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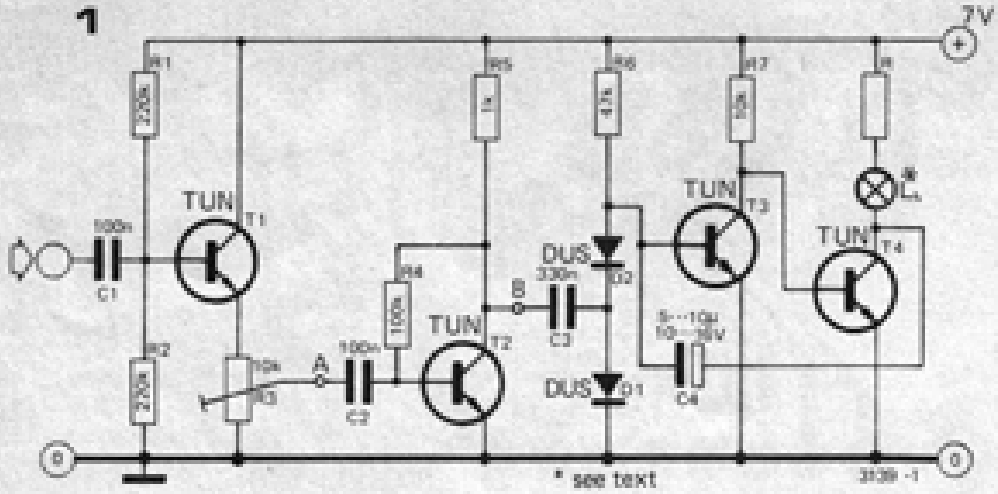
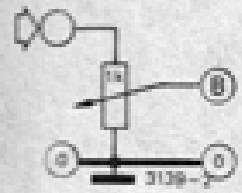
# overmodulation indicator

J. Tabel

1




2




During recording on tape, it is necessary to ensure that the signal voltage at some point does not exceed a predetermined level. A similar situation can occur with (pre-)amplifiers and measuring instruments.
In such cases a meter-type indication is not the only possibility – and indeed it is invariably not the best. An overmodulation indicator that lights a lamp is cheaper – and gives a more distinct warning. The accompanying circuit is designed for this purpose.
Transistor T1 is an emitter follower, providing a high input impedance (about 100 kΩ) to minimize the load on the signal source. The trimmer R3 sets the voltage at which the lamp will just light up (overmodulation level).
The circuit around T2 is a x 100 amplifier which enables the threshold to be set as low as 5 mV. When this high sensitivity is not needed, i.e. when the threshold is 0.5 volt or higher, the stage can be omitted. The points A and B are then bridged. If the high input impedance is also unnecessary, as for instance when a loudspeaker-connection is being monitored, it is obviously permissible to omit the input stage also. Figure 2 shows how the input is made to point B in this case.
The circuit following point B is the indicator proper. The current through R6 normally 'bottoms' T3, so that T4 is cut off. Alternating signal voltage at point B however, rectified by the action of D1, D2, C3 and C4, will cause a negative drive to be applied to T3 base. When this AC voltage exceeds about 0.5 volts, T3 will no longer be bottomed, so that T4 will start to conduct. 'Monoflop' action via C4 will now ensure that even short signal peaks are clearly indicated by the lamp.
When selecting the type of lamp, one should note that the maximum available current is about 100 mA. With a supply voltage of 7 V as shown, the lamp should be a 6 ... 7 volt type. If circumstances dictate, a resistor can be inserted in series with the lamp. Given the supply voltage ($V_B$), the lamp voltage ($V_L$) and the lamp current ($I_L$) in amps, the series resistor (R) value required is:

$$R = \frac{V_B - V_L}{I_L}$$

To take an example, suppose that a 6 volt 50 mA (= 0.05 A) lamp is to be used on a 9 volt supply:

$$R = \frac{9 - 6}{0.05} = 60\ \Omega,$$

for which the nearest lower standard value of 56 Ω would be taken.