122

MURPHY SERVICE INSTRUCTIONS

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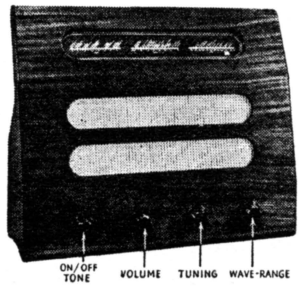
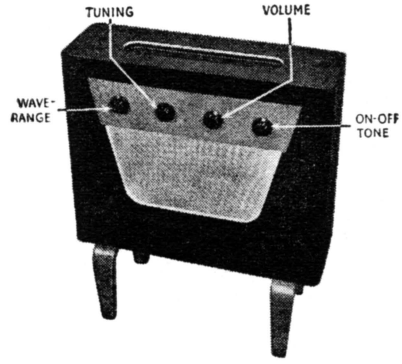


A122 & SA122
TABLE RECEIVERS



A122C
CONSOLE RECEIVER

MAINS SUPPLY:	A122 A122C	200–250 volts A.C., 50–100 cycles
	SA122:	105–150 and 210–260 volts A.C., 50–100 cycles
WAVE RANGES:		S. 16·5–53 Metres (18·10–5·65 Mc/s) M. 190–550 Metres (1580–545 Kc/s) L. 1000–2000 Metres (300–150 Kc/s)
INTERMEDIATE FREQUENCY:		465 Kc/s
VALVES:		MAZDA or EDISWAN, TH41, VP41, HL41DD, PEN45, and UU6
PILOT LAMPS:		Three 6·2 volt, 0·3 amp. (Miniature Screw)
SPEECH COIL IMPEDANCE:		3 ohms
TOTAL WEIGHT:	A122 SA122	25 lb.
	A122C:	35 lb.
CABINET DIMENSIONS:	A122 SA122	22¼″ wide, 18″ high, 7½″ deep
	A122C	25″ wide, 29″ high, 10″ deep
CONSUMPTION:		57 watts approx.

GENERAL NOTES

CIRCUIT. This is quite conventional, but it should be noted that the A.V.C. is delayed, and that the arrangement of the wave-range switch is unusual. The circuit diagram is drawn to show the circuit arrangements of the switch clearly, but the actual contact arrangement is indicated in the underneath view.

Negative feedback is used; it will be seen that the resistance R20 is only included in the table model; also C43, 0·01 mfd. in the table model, is changed to 0·05 mfd. in the console. Test point 62 is connected to chassis on short-waves, in order to obtain maximum gain on this wave-band. A smaller cathode decoupling condenser than usual is used with V3, and the combined effect is to produce the response best suited to the loudspeaker and cabinet in each case.

Difference between the Table and Console Models. The circuits of the two models are identical except for the negative feedback circuit mentioned above. In the Console the chassis is inverted and the layout of the external sockets and controls is therefore reversed; the tuning scale drive is also modified, the pulleys being mounted on short brackets of a different design.

The 8 in. P.M. loudspeaker used for the A122 and SA122 is replaced by a 10 in. P.M. type in the Console.

Note that the wave-range knobs on the two models are not interchangeable.

The layout drawings refer to the Table model chassis.

Installation. Firstly, the receiver must be adjusted for the correct mains voltage.

If these receivers are to give the performance for which they are designed, it is essential that a good aerial and earth system is used. When these have been connected a check should be made to see if any overloading of the frequency changer is caused by local transmitters; this is indicated by the presence of tunable whistles which can be made to disappear by reducing the aerial input. Overloading will normally only occur in locations within about 15 miles of a high powered transmitter (depending on the power of the station and the nature of the intervening ground), and it can be prevented by the use of an aerial filter tuned to the frequency of the station. Information on fitting and tuning of filters will be found in the Trimming Instructions on page 5.

MECHANICAL NOTES

The A122 table chassis is mounted in the base of the cabinet and is easily removed, if required, for servicing, after disconnecting the cord drive.

The A122C chassis is mounted on rubber buffers in the cabinet to prevent any tendency towards microphony. The buffers are inserted in the top and bottom of the chassis supporting shelves, and the chassis rests on them. The chassis fixing screws are passed through the buffers from the chassis and are secured by nuts and washers underneath.

The Cord Drives. Diagrams showing the arrangement of the main and pointer drives are given on the next page. The pointer drive can be replaced, if necessary, without removing the main drive, but the pointer drive should be removed if the main drive is to be replaced. To simplify replacement this can be easily accomplished without untying the knot, if the tension spring is unhooked.

The lengths of cord which are required to replace the drives are:- main drive, 3′ 6″, A122 and SA122 pointer drive 5′ 0″, and A122C pointer drive, 4′ 0″.

Early receivers used a thicker cord (type 5, Spec. 935) for both drives, but a thinner cord (type 3, Spec. 936) is now used on those sets with the scale type 48559/2.

In order that accurate calibration may be maintained, the pointer drive should be fitted with the thicker cord for the type 1 scale, and thin cord for the type 2 scale.

Scales. Owing to the change in the type of drive cord, it has been necessary to use two slightly different tuning scales. The type of scale fitted can be identified by the number printed along the lower edge. The two types are numbered 48359/1 and 48559/2. The alignment points differ according to which scale is fitted, and two tables of calibration figures are therefore printed in the Trimming Instructions. When a replacement is required, type 48559/2 will normally be supplied. (*cont. on p.* 4)

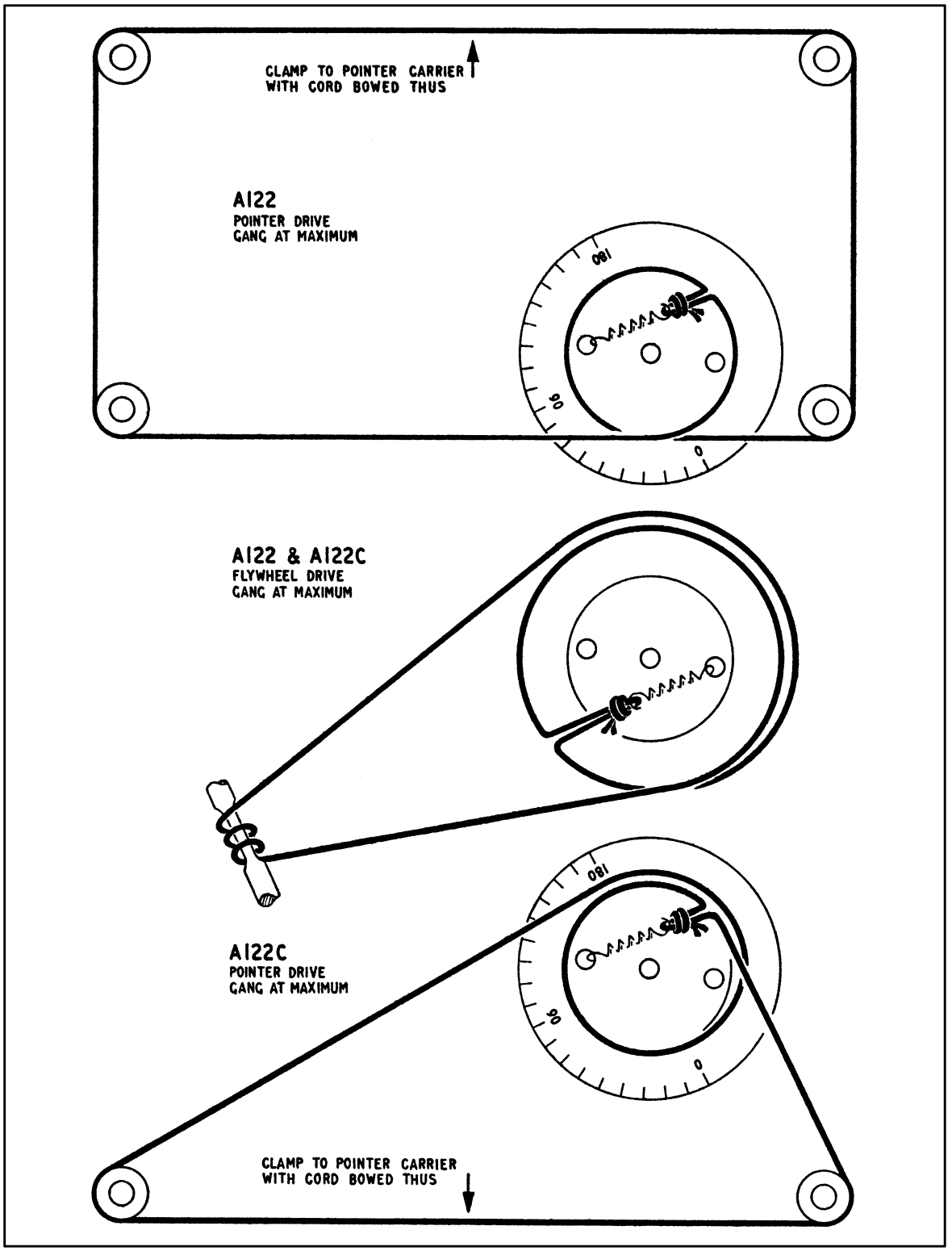


DIAGRAM OF A122 & A122C CORD DRIVES

(SA122 receiver uses same drive as A122)

Some variation from the calibration readings on the drive drum may be observed, owing to printing tolerances.

The tuning scale assembly is fixed to the cabinet (by two 2 B.A. or 3 B.A. nuts), and it is therefore necessary to detach the drive cord from the pointer carrier before removing the chassis from the cabinet. When the chassis is removed from the cabinet, calibration is provided by the scale on the tuning drum (sets of scale readings are given on page 5). When reassembling the receiver the cord should be clamped so that it is bowed slightly upwards, in order to hold the carrier firmly on to its guide rail. See that the pointers are in alignment with the end of the scale apertures when the gang condenser is at maximum capacity. To prevent the pointer carrier fitting loosely on its rail, and possibly causing rattle, it should be slightly bowed, but if it is bent or roughly handled the pointers may scratch the glass scale.

Early receivers will be dispatched with the pointer carrier held with adhesive tape; this must be removed before using the receiver.

If it is required to separate the chassis from the cabinet completely, the pilot lamps and leads can be removed from the scale, by pulling off each pilot lamp holder, and disconnecting the earthing lead from the reflector.

The I.F. Assemblies. The iron dust cores of the I.F. transformers are threaded on the outside, and U-shaped pieces of paxolin, fitting into slots in the coil former, hold them in position. It is possible for these cores to be screwed in too far, and they will then become disengaged from these U-shaped pieces; if this should occur, the opposite core should be removed, when it will be found possible to restart the loose core in its thread.

When replacing a component in an I.F. transformer (with the exception of the iron dust cores) it is first necessary to unsolder the leads, and then to remove the complete assembly. The tabs on the can may then be bent back, so that the coil assembly may be withdrawn. The piece of insulating material should be wrapped round the coil assembly before replacing the can.

Spare Parts. On pages 10 to 12 a list of component parts will be found. This is in two parts; in the first section the electrical components are listed, under their circuit numbers, with their values, tolerances, and part numbers. In the second section an alphabetical list is given, which contains all the other parts likely to need replacement.

It will be of considerable assistance if orders for spare parts contain the Part Number, in addition to the description, type, and serial number of receiver, and component numbers, if any.

In the case of some components, several alternatives may be used, but part numbers are quoted for the sake of completeness.

TRIMMING INSTRUCTIONS

The chassis of these receivers must be removed in order to adjust the R.F. and I.F. circuits; as the dial is fixed to the cabinet, the drive drum is marked in degrees to provide calibration points when trimming. The following instructions quote the settings of the drive drum for the different frequencies, and it is important therefore that the indicator is in alignment with "O" degrees when the gang condenser is at maximum capacity. After the chassis has been replaced in the cabinet the pointer should be fixed to the drive cord so that with the gang condenser at maximum capacity, all three pointers correspond accurately with the end of the scale aperture. Finally, a quick calibration check should be made on all bands.

All adjustments are made for maximum reading on an output meter connected to the L.S. sockets, with both the volume and the tone controls turned fully in a clockwise direction. The input to the receiver from the Signal Generator should be adjusted so that the output never exceeds 0·5 watts, in order to keep below the A.V.C. level.

The R.F. coils are not adjustable, with the exception of the L.W. oscillator coil which is fitted with an adjustable brass slug. They have been adjusted to fine limits at the factory and should remain constant over a long period. If, however, the S.W. coils are badly out of alignment the spiral turns at the end of the coils can be moved as described at the end of the table. This procedure is not recommended as a general rule, but only where the S.W. alignment is very poor; if it is done the turns should be sealed in position with a wax or similar compound.

The figures given for the drum calibration points refer to scale 48559/2 and drive cord Spec. 936. The figures in brackets refer to the scale 48539/1 and drive cord, Spec. 935 (thick).

Note.—The I.F. secondary coils are at the top of the I.F. assemblies, and the primary coils are accessible from below the chassis. **A non-metallic screwdriver should always be used to adjust the I.F.T. cores.**

The oscillator frequency is higher than the signal frequency on all bands.

Aerial Filters. When an aerial filter is required, it is fitted to the bracket on which the aerial and earth panel is mounted. It should be tuned for minimum signal from the local stations. Connect an 0–10 voltmeter between V1 cathode and chassis. To enable the adjustment to be made without removing the chassis from the cabinet, V1 cathode is connected to a tag on the output transformer; test points 5 and 16 on the transformer may therefore be used. Tune exactly to the local station, and then adjust the aerial filter for maximum voltage reading. When ordering aerial filters please state the frequencies required.

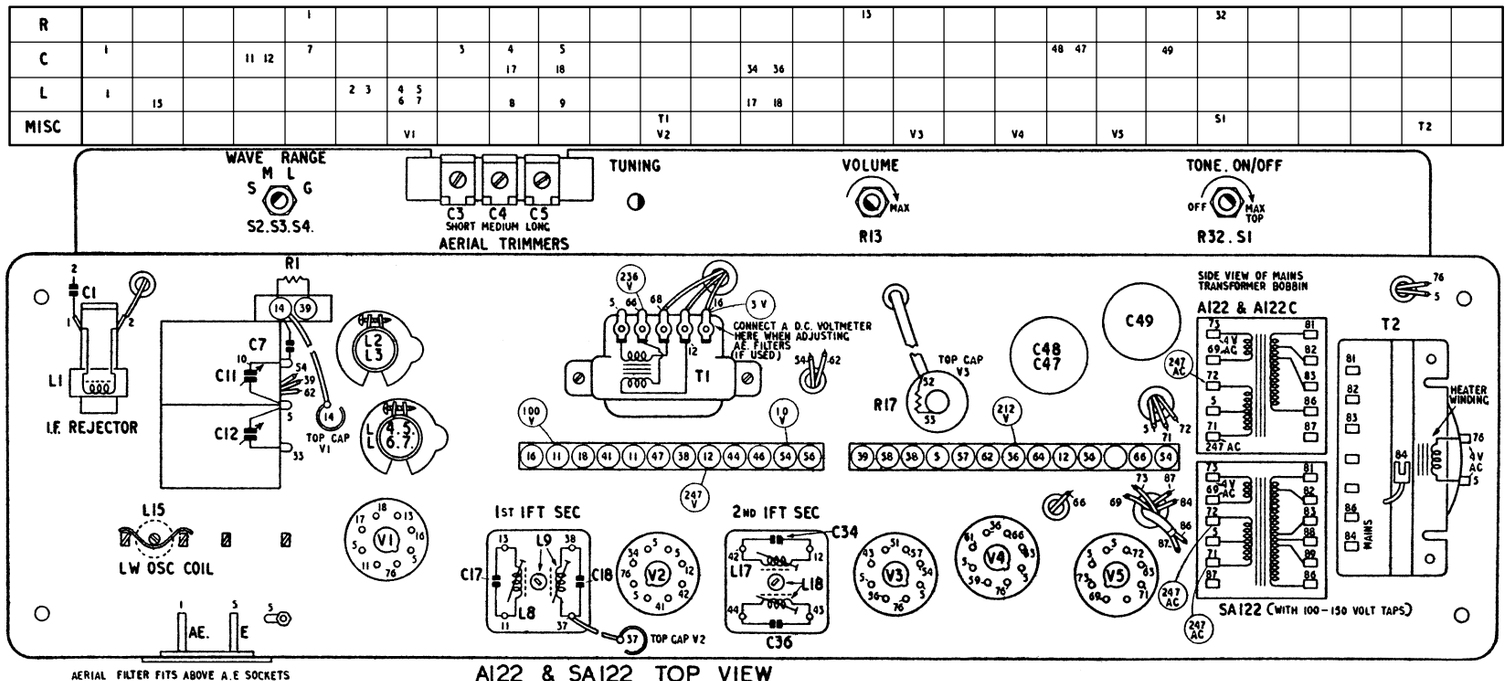
The I.F. Rejector has been accurately adjusted at the factory, and should not need readjustment. If it is necessary, however, the core can be moved with a non-metallic tool and should be adjusted for minimum A.F. output, with a modulated 465 kc/s signal, fed to the aerial and earth sockets.

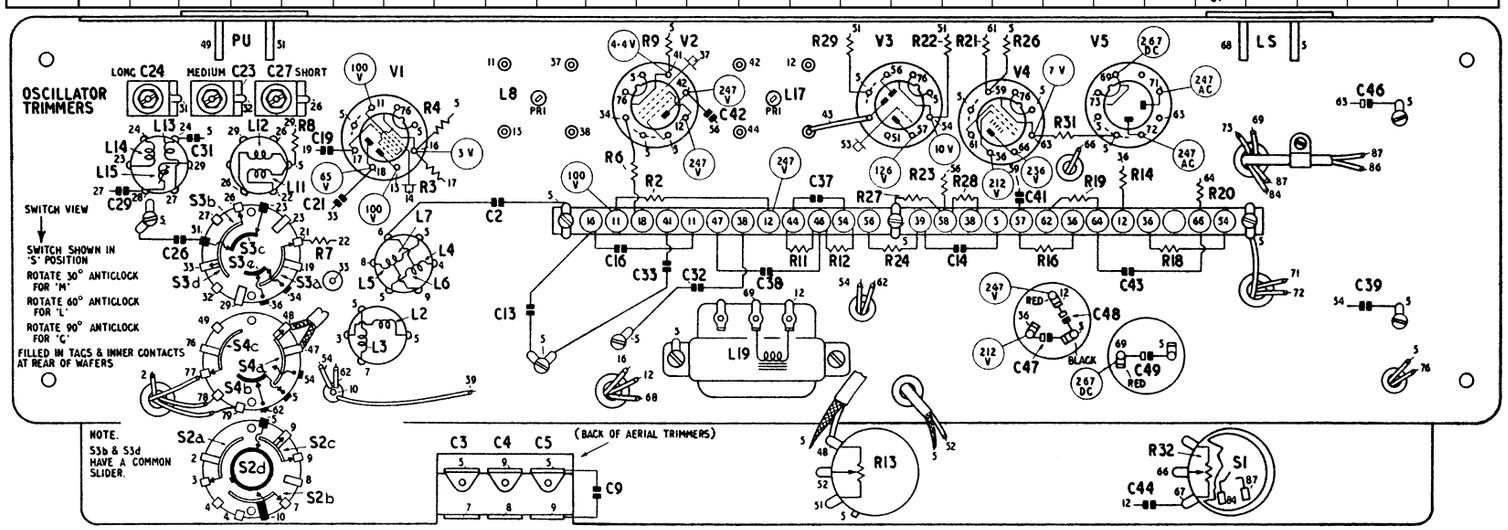
CIRCUIT	NOTES	SIG. GEN. FREQUENCY	SIG. GEN. TERMIN'TN	CONNECT SIG. GEN.	DRIVE DRUM SETTING	WAVE-RANGE	ADJUSTMENTS
2nd I.F.	Unscrew 2nd I.F. Pri. and Sec. cores to fullest extent	465 Kc/s	Via 0·1 mfd. Condenser	V2 Control Grid	0° (0°)	M.W.	2nd I.F. Sec. (L18, top view) 2nd I.F. Pri. (L17, bottom view) DO NOT READJUST
1st I.F.	Unscrew 1st I.F. Pri. and Sec. cores to fullest extent	465 Kc/s	Via 0·1 mfd. Condenser	V1 Control Grid	0° (0°)	M.W.	1st I.F. Sec. (L9, top view) 1st I.F. Pri. (L8, bottom view) DO NOT READJUST
L.W.	These adjustments should be repeated until there is no further improvement	300 Kc/s (1000 m)	Dummy Aerial	Aerial Socket	168° (166°)	L.W.	L.W. Osc. Trimmer (C24, bottom view) L.W. Aer. Trimmer (C5, front view)
		158 Kc/s	Dummy Aerial	Aerial Socket	31° (31°)	L.W.	L.W. Osc. Coil (L15, top view)
M.W.	There is no coil adjustment provided	1363 Kc/s 220 m	Dummy Aerial	Aerial Socket	157·5° (154°)	M.W.	M.W. Osc. Trimmer (C23, bottom view) M.W. Aer. Trimmer (C4, front view)
S.W.	To overcome the effect of oscillator pulling, rock the tuning control while adjusting the aerial circuits. Do not adjust the coil turns unless they are badly out of alignment.	15·23 Kc/s 19·7 m	Dummy Aerial	Aerial Socket	156·5° (153°)	S.W.	S.W. Osc. Trimmer (C27, bottom view) S.W. Aer. Trimmer (C3, front view)
		7·24 Kc/s 41·4 m	Dummy Aerial	Aerial Socket	53° (52·5°)	S.W.	Adjust the position of the spiral turn on the Osc. Coil (L12) and then the Aer. Coil (L3) for max. output. Then readjust C27 and C3 as above.

CALIBRATION AND ALIGNMENT POINTS

Alignment points are marked (*), other points have the tolerances quoted.

LONG WAVES					MEDIUM WAVES					SHORT WAVES				
Wave-length Metres	Freq. Kc/s	Scale 1	Scale 2	Tol.	Wave-length Metres	Freq. Kc/s	Scale 1	Scale 2	Tol.	Wave-length Metres	Freq. Mc/s	Scale 1	Scale 2	Tol.
1000	300	*166	*168	—	200	1500	164	168	±1	17·6	17	163	167	±1
1300	231	120	121	±1	220	1363	*154	156·5	—	20·0	15	151	154	±0·5
1500	200	91	92	±1	250	1200	139	141	±1	25·0	12	125	127	±1·5
1700	176·5	62	63	±1.5	300	1000	115	117	±1	30·0	10	102	103	±1·5
1900	158	*31	*31	—	500	600	28·5	29	±1	42·8	7	47	47·5	±1
					550	546	3	3	±1·5	50	6	16	16	±2·5





Voltages are measured between test points and chasis (except those shown otherwise on the mains transformer), using an Avometer type 7, with the receiver switched to M.W. and working on 245 volt mains, under no signal conditions. All figures are approximate, and variations may occur without affecting the performance of the receiver. **Note.** Replacement aerial coils have locating holes to correspond to the chassis lugs; oscillator coils have notches near tags 22 and 27.

MODIFICATIONS

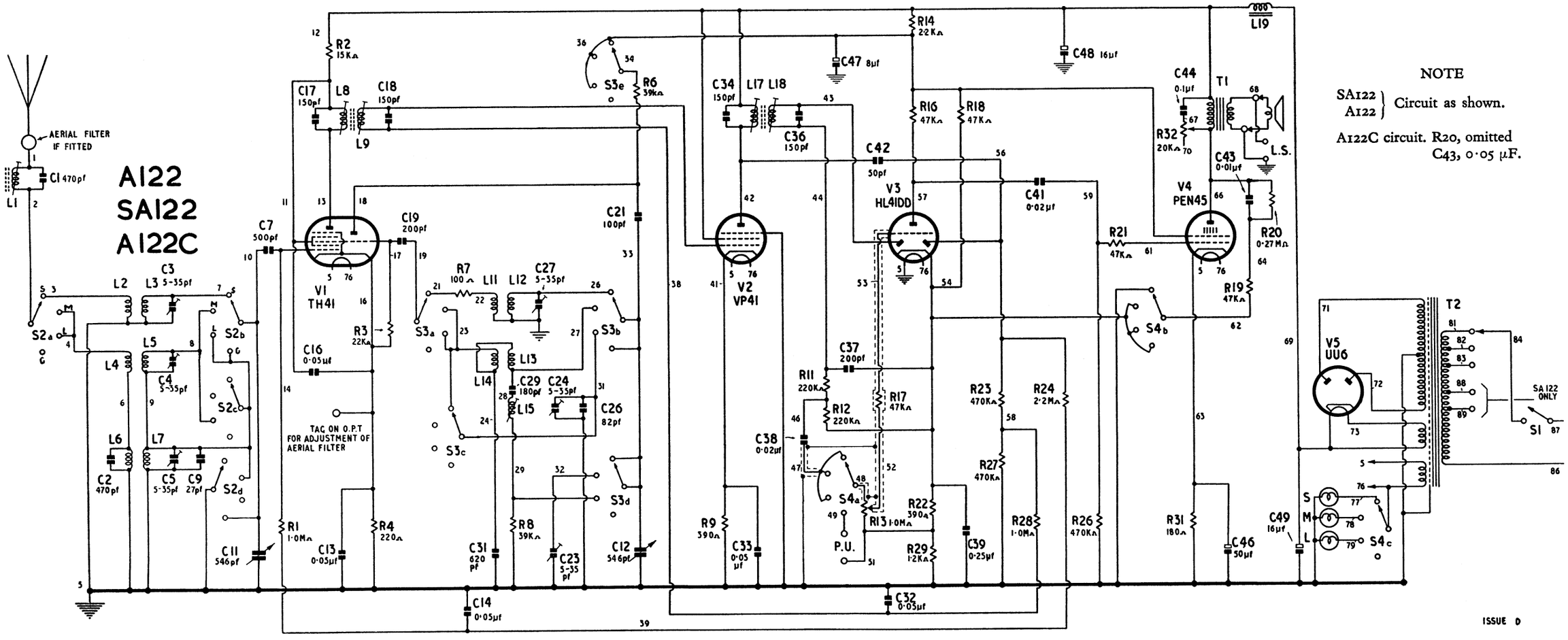
The following space is intended for use in noting any changes which may be made.

Details of Modification	Reason for Change

FAULTS

The space below is intended for service engineers' own use, so that a record can be kept of faults which occur.

Symptoms	Nature of Fault and Remedy



NOTE

SA122 / A122 } Circuit as shown.

A122C circuit. R20, omitted
C43, 0·05 µF.

ISSUE D

Subject to alteration without notice

COIL RESISTANCES

Typical readings obtained with an Avometer type 7. Where no figure is given, resistance is less than 0·5 ohm.

Coil Circuit No.	L1	L2	L3	L4	L5	L6	L7	L8	L9	L11	L12	L13	L14
D.C. Res. in Ohms	3	—	—	1	3·5	24	24	6	6	—	—	1·7	0·6

Coil Circuit No.	L15	L17	L18	L19	T1 Pri.	T1 Sec.	T2 Pri.	T2 H.T. Sec.	T2 L.T. Sec.
D.C. Res. in Ohms	5	6	6	270	320	—	30 + 3 + 3	150 + 160	—

VOLTAGE TABLE

Voltages are approximate figures, using an Avometer type 7; under "no signal" conditions.

Electrode	V1	V2	V3	V4	V5
Cathode	3	4·5	10	7	267 (D.C.)
Screen	100	247	—	212	—
Anode	100	247	126	236	247 + 247 (A.C.)
Osc. Anode	65	—	—	—	—

PARTS LIST

Components marked with an asterisk should normally be returned for repair, in the case of dealers in the United Kingdom.

CIRCUIT NO.	VALUE	PART NO.	REMARKS
C1	470 pf.	28173	± 5%
C2	470 pf.	28243	± 2%
C3	5–35 pf.	48563	Assembly of three trimmers
C4	5–35 pf.		
C5	5–35 pf.		
C7	500 pf.	23966 or 23967	± 20%
C9	27 pf.	23673	± 10%
C11	546 pf.	48504	Gang Condenser
C12	546 pf.		
C13	0·05 μf.	41403	± 20% 350 v. D.C. working
C14	0·05 μf.	41403	± 20% 350 v. D.C. working
C16	0·05 μf.	41403	± 20% 350 v. D.C. working
C17	150 pf.	28169	± 5%
C18	150 pf.	28169	± 5%
C19	200 pf.	23900 or 23901	± 20%
C21	100 pf.	23868 or 23867	± 20%
C23	5–35 pf.	37480	Trimmer
C24	5–35 pf.	37480	Trimmer
C26	82 pf.	28179	± 5%
C27	5–35 pf.	37480	Trimmer
C29	180 pf.	28242	± 1%
C31	620 pf.	28241	± 1%
C32	0·05 μf.	41403	± 20% 350 v. D.C. working
C33	0·05 μf.	41403	± 20% 350 v. D.C. working
C34	150 pf.	28169	± 5%
C36	150 pf.	28169	± 5%
C37	200 pf.	23900 or 23901	± 20%
C38	0·02 μf.	41402	± 20% 350 v. D.C. working
C39	0·25 μf.	41405	± 20% 350 v. D.C. working
C41	0·02 μf.	41451	± 20% 500 v. Neoprene sleeved
C42	50 pf.	23834 or 23835	± 20%
C43	0·01 μf.	41419	± 20% 1000 v. D.C. working (A122 and SA122 only)
C43	0·05 μf.	41403	± 20% 350 v. D.C. working (A122C)
C44	0·1 μf.	41422	± 20% 1000 v. D.C. working
C46	50 μf.	31316	+ 50% — 20% 12 v. P.V.
C47	8 μf.	46512	+ 50% — 20% 450 v. D.C. working
C48	16 μf.		+ 50% — 20% 450 v. D.C. working
C49	16 μf.	46503	+ 50% — 20% 450 v. D.C. working
R1	1·0 MΩ	27461	± 20%
R2	15 KΩ	25404 or 25405	± 10% (A122 and A122C)
R2	15 KΩ	29984 or 29925	± 10% (SA122 only)
R3	22 KΩ	27141	± 20%
R4	220 Ω	24677	± 10%
R6	39 KΩ	25564 or 25565	± 10%
R7	100 Ω	26693	± 20%
R8	39 KΩ	25541	± 10%
R9	390 Ω	24773	± 10%
R11	0·22 MΩ	27333	± 20%
R12	0·22 MΩ	27333	± 20%
R13	1 MΩ Var.	48575	Volume Control
R14	2·2 KΩ	26957	± 20%
R16	47 KΩ	27205	± 20%
R17	47 KΩ	27205	± 20%
R18	47 KΩ	25597 or 25596	± 10%
R19	47 KΩ	27205	± 20%
R20	0·27 MΩ	25861	± 10% (A122 and SA122 only)
R21	47 KΩ	27205	± 20%
R22	390 Ω	24773	± 10%
R23	0·47 MΩ	27397	± 20%
R24	2·2 MΩ	27525	± 20%
R26	0·47 MΩ	27397	± 20%
R27	0·47 MΩ	27397	± 20%
R28	1·0 MΩ	27461	± 20%
R29	1·2 KΩ	24965	± 10%
R31	180 Ω	24653	± 10%
R32	20 KΩ Var.	48579	Tone Control with Switch

PART	D.C. RES.	NO.	DESCRIPTION
*L1	3 Ω	48548	465 kc/s I.F. Rejector
*L2	—	48546	S.W. Aerial Coil
*L3	—		S.W. Grid Coil
*L4	1 Ω	48218	M.W. Aerial Coil
*L5	3·5 Ω		M.W. Grid Coil
*L6	24 Ω		L.W. Aerial Coil
*L7	24 Ω		L.W. Grid Coil
*L8	6 Ω	48467	1st I.F. Primary
*L9	6 Ω		1st I.F. Secondary
*L11	—	48545	S.W. Osc. Grid Coil
*L12	—		S.W. Osc. Anode Coil
*L13	1·7 Ω	48217	M.W. Osc. Anode Coil
*L14	0·6 Ω		M.W. and L.W. Osc. Grid Coil
*L15	5 Ω		L.W. Osc. Anode Coil
*L17	6 Ω	48467	2nd I.F. Primary
*L18	6 Ω		2nd I.F. Secondary
*L19	260 Ω	39276	Smoothing Choke
*T1		48766	Output Transformer SA122

PART	D.C. RES.	NO.	DESCRIPTION
*T1	—	48547	Output Transformer A122 and A122C
*T2	—	48764	Mains Transformer SA122
*T2	—	48543	Mains Transformer A122 and A122C
PL 1, 2 & 3	6·2 v. 0·3 A	16880	Pilot Lamps
S1	—	48579	Mains Switch; with R32
S2, S3, S4	—	48544	Ganged W/C Switch

VALVES

NO.	REMARKS	TYPE
V1	(Valves should always be obtained direct from valve manufacturers or distributors)	TH41 (Mazda (U.K.)
V2		VP41 (Mazda
V3		HL41DD (Mazda
V4		Pen45 (or Edis-
V5		UU6 (wan (other countries)

ALPHABETICAL LIST

(not including Fixed Resistors and Condensers)

DESCRIPTION	REMARKS	CIRCUIT NO.	PART NO.
B Back, Cabinet	For A122	—	48554
	For A122C	—	48963
	For SA122	—	48785
Brackets, with pulley for tuning drive	For A122 and SA122	—	48613 and 48614
	For A122C	—	48970
Bracket, for tuning spindle	—	—	48434
Buffer, Rubber	For A122C Chassis Support (with Spacer)	—	49703 with 14729
C Cabinet	For A122 and SA122	—	48562
	For A122C	—	48956
Cabinet Back	For A122	—	48554
	For A122C	—	48963
	For SA122	—	48784
Cap, Screening	For V3	—	48642
Carrier	For three Scale Pointers	—	48611
*Choke, Smoothing	—	L19	39276
Clamp	For Grid Coils	—	48223
	For Osc. Coils	—	48193
	For I.F. Rejector	—	46906
Clip	For Electrolytic Condensers	—	39271, 34184, or 43009

DESCRIPTION	REMARKS	CIRCUIT NO.	PART NO.
*Coils	I.F. Rejector	L1	48548
	S.W. Aerial and Grid	L2 and L3	48546
	M.W. and L.W. Aerial and Grid	L4, 5, 6, 7	48218
	S.W. Osc. Anode and Grid	L11 and L12	48545
	M.W. and L.W. Osc. Anode and Grid	L13, 14, 15	48217
	1st I.F.	L8 and L9	48476
	2nd I.F.	L17 and L18	48467
Condenser, Gang	—	C11 and C12	48504
Cord, for tuning drive	—	—	Spec. 935 or 936
Cores, Iron Dust	—	—	46911
D Drive Cord	—	—	Spec. 936 or 935
Drum, Calibrated	For Tuning Drive	—	48650
F Flywheel	With Spindle	—	48437
G Gang Condenser	—	C11 and C12	48504
H Holder	For three pointers	—	48611
I Indicator, calibration	Pointer, to register on Drive Drum	—	48500
K Knobs	Plain	—	18504
	G.L.M.S.—For A122 and SA122	—	48553
	G.L.M.S.—For A122C	—	48960
L Lamp-holder	For Pilot Lamps	—	48496
Lamp, Pilot	6·2 v. 0·3 A	PL 1, 2, and 3	SP1782 or 16880
Loudspeaker	8″ For A122 and SA122	—	45388
	10″ For A122C	—	45397
M Mounting Rubbers	For tuning scale	—	48505
Mounting Rubbers	For A122C Chassis Support (with Spacers)	—	49703 with 14729
P Panel, Component	Without Components	—	48637
Panel, Mains Tap	A122 and A122C	—	41659
	SA122	—	40133
Panel, Socket	For A and E, L.S. and Gram.	—	48438
Pilot Lamp	6·2 v. 0·3 A	PL 1, 2, and 3	SP1782 or 16880
Pointer	Tuning	—	43175
Plugs, L.S.	—	—	45974
R Reflector	With brackets (part of tuning Assy)	—	48451
Rubber Mounting	For tuning scale	—	48505
S Scale, tuning	Glass, with station names	—	48559
Scale Lamp	6·2 v. 0·3 A	PL 1, 2, and 3	SP1782 or 16880
Screw, Captive	With washer, for cabinet back	—	37458 and 37460
Spindle, tuning	With flywheel	—	48437
Spring	For drive cord	—	19448
Switch, on-off	With tone control	R32, S1	48579
Switch, wave-change	—	S2, 3, and 4	48544
T Terminal Strip	Without Components	—	48637
Terminal Strip	Small, on gang condenser	—	31228
Tone Control	With on-off switch	R32, S1	48579
*Transformer, I.F.	1st. I.F.	L8 and L9	48476
	2nd. I.F.	L17 and L18	48467
*Transformer, Mains	For A122 and A122C	T2	48543
	For SA122	T2	49618
*Transformer, Output	For A122 and A122C	T1	48547
	For SA122	T1	48766
V Valveholder	English Octal	—	3975
Volume Control	—	R13	48575
W Wave-change Switch	—	S1, 2, 3, and 4	48544