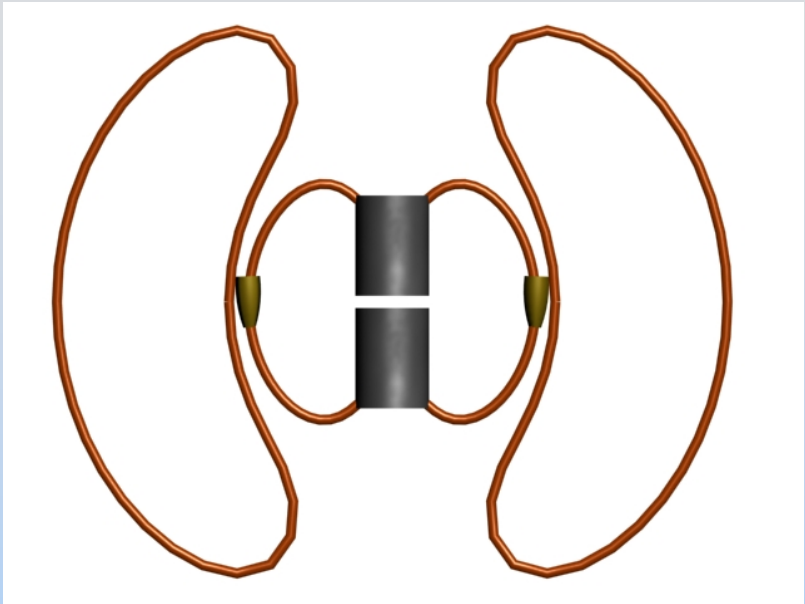
Concept Question: Spark Gap

At the time shown the charge on the top half of our 1/2 wave antenna is positive and at its maximum value. At this time the current across the spark gap is

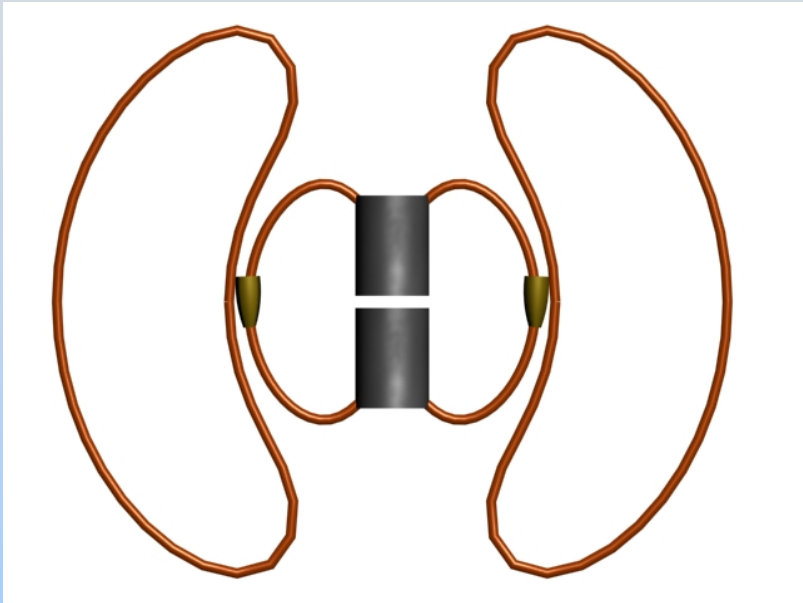


1. Zero
2. A maximum and downward
3. A maximum and upward
4. Can’t tell from the information given
5. I don’t know

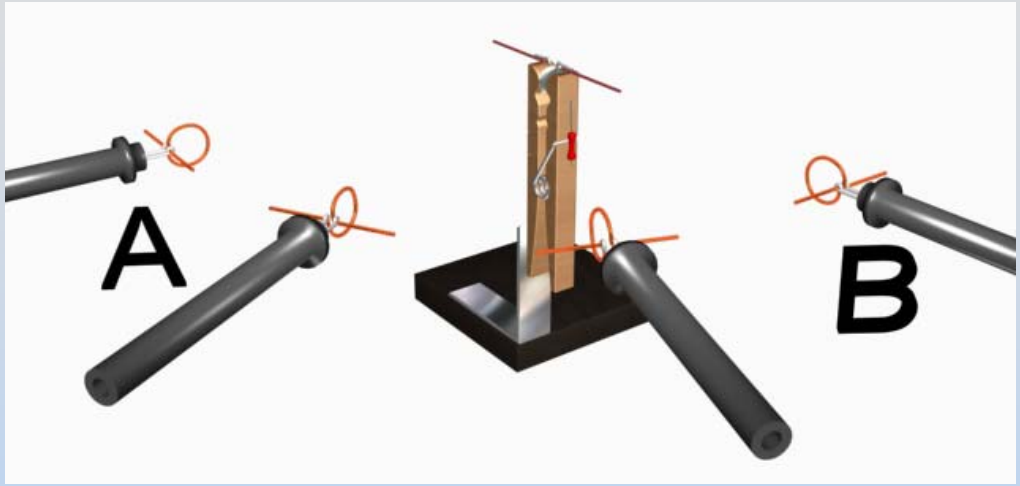
Concept Question Answer: Spark Gap

Answer: 1. The current is 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 near zero.



Concept Q.: Angular Dependence

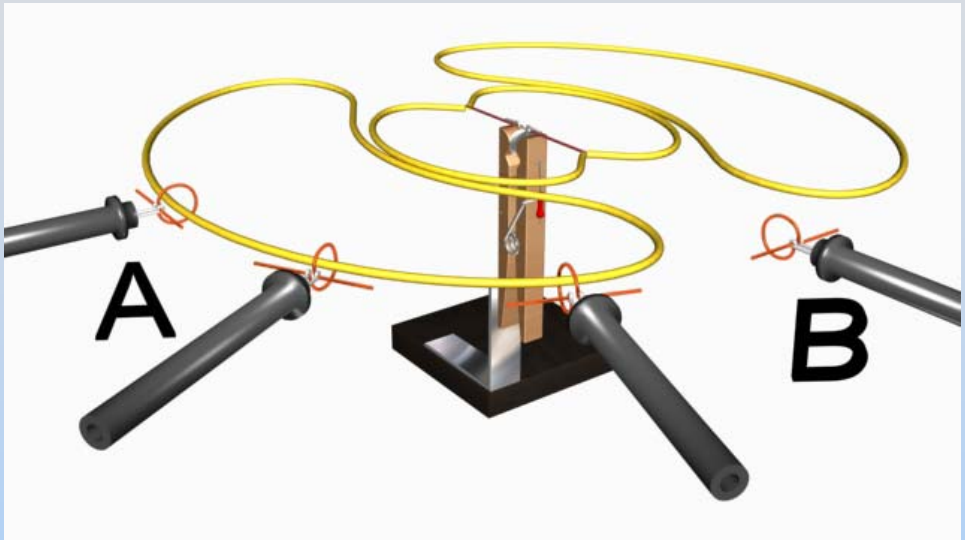


As you moved your receiving antenna around the spark gap transmitting antenna as above, you saw

1. Increased power at B compared to A
2. Decreased power at B compared to A
3. No change in power at B compared to A
4. I don’t know

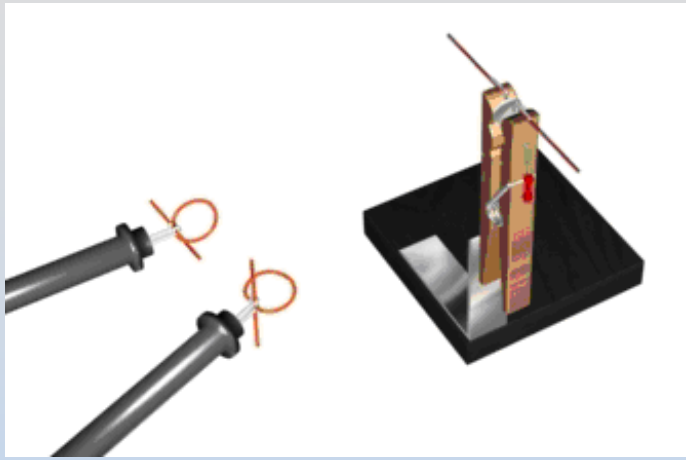
Concept Question Answer: Angular Dependence

Answer: 2. Less power at B than at A



See the E field pattern 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).

Concept Question: Polarization

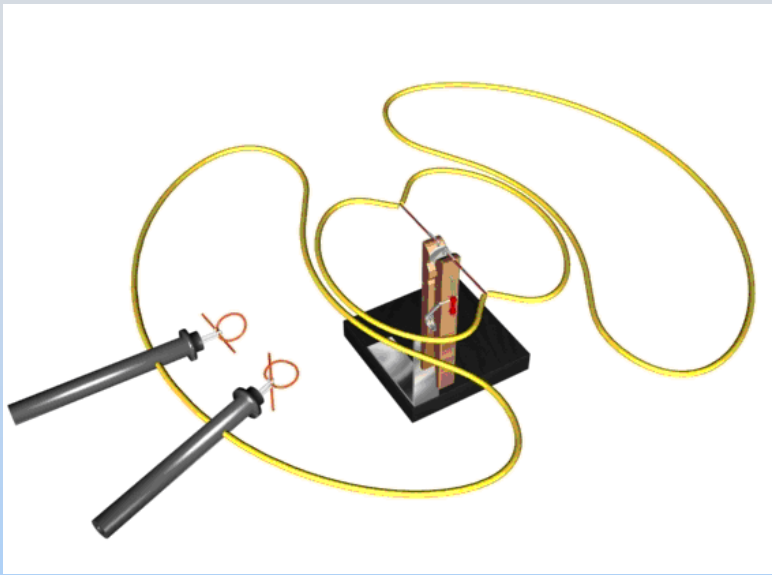


When located as shown, your receiving antenna saw maximum power when oriented such that

1. Its straight portion was parallel to the straight portion of the transmitter
2. Its straight portion was perpendicular to the straight portion of the transmitter
3. I don't know

Concept Question Answer: Polarization

Answer: 1. Maximum power when aligned (parallel)



See the E field pattern above. 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.

8.02SC Physics II: Electricity and Magnetism

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