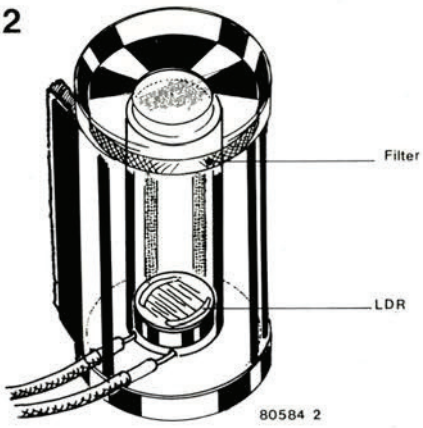
exposure lights off when switching on the enlarger lamp.
The role of potentiometer P2 has not yet been discussed. It enables the characteristics of the bridge amplifier to be altered to suit different kinds of paper, and should be provided with a suitable scale. The usefulness of the circuit will depend on how well it is calibrated.
Readers who wish to carry out spot measurements can simply mount the LDR into a cardboard tube. This is then placed inside a metal film can and covered by a piece of perspex which has been slightly sanded with emery paper. For details see figure 2.
When measuring the exposure time the perspex can be removed and a larger piece placed directly under the enlarger lamp. No details of the

2



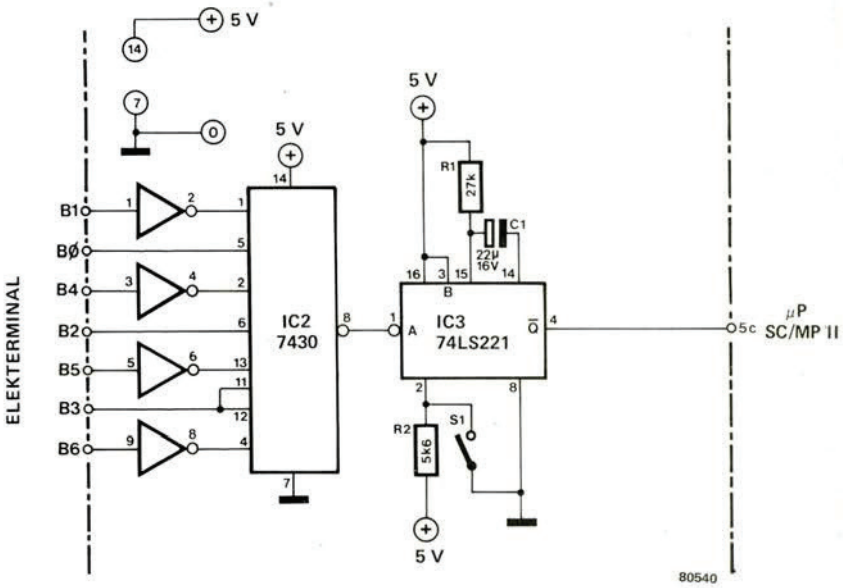
negative will be visible when the enlarger is switched on. The perspex is, of course, removed during exposure.

The circuit is calibrated by making test strips. Potentiometer P2 is given a linear scale division numbered 1 . . . 20. With S2 in the 'time' position, P1 is adjusted until a set of whole numbers is obtained which correspond to the length of time the lamp is on. This will form the scale for P1. Once this has been done a test strip is made using the old method.
The same exposure time is then selected with P1. Test strips are made with P2 in various positions until the best results are obtained. The positions of P1 and P2 are then written on the test strips to provide the correct coding for all types of paper.

D.S. Barrett

13 cassette interface adaption

For an ordinary cassette tape to be used as long term memory with the Elektor BASIC microcomputer a special cassette interface will have to be used. An example of this was published in the May 1980 issue of Elektor. The difference between the special and the ordinary kinds of cassette-interface aren't so great that the latter type can not be adapted. The small addition required is described here and involves no modification to the existing system.
Most interfaces operate on the FSK method according to the Kansas City Standard. With the aid of a device which makes the BASIC microcomputer stop for a certain period of time at the end of each line, virtually any cassette-interface can be used.
When the microcomputer is being programmed, a prompt automatically appears at the beginning of each line. This is generated by the computer in response to the CR (carriage return) at the end of every line. There is plenty of time for generating these prompts when a program is being entered by hand via the keyboard, but not when it is being entered from a tape that was recorded with a 'LIST' instruction (FSK modulator connected to flag Ø). In the latter case, the prompt will be generated while information is being entered. The result is that errors occur in the data that is stored in memory.
The circuit shown here works simply yet effectively. At the end of every line the processor is stopped for a period of time (during recording) so that an 'empty' space is recorded on the tape. This period is long enough



N1 . . . N4 = IC1 = 74LS04

to give the computer time to generate a prompt during playback without causing data loss.
The existing cassette interface (for instance, as described in Elektor's January issue 1978) is connected to the serial input and output of the BASIC computer in the normal fashion. Points BØ . . . B6 of the circuit shown here are connected to the correspondingly marked lines of the Elekterminal (Elektor December 1978) — of course, without disconnecting them — and the output of the circuit is connected to pin 5c (NHOLD) of the BASIC computer.
When a program is to be recorded on cassette, S1 of the extension will be closed. Then the BASIC 'LIST' instruction is entered (without carriage return). The cassette recorder is switched to record and is started. The return key is then pressed and the data is output from the computer.
When the circuit detects the hex code 'ØD' (carriage return) at the end of each row the output of IC2 goes low and triggers the monoflop IC3. This causes the SC/MP to stop. The duration of the monoflop has been selected to allow for a long enough space to be recorded but not so long as to cause unnecessary delay.

H. Schaller.