elektor shorthand

From various enquiries it has become clear that some of our readers feel that they have been plunged in at the deep end. Elektor's 'shorthand' style of symbols and conventions seems to have led to some confusion, in spite of our efforts to the contrary, so some further explanation seems to be called for.

Resistor and capacitor codes

When giving the values of resistors and capacitors, decimal points and large numbers of zeros are avoided as far as possible. To this end, extensive use is made of the international abbreviations:

p (pico-)	=	10^{-12}	= one millionth of one millionth;
n (nano-)	=	10^{-9}	= one thousandth of one millionth;
μ (micro-)	=	10^{-6}	= one millionth;
m (milli-)	=	10^{-3}	= one thousandth;
E	=	10^{0}	= unity;
k (kilo-)	=	10^{3}	= one thousand times;
M (mega-)	=	10^{6}	= one million times;
G (giga-)	=	10^{9}	= one thousand million times;
T (tera-)	=	10^{12}	= one million million times.

Furthermore, the symbols Ω (ohm) and F (farad) are usually omitted, since it is normal practice to state resistance values in ohms and capacitance values in farads. Finally, the decimal point is usually replaced by one of the abbreviations (p, n, μ ...) listed above (This has also been accepted practice for some years).

A few examples may serve to clarify all this:

Resistance value 2k7: this is 2.7 kΩ, or 2700 Ω.

Resistance value 470: this is 470 Ω.

Resistance value 3M9: this is 3.9 MΩ, or 3,900,000 Ω.

Capacitance value 4p7: this is 4.7 pF, or 0.000 000 000 004 7 F ...

Capacitance value 100 μ: this is 100 μF.

Capacitance value 4700 μ: this is 4700 μF, and could have been written as 4m7 — but never is.

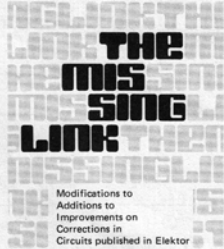
Capacitance value 10 n: this is 10 nF, and is also sometimes written (but not in elektor!) as 10,000 pF or 0.01 μF; or even as 10 kpF (10 kilo-pico-Farad), which is a horrible confusion of symbols. In the same way one sometimes finds $\mu\mu$F (micro-micro-Farad) instead of pF.

Semiconductor type numbers

Very often, a large number of equivalent types for one integrated circuit exist with different type numbers. On closer examination, a group of digits are often found to be identical, but they are pre- or suffixed with letters and digits which denote the manufacturer. As an example, a popular op-amp is variously denoted as μA741, LM741, L741, MC1741, MIC741, RM741, SN72741 or ZLD741, to name a few. To cut through this confusion, this IC is referred to in elektor as a '741' — which means that we couldn't care less who makes it, provided it meets the specifications...

In the same way, '7400' (or sometimes even '00') stands for SN7400, SN74H00, DM7400, MC7400, etc., and the last two figures are used in the same way for other ICs in the 7400 series.

Finally, transistors are sometimes listed 'TUP' or 'TUN'. This is explained elsewhere. Transistors can also be listed as BC107, for instance; a long list of equivalent types for the BC107 series is also given in the TUP/TUN list.



TV sound

The layout for the printed circuit board for 'tv sound' (elektor no. 2, p. 236) shows two capacitors marked 'C_X'. These are 100 n decoupling capacitors.

It should be noted that the circuit in its present form will not work with some of the latest models of tv receiver, as these use ceramic filters throughout (instead of IF coils) so that there is little or no stray field for the coil to pick up. Elektor laboratories are presently working on a front-end that will convert this design into an entirely independent receiver for tv sound.