

STABILISED POWER SUPPLIER PS2/81

Introduction

The PS2/81 provides two outputs, one of 0.5 amp at 24 volts and one of 0.5 amp at 6 volts. Alternatively, an output of 1 amp at 24 volts may be taken if the 6-volt output is unloaded, since the latter is derived from the 24-volt output. Both supplies are protected by current limiters. The unit requires an input of 50 volts d.c. (common positive) at 1.5 amps.

The PS2/81 is mounted on a chassis CH1/26A with index pegs at positions 18 and 42.

Circuit Description (Fig. 1)

The 50-volt input, which may be from the station battery, is applied between pins PLA 6 and 14. Some smoothing for residual ripple is provided by C2, C3 and R6-R8.

Consider first the 24-volt output. Series regulation is supplied by two paralleled circuits, TR6 and TR10 being regulating transistors controlled respectively by TR5 and TR9. The currents in TR5 and TR9 are in turn controlled by the output from the stabilising amplifier TR1 and TR2, and also by the current overload limiting stage TR3 and TR4. The control voltage from the stabilising amplifier depends on the difference between the reference voltage across zener diode D1 and the proportion of the output voltage across R10.

The overload limiter transistor pair, TR3 and TR4, is cut off for output currents up to the full rated value. As the current through the resistor pairs R14-R15 and R18-R19 increases above this figure, the base of TR4 becomes negative with

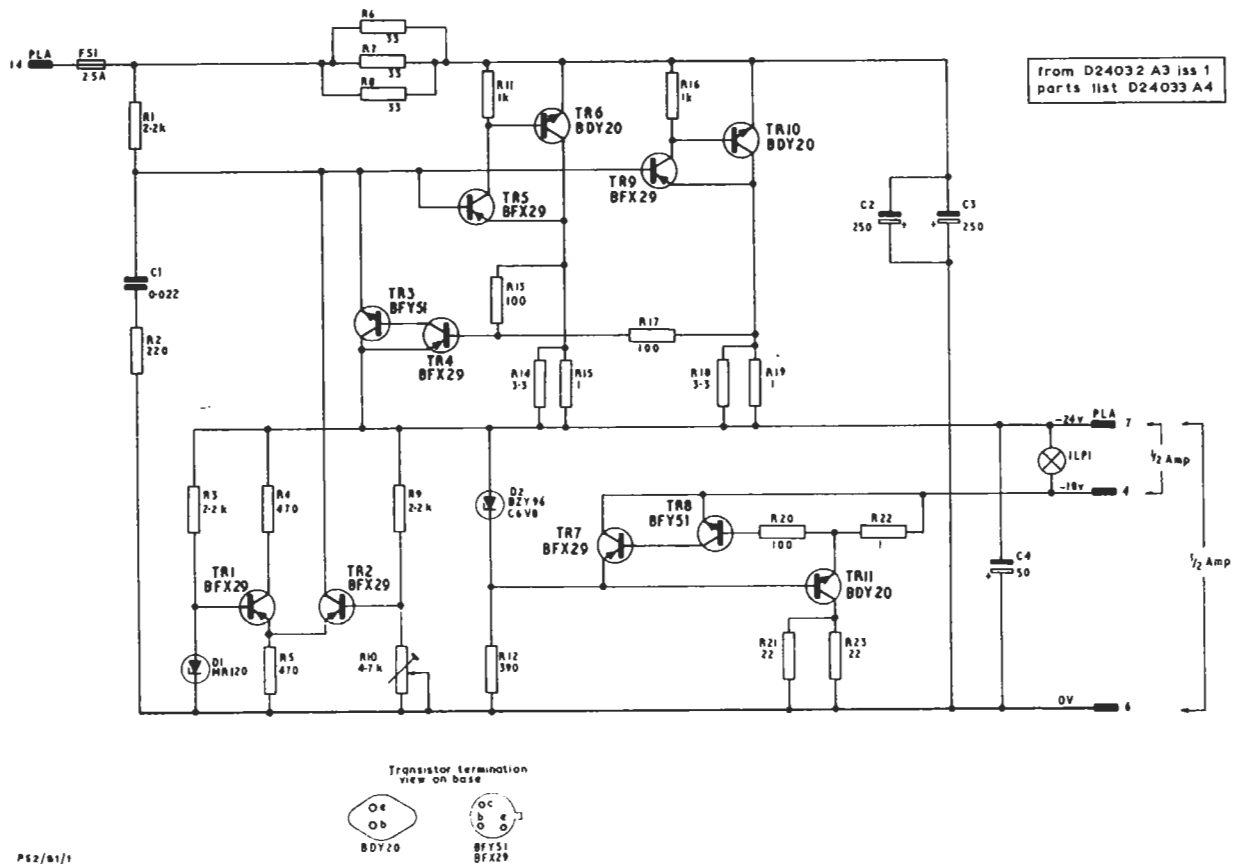


Fig. 1. Circuit of PS2/81

respect to the emitter and the pair conducts. The voltage developed across R1 increases and the collector currents of TR5 and TR9 fall. Hence the base currents of TR6 and TR10 also fall, thus limiting the current to the load.

The 6-volt supply is derived from the 24-volt supply via the series regulator TR11, whose base potential is controlled by the zener diode D2. TR7 and TR8 form the current limiter which comes into operation when the load current in R22 causes TR8 to conduct.

Test Specification

Input

50 volts, 1.5 amps d.c.

24-volt Output

Output voltage 24 volts $\pm 0.5\%$
(adjusted by R10)

Maximum load current 1 amp
(6-volt output unloaded)

Maximum load current 0.5 amp
(6-volt output loaded)

Output impedance < 0.2 ohm d.c.,
 < 1 ohm up to
100 kHz

Short-circuit current 1.6 ± 0.5 amps

6-volt Output

Output voltage 6.2 ± 0.3 volts

Maximum load current 0.5 amp

Output impedance < 1.2 ohms d.c.,
 < 2 ohms up to
100 kHz

Short-circuit current 0.6 ± 0.2 amp

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