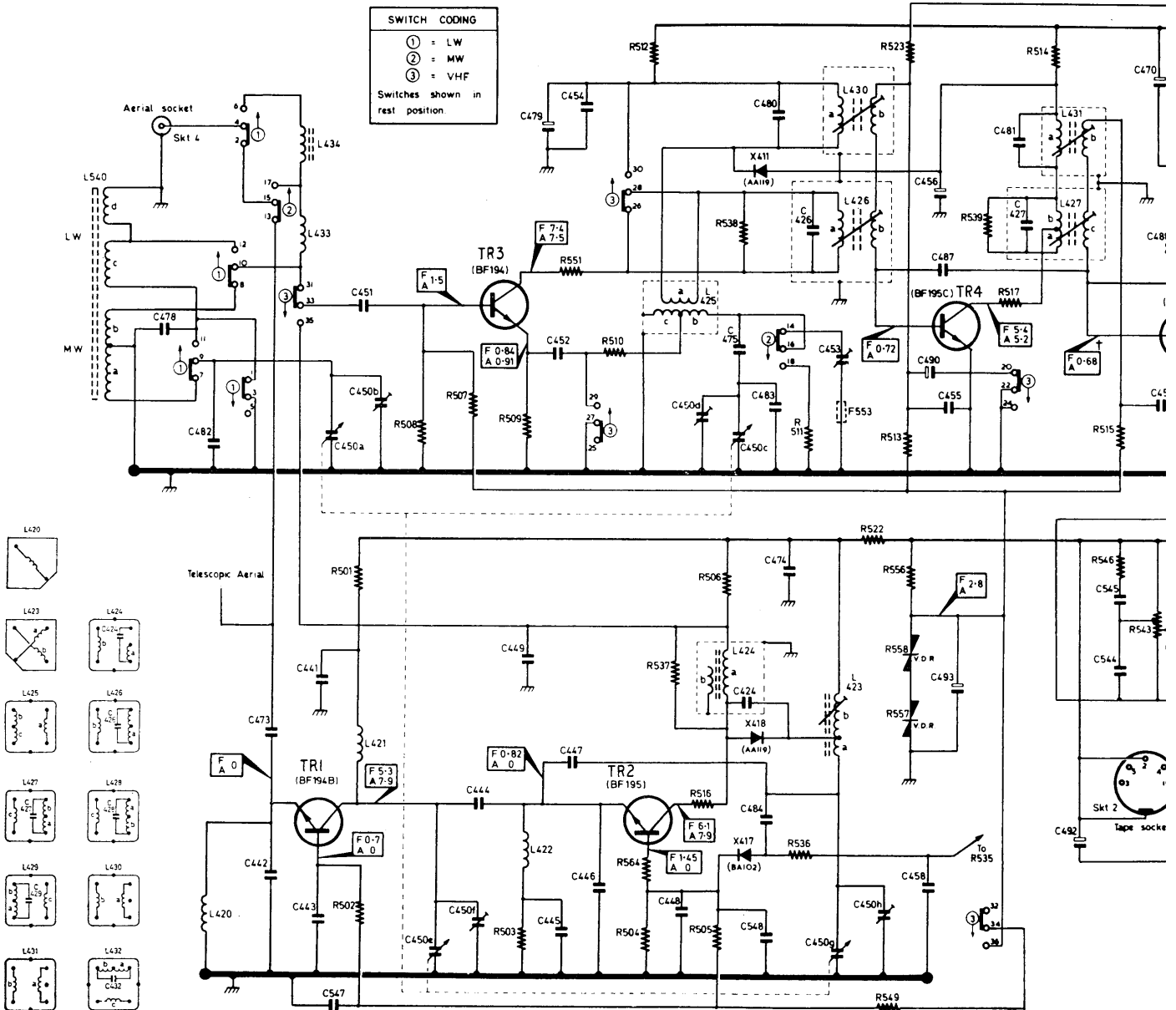


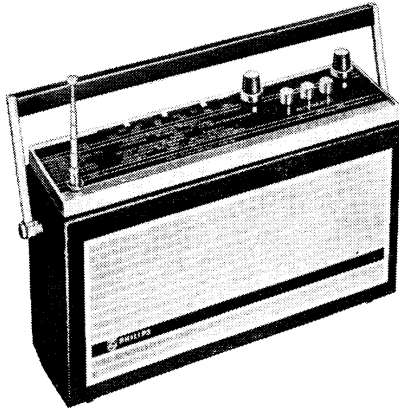
Philips 13RL386: Stella ST7008T

1924

Battery operated portable a.m./f.m. radio receiver

C	478	482	473	441	450a	451	450b	444	449	452	454	479	445	447	446	448	450d	475	424	480	426	453	456	487	481	427	492	545	47			
R				501	502	508	507	509	503	551	510	564	512	537	516	506	538	511	536	523	556	513	558	527	549	557	539	517	514	515	544	45
Misc.	L540	Skt 4	L434	L433	T401	L421	T403	L422	T402	L425	X411	L424	X417	X418	F553	L423	T404	L431	L427	Skt 2												





Resistors

R501	1kΩ	B2	R522	1kΩ	B2
R502	330kΩ	B2	R523	33kΩ	A1
R503	1kΩ	B2	R524	100kΩ	A2
R504	22kΩ	B2	R525	120kΩ	A2
R505	15kΩ	B2	R525	180Ω	A1
R506	100Ω	B2	R527	510Ω	A2
R507	15kΩ	B1	R528	220Ω	A2
R508	22kΩ	B1	R529	1Ω	A2
R509	1kΩ	B1	R530	1Ω	A2
R510	4.7kΩ	B1	R531	1.2kΩ	A2
R511	100kΩ	B1	R532	6.8Ω	A2
R512	470Ω	B1	R533	390Ω	A2
R513	47kΩ	A1	R534	22kΩ	A1
R514	1kΩ	A1	R535	470kΩ	A1
R515	82kΩ	A1	R536	470kΩ	B2
R516	47Ω	B2	R537	22kΩ	B2
R517	220Ω	A1	R538	22kΩ	B1
R518	470Ω	A1	R539	22kΩ	A1
R519	180Ω	A1	R540†	47kΩ	—
R520	4.7kΩ	A1	R541	3.3kΩ	—
R521	4.7kΩ	A1	R549	470Ω	B1
			R550	22kΩ	A1

Resistors

R551	220Ω	B1	C544	1,000pF	—
R552	100Ω	A1	C545	0.047μF	—
R554	47kΩ	A2	C547	0.01μF	B2
R556	5.6kΩ	A1	C548	2,200pF	B2
R557	—	A1	C566	100pF	—
R558	—	A1	C567	1,000pF	A2
R560	1kΩ	A1			
R561	2.2kΩ	A1			
R562	47kΩ	A1			
R563	47kΩ	A1			
R564	22Ω	B2			

Capacitors

C426	—	—	L425 b	4.5Ω	B1
C427	—	—	L426	—	B1
C428	—	—	L427	—	A1
C429	—	—	L428	—	A1
C432	—	—	L429	—	A1
C441	4,700pF	B2	L430	—	B1
C443	27pF	B2	L431	—	A1
C444	2,200pF	B2			
C445	3pF	B2	L432	[a 7Ω b 5Ω c 3.3Ω]	A1
C446§	470pF	B2	L433	25Ω	B1
C447	1.5pF	B2	L434	28Ω	B1
C448	2,200pF	B2			
C449	1,500pF	B2	L540	[a 2.6Ω c 4Ω]	—
C450	—	B2	L541	6Ω	—
C451	0.01μF	B1			
C452	0.022μF	B1			
C453	300pF	B1			
C454	0.022μF	B1			
C455	0.022μF	A1			
C456	4μF	A1			
C457	4,700pF	A1			
C458	0.1μF	B2			
C459	47pF	A1			
C460	1,500pF	A1			
C461	1,500pF	A1			
C462	10μF	A1			
C463	3,300pF	A1			
C464	1,000pF	A1			
C466	1.6μF	B1			
C467	0.22μF	A1			
C468	320μF	A2			
C469	1,000pF	A2			
C470	400μF	A1			
C471	200μF	A2			
C472	320μF	A2			
C473	22pF	B2			
C474	4,700pF	B2			
C475	300pF	B1			
C478	82pF	B1			
C479	32μF	B1			
C480	3,300pF	B1			
C481	3,300pF	A1			
C482	5pF	B1			
C483	18pF	B1			
C484	5pF	B2			
C487	2.7pF	A1			
C488	2.7pF	A1			
C489	0.022μF	A1			
C490	10μF	A1			
C491	0.01μF	A1			
C492	4μF	A2			
C493	64μF	A1			
C494	4,700pF	A1			
C495	100pF	A1			

Inductors*

L420	—	B2
L421	—	B2
L422	—	B2
L423	—	B2
L424	—	B2
L425 b	4.5Ω	B1
L426	—	B1
L427	—	A1
L428	—	A1
L429	—	A1
L430	—	B1
L431	—	A1
L432	[a 7Ω b 5Ω c 3.3Ω]	A1
L433	25Ω	B1
L434	28Ω	B1
L540	[a 2.6Ω c 4Ω]	—
L541	6Ω	—

Semiconductors

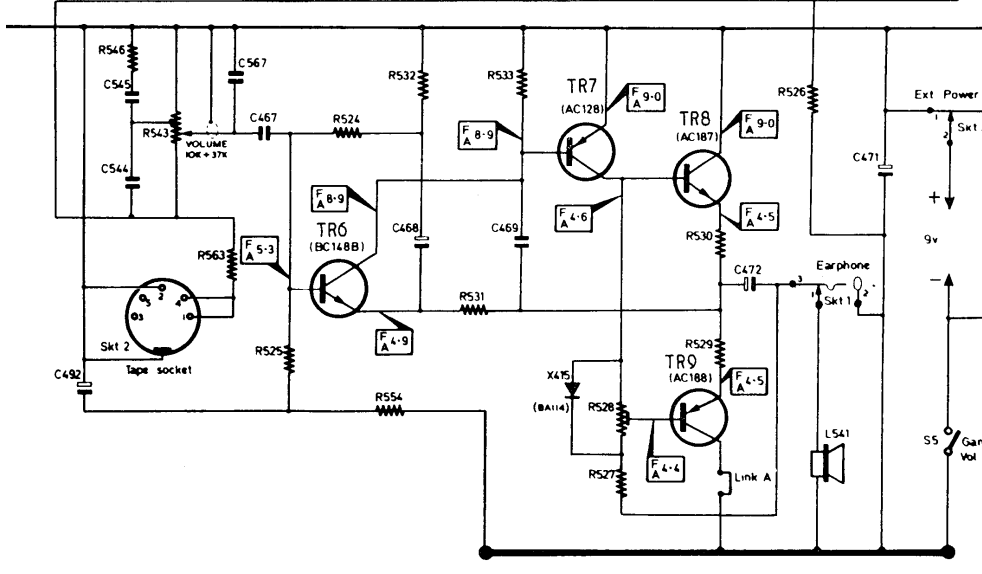
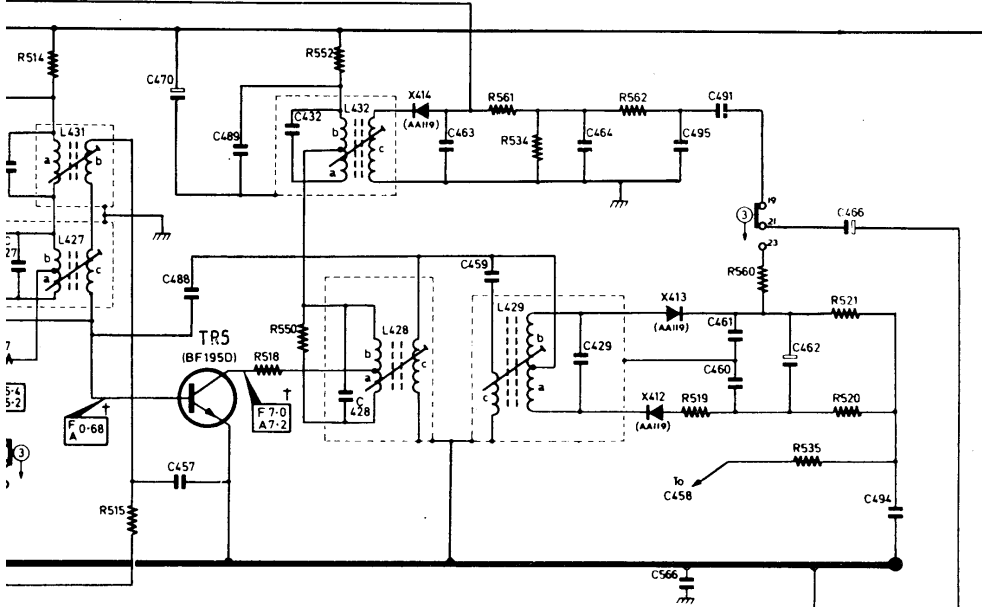
TR1	BF194B	B2
TR2	BF195	B2
TR3	BF194	B1
TR4	BF195C	A1
TR5	BF195D	A1
TR6	BC148B	A2
TR7	AC128	A2
TR8	AC127	A2
TR9	AC188	A2
X411	AA119	A1
X412	AA119	A1
X413	AA119	A1
X414	AA119	A1
X415	AA119	A1
X417	BA102	B2
X418	AA119	B2

Miscellaneous

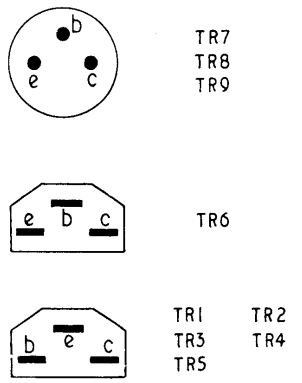
S1	—	B1
S2	—	B1
S3	—	B1
S4	—	B1
F553	—	B1

* Approximate d.c. resistance in ohms
† R543 taped at 10kΩ
§ Not fitted in some sets

81	427	492	545	488	567	432	463	459	464	495	461	462	466	494
17	514	515	543	563	518	550	552	534	561	528	519	560	536	521
	L431	L427	Skt 2	T405	L432	X414	L428	L429	X415	X412	T408	T409	Skt 1	L541
													SS	Skt 13



Circuit note: Voltages are negative with respect to chassis, they were measured with a 100kΩ/V meter under quiescent conditions; †10kΩ resistor in series with meter negative lead. F = v.h.f./f.m. A = m + .l.w./a.m.



1924 Philips 13RL386 Stella ST7008T

Introduction

CES radio and television group a.m./f.m. transistor portable radios, Philips model 13RL386 and Stella model ST7008T, covered by this *Service Sheet* have identical specifications and differ only with regard to their casing style. Incorporating nine transistors and seven semiconductor diodes, they feature press-button waveband selection; afc on vhf and four sockets for the connection of an earphone; tape recorder; battery eliminator, and external (car) aerial respectively

Reception is via an internal ferrite rod aerial assembly for m.w. 185-576m (1,620-520kHz) and l.w. 1,154-2,000m (260-150kHz), and telescopic rod aerial for v.h.f./f.m. 87.5-104MHz. An audio output of 750mW is handled by an 8Ω 6 x 4in elliptical loudspeaker and quiescent current consumption is 16mA on a.m. and 18mA on f.m. Power supply: six LPU2 cells, or equivalent.

The 13RL386 is housed in a black moulded case, has a black scale with white lettering and silver trim, matched with black and silver knobs and silver press-buttons. ST7008T has a silver grey case, finished in padded simulated leathercloth, and the scale is grey with white lettering.

Circuit alignment

A.M. circuits

Equipment required. - An r.f. signal generator amplitude modulated 30 per cent at 400Hz; an

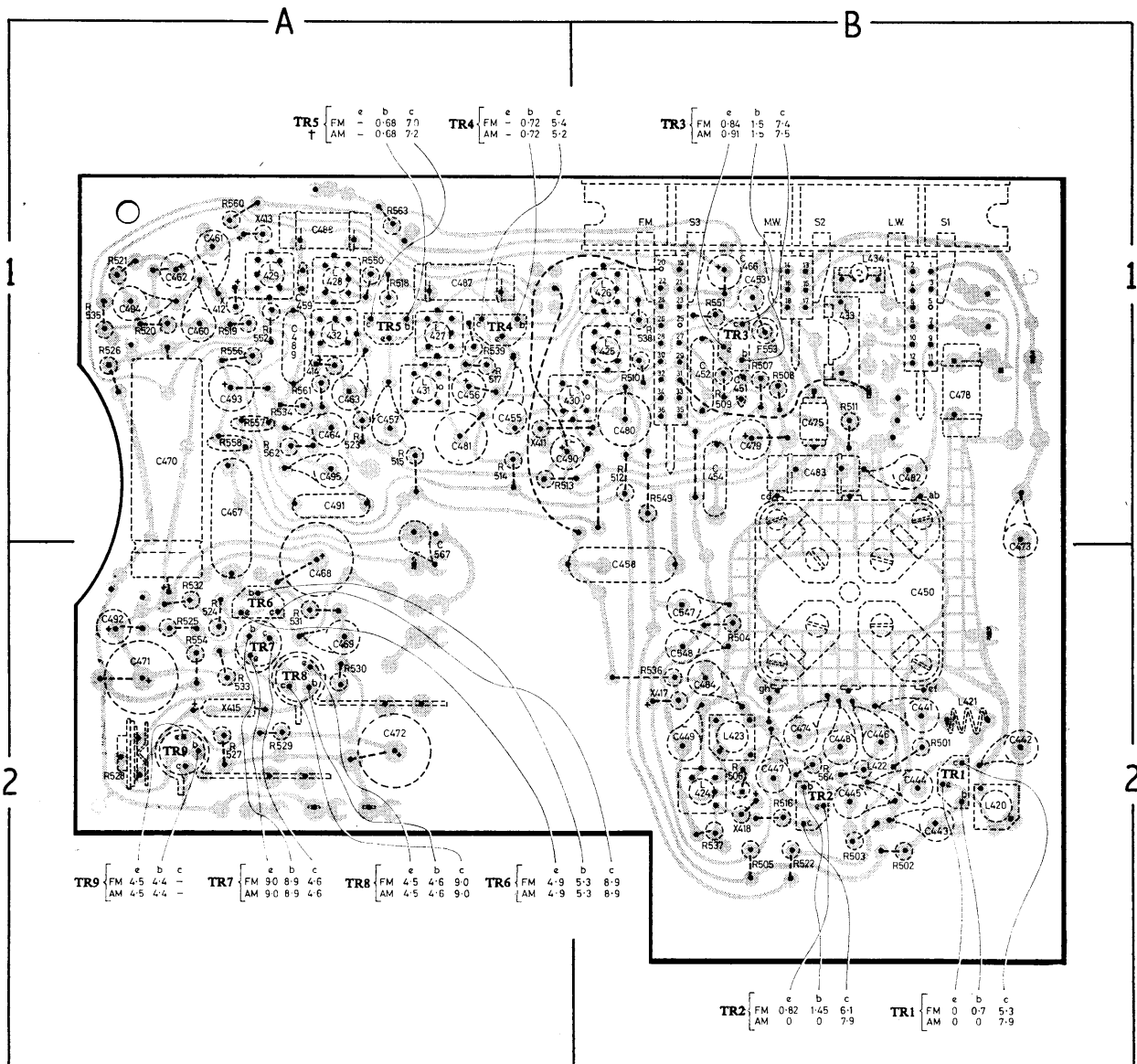
audio output meter set to 8Ω impedance or, alternatively, an a.c. voltmeter connected across the loudspeaker output, with an 8Ω load resistor replacing the loudspeaker; an r.f. coupling coil and a 0.47μF capacitor.

Rotate tuning gang to maximum capacitance and check that the cursor lines up with the calibration mark at the l.f. end of the scale. Preset volume control to maximum, and as receiver sensitivity increases, attenuate r.f. input so that an audio output of approximately 50mW is maintained, thereby preventing alignment peaks being masked by a.g.c. action. Carry out operations 1 to 7 in the alignment table.

Adjustment of C453. - To decrease the capacity of C453, carefully unwind the wire from the ceramic tube until the correct tuning point is reached, then cut off the surplus wire (capacity should not be increased by rewinding the wire). If more capacity is required, C453 must first be replaced with a new capacitor of the same type. With C453 fully wound (max. capacity) proceed as above.

F.M. circuits

Equipment required. - An r.f. signal generator covering the range 10-200MHz unmodulated;



Printed panel viewed from foil side.
Note: †10kΩ resistor in series with meter negative lead.

a 20,000Ω/V d.c. voltmeter set to the 1 volt range, and one each 4,700pF and 1pF capacitors.

With the output meter connected across **C432**, attenuate input signal so that the reading does not exceed 0.5 volts. When carrying out operations 13 to 15 short circuit **C458** to disable the a.f.c. circuit and rotate volume control to minimum.

Adjustment of L421. – **L421** is adjusted by compressing or stretching the turns of the coil. By leaving this adjustment until last, little or no bending of the turns should be necessary.

General notes

Access for service. – Place the receiver face down on a protective surface and remove the cells. Unscrew and remove two 3mm screws from the base of the case (one screw located in the battery compartment). Next, release the ornamental screw and spacer from each end of the handle. The case back may now be removed by carefully hinging it out from the bottom, at the same time sliding out the battery contacts. Reassemble in reverse order.

Removing the chassis. – Remove the case back as described above. Unsolder three wires from the loudspeaker, slide out both socket panels and the positive battery contact. The complete chassis may now be withdrawn from the front section of the case. When refitting the chassis, care should be taken to ensure that the wires to the sockets are positioned well away from the space occupied by the telescopic aerial when fully retracted.

Removing the top moulding. – Remove the chassis as previously described. Pull off the volume and tuning knobs, unscrew the slotted nut securing the telescopic aerial and withdraw the aerial complete. The top moulding, complete with station scale, may be released by bending the plastics support pillar at each end of the moulding outwards just enough to allow the moulding to be removed.

Replacing the station scale. – Remove the top moulding, then turn the moulding upside-down, and ease the scale away from the three locating points behind the front edge with the aid of a small screwdriver. Transfer the three station markers to the new scale, which may then be pressed into position in the moulding.

Replacing the press-buttons. – Remove the retaining ring from the faulty press-button. The button must be depressed before removal to ensure that when it is pulled off, the strain is taken by the mechanism instead of the switch body. Avoid excessive bending of the switch operating shaft. Finally, place the retaining ring over the lower part of the new press-button and press the button onto the shaft (a snap-on action).

Adjustment of R528. – Connect a d.c. milli-ammeter in series with the collector of **TR9** (a solder link is provided on the foil at point A to facilitate this measurement). Turn the volume control to minimum and adjust **R528** to give a meter reading of 4.75mA ± 0.25mA.

Drive cord replacement. – Remove the chassis from the case, detach the old cord and pointer, then make up the new cord as shown. Rotate tuning gang to maximum capacity (fully clockwise) fit the tension spring in the drive drum as shown and attach one end of the cord to the free end of the spring. Lead the cord out through the slot in the drum and pass it via pulleys A and B, to the tuning spindle. Take the cord three turns round the spindle, round pulley C and across to pulley D. Pass the cord over pulley D and half a turn clockwise round the drive drum. Finally, pass the free end of the cord in through the slot in the drum and hook it onto the tension spring.

Cursor setting. – Attach the cursor to the drive cord as shown. Turn the tuning gang to maximum capacity and adjust the cursor to line up with the calibration mark at the i.f. end of the scale.

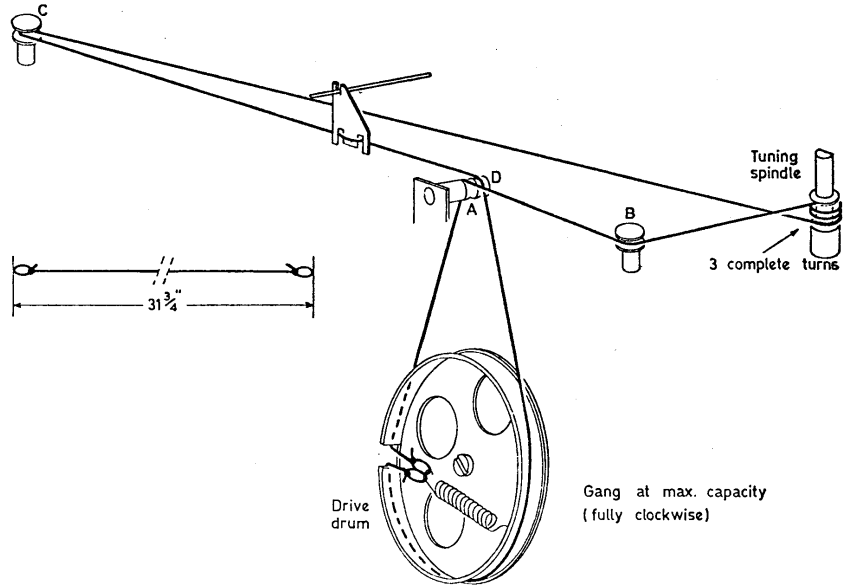


Illustration of drive cord assembly.

Alignment Table

Operation	Switch to	Tuning gang	Generator frequency	Apply to	Adjust	Output
A.M. alignment						
1	m.w.	Min.	468kHz	Aerial side of C451 via 0.47µF	L432 L431 L430	Max.
2	m.w.	Max.	518kHz	ditto	L425	Max.
3	m.w.	Min.	1,630kHz	ditto	C450d	Max.
<i>Repeat operations 2 and 3 until no further improvement results</i>						
4	l.w.	Max.	148kHz	ditto	C453*	Max.
<i>Pre-set position of L540ab 3/8in from end of rod, and C450b 1/2 turn back from fully closed</i>						
5	l.w.	Tune in receiver	190kHz	Via loop	L540cd	Max.
6	m.w.	ditto	550kHz	ditto	L540ab	Max.
7	m.w.	ditto	1,500kHz	ditto	C450b	Max.
<i>Repeat operations 6 and 7 until no further improvement results</i>						
F.M. alignment						
8	f.m.	Min.	10.7MHz	T404col. via 4,700pF	L428	Max. across C462
9	f.m.	Min.	10.7MHz	ditto	L429	Zero §
10	f.m.	Min.	10.7MHz	T403col. via 4,700pF	L427	Max. across C462
11	f.m.	Min.	10.7MHz	T402col. via 4,700pF	L426	Max. across C462
12	f.m.	Min.	10.7MHz	T402col. via 1pF†	L424	Max. across C462
<i>Short-circuit C458. Pre-set C450h 1 1/2 turns back from fully closed.</i>						
13	r.m.	Max.	86.5MHz	Car aerial socket	L423	Max. across C462
14	f.m.	Min.	105MHz	Car aerial socket	C450h-f	Max. across C462
15	f.m.	Max.	86.5MHz	Car aerial socket	L423 L421*	Max. across C462

* Refer to alignment instructions

§ Connect meter between junction **R520/R535** and chassis

† Keep generator leads clear of i.f. part of panel. Leads from the 1pF capacitor should be less than 5mm long

Manufacturers' service department

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