

POWER SUPPLIER CONTROL UNIT UN3/23

Introduction

The UN3/23 is the control unit of the PS2L/80 Power Supplier. It consists of two printed-circuit boards and has three outputs, ± 15 volts at 3 amperes and +50 volts at 50 milliamperes. The UN2/23 operates in conjunction with two external mains transformers and a UN1/117 Power Supply Regulator Unit which contains the series regulator transistors for the $\pm 15V$ supplies.

Overload and over-voltage protection is provided.

The circuit boards, the two transformers and the UN1/117 are mounted together on half a PN3/23 panel.

General Specification

Outputs

15 V supplies	+15V (+0V -100mV), 3A
	-15V (+100mV -0V), 3A
+50 V supply	+50V $\pm 0.5V$ at 50mA

Ripple Component at Full Load

15V supplies	less than 5mV p-p
50V supply	less than 10mV p-p

Output Impedance of

15V Supplies at L.F. less than 0.1 ohm

Maximum Temperature of Cooling Air Entering Unit 40° C

Power Inputs

two at 20V, 50Hz
one at 55V, 50Hz

Fuses

15V supplies 5A fast blow
250mA anti surge

Circuit Description

The circuit diagram is given in Fig.1. The 15-volt supplies are identical. The positive supply is described.

The output from the bridge rectifier D1 is 23V d.c. plus a full-load ripple voltage of 1.6V p-p 100Hz. The regulator is conventional, consisting of TR2, TR3 and

the reference zener diode D4 in association with the series regulator transistor in the UN1/117. TR1 provides a constant-current source for TR3. This circuit produces a high loop gain without a specially elevated supply rail and a high-valued collector resistor for TR3. The output voltage is set by R12. Remote voltage-sensing is used so that the interconnecting cable between the power supply and the load is included in the feedback loop. This ensures a low-impedance power source at the load. D5 in the sensing circuit provides the required d.c. voltage shift at the same time presenting a low impedance to a.c. disturbances at the load.

Overload protection is provided by TR4 and R9. TR4 is normally cut off but, under overload conditions when the potential across R9 rises, it conducts. This occurs when the load current reaches 10 to 15 amperes and causes TR2 to be starved of current. The current drive into the regulator transistor base (TR1 in the associated UN1/117) is reduced and a constant-current condition is established. With a current of 10 amperes flowing, the fuse FS1 fails in under 10 seconds.

Over-voltage protection is provided by the thyristor CSR1. If the output voltage rises to 16.5 volts, the increased voltage drop across R14 triggers CSR1 into conduction. This applies a short circuit across the output and fuse FS1 fails as described above.

R51 and R52 are replaced by D15/D16 and D17/D18 when rapid on-load changeover of suppliers is required.

The 50-volt supply is conventional. D13 provides the reference potential and R43 sets the output voltage. Overload protection is given by TR12 which limits the short-circuit current to 120mA. Over-voltage protection is not provided.

Maintenance

Any maintenance checks must be carried out with the unit in the parent unit PS2/80.

Reference

1. Designs Department Specification No. 8.357(69).

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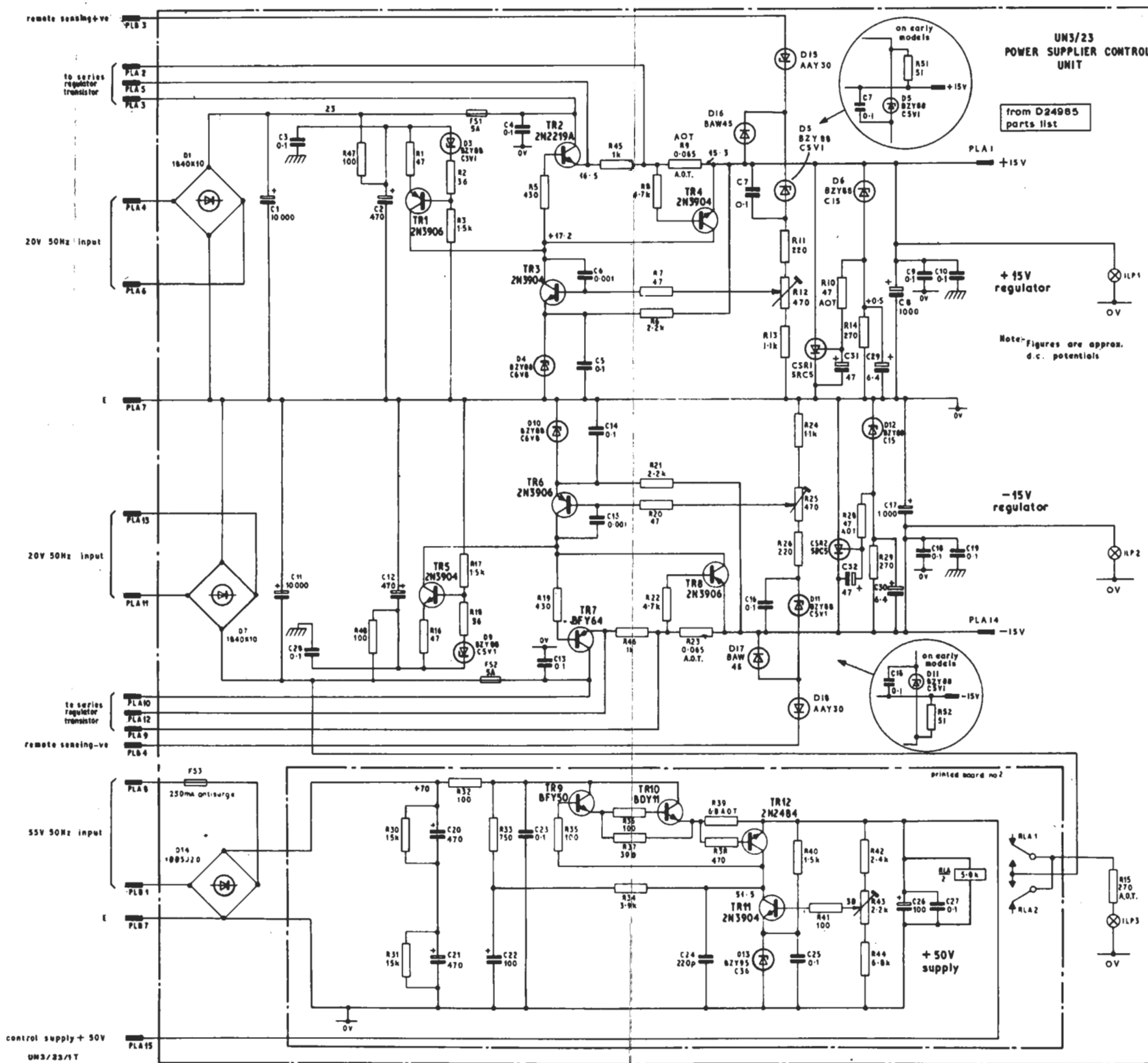


Fig.1. Circuit of the UN3/23