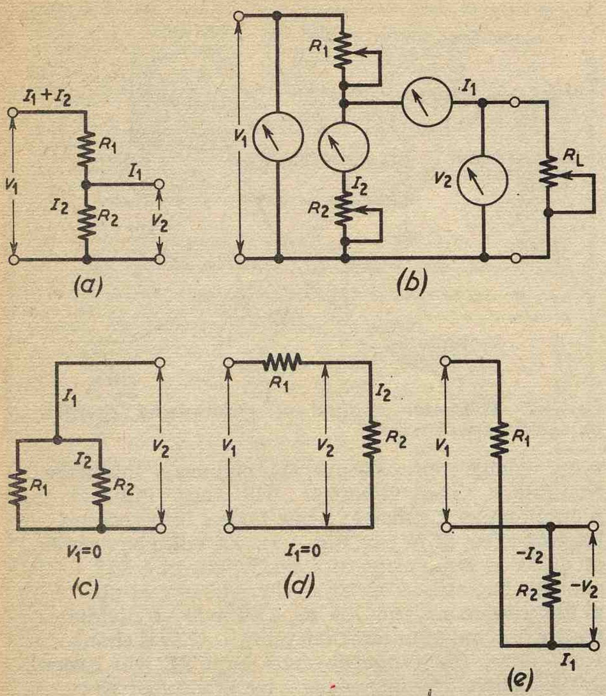


*Fig. 4.4. (a) voltage divider circuit; (b) direct simulation of (a); (c), (d) and (e), three variations on (a)*

but it does involve at least six variable quantities $V_1$, $V_2$, $I_1$, $I_2$, $R_1$, and $R_2$, and to solve a problem for any unknown, one of six equations would be required, based on

$$R_1 = \frac{V_1 - V_2}{I_1 + I_2} \qquad \text{(Eq. 4.5)}$$

and

$$R_2 = \frac{V_2}{I_2} \qquad \text{(Eq. 4.6)}$$

Thus, although it would be ridiculous to use the computer to find one specific answer to one particular voltage divider problem, the paperwork involved in solving six equations for several sets of variables could become surprisingly laborious. What the computer does in fact allow is the solution to literally any voltage divider problem under any conditions, without the need for re-programming.

To solve Eq. 4.5 and Eq. 4.6 simultaneously on UNIT "A", the equations are first transposed for terms $V_2$ and $I_2$, which are common to both.

$$V_2 = V_1 - R_1(I_1 + I_2) \qquad \text{(Eq. 4.7)}$$

and

$$I_2 = \frac{V_2}{R_2} \qquad \text{(Eq. 4.8)}$$

Next, both equations are linked to give a self-enforcing systems, shown diagrammatically as,

$$V_1 - R_1(I_1 + I_2) = V_2 \longrightarrow \frac{V_2}{R_2} = I_2$$

where the answer to Eq. 4.5 is one of the terms of Eq. 4.6 ($V_2$), and the answer to Eq. 4.6 is one of the

*Fig. 4.5. Programme layouts for voltage divider analysis (a) (right) symbolised diagram, (b) (below) patching circuit*