sinclair

Sinclair Radionics Limited
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ASSEMBLY INSTRUCTIONS
SINCLAIR MICROMATIC
WORLD'S SMALLEST RADIO

1s

COMPONENTS PRICE LIST

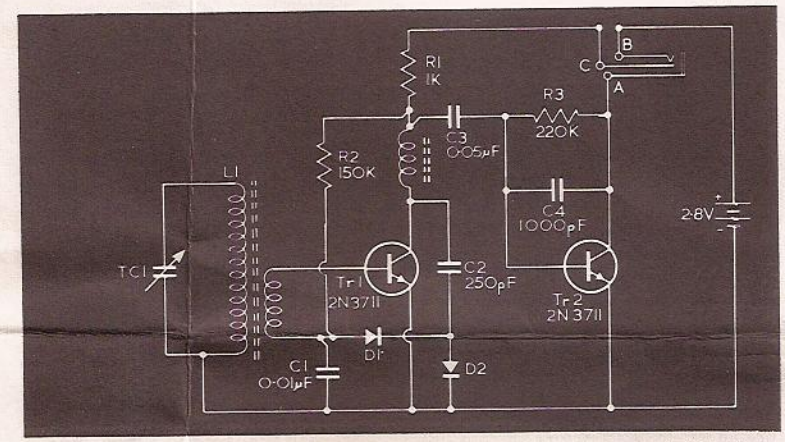
R1	1 K Ω	6d
R2	150 K Ω	6d
R3	220 K Ω	6d
Tc1	3–40pF Tuning capacitor	1/6d
C1	0.01μF	1/-
C2	250pF	1/-
C3	0.05μF	1/-
C4	1000pF	1/-
D1	Silicon diode	4/-
D2	Silicon diode	4/-
Tr1	2N3711	7/-
Tr2	2N3711	7/-
L1	Ferrite rod Aerial	4/6
L2	Choke	3/-
Printed circuit board		3/6
Magnetic earpiece		15/-
Socket		1/6
Case with trim		2/-
Dial and spindle assembly		1/6
Battery clips, wire, locking washer, nut		1/6
Solder		1/-
Instructions		1/-
	Total	63/6d
	Kit Price	49/6d

TECHNICAL DETAILS

The Sinclair Micromatic is the world's smallest transistor radio and requires no external aerial or earth. Its high performance is obtained by using the latest high gain silicon planar transistors in a completely new circuit.

The circuit diagram of the receiver is shown in fig. 1. The RF signal, picked up by L1 and selected by L1 and TC1, is amplified by Tr1. The gain of this stage is greatly increased by positive feedback from L2 to L1. The axes of L1 and L2 are normally at right angles but L2 can be bent over to increase the coupling and hence the feedback.

The RF output is fed to the double diode detector, D1 and D2, via C2. The detected signal consists of three parts: an unwanted RF signal which is removed by C1; a DC voltage proportional to the signal strength which is used to control the collector current of Tr1 and hence the gain of Tr1, giving A.G.C.; and an a.f. signal which is fed to the base of Tr1. This signal is then amplified, first by Tr1 and then by Tr2.



The Micromatic, although minute, is not at all difficult to build if the instructions are followed carefully. Read the instructions right through before starting construction.

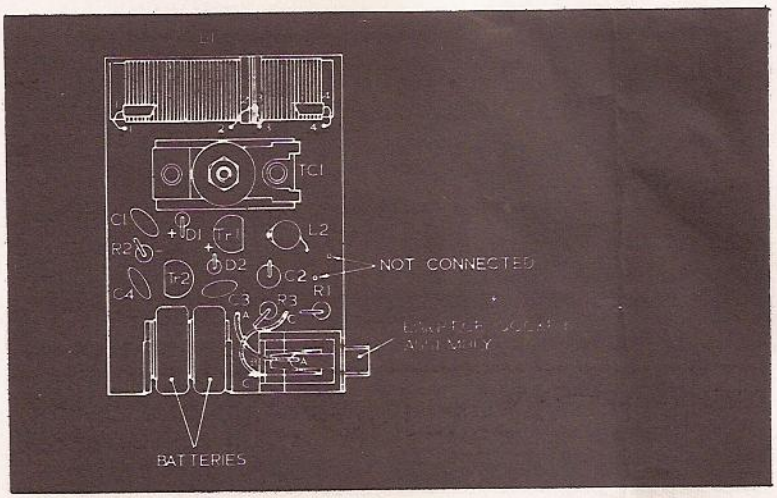
CONSTRUCTION

Use only the specified components. In addition you will need a small soldering iron, such as the Antex 15w model CN with a $^{3}/_{32}$" bit, a small pair of sidecutters or nail clippers and a small pair of pliers or tweezers.

Before starting check the components list to ensure you have all the necessary components. The diagrams will help you identify them. All the components should be mounted on the opposite side of the board from the printed copper circuit and in the following order:—

L1, TC1, C1, D1, Tr1, R2, C4, Tr2, D2, C3, C2, L2, R3, R1, earphone socket and battery clips.

The positions of the components are shown in fig. 2 and clarified in figs. 4 to 11.



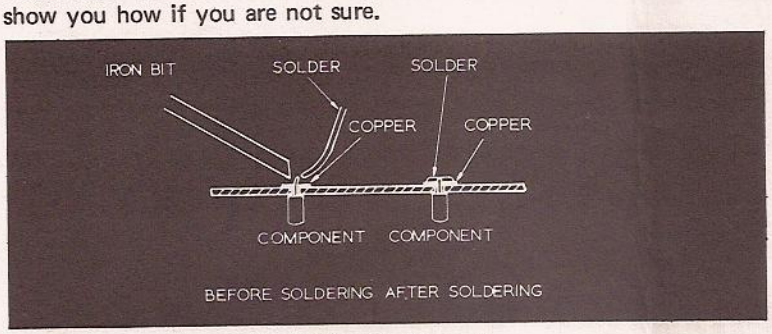
It is very important that all components, except L2, be mounted as close to the board as possible. The leads should be clipped to within about $^{1}/_{32}$" from the board and soldered. Do not clip the lead off flush with the board. The solder must not protrude further from the board than absolutely necessary.

SOLDERING

Use only the solder supplied with the kit, further packs can be obtained from us at 1/- each. **Never** use any additional flux as paste or fluid fluxes will cause very serious damage to the board, and we regret that we cannot service sets showing any traces of these fluxes, nor are such sets covered by our guarantee.

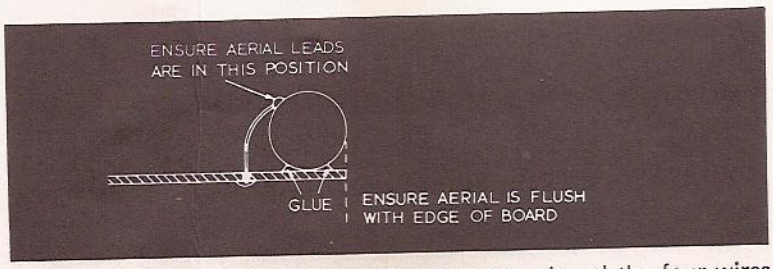
To ensure a good joint the solder should be applied to one side of the joint to be soldered and the tip of the bit should be applied to the other side of the joint. Leave the iron in contact with the joint long enough for the solder to melt and flow over the joint but no longer as the components may be damaged. Do not run the solder down the iron as the special flux burns away very quickly. Fig. 3 shows the joint before and after soldering.

Please read the notes on soldering. It is a good idea to get a friend to show you how if you are not sure.



FERRITE ROD AERIAL L1

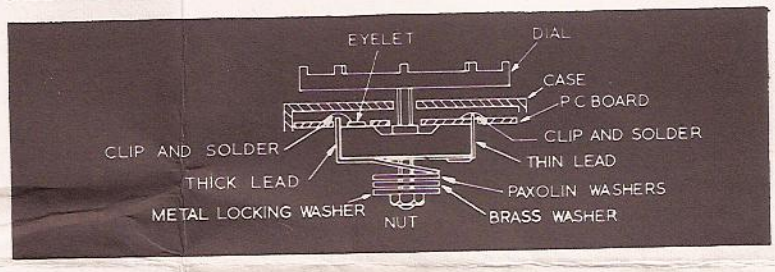
Glue L1 to the board using a good quality glue such as Bostik 1 and following the instructions on the glue. Make sure you stick it the correct way round on the correct part of the board, as shown in Fig. 2, and make certain that the four leads to the aerial are all free. The fixed aerial is shown in Fig. 4.



Wait for the glue to dry. Now, using tweezers, thread the four wires through holes 1, 2, 3, and 4, making sure that you get the correct leads in the correct holes. Make sure that none of the silver end of the lead is left on the component side of the board: solder the lead where the silver section stops, then cut the free ends off.

TUNING CAPACITOR TC1

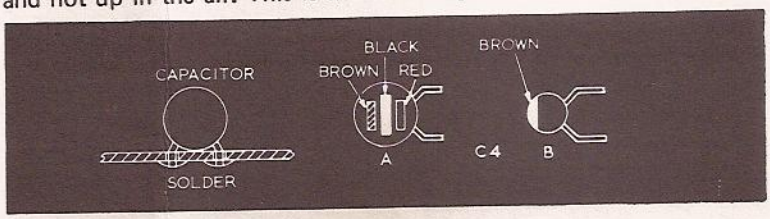
TC1 must lie flat on the board as shown in Fig. 5. The eyelet and bush protrude slightly into holes on the board and it may be necessary to bend the leads slightly so that they fit the holes properly. The leads, when clipped, should not extend more than $^{1}/_{32}$" from the board, and should be soldered as in Fig. 5.



C1, C3, C4

C1 and C3 are marked with their values. C4 may be either of the types shown in Fig. 6.

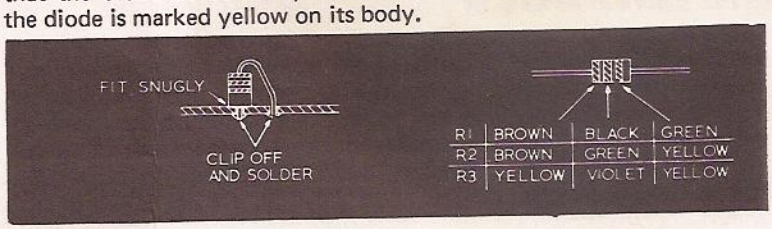
Make sure the body of the capacitor sits well down on to the board and not up in the air. This is shown in Fig. 6.



DIODES AND RESISTORS

Bend one lead over close to the component body and mount flush with the board as shown in Fig. 7.

It is important that the positive lead of the diode be bent over and that the diode be correctly mounted in position. The positive end of the diode is marked yellow on its body.



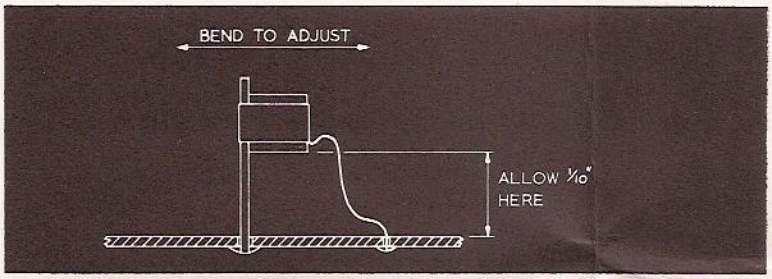
R1	BROWN	BLACK	GREEN
R2	BROWN	GREEN	YELLOW
R3	YELLOW	VIOLET	YELLOW

TRANSISTORS

The transistor connections are shown in Fig. 8. Make sure that the transistors are positioned as shown in Fig. 2, when the leads will naturally fit into the correct holes.

CHOKE L2

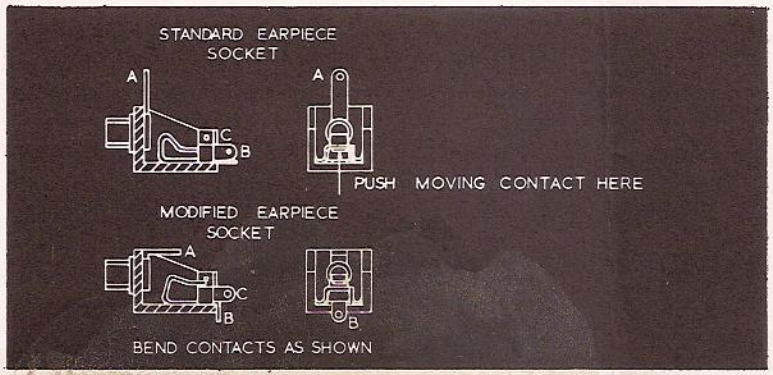
Fit L2 as shown in Fig. 9. Do not fit this flush with the board. Leave plenty of slack in the fine wire lead to allow for adjustment. Always handle the choke by its thick wire support or this will rotate relative to the body, breaking the connection.



Spare chokes are available at 3/- each.

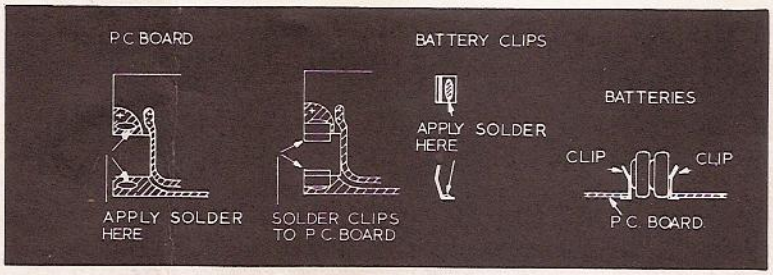
EARPIECE SOCKET

This is supplied with contacts which break when the plug is inserted. The contacts must be first modified to make on insertion. To do this push the moving leaf, as shown in Fig. 10, with a small screwdriver, when it will spring into the correct position.



BATTERY CLIPS

These are fitted as shown in Fig. 11. First tin the board and clips, then solder the two together. Now place the assembly on the edge of the table and anchor the assembly by placing a suitable book on it, leaving room to solder the clips. Holding the clips with the pliers (or tweezers) solder them to the board, but make sure that they are correctly positioned before soldering. Great care should be exercised to avoid overheating the copper print on the board since this can be caused to peel away by overheating.



BATTERIES

The Micromatic uses two RM 675 cells, available from most good chemists and radio shops, or in case of difficulty from Sinclair Radionics Ltd. They cost 2/9 each or 15/- for six. Fit them between the battery clips as shown in Fig. 2 making sure they are the correct way round.

OPERATION

Plug in the earpiece and you should be able to hear a station or two by adjusting the screw in TC1. If so the set is working and can be fitted into its case.

FINAL ASSEMBLY

With the case flat on its face hold the board upright and fit the socket into its hole, then rotate the board which will drop into place. This is shown in Fig. 12.

Remove the screw and washers from TC1, retaining the washers. Screw the dial assembly in from outside the case and fit the paxolin washer, brass washer, special locking washer and nut. Screw the nut tightly down.

Tune in a local station of known frequency. Remove the circular metal dial insert, peel off the backing paper and reinsert it in the dial so that the calibrations are correct.

The set's sensitivity can be adjusted by bending RC sideways as shown in Fig. 4. Always bend this by moving the main support wire, do not touch the ferrite bobbin. As this is bent further from the upright position the sensitivity increases, but if bent over too far the set will start whistling. Do not experiment too much or the support wire will break off.

NOTICE

All components for the Micromatic are tested before despatch, but if you consider any of them are faulty we will replace them free of charge if you return them to us with a stamped addressed envelope.

The Micromatic should work perfectly when completed and if it does not you may have damaged some components or your construction may be wrong. If you cannot cure the fault yourself we can service it for you at a fixed charge of 15/-.

Just return the set to us with earpiece and batteries packed in its original box together with cheque or postal order for 15/-. Please use the form supplied with the kit. If the fault is a very minor one we will return your 15/- with the set put right.