

**SYMPTOM:** Random graphics on the screen

When power is connected to the Spectrum a display of random graphics in assorted colours appears. There is no copyright message present. If this occurs with no external circuits connected to the Spectrum, your Spectrum will have to be repaired professionally. The fault is normally caused by bad power supply regulation or a fault in one of the chips. The reduction in regulation of the power supplies caused by extra circuits being added can sometimes cause this problem as well. You should therefore disconnect any external circuits and try providing them with an external power supply.

Long leads to external circuits can also cause problems. There are two solutions to long leads. You can either shorten the leads, or if this is impossible, incorporate some buffer integrated circuits.

If this problem occurs even with no peripherals attached, the fault is most probably with the power supply. You can verify this by listening to the Spectrum when it is switched on. A small buzzing sound can be heard if the power supply is functioning properly.

It is advised that you return your Spectrum to Sinclair Research if this is the fault with your Spectrum. If you are feeling adventurous, however, you may take your Spectrum's life in your own hands and try replacing TR4 with a small NPN transistor. If this does not rectify the fault, then try replacing TR5 with a small PNP transistor.

## 13. FAULT DIAGNOSIS

The Spectrum is a complicated device and there are several faults which could occur. Most faults tend to be of a simple nature such as a loose connection, bad tuning or a blown fuse. It is these simple type of faults which this chapter aims to isolate. For more complex repairs, the computer should be returned to Sinclair or a qualified repair company.

**SYMPTOM:** No display at all

Follow these instructions in sequence:

- a. Connect the video lead from the Spectrum to the television.
- b. Switch on the TV.
- c. Connect the Spectrum power supply unit to the mains.
- d. Connect the supply lead to the Spectrum.
- e. Press the 'ENTER' key on your Spectrum and keep it pressed. Can you hear a faint clicking coming from the buzzer? If you cannot then go to 'g'.
- f. If you get here then most of your Spectrum is working. Try tuning your television to match the channel output from the Spectrum. If you still do not get a display on the TV then go to 'j'.
- g. Check that your mains power pack lead is correctly inserted into the Spectrum.
- h. Check the fuse in the mains plug to the ZX power supply.
- i. If you have access to a multimeter check that there is a +9 volts between the 0v and +9 connections on the rear edge connector. If there is not any voltage then thoroughly check all power supply connections. There is almost certainly a break in connection somewhere.
- j. If your Spectrum still isn't working then seek professional aid.

**SYMPTOM:** No colour on the display

Follow these instructions in sequence:

- a. Make sure that you are actually meant to be displaying colour. The program on page 109 of your BASIC manual will put all available colours onto the screen.
- b. Check that the colour control on your television set is adjusted to give colour. At one end of the scale you will only get black and white pictures.
- c. Check that the TV channel you are using is exactly tuned to your Spectrum. If it is not you will get a poor quality display with little or no colour.
- d. If you get as far as this it is quite probable that the colour crystal in your Spectrum is not tuned to the colour crystal in your television. You will therefore have to tune it. First unscrew the 5 screws on the bottom of your Spectrum so that you can move the keyboard. The adjustment to be varied is VC2. Look at the component layout diagram in appendix D or fig 9b to find it. Now rotate VC2 slowly using a small screwdriver (clockwise or anticlockwise). You should find a point at which colour returns to your display. If after a complete turn of VC2 the colour hasn't returned you will have to get the Spectrum repaired professionally.