

universal display

It is frequently necessary to have available a numeric display for many projects such as frequency counters, digital voltmeters etc. It is a tedious and untidy business to build up such displays on matrix board, so Elektor have designed a universal display which should satisfy the requirements of most enthusiasts. The display may be used with seven-segment LED indicators.

The universal display is modular in construction and its basic form consists of a board to accommodate two displays and their associated decoders. The system may be extended to any number of digits and decade counter/latch boards may also be added.

The universal display uses the popular 7447 decoder. The display format of this decoder is given in figure 1. However, for digits 6 and 9 the improved format described in Elektor 2, p. 258, is employed. This is shown in figure 2. The basic configuration of the decoder with the additional transistors is shown in figure 3 and the complete circuit of a display module for use with LED displays is given in figure 4.

Construction

Double-sided boards are employed in the construction of the display module and it may be seen from figures 5 and 6 that components are mounted on both sides of the board. It should be emphasised here that great care is required in the assembly of these boards due to the degree of miniaturisation involved.

The soldering iron must have an extremely fine tip and soldering must be done extremely quickly to avoid peeling the fine track from the board. The boards available from Elektor employ plated-through holes, so that it is unnecessary to solder to component leads on both sides of the board. Simply solder on the opposite side of the board to that on which the component is mounted. ◀

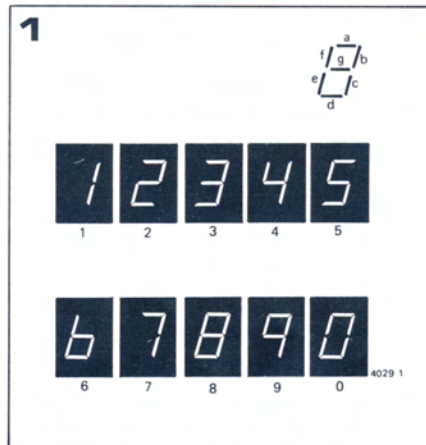


Figure 1. The display format produced by the 7447 decoder.

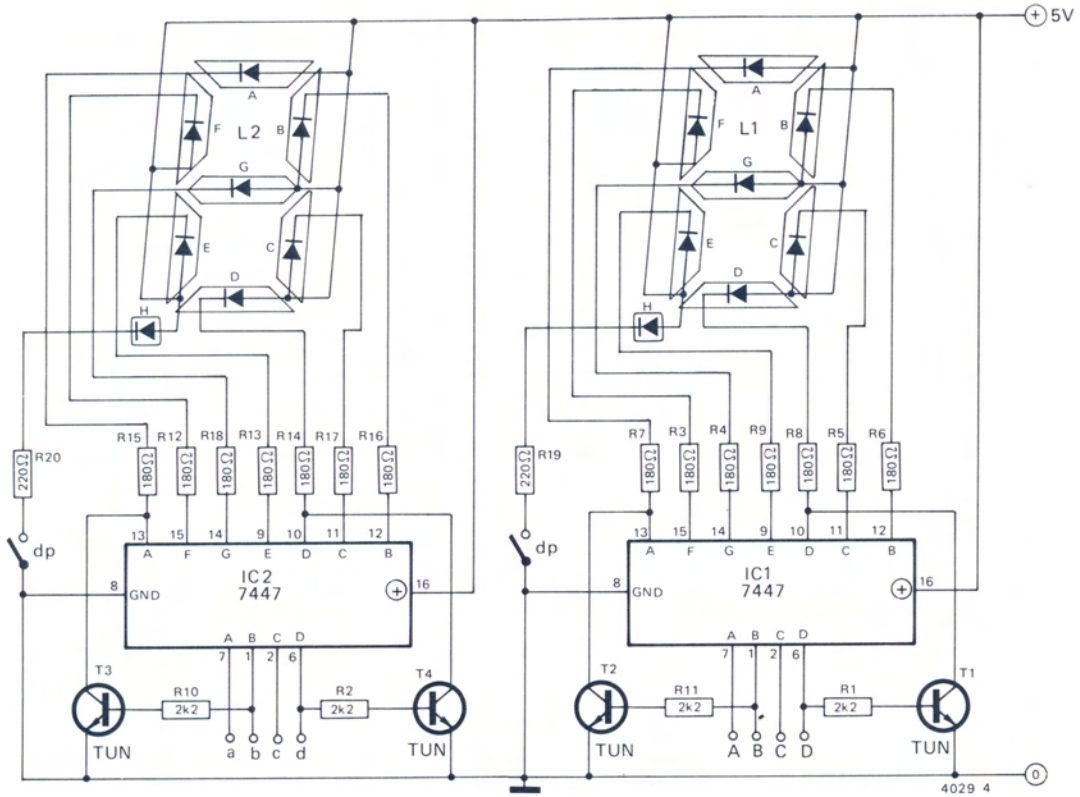
Figure 2. The improved presentation of the digits 6 and 9 as used in the universal display.

Figure 3. The circuit used with the 7447 to achieve the improved 6 and 9 display.

Figure 4. Circuit of the LED version of the universal display. Note that the decimal point series resistor has a higher value than the segment resistors to achieve the same luminous intensity.

Figures 5 and 6. The p.c. board and layout for the LED display. The track shown in feint in the component layouts is the side of the board on which the components are mounted, i.e. the components are mounted directly on top of the track shown. Figure 5 shows the components on the back of the board, and figure 6 shows the display side. (EPS4029-2).

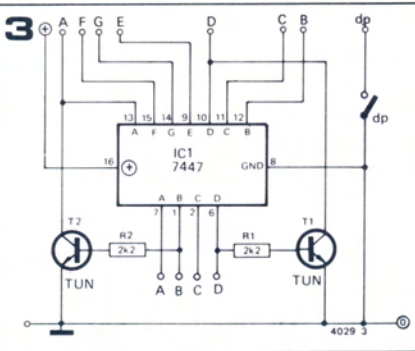
4



2



3



Components list for figure 4:

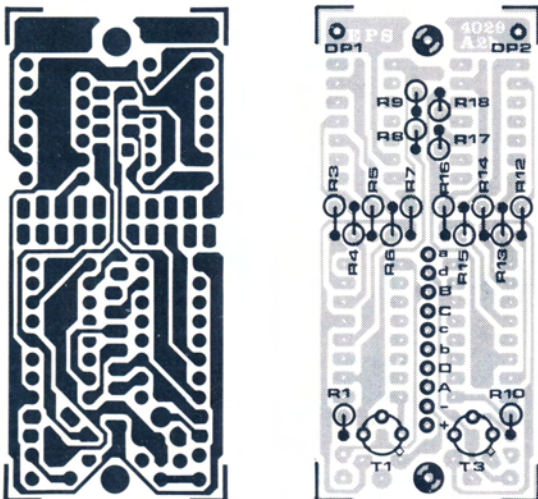
Resistors:

R1, R2, R10, R11 = 2k2
R3 to R9, R12 to R18 = 180 Ω

Semiconductors:

T1 to T4 = TUN
IC1, IC2 = 7447
L1, L2 = e.g. H.P.5082-7730 or 7750, Opcoa SLA 1, T.I. Til 302, Data Lit DL 707.

5



6

