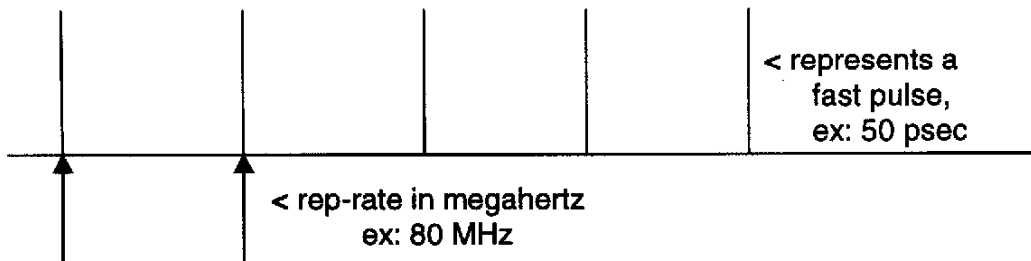


# QUANTUM TECHNOLOGY INC

## CW Mode-Locking and DD-1 Application Note

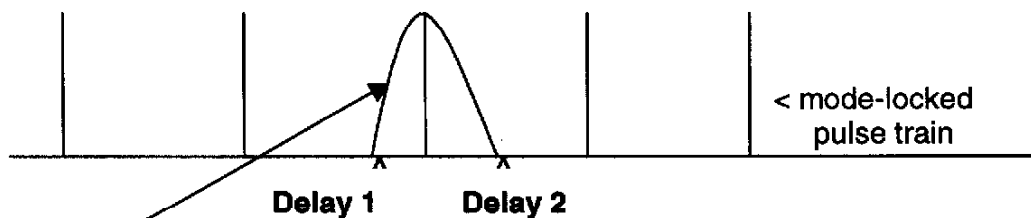
When a laser is configured in mode locking, the pulses produced are very short, pico or femto seconds. The rate at which these pulses are produced depends on the physical layout of the laser cavity (length L). This is the frequency ( $f = c/2L$ , where "c" is the speed of light) that describes the laser in megahertz. This frequency can range from ~ 30 MHz to over 100 MHz. So we have two things: 1) the actual pulse of the laser that is short and 2) the rep-rate/frequency that these are produced in the megahertz, where the longer the cavity the lower the frequency. A sketch is:



### SKETCH OF MODE-LOCKED PULSE TRAIN

The Quantum Technology DIVIDER/DELAY unit, DD1, "locks" into the rep-rate, divides that down by the selection of the digital thumb-wheel switch, then appropriate delays are added so that a "window" is produced to select a pulse at some low frequency rate, say 10Hz for example. See below.

Pulses before delay 1 are pre-pulses, those after delay 2 are post-pulses.



**WINDOW**  
produced by DD1.  
extracting the pulse in the WINDOW

