The "resistance" parameter k_0 scales with the geometry of the flashlamp as

$$k_0 = k \frac{\ell}{d} \text{ ohm(amp)}^{1/2} \qquad (1)$$

where ℓ is the length of the lamp in cm, d is the bore diameter in cm, and k is a function of the pressure and type of gas used in the lamp. Typical valves of k are 1.1-1.3. With careful design of the discharge geometry, the use of a new class of extended-foil, low inductance capacitors, and low inductance spark gaps, the bulk of the inductance and "resistance" is found to lie in the flashlamps. Furthermore, it has been long known that the discharge does not begin uniformly across the entire bore of the lamp, but a very thin streamer is first started and then grows to fill the lamp. (LeC, 56) During the initial growth of the streamer, the circuit independence is much larger than the full volume discharge as given by the empirical Eq. (1).

By running the lamps in a simmering mode, (Jet, 74) in which the lamps always have 40-50 ma of current flowing through them, a thin streamer is already established. The simmer current also apparently reduces the electrode sputtering on to the walls of the flashlamp, hence, greatly increases their lifetime. Finally, the time and amplitude jitter of the discharge is greatly reduced. The speed of the discharge is further enhanced by incorporating a small prepulse several microseconds before the main pulse (Orn, 74). The small discharge does not produce enough light to significantly alter alter the populations of the energy levels of the dye molecules, but the growth period for the plasma to fill the lamp is greatly reduced. The most effective delay