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The Effect of Post-Burst Energy on Exploding Bridgewire Output ELIZABETH LEE, MIKE BOWDEN, Atomic Weapons Establishment — For an EBW detonator, as the fireset energy is increased from threshold to all-fire level the post-burst energy delivered to the detonator increases, and the function times decrease. To gain an understanding of the processes through which the post-burst electrical energy influences the function times the effect of the post-burst energy on the explosion of bridgewires was studied. A fireset was developed which enabled the post-burst energy to be varied independent of the burst energy by terminating the current flow at pre-selected times. The effect of this on the bridgewires was characterised at a range of firing voltages and a range of termination times. The response of the bridgewire was characterised using Photonic Doppler Velocimetry. The velocimetry trace detected two families of velocities. The first family had initial velocities in the range $1-2 \text{ km.s}^{-1}$ and the second family had velocities in the range $0-0.5 \text{ km.s}^{-1}$. The relative position of the two families depended on the post burst energy. The results show that a reduction in the post-burst energy and therefore the total delivered energy, but for a constant energy delivered to burst, corresponds to a decrease in the acceleration and peak velocity of the bridgewire / plasma at burst.

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