

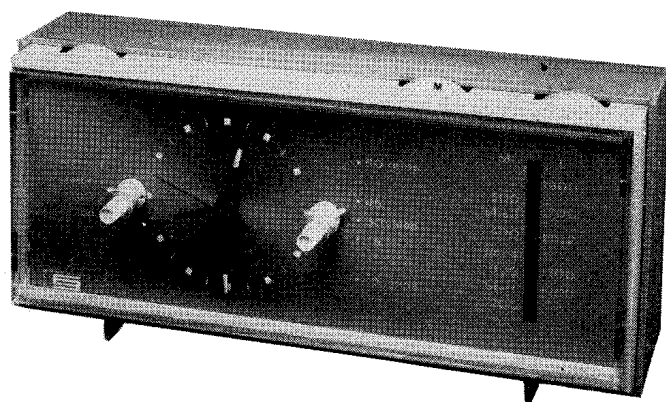
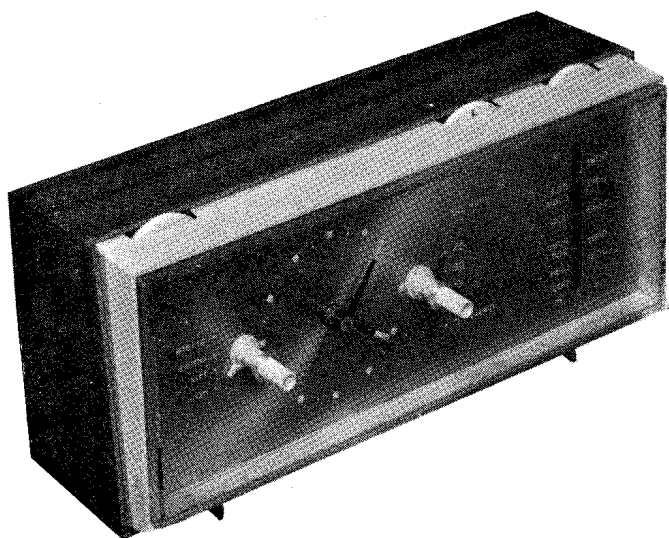
RADIO

SERVICE INFORMATION FOR THE

PHILIPS **Stella**
CLOCK RADIOS

1BRS273

ST4503



ces ▶

COMBINED ELECTRONIC SERVICES LIMITED

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Telex 262308

NOVEMBER, 1969

(Please quote CES 757 when ordering further copies)

CES 757

INTRODUCTION

The 13RS273 and ST4503 are compact, mains operated clock radios featuring a radio/buzzer alarm, the radio being switched on first, the buzzer sounding approximately 10 minutes later. Also featured is an automatic 'sleep control' which can be set to switch off the radio at a pre-determined time of up to 60 minutes. The radio consists of a micro-technique chassis employing 6 transistors, two diodes and a rectifier in a very sensitive circuit, to provide excellent reception on the long and medium wavebands.

SPECIFICATION

Semi-conductors

	Type	Function
T1	AF117	Mixer/oscillator
T2	AF117	1st I.F. amplifier
T3	AF117	2nd I.F. amplifier
T4	OC81 or AC128	A.F. driver
T5-T6	OC81 or AC128	Push-pull output
X1	OA70	Detector and A.G.C. diode
X2	OAZ202	Zener stabilizing diode
MR1	S.T.C.—S7	Rectifier
Mains voltage		200-240 volts a.c. 50Hz
Consumption		4 watts (40mA including clock)
Waveband ranges		M.W. 185-571 metres (1622-525kHz) L.W. 1175-2000 metres (225-150kHz)
Power output		200mW
Intermediate frequency		470kHz
Loudspeaker		3" circular, 8Ω impedance
Dimensions		Width 9 $\frac{7}{8}$ "; Height 4 $\frac{9}{16}$ "; Depth 4 $\frac{1}{4}$ ".
Weight		2 $\frac{1}{2}$ lb.

Cabinet presentation

13RS273/00X

Blue and white moulded cabinet, pale blue scale and white knobs.

13RS273/00S

Printed woodgrain finish, white front moulding, champagne coloured scale and white knobs.

ST4503

Grey and white moulded cabinet, grey scale and white knobs.

DISMANTLING

(a) Removing the cabinet rear

Place the receiver face downwards on a soft protected surface, then remove the two retaining screws from the rear of the cabinet, which can be carefully lifted away to the extent of the loudspeaker connecting leads. To detach the rear section completely, the loudspeaker leads must be disconnected. The component side of the printed panel, the power supply and the clock assembly are then readily accessible.

(b) Releasing the printed panel

Release the three panel securing screws, two at the top adjacent to the ferrite rod and one at the bottom of the paxolin panel. The panel and ferrite rod assembly can now be lifted from the front moulding, giving access to the print side of the panel and the drive cord assembly.

(c) Releasing the power supply panel

Remove the three retaining screws, one at the top adjacent to the volume control and two at the bottom near the mains transformer. The metal panel now can be lifted from the front panel.

(d) Releasing the clock unit

Release the printed and power supply panels, as described above

in paras. (b) and (c). Swivel the four spire clips (one in each corner of the front moulding) through 90° and lift off the perspex facia. With the alarm set control, set all the clock hands to 12 o'clock, then remove the sweep, minute, hour and alarm hands, in that order, from their respective spindles (reverse order for re-assembly). Remove the control knob pointers and detach the silver clockface. (Do not attempt to remove the control knobs before removing the clock unit from the front moulding). Prise off the four circular spire clips and remove the rubber washers holding the clock unit to the front moulding. Disconnect the four leads to the clock unit, two to the motor and two to the switch (see Fig. 4), after which the unit can be removed.

For re-assembly proceed in the reverse order. When replacing the perspex facia, rotate the four spire clips into their original positions, then push the facia onto the front moulding so that it clicks into place.

CLOCK ADJUSTMENTS

When a replacement clock unit is fitted, or the hands of the existing unit are removed, to ensure that the alarm will operate at the correct time (i.e. radio will operate approximately 10 minutes before the time shown by the alarm hand), the following setting up procedure should be carried out.

- With the clock unit viewed from the bottom (vibrator reed furthest), observe that the cam faces on the two large gear wheels nearest the clockface are not co-incident. If they are co-incident push in and turn the alarm set control, on the back of the receiver, to separate them.
- Turn the sleep control knob fully clockwise to the 'OFF' position.
- Turn the function control knob fully anti-clockwise to the 'ON' position, then fully clockwise to the 'Alarm' position.
- Push in and SLOWLY turn the alarm set control at the rear of the receiver so that the alarm hand spindle (outer, largest) turns in an anti-clockwise direction. The mechanism will produce two audible clicks; the first will be the radio operating switch closing and the second, the alarm reed releasing. Immediately the second click is heard, stop turning the alarm set control and affix the hands to their respective spindles in the following order at the 12 o'clock position:—alarm, hour, minute and sweep. Check for adequate clearance between adjacent hands and between the clockface and perspex facia.

IMPORTANT SAFETY PRECAUTION: Due to the poisonous nature of the luminous paint on the clock hands it is essential that, after touching them, the engineer should wash his own hands.

REPLACING THE DRIVE CORD

Note: Tweezers or small pliers will greatly assist this operation. Detach the old cord and pointer and make up and fit the new cord as shown in Fig. 2. With the chassis viewed from the print side of the panel and the ferrite rod assembly to the front, turn the gang to minimum capacity (drive drum fully anticlockwise). Anchor the cord around the post on the drive drum and under one leg of the tension spring. Lead the cord out through the drum aperture, anticlockwise round the outside of the drum to the tuning spindle and wind on 2 $\frac{1}{2}$ turns clockwise, winding from bottom to top. Take the cord up to and clockwise round support pillar A, anti-clockwise around the drive drum and back through the aperture in the drum rim. Compress the tension spring and anchor the cord loop on to the "V" in the other leg of the tension spring.

Pointer setting

Turn the drum to its fully clockwise position (tuning knob fully anticlockwise). Attach the pointer to the cord and align it with the notch in the scale backing plate, adjacent to the tuning knob.

TRIMMING INSTRUCTIONS

General

(a) Output should be observed on an output meter set for 8Ω load impedance; trimming level 50mW. Alternatively, an a.c. voltmeter (2.5V range) with an 8Ω resistor in parallel may be used; trimming level 0.75V. In either case the loudspeaker should be disconnected and the output meter/voltmeter and resistor connected in its place. Set volume control to maximum.

(b) When trimming the aerial circuits, the generator should be loosely coupled to the receiver. A suitable coupling may be made by looping a single turn of wire, approximately 12" long, around the receiver and connecting the ends of the loop to a low impedance output from the generator.

I.F. trimming

1. Switch to M.W. and turn the gang to minimum capacity (tuning knob fully clockwise).
2. Apply a signal of 470kHz to the trimming point provided (see Fig. 4) via a 470kpF capacitor.
3. Trim L10, L8 and L6 in that order for maximum output.

Oscillator trimming

1. Connect the generator to the trimming point provided (see Fig. 4) via a 470kpF capacitor.
2. Switch to L.W. and turn the gang to maximum capacity (tuning control fully anticlockwise).
3. Apply a signal of 148kHz and trim L4 for maximum output.
4. Switch to M.W. and turn the gang to minimum capacity (tuning knob fully clockwise).
5. Apply as signal of 1630kHz and trim C27 for maximum output.
6. Repeat as necessary.

Aerial trimming

1. Connect the generator to the coupling loop.

2. Switch to L.W., apply a signal of 190kHz and tune the receiver to this frequency.
3. Adjust position of L3/L14 for maximum output.
4. Switch to M.W., apply a signal of 525kHz and tune the receiver to this frequency.
5. Adjust position of L1/L2 for maximum output.
6. Apply a signal of 1300kHz and tune the receiver to this frequency.
7. Trim C28 for maximum output.
8. Repeat as necessary.

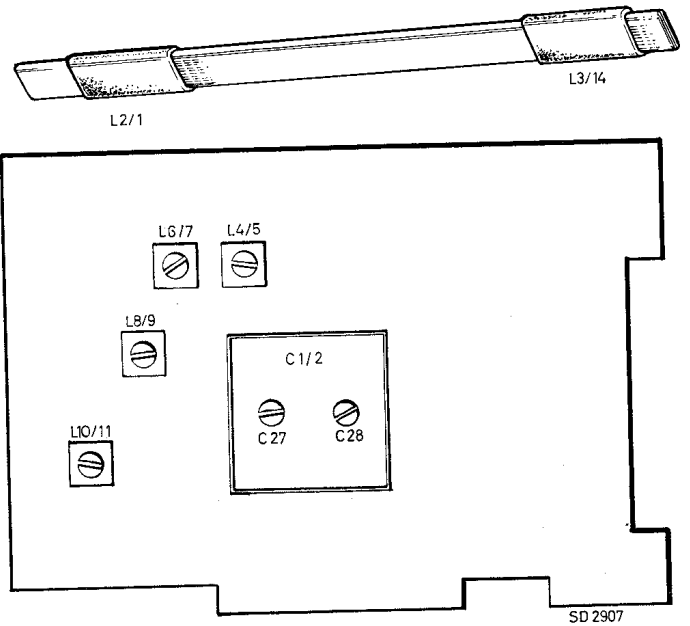


Fig. 1 Trim plan

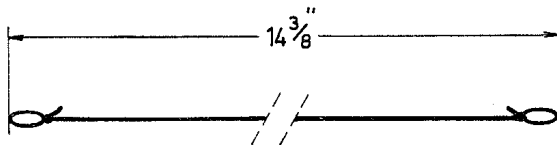
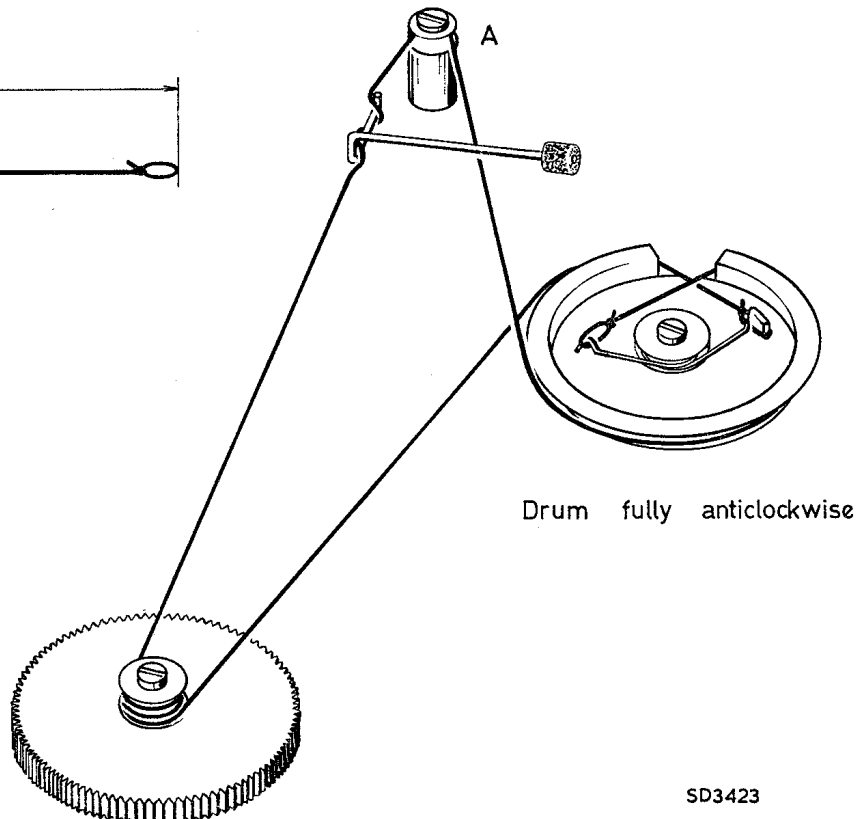
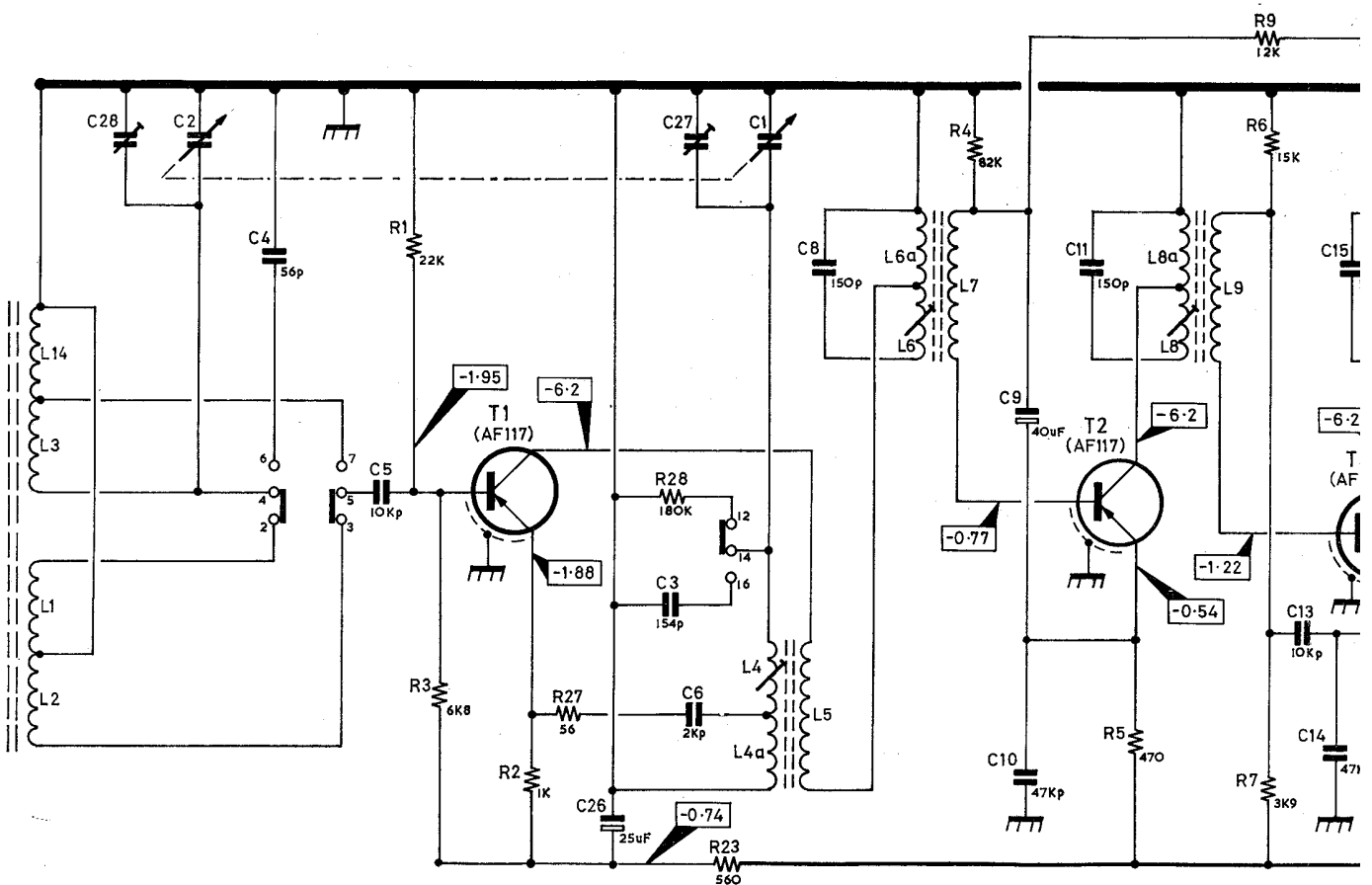


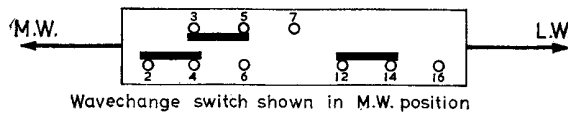
Fig. 2 Drive cord



L	14, 3, 12.																4, 4a.	5.		6a, 6.	7.			8a, 8.	9.			
C		28.	2.	4.	5.				26.	3.	6.	27.	1.	8.									9.	11.		13.	14.	
R					1.	3.	2.	27.	28.	23.					4.								5.	9.	6.	7.		
Misc																											T1.	T2.

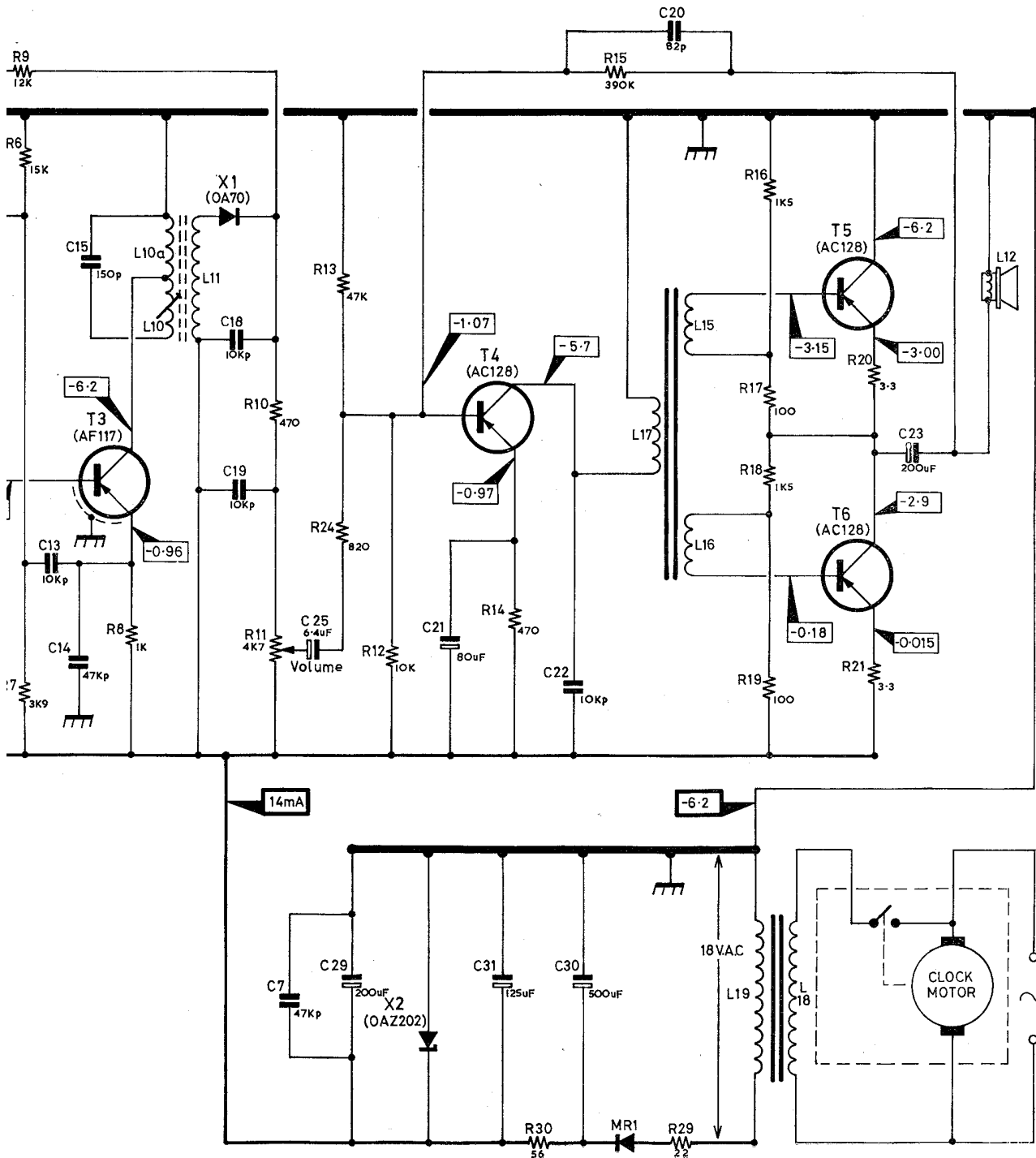


COIL RESISTANCES			
L1	4Ω	L9	<1Ω
L2	<1Ω	L10	9Ω
L3	19Ω	L10a	3.3Ω
L4	4.8Ω	L11	1.8Ω
L4a	<1Ω	L12	8Ω
L5	<1Ω	L14	3Ω
L6	8Ω	L15	60Ω
L6a	2.1Ω	L16	60Ω
L7	<1Ω	L17	250Ω
L8	7.5Ω	L18	1500Ω
L8a	2.4Ω	L19	34Ω



All voltages taken with respect to +ve line (junction R30/C31/X2) using 100KΩ/V meter. Mains input 240 V.A.C. No signal input.

10a.	11.	17.	15.	19.	18.	12.	L											
13.	14.	18.	19.	7.	25.	29.	21.	31.	22.	30.	20.	23.	C					
9.	6.	7.	8.	10.	11.	13.	24.	12.	14.	30.	15.	16.	17.	18.	19.	20.	21.	R
T3.	X1.	X2.	T4.	MR1.	T5.	T6.	MISC											



5D3422

L	D	1	C ^A 2	B		17	16	15	3	14		12		19	18	20	L			
C	18	10	14	13	9	27	6	28	22	26	20	5	3	4	23	29	31	30	C	
R	5	8	9	4	6	7	13	14	21	1	27	3	2	23	28	16	17	20	11	R
	10			24	7	12	14		21	1	3		15		18	19		29	30	

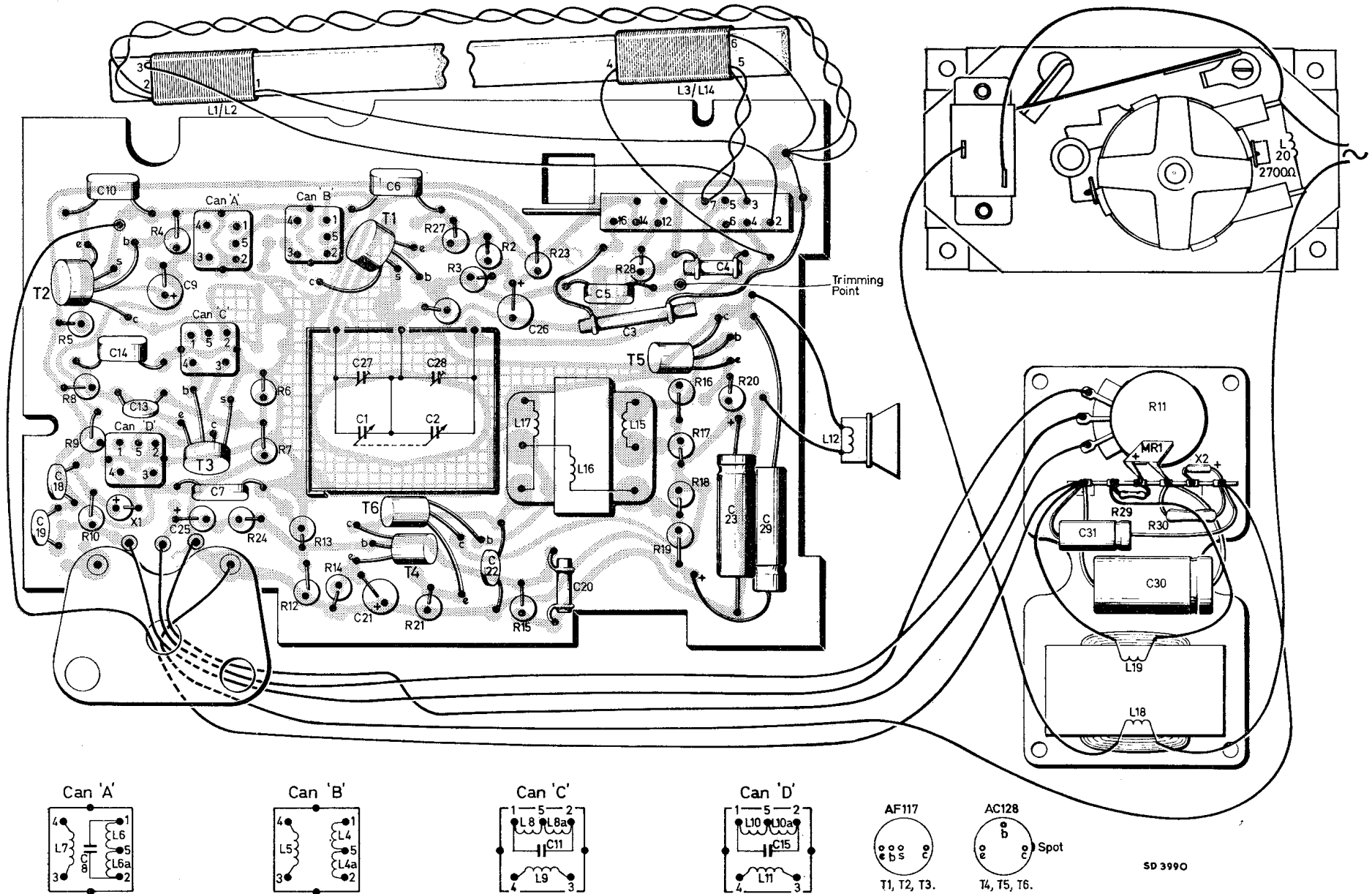
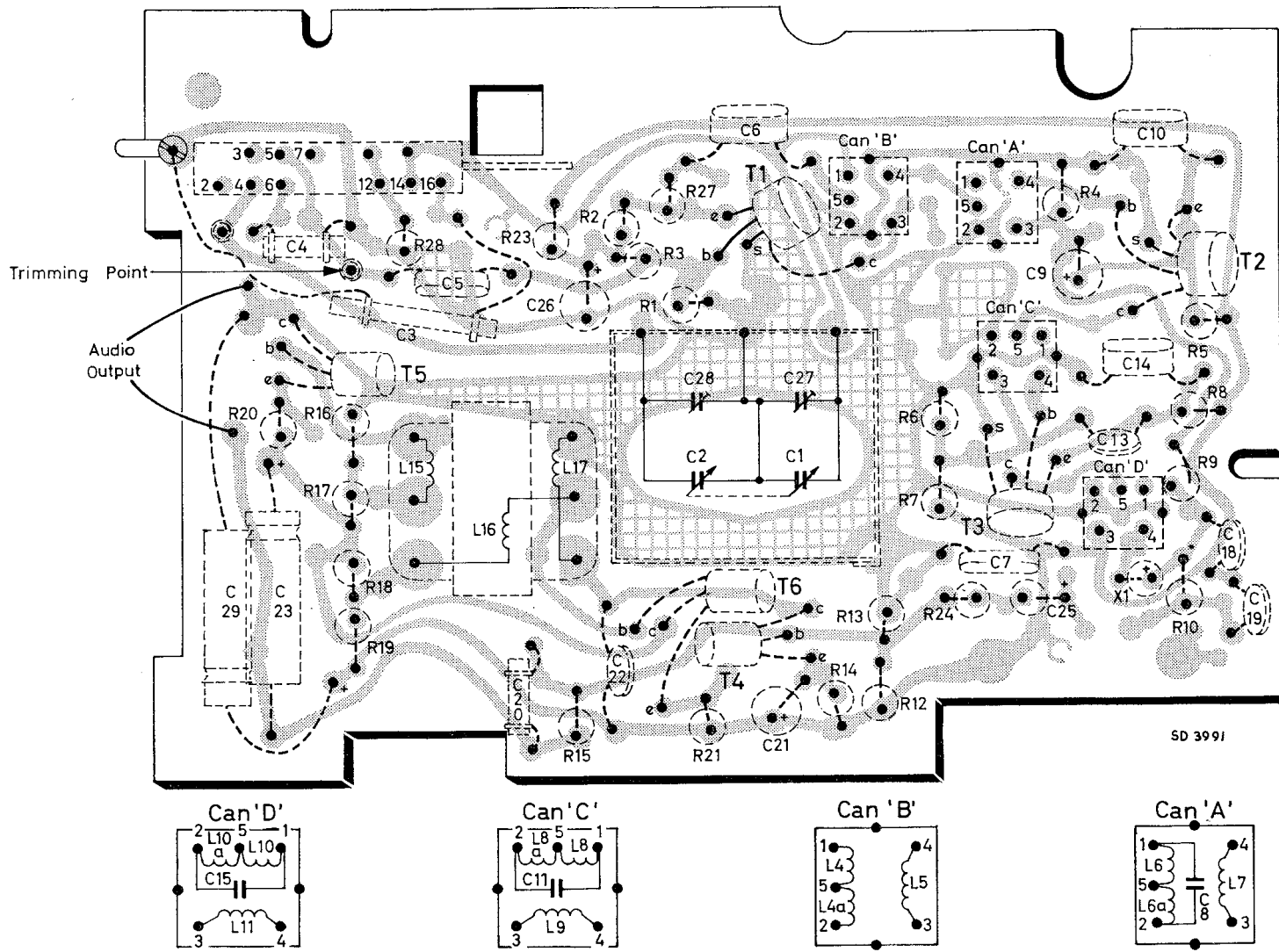


Fig. 4 Printed panel and wiring diagram

SD 3990

L				15		16		17				B		A	C			D					L												
C			29	23	4		3	5			20	26	22	28	2	6	27	1	21				7	25	9	13	14	10	18	19		C			
R				20		17	16		28			23		2	3	27	1		21				14	13	6	7	24		4		9	8	5		R



SD 3991

Fig. 5 Printed panel—print view

SPARE PARTS LIST

SUPPLY OF SPARE PARTS: To ensure correct interpretation of requirements please include the following information on orders for spare parts.

1. The full type number recorded on the type number plate, including any suffix. **Do not use the commercial abbreviation which may be misleading.**
2. Whenever possible, quote the serial number of the receiver. In some models the components have been changed during production.
3. **Always give a brief description** and colour where applicable.
Quote part number.

It is necessary to return components, always include full identification on the accompanying advice note.

Item No.	DESCRIPTION	Part No.	Value	Type	Notes
CABINET ASSEMBLY					
1	Bush retaining item 4 (4) ...	3113.104.04670		T1 ...	AF117
2	Bush retaining item 3 (4) ...	3113.104.04680		T2 ...	AF117
3	Clock unit ...	3113.108.52170		T3 ...	AF117
4	Cover front clear plastic (13RS273) ...	3113.108.11180		T4 ...	AC128
4	Cover front clear plastic (ST4503) ...	426.57001		T5 ...	AC128
5	Clips for item 3 and speaker (12) ...	3113.101.01080		T6 ...	AC128
6	Clip for item 3 ...	3113.101.01070		X1 ...	OA70
7	Front moulding ...	3113.104.04580		X2 ...	OA2202
8	Hand—alarm ...	3113.105.11430		or X2 ...	BZY.88/C6V2
9	Hand—hour ...	3113.105.11440		MRI Rectifier ...	3113.100.50170
10	Hand—minute ...	3113.105.11450			
11	Hand—second ...	3113.105.11460			
11a	Label warning ...	3113.106.03880			
12	Nut for item 13 (2) ...	MK.927.44			
13	Rear moulding wood grain (13RS273/00S) ...	426.27001			
13	Rear moulding blue (13RS273/00X) ...	426.27002			
13	Rear moulding grey (ST4503) ...	425.27001			
14	Station scale blue (13RS273/00X) ...	333.47001			
14	Station scale champagne (13RS273/00S) ...				
14	Station scale grey (ST4503) ...	333.47002			
15	Screw for item 13 3 x 30mm. (2) ...	B054.ED/3 x 30			
17	Washer plastic for item 3 and speaker (18) ...	3113.104.04730			
CONTROL KNOBS					
25	Clock control (2) ...	3113.104.04700			
26	Clip for item 31 ...	MK.752.00			
27	Handset ...	3113.104.04710			
28a	Pointer for item 25 (2) ...	3113.104.04770			
29	Screw for item 32 2.6 x 4mm. ...	B054.ED/2.6 x 4			
30	Tuning ...	3113.104.04640			
31	Volume ...	3113.108.11130			
32	Waveband ...	3113.104.04630			
33	Washer for item 32 4mm. ...	B064.AF/4			
34	Washer for item 32—special ...	3113.101.23640			
35	Washer for item 25 (2) 3mm. ...	B064.AA/3			
MAIN CHASSIS					
40	Bracket plastic for rod aerial ...	3113.104.04660			
41	Clip for item 40 ...	3113.101.00540			
42	Cord for drive ...	K299.ZZ/938			
43	Drum for drive ...	3113.104.04610			
44	Lead mains input—2 yds. ...	0713.181.00012			
45	Label type ...	A3.596.50			
46	Label handset ...	3113.106.03140			
47	Lever waveband plastic ...	3113.104.04620			
48	Plate chassis retaining ...	3113.108.11100			
49	Plate and spindle assy. large ...	3113.108.11080			
50	Plate and spindle assy. small ...	3113.108.11090			
51	Plate insulating clock ...	3113.103.21260			
52	Plate mtg. power unit ...	3113.101.23660			
53	Pointer ...	3113.108.11110			
53a	Ring for speaker ...	3113.100.40370			
54	Printed panel ...	3113.108.11070			
55	Spring for item 42 ...	3113.101.01040			
56	Spring retaining item 44 ...	3113.101.00080			
57	Rivet for item 50/56/61 (5) ...	B014.TD/11IN x 1/8			
58	Rivet for item 49 (2) ...	B002.AF/2 x 0.3 x 3			
58a	Switch—waveband ...	MK.996.46			
59	Screw for item 34/48 2.6 x 8mm. (3) ...	999/2.6 x 8			
60	Screw for chassis and power unit ...	B070.AD/5N x 3/8			
61	Tag strip on power unit ...	3113.108.70760			
62	Washer for item 43 ...	3113.101.23640			
63	Clamp for mains lead ...	3113.104.05790			
COILS AND TRANSFORMERS					
L1-3-14	Ferrite rod aerial ...	3113.108.22520			
L4/5	Osc. coil ...	A3.192.55			
L6/7	1st I.F. transformer ...	MK.571.05			
L8/9	2nd I.F. transformer ...	MK.571.06			
L10/11	3rd I.F. transformer ...	MK.571.07			
L12	Loudspeaker ...	940/AD23195Y			
L15/17	Driver transformer ...	MK.516.62			
L18/19	Mains transformer ...	3113.108.30280			
SEMI-CONDUCTORS					
R1		22,000	Value Ω		B8.305.04A/22K
R2		1,000			B8.305.04A/1K
R3		6,800			B8.305.04A/6K8
R4		82,000			B8.305.04A/82K
R5		470			B8.305.04A/470E
R6		15,000			B8.305.04A/15K
R7		3,900			B8.305.04A/3K9
R8		1,000			B8.305.04A/1K
R9		12,000			B8.305.04A/12K
R10		470			B8.305.04A/470E
R11	Volume	4,700			2322 350 90122
R12		10,000			902/A10K
R13		47,000			B8.305.04A/47K
R14		470			902/A470E
R15		0.39M			B8.305.82A/390K
R16		1,500			B8.305.04B/1K5
R17		100			B8.305.04B/100E
R18		1,500			B8.305.04B/1K5
R19		100			B8.305.04B/100E
R20		3.3			B8.305.82A/3E3
R21		3.3			B8.305.82A/3E3
R23		560			B8.305.04A/560E
R24		820			B8.305.04A/820E
R27		56			B8.305.04A/56E
R28		0.18M			B8.305.04A/180K
R29		22			902/AA22E
R30		56 when X2 is OAZ202			902/56E
or R30		82 when X2 is BZY88			43.426.05/82E
RESISTORS					
C1/27	Type	Value pF			
C2/28	Gang				125.20012
C3	Ceramic	154			C304.GB/D154E
C4	Ceramic	56			C304.GH/C56E
C5	Foil	10,000			C280.AA/P10K
C6	Foil	2,000			MK.199.26
C7	Foil	47,000			B1.532.31
C8		150			In L6/7
C9	Foil	40uF			C426.AR/A40
C10	Foil	47,000			B1.532.31
C11		150			In L8/9
C13	Ceramic	10,000			MK.207.10
C14	Foil	47,000			B1.532.31
C15		150			In L10/11
C18	Ceramic	10,000			MK.207.10
C19	Ceramic	10,000			MK.207.10
C20	Ceramic	82			C304.GH/A82E
C21	Elco	80uF			C426.AR/A80
C22	Ceramic	10,000			MK.207.10
C23	Elco	200uF			C426.AR/C200
C25	Elco	6.4uF			C426.AS/C6.4
C26	Elco	25uF			C426.AR/C25
C29	Elco	200uF			C426.AR/C200
C30	Elco	500uF			3113.100.50180
C31	Elco	125uF			C426.AR/EI25