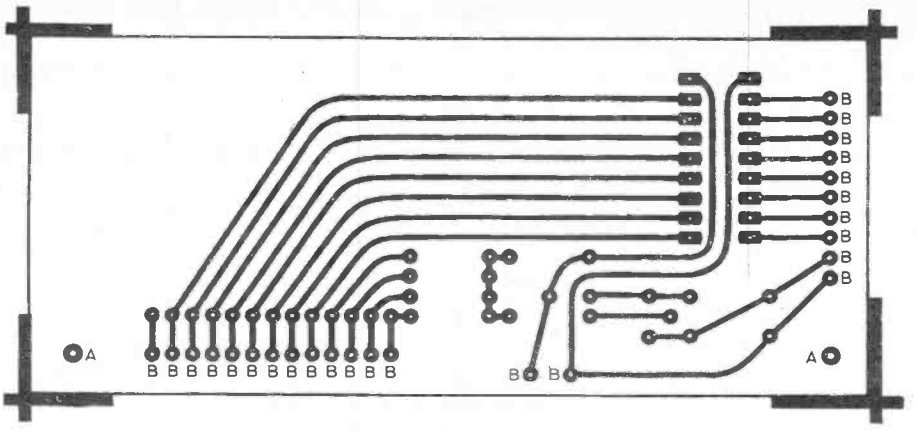

Fig. 6. PCB foil pattern and drilling details.

with small tye-wraps, and lead them towards the rear of the counter unit PCB.

Remove the temporary fastenings on the other cables around the rear panel, and replace them in their original positions. Replace the IF Unit PCB, securing all six screws, and replacing all the plugs. (If you get confused, each plug is marked with its number, and the illustration on page 45 of the Instruction Manual shows where they go).

Before continuing, have a last look round to make sure that no wires are trapped (or melted with your soldering iron!) and that all plugs are firmly in their correct place.

Make the new PCB using any of the usual techniques (sorry, but they are *not* available from the author). Fit all components, and solder up, being careful not to make any unwanted solder bridges. Remove the two mounting screws for the Counter Unit PCB nearest the rear of the set, and mount the new PCB (using two ¾ inch long No. 6 self tapping screws and ½" long 4BA spacing pillars) above and to the rear of the Counter Unit PCB. These screws pass through the lower PCB into the original holes in the chassis.

Put the 10 pin connector onto the 10 wires from the D socket, and the 2 pin connector onto the two wires from the 12V phono socket, trimming the wires to a convenient length (not too short, or they will tend to be pulled off). Unplug P56 from J03 on the Counter Unit PCB, and plug P56 into J01 on the new board. Plug P01 from the new board into J03 on the Counter Unit PCB. Plug the other two connectors into the new PCB.

Take a final look round before replacing the top cover, and check out that all is well. The truth table for the 15 pin D socket is shown in **Table 1**, and the voltage should be at least 11 volts when a 100Ω resistor is connected between any 'active' pin and common. Replace the top cover (6 screws) and place the transceiver on the air to check that you haven't inadvertently disturbed something.

2) **Relay Box:** Mark out and drill the holes for the 6 coax sockets along one side of the box, avoiding any internal webs. Also drill holes for the control cable and ground post. Mark out and drill the holes for the 5 relays, so that the solder tags on the relay ends are about 30mm from their respective coax socket. Mount the 12 way terminal block in the bottom of the box, and drill holes for mounting the completed box if necessary.

Mount all components securely. Wire up the coils of the relays first, using colour-coded flex cable for identification. Next wire up the RF circuits, using 16 swg tinned copper wire. Do not omit the grounding wire on the Normally Closed contacts, as this is a useful feature that not only grounds all unused aerials, but grounds ALL aerials when the transceiver is switched off.

Make up the necessary length of interconnecting cable with a 15 pin D plug at one end. Pass the other end through a grommet in the hole drilled in the side of the box, and make off the ends for connection into the terminal block. One or more wires from this cable may be connected in parallel to operate any one relay, depending on the band selected, so that a relay may be activated on more than one band. Changes to the selection used may be made at any time by re-positioning the wires on the terminal block

Finally, make a note of your arrangement, and sellotape it to the inside of the lid before closing the box. The ground post on the Relay Box should be connected to the station earth.

Use

To make use of this new facility, a piece of coax is connected between the AERIAL socket on the transceiver and the INPUT socket on the relay box. Each of your aerials is then connected to its appropriate socket on the relay box. Now, as you change from band to band, using the BAND switch on the FT102, the relay box will select the correct aerial for you. However, don't forget to re-tune your transceiver PA stage!

The author has the relay box mounted on the shack wall, close to where the aerial feeders enter the shack. However, there is no reason why the relay box couldn't be made watertight, and mounted on top of a mast, so that the whole aerial system is fed with only one feeder. However, each relay draws about 100mA, and the suggested multicore cable is rather fine (0.055mm²) for long runs, having a resistance of about 1 ohm per 10 ft. Because two wires are used for each relay (supply and return), the effective resistance is 2 ohms per 10 ft. The relays will operate satisfactorily down to 10 volts, and this limits the total acceptable line resistance to 20 ohms maximum, or say 100 ft of cable. For longer cable runs a heavier cable is needed. A 12 core, 0.22mm² cable is a standard product, and this would allow cable runs of up to 350 ft, or the next size up (0.5mm²) would allow cable runs of up to 800 ft, surely enough for the most extensive aerial farm!

Due to lack of space, the PCB overlay and components list have been held over until next month.