Claims

1. A conducted electrical weapon, comprising:

a housing comprising:

a bay defining a receptacle in the housing;

a trigger; and

a control circuit configured to generate an ignition signal upon actuation of the trigger; and

a deployment unit removably inserted into the bay, the deployment unit comprising:

an electrode configured to be deployed from the deployment unit; and

a propulsion module comprising:

a conductor electrically coupled to the control circuit and configured to increase in temperature upon receipt of the ignition signal;

a primer material disposed adjacent the conductor within the propulsion module, wherein the primer material is configured to ignite in response to the increase in temperature of the conductor, and wherein the conductor conducts the ignition signal outside the primer material and ignition of the primer material causes the electrode to be deployed from the deployment unit; and

an at least partially combustible barrier disposed between the conductor and the primer material.

2. The weapon of claim 1, wherein the at least partially combustible barrier is configured to at least partially combust in response to the increase in temperature of the conductor.

3. The weapon of claim 2, wherein the barrier comprises paper.

4. The weapon of claim 2, wherein the conductor is integrated into the barrier.

5. The weapon of claim 1, wherein the conductor is disposed in contact with the primer material along a surface of the primer material.

6. The weapon of claim 1, wherein the conductor comprises a wire, wherein the wire is positioned adjacent a surface of the primer material, and wherein the wire is configured to provide a signal path for the ignition signal adjacent the surface of the primer material.

7. The weapon of claim 1, wherein the conductor comprises a nichrome wire.

8. The weapon of claim 1, wherein the conductor is positioned adjacent a surface of the primer material, and wherein a length of the conductor adjacent the surface of the primer material is less than a diameter of the surface of the primer material.

9. The weapon of claim 1, wherein the conductor is positioned adjacent a first surface of the primer material from an edge of the first surface of the primer material to a central region of the first surface of the primer material.

10. The weapon of claim 1, wherein the ignition signal has a current of at least 2 Amps.

11. The weapon of claim 1, wherein a duration of the ignition signal is less than 300 milliseconds.

12. The weapon of claim 1, wherein the ignition signal comprises a first portion and second portion, wherein the first portion and the second portion each provide a different current to the conductor, and wherein at least one of the first portion and the second portion causes ignition of the primer material.

13. The weapon of claim 1, wherein the propulsion module further comprises a primer cup, wherein the primer cup comprises walls and a base, and wherein the primer material is positioned within the primer cup between the base of the primer cup and the conductor.

14. A propulsion device for deploying at least one provided projectile using an ignition signal from a provided ignition signal source, the propulsion device comprising:

a conductor, configured to receive the ignition signal from the provided ignition signal source and increase in temperature upon receipt of the ignition signal;

a primer material disposed adjacent the conductor within the propulsion device, the primer material configured to ignite in response to the increase in temperature of the conductor, wherein the conductor conducts the ignition signal outside the primer material and ignition of the primer material causes the at least one provided projectile to be deployed; and

a primer cup comprising a base axially offset from the conductor, wherein the primer material is positioned within the primer cup between the base of the primer cup and the conductor, and wherein in response to the primer material igniting, the primer cup is configured to separate in a direction towards the at least one provided projectile.

15. The propulsion device of claim 14, further comprising a barrier disposed between the conductor and the primer material, wherein the barrier is configured to at least partially combust in response to the increase in temperature of the conductor.

16. The propulsion device of claim 14, wherein the conductor comprises a nichrome wire positioned adjacent a surface of the primer material, and wherein the conductor is configured to provide a signal path for the ignition signal adjacent the surface of the primer material.

17. The propulsion device of claim 14, wherein ignition of the primer material produces a rapid expansion of gas, and wherein the rapid expansion of gas separates the primer cup from the propulsion device.

18. A method of deploying at least one projectile using a propulsion device, the propulsion device including a conductor disposed outside of and adjacent to an outer contact surface of a primer material, the method comprising:

receiving an ignition signal in the conductor, wherein the ignition signal is conducted by the conductor outside the primer material and adjacent to the outer contact surface of the primer material;

increasing a temperature of the conductor based on the received ignition signal;

igniting the primer material in response to the increase in the temperature of the conductor, wherein ignition of the primer material causes the at least one projectile to be deployed; and

providing a stimulus signal through the at least one projectile.

19. The method of claim 18, further comprising at least partially combusting a barrier between the conductor and the primer material in the propulsion module, wherein the primer material ignites after the at least partially combusting the barrier.

20. The method of claim 18, wherein the primer material has an associated temperature at which the primer material ignites in response to the increase in temperature of the conductor, and wherein increasing the temperature of the conductor based on the received ignition signal includes increasing the temperature of the conductor above the associated temperature at which the primer material ignites.