24. As the AC supply is already regulated to ± 2%, it is necessary to stabilise the HT supplies only against changes in load. This is done by means of shunt stabiliser units, driven by control amplifiers that are fed by the signals across preset resistances in the negative sides of the supply circuits. The currents in the stabiliser units vary so as to keep the total direct current, and hence the terminal voltages, substantially constant. For marginal-test purposes, extra resistance is switched in, which both reduces the terminal voltage directly and increases the output signal to the control amplifier. The amount of resistance switched in should be set by means of the thumb wheels projecting through the engineer's panel, to give a drop of 10% on the three supplies. (See Vol 4).

25. The shunt stabiliser unit is shown in full in fig. 2.12. Two of these are used in parallel for the +200V supply, three for the +300V supply, and one for the -150V supply. Each unit comprises ten 12E1 tetrodes in parallel, a jack socket and selector switch enabling the anode currents of the valves to be monitored separately. The screens of the -150V and +200V stabilisers are taken to the same potential as the anodes; a separate potentiometer is provided for adjusting the screen potential of the +300V stabiliser. Meters are provided to show the total anode current of the +300V stabiliser units and the sum of the anode and screen currents in the +200V and -150V stabiliser units. A switched meter connected across shunts in the earthy sides of the supplies measures the total currents consumed by the stabilisers and the computing equipment together. Another switched meter is provided to measure terminal voltages within the left-hand bay of the power-supply cabinet.

26. Potential levels in the control amplifier are held constant with respect to one side of the smoothing capacitor, as can be seen from the diagram. (Fig 2-14). The other side of the smoothing capacitor is capacitively coupled to the grid of V4A in the amplifier to give the necessary AC control. Since the computing cabinet and the power-supply cabinet may be installed some distance apart, the AC control connection for the +200V supply, which must have an output impedance no greater than 0.1 ohm, is made at the terminal panel on the computing cabinet (fig. 2.9). The DC feed to V4a, in the amplifier is pre-adjustable by means of RV2 to give the desired shunt current and, hence, terminal voltage.

27. The amplifier inputs, referred to the potential across the neon stabiliser V3, are amplified in V4a and V7a and fed through cathode-follower V7b to the grids of the stabiliser valves. To prevent the stabiliser anode current from rising above a safe limit, a portion of the potential across a common cathode resistance of 7.5 ohm, (two 15-ohm, 12-watt resistors in parallel) is applied to the grid of V4b. The anode of V4b is coupled to the anode of V7a and hence to the grid of V7b; if the stabiliser current rises too high, V4b cuts on, and the resulting potential drop across anode load R11, transmitted to the grid of V7b, limits the output of the amplifier and consequently the potential rise on the grids of the stabiliser valves.

**ALARM CIRCUITRY**

28. Belling-Lee spring-contact alarm fuses are used. When the contact spring is released, the effect is to short-circuit a secondary winding of a transformer, the primary winding of which is across the bridge rectifier that supplies one of the alarm