

Proof-of-Principle for an 81-mm Non-Lethal Mortar Cartridge

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James M. Garner and David H Lyon
U.S. Army Research Laboratory

Abstract: U.S. military forces increasingly find themselves in situations compatible with the use of non-lethal weapons. Operations-other-than-war, to include peace making, peace keeping, and humanitarian missions, in locations such as Somalia, Haiti, Bosnia, and Kosovo repeatedly demonstrate the need for non-lethal weapons effective in the roles of both crowd control and non-destructive area denial. This paper describes the development of a non-lethal 81-mm cartridge that is ultimately viewed as a potential tool in operations-other-than war. Payload configurations and specifications are deliberately absent as the round may have a variety of users with various desired payloads. The creation of this round initially built upon the technology developed for previous standard 81-mm mortar projectiles. The dimensions and weights of the prototype round are such that it requires no special logistics or handling, and is similar in appearance and operation to current rounds, making its employment nearly transparent to the user. The proof-of-principle testing is a logical progression from the initial concept demonstration performed in collaboration between the U.S. Army Research Laboratory and United Defense. The paper discusses non-lethal, 81mm mortar projectile advancements in expulsion charge parameters and parachute deployment schemes for the prototype. An explanation is also given for the partially successful parachute deployment experienced in the early phase. Replacement of various round components and their associated benefits are also discussed. The prototype round is intended to employ current technology and hardware with currently available components to create a reliable, cost effective design. The round has demonstrated functionality and is further touted as the test vehicle for upcoming payload dispersion studies. Other evolutionary designs are also offered as vehicles for improving reliability and building on the proven technology described herein.