

The 22 S . . . A Common Fault

Ian Jackson VK3BUF
52 Virginia Street, Springvale 3171

From "Gateway" February 1982

The 22S is a very popular 2 metre transceiver, hundreds of them are used in Melbourne alone, their frequency control uses a diode matrix system to select a channel in a 25 kHz increment.

The printed circuit board is very susceptible to intermittent faults which produces an "out of lock" condition, these faults are annoying but can be repaired in time.

This article is not about the "out of lock" fault, but of a secondary fault that may arise from this condition . . . the frying of the voltage regulator.

The circuit Fig. 1 is of a voltage regulator that supplies half of the set with power, RF oscillators, mic. pre-amp stages and the PLL board.

The circuit is duplicated in Fig. 2 in a simplified form. It shows a typical zener reference assigning 9.6 volts to the base of a series regulating transistor via a diode. The transistor has full supply voltage (13.8V typ.) applied to the collector via a 15 ohm resistor and thus 9 volts regulated appears at the emitter.

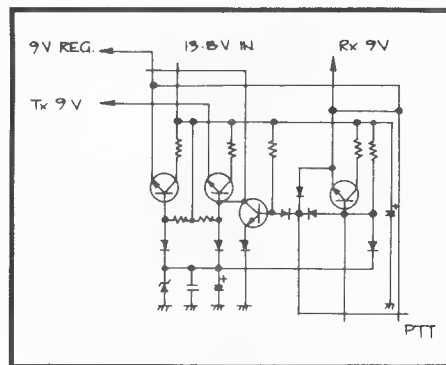


FIG. 1

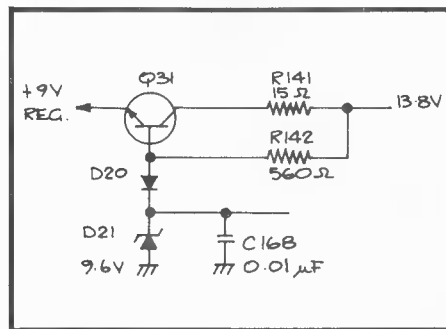


FIG. 2

Under normal operating conditions 86 milliamps is drawn through the regulator, there is an input-output voltage difference of approximately 4.8 volts, minus the 0.6 volt drop across Q31. There remains 4.2 volts across R141. The resistor therefore dissipates 360 milliwatts.

This means that the resistor in circuit is underrated and has on many occasions burnt out, though usually it just gets very hot. If the set goes out of lock either through a fault condition or if a channel position has been selected, that is vacant of diodes, the idle current shall rise from 86 to 100 milliamps. The extra current will in a very short interval cook the resistor, which shall rise in resistance and simulate many other faults, particularly in the phase-locked loop board by providing less than 9 volts.

This effect may occur more frequently to those who use an "external programmer" comprising eight switches as, through usage, they tend to fall out of lock more frequently.

It is therefore suggested that, whenever routine maintenance to the 22S is being done, that this resistor, R141, be replaced with a 1/2W version of the same value. It's only a little modification but it could save some major headaches.

AR