

## Passive network to measure distortion

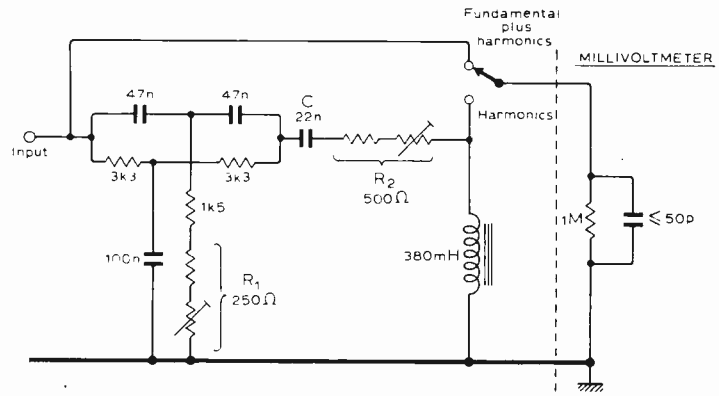
IN the common form of distribution factor meter, negative feedback equalises the response to harmonics of an applied sine wave. This feedback has the undesirable effect of making the null adjustment more critical. Less ambitious distortion measurements of low impedance sources at 1kHz can be made with this passive circuit when used with an audio millivoltmeter. A high pass LC filter removes low frequency noise in the input signal and compensates for the loss of harmonic frequencies. It also contributes about 10dB to the rejection at 1kHz so that the null adjustments are less critical. If used for setting the bias and recording levels of a tape recorder, it is much less affected by transport speed variations than a conventional instrument. Dynamic range is large because only a small fraction of the input signal appears across the inductor.

If a higher input impedance is required, 23kΩ at the fundamental reducing to 10kΩ at the fifth harmonic, all inductance and resistance values can be increased by a factor ten and the capacitance values decreased also by a factor of ten. However, this will cause an insertion loss of around a dB after equalisation.

To set up, R<sub>1</sub> is adjusted to give the best null, then R<sub>2</sub> and C are adjusted to

equalise the responses at harmonic frequencies. The prototype used 2% metal oxide resistors and 5% polycarbonate capacitors. After three years use without adjustment the circuit has remained level to within ±3% over the first twelve harmonics and still measures t.h.d. to below 0.05%.

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## Touch-tune for f.m. receivers

THIS circuit enables up to 10 channels to be touch tuned with a varicap supply voltage of up to 18V, and it features low drift with temperature variations. The 4017 is inhibited by R<sub>4</sub> until a channel is required. The appropriate section of the 4016 is turned on by finger contact which drives the clock inhibit line low. The 4017 counts clock pulses until the desired output goes high, and it is then

inhibited again. Components C<sub>1</sub> and R<sub>5</sub> ensure that channel 0 is selected at switch on.

In a receiver using the popular 1310 decoder, the circuit can be clocked at 19kHz using the buffered output from pin 10.

Alternatively, a 100Hz clock signal can be derived from a few turns of wire, around the mains transformer, and a

bridge rectifier as shown. Although no trouble has been experienced with static damage to the transmission gates, input protection as shown can be included.

For safety reasons this circuit should only be used in equipment incorporating a double wound mains transformer and an earthed chassis.

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