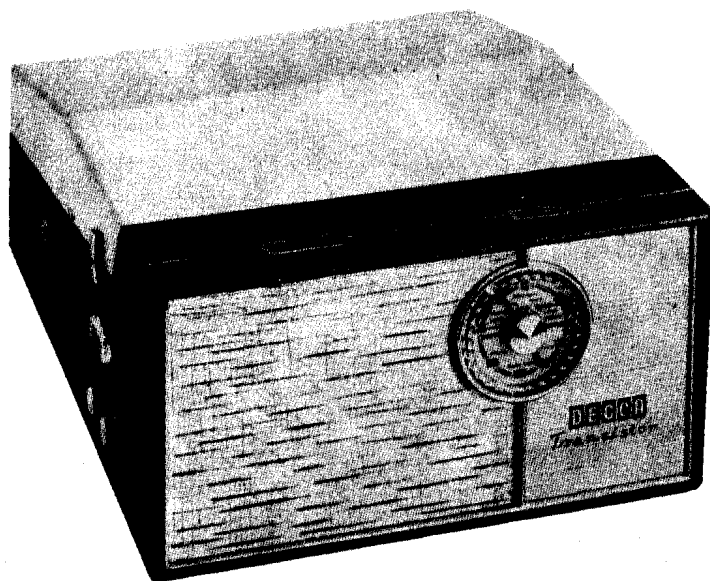


DECCA

SERVICE

NOTES

TRANSISTOR RADIOGRAM
TP./RG.100



DECCA RADIO AND TELEVISION

branch of The Decca Record Co., Ltd.

**INGATE PLACE,
QUEENSTOWN ROAD, LONDON, S.W.8.**

MACaulay 6677

S P E C I F I C A T I O N .

- AERIALS:** Internal aerials for Medium and Long Wavebands. Co-axial socket for connection of external aerials.
- WAVEBANDS:** Medium 190-555 metres.
Long Waves 1140-2000 metres.
Intermediate frequency 472 Kc/s.
- LOUDSPEAKER:** 5" round high flux speaker - 25 ohms.
- MOTOR:** E.M.I. 97900AD
- PICK-UP:** B.S.R. TC8M turnover cartridge.
- SAPPHIRE:** TC8R - red coding for microgroove records
TC8G - green coding for 78rpm records.
- CONTROLS:** Front Controls - Volume, combine On/Off switch and Waveband selector.
Side Controls - Radio/Gram switch, Gram tone.
- TRANSISTORS:**
- | | | |
|-----|--------|--------------------------|
| TR1 | OC44 | Frequency Changer |
| TR2 | OC45 | 1st I.F. Amplifier |
| TR3 | OC45 | 2nd I.F. Amplifier |
| TR4 | OC71 | Gramophone pre-amplifier |
| TR5 | OC81/D | Audio Amplifier |
| TR6 | OC81 | Output |
| TR7 | OC81 | Output |
| MRI | OA70 | Detector. |
- RECOMMENDED BATTERIES:** Ever Ready PP1 6-volt (2 off) for transistors
Ever Ready PP9 9-volt battery for motor.

TRANSISTOR SERVICING.

- 1) Take great care not to scratch or chip the paint covering on glass-cased transistors. If light is admitted, the transistors will act as a photo electric device (i.e. light will modulate the transistor current) and this may produce hum etc.
- 2) When soldering transistor connections, it is essential to use a heat sink (preferably a reasonably sized pair of pliers). If excessive heat is transmitted to the transistors, it could easily cause serious damage and transistors should not be subjected to a temperature above 60°C. It is also important to realize that the electric soldering iron should be earthed, irons often have a very slight leak when hot and the resultant current can often damage a new transistor.
- 3) When replacing transistors, please note that a standard wiring coding has been used in the model TPRG.100.

Green.....Base

White.....Collector

Red.....Emmitter

GENERAL NOTES.

The first stage consists of an OC44 transistor operating in a self oscillator mixing circuit. Coupling to the first I.F. amplifier (OC45) is by a double tuned transformer T1. Another OC45 (TR3) is the second I.F. amplifier, the signal being passed to the detector diode (OA70) via T4.

The A.G.C. line is taken from the junction of R11 and C24 being applied through T1 to the base of the first I.F. amplifier (TR2). The detected signal is applied to the driver transistor (OC81D), the primary of the driver transformer (T5) being in the collector circuit.

Equal and opposite voltages are applied to the base of the push pull output transistors TR6 and TR7. A 25ohm loudspeaker is used, obviating the need for a push pull output transformer.

The negative feedback chain is arranged so that the audio amplifier has a high amplification factor when dealing with a weak signal than with a strong home signal. The chain consists of C32, C30/R27, R18, RV2, C28 and R20, the feedback being thus applied to the base of TR5. With a weak signal the operator will turn RV2 to maximum or near maximum resistance thus decreasing the voltage feedback. The converse applies when the operator adjusts the volume control for a strong signal.

The gramophone pre-amplifier is situated away from the main chassis on the right-hand side of the cabinet (looking from the back) as shown in Fig. 1. The pick-up signal is applied to TR4 by a variable tone control network C25 and RV1. With the Radio/Gram switch in the Gram position, the signal is applied to the volume control (RV2) and thence to the driver valve. The Radio/Gram switch similarly applies HT to TR4 when on Gram operation.

On some models C31 (shown dotted in the circuit diagram) has been added in the base circuits of the output stage. This condenser of either 500 pf. or 1000 pf. has been added to neutralize phase shift effects of T5 when necessary.

CHASSIS REMOVAL.

RADIO CHASSIS.

- 1) Gently prise off plastic tuning knob.
- 2) Prise off boss and tuning pointer with tweezers or pliers.
- 3) Having removed motor board and sloping panel, remove the two hexagonal 2BA nuts from the radio chassis.
- 4) After the leads have been disconnected, the chassis can then be withdrawn from the cabinet.

NOTE: The radio chassis can be used without the gramophone pre-amplifier for test purposes if the connection lead terminated in the octal plug is turned round and plugged into the radio octal socket.

GRAMOPHONE PRE-AMPLIFIER CHASSIS.

This is easily removed by removing the wood screw securing it to the chassis.

TRANSISTOR ALIGNMENT INSTRUCTIONS.

Readings taken with meter across loudspeaker coil on low A.C. range.

I.F. ALIGNMENT.

Set signal generator to 472 kc/s.

Turn main tuning condenser until gang is closed.

Switch to medium waveband.

Connect signal generator across medium wave coil (L1)

Feed in modulated signal to give low output indication.

Peak top and bottom cores T1 and T3 for maximum output. Peak T4 (one core only) for maximum output.

Adjust generator level whenever necessary.

Repeat above operation.

R.F. ALIGNMENT.

Medium Wave.

Tune receiver to 460 metres.

Set signal generator to 652 kc/s.

Feed Signal into aerial sockets via 1K resistor.

Adjust oscillator coil T2 for maximum output.

Adjust L1 for maximum output.

Tune receiver to 230 metres.

Re-set generator to 1300 kc/s and adjust oscillator trimmer C11 for maximum output.

Adjust aerial trimmer C2 for maximum output.

Repeat above operation.

Long Wave.

Tune receiver to 1750 metres.

Set signal generator to 170 kc/s.

Feed signal into aerial sockets via 1K resistor.

Adjust oscillator trimmer C12 for maximum output. (There may be a degree of oscillator pulling when tuning C12, care should be taken to adjust L2 and C12 for maximum signal at the correct tracking point).

Re-tune receiver to 1250 metres.

Feed in signal at 240 kc/s.

Adjust C4 for maximum output.

Repeat above operation.

MAIN PARTS LIST.

QUANTITY	CIR. REF.	DESCRIPTION	PART NO.
1	T1	1st I.F. Transformer	56531
1	T2	Oscillator Transformer Coil Pack	56530
1	T3	2nd I.F. Transformer	56532
1	T4	3rd I.F. Transformer	56533
1	T5	Driver Transformer	56529
1	C1A C1B	Main Tuning Condenser	58058
1	S1A/B/C/D/E	Main Switch Assembly	59790
1	L1/2	Aerial Rod Assembly	56562
1	RV2	5K Potentiometer	59750
1	RV1	10K Potentiometer	59782
1		Wave Change Control Escutcheon	51975
1		Volume Control Escutcheon	51976
1		Wave Change Control Knob	59753
1		Volume Control Knob	59753
1		Tuning Knob	55875
1		Tuning Scale	59803
1		Pointer Boss	55871
1		Tuning Pointer	51861
1		Main Front Escutcheon	55938
1		25 ohm Loudspeaker	Plessy CPL3006/09
1		Complete Gramophone Pre-amplifier	55930/CA
1		Tone Control Knob	55939
1		Control Knob Radio/Gram	55939
1		Pre-amplifier Control Escutcheon	59875

RESISTORS.

CIR. REF.	VALUE	WATTAGE	TOLERANCE	LOCATION.
R1	47K	$\frac{1}{4}$ W	10%	A1
R2	10K	$\frac{1}{4}$ W	10%	A1
R3	390	$\frac{1}{4}$ W	10%	B1
R4	3.3K	$\frac{1}{4}$ W	10%	B1
R5	75K	$\frac{1}{4}$ W	10%	B1
R6	6.8K	$\frac{1}{4}$ W	10%	C1
R7	1K	$\frac{1}{4}$ W	10%	C1
R8	12K	$\frac{1}{4}$ W	10%	B1
R9	3.3K	$\frac{1}{4}$ W	10%	C2
R10	1.8K	$\frac{1}{4}$ W	10%	C1
R11	390	$\frac{1}{4}$ W	10%	C2
R12	820K	$\frac{1}{4}$ W	10%	Pre-amp
R13	18K	$\frac{1}{4}$ W	10%	Pre-amp
R14	82K	$\frac{1}{4}$ W	10%	Pre-amp
R15	5.6K	$\frac{1}{4}$ W	10%	Pre-amp
R16	1.5K	$\frac{1}{4}$ W	10%	Pre-amp
R17	470	$\frac{1}{4}$ W	10%	A4
R18	6.8	$\frac{1}{4}$ W	10%	A4

RESISTORS Contd.

R19	56K	$\frac{1}{4}$ W	10%	A4
R20	18K	$\frac{1}{4}$ W	10%	A4
R21	1.8K	$\frac{1}{4}$ W	10%	B4
R22	470	$\frac{1}{4}$ W	10%	A4
R23	2.2K	$\frac{1}{4}$ W	10%	B4
R24	68	$\frac{1}{4}$ W	10%	B4
R25	2.2K	$\frac{1}{4}$ W	10%	B4
R26	68	$\frac{1}{4}$ W	10%	B4
R27	330	$\frac{1}{4}$ W	10%	A4
R28	2.2	$\frac{1}{4}$ W	10%	B4
R29	2.2	$\frac{1}{4}$ W	10%	B4

CONDENSERS.

CIR. REF.	VALUE	VOLTAGE WORKING	TOLERANCE	PART NO.	LOCATION
C1 A.B.	500pf.	-	-	58058	B1
C2	3/30pf.	-	-	58060	A2
C3	30pf.	-	$\pm 5\%$	-	A3
C4 See C2.	-	-	-	-	-
C5	.25mfd	150v.	-	W.48	A1
C6	.05mfd.	15v.	-	Hunts W99	A1
C7	-	-	-	-	-
C8	.01mfd	12v.	-	Daly FS/49/2	
C9	101mfd.	150v	-	Hunts W99	B1
C10	-	-	-	-	Inside T1
C11	3/30pf.	-	-	58060	A2
C12 See C11	-	-	-	-	-
C13	220pf.	-	$\pm 5\%$	LEM1510E	A2
C14	10mfd.	12v.	-	-	B1
C15	4pf.	-	$\pm \frac{1}{2}\%$	LEM1106R	C1
C16	-	-	-	-	Inside T3
C17	-	-	-	-	Inside T3
C18	10mfd.	12v.	-	-	C1
C19	.0f mfd.	150v.	-	Hunts W99	C1
C20	-	-	-	-	Inside T4
C21	20pf.	-	$\pm 2\%$	LEM1106R	C2
C22	10mfd.	12v.	-	-	C1
C23	.01mfd.	150v.	-	Hunts W99	C2
C24	.01mfd	150v.	-	Hunts W99	C2
C25	.1mfd	150v.	-	Hunts A300	Pre-amp
C26	10mfd.	12v.	-	Daly R552	Pre-amp
C27	100mfd.	12v.	-	Daly FS/49/2	Pre-amp
C28	10mfd.	12v.	-	-	A4
C29	100mfd.	12v.	-	Daly FS/49/2	B4
C30	.01mfd.	400v.	-	Hunts W99	A4
C31	See General Notes	-	-	-	-
C32	100mfd	6v.	-	-	A4

VOLTAGE READING CHARTS			
Chart 1 Radio.			
TRANSISTOR	EMITTER (Red)	BASE (Green)	COLLECTOR (White)
TR 1	1.0	1.2	7.9
TR 2	0.9	1.0	8.0
TR 3	1.2	1.3	9.0
TR 4	NOT IN CIRCUIT		
TR 5	1.3	1.4	11.5
TR 6	6.0	6.2	12.3
TR 7	Very low	0.2	6.0

Chart 2 Gram.			
TRANSISTOR	EMITTER (Red)	BASE (Green)	COLLECTOR (White)
TR 1	1.0	1.1	7.1
TR 2	0.8	1.0	7.2
TR 3	1.0	1.2	7.8
TR 4	0.9	1.0	3.0
TR 5	1.2	1.3	11.5
TR 6	6.0	6.2	12.0
TR 7	Very low	0.2	6.0

1. Chart 1. readings are taken with radiogram switch in 'Radio' position; Chart 2 with switch in 'Gram' position.
2. Readings taken with Avo model 8 on 10 volt range with obvious exceptions. Positive lead connected to chassis.
3. Both sets of readings taken with Volume Control at zero and tuning condenser with gang fully closed.

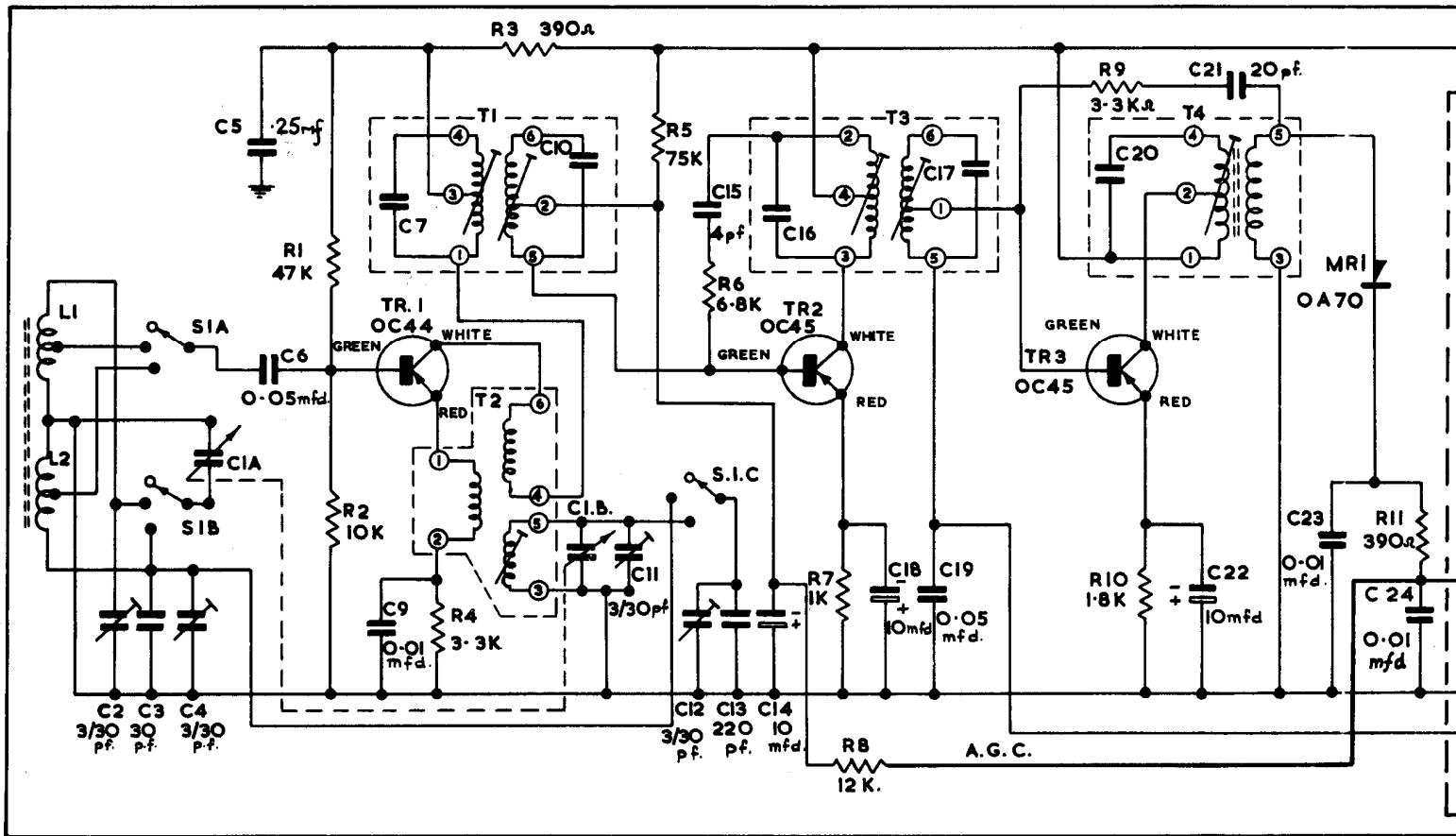


Fig. 3

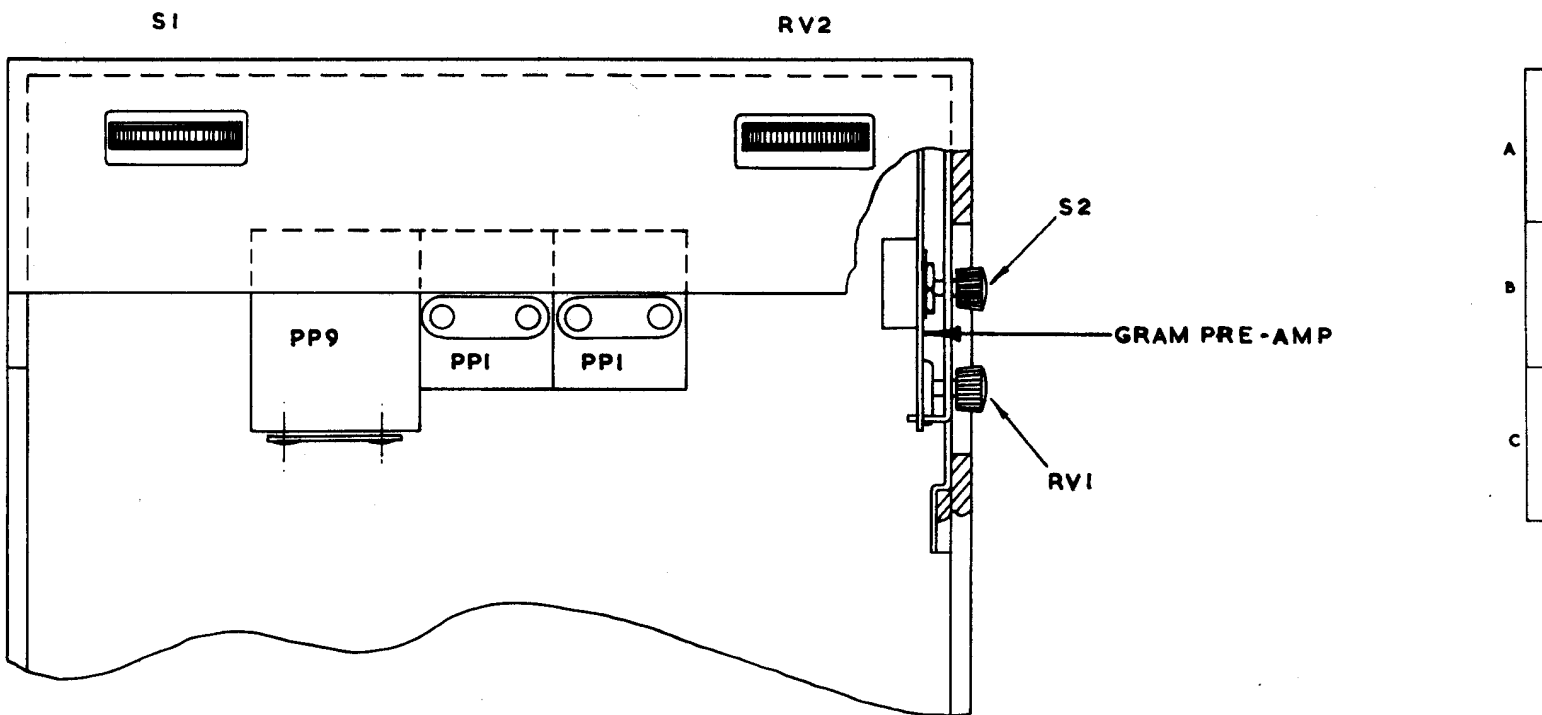


Fig. 1

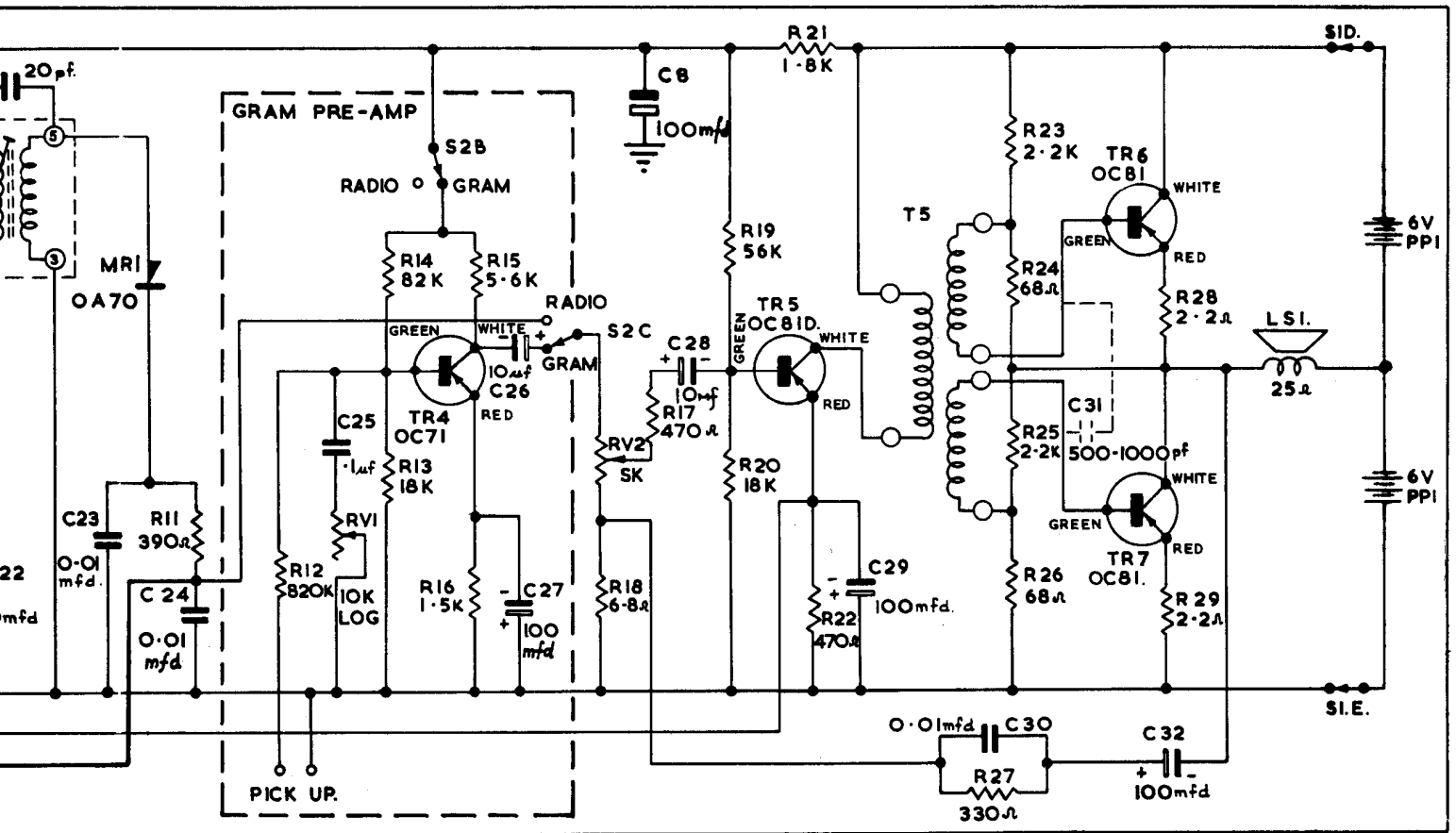


Fig. 3

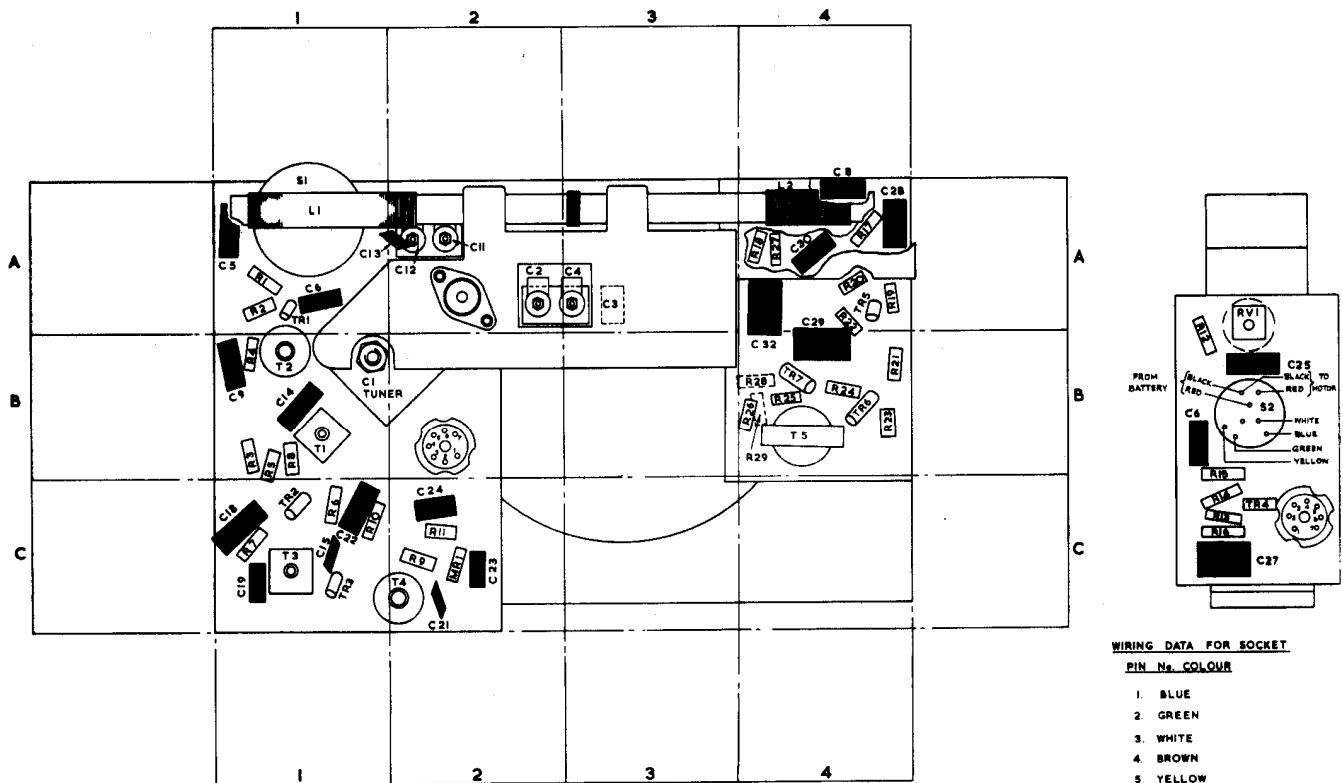


Fig. 2