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8-Channel Broadband Laser Ranging Hardware Development¹ COREY BENNETT, Lawrence Livermore Natl Lab, BRANDON LA LONE, National Security Technologies LLC, PATRICK YOUNK, Los Alamos Natl Lab, ED DAYKIN, National Security Technologies LLC, MICHELLE RHODES, DANIEL PERRY, Lawrence Livermore Natl Lab, VU TRAN, EDWARD MILLER, National Security Technologies LLC — Broadband Laser Ranging (BLR) is a new diagnostic being developed to precisely measure the position vs. time of surfaces, shock break out, particle clouds, jets, and debris moving at kilometers per second speeds. The instrument uses interferometry to encode distance into a modulation in the spectrum of pulses from a mode-locked fiber laser and uses a dispersive Fourier transformation to map the spectral modulation into time. Range information is thereby recorded on a fast oscilloscope at the repetition rate of the laser, approximately every 50 ns. Current R&D is focused on developing a compact 8-channel system utilizing one laser and one high-speed oscilloscope. This talk will emphasize the hardware being developed for applications at the Contained Firing Facility at LLNL, but has a common architecture being developed in collaboration with NSTec and LANL for applications at multiple other facilities.

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