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5P72 - Design and Performance of a 4 MV, 14 kJ Marx Generator

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Applied Physical Electronics, L.C. (APELC) has built and characterized a large Marx generator designed for a maximum erected voltage of 4 MV, with a maximum pulse energy of 14.5 kJ. The generator is based on a dual polarity charging topology, which helps reduce the source impedance to approximately 70 Ohms. When driving a matched resistive load, a peak power of 230 GW is delivered, with an approximate rise time of less than 200 ns, and a pulse width of approximately 300 ns. The generator is uniquely designed to be generally insulated with transformer oil, but switched in a dry air medium. Sets of spark gap switches are uniquely encased in common "switch blocks", making use of UV-coupling to better the switching performance. This paper describes the design and performance of the Marx generator.

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