

THE REDUCTION OF WEAPON BLAST NOISE USING SIMULATION TECHNIQUES

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In common with most weapon systems with chemical propulsion, the sudden release of high energy gas initiates a blast (or shock) wave which grows three dimensionally about the point of emergence. The spreading of this blast wave will eventually reach the gunner and may cause some physical discomfort or permanent physiological damage. A detailed study of real weapon blast is difficult to accomplish both in terms of costly operation and hazard of live ammunition, hence simulation techniques are employed.

This paper presents two simulation techniques to model the growth of a blast wave emanating from a weapon muzzle or a launcher tube venturi. The first of the two techniques is a two dimensional 'analogue' simulation on a water table, where the study was mainly centred on the qualitative assessment of 'blast' strength reduction devices commonly known as silencers. The 'analogue pressure level' is translated from the water height measured by a Capacitance proximity probe. The second technique, which has been used for most of the research, is a tube in which compressed air is suddenly released to create a shock wave to model the weapon blast. A single spark technique was used to record the 'blast' development. Shock overpressure levels around the open end of the tube were measured using an array of miniature piezo-resistive pressure transducers installed in 'lollipop' housings. In addition to blast simulation, the shock tube is being developed to simulate weapon recoil.