

AIR BLAST FROM SMALL HE CHARGES

FORD,R.D.

A series of trials has been carried out using 125 g and 1 kg spheres of high explosive as the source. The object has been to obtain results in the transition region between shock and linear acoustic behaviour, ie with peak levels of 140 to 170 dB (0.03 to 1 psi).

In the first trial the peak pressure and waveform were measured in "free air" with minimal effect from ground reflections at distances of up to 100m from the source. The geometry can be scaled by referring all distances to the characteristic radius of source and, when compared with other published data, the results show extremely good agreement.

In subsequent trials the 1 kg charges were fired at the height of 2m above ground level and the 125g charges at both 1 and 2m above ground level. The peak pressure and waveform have been measured at heights of 0.12, 1.95, 4.5 and 10.0m above ground level and at distances of 25, 50 and 100m from the source over both concrete and grass. Over concrete the Mach stem is established as would be expected. The observed increase in peak pressure, when adjusted to the scaled height and distance, agree well with other published data for the close-in part of the range and extends the model to greater distances. Over grass the waveform is quite different. It is clear that wave reflected from the ground undergoes phase reversal of the higher frequencies and partially cancels the direct wave. Close to the ground at a distance of 100m the sharp initial rise has almost disappeared leaving a waveform which is dominated by the lower frequencies. The peak levels are significantly less than those measured over concrete. The scaling for propagation over grass is being investigated.