Eagle Harbor Technologies, Inc. (EHT) is developing high voltage nanosecond pulsers with independently adjustable output voltage, pulse width, pulse repetition frequency (PRF). EHT nanosecond pulsers with voltages up to 20 kV are now commercially available and used to drive a wide range on nonequilibrium plasmas for aerospace, combustion, biomedical, and material science applications. These pulsers can generate pulses with widths between 20 - 250 ns and operate at PRF up to 100 kHz CW and can be burst to frequencies up to 1 MHz.

EHT is continuing to advance the capabilities of these pulsers. Higher voltages (over 50 kV) are of interest for driving nonlinear transmission lines for high power microwave applications. EHT has recently demonstrated high voltage pulses operating at 100 kHz while maintaining the capability of pulse width adjustability. Additional research is being conducted to control high voltage pulses operating at 100 kHz while maintaining the capability of dissapating 5 kW. This pulser is currently being used as a prime contractor for aerospace research.

Below are waveforms showing the variable pulse width, a single pulse into a 100 Ω load, and a burst at 400 kHz CW. The next generation pulser will produce 20 kV pulses at 100 kHz. The initial waveforms are shown in the Dielectric Barrier Discharges Waveforms.

**NSP-5000**
EHT has developed a 5 kW nanosecond pulser that produces 5 kV output pulses into a 100 Ω load with adjustable pulse width (20 - 105 ns) that can operate at 100 kHz CW or be burst to higher frequency. In order to test this pulser, EHT developed a custom low inductance resistor array capable of dissipating 5 kW. This pulser is currently being used as a prime contractor for aerospace research.

**Conclusions**
EHT is developing a range of nanosecond pulsers than can operate with at PRF up to 100 kHz CW and be burst even higher. These pulsers can drive a wide range of nonequilibrium plasma sources for aerospace, combustion, biomedical and material science applications. The pulsers have the following characteristics:
- Independently adjustable voltage (0 - 20 kV), pulse width (20 - 250 ns), and pulse repetition frequency (up to 100 kHz CW and 1 MHz burst).
- Output waveform does not change in the presence of a DBD
- Fully integrated front panel pulse control
- Turnkey system that includes DC power supply
- Pulse shaping output stage is available
- Available in a range of powers: 30 W - 5 kW

Ongoing research at EHT is extending these capabilities to include higher voltage (over 50 kV), faster rise times, and the ability to drive low impedance loads as well as waveform shape control. The next generation pulsers will be used for driving nonlinear transmission lines for high power microwave production.

**Further Information:**
For more information on nanosecond pulsers or other switching power supplies please visit our website (http://www.eagleharbortech.com) or email.

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