ECONOMICAL TIME-MARK GENERATOR

REFERRING to the time-mark generator described in the November issue, I have had a similar circuit in use for some time, and in the light of my experience would offer these comments.

1. Starting with a 10MHz crystal has two advantages. It enables the faster timebases of modern oscilloscopes to be calibrated. It also enables more easily distinguishable harmonics to be used when calibrating v.h.f. receivers.

2. Unless the oscillator is supplied with a higher h.t. voltage than the 5 volts needed for the rest of the circuit, it is difficult to get a sufficiently steep wavefront to trigger the first decade divider, especially if it is a 10MHz crystal. It is therefore advisable to insert a Schmitt trigger (7413) between the oscillator and the first 7490. This will trigger from a slowly rising wavefront.

3. The setting of C_1 is quite critical if the highest order of accuracy is wanted. An easily available standard frequency is the BBC transmission on 200kHz, which can be picked up in most parts of the country on a few feet of wire attached to a simple tuned circuit. For example in North Yorkshire, well over 100 miles from the transmitter, I get 150mV peak to peak on a 10ft aerial attached to the top of a tuned circuit, and this is much more than adequate to display on one input to a double trace oscilloscope, while the other trace is locked to the calibrator switched to the 10μs output. There will then be exactly two radio waves for every marker, and C_1 should be adjusted until the radio waves are stationary on the screen. It will be found that the adjustment of C_1 is then much too fierce, and a better result is obtained by splitting it into a fixed capacitor in parallel with a variable of some 10pF.

4. Finally, in Fig. 3, I would query how accurate counting could be accomplished. Whichever frequency was used to lock the timebase, the other would be travelling across the face of the tube at a rate of knots too fast to count.

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