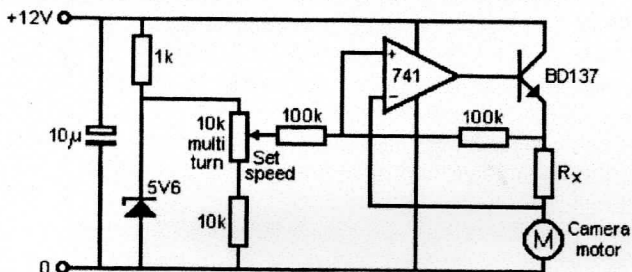


The motor

Whilst in a monitor the incoming video signal controls the speed of the motor, in a camera the motor speed controls the video signal. Different types of motors can be used. The speed of an AC motor is governed by the supply frequency and the number of poles on the rotor. Whilst a dynamo is normally a generator, applying an AC supply it will act as a motor. At 50 Hz an eight-pole dynamo will rotate at 750 rpm, which is the correct speed for NBTV. Whilst small motors of this type are rare rather than common, a bicycle dynamo can be used, although it will need to be turned by hand to start. By using dynamos on both camera and monitor the common ac supply will keep both units in synchronisation. The most popular motor used however is the small DC motor 'liberated' from an old cassette recorder. It is important to ensure the motor has not got an internal speed regulator fitted. If it has this can be easily bypassed. In its simplest form a variable DC voltage is applied to the motor to vary the speed. This is what the motor control in the power supply circuit does.

Improved speed control

The natural tendency of the motor is to change speed as the windings 'heat up'. This can be compensated with an improved circuit that is well known and is also used in cassette recorders. The back-emf of the motor is kept constant by a normal operational amplifier. The losses in the copper wire of the motor are compensated because the motor is operated in a wheatstone bridge circuit that also contains a copper wire wound compensation resistor R_x with the same resistance and the same heating-up characteristics.



The exact motor speed is judged by observing the spokes of a stroboscope disc glued to the centre of the scanning disc, illuminated by the light from an AC driven neon or fluorescent tube. In

50 Hz supply areas an eight spoke strobe is observed stationary at 750 rpm, this is 12½ Hz. In 60 Hz areas, including the USA and Japan, a 10-spoked strobe should be used, which will appear stationary at 720 rpm, i.e. 12 Hz. Small constant slip frequencies are acceptable.

Monitor part

The next parts are the LED cluster and LED driver circuit. They are identical to the monitor in the previous chapter. The sync pulse circuit and automatic motor synchronisation circuit are not needed. The video input is connected directly to the detector head, which is a separate unit.