

BRITISH NATIONAL RADIO AND ELECTRONICS SCHOOL
PRACTICAL ELECTRONICS

COMPONENTS LIST AND STUDY INSTRUCTIONS FOR STEP NO. 3

INSTRUCTIONAL MATERIAL

1. Practical Work Instructions for this Step.
2. Circuit Diagram for Step No. 3
3. Diagrams Fig. 6, 7 and 8
4. Soldering Instructions

COMPONENTS

Potentiometers (Variable Resistors)

- 1 - 500 Kohm (or 470 Kohm) pot (RV3) timebase synchronisation control ✓
- 2 - 1 Mohm pots. (RV1, RV8), Y-gain and timebase stability controls ✓
- 1 - 5 Mohm (or 4.7 Mohm) pot (RV7), timebase fine frequency control. ✓

Sockets

- 1 - 4mm panel mounting socket, black (SK2) ✓
- 2 - 4mm panel mounting sockets, yellow (SK5, SK6) ✓
- 1 - 4mm panel mounting socket, blue (SK4) ✓
- 1 - 4mm panel mounting socket, red (SK3) ✓
- 1 - Co-axial socket, panel mounting (SK1) ✓

Miscellaneous

- 1 - 2ft. length resin cored solder ✓
- 2 - 1.5v cells (to form 3V battery) ✓
- 1 - 3.5v bulb ✓
- 1 - bulb holder ✓
- 2 - 4mm banana plugs, 1 red, 1 black ✓
- 1 - Engraved graticule ✓

- 2 - crocodile clips
- 1 - 1 ft. length sleeving $1\frac{1}{2}$ mm i/d
- 1 - 3 ft. length insulated wire with stranded conductor, white

- 1 - 4 ft. length 24 s.w.g. tinned copper wire
- 1 - 9 ft. length of 24 g insulated wire, white
- 1 - 8 ft. length of 24 g insulated wire, grey
- 1 - 4 ft. length of 24 g insulated wire, green
- 1 - 7 ft. length of 24 g insulated wire, yellow
- 1 - 2 ft. length of 24 g insulated wire, red
- 1 - 4 ft. length of 24 g insulated wire, blue
- 1 - 18 inch length of 24 g insulated wire, orange.
- 1 - 12 inch length of 24g insulated wire, violet.

Capacitors

- 1 - 0.01 μ F 500 V tub. polyester capacitor (C3)

STUDY INSTRUCTIONS

1. Study the instructions on soldering very carefully. Good soldering is ESSENTIAL in electronic work.
2. Carry out all the practical work described on the sheets attached (instructions 1 - 24)
3. Complete the green copy of the Circuit Diagram and compare your attempt with the yellow copy for Step No. 3. In case of difficulty, read again the leaflet entitled "Circuit Diagrams".

Transfer the relevant information on the yellow sheet to your white master copy.

NEXT STEP

We commence laying out components and wiring on the Circuit Board. (Matrix Board).

PRACTICAL WORK INSTRUCTIONS FOR STEP NO.3.

FURTHER WORK ON ASSEMBLY OF FRONT PANEL

with the Brilliance and Focus controls on the Front Panel. Fig. 8 shows how this is done.

The connecting tags of the variable resistors have been arbitrarily numbered in Fig. 8 for ease of reference in the instructions. Tag 1 on each variable resistor represents the fully anti-clockwise position of the control, the wiper contact being given the number 2. Tag 3 represents the fully clockwise position.

WIRING INSTRUCTIONS

12. Connect a .01 mF 500 V capacitor (C2) between tag 2 of the Focus control (RV 4) and the earth tag under the fixing to the Hood (Fig. 8).

Keep the capacitor leads as short as possible without stretching them, and sleeve the lead on the connection to RV4.

13. Connect a .01 mF 500 V capacitor (C3) between tag 2 of the Brilliance control (RV 5) and the other earth tag under the hood fixing. Sleeve the connection to RV5.

The following instructions deal with link wires to components on the Front Panel.

14. Connect a 2.2" (56mm) length of white wire between tag 2 of the Brilliance control (RV 5) and tag 3 of the Focus control (RV 4).

NOTE The length of wire given, allows 0.2" (5mm) at each end for jointing, which must be stripped of insulation and firmly cleated to the appropriate tag before soldering. The process of stripping 0.2" of insulation will be referred to as preparing the wire in later instructions.

yellow wire to the socket labelled 'X IN'.

The following instructions refer to links on the Timebase Range Switch S 1. (See Fig. 8.)

The connecting tags of the 3-pole 4-way 'T/B RANGE' Switch S 1 have been numbered in the diagram for ease of reference. These tags should be identified with the aid of a battery and bulb test circuit, explained on page 4 and Fig. 1 of Part B of the Manual - "Electronic Components". In the oscilloscope, only two of the switch sections are used and these have been labelled A and B. These sections should be labelled correspondingly when you mark up your Circuit Diagram. The tag corresponding to the fully anticlockwise position of the switch, labelled-1 on the Front Panel, is also labelled 1 on the switch diagram, with a prefix A or B depending upon the section of the switch to which it belongs. Thus, the poles of the switch are AO and BO and the corresponding switch points are A 1 to A 4 and B 1 to B 4 respectively. The tags of the unused section of the switch have not been numbered.

Take great care in determining these connections. It is very easy to make a mistake, so double check every connection.

21. Connect terminal BO of the switch to terminal A1 with a short straight length of 24 g tinned copper wire having ensured that the terminals are clean. Keep the connection on terminal BO as low down as possible - a further connection has to be made to this point later.
22. Connect terminal A1 to terminal A2 with a short link of 24 g tinned copper wire and having made the connection to A2 carry on with the same piece of wire to:- Para. 23
23. Connect terminal A2 to A3.
24. Fit two 6 BA $\frac{1}{4}$ " long bolts to the 2 holes vacant on either side of the range switch. Secure on inside of front panel with washer and 6 BA nuts.

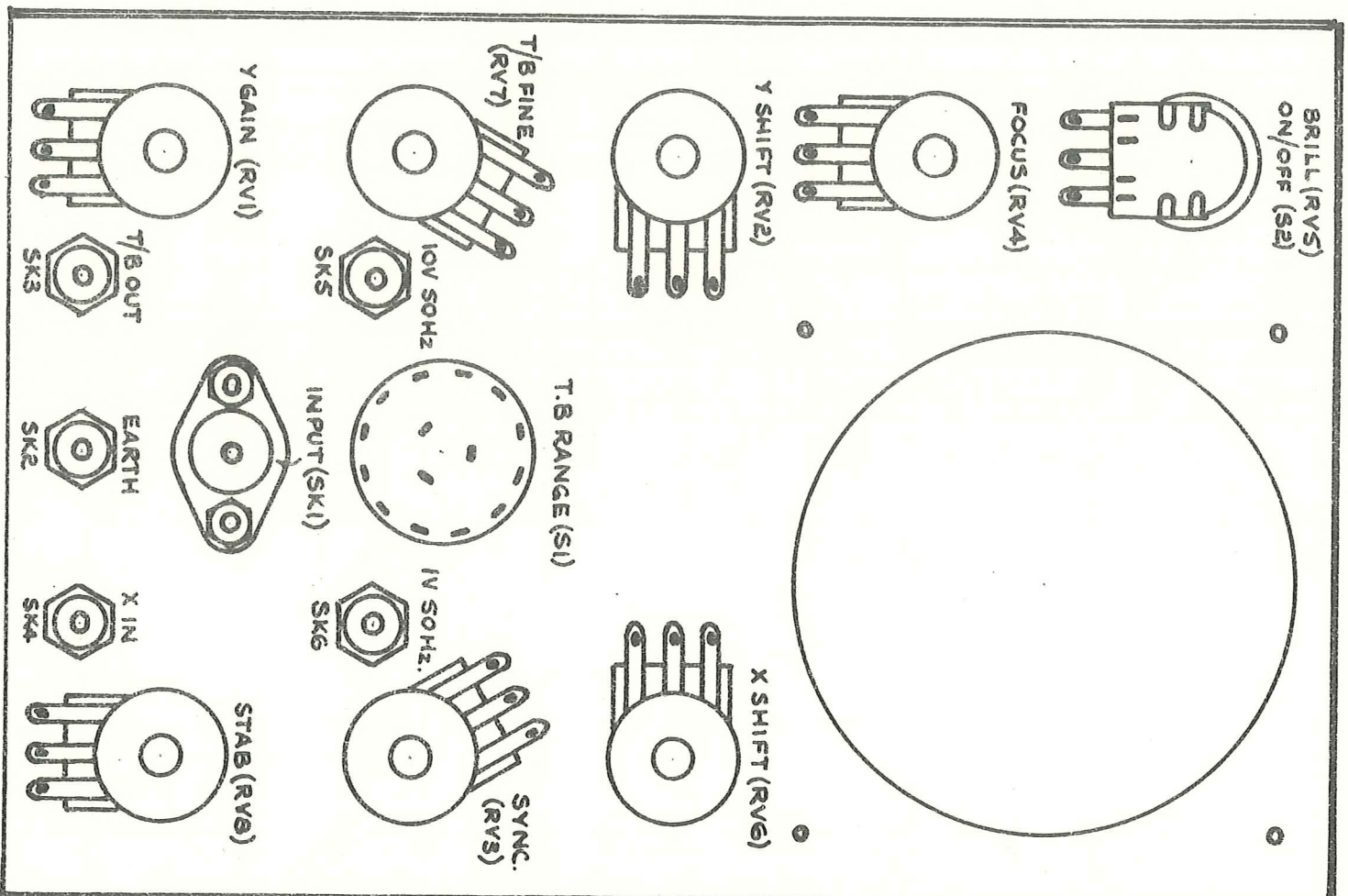


FIG. 6. FRONT PANEL REAR.

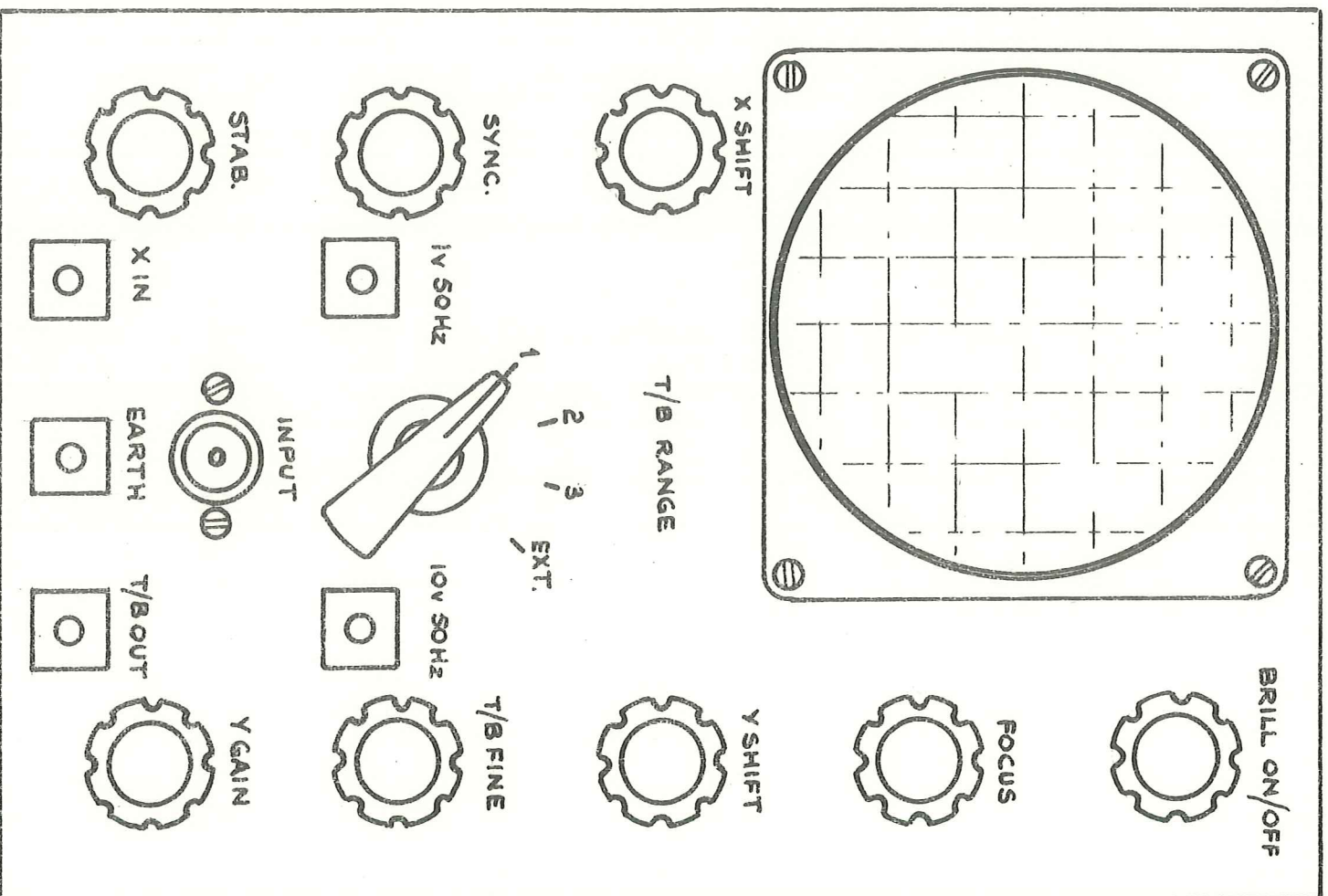


FIG. 7. FRONT PANEL LAYOUT.

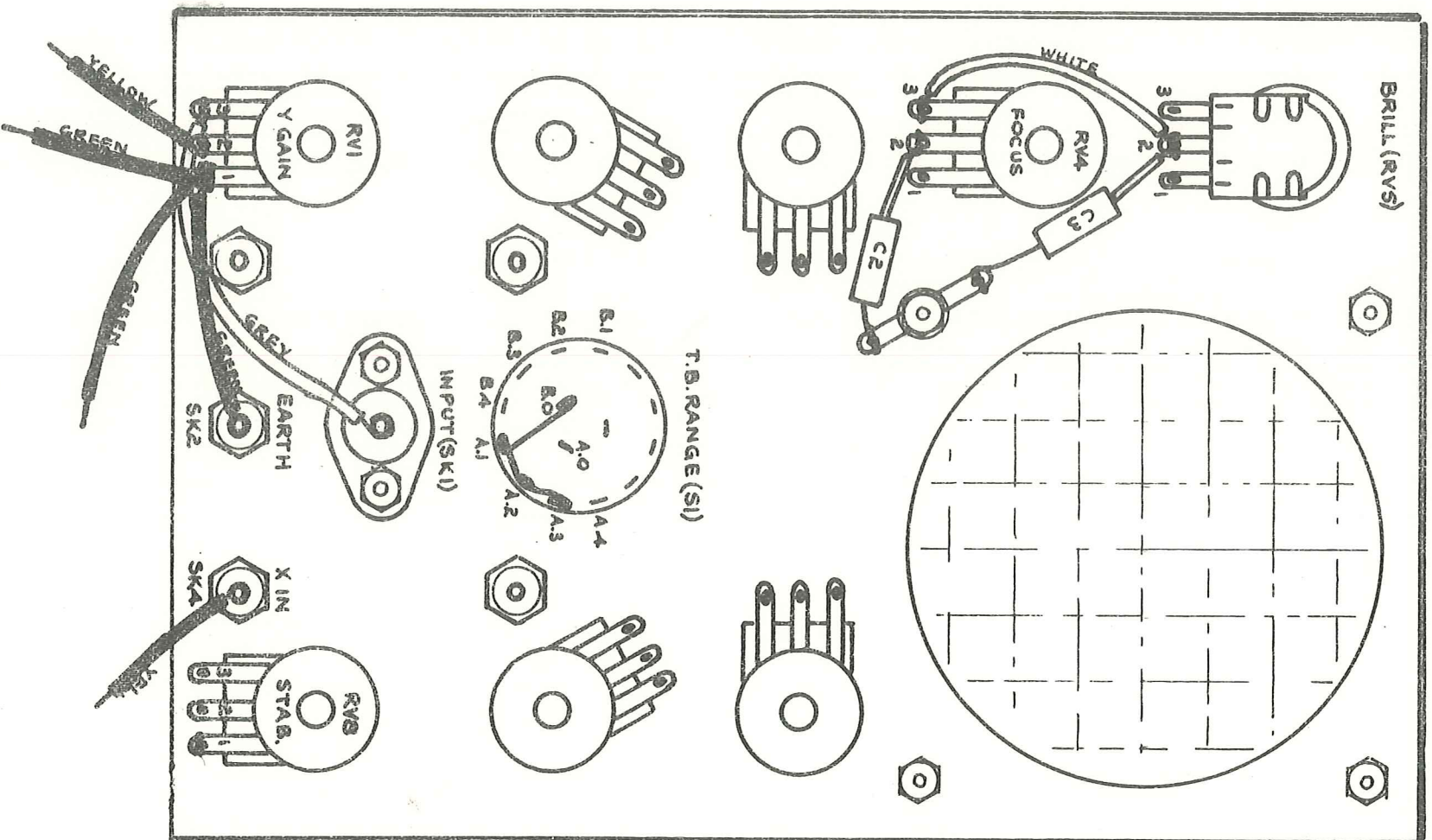


FIG. B. FRONT PANEL WIRING.