

Polar

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User Manual **580**
TONEOHM



Polar

SPECIFICATIONS

- DRIVE SOURCE: Open circuit voltage 550 mV peak.
Short circuit current 180 mA peak (approx).
Frequency 50kHz (approx).
Isolated from ground.
Protected against connection to $\pm 30V$.
- PROBE: Capable of detecting sufficient signal to activate tone output when lined up against a pcb track carrying the DRIVE SOURCE current limited by 200 ohms.
- SUPPLY: 120V or 220/240V selected by internal links.
50/60 Hz at 12VA (approx).

CAUTION

Do not let the black probe or drive source clips touch a hot surface e.g. soldering iron or a pcb that has just been soldered, as this may soften the plastic, requiring it to be replaced.

Note: A service Manual is available from your distributor or direct from Polar Instruments.

SWITCH ON

- 1.1 Connect the 580 to a suitable AC supply voltage (check the rear panel for details of whether the 580 is wired for 120V or 220/240V).
- 1.2 Turn the SENSITIVITY control fully clockwise.
- 1.3 Connect the red and black clips from the DRIVE SOURCE together.
- 1.4 Put the PROBE tip near to one of the leads, a sound should be emitted from the unit.
- 1.5 Turn the SENSITIVITY fully anti-clockwise (but do not turn to POWER OFF). There should be no sound even when the PROBE is placed near to the DRIVE SOURCE leads.
- 1.6 Rotation of the SENSITIVITY knob will alter the distance over which the probe detects the current flowing in the DRIVE SOURCE leads, indicated by the tone emitted from the unit.

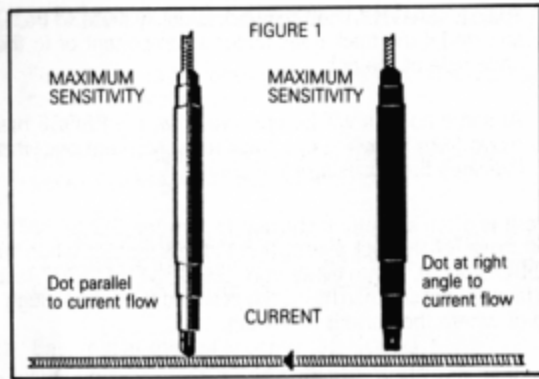
The PROBE is most sensitive when the white dot on the probe tip is parallel to the current flow as shown in figure 1.

LOCATION OF PCB SHORTS

- 2.1 Ensure that the faulty printed circuit board with a short, is unpowered.
- 2.2 Connect the two DRIVE SOURCE leads to the two tracks that are shorted together. Note that the DRIVE SOURCE produces a very low voltage drive of 0.55V maximum and thus will not damage components.
- 2.3 Place the PROBE tip, with the white dot running in line with one of the DRIVE SOURCE leads, a few millimetres away from the lead, as shown in figure 1.
- 2.4 Adjust the SENSITIVITY control clockwise so that a tone is emitted — do not turn the knob beyond this point.

If the PROBE is moved away from the DRIVE SOURCE lead (or the pcb track carrying the DRIVE SOURCE current) then the tone will disappear.

Turning the SENSITIVITY control clockwise increases the distance over which the PROBE will detect the current flowing in the lead or track.



- 2.5 Place the PROBE near the pcb track where one of the DRIVE SOURCE leads is connected, and line up the probes white dot with the pcb track — a tone should be heard.
- 2.6 The PROBE can now be moved along the pcb and provided that a tone is heard, it is close to the track carrying the DRIVE SOURCE current.

- 2.7 The SENSITIVITY knob may occasionally need to be adjusted if the track goes under a component or to the underside of the pcb.
- 2.8 At some point, it will be observed that the PROBE has to move from following one track to an adjacent one, this indicates the position of the short.

Note: It is often a useful technique to turn the SENSITIVITY control nearly fully clockwise so that a tone is emitted when the PROBE is about 10mm away from the DRIVE SOURCE leads. The faulty board can then be quickly scanned to obtain a rough idea of where the current is flowing.

Do not let the DRIVE SOURCE leads drape over the faulty pcb as this can give misleading results.

LOCATION OF BUS FAULTS, PARTIAL SHORTS

- 3.1 The technique for locating this type of fault is very similar to that for locating pcb shorts.

The unit is capable of tracing up to 200 ohms between two tracks that are not capacitively coupled.

It is likely that the SENSITIVITY control will need to be fully clockwise to trace faults of around 200 ohms, or if a ground plane is present in the pcb under test.

- 3.2 Ensure that the faulty pcb is unpowered.
- 3.3 Connect the two DRIVE SOURCE leads to the two tracks that have the fault between them, not that the low DRIVE SOURCE voltage of 0.55V maximum prevents damage to any components.
- 3.4 Turn the SENSITIVITY control clockwise so that a tone is produced when the PROBE is within 5 to 10mm of one of the DRIVE SOURCE leads.

- 3.5 A quick scan of the pcb, particularly down each side of the integrated circuit pins is often useful at this stage, since it can locate the fault immediately, without having to trace the flow through the whole pcb.

It is often the case that current is found entering one pin of an IC and leaving it at another pin, indicated by the presence of a tone when the PROBE is close to those pins.

This IC must be taking current from the DRIVE SOURCE and hence be responsible for the low resistance between the tracks.

- 3.6 If the technique in 5 does not identify the fault, then the procedure as outlined in 2.3, 2.4, 2.5, 2.6, and 2.7 should be followed. In this way the current path is traced and the current will eventually be found to enter a device or component which is causing the low resistance between the two faulty tracks.

LIMITED WARRANTY

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