

THE EFFECTS OF A HIGH SOUND SPEED LAYER ON MACH STEM FORMATION AND SHOCK PROPAGATION FOR MIGHTY MACH&

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Theoretical calculations were performed for several MIGHTY MACH events with heights of burst between 0 and 20 feet. The MIGHTY MACH events used 1000 pound charges of pentolite detonated over hard smooth surfaces. A high sound speed layer was simulated by a thin plastic bag containing a helium air mixture. The calculations simulated the helium bags with hot air. The calculations show multiply peaked overpressure wave-forms and dynamic pressure enhancement of nearly a factor of 2 over ideal.

Comparison of experimental overpressure waveforms with calculation show good agreement. The total head and dynamic pressure waves could not readily be measured experimentally. The calculations provide the dynamic pressure waveforms to supplement the experiments. In addition, the calculated flow angles indicate that dynamic pressure measurements will be very difficult in such pertubated flows.