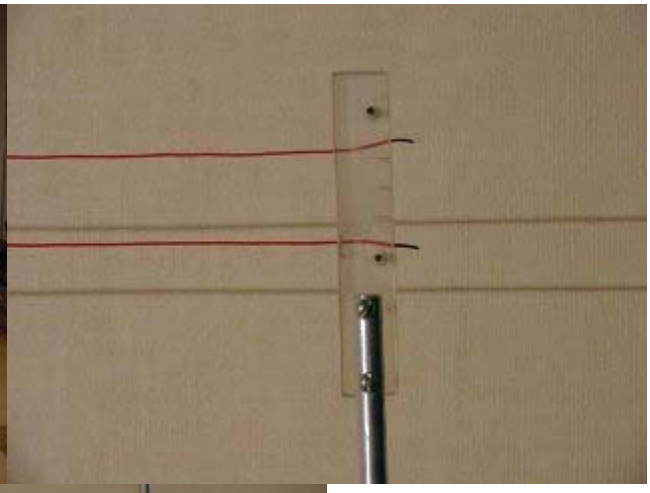
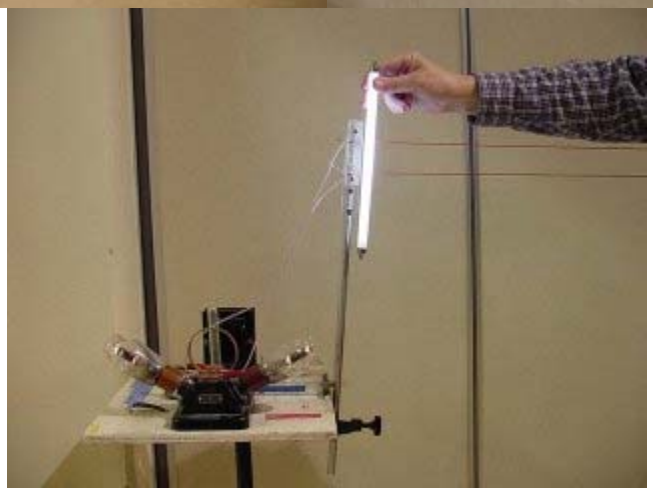
Question #253

The radio wave source from Question #251 and Question #252 is attached to an antenna, formed by two parallel wires 4.5 cm apart and approximately 4.95 m long, as seen in the photograph at the left below. The wires at the end of the antenna opposite the source are not connected, as seen in the photograph at the center below. When the oscillator is turned on and a fluorescent light tube positioned across the wires at the oscillator end, the fluorscent tube glows, as seen in the photograph at the right below.

Now suppose that the fluorescent tube is slid along the wires from the oscillator end to the opposite end, while contacting the wires as seen in the photograph at the right above. The question this week involves what the light will do: in particular, will it stay ON, will it go OFF and stay OFF, will it go ON and OFF several times as it slides along, or will it do something else?

Oh yes, you might (or might not) like some additional information, such as: the frequency of the oscillator is 82.3 MHz, and the effective wave speed in the antenna is approximately 2.72×10^8 m/s.

Let's divide the question into two parts.

Part 1. When the fluorescent tube is positioned at the far end of the antenna, it will be:

- on.

- off.

Part 2. As the fluorescent tube is slid along the tube, it will:

- (a) go off and stay off.
- (b) stay on over the full length of the antenna.
- (c) alternate between on and off as the tube is moved along the antenna.

Click here for Answer #253 after May 15, 2006.

Question of the Week

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For questions and comments regarding the *Question of the Week* contact Dr. Richard E. Berg by e-mail or using phone number or regular mail address given on the Lecture-Demonstration Home Page.