

BUSH RADIO

Service Information

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MODEL SRP.31 4-Speed Autochanger Record Player.

MODEL AU.31 Amplifier Unit

GENERAL DESCRIPTION

SRP.31

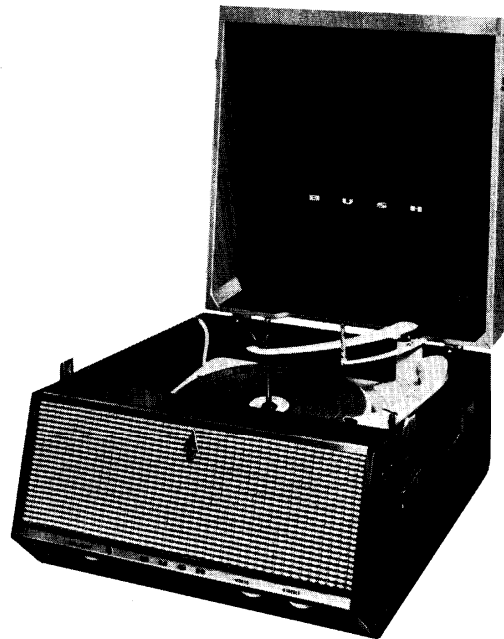
Four-speed autochanger with push-pull-output audio amplifier for operation on a.c. mains only (40, 50 or 60 c/s). Two loudspeakers are fitted—6 in. × 4 in. elliptical and a tweeter unit. Provision for reproducing stereophonic recordings. The record player may be used as the second amplifier for the stereo output signal derived from another record player.

AU.31

Model AU.31 has been designed primarily as the second amplifier for the stereo output signal derived from Model SRP.31. The unit may, however, be used in conjunction with a microphone, tape recorder or gramophone pick-up giving a suitable output. The circuit is similar to that of SRP.31; information contained in this publication applies to both models unless stated to the contrary.

CABINET FINISH

Brown and beige Rexine with moulded escutcheon and gold trim.



MODEL SRP.31

CABINET DIMENSIONS

Height *9 $\frac{5}{16}$ in. (23.6 cm)

Width 15 $\frac{7}{16}$ in. (39.4 cm)

Depth 17 $\frac{1}{2}$ in. (44.5 cm)

*Includes projections and rubber feet.

WEIGHT

SRP.31 24 lb. (10.9 kg)

AU.31 14 lb. (6.36 kg)

SPECIFICATION

VOLTAGE RANGE

200-250 volts a.c. only, 50 cycles per second. Mains supplies of 40 or 60 cycles per second may be used if the appropriate drive pulley is fitted to the gramophone turntable unit. Two voltage taps are provided on the mains transformer (fig. 3) as follows:—

- (1) 200 to 225 volts.
- (2) 225 to 250 volts.

POWER CONSUMPTION

SRP.31 40 watts.

AU.31 30 watts.

LOUDSPEAKERS

(1) Elliptical 6 in. × 4 in. (15 × 10 cm) of flux density 8,500 lines per square centimetre.

(2) Electrostatic tweeter unit.

No provision for external loudspeaker.

VALVES

Mullard Type

ECL83 (2) push-pull audio amplifier.

METAL RECTIFIER

STC type C2D.

CONTROLS

Edge-operated, at front of cabinet, from left to right—

Volume—On/Off.

Bass.

Treble.

Mounted on Motor board (SRP.31 only).

Turntable speed control.

Manual/Auto switch.

Stop button.

SENSITIVITY

550 mV for 3 watts output at 400 c/s.

AUDIO OUTPUT

3 watts.

GRAMOPHONE UNIT

Garrard type RC121 mk. II, four-speed manual and auto record player unit with type GC8 plug-in dual-stylus pick-up. The autochanger will accommodate ten records. 10-in. and 12-in. records of similar speed and groove size may be mixed in any order. Smaller size records may be included in the same batch provided that—

(1) they are placed at the top of the stack and

(2) they are of the same speed and groove size as other records in that batch.

PILOT LAMP

6.5 volt, 0.3 ampere rating, M.E.S. cap type.

FUSE LAMP

6.0 volt, 0.5 ampere rating, M.E.S. cap type.

STEREOPHONIC RECORDINGS

Stereophonic records may be played on the record player with the addition of the following items:—

- (1) a stereophonic pick-up, type GCS10 (MPM3 moulding).
- (2) a suitable audio amplifier and loudspeaker, i.e. Model AU.31.
- (3) a length of co-axial cable.

PROCEDURE

Replace the GC8 pick-up with the type GCS10. Never play a stereophonic record with a standard pick-up since this will seriously damage the record. A standard fine-groove recording may be played with the stereophonic pick-up.

Couple the "Stereo Output" socket (Model SRP.31) to the input socket of the second amplifier. The second amplifier and its associated loudspeaker should form the left-hand channel while the amplifier and loudspeaker in the record player should form the right-hand channel (see Fig. 4).

Model SRP.31 may be used as the second amplifier for the stereo output signal derived from another record player. In this instance the stereo output from the master player (the master player now occupies the right-hand position) should be coupled to the "Amp. Input" socket of the Model SRP.31.

REPLACEMENT OF STYLUS

A modern lightweight pick-up is a sensitive instrument and must be handled very carefully to avoid damage.

A sapphire stylus has a long life if used carefully. Only records in good condition with clean, dust-free surfaces should be used since worn surfaces may damage the stylus. A worn or damaged stylus causes harsh reproduction and increased surface noise and should be replaced immediately.

The record player uses a type GC8 pick-up, with two sapphire styluses. The pick-up head is removable for ease of stylus replacement, the recommended procedure being as follows:—

Detach the pick-up head. Insert the blade of a penknife under the stylus shank (Fig. 1) and gently lever the whole stylus assembly clear of the pick-up. The replacement stylus assembly may then be fitted by gently pressing the shank into the socket in the cartridge, ensuring that it engages with the small plastic foot projecting from the cartridge moulding. Replacement styluses for the GC8 pick-up are as follows:—

Standard (78 r.p.m.)—stylus GC8-3 (colour code green)

Long playing (16, 33, 45 r.p.m.)—stylus GC8-1 (colour code red)

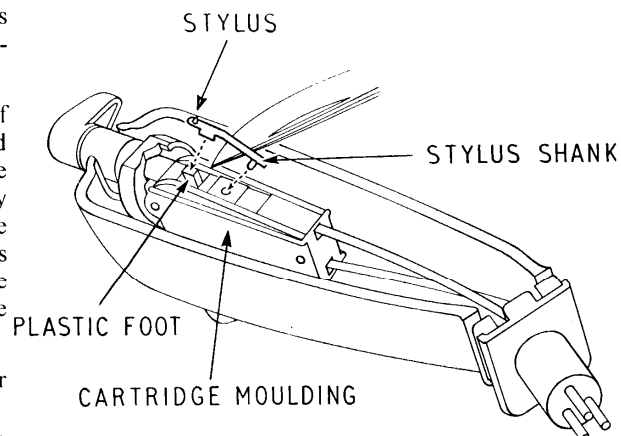


Fig. 1 Detachable Pick-up Head

DISMANTLING

Remove the plastic escutcheon at the lower front edge of the cabinet by unscrewing the three retaining screws. This will give access to both the pilot lamp and the fuse lamp.

To withdraw the amplifier chassis, slightly lower and remove the baffle holding the two loudspeakers and output transformer. Unscrew the four 4BA nuts holding the rear of the chassis to the cabinet and pull forward the chassis as far as the pick-up input lead will allow. The upper and lower sides of the chassis are then accessible for most servicing operations but should it be necessary to withdraw the chassis completely, the inner conductor of the pick-up lead should be unsoldered from the terminal on the chassis while the screened outer conductor should be freed by unscrewing the tag securing it to chassis.

To replace the chassis, reverse the above procedure.

N.B.—Refer to notes 3 and 4 on the circuit diagram (page 4) outlining phase requirements of loudspeaker connections if the loudspeaker leads need to be unsoldered.

In dismantling Model AU.31, the audio-input socket should be removed if the chassis is to be withdrawn.

The turntable unit (SRP.31 only) may be removed after the four Phillips screws holding the wooden baseboard to the cabinet have been unscrewed.

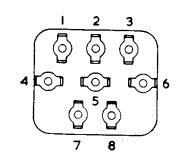
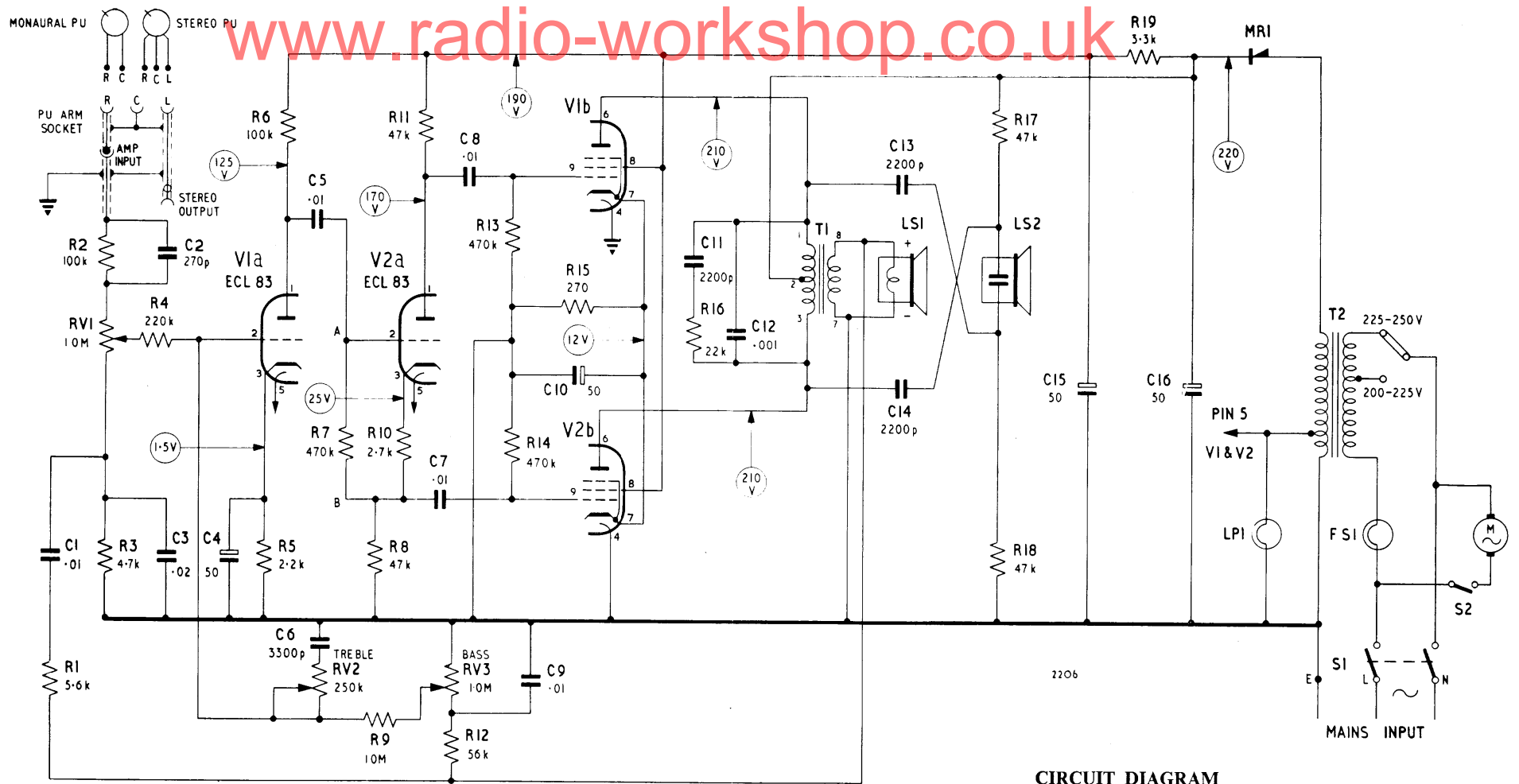
PARTS LIST

Note: Ordering to these part numbers will give the right type and rating of component. When fitting replacements from stock always use the same type as that of the component being replaced.

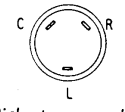
Reference	Value (ohms)	Tolerance (± %)	Rating (watts)	Part Number
R1	5.6 k	5	$\frac{1}{4}$	P6557
R2	100 k	20	$\frac{1}{4}$	P6863
R3	4.7 k	10	$\frac{1}{4}$	P6533
R4	220 k	20	$\frac{1}{4}$	P6947
R5	2.2 k	20	$\frac{1}{4}$	P6443
R6	100 k	20	$\frac{1}{4}$	P6863
R7	470 k	20	$\frac{1}{4}$	P7031
R8	47 k	10	$\frac{1}{4}$	P6785
R9	1 M	20	$\frac{1}{4}$	P7115
R10	2.7 k	20	$\frac{1}{4}$	P13897
R11	47 k	10	$\frac{1}{4}$	P6785
R12	56 k	20	$\frac{1}{4}$	P14137
R13	470 k	20	$\frac{1}{4}$	P7031
R14	470 k	20	$\frac{1}{4}$	P7031
R15	270	20	$\frac{1}{2}$	P13716
R16	22 k	20	$\frac{1}{4}$	P6695
R17	47 k	20	$\frac{1}{4}$	P6779
R18	47 k	20	$\frac{1}{4}$	P6779
R19	3.3 k	5	6	AP25684
RV1	1 M	—	—	BP61783
RV2	250 k	—	—	*BP61785
RV3	1 M	—	—	BP62217

Reference	Value		Tolerance (± %)	Rating (volts)	Part Number
	pf	μf			
C1	—	0.01	+80—20	350	AP27422
C2	270	—	20	500	AP21906
C3	—	0.02	20	350	AP60859
C4	—	50	+50—20	12	AP61531
C5	—	0.01	+80—20	350	AP27422
C6	3,300	—	20	750	AP61779
C7	—	0.01	+80—20	350	AP27422
C8	—	0.01	+80—20	350	AP27422
C9	—	0.01	+80—20	350	AP27422
C10	—	50	+50—20	12	AP61531
C11	2,200	—	10	750	AP24717
C12	—	0.001	20	750	AP61247
C13	2,200	—	10	750	AP24717
C14	2,200	—	10	750	AP24717
C15	—	50	+50—20	275	AP61781
C16	—	50	+50—20	275	AP61781

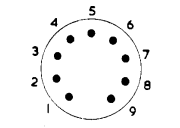
* Later models (and in the event of replacement) 1 Megohm, Part No. BP62216.



Output transformer



Pick-up arm socket viewed from front



B9A valvebase viewed from underside

CIRCUIT DIAGRAM

NOTES

- 1 Component values are in ohms or μF unless stated otherwise.
- 2 All voltages were measured with an AVO Model 8. Voltages greater than 10 volts were measured on the 1,000-volt range, voltages less than 10 volts were measured on the 10-volt range.

- 3 A potential applied to the speech coil as indicated on the circuit diagram will cause the loudspeaker cone to move outwards.
- 4 A positive potential applied between points A and B (across R7) will produce the speech-coil polarity indicated on the circuit diagram.

MODEL AU.31

The circuit diagram for Model AU.31 is similar to that for Model SRP.31 less the following items,

Monaural pick-up, stereo pick-up, pick-up arm socket, stereo output socket, record player (M) and switch (S2).

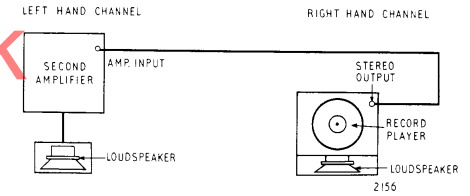
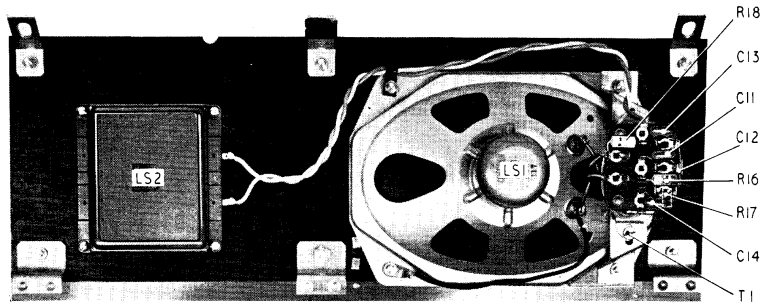


Fig. 4 Loudspeaker Positions in Stereophonic Usage.

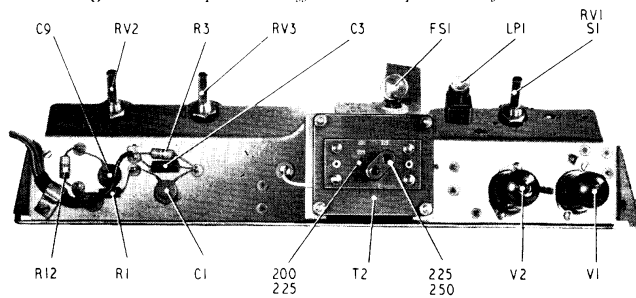
NOTE

RV2 is changed to 1 Megohm in later models.



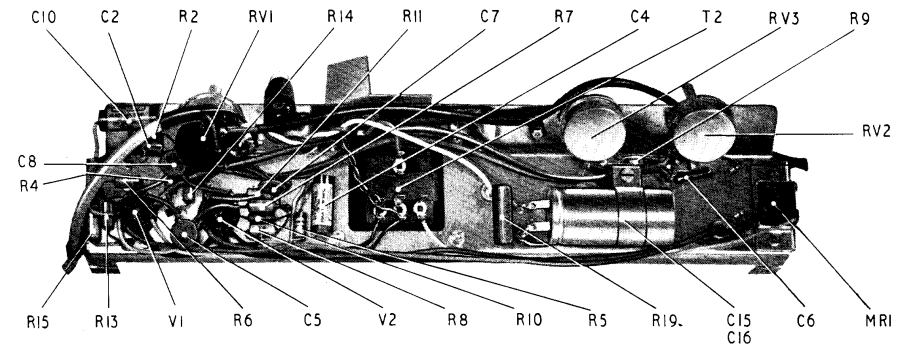
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Fig. 2 Loudspeaker Baffle and Output Transformer.



2177

Fig. 3 Top View of Chassis.



2182

Fig. 5 Under View of Chassis.

Reference	Description	D.C. Resistance (ohms)	Part Number
T1	Output transformer—primary	490	CS61872
	secondary	0.45	
T2	Mains transformer —primary	98	DS61867
	secondary (h.t.)	111	
	(l.t.)	0.2	

Reference	Description	Part Number
LS1	Loudspeaker, p.m., elliptical	CP26511
LS2	Loudspeaker, electrostatic	BP60090
LP1	Lamp, 6.5 volt, 0.3 ampere, M.E.S. fitting	AP18628
FS1	Lamp, 6.0 volt, 0.5 ampere, M.E.S. fitting	AP61337
MR1	Metal rectifier, type C2D	AP61780
S1	Mains, On/Off switch	Ganged to RV1
S2	Gramophone motor switch	Part of record player

Description	Part Number
Cabinet assembly (SRP.31)	FP61659
Cabinet assembly (AU.31)	FP61982
Carrying handle	CP61901
Escutcheon	EP61630
Knob, control	AP61666
Lampholder, fuse lamp	AS61866
Lampholder, pilot lamp	AP61517
Motif, Bush	CP60870
Plate, vent	DP61740
Plug, co-axial	AP23392
Socket	AP30085
Valveholder, B9A	AP22419
Voltage adjustment panel	AP61828
Voltage adjustment plug, 2-pin	AP61192

BUSH RADIO

SRP.31 Service Information Supplement

Tape Output Circuit

Later models of the SRP.31 have sockets providing an 'OUTPUT TO TAPE RECORDER.' These sockets are situated to the left of the louvred ventilation plate inside the cabinet and the connections are taken from a tertiary winding on the output transformer as shown in Fig. 1. The tag layout on the transformer is as shown in Fig. 2.

The pick-up now has four connections as shown in Fig. 3.

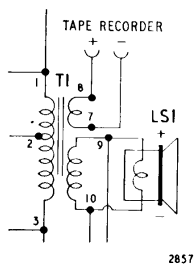


Fig. 1
Tape recorder connections.

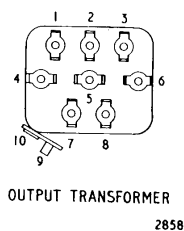


Fig. 2
Output transformer tag layout.

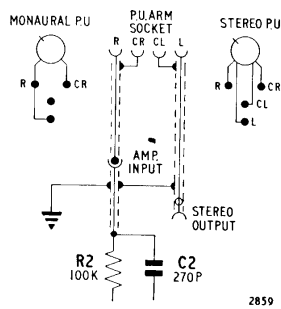


Fig. 3
Four-pin pickup connections.

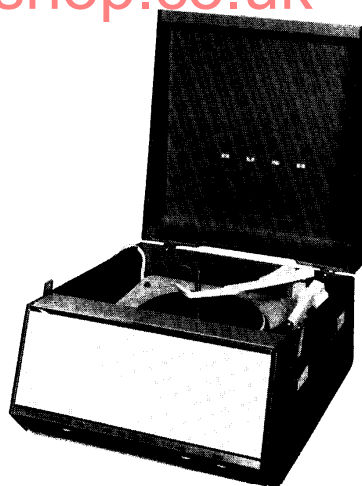
The part number of the modified transformer is CS63423. The d.c. resistance of the primary and secondary is as quoted in the parts list. The tertiary winding has a d.c. resistance of 0.05Ω.

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MODEL SRP.31c 4-SPEED AUTOCHANGER RECORD PLAYER (Supplement to TP1156 for SRP.31)



3223

INTRODUCTION

Model SRP.31c is electrically identical to later models of the SRP.31, the differences being in the cabinet finish and type of changer unit fitted. Earlier models of SRP.31c are fitted with a Garrard type 210 record changer, whilst later models employ the Garrard Autoslim changer. The Service Information contained in TP1156 (Model SRP.31 Service Information) may be applied to Model SRP.31c if the following differences are noted:—

SPECIFICATION (Page 2)

GRAMOPHONE UNIT Add

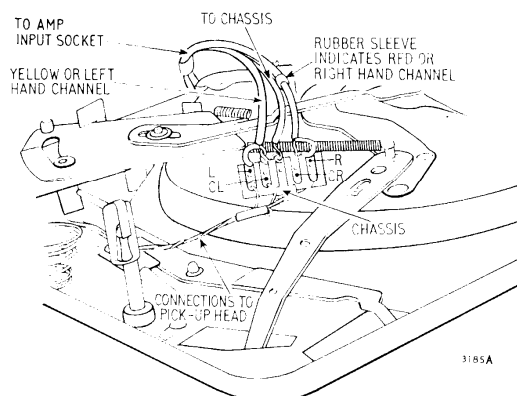
Garrard Autoslim four-speed manual and auto record player unit with type GC8 plug-in dual-stylus pick-up. The auto-changer will accommodate six records which may be mixed in any order provided that they are of the same speed and groove width. No setting for the record size is required, the records are automatically selected by the mechanism. For stereophonic operation the GC8 pick-up should be replaced by a Reuter type STD2 (M6 housing, open front). The stylus pressure will be maintained if the recommended steel counterweight is fitted into the pick-up moulding. The correct stylus pressure for the Reuter STD 2 pick-up is 6-8 grammes.

DISMANTLING

AUTOSLIM RECORD CHANGER—REMOVAL AND REPLACEMENT PROCEDURE

- 1 Lock the pick-up arm to its rest.
- 2 Unscrew the four Phillips screws holding the wooden baseboard to the cabinet and lift baseboard together with the changer clear.
- 3 Unsolder the pick-up leads from the tag strip (see Fig. 1).
- 4 Disconnect the motor supply leads from the terminal block.
- 5 With the two transit screws in the playing position, turn the spring locks on the ends of the transit screws through 90° so that they may be withdrawn through the holes in the baseboard as the changer unit is lifted clear.
- 6 For replacement, reverse the procedure.

Further service and maintenance notes may be found in the Garrard instruction leaflet supplied with each record player.



3185A

Fig. 1 Pick-up connections.

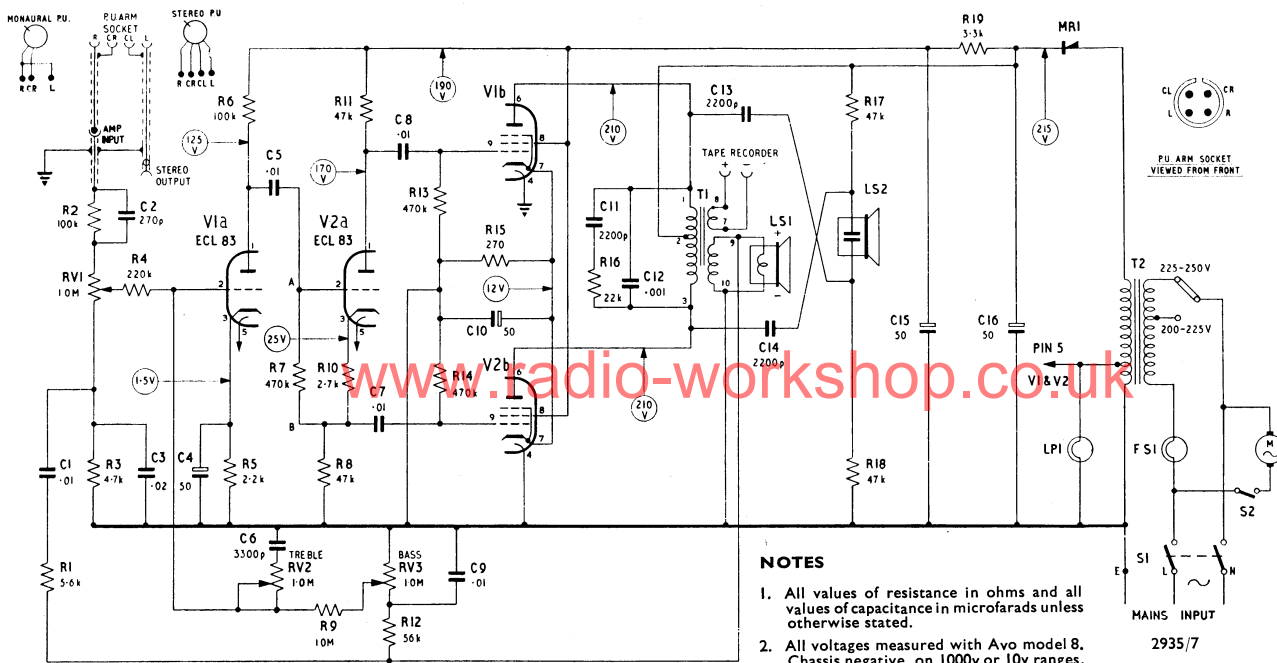


Fig. 2 Circuit diagram.

PARTS LIST

MISCELLANEOUS

Reference	Description	D.C. Resistance (ohms)	Part No.
T1	Output transformer—primary —secondary 1 —secondary 2 (tape)	490 0.45 0.05	CS63423
LS1	Loudspeaker, p.m. elliptical		CP26511

Description

*Cabinet assembly
Carrying handle
Escutcheon
Knob, control
Lampholder, pilot lamp
Motif (Bush)

Part Numbers

FS64680
CP64705
EP64688
AP64720
AP64911
CP64867

*When ordering replacement cabinet assemblies, it is important to mention the type of changer unit for which they are required, i.e. Model 210 or Autoslim.

SPARES AND SERVICE

When ordering replacement components please quote :—

- 1 The model number and serial number of the receiver.
 - 2 The description and part number of the component(s) and the quantity required.
- To avoid delay send orders for replacement parts and requests for technical information to:

THE SERVICE DEPARTMENT



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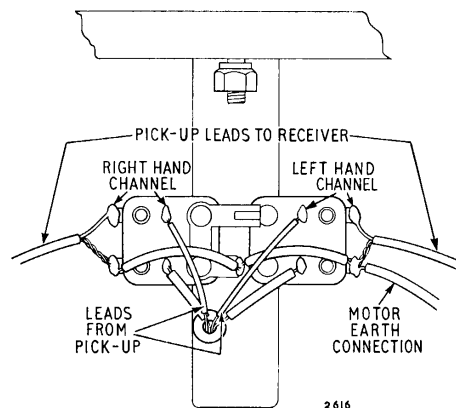
MODELS SRG.80, 81, 82, 83, 85, 86 and SRP.31 and 32

REMOVAL AND REPLACEMENT OF RECORD CHANGER MODEL 210

The following notes have been prepared to assist engineers when servicing the above models which may be fitted with a Garrard record changer Model 210. The Model 210 record changer will play automatically up to 8 records in number. 12 in., 10 in., and smaller records of the same speed and groove width may be played in the same batch provided the discs smaller than 10 in., are placed at the top of the stack. The 10 in., and 12 in., discs may be mixed in any order. The changer may be stopped and started without rejecting the record being played, and independent controls are fitted for manual and automatic operation.

PROCEDURE FOR ALL MODELS EXCEPT SRP.31 AND SRP.32

- 1 Lock the pick-up arm to its rest.
- 2 Remove the right-hand portion of the cabinet back (entire back Models SRG.81, 82).
- 3 Unsolder the pick-up leads from the terminal tags (see Fig. 1).
- 4 Remove the cover of the motor terminal block and disconnect the mains supply lead.
- 5 Remove the three screws which secure the baseplate to the suspension springs and lift out the changer unit.
- 6 For replacement, reverse the procedure.



PROCEDURE FOR SRP.31 AND SRP.32

The above procedure applies, except that operation 2 should read:—

- 2 To lift the turntable unit, unscrew the four Phillips screws holding the wooden baseboard to the cabinet.

This information should be used in conjunction with the appropriate service information for individual models. Further service and maintenance notes may be found in the Garrard instruction leaflet supplied with each record changer.

SPARES AND SERVICE

When ordering replacement components dealers are requested to give the following information.

- 1 Model number and serial number of the receiver.
- 2 Description and part number of component(s) and quantity required.

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LONDON

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www.radio-workshop.co.uk **FAULT LOCATION SHEET**

GARRARD AUTO-SLIM CHANGER USED WITH BUSH MODELS SRG90, SRG91 AND SRP31c.

This fault location sheet has been prepared at the request of dealers who have experienced trouble with the auto-slim unit.

In addition to the faults shown, cases may be met where the lubricant used by Garrard appears to have undergone a chemical change and does not act effectively. This is especially true when the unit is cold.

Relubrication is called for and it is advisable to remove all the old grease as well as any grit or burrs that may be present before regreasing and oiling.

Check finally that the over-arm, pick-up arm and all plates and leavers move smoothly and easily.

1. THE PICK-UP DROPS NORMALLY ON RECORD, BUT ONLY PLAYS ONE GROOVE, AND THEN RETURNS TO THE POST.

The red operating lever remains in "Auto" position, and this is due to a pin on the end of the "Switch lever unit" rubbing on the underside of the motor plate. Bend lever slightly downwards to give clearance between end of pin and motor plate, (see page 12 of Garrard Manual).

2. THE PICK-UP ARM SWINGS TO WITHIN A HALF AN INCH OF THE RECORD SPINDLE, THEN JUMPS BACK AND DROPS INTO THE 7 INCH PLAY POSITION.

Check for lack of grease or burrs on the edge of the slot in the lower casting. If the selector arm pawl remains in a "stuck" position. Scrape off the burrs, and lubricate with grease.

3. THE PICK-UP HEAD SCORING THE UNDERSIDE OF THE NEXT RECORD ON THE SPINDLE, WHEN RETURNING AFTER PREVIOUS PLAY.

The height adjustment screw requires a quarter to half a turn in the anti-clockwise direction to lower the pick-up head.

4. FAILURE OF PICK-UP TO LEAVE THE REST.

This can be due to height adjustment. The height adjusting screw requires a quarter to half a turn in a clockwise direction.

5. AFTER PLAYING A SELECTION OF RECORDS, THE UNIT DOES NOT SWITCH OFF, BUT GOES ON REPEATING THE LAST RECORD AT 7 INCH POSITION.

This can be due to: www.radio-workshop.co.uk

- a) The tension spring on the "automatic switch tail lever" becoming detached from the lever. (This spring may also become detached from the lower casting, and fall into the bottom of the cabinet).
- b) The switch lever tail, may be slightly bent, and not engaging, (see page 12 of Garrard Manual).
- c) Overarm spindle sticks in up position due to burrs on spindle or lack of lubrication. Grease, and ensure that this spindle operates freely.

6. THE UNIT WILL NOT WORK ON AUTO, BUT CAN BE USED ON MANUAL.

The spring No. 31, may become detached from the spring blade. (see page 22 in Garrard Manual).

7. ERRATIC OR WRONG SPEEDS. (INTERMEDIATE WHEEL WORN).

Check and adjust the height of the stepped pulley, tighten the two grub-screws.

8. FAST OR SLOW RUNNING.

Change stepped pulley. This normally has two rings near the grub-screws. Use a three ring type for slower running, and a one ring type for faster running.

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