

SECTION 4

STABILISED POWER-SUPPLY UNIT SPS/3

Introduction

The Stabilised Power-Supply Unit SPS/3 is designed to feed the Television Test Generator TV.TG.1. It provides a stabilised positive h.t. supply of 270 volts at a maximum current of 250 mA, and a stabilised negative h.t. supply of 100 volts (nominal) at a maximum current of 60 mA. Two 6.3-volt r.m.s. feeds are available, both rated at a maximum current of 5 amperes. The 270-volt h.t. supply can be varied within narrow limits about the mean value.

The unit is mounted on a $19 \times 8\frac{3}{4}$ -inch panel suitable for bay mounting; when so mounted, the unit projects through the bay. Power dissipation in the unit is high, and adequate ventilation must be provided. Because of ventilation requirements, the unit must not be operated when resting on a flat surface.

Circuit Description

A complete circuit diagram of the unit is shown in Fig. 4. The stabilised positive h.t. supply is

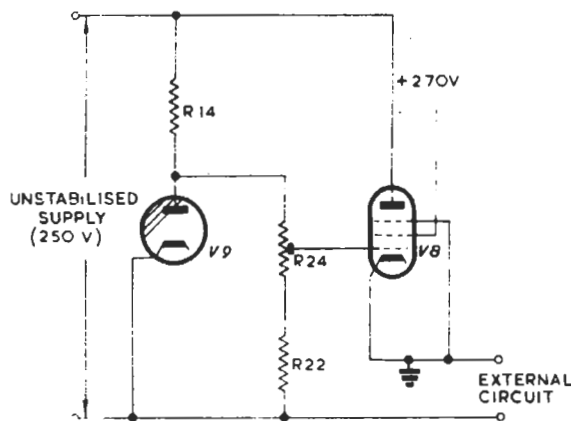


Fig 4.1. Simplified Diagram of Negative H.T. Supply Stabilising Circuit

almost identical with that described in Section 1 and will not be described further here.

The stabilised negative h.t. supply employs a conventional h.t. rectifier circuit, using valve V5. The external circuit acts as a load for the cathode-follower V8, as shown in the simplified circuit diagram of Fig 4.1. The grid of V8 is fed from a source of stabilised potential (V9) and thus the

cathode voltage is also stabilised. It will be noted that the stability of the output voltage is thus critically dependent upon the performance of V9. The source impedance of the stabilised supply is the output impedance of V8, some 100 ohms. The output voltage can be varied within narrow limits by R24.

Metering facilities are provided by meter M1, which can be switched to measure either h.t. voltage. The meter is scaled 0-200 and is of 1 mA F.S.D. An internal resistor of 200 kilohms is included, so that the meter reads 0-200 volts when connected to the negative 100-volt supply. External resistors (R18, R19) are brought into circuit when the meter is set to check the 270-volt supply, so that the meter reads 400 volts F.S.D.

Input and Output Connections

Mains input and power output connections are made by plugs and sockets at the rear of the unit. The mains input plug is of the three-pin recessed type (Bulgin type P.73), the socket being located by a keyway. The power output is taken by means of an eight-way socket (F. and E. type JS-8-AB).

Mechanical Construction

The unit is mounted on a 19-inch panel. Behind this front panel and at a distance of $6\frac{1}{2}$ inches from it, is a second panel secured to side panels, attached in turn to the front panel. On this second panel are mounted the major components. The unit is enclosed by a cover, detachable from the rear, which is located in use by the side panels. The cover is cut out at the rear to give access to the input and output connectors.

Access to the valves from the front of the unit is given by a detachable plate, secured to the front panel by two catches, each attached to a handle projecting through the plate.

Valve Data

Valve	Type
V1, V2	UU5
V3, V4	12E1
V5	EF50
V6	85A1
V7	6X5
V8	EF55
V9	7475

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General Data

Voltmeter Weston model S33, 0–200 V

Test Specification

(a) 270-volt supply

1. The output voltage control should vary the output from 260–280 V (minimum range).
2. With the chassis of the unit connected to h.t. negative, the hum level measured on a high-impedance oscilloscope should not exceed 20 mV d.a.p. at an output current of 235 mA at 270 V.
3. With the output voltage set to 270, the output voltage should not vary by more than 3 V between no load and 235 mA.
4. With an output voltage of 270, load current of 235 mA, and nominal 230 V a.c. input, the output voltage should not vary by more than 3 V for changes in the a.c. input of 20 V.
5. Sudden changes of 10 per cent in the input

mains voltage should produce transient changes in the output of not more than 40 mV d.a.p. at any value of load current.

6. The accuracy of the output voltage reading on the internal meter should be within 5 per cent.

(b) 100-volt supply

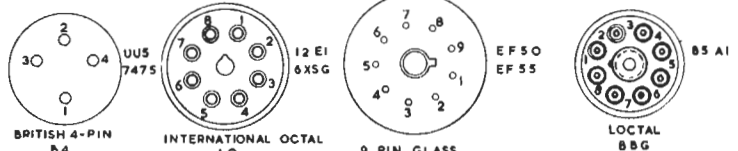
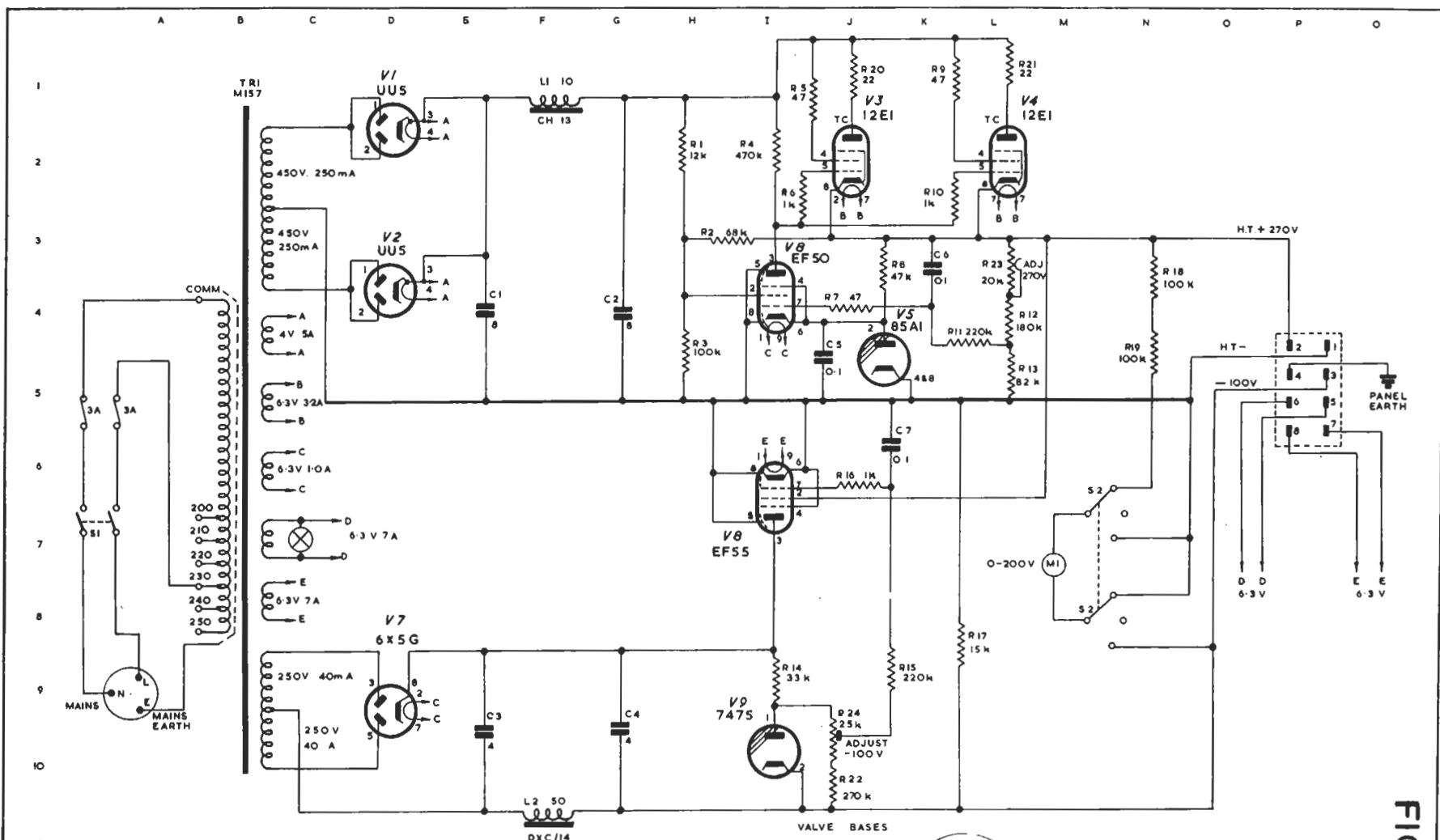
1. The output voltage should be variable over the range 90–95 V.
2. With the chassis of the unit connected to h.t. negative, the hum level measured on a high-impedance oscilloscope should not exceed 0.3 V at any value of output current.
3. The output voltage should not change by more than 3 V when the load current changes from 30 to 55 mA.

- (c) The l.t. voltages should be 6.3 ± 0.3 V at full load.

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SPS/3 STABILISED POWER SUPPLY UNIT CIRCUIT

FIG 4

V4