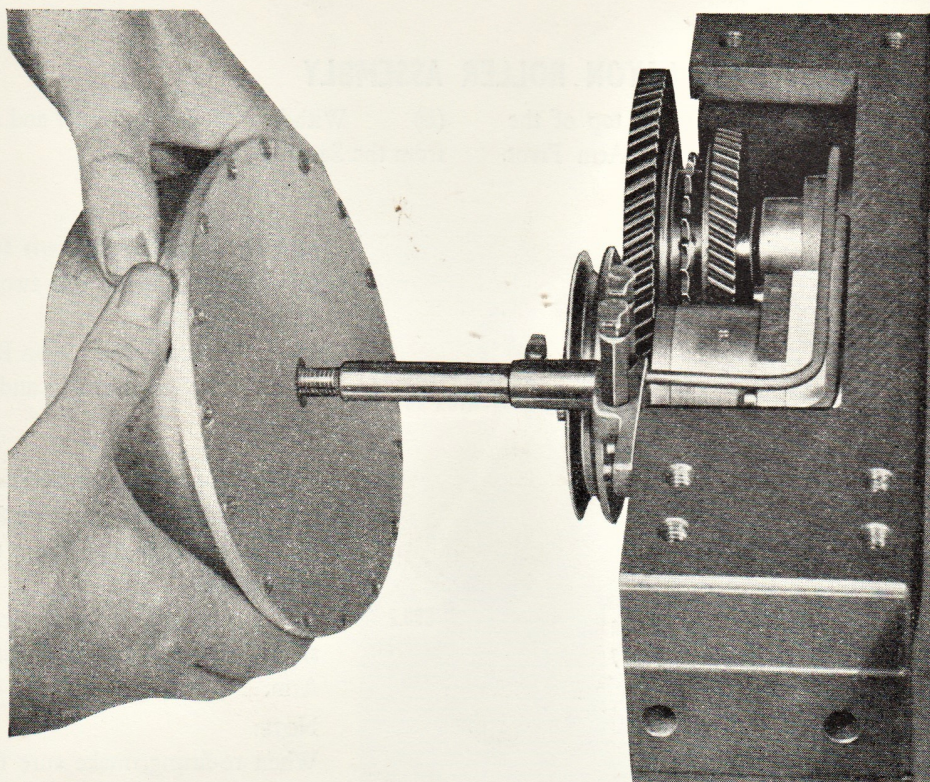


FIGURE T7. TAKE CARE WHEN REMOVING FLYWHEEL

### Inspection

(d) Inspect the Flywheel for damage or flaws, and renew it if any obvious defects appear. Check that the Filler Plugs are tight, if any trace of leakage from any other point is visible, fit a new Flywheel.

*N.B.* Dents that may be found in Flywheels part 83071 or 428000 may have an adverse effect on the steadiness of the Scanning Drum, for this reason, they should be replaced as described in the notes on Sheet AP 83/19a.

## SCANNING DRUM SHAFT AND HOUSING (on Plate 2)

- (a) Remove the Flywheel as above.
- (b) Remove the three screws SCX 1093 and their washers which hold the flanged Scanning Drum Shaft Housing into its bore in the Scanning Unit casting.
- (c) Lift the Layon Roller and withdraw the Scanning Drum Shaft and Housing. Take great care not to scratch or mark the surface of the Scanning Drum in this process.
- (d) Remove the three screws securing Bearing Cover Plate 83510, and withdraw the Plate.
- (e) Remove the screws SCX 1059 securing the

Front Bearing Cover Plate 83509.

- (f) Withdraw the Scanning Drum Shaft 83501, complete circlip CSE  $\frac{5}{8}$  in., and the Front Ball Bearing.
- (g) Remove the circlip CSE  $\frac{5}{8}$  in. with a pair of circlip pliers, or narrow nosed pliers with their tips ground down to two points.
- N.B.* On older Soundheads of this Type, a Collar 83508 was employed instead of the circlip. Where a Shaft fitted with such a Collar is to be replaced, refer to the notes on Sheet AP 83/19a.
- (h) Remove the Front Ball Bearing.



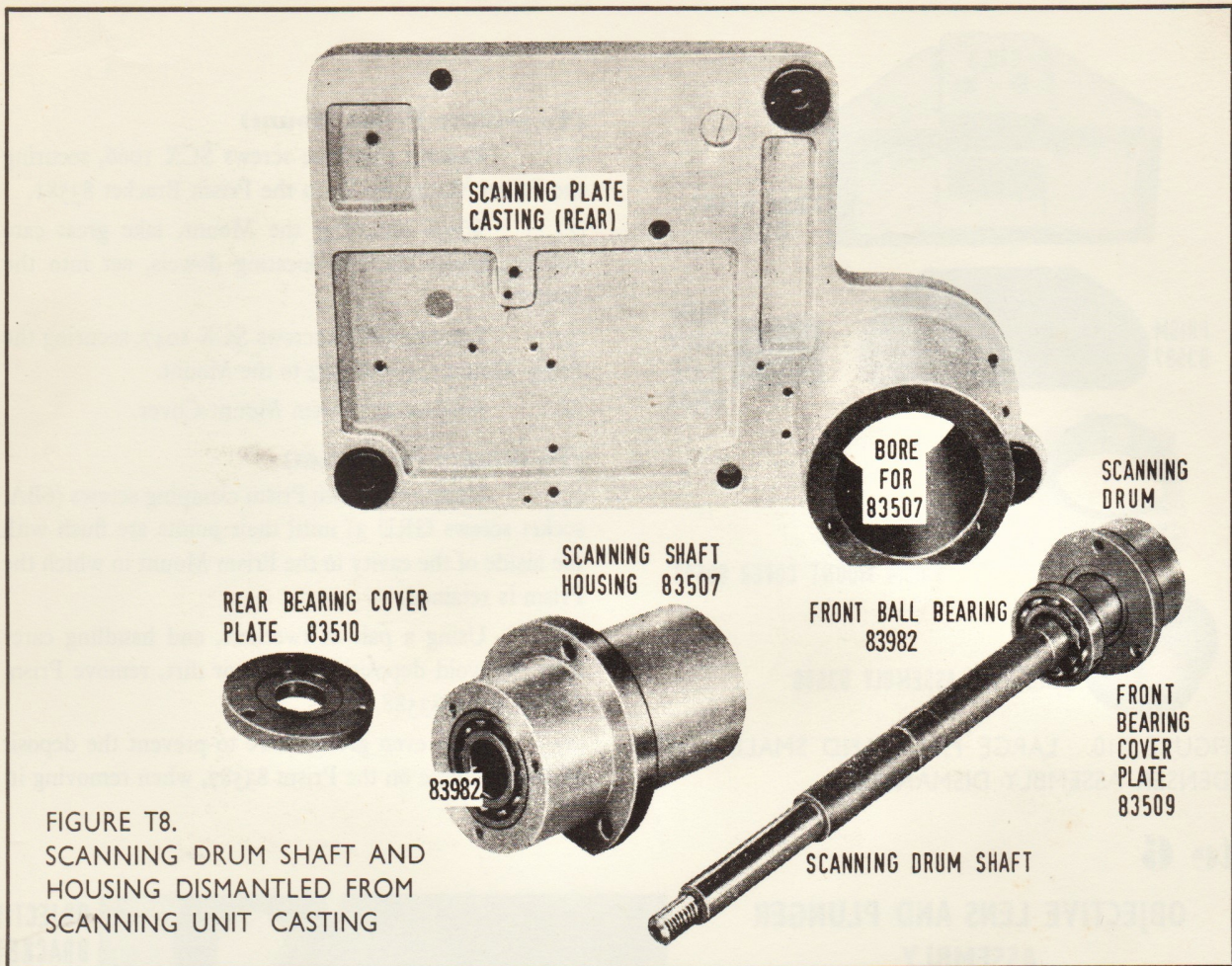
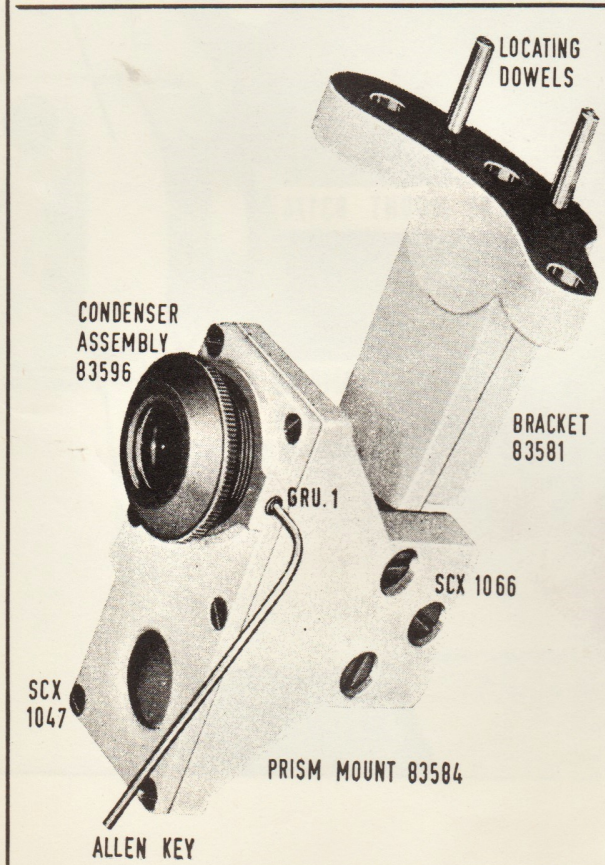


FIGURE T8.  
SCANNING DRUM SHAFT AND  
HOUSING DISMANTLED FROM  
SCANNING UNIT CASTING



## Plate 5

### LARGE PRISM AND AUXILIARY CONDENSER ASSEMBLY

#### (To remove Auxiliary Condenser)

- Unscrew 6BA. socket screw GRU 1.
- Grasp the Condenser Assembly 83596 by the milled flange, unscrew and remove it.
- Remove the three fixing screws SCX 1086.
- Remove the Bracket 83581 from the Scanning Unit Casting.

FIGURE T9.  
LARGE PRISM AND AUXILIARY CONDENSER  
ASSEMBLY, showing:

- Allen Key Freeing Condenser Locking Screw GRU 1.
- Base of Bracket, with Locating Dowels.



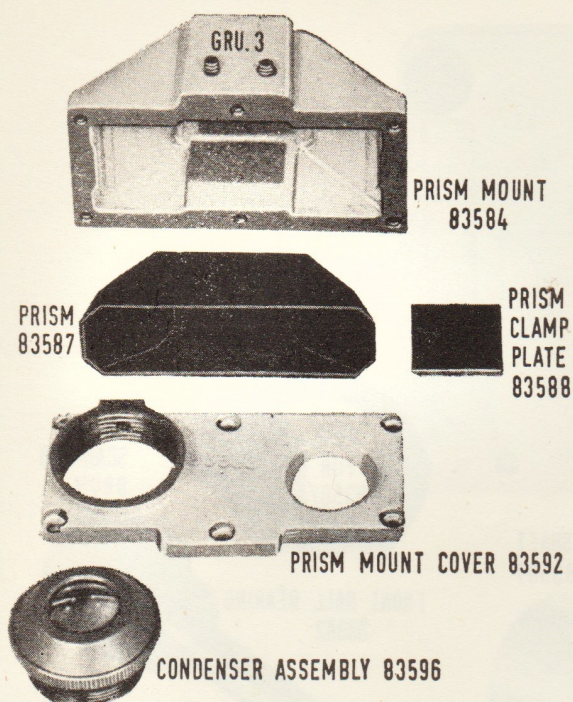


FIGURE T10. LARGE PRISM AND SMALL CONDENSER ASSEMBLY DISMANTLED

**(To remove Prism Mount)**

- (e) Remove the three screws SCX 1066, securing the Prism Mount 83584 to the Prism Bracket 83581.
- (f) When removing the Mount, take great care not to damage the two locating dowels, set into the mount.
- (g) Remove the six screws SCX 1047, securing the Prism Mount Cover 83592 to the Mount.
- (h) Remove the Prism Mount Cover.

**(To remove the Prism)**

- (i) Unscrew the two Prism clamping screws (6BA. socket screws GRU 3) until their points are flush with the inside of the cavity in the Prism Mount in which the Prism is retained.
- (j) Using a pair of tweezers, and handling carefully, to avoid depositing grease or dirt, remove Prism Clamp Plate 83588.
- (k) Take even greater care to prevent the deposit of dirt or grease on the Prism 83587, when removing it.

## Plate 6

### OBJECTIVE LENS AND PLUNGER ASSEMBLY

**(To remove Objective Lens Mount)**

- (a) Loosen clamping screw SCX 1059.
- (b) Grasp the milled end of the Lens Mount 83174, and unscrew it from the Bracket 83170.

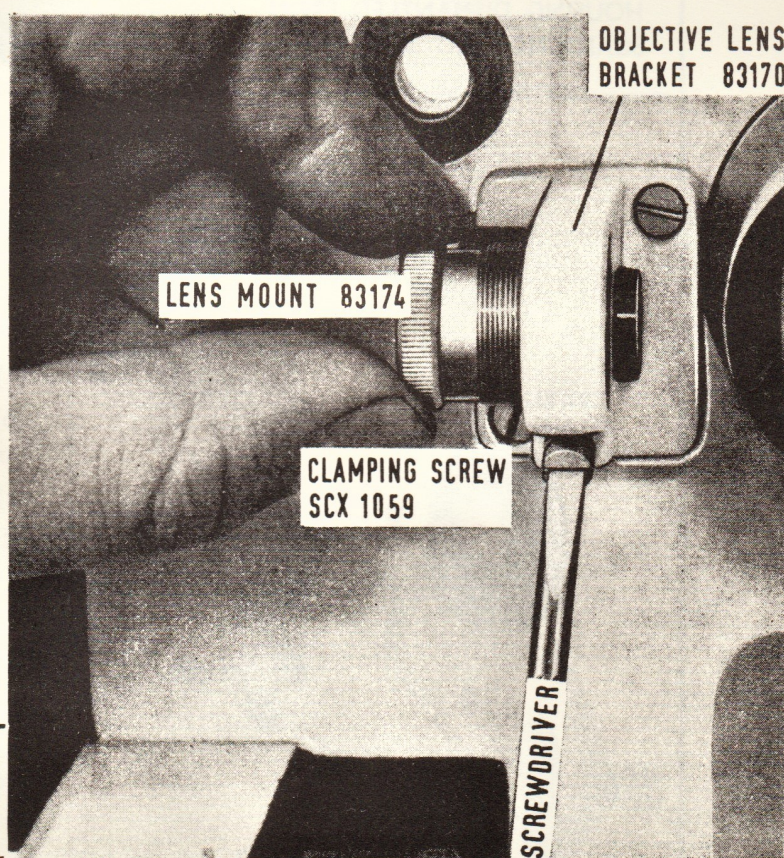
**(To remove the Objective Lens from the Mount)**

- (c) Grasp the milled end of the Mount 83174, and unscrew the Lens 83175 from the opposite end.

**NOTE:**

When refitting Lens and/or Mount, the Optical System of the Soundhead should be refocused as in Sheet AT 83/8a, under the second "NOTE" heading.

FIGURE T11. REMOVING OBJECTIVE LENS FROM BRACKET





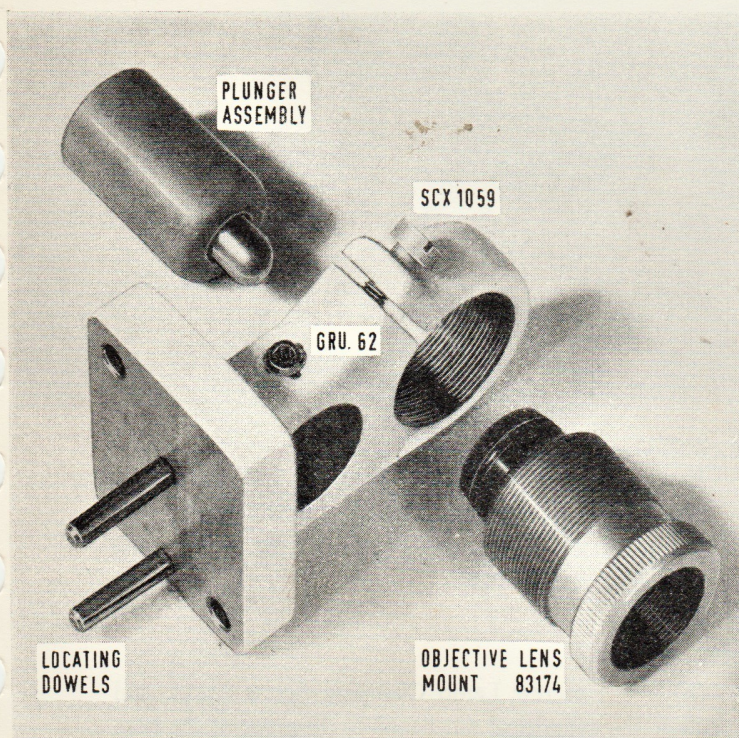


FIGURE T12. OBJECTIVE LENS AND PLUNGER ASSEMBLY, PART DISMANTLED, SHOWING LOCATING DOWELS ON BRACKET

### GUIDE ROLLER (on Plate 2)

- (a) Unscrew set screw GRU 1 in Collar 83973. Remove the Collar.
  - (b) Remove the Guide Roller, complete with bearings.
- N.B.* Only if new Ball Bearings BRH 466 are to be fitted should the old ones be removed.
- (c) To remove Spindle 83971, insert a small Tommy Bar through the hole in the flange against the Guide Roller Plate. With this Tommy Bar, unscrew the Spindle from Guide Roller Mounting Plate 83970.
  - (d) To remove Mounting Plate 83970, first withdraw the two fixing screws SCX 1058.

FIGURE T13. GUIDE ROLLER AND MOUNTING PLATE DISMANTLED  
(NOTE: Ballraces (BRH 466) not to be removed unless replaced by new)

### (To remove the Plunger Assembly)

- (d) Unscrew Socket set screw (2BA.) GRU 62, in the side of Bracket 83170.
- (e) Remove the Plunger assembly. (This assembly is tapered.)

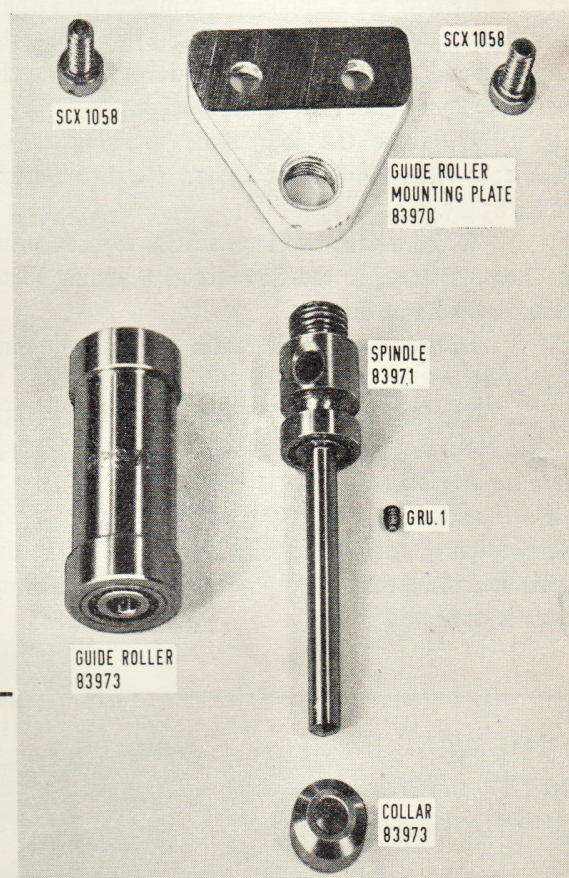
#### NOTE:

- (i) On reassembly, unless adjustment of the pressure on the Layon Roller is necessary, the Plunger assembly should be refitted so that the taper prevents it being inserted farther into the Bracket.
- (ii) To adjust the pressure on the Layon Roller, the position of the Plunger assembly can be altered; moving it towards the front of the Soundhead will decrease the pressure.

The pressure on the Layon Roller should be enough to hold the Film against the Scanning Drum, but must never be enough to mark the Film in any way.

### (To Remove the Bracket)

- (f) Unscrew the two screws SCX 1073, retaining the Bracket 83170 to the Scanning Plate.
- (g) Remove the Bracket.

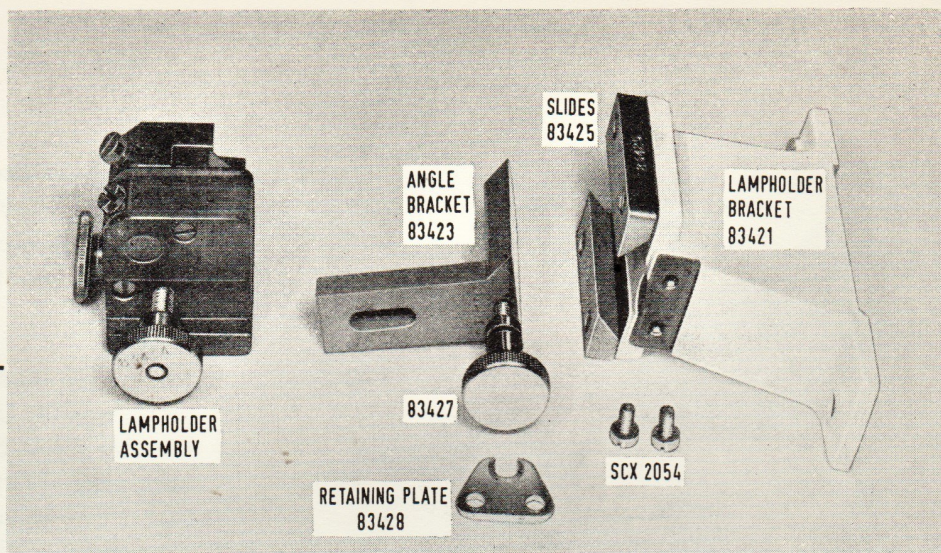




## Plate 7

### EXCITER LAMPHOLDER ASSEMBLY

FIGURE T14  
EXCITER LAMPHOLDER PART  
DISMANTLED



#### (To remove Exciter Lamp)

- (a) Slacken Lamp Clamping Screw 83438, and withdraw the Lamp.

#### NOTE:

When replacing the Lamp, read the instructions on Sheet AP 83/4a re setting the height of the Lamp. The height of the Lamp can be altered by turning the Elevating Screw 83427.

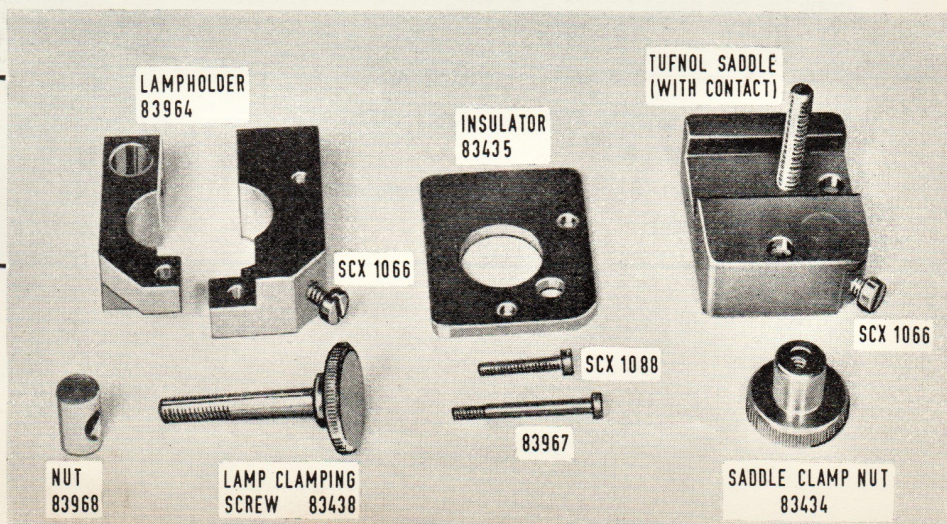
#### (To dismantle Lampholder)

- (b) Remove the two screws SCX 2054, securing the Retainer Plate 83428 to the Bracket 83421.  
(c) Remove the Lampholder, complete with Angle Bracket 83423 and Elevating Screw 83427 by sliding the travelling end of the Angle-Bracket down between the two slides 83425 until clear of the Bracket.  
(d) Withdraw the four Slide retaining screws SCX 1060 from the Bracket 83421. Remove the two Slides 83425.  
(e) Withdraw the two screws SCX 1072, securing the Lamp Bracket to the Soundhead Scanning Plate. Remove the Lamp Bracket.  
(f) Disconnect the Cableform 83190, by loosing the two connector screws SCX 1066.  
(g) Release the milled Saddle Clamp Nut 83434, and remove the Lampholder Saddle Assembly 83433 from the Angle Bracket 83423.

N.B. This Saddle Clamp Nut can be loosed to allow the position of the Lampholder to be adjusted in the Horizontal plane; for this purpose the hole for the Clamp screw is elongated.

- (h) Unscrew Lamp Clamping Screw 83438, and allow the cylindrical nut 83968 to drop out of the bore in which it rests.  
(i) Remove the special screw 83967, which is only threaded where it passes through the fixed section of the Lampholder. This screw is the one on which the free section of the Lampholder pivots; its head will be found sunk just below the lower surface of the Tufnol Saddle, close to the brass base of Contact assembly 83488.  
(j) Remove the moving section of the Lampholder.  
(k) Unscrew the retaining screw SCX 1088 in the Saddle assembly. The head of this screw is sunk below the surface of the channel in which the Angle Bracket locates.  
(l) Remove the fixed section of the Lampholder.  
(m) Insulator 83435 is located between the Saddle and the Lampholder in such a position that it is retained by the screws which hold the two together. It is released when these screws are withdrawn.

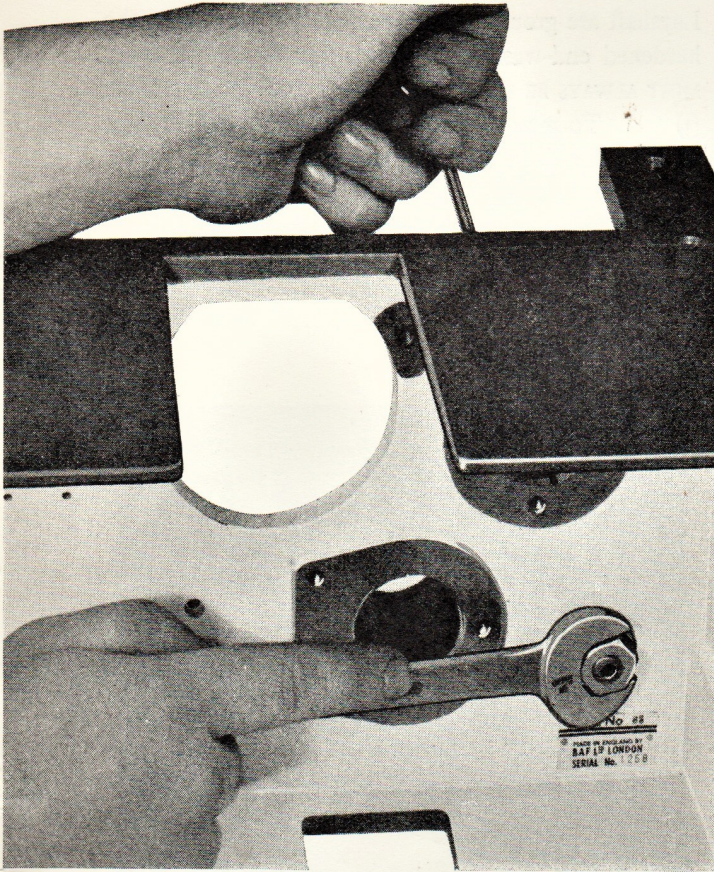
FIGURE T15.  
EXCITER LAMPHOLDER  
ASSEMBLY DISMANTLED





## Plate 8

FIGURE T16.  
UNSCREWING LAYSHAFT RETAINING NUT



### (To remove Layshaft)

- (f) Place a Tommy Bar through the transverse hole drilled through the Layshaft for this purpose. The Layshaft is the Shaft in the bottom left hand corner of the Soundhead, and the Tommy Bar hole is between the Idle Sprocket and the Soundhead casting.
- (g) Steady the Layshaft with the Tommy Bar. With a  $\frac{7}{16}$  in. Whitworth spanner remove nut NUT 9/145 and the washer WAS 3/426, situated above the Label on the operating side of the Soundhead.
- (h) Withdraw the Layshaft from the non-operating side of the Soundhead.

FIGURE T17.  
UNSCREWING SPECIAL NUT RETAINING MAIN  
DRIVE PULLEY TO LAYSHAFT  
(Note marks on Pulley and Gear for correct meshing)

### LAYSHAFT ASSEMBLY

**Always remove Main Drive Pulley and Gear assembly BEFORE removing Layshaft from Soundhead**

- (a) Unscrew and remove the hexagonal headed retaining Screw 83749, and remove the hardened washer 83748.

#### NOTE:

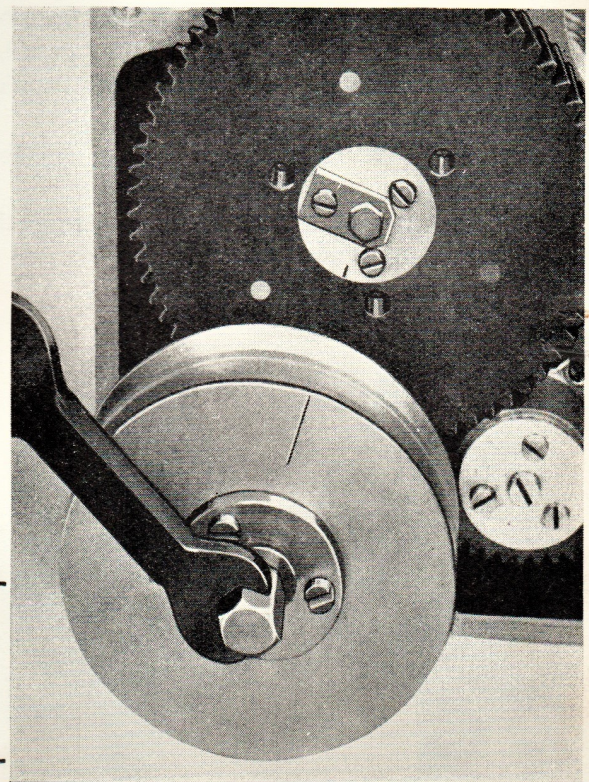
When replacing the Washer, take care to fit it with the bevelled edge facing away from the Pulley.

- (b) Before separating gears ALWAYS mark with a soft pencil as shown in Figure T17 with a line on the external face of each gear assembly.

#### NOTE:

Where the original gears are refitted, they have already been run-in, and they MUST therefore be assembled so that these pencil marks line up in the same way as when they were removed.

- (c) Withdraw the assembly comprising the Main Drive Pulley 83745, the Main Drive Pinion 83744, and the Pulley Sleeve 83746.
- (d) Remove the hardened Thrust washer 83743, which lies between Main Drive Pulley assembly and the Idle Chain-Sprocket 83742.
- (e) Remove the Idle Chain-Sprocket.





### (To separate Main Drive Pulley and Gear)

(i) Unscrew the three fixing screws SCX 1135, which pass through the Pulley, Sleeve and Gear. Withdraw first the Gear and then the Pulley from the Oilite bushed Pulley Sleeve 83746.

NOTE:

(i) When refitting, fit the Pulley so that the engraved Part Number is on the non-operating side (by the flange on the sleeve). Fit the Main Drive Gear with the spacing flange against the Pulley and the engraved Part Number facing away from the Pulley.

(ii) To ensure smooth, steady running of the Pulley and Main Drive Gear, the Pulley Sleeve and Layshaft are ground together across the end below the hardened end-washer. For this reason the LAYSHAFT MUST ALWAYS BE FITTED WITH THE SAME PULLEY SLEEVE.

(i) To remove the Rotherham Oiler OAL-1, unscrew with a  $\frac{3}{16}$  in Whitworth spanner.

NOTE:

When refitting, renew the leather washer 83052 if this is damaged in any way.

## Plate 9

### SPROCKET SHAFT

(a) Remove the end screw on the NON-OPERATING SIDE of the Sprocket Shaft. In the case of the upper or Feed Sprocket, this is a hexagonal headed screw SCX 3072, locked by a special Keeper. To free this end screw, the screw securing Keeper 83050 must first be removed, and the Keeper withdrawn. The end-screw on the Lower Sprocket Shaft is a cheesehead, SCX 1072.

(b) After removal of the end screw in each case, remove the complete Gear Assembly.

(c) Unscrew the three retaining screws SCX 1093, which secure each Sprocket Shaft and Bearing assembly to the Soundhead casting. (These are the three 2BA. screws countersunk into the Sprocket Shaft Mounting Bracket 83087.)

(d) Withdraw the Shaft and Bearing assembly from the casting.

(e) Unscrew SCX 1129, which passes through the Stripper 83106 into the mounting bracket.

(f) Remove the Stripper.

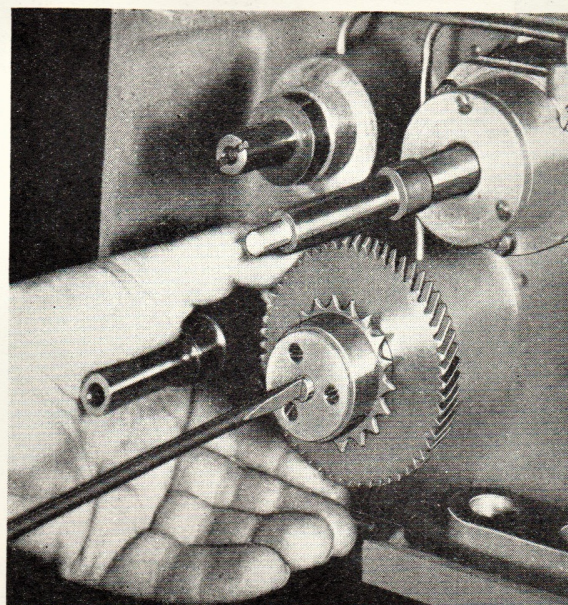


FIGURE T18. REMOVING END-SCREW SECURING HOLDBACK SPROCKET GEARING TO SHAFT

NOTE:

(i) There is a locating key on the Stripper which can locate in either of two slots radiating from the threaded hole to which it is screwed. These slots give a choice of Stripper position, depending on whether the assembly is mounted as the Upper or Lower Sprocket Shaft. See Figure T19.

(ii) For use in the Upper position, the key should locate the Stripper to the right of the Sprocket, away from Spring 83072.

(iii) For use in the lower position, the Stripper should be located to the left of the Sprocket, just in front of Spring 83072.

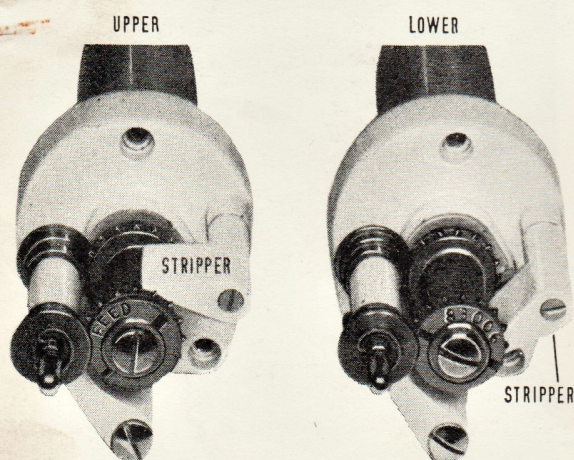


FIGURE T19. ALTERNATIVE STRIPPER POSITIONS ON UPPER AND LOWER SPROCKET SHAFTS



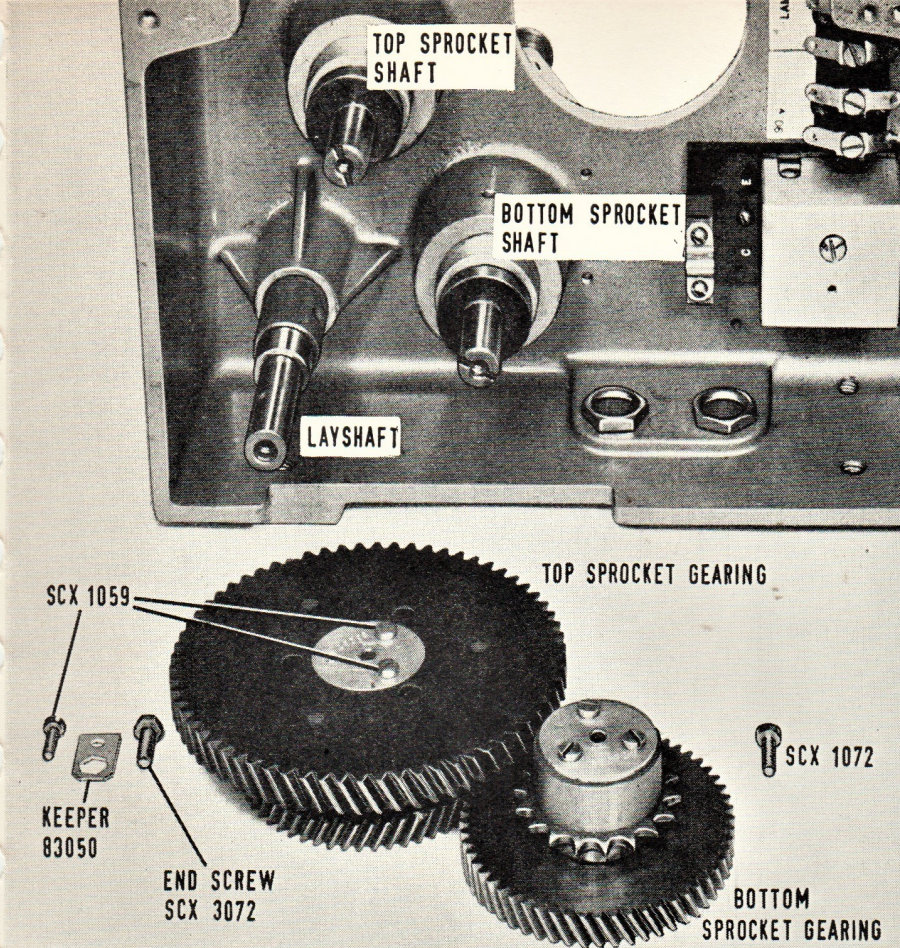


FIGURE T20. SPROCKET SHAFT GEARING REMOVED FROM SOUNDHEAD NON-OPERATING SIDE

### (To remove the Sprocket)

- (g) Unscrew the end screw 83097, and remove key-washer 83007.
- (h) Withdraw the Sprocket. The part number of the Feed Sprocket on the Upper Shaft is 83005, that of the Hold-back Sprocket 83006.
- (i) Unscrew retaining screw 83097 (identical to the Sprocket Shaft end screw), which holds the Roller and Arm assembly 83096 to the Roller Pivot 83088.
- (j) Unscrew the three screws SCX 1052, and remove the Mounting Bracket 83087. These screws are situated on the non-operating side of the Bearing Flange.
- (k) With a 2BA. Allen key, release set screw GRU 64 and withdraw Locking Collar 83083, on the Sprocket Shaft 83081 at the non-operating end of the Bearing 83082.
- (l) Withdraw the Shaft from the operating side of the Bearing.

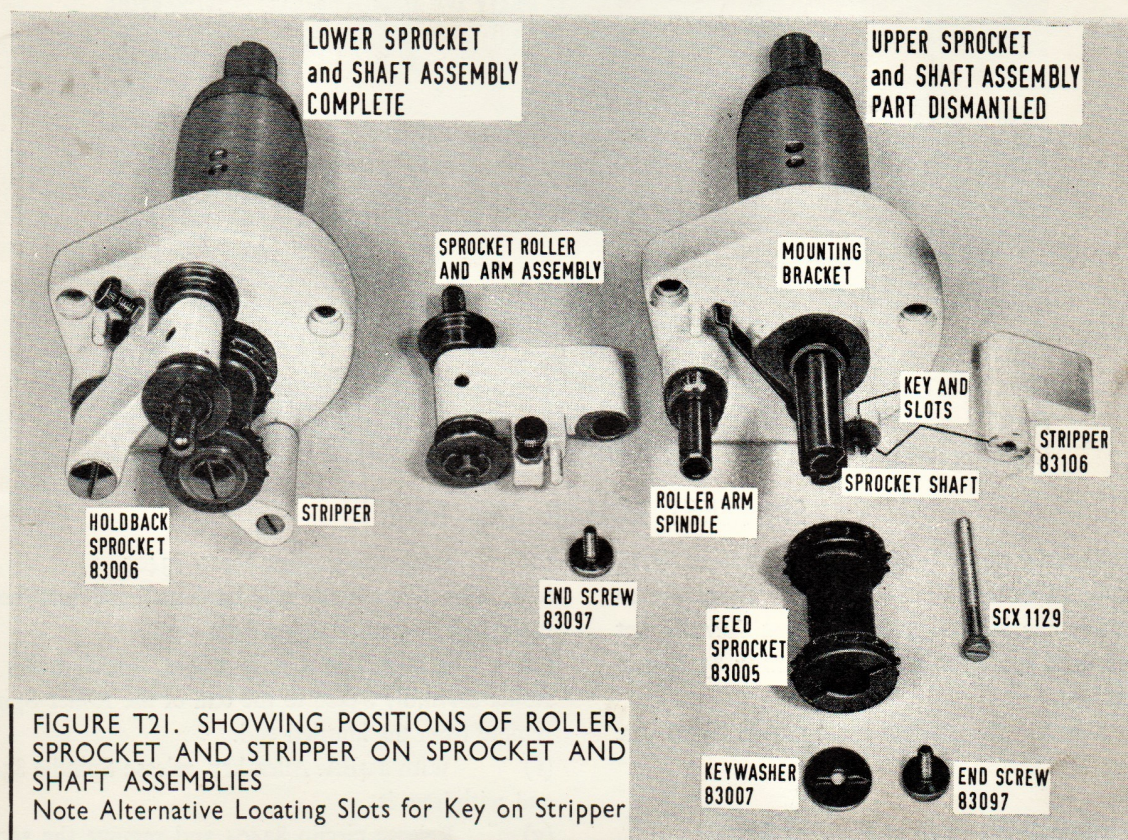


FIGURE T21. SHOWING POSITIONS OF ROLLER, SPROCKET AND STRIPPER ON SPROCKET AND SHAFT ASSEMBLIES  
Note Alternative Locating Slots for Key on Stripper



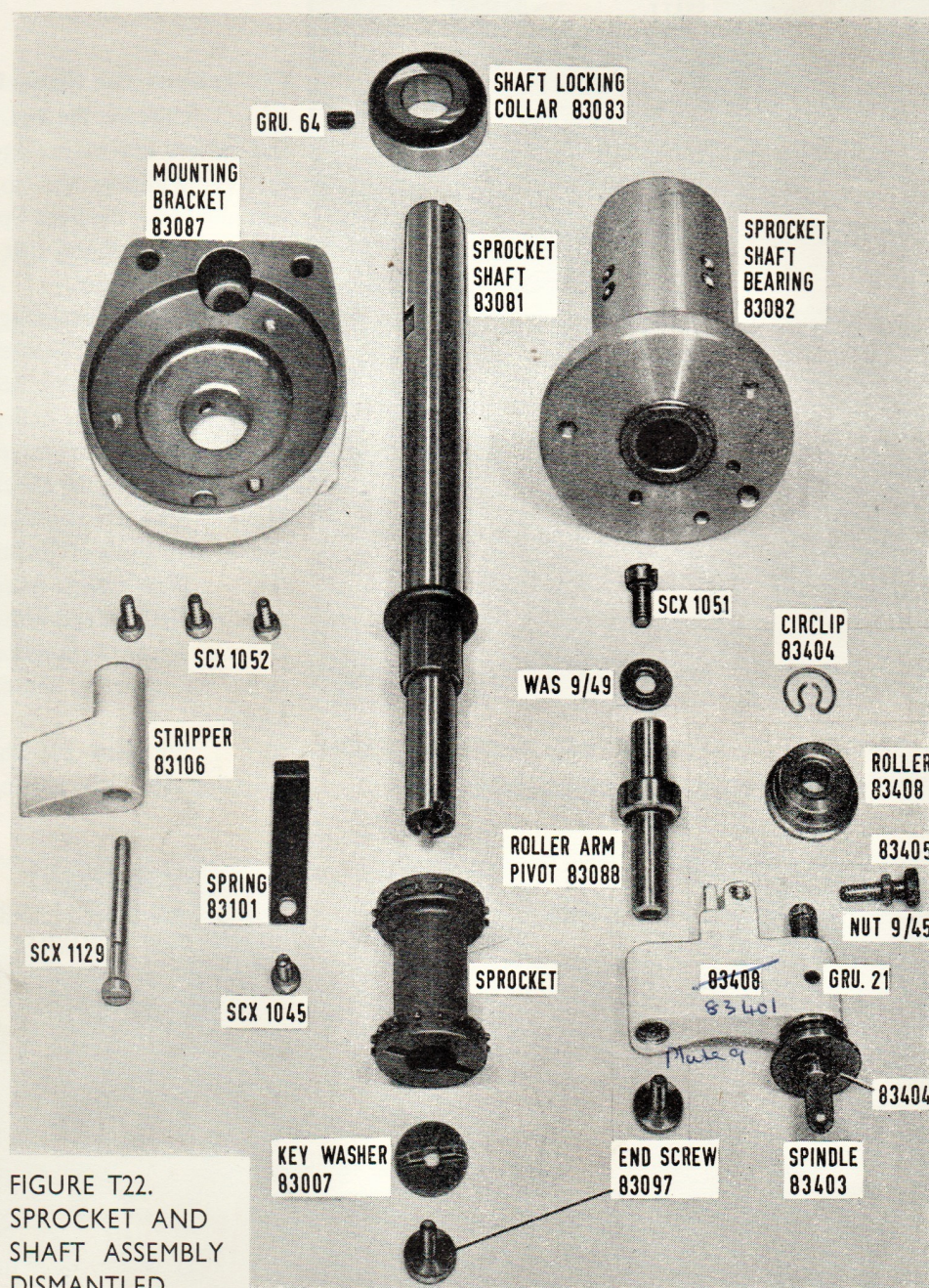


FIGURE T22.  
SPROCKET AND  
SHAFT ASSEMBLY  
DISMANTLED

### SPROCKET ROLLER AND ARM

- (a) Remove screw SCX 1051 and washer WAS 9/403 from Mounting Bracket 83087. These are so positioned in the Mounting Bracket that they are not accessible until the Sprocket Shaft Bearing 83082 has been removed.
- (b) Remove the Roller Pivot 83088 from the Mounting Bracket.

#### (To dismantle Sprocket Roller Arm)

- (c) Slack off locknut NUT 9/45.

- (d) Remove adjusting screw 83405.  
N.B. This screw is specially hardened, and must not be replaced by a normal screw from stock.
- (e) Remove the circlip 83404, which holds the Roller assembly 83408 to the end of the Roller Spindle remote from the knurled end.
- (f) With a 4BA. Allen key, release Spindle 83403, and withdraw it.
- (g) Release circlip 83404 and remove the second Roller assembly.



**Plate 10****MAIN DRIVE GEARING**

- (a) The Keywasher 83032 is secured by three screws SCX 1059, one of which also retains the Keeper 83050. This third screw will have been removed before the Gearing was withdrawn from the Sprocket Shaft, but now the other two must be removed.
- (b) Remove the Keywasher.
- (c) Remove the three screws SCX 1066 situated on the side of the Gearing facing the Sprocket.
- (d) Remove the Sound Sprocket Gear from the Main Drive Gear.
- (e) Remove the three screws SCX 1073, counter-bored into the Main Drive Gear 83027.
- (f) Remove the Takeup Chain Sprocket 83035.

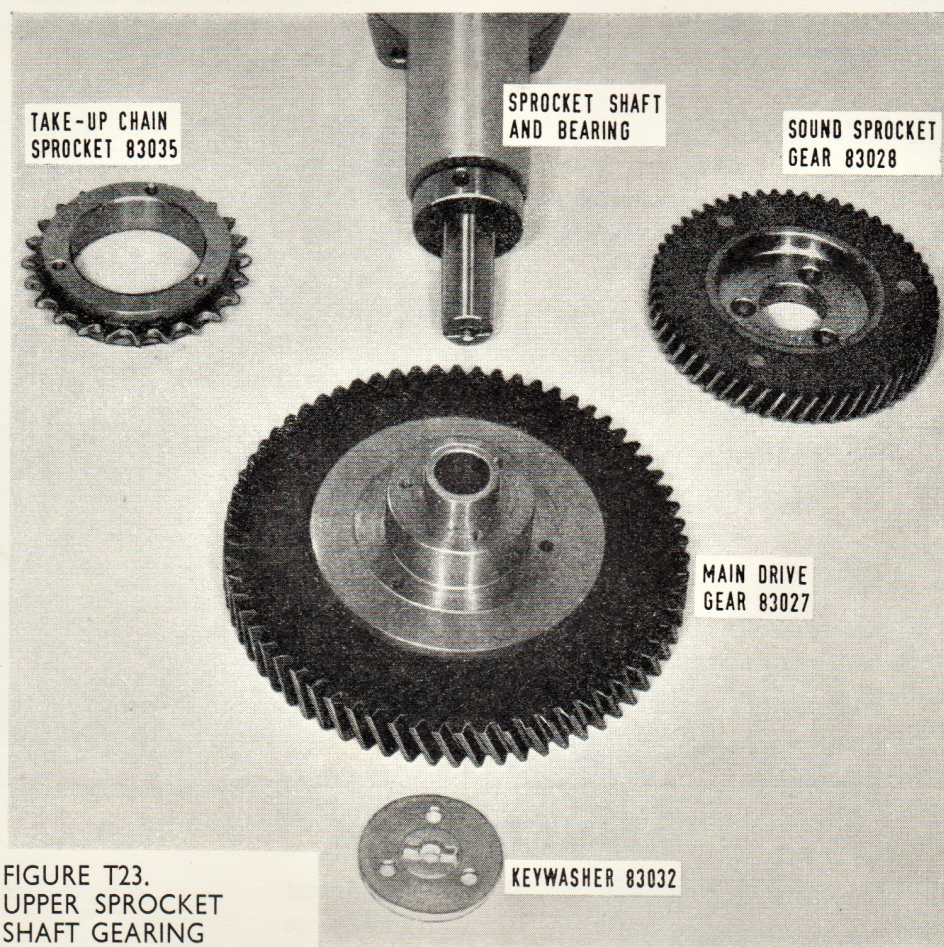


FIGURE T23.  
UPPER SPROCKET  
SHAFT GEARING

**HOLDBACK SPROCKET GEARING**

- (a) Remove the three screws SCX 1059, securing the keywasher.
- (b) Remove Keywasher 83032.
- (c) Withdraw Idler Sprocket 83031.

**NOTE:**

When refitting Idler Sprocket, it should be placed on the Holdback Sprocket Gear 83030 so that the Sprocket teeth lie nearer to the gear than to the keywasher.



## Plate F.

### SCREENED TERMINAL BLOCK

- (a) Unscrew the two fixing screws SCX 2045. The Screened Terminal Block and Saddle Clip assembly can then be removed.
- (b) Unscrew the Earthing screw 69169, projecting through the cover of the screened terminal block. The Cover can now be removed.
- (c) The tag under the Earthing screw is retained

by a special hexagonal Earth Terminal 69165, tapped to take the Earthing screw. To remove this Tag, this Earth Terminal must be unscrewed.

#### NOTE:

The Terminal Block itself, and the Saddle Clip Spacer, are secured to their base by sealed screws, and should not be removed.

### TERMINAL BLOCKS (shown on Plate F)

#### (To remove tags)

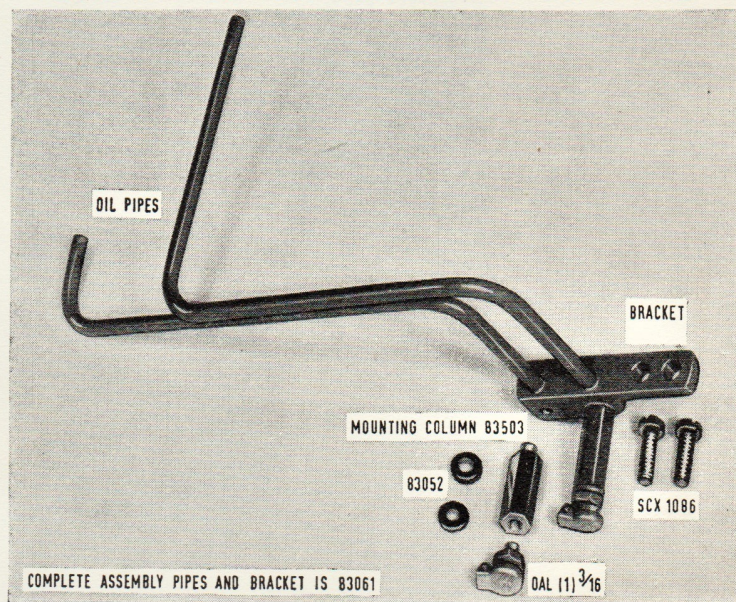
- (a) Unscrew tag retaining screw SCX 1044.
- (b) Remove any Tag TRC 209, as required.

- (c) The two unscreened Terminal Blocks can be removed by unscrewing the fixing screws SCX 1087, two to each block.

### OIL PIPE ASSEMBLY

- (a) The two pipes of this assembly are soldered into the Bracket, and this complete assembly 83061 should be replaced.
- (b) Withdraw the two screws SCX 1086, securing the Bracket to the Soundhead casting. Remove the Bracket.
- (c) The Rotherham Type Oilers OAL 1- $\frac{3}{16}$  are screwed into Mounting Columns 83053, which are hexagonal, and which can be unscrewed from the threaded holes in the Bracket.
- (d) Identical Washers, 83052, are fitted between the Oilers and the Mounting Columns, and between the Columns and the Brackets. These Washers must be replaced on reassembly.

FIGURE T24. OIL PIPES ASSEMBLY PART DISMANTLED



### Tools Required

Spanners, flat	...	$\frac{1}{4}$ in. Whitworth
		$\frac{5}{16}$ in. Whitworth
		$\frac{7}{16}$ in. Whitworth
		2BA.
Spanners, box	...	$\frac{7}{16}$ in. Whitworth
		2BA.
		4BA.
Allen keys	...	2BA.
		4BA.
		6BA.

Screwdrivers	...	$\frac{3}{32}$ in. to $\frac{5}{16}$ in. blades
Circlip pliers		
Pin punch		0.050 in. dia. (or 1.25mm)
Tommy Bar		$\frac{3}{16}$ in. dia. (or 4.75mm)
Small soldering iron.		

#### Test Film

One loop or length of 5,000 cycle modulated focusing film. Meter having a 12 volt A.C. range.



# REPLACEMENT and REASSEMBLY

## WIRING

When reassembling the Terminal Blocks, Exciter Lamp-holder, or Photocell base, or when replacing aged or damaged internal wiring, reference should be made to FIGURE T25 below.

Points to be noted are that the black and white leads to the Exciter Lampholder, and also the Exciter supply

to the Terminal Block must be twisted together where possible. The correct cableform, 83189, must be employed to provide the necessary screened lead from Cell Cathode to Terminal Block. Correct connections for the coloured leads in the Cableforms are shown in the illustration.

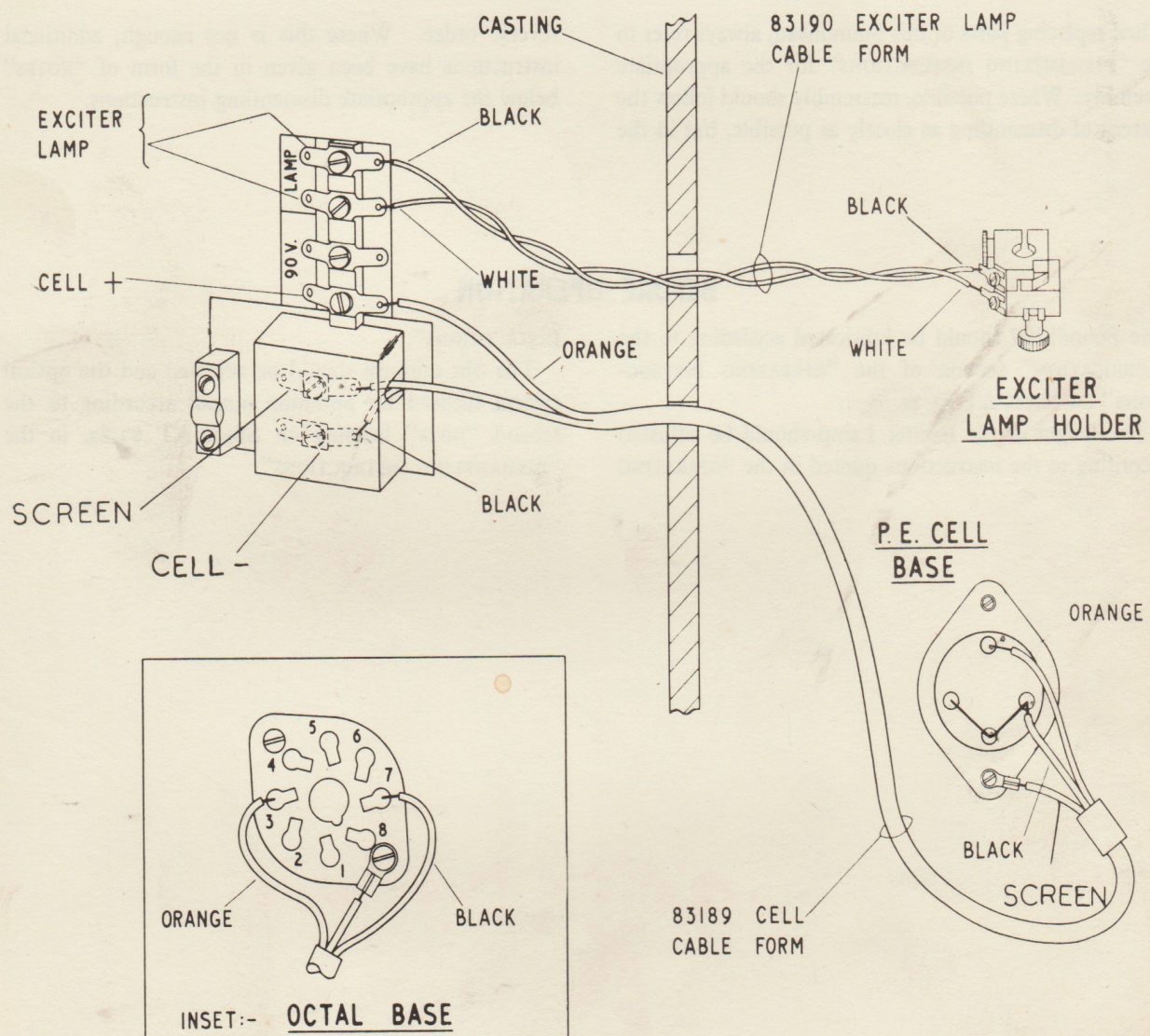


FIGURE T25. WIRING DIAGRAM—OPTICAL SOUNDHEAD (SHOWING ALTERNATIVE AMERICAN PHOTOCCELL BASE) AND TAGS FOR EXTERNAL CONNECTIONS



## REPLACEMENT OF PARTS

In order to preserve the high quality output from these Soundheads, and to prevent Film damage, worn or damaged parts should be removed and identical new parts fitted in their place.

Where replacement parts are required for Soundheads refer to the Spare Parts List which shows all major modifications introduced since the first Soundhead of

this type left the works; and gives details of obsolete parts interchangeable with their current equivalents. Where wear or damage on an obsolete part necessitates the replacement of a complete sub-assembly by its modified equivalent, this fact is stated in the Parts List, and instructions for the replacement of the assembly are quoted.

## REASSEMBLY

When replacing parts of this Soundhead, always refer to the "DISMANTLING INSTRUCTIONS" for the appropriate assembly. Where possible, reassembly should follow the pattern of dismantling as closely as possible, but in the

reverse order. Where this is not enough, additional instructions have been given in the form of "NOTES" below the appropriate dismantling instructions.

## BEFORE OPERATION

The Soundhead should be lubricated according to the "LUBRICATION" section of the "OPERATING INSTRUCTIONS" on Sheet AT 83/3a.

The height of the Exciter Lamp should be adjusted according to the instructions quoted in the "OPERATING

INSTRUCTIONS".

The Slit azimuth should be adjusted and the optical system focused for optimum output according to the second "NOTE" heading on Sheet AT 83/8a, in the "DISMANTLING INSTRUCTIONS".



# SPARE PARTS LIST

## Gaumont-Kalee Soundheads Type 83 and Type 845

When ordering Spare Parts from this List, always give as much information as possible. In addition to the number of the part to be replaced, quote its name, with the type and serial numbers of the unit in which it is fitted.

### **IMPORTANT: The Part Number must ALWAYS be quoted.**

*Every major assembly has a part Number ending in three noughts. The number prefixing these three noughts is known as the Type Number, normally used to describe the complete major assembly. Each sub-assembly or part produced for this assembly has a three figure Part Number, prefixed by the Type Number. Exceptions are proprietary parts, which are given a Stock Reference Number, prefixed by identifying letters.*

EXAMPLE: The '83' Soundhead has the Type Number 83, its Part Number is 83,000. The Part Number of the Lens Shield is 83,178, a securing screw is SCX 1073. The Flywheel provided with the Soundhead is a Type 674, which should be ordered under its Part Number, 674,000.

NOTE: In the following Spare Parts list, many screws which are illustrated with Reference Numbers beginning 'SCX' are listed with different prefixes, due to a change in materials employed. These screws should be ordered with the prefix in the list, not that shown in the illustration.

Bei der Bestellung von Ersatzteilen sollte eine eingehende Beschreibung beigelegt werden. Ausser der Nummer des Teils, das ersetzt werden soll, sollte seine Benennung sowie die Typen- und Seriennummer des Gerätes angegeben werden, in den das Teil eingebaut werden soll.

### **WICHTIG: Die Listenbezeichnung des Teils muss auf jeden Fall angegeben werden.**

*Jeder Hauptbestandteil hat eine Nummer mit drei Nullen am Ende. Die Nummer vor den drei Nullen wird die Typennummer genannt und im allgemeinen zur Identifizierung dieses Hauptbestandteils benützt. Jeder Teil oder Teilmontage dieses Hauptbestandteils hat eine Nummer mit drei Ziffern, die an die Typennummer angehängt werden. Ausgenommen sind handelsübliche Teile, die eine aus Buchstaben und Ziffern bestehende Lagerbezeichnung haben.*

BEISPIEL: Das Tongerät "83" hat die Typennummer "83", seine Teilnummer ist 83000. Die Teilnummer des Objectivschutzrings ist 83178, die einer Halteschraube SCX 1073. Das Schwungrad des Tongerätes hat die Typennummer 674, und sollte mit seiner Teilnummer 674000 bestellt werden.

BITTE BEACHTEN: In der folgenden Ersatzteilliste sind eine Anzahl von Schrauben, die auf den Abbildungen Nummern haben, die mit 'SCX' aufangen, mit anderen Anfangsbuchstaben aufgeführt. Der Grund dafür ist, dass das Material geändert worden ist. Bei der Bestellung dieser Schrauben sollte die Listennummer, und nicht die Nummer unter der Abbildung, angegeben werden.

Quand vous commandez des pièces à l'aide de cette liste, veuillez donner le plus d'informations possible. En plus du numéro de la pièce, veuillez indiquer son nom ainsi que le type et numéro de la machine à laquelle elle est destinée.

### **IMPORTANT : le numéro de la pièce doit TOUJOURS être donné.**

*Chaque partie principale à un numéro se terminant par 3 zéros. Le numéro précédant ces 3 zéros est le numéro type de cette partie et la désigne en son entièreté. Chaque sous-ensemble ou élément, fabriqué pour cette partie principale, est doté d'un numéro à 3 chiffres, précédé du numéro type de la partie principale.*

Les pièces fabriquées en dehors de nos usines ont un numéro de référence précédé de lettres identificatrices.

EXEMPLE: Le lecteur de son 83 possède le numéro type "83". Son numéro est 83.000. Le numéro du "Lens shield" est 83.178, et sa vis est SCX1073. Le type de flywheel de ce lecteur a le numéro type "674" qui devra tre commandé sous le numéro 674,000.

NOTE: Sur la suivante Liste de Pieces de Rechange, plusieurs ecrous qui y sont illustres avec des numeros de reference commençant par "SCX" sont sur la liste avec differents prefixes, du au change de materiel employe. Ces ecrous devront etre commandes avec le prefixe sur la liste, et non sur l'illustration.

Cuándo se hace un pedido de piezas de recambio se debe hacer lo mas detallado posible. Aparte del número de la parte que se reemplaza, indicar su nombre, con los numeros de tipo y serie de la sección donde van ajustados.

### **IMPORTANTE: El número de la Parte debe indicarse siempre.**

*Todas las secciones mayores tienen un Número de Parte terminado con tres ceros. El numero que precede a estos tres ceros es conocida como Numero de Tipo, "Type Number", normalmente usado para describir una sección mayor completa. Cada una de las partes, de una sección, lleva un número de tres cifras que es el numero de Parte, "Part Number" precedido por el Numero del Tipo, "Type Number".*

Las ecepciones son partes que tienen su propiedad, las cuales llevan el numero de Almecon precedidos por letras de identificación.

EJEMPLO: El número "83", "Soundhead", Cabeza de Sonido, lleva el Número de Tipo 83 el numero de Parte es 83000. El Número de Parte de Lens-Shield es 83,178. Un tornillo de sujecion es SCX 1073. El volante proveido con la Cabeza de Sonido, "Soundhead", es Tip 674 el cuál debe de pedirse con el Número de Parte, 674,000.

NOTA: En la siguiente lista de piezas de recambio, muchos tornillos que se encuentran ilustrados con la referencia Números empezando por "SCX", figuran en la lista con diferentes prefijos, debido al cambio de materiales empleados. Estostornillos deben ser encargados con el prefijo de la lista y nunca con el que aparece en la ilustración.



## KEYPLATE - 83 Soundhead Spare Parts List

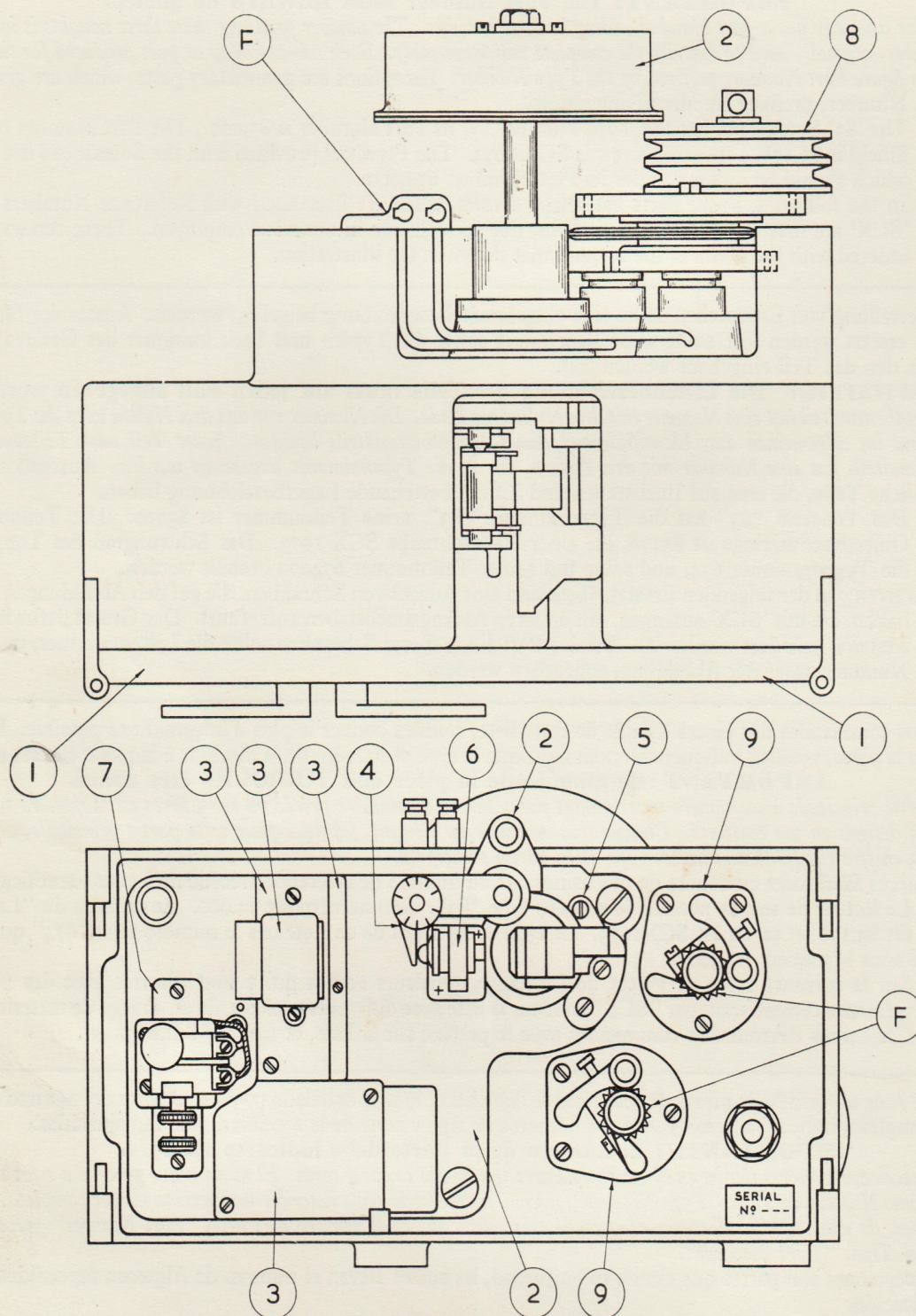


FIGURE 6. PLAN AND OPERATING SIDE KEYPLATE



FIGURE 7.  
NON-OPERATING  
SIDE KEYPLATE

Sheet AP 83/17a

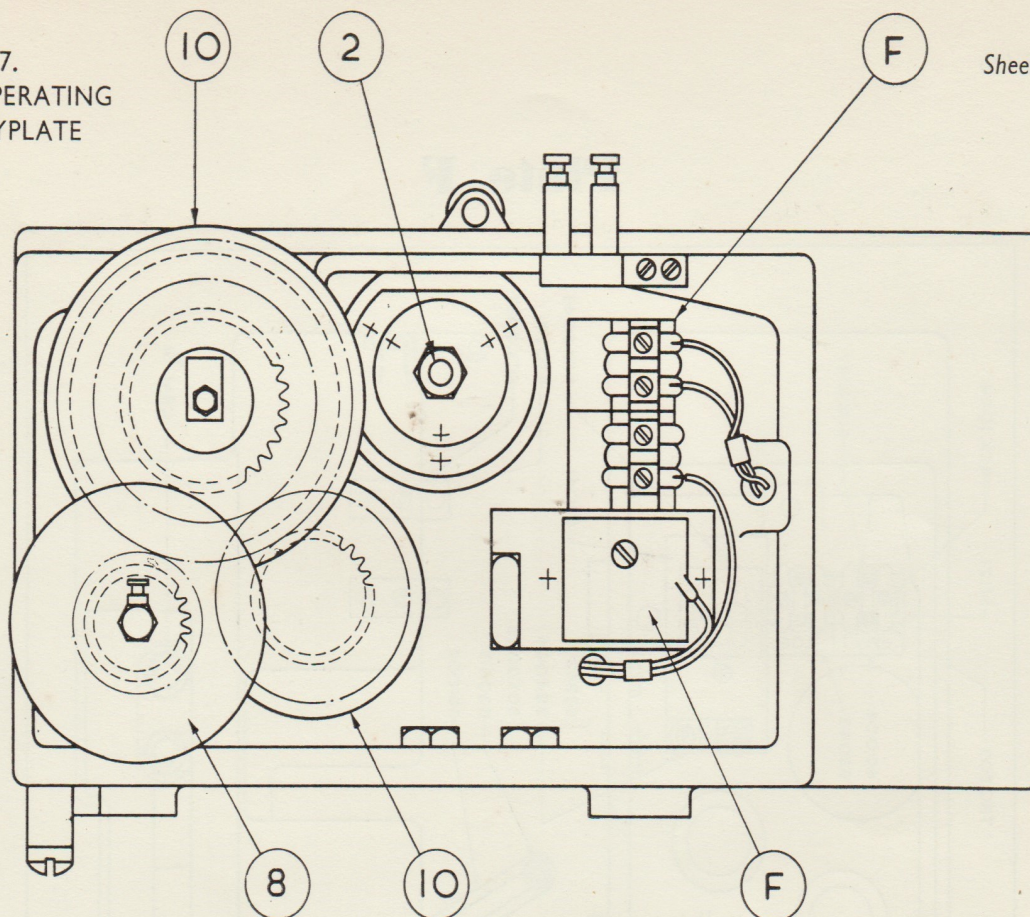


Plate No.	Part No.	Assemblies	No. Off.	Fixing Screws†	Stock Reference	No. Off.
<b>Plate F</b>		FINAL ASSEMBLY minor parts				
	83,041	Screened Terminal Block ...	1	2BA. $\frac{1}{4}$ in. roundhead	SCR 9/2045	2
		Oiler and Pipes assembly ...	1	2BA. $\frac{5}{8}$ in. cheesehead	SCR 9/1086	2
<b>Plate 1</b>	83,073	LARGE DOOR ...	1			
	83,074	Small door ...	1			
<b>Plate 2</b>	83,021	SCANNING UNIT ASSEMBLY ...	1	Secured by 83,022-23		
	†83,022	Mounting cushions ...	6			
	†83,023	Mounting screws ...	3			
	*83,156	Flywheel Shaft and Drum ...	1	2BA. $\frac{3}{4}$ in. cheesehead	SCR 9/1093	3
	*83,975	Guide Roller and Spindle ...	1	Threaded (into 83,970)		
	†83,970	Mounting Plate ...	1	2BA. $\frac{3}{8}$ in. cheesehead	SCR 9/1058	2
<b>Plate 3</b>	*83,186	CONDENSER LENS ASSEMBLY ...	1	2BA. $\frac{1}{2}$ in. cheesehead	SCR 9/1072	1
	*83,114	Cell Holder and Cover ...	1	4BA. $\frac{3}{4}$ in. cheesehead	SCR 9/1190	2
	*83,134	Slit Unit Assembly ...	1	4BA. $\frac{3}{8}$ in. cheesehead	SCR 9/1059	4
	*83,129	No. 2 Prism ...	1	4BA. $\frac{5}{8}$ in. cheesehead	SCR 9/1087	2
<b>Plate 4</b>	*83,976	ARTICULATED LAYON ROLLER ...	1	2BA. $\frac{5}{16}$ in. socket grub	GRU 64	1
<b>Plate 5</b>	*83,181	No. 1 PRISM MOUNT ...	1	2BA. $\frac{5}{8}$ in. cheesehead	SCR 9/1086	3
<b>Plate 6</b>	*83,172	PLUNGER ASSEMBLY ...	1	2BA. socket grub	GRU 62	1
<b>Plate 7</b>	*83,125	EXCITER LAMPHOLDER ...	1	2BA. $\frac{1}{2}$ in. cheesehead	SCR 9/1072	2
<b>Plate 8</b>	83,012	LAYSHAFT ...	1	$\frac{7}{16}$ in. BSF nut	NUT 9/145	1
<b>Plate 9</b>	83,003	SPROCKET SHAFT ...	2	2BA. $\frac{3}{4}$ in. cheesehead	SCR 9/1093	6
	83,096	Sprocket Roller and Arm ...	2	Held to pivot by 83,097		
	†83,097	End Screw ...	1			
<b>Plate 10</b>	83,026	MAIN DRIVE GEARING ...	1	On upper Sprocket Shaft		
		Holdback Sprocket Gearing ...	1	On lower Sprocket Shaft		

NOTE: For assemblies having no Part Number, and for components of all assemblies, refer to the separate plates on the following pages.

\* These assemblies are assembled to 83,021, the SCANNING UNIT ASSEMBLY.

† Fixing screws, etc., illustrated on following Plates.



# Plate F

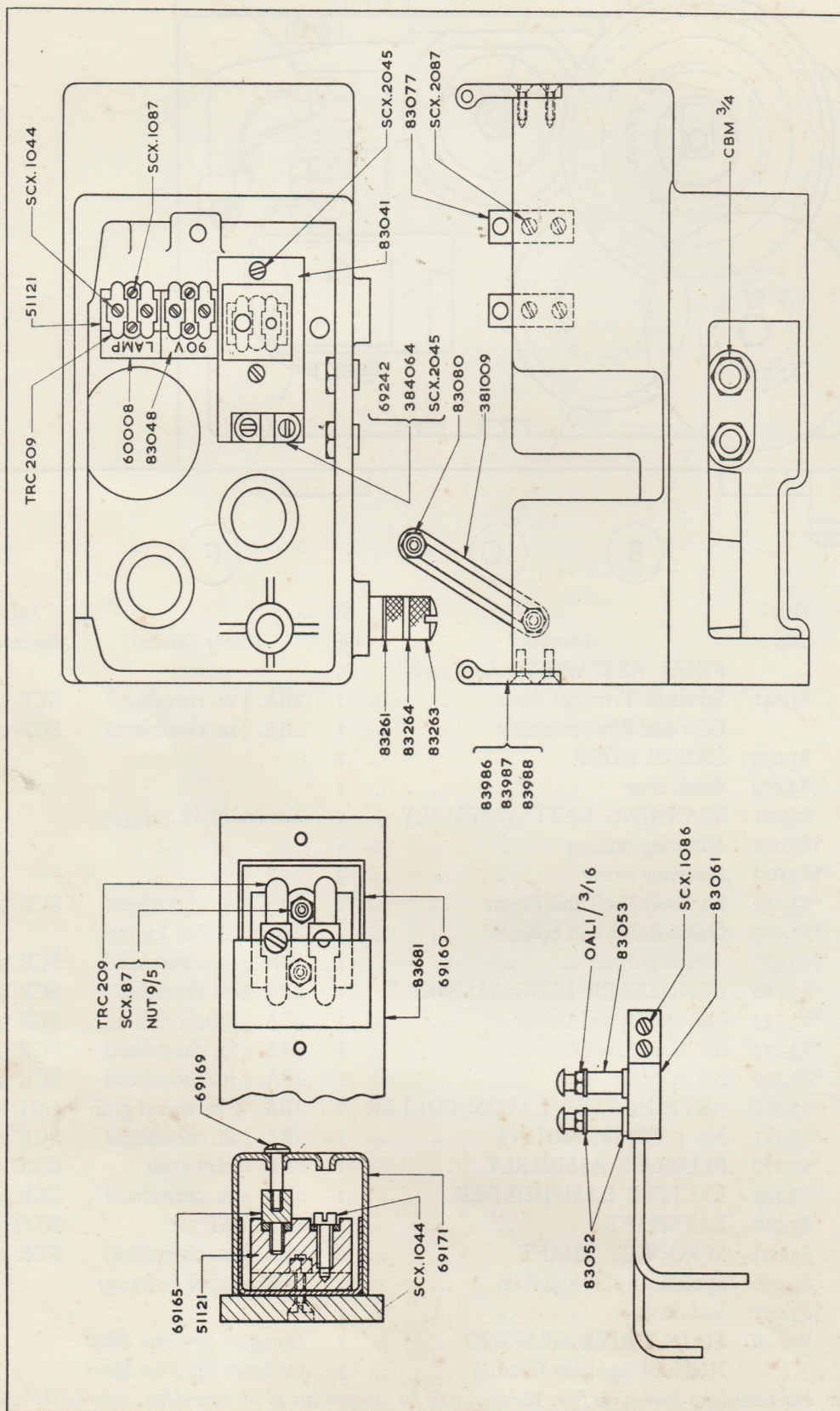


FIGURE 8. SOUNDHEAD—BODY ASSEMBLY



# **PLATE F—SOUNDHEAD BODY**

## **SCREENED TERMINAL BLOCK ASSEMBLY (83,041 COMPLETE)**

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,681	Base ... ..	1	As assembly		
51,121	Terminal Block ... ..	1	4BA. $\frac{5}{8}$ in. countersunk	SCR 9/87	2
			4BA. nut	NUT 9/5	2
TRC 209	Tags ... ..	2	2BA. $\frac{1}{4}$ in. cheesehead	SCR 9/1044	1
			69,165		
69,165	Earth Terminal ... ..	1	Threaded		
69,169	Earth Screw ... ..	1	Threaded		
69,160	Lower Cover ... ..	1	As 51,121		
384,064	Saddle Clip ... ..	1	4BA. $\frac{1}{4}$ in. roundhead	SCR 9/2045	2
69,242	Distance Piece ... ..	1			
69,171	Cover ... ..	1	Held by 69,169		

## **OILERS AND PIPES**

83,061	Oil Pipes and Bracket ... ..	1	2BA. $\frac{5}{8}$ in. cheesehead	SCR 9/1086	2
83,053	Oiler Mounting Column ... ..	2	Threaded		
83,052	Leather Washer ... ..	4			
OAL 1	Oilers ... ..	2	Threaded		

## **MINOR PARTS**

83,001	Main Casting ... ..	1			
83,986	Hinge Piece (Upper) ... ..	2	2BA. $\frac{3}{8}$ in. countersunk	SCR 1/58	4
83,987	Hinge Piece (Lower) ... ..	2	2BA. $\frac{3}{8}$ in. countersunk	SCR 1/58	4
83,988	Hinge Pin ... ..	4			
83,019	Nameplate ... ..	1	No. 00 $\frac{1}{8}$ in. PK screw	SZ 990001	2
83,077	Catch Plate ... ..	2	4BA. $\frac{5}{8}$ in. roundhead	SCR 9/2087	4
81,009	Door Stay ... ..	1	Secured by 83,081		
83,081	Shoulder Screw for 381,009 ... ..	1			
51,121	Terminal Block ... ..	2	4BA. $\frac{5}{8}$ in. cheesehead	SCR 9/1087	4
TRC 209	Tag ... ..	4	2BA. $\frac{1}{4}$ in. cheesehead	SCR 9/1044	4
60,008	Designation Plate ... ..	1			
83,048	Designation Plate ... ..	1			
CBM $\frac{3}{4}$	Conduit bush $\frac{3}{4}$ in. ... ..	2			

Part No. 83,054

## **OIL COLLECTOR**

In Soundheads manufactured before May 1956, this Oil Collector was fitted, but on later models a modification to the Soundhead Body casting makes it unnecessary. For Soundheads having this assembly, Spares are held under the following Part Nos.:

- 83,054 Complete Oil Collector assembly.
- 83,261 Oil Collector Body.
- 83,263 Screw Cap.
- 83,264 Washer.

Part No. 83,986

## **HINGE ASSEMBLY**

This assembly appeared in the past as assemblies 83,072 (left) and 83,073 (right). The hinge pieces and pins are now detailed separately to facilitate replacement.



# Plate 1

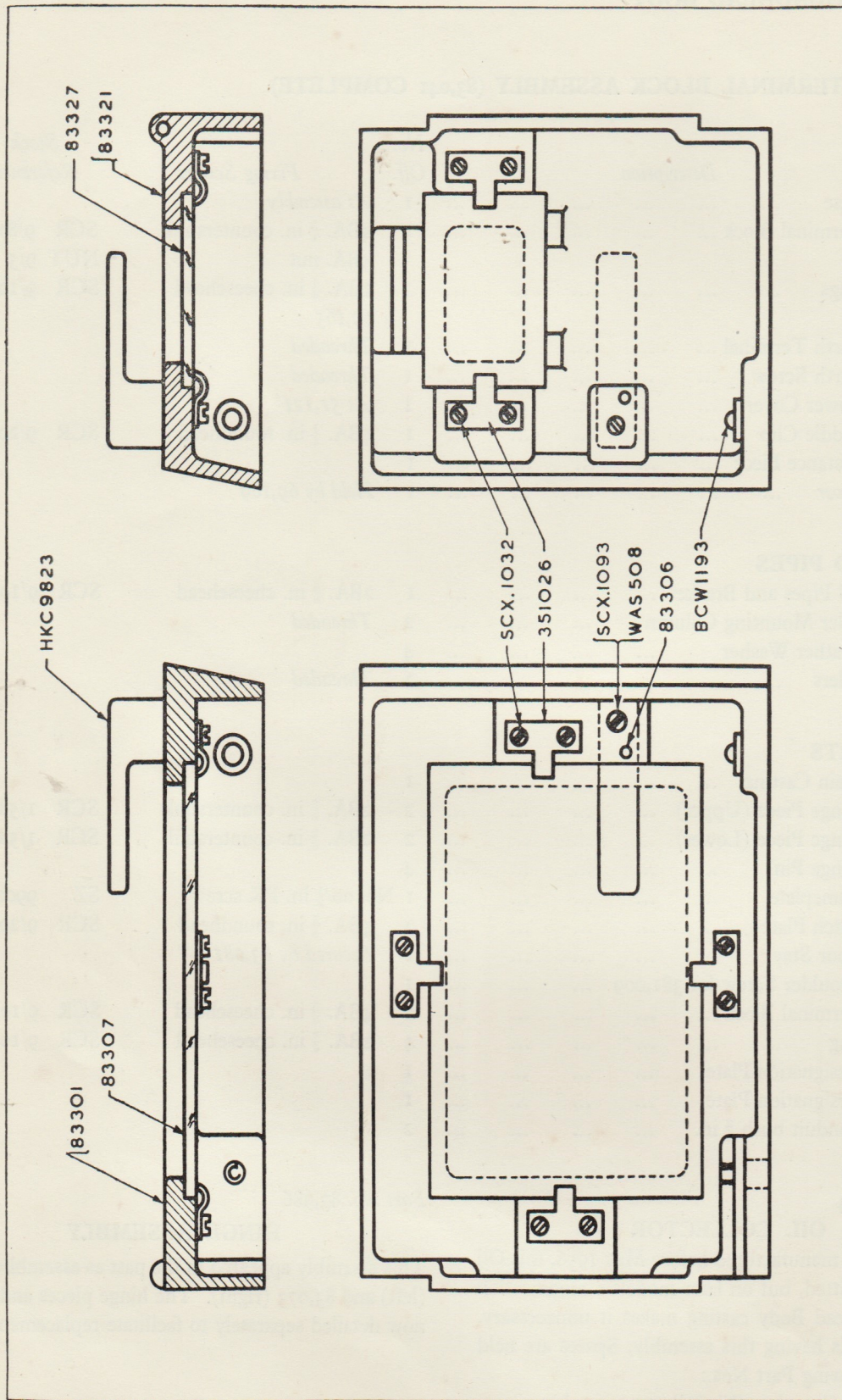


FIGURE 9. SOUNDHEAD DOORS



## PLATE 1—LARGE AND SMALL DOOR ASSEMBLIES

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,073	LARGE DOOR ASSEMBLY				
83,301	Door ... ..	1			
HKC 9823	Handle ... ..	1	2BA. $\frac{3}{4}$ cheesehead	SCR 9/1093	
83,306	Dowel Pin ... ..	1	Shakeproof	WAS 508	
83,307	Window ... ..	1	Secured by 351,026		
351,026	Window Clamp ... ..	4	6BA. $\frac{3}{16}$ in. cheesehead	SCR 9/1032	8
BCW1193	Ball Catch ... ..	1			
83,074	SMALL DOOR ASSEMBLY				
83,321	Small Door ... ..	1			
HKC9823	Handle ... ..	1	2BA. $\frac{3}{4}$ in. cheesehead	SCR 9/1093	1
83,306	Dowel Pin ... ..	1	Shakeproof	WAS 508	1
83,327	Small Window ... ..	1	Secured by 351,026		
351,026	Window Clamp ... ..	2	6BA. $\frac{3}{16}$ in. cheesehead	SCR 9/1032	4
BCW1193	Ball Catch ... ..	1			

Notes below apply to Plate 2 overleaf.

Part No. 674,000

## FLYWHEEL ASSEMBLY

On early model Soundheads a spun aluminium Fluid Flywheel was used, either Part No. 83,071 or the similar but later 428,000. On Soundheads made after June 1952, the current type, Part No. 674,000, made of cast aluminium, is employed instead of the now obsolete spun models. Where it is necessary to replace one of the older types a new Part 674,000 will be supplied. This can be fitted in place of the older types if the following instructions are followed:

The collar and washer on the Shaft should be removed with the old Flywheel, and the new Flywheel should then be fitted to the Shaft with the screwheads of the two Filler Plugs facing away from the Soundhead Body. A standard  $\frac{3}{8}$  in. washer should then be fitted (the old washer can be used, but the collar must never be refitted), and the Flywheel and washer secured by the  $\frac{3}{8}$  in. Whitworth nut.

Part No. CSE  $\frac{5}{8}$  in.

## FLYWHEEL AND SHAFT

(NOTE: For Flywheel see 674,000)

On Soundheads manufactured before June 1953, the Locking Collar, type 83,503, was employed instead of Circlip CSE  $\frac{5}{8}$  in. to retain the Flywheel Shaft in its Housing.

On Soundheads so fitted, replacement of the Collar will necessitate replacement of the complete Shaft and Bearing assembly with the new assembly 83,501. This is to ensure that the new type Flywheel Shaft, grooved for the Circlip, cannot be fitted in old Bearings, where it would cause irregular scanning, with resultant loss of sound quality. Where models already fitted with the Circlip require replacement of any part of this assembly other than Shaft or Bearings, this part may be replaced as a single item, but Shaft and Bearings must always be replaced together.



# Plate 2

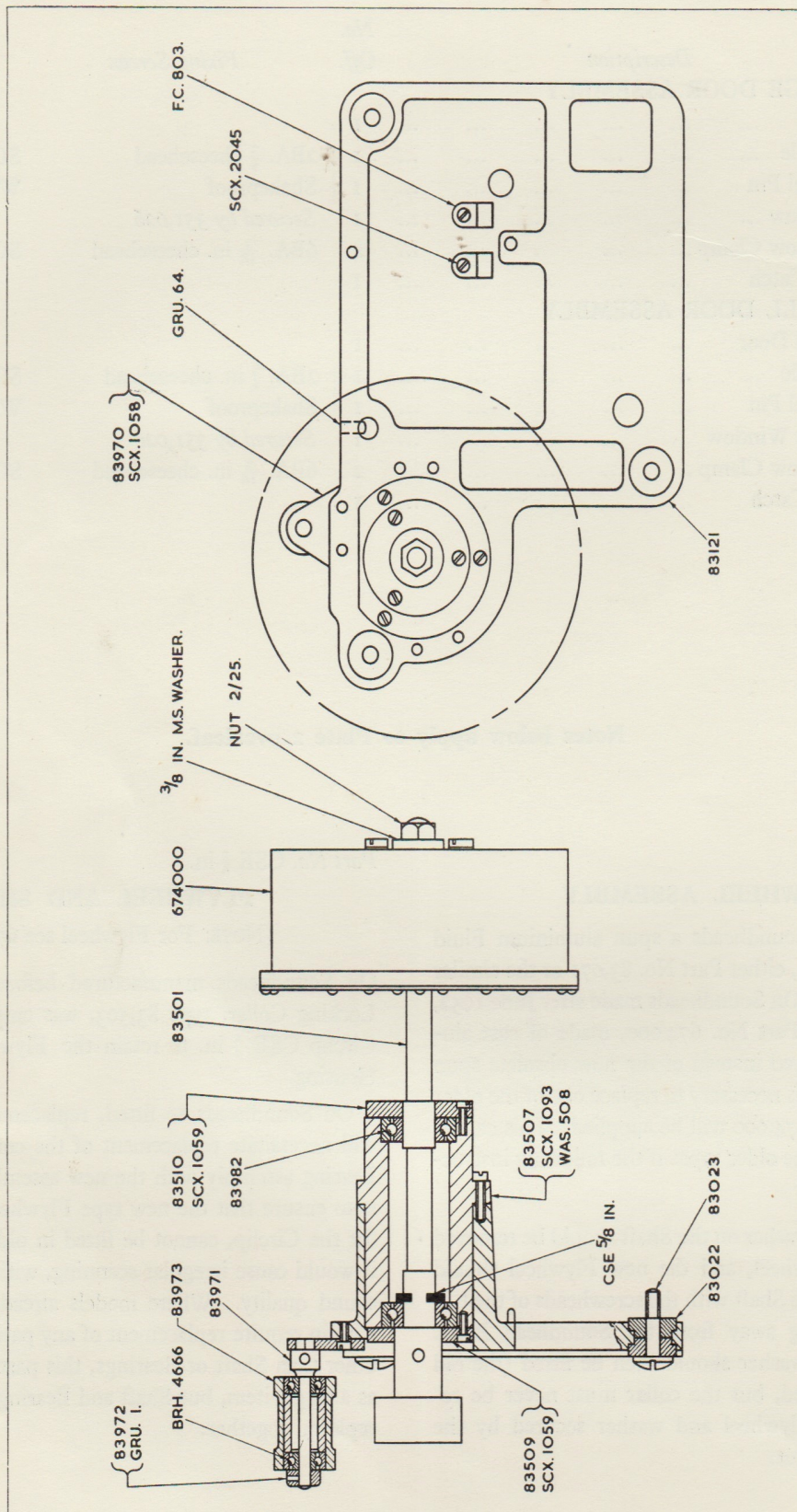


FIGURE 10. SCANNING UNIT, FLYWHEEL AND SHAFT, AND GUIDE-ROLLER



**PLATE 2—SCANNING UNIT ASSEMBLY (83,021 COMPLETE)****Less Incorporated Assemblies:†**

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,121	Scanning Unit Casting ... ..	1	As assembly	83,022	3
*83,175	Objective Lens ... ..	1	4BA. $\frac{3}{8}$ in. cheesehead clamp	SCR 9/1059	1
*83,170	Objective Lens Bracket ... ..	1	4BA. $\frac{1}{2}$ in. cheesehead	SCR 9/1073	2
*83,174	Objective Lens Mount ... ..	1			
*83,178	Objective Lens Shield ... ..	1			
FC,803	Cable Clip ... ..	2	4BA. $\frac{1}{4}$ in. roundhead	SCR 9/2045	2
83,970	Guide-Roller Mounting Plate ... ..	1	2BA. $\frac{3}{8}$ in. cheesehead	SCR 9/1058	2

**FLYWHEEL SHAFT AND ROLLER ‡ (83,156 COMPLETE)**

83,507	Flywheel Shaft Housing ... ..	1	As assembly	SCR 9/1093	3
83,509	Front Bearing Cover Plate ... ..	1	4BA. $\frac{3}{8}$ in. cheesehead	SCR 9/1059	3
83,510	Rear Bearing Cover Plate ... ..	1	4BA. $\frac{3}{8}$ in. cheesehead	SCR 9/1059	3
83,982	Ballrace ... ..	2			
83,501	Roller and Shaft ... ..	1			
CSE $\frac{5}{8}$ in.	Circlip ... ..	1			
674,000	Flywheel ... ..	1	$\left\{ \begin{array}{l} \frac{3}{8} \text{ in. Whitworth Nut} \\ \frac{3}{8} \text{ in. Washer} \end{array} \right.$	NUT 2/25	1 1

**GUIDE ROLLER AND SPINDLE (83,975 COMPLETE)****On 83,970**

83,971	Guide Roller Spindle ... ..	1	Threaded (into 83,970)		
83,972	Roller Retaining Collar ... ..	1	6BA. $\frac{1}{8}$ in. socket grub	GRU 1	1
83,973	Bushed Roller ... ..	1			
BRH4666	Ballrace ... ..	2			

\* Part of this assembly, but illustrated (and listed again), on Plate 6

† Incorporated assemblies are shown on Plates 3, 4, 5, 6, and 7.

‡ For early models, see above, Sheet AP 84/19a.



# Plate 3

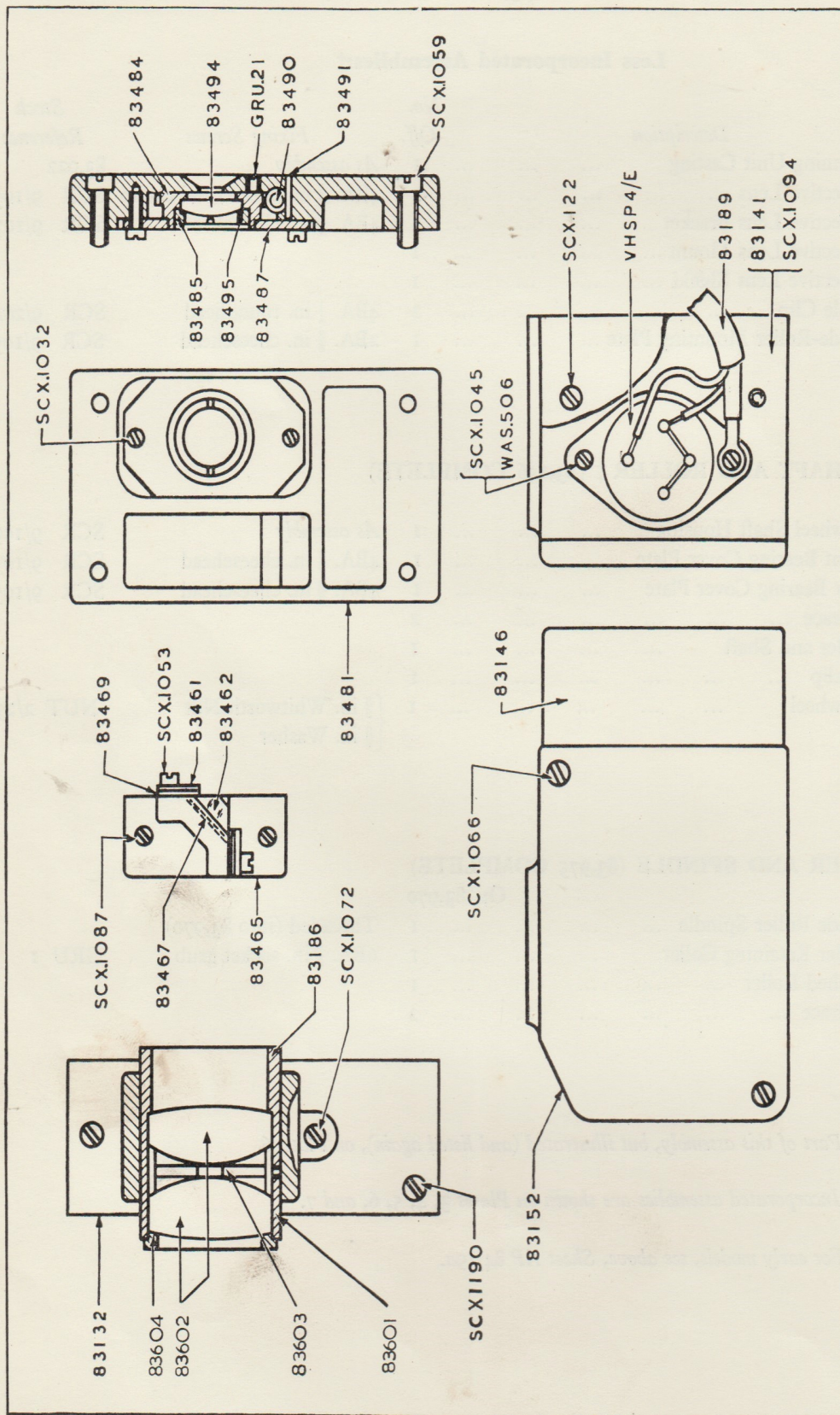


FIGURE 11. CELL HOLDER, CASTING, CONDENSER, SLIT AND SMALL PRISM



**PLATE 3—CELL HOLDER WITH LARGE CONDENSER, SLIT AND No. 2 PRISM****CONDENSER LENS (83,186 COMPLETE)**

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,601	Condenser Tube ... ..	1	As assembly	SCR 9/1072	1
83,602	Condenser Lens ... ..	2			
83,603	Spacer ... ..	1	10BA. 0.15 in. grub screw	GRU 83,186	1
83,604	Retaining Ring ... ..	1	Threaded		

**CELL HOLDER AND COVER (83,114 COMPLETE)**

83,132	Condenser Mount Casting ... ..	1	2BA. $2\frac{1}{4}$ in. cheesehead	SCR 9/1190	2
83,141	Cell Holder Casting ... ..	1	As assembly		
83,152	Cell Cover ... ..	1	4BA. $\frac{7}{16}$ in. cheesehead	SCR 9/1066	2
83,146	Cell Holder Cover ... ..	1	4BA. $1\frac{1}{4}$ in. countersunk	SCR 9/122	2
*SP 4/E	Four Pin Cell Holder ... ..	1	4BA. $\frac{1}{4}$ in. cheesehead	SCR 9/1045	2
			Shakeproof washer	WAS 506	2

**SLIT UNIT (83,134 COMPLETE)**

83,481	Slit Plate ... ..	1	As assembly	SCR 9/1059	4
83,487	Slit Bearing Plate ... ..	1	6BA. $\frac{3}{16}$ in. cheesehead	SCR 9/1032	2
83,484	Slit Mount Gear ... ..	1	4BA. $\frac{1}{8}$ in. grub locking	GRU 21	1
83,491	Pin for Driving Worm ... ..	1			
83,490	Slit Azimuth Driving Worm ... ..	1			
83,485	Locking Ring ... ..	1			
83,495	Washer ... ..	1			
83,494	Slit Mask, <i>Standard width</i> ... ..	1			

**No. 2 PRISM (83,129 COMPLETE)**

83,465	Prism Mount ... ..	1	As assembly	SCR 9/1087	2
83,467	Cushion ... ..	1			
83,469	Packing Strip ... ..	2	6BA. $\frac{5}{16}$ in. cheesehead	SCR 9/1053	4
83,461	Prism Clamp Plate ... ..	2	As for 83,469		
83,462	Prism ... ..	1			

Part No. 83,494

**SLIT MASK**

On certain early Soundheads of this type, Slit Mask 83,483 was used, this was narrower than that now used, having a width of 0.009 in., while the present 83,494 Slit has a width of 0.0108 in. The external dimensions of these Slit Masks are identical, so that where replacement is necessary, the old type can be replaced by the new.

Part No. 83,114

**CELL HOLDER ASSEMBLY**

This Cell Holder and Cover assembly was Part No. 83,976, the two assemblies are interchangeable.

\* On Soundhead Type 845, this is replaced by Octal base, Stock Reference SP 8 US; to take American Photocell RCA 930.



# Plate 4

## ARTICULATED LAYON ROLLER (83,976 COMPLETE)

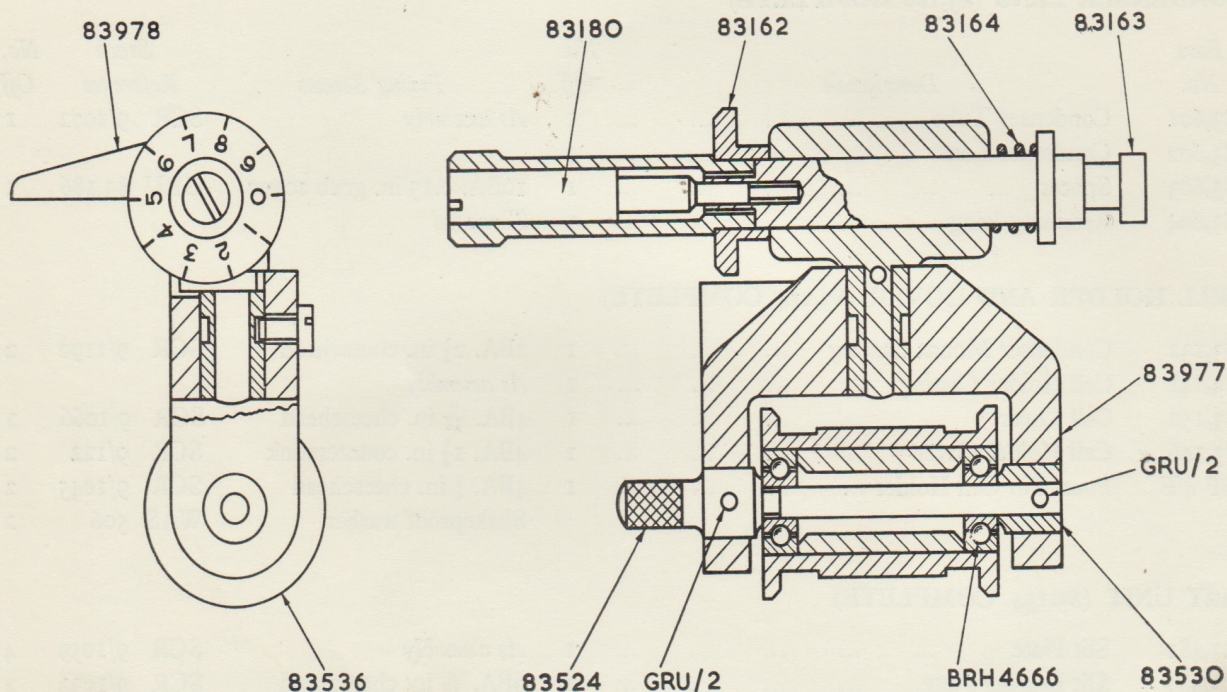


FIGURE 12. LAYON ROLLER AND ARM

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,978	Layon Roller Bearing Arm ... ..	I	Secured by adjusting knob 83,162		
83,977	Layon Roller Arm ... ..	I	Secured to 83,978 by 83,979		
83,979	Special Screw ... ..	I			
83,536	Layon Roller ... ..	I	On 83,524		
83,524	Layon Roller Spindle ... ..	I	6BA. $\frac{3}{16}$ in. socket grub	GRU 2	I
83,530	Spindle Locating Collar ... ..	I	6BA. $\frac{3}{16}$ in. socket grub	GRU 2	I
BRH4666	Ballrace ... ..	2			
83,162	Adjusting Knob and Extension ... ..	I			
83,163	Layon Roller Pivot Spindle ... ..	I	Locked by 83,180		
83,180	Locking Screw ... ..	I			
83,164	Spring ... ..	I			

Part No. 83,976

### LAYON ROLLER ASSEMBLY

Certain early Soundheads were fitted with a rigid Layon Roller Arm, instead of the present Articulated Arm. This rigid Arm is obsolete, and where wear or damage make it necessary to replace any part of this assembly, a complete new assembly 83,976 must be fitted in its place. The two assemblies are directly interchangeable.



## Plate 5

### No. 1 PRISM MOUNT (83,181 COMPLETE)

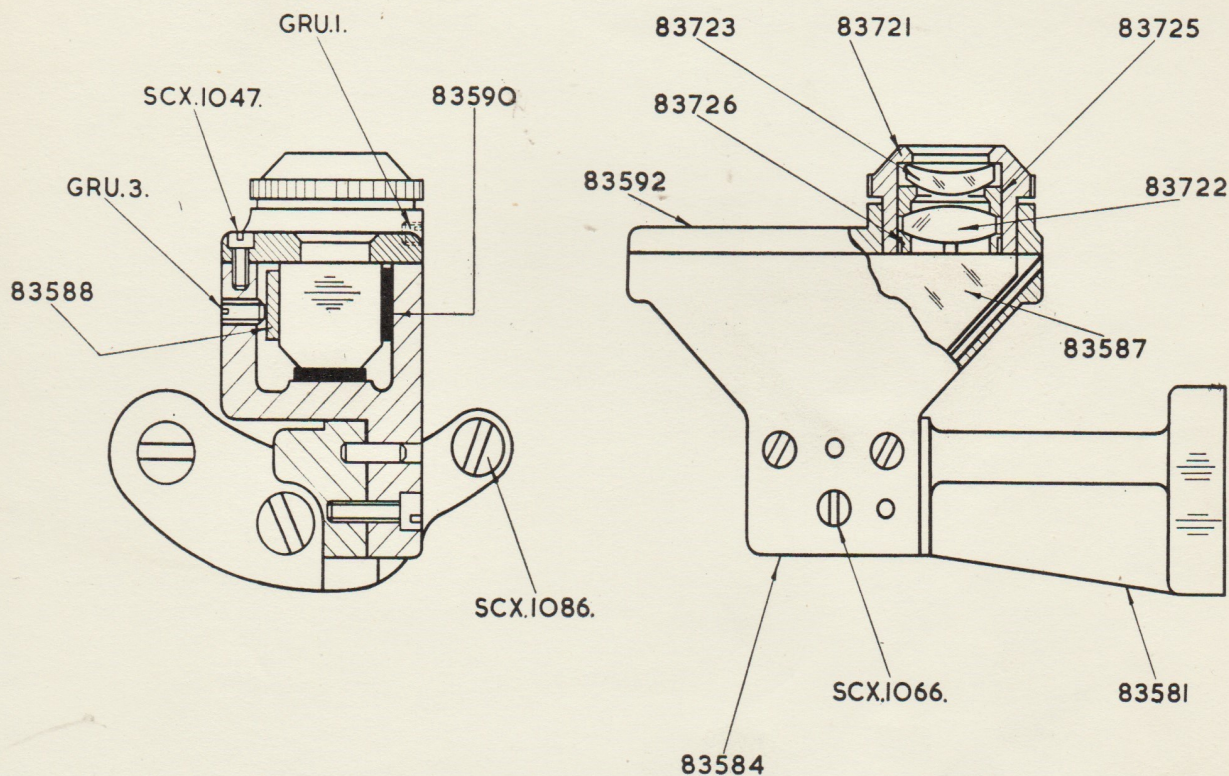


FIGURE 13. No. 1 PRISM MOUNT, WITH PRISM AND AUXILIARY CONDENSER LENS

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,581	Prism Bracket ... ..	1	As assembly	SCR 9/1086	3
83,584	Prism Mount ... ..	1	4BA. $\frac{7}{16}$ in. cheesehead	SCR 9/1066	1
*83,596	Auxiliary Condenser Lens ... ..	1	6BA. $\frac{1}{8}$ in. socket grub	GRU 1	1
83,592	Prism Mount Cover ... ..	1	8BA. $\frac{1}{4}$ in. cheesehead	SCR 9/1047	6
83,590	Prism Cushion ... ..	2			
83,587	Prism ... ..	1	Clamped by 83,588		
83,588	Prism Clamp Plate ... ..	1	6BA. $\frac{1}{4}$ in. socket grub	GRU 3	2

**\*AUXILIARY CONDENSER LENS (83,596 COMPLETE) consists of:**

83,721	Auxiliary Condenser Mount ... ..	1	As assembly	GRU 1	1
83,722	Condenser Lens '1' ... ..	1			
83,723	Condenser Lens '2' ... ..	1			
83,725	Spacer ... ..	1			
83,726	Locking Ring ... ..	1			



## Plate 6

### PLUNGER AND OBJECTIVE LENS BRACKET

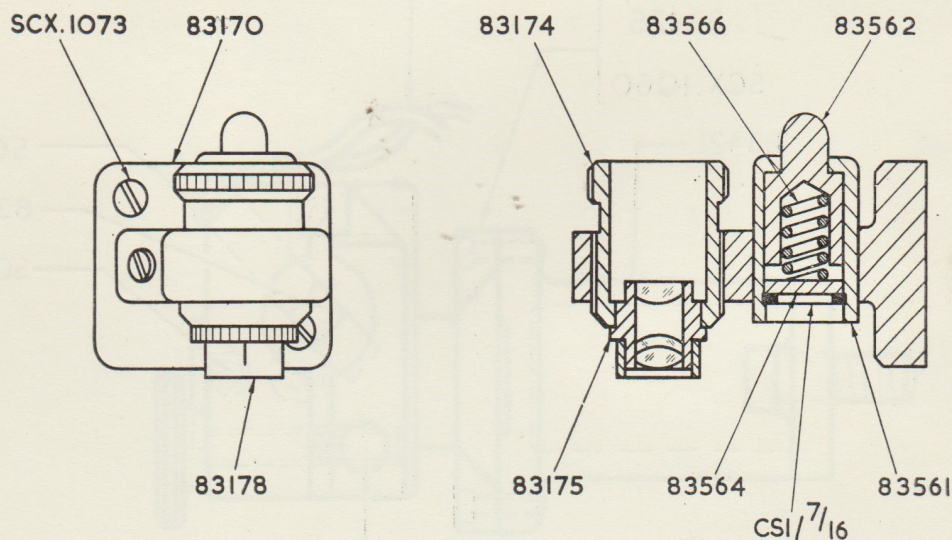


FIGURE 14. PLUNGER AND OBJECTIVE LENS BRACKET

### PLUNGER (83,172 COMPLETE)

#### On Objective Lens Bracket 83,170

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,561	Plunger Assembly ...	I	As assembly	GRU 62	I
83,562	Plunger ...	I			
83,564	Disc ...	I			
83,566	Spring ...	I			
CSI $\frac{7}{16}$	Circlip ...	I			

These **Objective Lens** and **Bracket** Parts are components of the Scanning Unit Assembly.

83,175	Objective Lens ...	I	4BA. $\frac{3}{8}$ in. cheesehead clamp	SCR 9/1059	I
83,170	Objective Lens Bracket ...	I	4BA. $\frac{1}{2}$ in cheesehead	SCR 9/1073	2
83,174	Objective Lens Mount ...	I			
83,178	Objective Lens Shield ...	I			

Part No. 83,178

### LENS SHIELD

This part is not fitted to Soundheads completed before 1948. On Soundheads despatched from the Works during or after 1956, the Lens Shield 83,178 is replaced by a shield manufactured integral with the Lens Assembly 83,175. Where a Lens is to be replaced, the new type with integral Shield will be supplied. A stock of Shields 83,178 is still held for replacement purposes.



# Plate 7

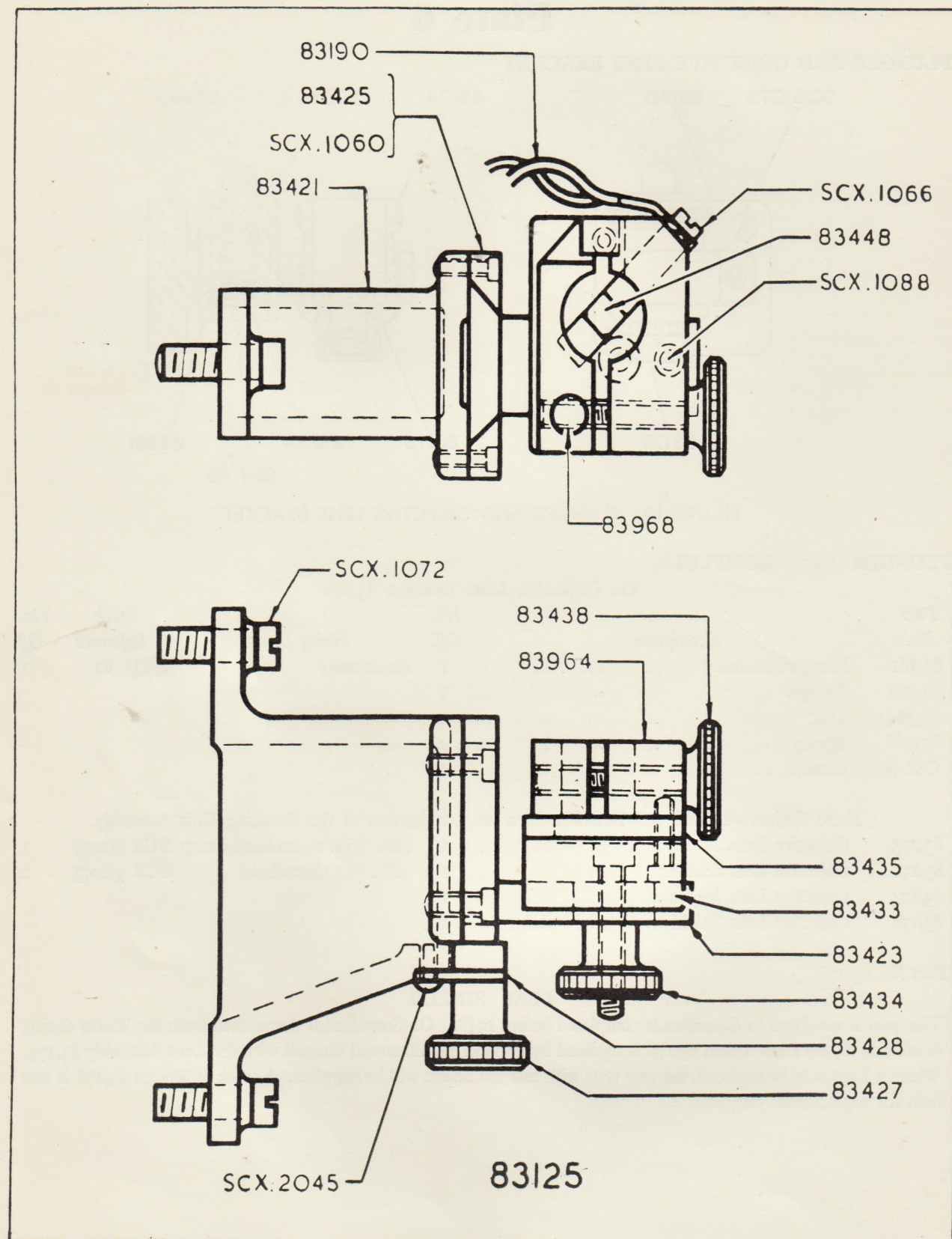


FIGURE 15. EXCITER LAMPHOLDER



**PLATE 7—EXCITER LAMPHOLDER ASSEMBLY (83,125 COMPLETE)**

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,190	Cableform ... ..	1	As assembly	SCR 9/1072	2
83,421	Lamp Bracket ... ..	1			
83,423	Angle Bracket ... ..	1	Secured by slides 83,425		
83,425	Slide ... ..	2	6BA. $\frac{3}{8}$ in. cheesehead	SCR 9/1060	4
83,427	Elevating Screw ... ..	1	Locked by 83,428		
83,428	Retainer ... ..	1	4BA. roundhead $\frac{1}{4}$ in.	SCR 9/2045	2
83,433	Saddle and Clamp Screw Assembly ... ..	1	Nut 83,434		
83,434	Saddle Clamp Nut ... ..	1			
83,435	Insulator (Retained between Saddle and Lampholder)				
83,438	Lamp Clamping Screw ... ..	1	Special nut 83,968		
83,964	Lampholder ... ..	1			
83,968	Cylindrical Nut ... ..	1			
83,488	Contact Assembly ... ..	1	4BA. $\frac{7}{16}$ in. cheesehead (Terminal screws)	SCR 9/1066	2

Part No. 83,964

**LAMPHOLDER**

On early Soundheads, Lampholder Part 83,436 was used.  
This is interchangeable with the present 83,964.



## Plate 8

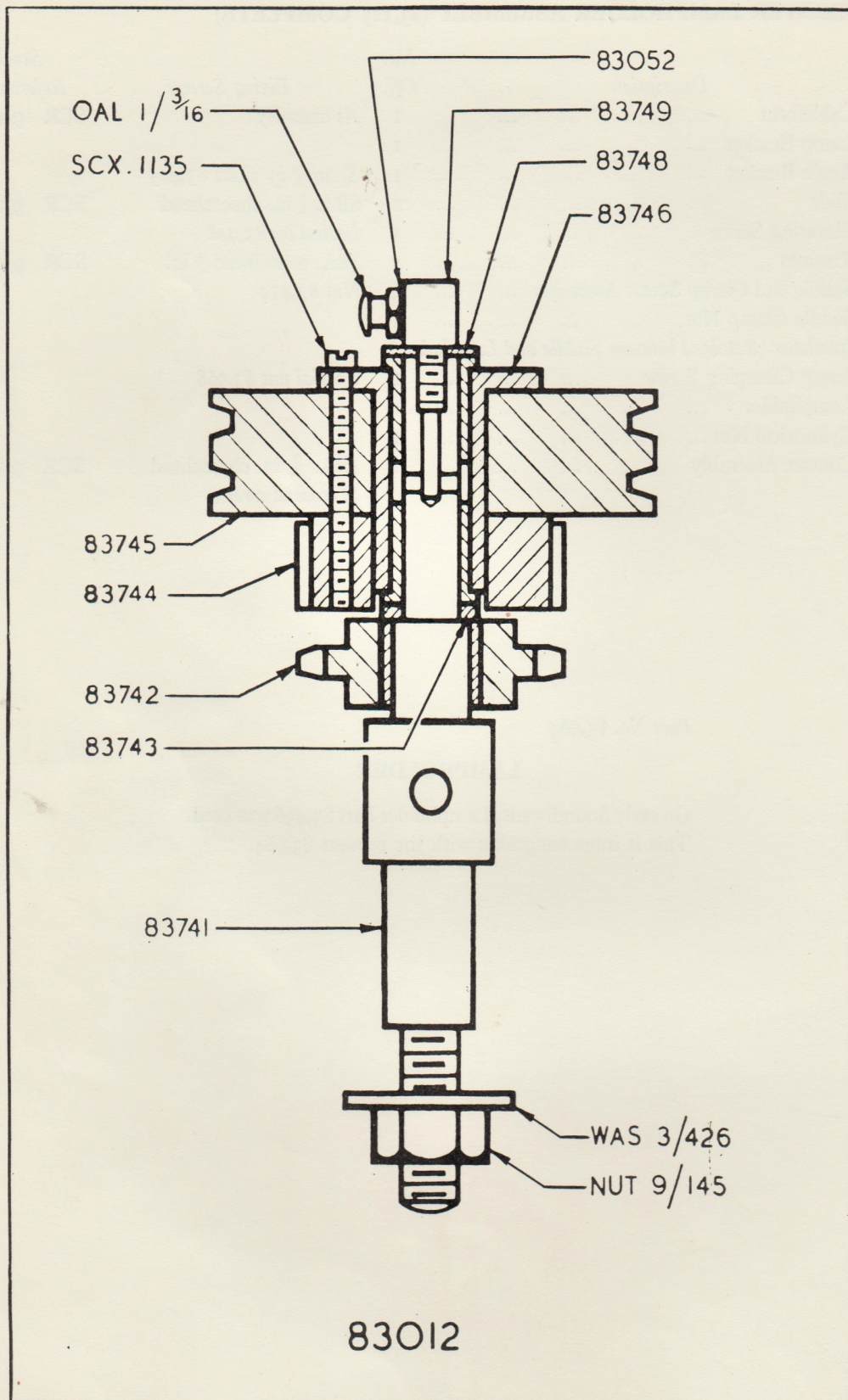


FIGURE 16. LAYSHAFT AND MAIN-DRIVE PULLEY



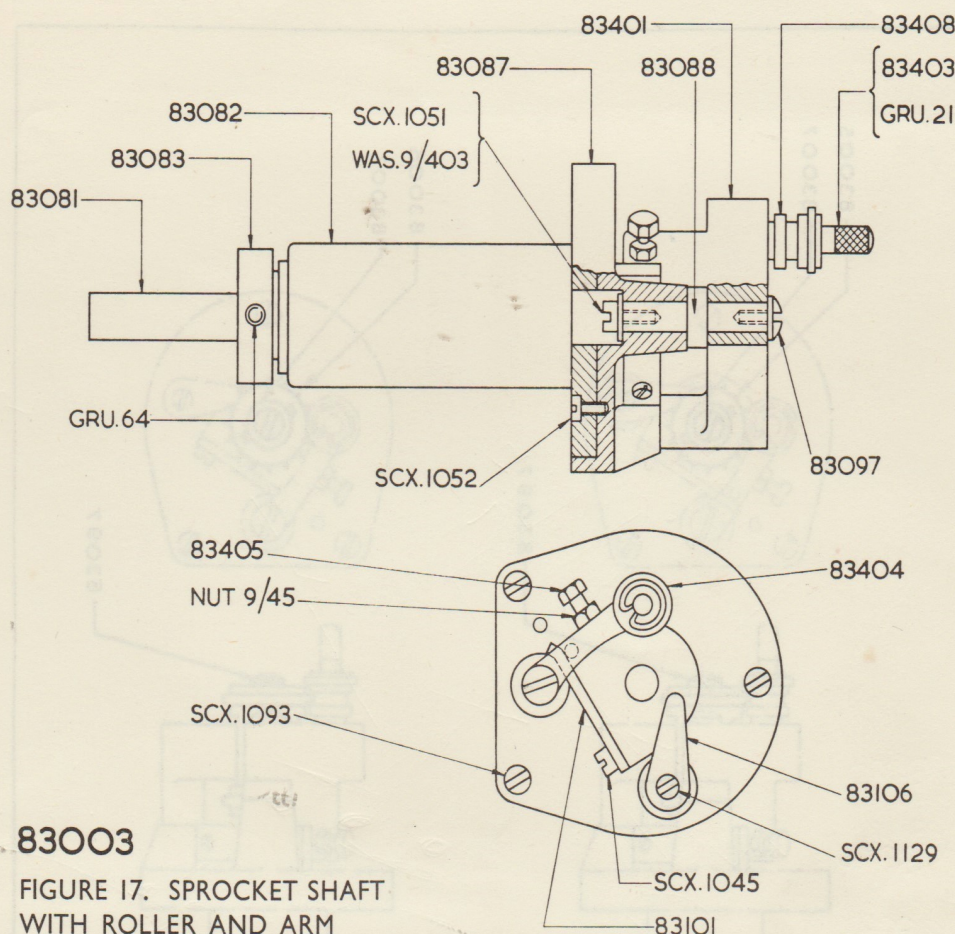
**PLATE 8—LAYSHAFT ASSEMBLY (83,012 COMPLETE)**

<i>Part No.</i>	<i>Description</i>	<i>No. Off.</i>	<i>Fixing Screws</i>	<i>Stock Reference</i>	<i>No. Off.</i>
83,741	Layshaft ...	1	As assembly	WAS 3/426	1
				NUT 9/145	1
83,742	Idler Sprocket ...	1			
83,743	Thrust Washer ...	1			
83,744	Main Drive Pinion ...	1			
83,745	Main Drive Pulley ...	1	2BA. 1½ in. cheesehead	SCR 2/1135	3
83,746	Pulley Sleeve (Oilite bushed) ...	1			
83,748	Washer ...	1	Under 83,749		
83,749	Retaining End Screw ...	1			
83,052	Leather Washer ...	1	Under Oiler OAL 1 $\frac{3}{16}$		
OAL 1 $\frac{3}{16}$	Oiler ...	1	Threaded		



# Plate 9

## SPROCKET SHAFT WITH ROLLER AND ARM



**83003**

FIGURE 17. SPROCKET SHAFT WITH ROLLER AND ARM

### SPROCKET SHAFT (83,003 COMPLETE)

Part No.	Description	No. Off.	Fixing Screws	Stock Reference	No. Off.
83,087	Mounting Bracket ... ..	1	As assembly	SCR 9/1093	3
83,082	Sprocket Shaft Bearing ... ..	1	4BA. $\frac{5}{16}$ in. cheesehead	SCR 9/1052	3
83,081	Sprocket Shaft ... ..	1	Retained by 83,083		
83,083	Locking Collar ... ..	1	2BA. $\frac{5}{16}$ in. socket grub	GRU 64	1
83,106	Stripper ... ..	1	4BA. $\frac{13}{8}$ in. cheesehead	SCR 9/1129	1
83,101	Spring ... ..	1	4BA. $\frac{1}{4}$ in. cheesehead	SCR 9/1045	1
83,088	Roller Arm Pivot ... ..	1	2BA. $\frac{5}{16}$ in. cheesehead	SCR 9/1051	1
	To take assembly 83,096 (below)		2BA. washer	WAS 9/403	1

### ROLLER AND ARM (83,096 COMPLETE)

83,401	Roller Arm ... ..	1	As assembly, held by	83,097	1
83,403	Spindle ... ..	1	4BA. $\frac{1}{8}$ in. socket grub	GRU 21	1
*83,408	Bushed Roller ... ..	2	Held by 83,404		
83,404	Circlips ... ..	2			
83,405	Adjusting Screw ... ..	1	4BA. locknut	NUT 9/45	1
83,097	End Screw ... ..	1			

#### \* ROLLER ASSEMBLIES

The older type Soundheads were fitted with Rollers Part No. 83,402. Where one of these is to be replaced, both Rollers on the same Spindle must be replaced at the same time by new Roller assemblies Part No. 83,408.



# Plate 10

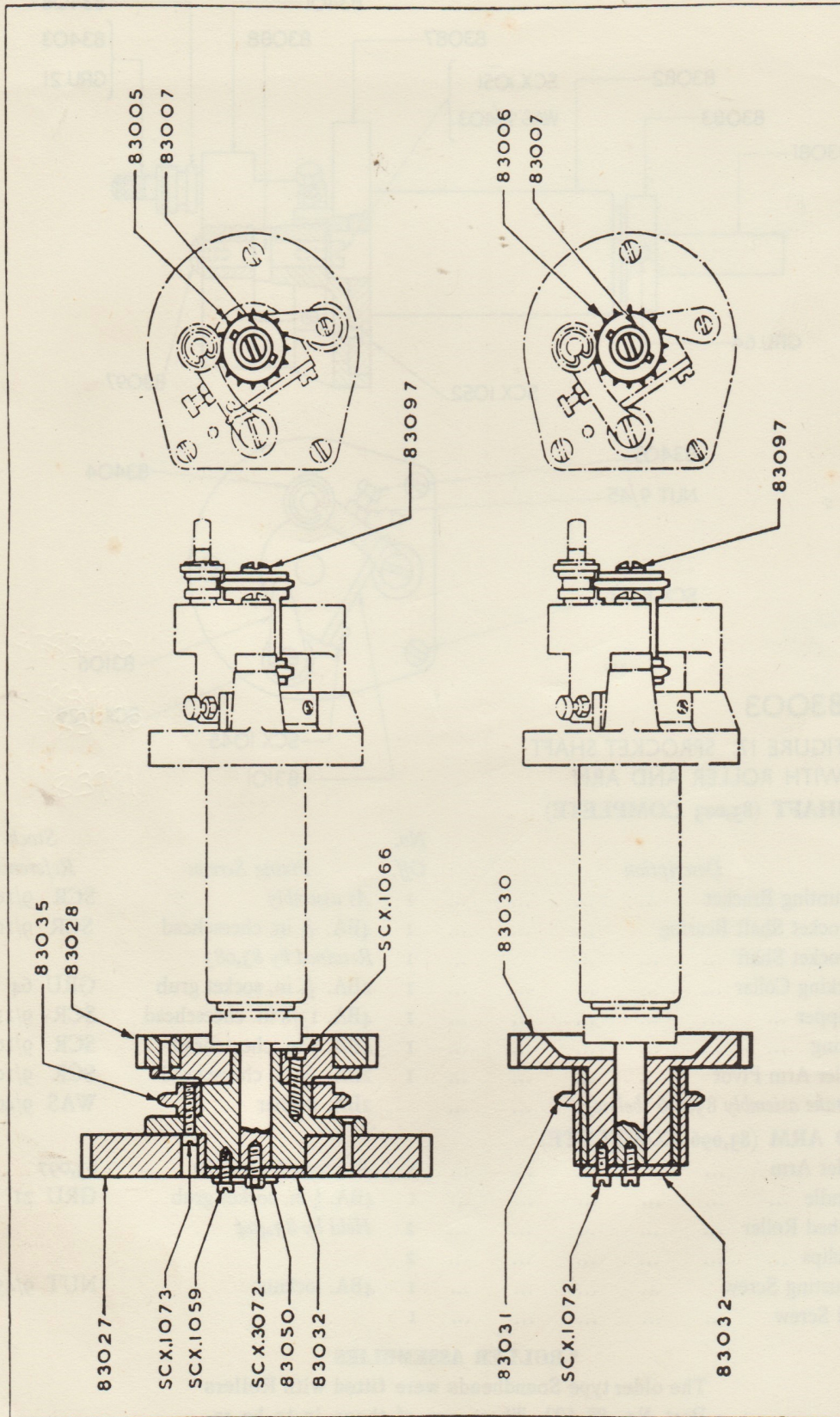


FIGURE 18. TOP AND BOTTOM SPROCKET GEARING, WITH SPROCKETS



**PLATE 10—TOP AND BOTTOM SPROCKET GEARING****MAIN DRIVE GEARING (83,026 COMPLETE)**

<i>Part No.</i>	<i>Description</i>	<i>No. Off.</i>	<i>Fixing Screws</i>	<i>Stock Reference</i>	<i>No. Off.</i>
83,027	Main Drive Gear ... ..	I	2BA. $\frac{1}{2}$ in. hexagonal end screw <i>With keywasher 83,032</i>	SCX 3072	I
83,032	Keywasher ... ..	I	4BA. $\frac{3}{8}$ in. cheesehead	SCX 1072	2
83,050	Keeper ... ..	I	4BA. $\frac{3}{8}$ in. cheesehead	SCX 1072	I
83,028	Sound Sprocket Gear ... ..	I	4BA. $\frac{7}{16}$ in. cheesehead	SCR 1066	3
83,035	Main Drive Chain Sprocket ... ..	I	4BA. $\frac{1}{2}$ in. cheesehead	SCR 9/1073	3

**LOWER SPROCKET SHAFT GEARING**

83,031	Idler Sprocket ... ..	I	<i>Retained by 83,032</i>		
83,032	Keywasher ... ..	I	4BA. $\frac{3}{8}$ in. cheesehead	SCX 1072	3
83,030	Holdback Sprocket Gear ... ..	I	<i>Retained by 83,032 and END</i> SCREW 2BA. $\frac{1}{2}$ in. cheesehead	SCR 9/1072	I

**SPROCKETS**

83,005	Feed Sprocket ... ..	I	<i>Retained by 83,007</i>
83,006	Holdback Sprocket ... ..	I	<i>Retained by 83,007</i>
83,007	Keywasher ... ..	2	<i>Retained by 83,097</i>
83,097	End Screw ... ..	2	

**CINEMASCOPE SPROCKETS**

Where Cinemascope magnetic or mag/optical Film, with its smaller Sprocket Holes, is to be run, alternative Sprockets can be supplied. These Sprockets can be used when running either Cinemascope or normal Film, though normal Sprockets cannot be used when running Cinemascope Film. The Cinemascope Sprockets detailed below are directly interchangeable with their Normal equivalents:

- 83,990 Feed Sprocket (Cinemascope).
- 83,991 Holdback Sprocket (Cinemascope).

*Part No. 83,050*

**KEEPER**

This part was not fitted to Soundheads completed before May, 1949. Where not already fitted it need not be added.



A 543

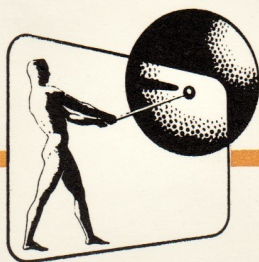
Issue 1/160

**GAUMONT-KALEE**

**OPTICAL SOUNDHEADS**

**TYPES-543-378-847**

**SPARES LIST**



**RANK PRECISION INDUSTRIES LTD.**

**GAUMONT-KALEE DIVISION**

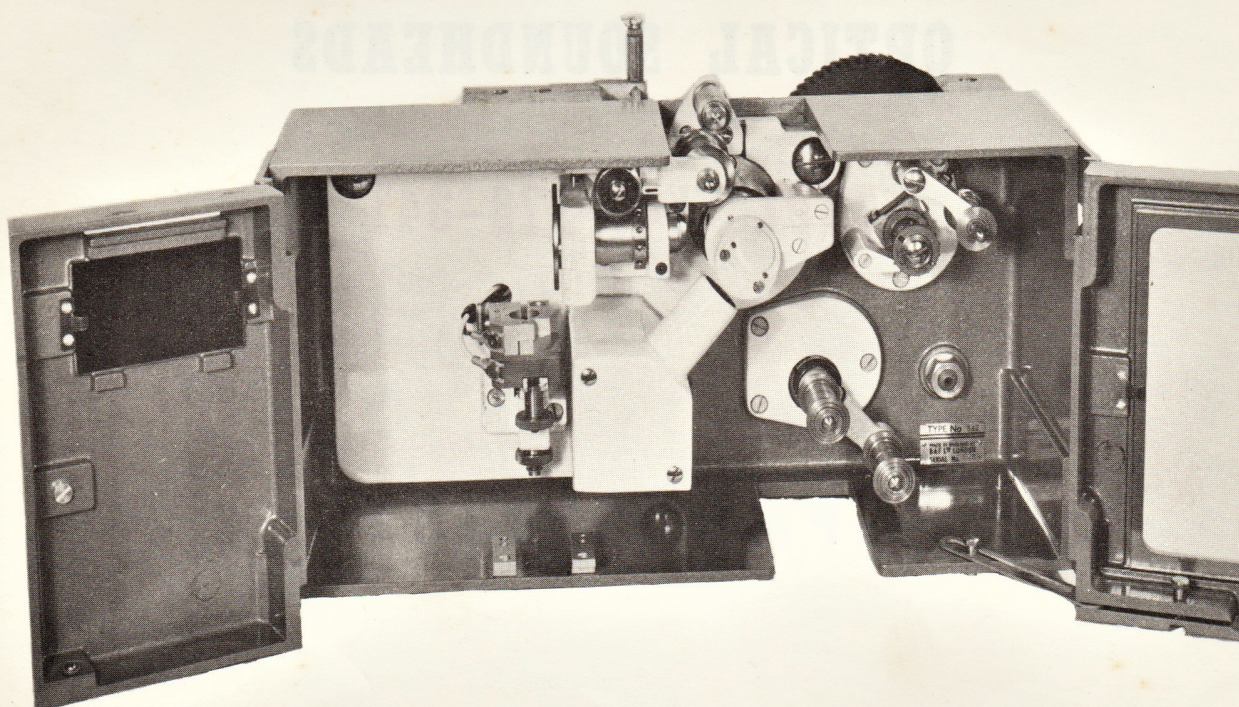
Woodger Road, Shepherds Bush, London W.12, England

Telephone: SHEpherds Bush 2050 Cables: 'RANKALEE LONDON' Telex: 24408



**GAUMONT-KALEE**

**TYPE 543**



**OPTICAL**

**SOUNDHEAD**



# SPARE PARTS LIST

When ordering Spare Parts from this List, always give as much information as possible. In addition to the number of the part to be replaced, quote its name, with the type and serial numbers of the unit in which it is fitted.

**IMPORTANT:** The Part Number must always be quoted.

Bei der Bestellung von Ersatzteilen sollte eine eingehende Beschreibung beigelegt werden. Ausser der Nummer des Teils, das ersetzt werden soll, sollte seine Benennung sowie die Typen- und Seriennummern des Gerätes angegeben werden, in den das Teil eingebaut werden soll.

**WICHTIG:** Die Listenbezeichnung des Teils muss auf jeden fall angegeben werden.

Quand vous commandez des pièces a l'aide de cette liste veuillez donner le plus d'information possible. En plus du numéro de la pièce, veuillez indiquer son nom ainsi que le type et numéro de la machine à laquelle elle est destinée.

**IMPORTANT:** Le numéro de la pièce doit toujours être donné.

Cuando se hace un pedido de piezas de recambio se debe hacer lo mas detallado posible. Aparte del número de la parte que se reemplaza, indicar su nombre, con los números de tipo y serie de la sección donde van ajustados.

**IMPORTANTE:** El número de la parte siempre debe indicarse.

Bij bestelling van onderdelen van deze lijst verzoeken wij U altijd zoveel mogelijk bijzonderheden te verstrekken. Afgezien van het nummer van het te vervangen onderdeel verzoeken wij U de naam ervan op te geven alsmede het type en de serie nummers van de machines, waarin e.e.a. gemonteerd moet worden.

**BELANGRIJK:** Het nummer van het onderdeel moet altijd opgegeven worden.

Per ordinare pezzi di ricambio da questo elenco, date sempre i più dettagli possibile. Oltre il numero del pezzo che deve essere cambiato, date anche il nome, il modello ed il numero di serie del unità nella quale è montato.

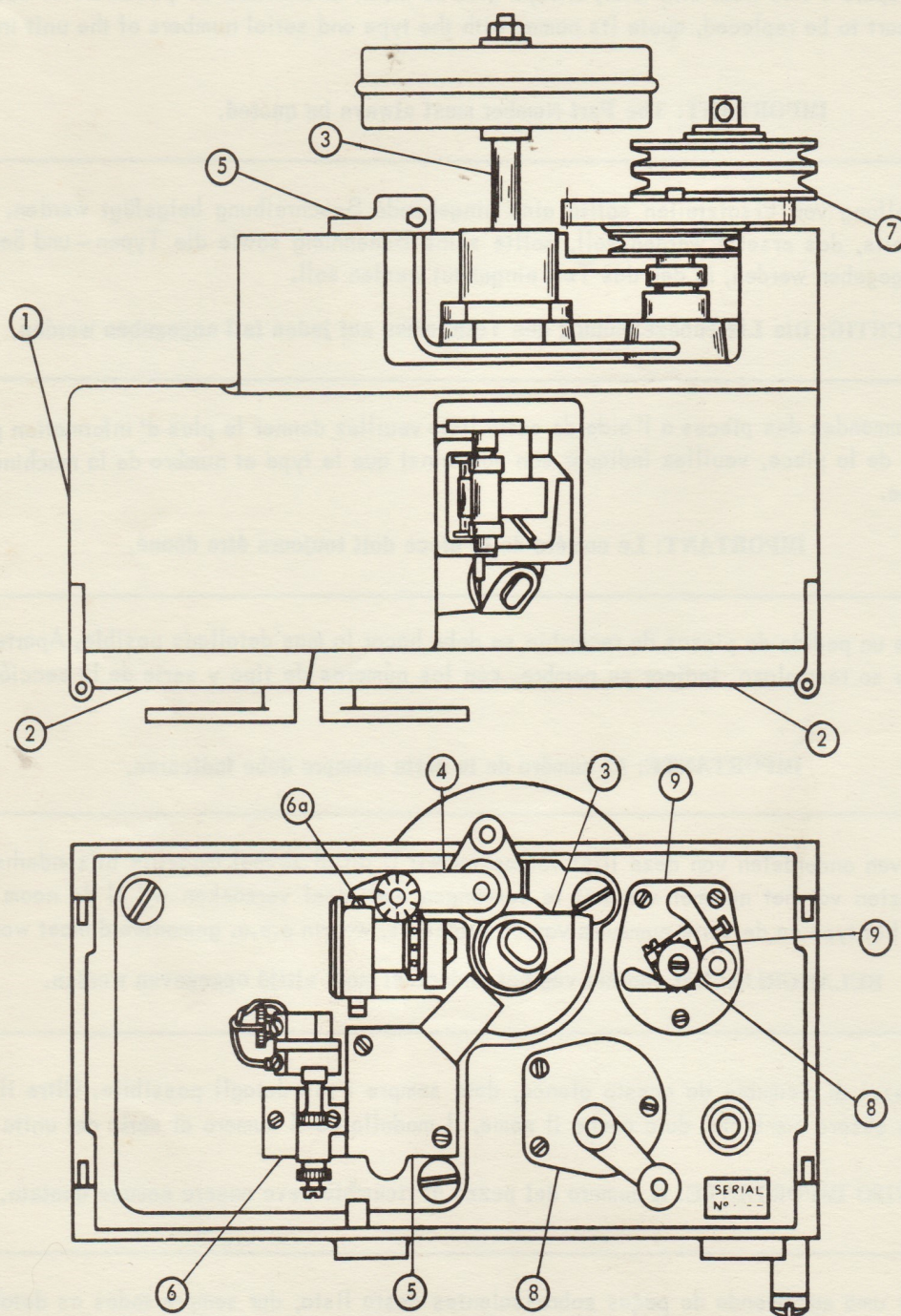
**AVVISO IMPORTANTE:** Il numero del pezzo di ricambio deve essere sempre quotato.

Quando se fizer uma encomenda de peças sobressalentes desta lista, dar sempre todos os detalhes possíveis. Além do número da peça a substituir, indicar o seu nom, bem como tipo e número da máquina onde a mesma deve ser ajustada.

**IMPORTANTE:** O número da peça sempre deve indicar-se.



# KEYPLATE 543 SOUNDHEAD



ENCIRCLED FIGURES REFER TO PLATE NUMBERS



# SPARE PARTS LIST

When ordering Spare Parts from this List, always give as much information as possible. In addition to the number of the part to be replaced, quote its name, with the type and serial numbers of the unit in which it is fitted.

**IMPORTANT:** The Part Number must always be quoted.

Bei der Bestellung von Ersatzteilen sollte eine eingehende Beschreibung beigefügt werden. Ausser der Nummer des Teils, das ersetzt werden soll, sollte seine Benennung sowie die Typen- und Seriennummern des Gerätes angegeben werden, in den das Teil eingebaut werden soll.

**WICHTIG:** Die Listenbezeichnung des Teils muss auf jeden fall angegeben werden.

Quand vous commandez des pièces a l'aide de cette liste veuillez donner le plus d'information possible. En plus du numéro de la pièce, veuillez indiquer son nom ainsi que le type et numéro de la machine à laquelle elle est destinée.

**IMPORTANT:** Le numéro de la pièce doit toujours être donné.

Cuando se hace un pedido de piezas de recambio se debe hacer lo mas detallado posible. Aparte del número de la parte que se reemplaza, indicar su nombre, con los números de tipo y serie de la sección donde van ajustados.

**IMPORTANTE:** El número de la parte siempre debe indicarse.

Bij bestelling van onderdelen van deze lijst verzoeken wij U altijd zoveel mogelijk bijzonderheden te verstrekken. Afgezien van het nummer van het te vervangen onderdeel verzoeken wij U de naam ervan op te geven alsmede het type en de serie nummers van de machines, waarin e.e.a. gemonteerd moet worden.

**BELANGRIJK:** Het nummer van het onderdeel moet altijd opgegeven worden.

Per ordinare pezzi di ricambio da questo elenco, date sempre i più dettagli possibile. Oltre il numero del pezzo che deve essere cambiato, date anche il nome, il modello ed il numero di serie del unita nella quale e montato.

**AVVISO IMPORTANTE:** Il numero del pezzo di ricambio deve essere sempre quotato.

Quando se fizer uma encomenda de peças sobressalentes desta lista, dar sempre todos os detalhes possíveis. Além do número da peça a substituir, indicar o seu nom, bem como tipo e número da máquina onde a mesma deve ser ajustada.

**IMPORTANTE:** O número da peça sempre deve indicar-se.



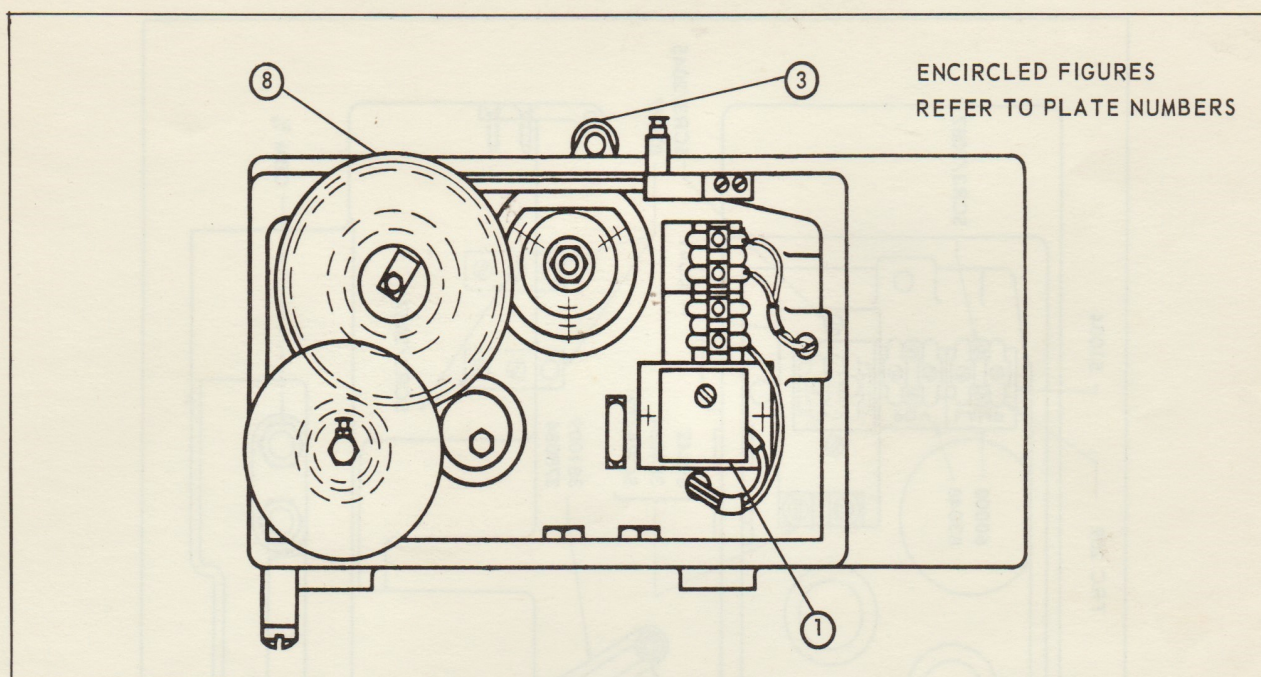
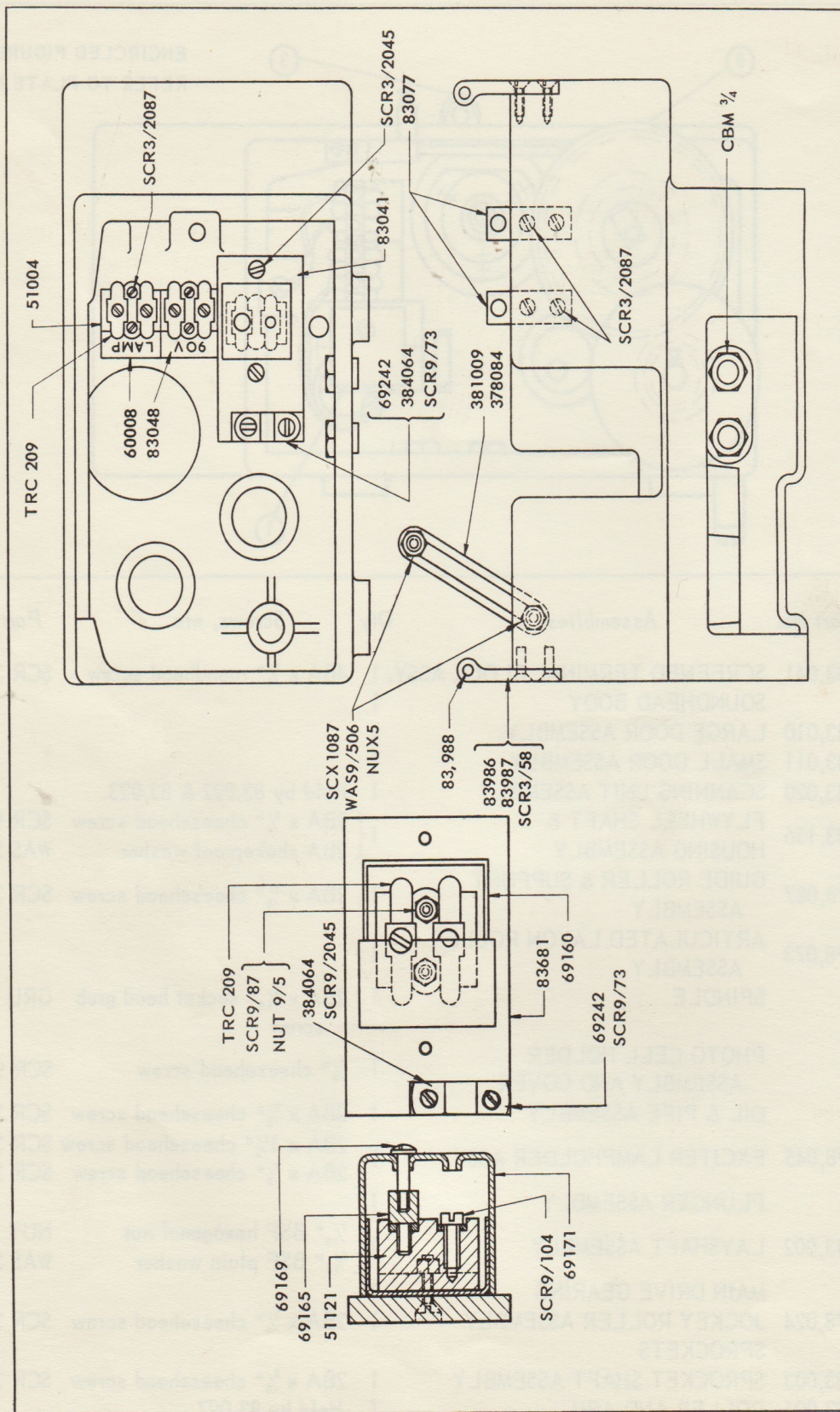


Plate No.	Part No.	Assemblies	Qty	Screws, etc.	Part No.	Qty
Plate 1	83,041	SCREENED TERMINAL BLOCK ASSY.	1	4BA x $\frac{1}{4}$ " roundhead screw	SCR 3/2045	2
		SOUNDHEAD BODY	1			
Plate 2	543,010	LARGE DOOR ASSEMBLY	1			
	543,011	SMALL DOOR ASSEMBLY	1			
Plate 3	543,020	SCANNING UNIT ASSEMBLY	1	Held by 83,022 & 83,023		
	83,156	FLYWHEEL SHAFT & HOUSING ASSEMBLY	1	2BA x $\frac{3}{4}$ " cheesehead screw	SCR 9/1093	3
				2BA shakeproof washer	WAS 508	3
	378,087	GUIDE ROLLER & SUPPORT ASSEMBLY	1	2BA x $\frac{3}{8}$ " cheesehead screw	SCR 3/1058	2
Plate 4	378,073	ARTICULATED, LAYON ROLLER ASSEMBLY	1			
		SPINDLE	1	2BA x $\frac{5}{16}$ " socket head grub screw	GRU 8/64	1
Plate 5		PHOTO CELL HOLDER ASSEMBLY AND COVER	1	$\frac{3}{4}$ " cheesehead screw	SCR 9/1093	2
		OIL & PIPE ASSEMBLY	1	2BA x $\frac{5}{8}$ " cheesehead screw	SCR 3/1086	2
Plate 6	378,045	EXCITER LAMPHOLDER ASSY,	1	2BA x $1\frac{1}{2}$ " cheesehead screw	SCR 3/1135	1
Plate 6a		PLUNGER ASSEMBLY	1	2BA x $\frac{5}{8}$ " cheesehead screw	SCR 3/1086	1
Plate 7	543,002	LAYSHAFT ASSEMBLY	1	$\frac{7}{16}$ " BSF hexagonal nut	NUT 3/145	1
				$\frac{7}{16}$ " BSF plain washer	WAS 3/426	1
Plate 8		MAIN DRIVE GEARING	1			
	378,024	JOCKEY ROLLER ASSEMBLY SPROCKETS	1	2BA x $\frac{3}{4}$ " cheesehead screw	SCR 3/1093	3
Plate 9	83,003	SPROCKET SHAFT ASSEMBLY	1	2BA x $\frac{3}{4}$ " cheesehead screw	SCR 3/1093	3
	83,096	ROLLER AND ARM	1	Held by 83,097		



# PLATE 1





## PLATE-1

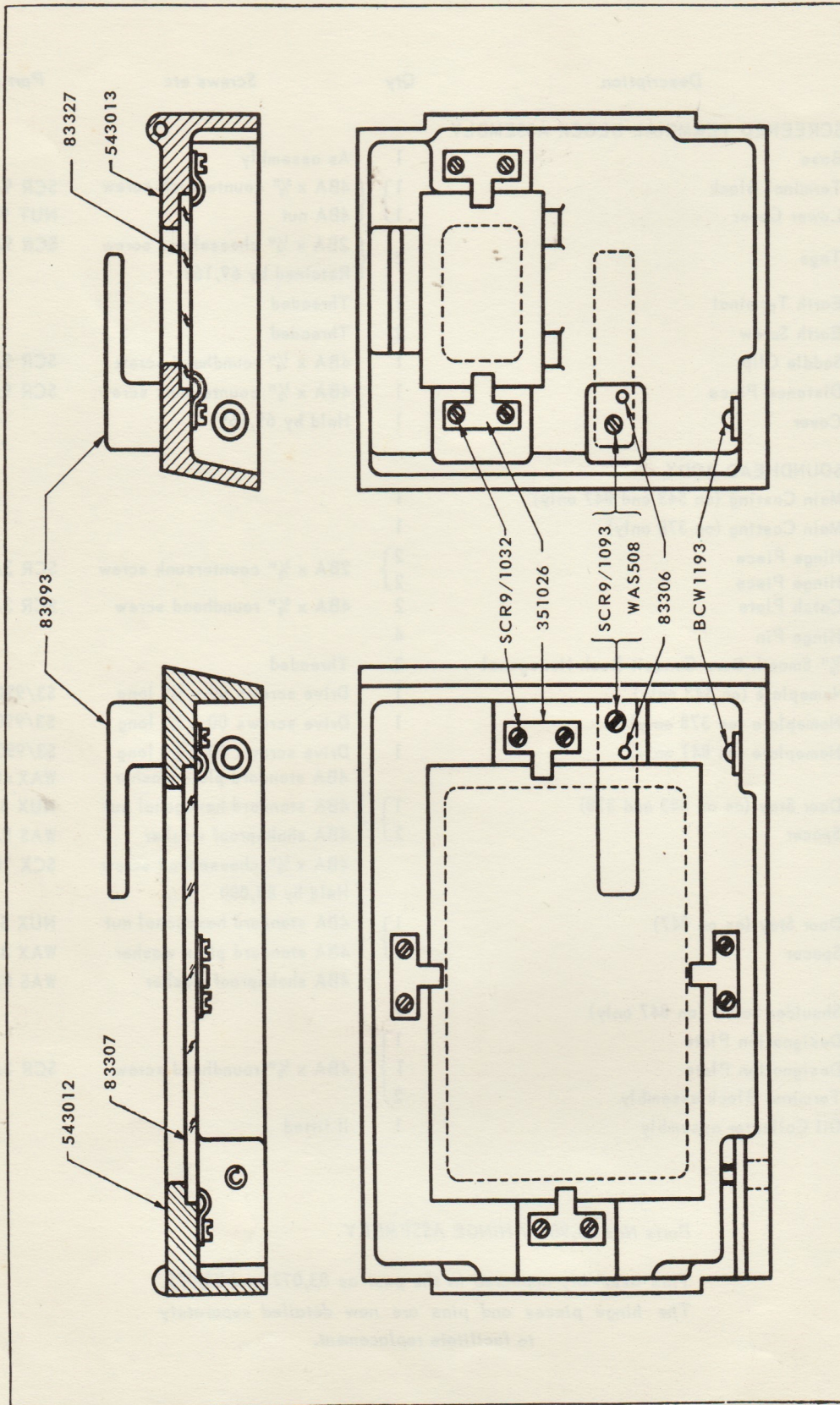
Part No.	Description	Qty	Screws etc	Part No.	Qty
83,041	SCREENED TERMINAL BLOCK ASSEMBLY				
83,681	Base	1	As assembly		
51,121	Terminal Block	1	{ 4BA x $\frac{5}{8}$ " countersunk screw	SCR 9/87	2
69,160	Lower Cover	1		NUT 9/5	2
TRC 209	Tags	2	{ 2BA x $\frac{1}{4}$ " cheesehead screw	SCR 9/1044	1
			{ Retained by 69,165		
69,165	Earth Terminal	1	Threaded		
69,169	Earth Screw	1	Threaded		
384,064	Saddle Clip	1	4BA x $\frac{1}{4}$ " roundhead screw	SCR 9/2045	2
69,242	Distance Piece	1	4BA x $\frac{1}{2}$ " countersunk screw	SCR 9/73	2
69,171	Cover	1	Held by 69,169		
	SOUNDHEAD BODY				
543,006	Main Casting (on 543 and 847 only)	1			
83,001	Main Casting (on 378 only)	1			
83,987	Hinge Piece	2	{ 2BA x $\frac{3}{8}$ " countersunk screw	SCR 3/58	8
83,986	Hinge Piece	2			
83,077	Catch Plate	2	4BA x $\frac{5}{8}$ " roundhead screw	SCR 3/2087	4
83,988	Hinge Pin	4			
CBM $\frac{3}{4}$ "	$\frac{3}{4}$ " Smooth Bore Conduit Bush Hexagonal	2	Threaded		
543,005	Nameplate (on 543 only)	1	Drive screws 00 x $\frac{1}{4}$ " long	S3/990001	2
378,044	Nameplate (on 378 only)	1	Drive screws 00 x $\frac{1}{4}$ " long	S3/990001	2
847,002	Nameplate (on 847 only)	1	Drive screws 00 x $\frac{1}{4}$ " long	S3/990001	2
381,009	Door Stay (as on 543 and 378)	1	{ 4BA standard plain washer	WAX 405	3
378,084	Spacer	2		NUX 5	2
				WAS 9/506	2
				SCX 1087	2
			{ Held by 83,080		
381,009	Door Stay (as on 847)	1	{ 4BA standard hexagonal nut	NUX 5	2
378,084	Spacer	1		WAX 405	2
				WAS 9/506	2
83,080	Shoulder Screw (on 847 only)	2			
60,008	Designation Plate	1	{ 4BA x $\frac{5}{8}$ " roundhead screw	SCR 3/2087	4
83,048	Designation Plate	1			
51,004	Terminal Block assembly	2			
83,054	Oil Collector assembly	1	If fitted		

## Parts Nos 83,986/7 HINGE ASSEMBLY

This assembly appeared in the past as 83,072 and 83,073.  
The hinge pieces and pins are now detailed separately  
to facilitate replacement.



# PLATE 2





## PLATE 2

Part No.	Description	Qty	Screws etc	Part No.	Qty
543,010	LARGE DOOR ASSEMBLY (on 543 & 847 only)				
83,073	LARGE DOOR ASSEMBLY (on 378 only)				
543,012	Door (on 543 and 847 only)	1			
83,301	Door (on 378 only)	1			
83,993	Handle	1	{ 2BA x 3/4" cheesehead screw	SCR 9/1093	1
			{ 2BA shakeproof washer	WAS 508	1
83,306	Dowel Pin	1			
83,307	Window	1	Held by 351,026		
351,026	Clamp	4	6BA x 3/16" cheesehead screw	SCR 9/1032	8
BCW 1193	Ball Catch	1			
543,011	SMALL DOOR ASSEMBLY (on 543 & 847 only)				
83,074	SMALL DOOR ASSEMBLY (on 378 only)				
543,013	Door (on 543 & 847)	1			
83,321	Door (on 378 only)	1			
83,993	Handle	1	{ 2BA x 3/4" cheesehead screw	SCR 9/1093	1
			{ 2BA shakeproof washer	WAS 508	1
BCW 1193	Ball Catch	1			
83,306	Dowel Pin	1			
351,026	Clamp	2	6BA x 3/16" cheesehead screw	SCR 9/1032	4
83,327	Window	1	Held by 351,026		

## NOTES BELOW APPLY TO PLATE 3 OVERLEAF

Part No 674,000

## FLYWHEEL ASSEMBLY

On early model Soundheads a spun aluminium Fluid Flywheel was used, either part No 83,071 or the similar but later 428,000. On Soundheads made after June 1952, the current type, part No 674,000 made of cast aluminium, is employed instead of the now obsolete spun models. Where it is necessary to replace one of the older types a new part No 674,000 will be supplied. This can be fitted in place of the older types if the following instructions are followed:

The collar and washer on the Shaft should be removed with the old Flywheel, and the new Flywheel should then be fitted to the Shaft with the screwheads of the two Filler Plugs facing away from the Soundhead Body. A standard 3/8in. washer should then be fitted (the old washer can be used, but the collar must never be refitted), and the Flywheel and washer secured by the 3/8in. Whitworth nut.

Part No CSE 5/8"

## FLYWHEEL AND SHAFT

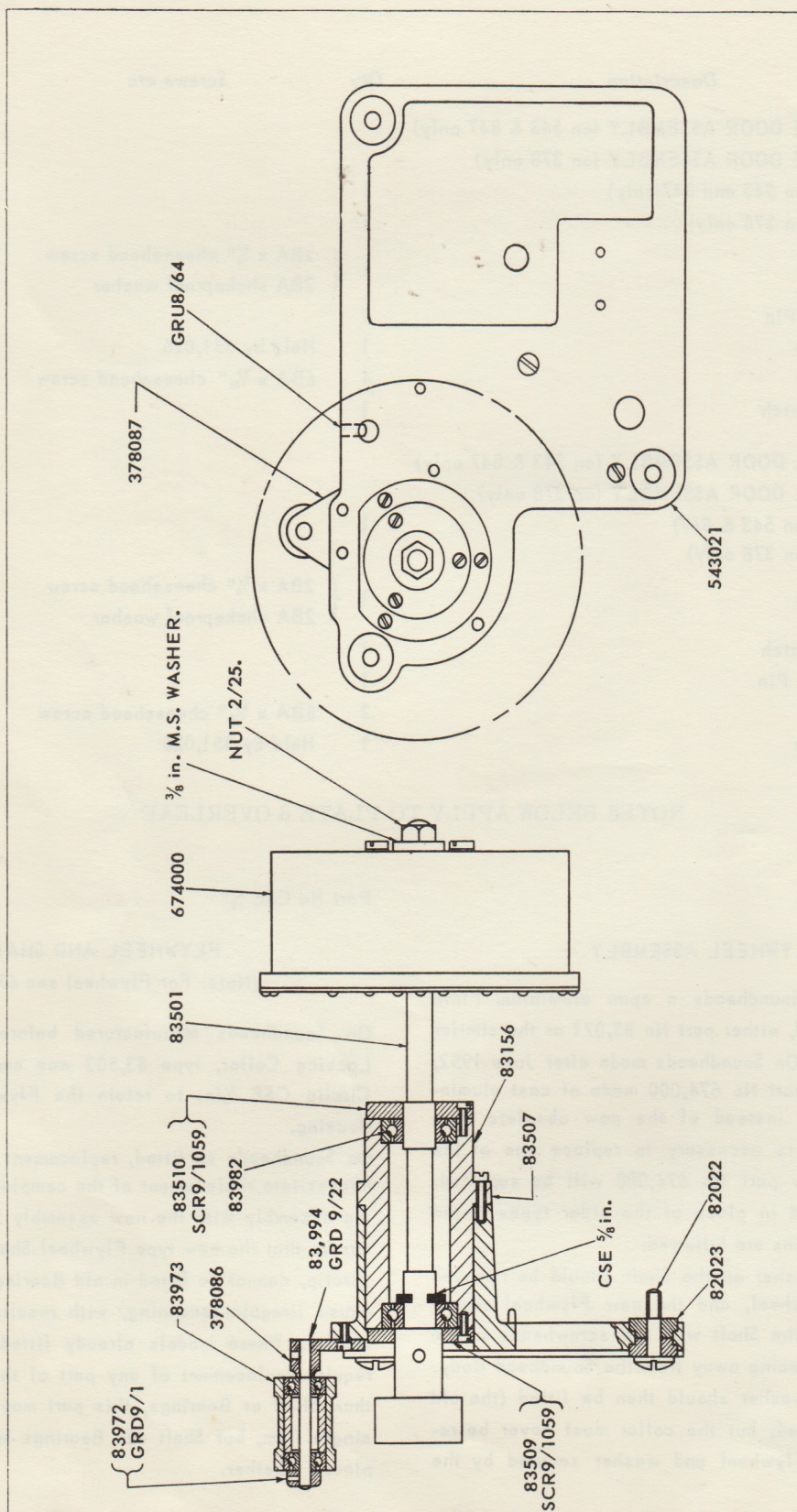
(Note: For Flywheel see 674,000)

On Soundheads manufactured before June 1953, the Locking Collar, type 83,503 was employed instead of Circlip CSE 5/8in. to retain the Flywheel Shaft in its Housing.

On Soundheads so fitted, replacement of the Collar will necessitate replacement of the complete Shaft and Bearing assembly with the new assembly 83,501. This is to ensure that the new type Flywheel Shaft, grooved for the Circlip, cannot be fitted in old Bearings, where it would cause irregular scanning, with resultant loss of sound quality. Where models already fitted with the Circlip require replacement of any part of this assembly other than Shaft or Bearings, this part may be replaced as a single item, but Shaft and Bearings must always be replaced together.



# PLATE 3





## PLATE-3

Part No.	Description	Qty	Screws etc	Part No	Qty
543,020	SCANNING UNIT ASSEMBLY (on 543 only)				
378,001	SCANNING UNIT ASSEMBLY (on 378 only)				
847,001	SCANNING UNIT ASSEMBLY (on 847 only)				
543,021	Casting and Dowell assembly (on 543 and 847 only)	1	As assembly		
378,068	Casting and Dowell assembly (on 378 only)	1	As assembly		
83,022	Mounting Screws	3			
83,023	Mounting Cushions	6			
378,050	Taylor Hobson Optical Unit	1	2B x $\frac{5}{8}$ " cheesehead screw	SCR 3/1086	3
83,156	*FLYWHEEL SHAFT & HOUSING ASSEMBLY				
83,501	Flywheel Roller and Shaft assembly	1	Circlip $\frac{5}{8}$ "	CSE $\frac{5}{8}$ "	1
83,509	Bearing Cover Plate	1	4BA x $\frac{3}{8}$ " cheesehead screw	SCR 9/1059	3
83,510	Bearing Cover Plate	1	4BA x $\frac{3}{8}$ " cheesehead screw	SCR 9/1059	3
83,507	Flywheel Shaft Housing	1	As assembly		
83,982	Ballrace	2			
674,000	Flywheel	1	$\left\{ \begin{array}{l} \frac{3}{8}" \text{ Whitworth machined nut} \\ \frac{3}{8}" \text{ standard plain washer} \end{array} \right.$	NUT 2/25 WAS 2/425	1 1
378,087	*GUIDE ROLLER & SUPPORT ASSEMBLY				
83,973	Guide Roller assembly	1	Held by 83,972		
83,972	Collar	1	6BA x $\frac{1}{8}$ " socket head grub screw	GRD 9/1	1
378,086	Support	1	As assembly		
83,994	Spindle	1	4BA x $\frac{3}{16}$ " socket head grub screw	GRD 9/22	1

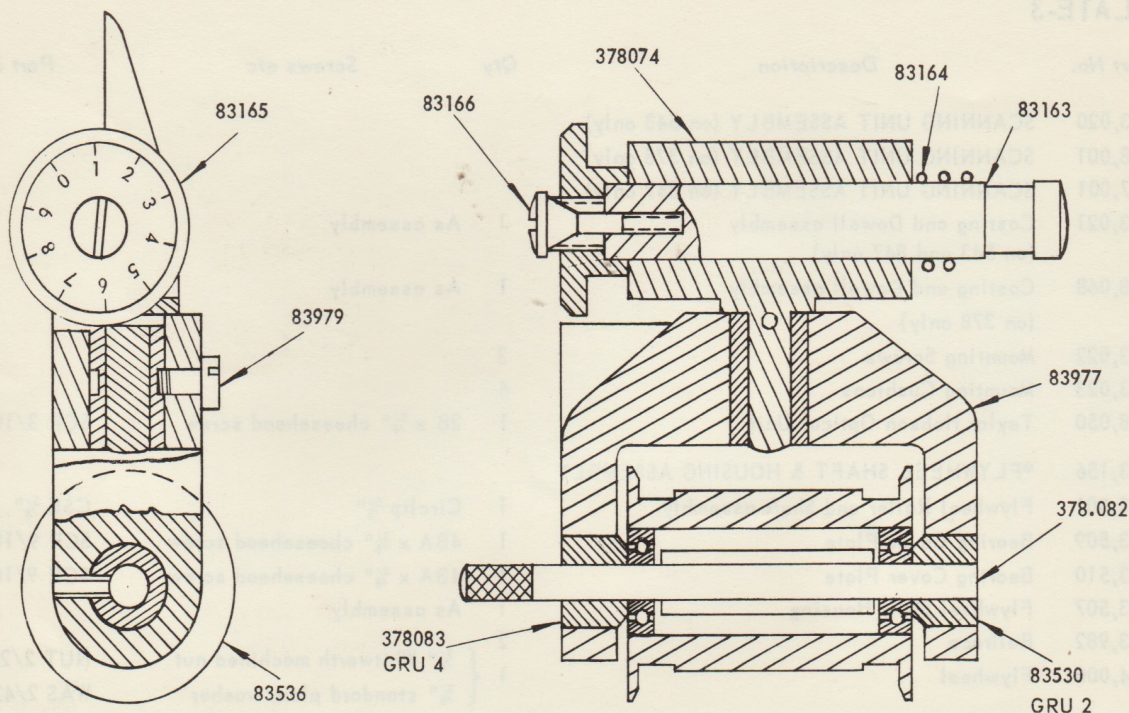
NOTE: The sub-assemblies of the Scanning Unit assembly will be found on plates 3,4,5 and 6; these will be shown thus: \*

## GUIDE ROLLER AND SUPPORT ASSEMBLY

On early model Soundheads part No. 83,970 Support and part No 83,971 Spindle were used, they have now been replaced by part No 378,086 Support and part No 83,974 Spindle. The old type Spindle was screwed into the Support, the modified Spindle is now a slide fit and is secured by a socket head grub screw. Should either of the old parts need replacing both new parts must be ordered. The fixings to the Scanning Unit assembly are the same for both old and new parts.



# PLATE 4



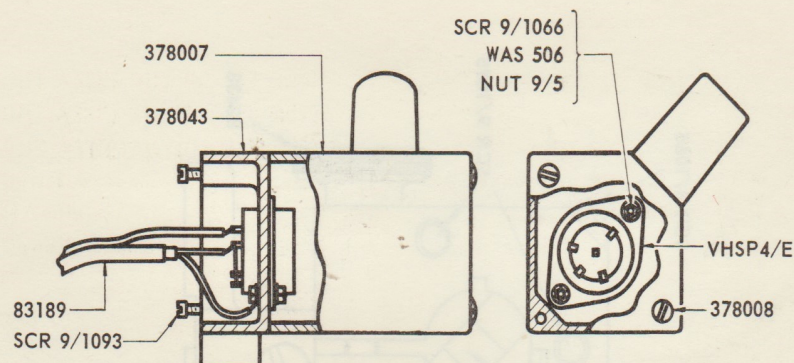
Part No.	Description	Qty	Screws Etc	Part No.	Qty
	<b>*SPINDLE</b>				
83,163	Pivot Spindle	1			
83,164	Spring	1			
83,165	Adjusting Knob	1	Held by 83,166		
83,166	Locking Screw	1			
378,073	<b>*ARTICULATED LAYON ROLLER ASSEMBLY</b>				
83,977	Layon Roller Arm	1	Held by 83,979		
378,074	Bearing Arm and Pin assembly	1	As assembly		
83,979	Special Screw	1			
83,536	Layon Roller	1			
378,082	Layon Roller Spindle	1	{ 6BA x $\frac{5}{16}$ " socket head grub screw 6BA x $\frac{3}{16}$ " socket head grub screw	GRU 4	1
83,530	Spindle Locating Collar	1		GRU 2	1
378,083	Spindle Locating Collar	1			

## Part No 378,073 LAYON ROLLER ASSEMBLY

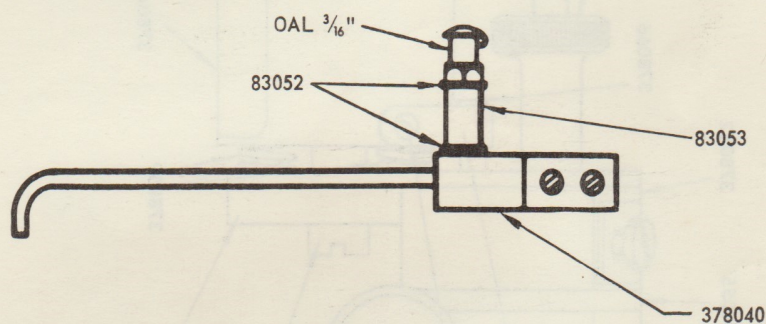
Certain early Soundheads were fitted with a rigid Layon Roller Arm, instead of the present Articulated Arm. This rigid Arm is obsolete, and where wear or damage make it necessary to replace any part of this assembly, a complete new assembly 83,976 must be fitted in its place. The two assemblies are directly interchangeable.



# PLATE 5



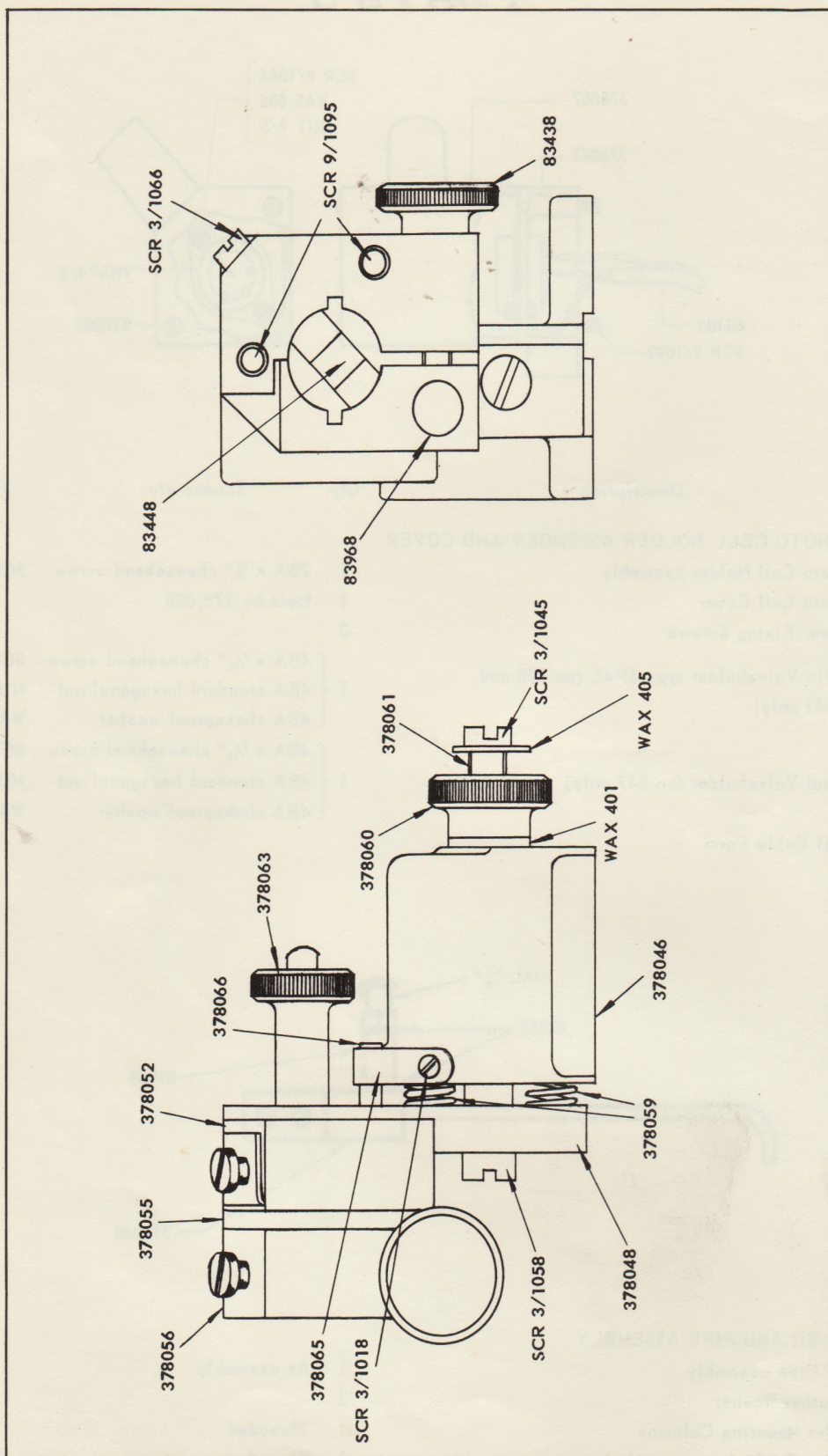
Part No.	Description	Qty	Screws etc	Part No.	Qty
<b>*PHOTO CELL HOLDER ASSEMBLY AND COVER</b>					
378,043	Photo Cell Holder assembly	1	2BA x 3/4" cheesehead screw	SCR 9/1093	2
378,007	Photo Cell Cover	1	Held by 378,008		
378,008	Cover Fixing Screws	2			
VHSP4E	4 Pin Valveholder type SP4E (on 378 and 543 only)	1	4BA x 7/16" cheesehead screw	SCR 9/1066	2
			4BA standard hexagonal nut	NUT 9/5	2
			4BA shakeproof washer	WAS 506	2
VHSP8/US	Octal Valveholder (on 847 only)	1	4BA x 7/16" cheesehead screw	SCR 9/1066	2
			4BA standard hexagonal nut	NUT 9/5	2
			4BA shakeproof washer	WAS 506	2
83,189	Cell Cable Form				



<b>OILER AND PIPE ASSEMBLY</b>					
378,040	Oil Pipe assembly	1	As assembly		
83,052	Leather Washer	2			
83,053	Oiler Mounting Columns	1	Threaded		
OAL 3/16"	Oiler. Rotherham type AL 1	1	Threaded		



# PLATE 6

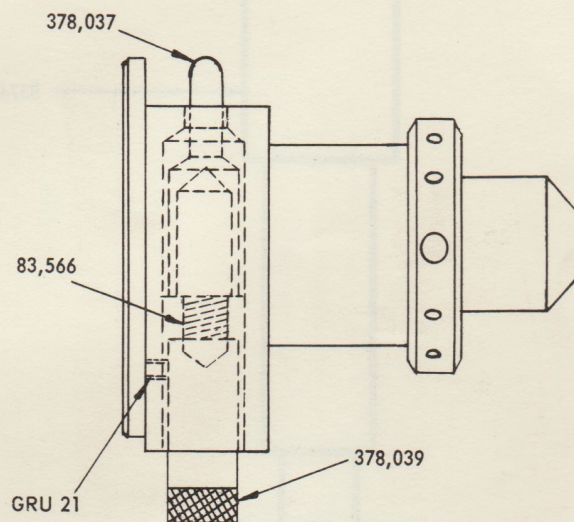




# **PLATE-6**

Part No.	Description	Qty	Screws etc	Part No.	Qty
378,045	*EXCITER LAMPHOUSE ASSEMBLY				
378,046	Lamp Bracket	1	{ OBA standard plain washer Held by 378,060	WAX 401	1
378,048	Slide assembly	1	2BA x $\frac{3}{8}$ " cheesehead screw	SCR 3/1058	1
378,052	Saddle assembly	1	{ 6BA x $\frac{3}{4}$ " cheesehead screw Held by 378,063	SCR 9/1095	2
378,055	Insulator	1			
378,056	Clamp assembly	1			
378,059	Spring	2			
378,060	Adjusting Nut	1	4BA x $\frac{1}{4}$ " cheesehead screw	SCR 3/1045	1
			4BA large washer	WAX 405	1
378,061	Vertical Adjusting Spindle	1			
83,438	Lamp Clamping Screw	1			
83,448	Contact assembly	1	4BA x $\frac{7}{16}$ " cheesehead screw	SCR 3/1066	2
378,063	Saddle Clamp Nut	1			
378,065	Spring	1	6BA x $\frac{1}{8}$ " cheesehead screw	SCR 3/1018	1
378,066	Pin	1	Fitted under 378,065		
83,968	Nut	1			
83,190	Exciter Lamp Cable Form				

## **PLATE-6a**

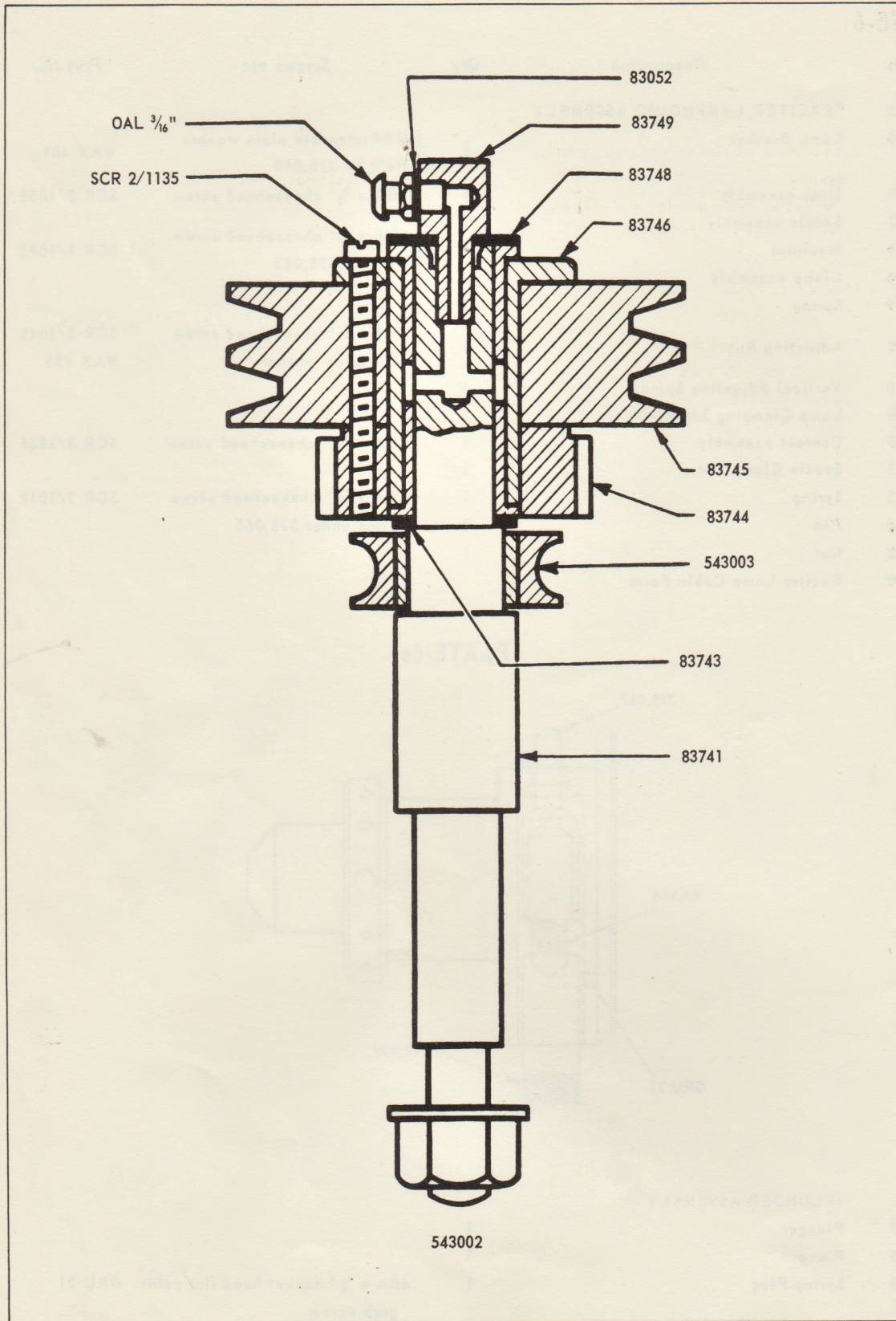


### **+PLUNGER ASSEMBLY**

378,037	Plunger	1			
83,566	Plunger	1			
378,039	Spring Plug	1	4BA x $\frac{1}{8}$ " socket head flat point grub screw	GRU 21	1



# PLATE 7



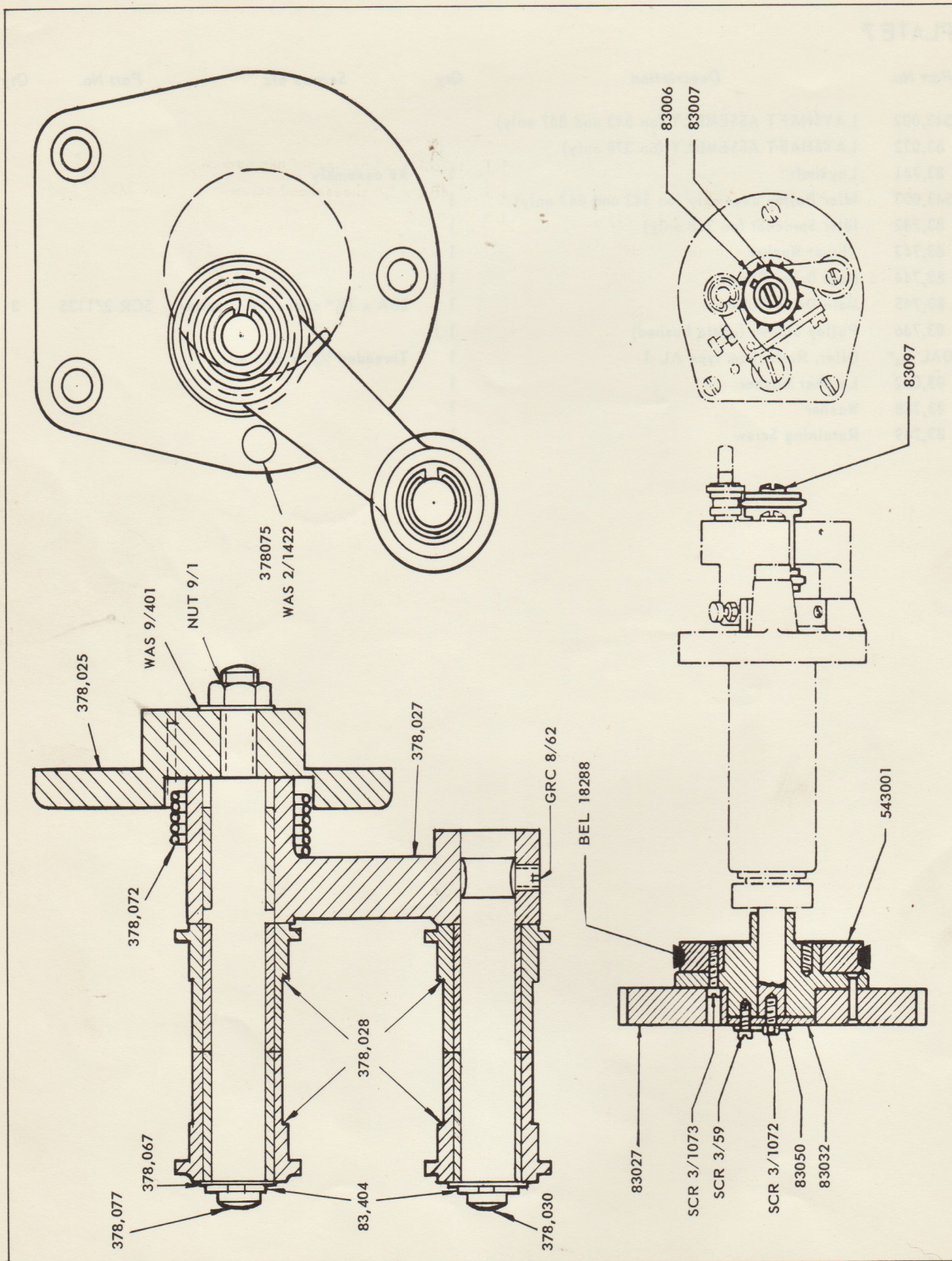


# **PLATE 7**

Part No.	Description	Qty	Screws etc	Part No.	Qty
543,002	LAYSHAFT ASSEMBLY (on 543 and 847 only)				
83,012	LAYSHAFT ASSEMBLY (on 378 only)				
83,741	Layshaft	1	As assembly		
543,003	Idler Pulley assembly (on 543 and 847 only)	1			
83,742	Idler Sprocket (on 378 only)	1			
83,743	Thrust Washer	1			
83,744	Main Drive Pinion	1	2BA x 1½" cheesehead screw	SCR 2/1135	3
83,745	Main Drive Pulley	1			
83,746	Pulley Sleeve (oilite bushed)	1			
OAL ⅜"	Oiler. Rotherham type AL 1	1	Threaded ⅜" x 32 t.p.i.		
83,052	Leather Washer	1			
83,748	Washer	1			
83,749	Retaining Screw	1			



# PLATE 8





## PLATE 8

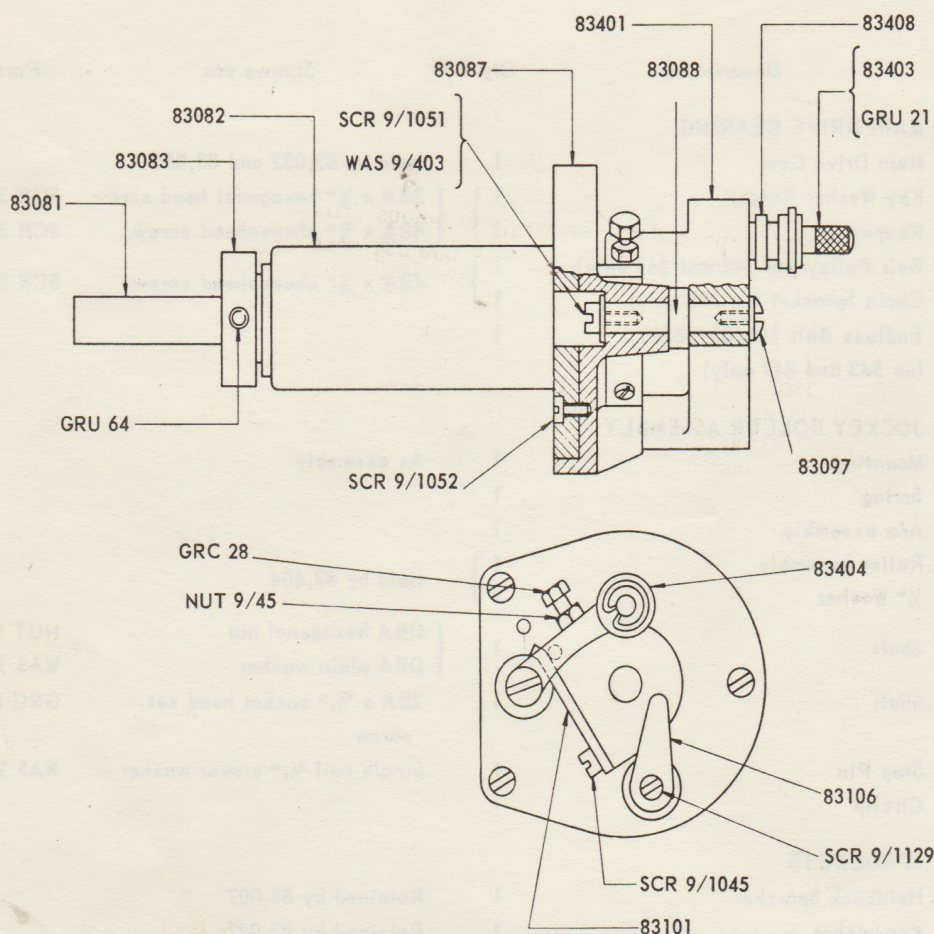
Part No.	Description	Qty	Screws etc	Part No.	Qty
MAIN DRIVE GEARING					
83,027	Main Drive Gear	1	Held by 83,032 and 83,050		
83,032	Key Washer (large)	1	{ 2BA x 1/2" hexagonal head screw	SCR 3/1072	1
83,050	Keeper	1		SCR 3/59	3
543,001	Belt Pulley (on 543 and 847 only)	1	{ 4BA x 1/2" cheesehead screw		
83,035	Chain Sprocket (on 378 only)	1		SCR 3/1073	3
BEL 18288	Endless Belt 100/03/18288 (on 543 and 847 only)	1			
JOCKEY ROLLER ASSEMBLY					
378,024	Mounting	1	As assembly		
378,072	Spring	1			
378,027	Arm assembly	1			
378,028	Roller assembly	4	{ Held by 83,404		
378,067	1/4" Washer	2			
378,077	Shaft	1	{ OBA hexagonal nut	NUT 9/1	1
			{ OBA plain washer	WAS 9/401	1
378,030	Shaft	1	2BA x 3/16" socket head set screw	GRC 8/62	1
378,075	Stop Pin	1	Single coil 3/16" grover washer	WAS 2/1422	1
83,404	Circlip	1			
SPROCKETS					
83,006	Holdback Sprocket	1	Retained by 83,007		
83,007	Keywasher	1	Retained by 83,097		
83,097	End Screw	1			

## Part No. 83,050 KEEPER

This part was not fitted to Soundheads completed before  
May 1949. Where not already fitted it need not be added.



# PLATE 9



Part No.	Description	Qty	Screws etc	Part No.	Qty
83,003	SPROCKET SHAFT				
83,087	Mounting Bracket	1	As assembly		
83,082	Sprocket Shaft	1	4BA x $\frac{5}{16}$ " cheesehead screw	SCR 9/1052	3
83,081	Sprocket Shaft	1	Retained by 83,083		
83,083	Locking Collar	1	2BA x $\frac{5}{16}$ " socket head grub screw	GRU 64	1
83,106	Stripper	1	4BA x $1\frac{3}{8}$ " cheesehead screw	SCR 9/1129	1
83,101	Spring	1	4BA x $\frac{1}{4}$ " cheesehead screw	SCR 9/1045	1
83,088	Roller Arm Pivot	1	{ 2BA x $\frac{5}{16}$ " cheesehead screw 2BA Washer	SCR 9/1051 WAS 9/403	1
83,096	ROLLER AND ARM				
83,401	Roller Arm	1	As assembly		
83,403	Spindle	1	4BA x $\frac{1}{8}$ " socket head grub screw	GRU 21	1
83,408	Bushed Roller	2	Retained by 83,404		
83,404	Circlips	2			
GRC 28	Adjusting Screw	1	4BA locknut	NUT 9/45	1
83,097	End Screw	1			

## ROLLER ASSEMBLIES

The older type Soundheads were fitted with Rollers part No. 83,402. Where one of these is to be replaced, both Rollers on the same spindle must be replaced at the same time by new Roller assemblies part No. 83,408.