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Large Weapon Source Emission Data Protocols and Results

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The U.S. Army needs detailed information about the blast pressure field created by large weapons to avoid negative impacts on testing and training mission capabilities due to noise. The noise software tools BNOISE2TM and RMTK Noise Tool, which the Department of Defense (DoD) uses to predict and assess impacts of large weapon noise, require accurate acoustic source emission models. A free-field representation of the sound source acoustical emission, containing no waveform signal perturbations due to the ground, other reflecting surfaces, ballistic waves, or propagation anomalies, is required. The measurement protocols have been developed to collect the free-field source emission data. These protocols are described along with acoustical data and emission source results for the 120 mm M-1 tank gun, the 105 mm Stryker gun, and various weights of C-4 explosives. In addition, the measured acoustic data are compared with an idealized Friedlander curve. The overall results demonstrate that the protocols do provide sufficient free-field blast waveforms.