IN BRIEF

This edition of the LLE Review contains articles on new developments in laser engineering, OMEGA experiments, plasma theory, and subpicosecond research that occurred during the last quarter of 1981. Some of the highlights of the work described in this issue are the following:

- Optical absorption signatures from impurities in thin film dielectric coatings have been measured with photoacoustic absorption spectroscopy. This technique may prove useful for understanding and improving the damage thresholds of coatings employed in LLE laser systems.
- Preliminary results from target interaction experiments on OMEGA at long pulses confirm that the absorption mechanism changes from inverse bremsstrahlung to resonance absorption as laser intensity on target increases from 10^{14}W/cm^2 to 10^{15}W/cm^2.
- A theoretical analysis of filamentation of laser light entering a laser-plasma corona shows that plasma flow transverse to the filaments can significantly alter the thresholds and growth rates for this type of instability.
- An improved method for interpreting laser fusion target interferograms will provide the target fabrication group with a means for measuring small values of target shell nonconcentricity. It will be

possible to perform this measurement on gas-filled glass microballoons possessing a wide range of fill pressure.

- Modification to the chemical structure of polymer coatings used to form ablation layers on laser fusion targets reduces their crystalline texture. After annealing, these modified polymer coatings exhibit a smoother surface and more uniform density, two desirable target features for uniform laser-driven implosions.
- The monoenergetic photoelectron replica of an optical pulse that is produced by the image converter tube in a streak camera can be used to study laser-induced structural changes in materials in the picosecond time domain. Transmission electron diffraction patterns of an aluminum specimen 150 Å thick have been obtained with a single 100 psec electron pulse.
- Laser pulses shorter than 70 femtoseconds have been generated in a dye laser synchronously pumped by a frequency-doubled CW mode-locked Nd:YAG laser. These short pulsewidths are obtained at a wavelength of 615 nm with an overall efficiency of 10%.

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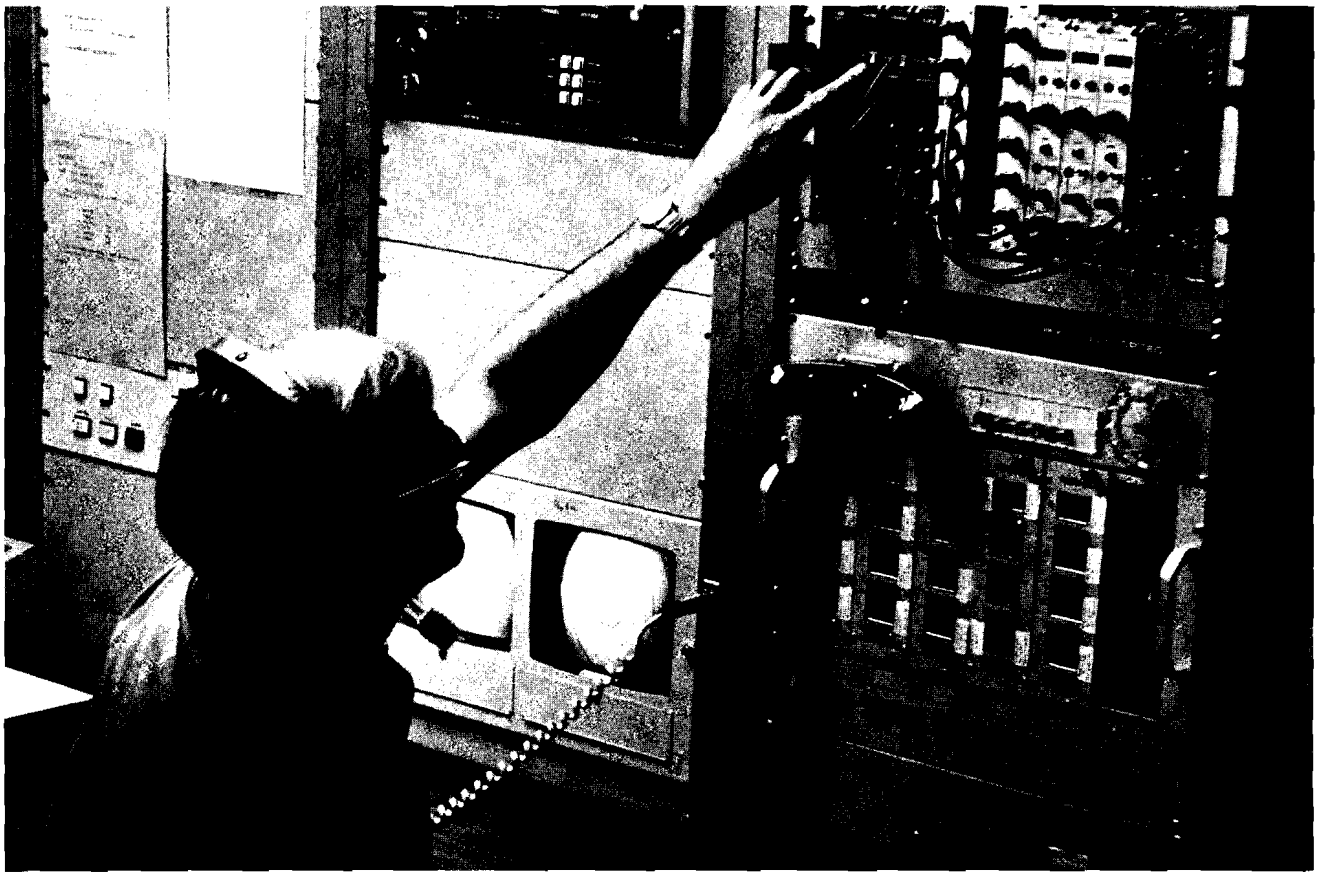

Bill Watson, lead mechanical engineer in the experimental area, preparing the copper activation counter, one of many OMEGA target diagnostics, prior to a 24-beam OMEGA system shot.