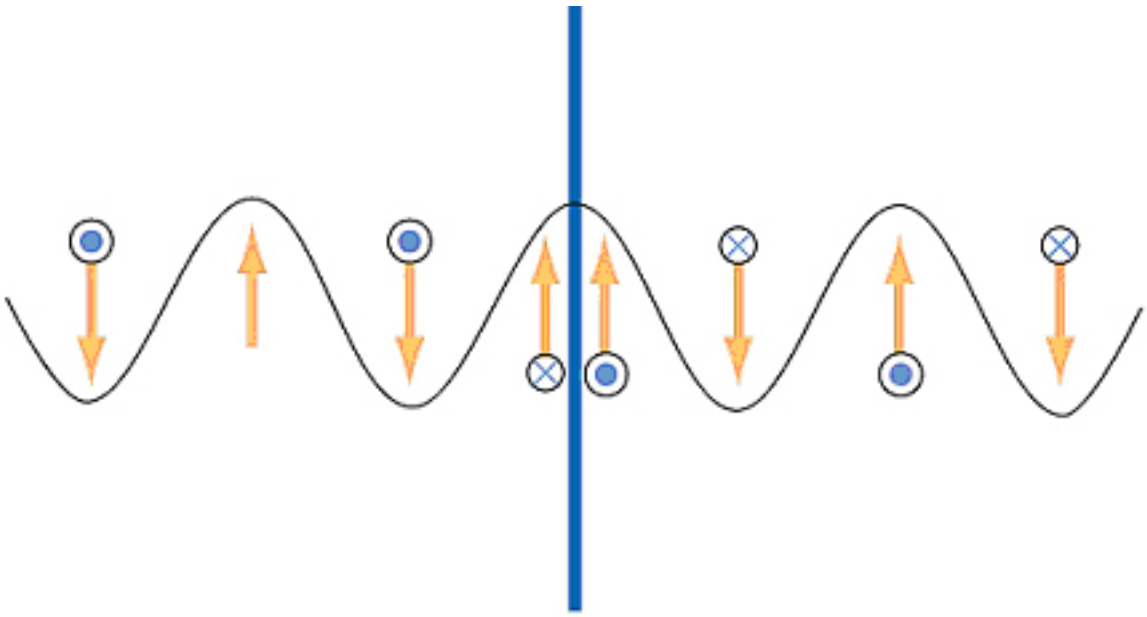
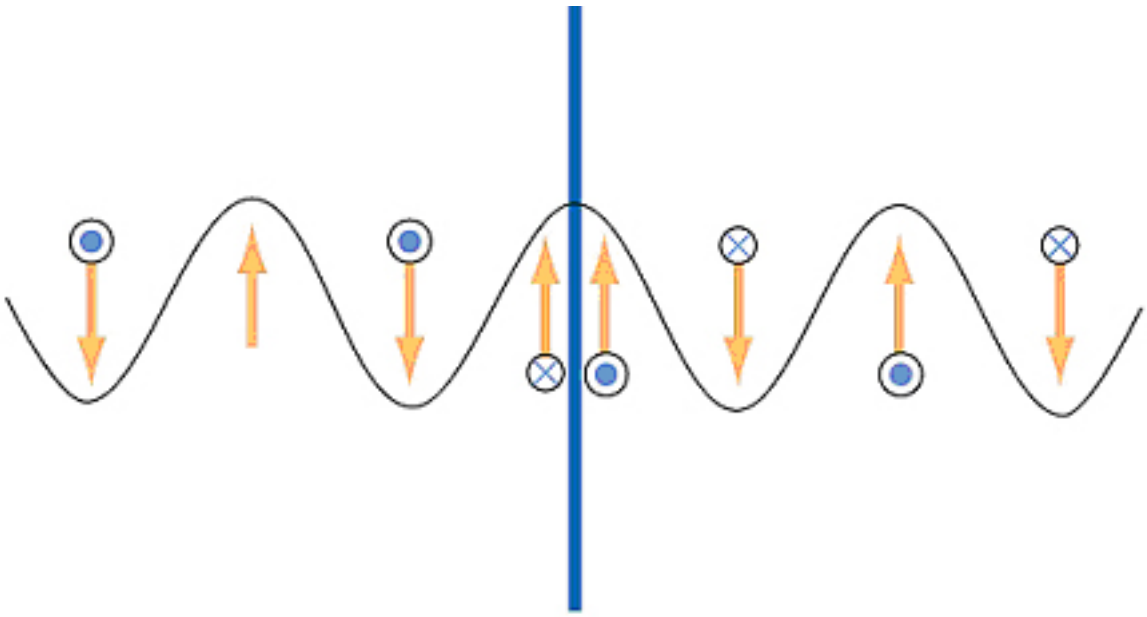
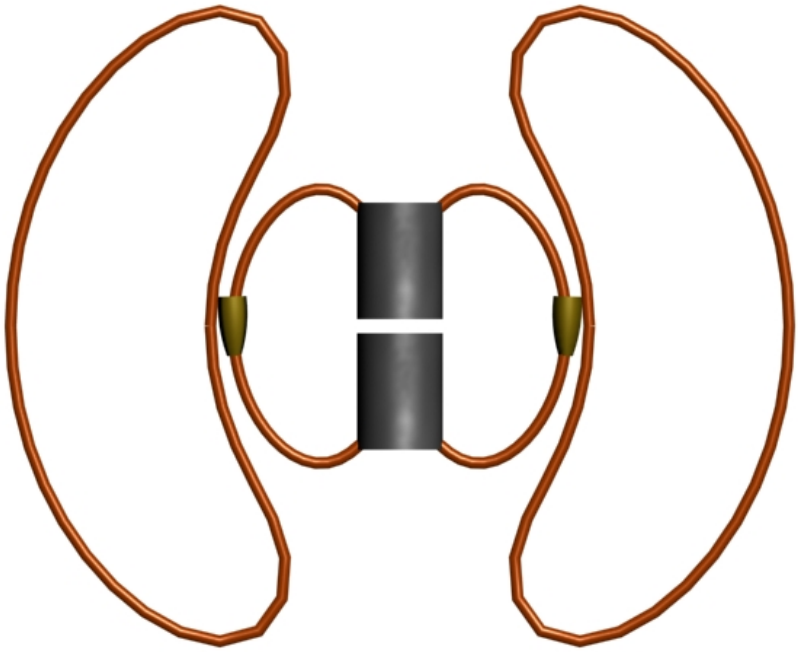


A plane E&M wave is generated by shaking a sheet of charge up and down. At the time shown, the sheet is moving

1. Up
2. Down
3. The sheet is not moving at this time
4. Don't Have A Clue

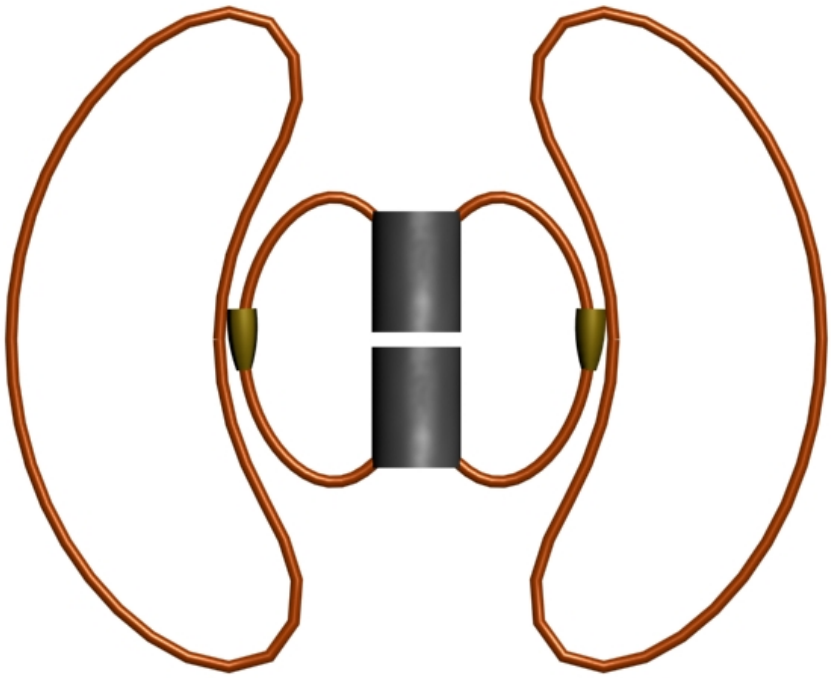


Answer: (1) Down. We can see this because the magnetic field is consistent with a current sheet carrying current downwards. Also, if we are moving the sheet downwards, the perturbation electric field right at the sheet is upwards, as it must be if it is to resist the fact that we are moving the sheet downwards.

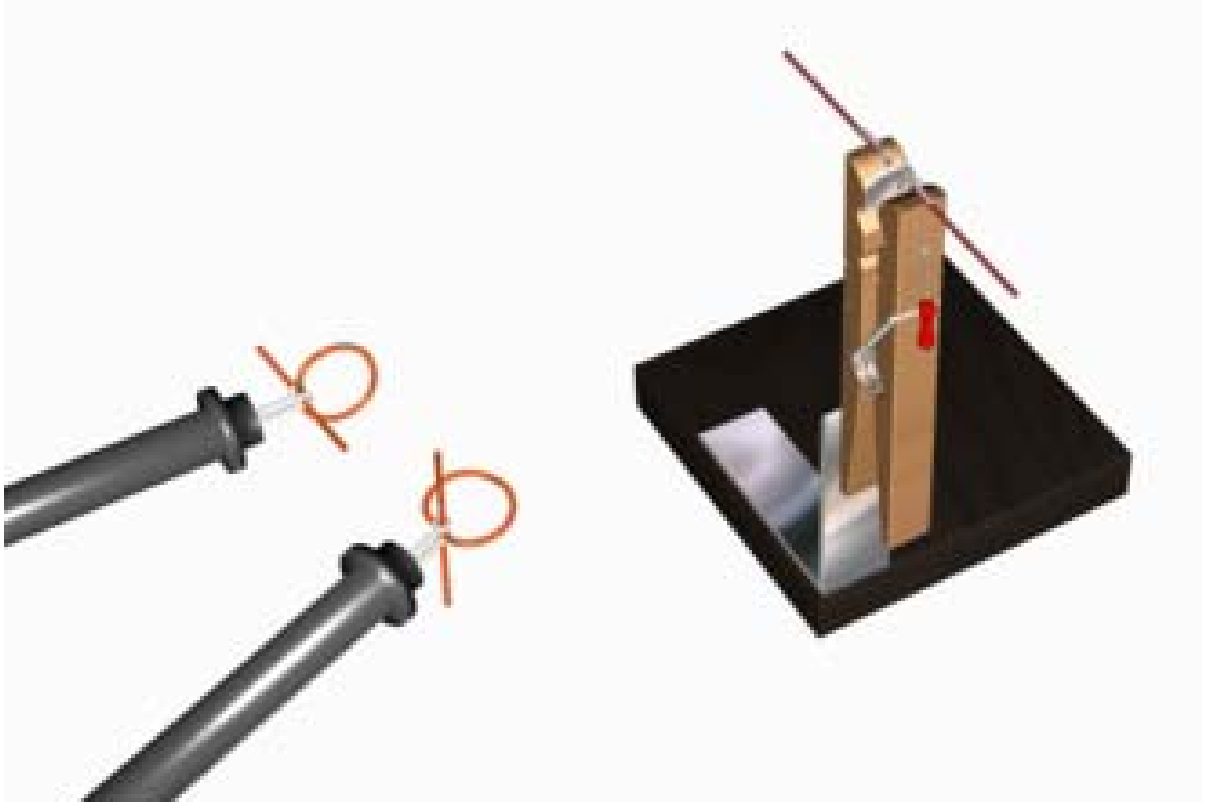


At the time shown the charge on the top half of our ¼ wave antenna is positive and at its maximum value. At this time:

1. **The current across the spark gap is about zero.**
2. **The current across the spark gap is maximum and downward.**
3. **The current across the spark gap is maximum and upward.**
4. **Can't tell from the information given.**

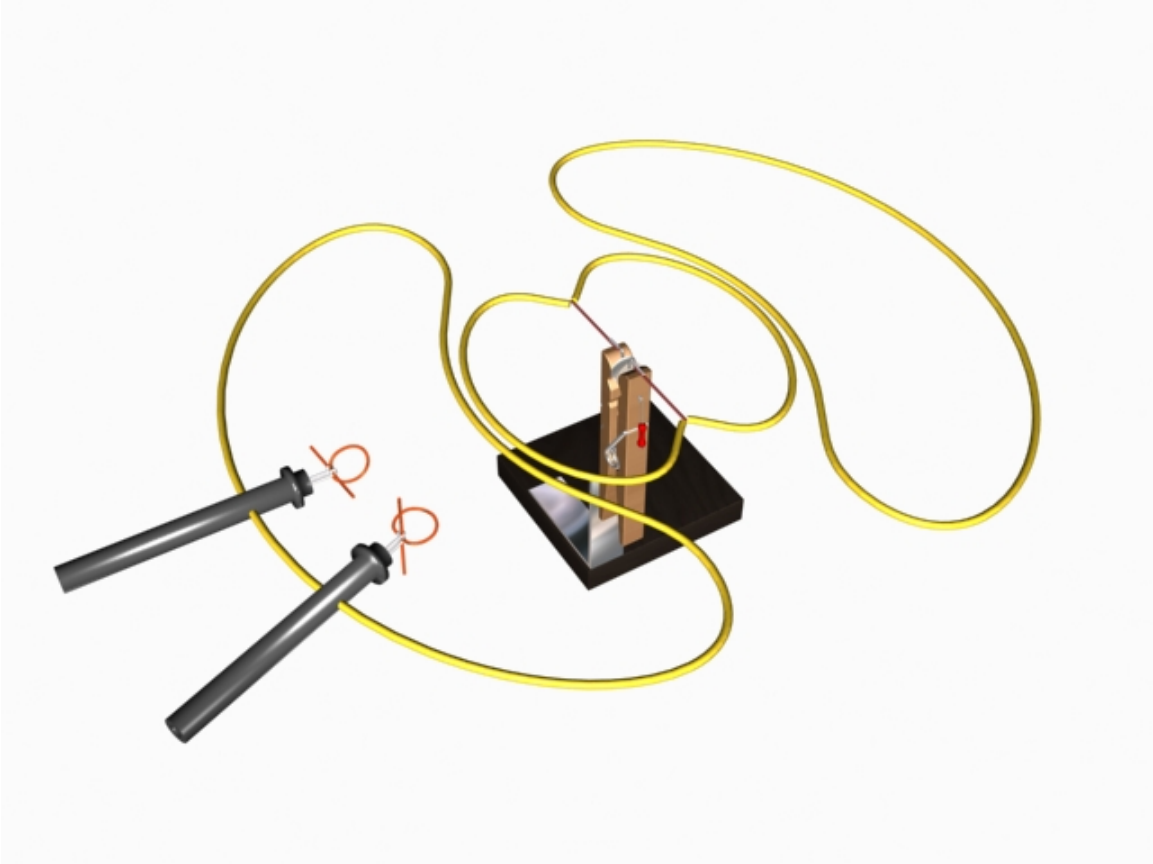


Answer: (1) The current is about zero. The charge on the top half of the antenna is at its maximum value, and therefore the current, which is the time rate of change of the charge, must be neat zero.

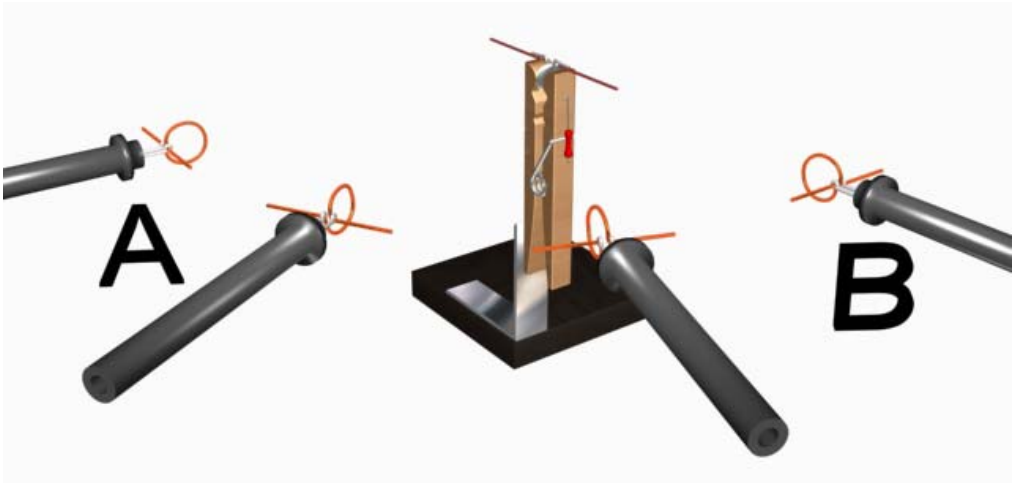


When located as shown, our receiving antenna sees maximum power when oriented such that

1. **Its straight portion is parallel to the straight portion of the transmitter**
2. **Its straight portion is perpendicular to the straight portion of the transmitter**
3. **Don’t have a clue.**

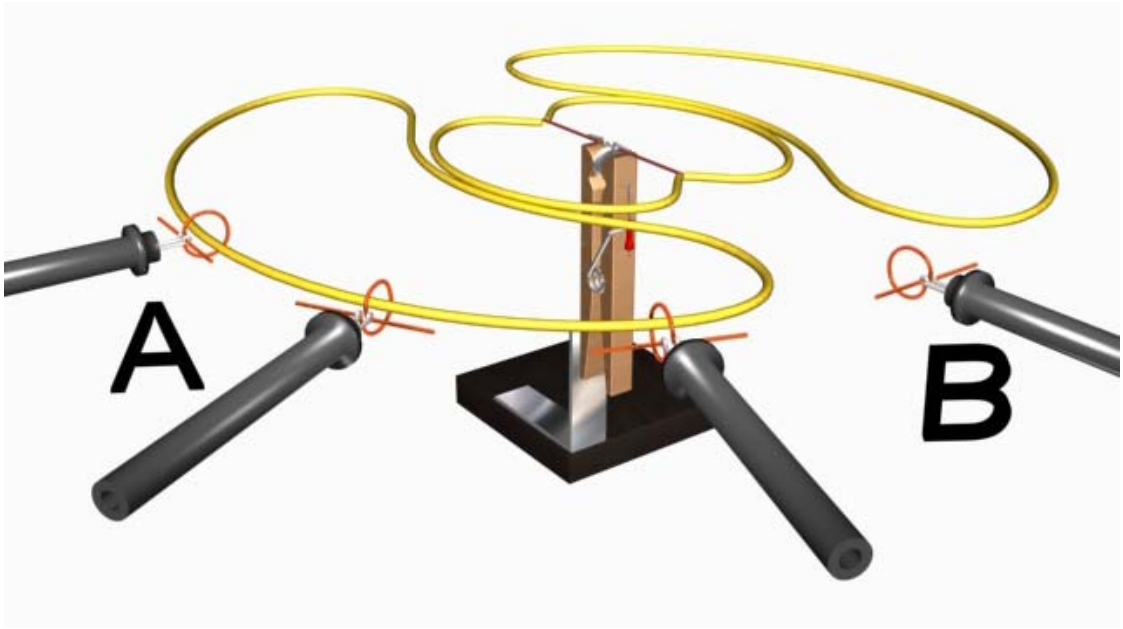


Answer: 1. The electric field pattern from the spark gap antenna is shown above. When positioned as shown, the receiving antenna gets maximum power when parallel to the transmitting antenna wire, because the electric field can then drive the maximum current in the receiver. We say that the wave is "polarized" in the direction of the E field.



As we move our receiving antenna around the spark gap transmitting antenna in the manner shown in the figure, we will see

1. **Increased received power at position B as compared to position A**
2. **Decreased received power at position B as compared to position A**
3. **No change in received power when the receiver is at position B as compared to position A**
4. **Don’t have a clue.**



Answer: 2. Maximum power at A.

The electric field pattern from the spark gap antenna is shown above. We get maximum power when the line from the transmitter to the receiver is perpendicular to the direction of the antenna (at A). We get (in principle) zero power when the line from the transmitter to the receiver lies along the direction of the antenna (at B).