FASTER THAN LIGHT?

In the January 1983 issue of **Radio-Electronics,** Dr. Harold W. Milnes claims that his experiments have shown that electric waves move over wire with velocities exceeding *c*—the speed of light.

It is not my purpose here to argue about the theoretical aspects of his article; neither will I take the space to show some flawed assumptions—such as the negligence of the inductions of his giant loop, etc.

If we want to compare the velocity of light propagation *c* with the velocity of propagation of an electrical wavefront along a wire or a transmission line, then an experimental arrangement should be—and can be—devised to let the one "race" against thc other.

A most appropriate experimental setup—which, I agree, cannot be devised on the cheap—is to initiate an electrical wave as a result of a light wave.

Needed equipment (and that is where the cost comes in): A collimated light source with remote control over a shielded wire by means of a pushbutton switch; a straight stretch of twin lead (300 ohm) transmission about 100 meters long; two photodiodes—with identical characteristics (no photo transistors—they are too slow for the experiment); appropriate biasing battereis and "pots" for the diodes—also 300-ohm termination resistances for each diode. Now, the most expensive item: a two-channel, high-frequency scope with "storage" feature.

The setup: Connect the 300-ohm terminated transmission line to "channel A" of the scope with one photo diode at the "far end" (properly biased to threshold forward conduction).

Connect the other photo diode to the input "channel B", again threshold-biased and terminated.

Align the two diodes with the collimated light source, so that the light will "hit" the diode of channel A first. Use the pushbutton also to trigger off the horizontal sweep of the scope.

Incidentally, to be able to distinguish the output of the two diodes, one might like to have the one connected in the opposite-polarity sense with respect to the other. That is easy, because we have two independent bias batteries.

After proper arrangements are made, take care that no stray light hits either diode. (Wait until dark, for example.)

Now, the experiment: Push the button briefly to obtain a light flash. The light wavefront will hit the "far" diode first and then the one of channel B about ⅓ microsecond later. The electrical wave front set off by the first photo diode meanwhile has traveled the distance toward the scope, but along wire. The position difference between the two vertical lines of the scope will tell you which one traveled faster than the other.

The possible delay between light and con-