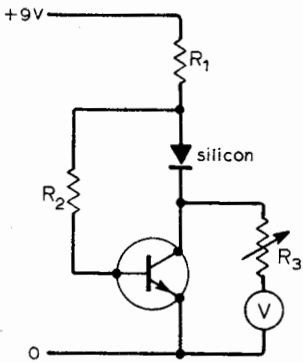
Measuring transistor gain

This transistor checking device has the advantage of simplicity in checking silicon transistors in which leakage current is negligible and measures gain over a wide range satisfactory as it is indicated on the ohms scale of a multimeter. The meter is set to give full scale reading by adjusting R_3 with a transistor with base and emitter only connected. (The meter is used as a voltmeter, R_3 being such as to bring it to approximately 9V full scale.) When the collector is connected, β will be given by the reading on the ohms scale, provided $R_2 = (R_{mid} - 1)R$, numerically. The value R_{mid} is the mid-range value of the ohms scale and R is the parallel combination of R_1 and the total resistance in the meter circuit.

In my case $R_1 = 1\text{k}\Omega$, the meter resistance was $300\text{k}\Omega$ and could be neglected and R_{mid} was 18Ω. The use of an $18\text{k}\Omega$



resistor for R_2 was sufficiently close for practical purposes.

As an alternative, R_3 may be adjusted with the transistor removed to give a meter indication of "-1 ohm", that is, just beyond the normal full scale reading.

Once the meter is set it does not need readjustment while similar transistors are being checked. If the ohms scale is not of a suitable range, it may, of course, be multiplied by a factor so long as R_2 is calculated using the "scaled" R_{mid}.

R. G. T. Bennett,
Christchurch, New Zealand.