



## Series 600 Pulsed Nd:YAG Lasers

### Pseudo-Q-switched Pulsing Boosts Cutting Performance

The Series 600 lasers have been designed specifically for precision cutting and drilling of thin metals. Such applications include the cutting of stencils for hybrid microcircuits and printed circuit prototyping. The most popular laser to emerge for these cutting applications is the company's Model 650M/CD which is a 50-Watt average power, multimode cutter/driller.

Users of the Model 650M/CD report that its cutting speed is at least twice as fast and produces a much superior cut quality than the lasers that they have been using for similar applications. Beam quality (roundness, and low diameter and divergence values) contribute to the laser's superior performance.

What makes the Model 650M/CD such an effective cutter of thin metals (stainless steel, titanium, etc.) is its combination of very short pulse width, 50  $\mu$ s, and the laser's *pseudo-Q-switched pre-pulse*. The 50- $\mu$ s drilling/cutting pulse width minimizes the heat content of the pulse and essentially eliminates noticeable heat effect zone (HAZ).

The pseudo-Q-switched pre-pulse appears at the leading edge of the main pulse. It has an amplitude several times that of the main pulse, but contains a much higher level of *peak pulse power* by virtue of its much shorter pulse width, about 1  $\mu$ s. The attached oscilloscope trace of the Model 650M/CD operating at 1000 pps pulse rate shows the presence of the pre-pulse. Pseudo Q-switched pre-pulse performance can be achieved at pulse rates up to 2000 pps.

