

# CHARACTERIZATION OF A LARGE SHOCK TUBE

P. J. Rae, J. Gunderson

*Los Alamos National Laboratory, M-6, PO Box 1663, Los Alamos, NM 87545*

## ABSTRACT

This submission relates to the design, fabrication, commissioning, modeling, and calibration pressure profiles obtained from a 45.7 m long, 2.4 m diameter shock tube to be driven with between 11.3 and 45.4 kg of ammonium nitrate and aluminum powder explosive.

Los Alamos National Laboratory has the requirement to blast load some test objects with a prescribed air pressure profile. The pressures and durations of this profile are best produced using a long, and large diameter, shock tube.

The explosive charge(s) are placed closer to the massive tube end closure and may be independently detonated. By altering the timing and location, tailoring of the pressure pulse is possible. Stagnation pressure gauges are placed at locations along the tube wall as time of arrival gauges to assist the ongoing modeling efforts. Additionally, 6 pencil pressure gauges are placed across the diameter of the open end of the tube to measure the pressure profile that will eventually load the test objects.

Initial calibration shots indicate that the tube will likely be capable of producing the required air blast profiles. Owing to the large physical size of the tube, the long duration of the pressure processes, and difficulties in creating appropriate detonation models for the explosive used, accurate computer modeling of the tube response is so far proving challenging.