VAN DE GRAAFF INACCURACIES

"The Wimshurst Machine" (**Popular Electronics**, December 1990) contains some inaccuracies in its description of the operation of the Van de Graaff generator.

The Van de Graaff generator does not produce static electricity by friction. It works with induction, just as the Wimshurst machine does. Unlike the figure in the article, the combs of the Van de Graaff do not touch the belt. They are a few millimeters away. Friction does generate a small positive charge in the lower pulley and, by induction, produces a negative charge in the lower comb. Because the teeth of the comb are pointed, a corona discharge sprays electrons onto the moving belt. At the top, the electrons jump to the teeth of the upper comb and are deposited on the dome. Electrons repel each other and end up on the outer surface of the dome, leaving the inner surface neutral—*i.e.*, a Faraday cage. The limit to the charge on the dome is governed by corona leakage.

The source of electrons is the Earth itself. That is why the generator works best when the base is connected to a water pipe. A positive charge can be sprayed onto the belt if a positive supply of charges is attached to the lower comb through a battery or a power supply.

I hope this will help dispel some of the myths that have surrounded the explanation of the Van de Graaff generator.

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