

# Laser Interaction

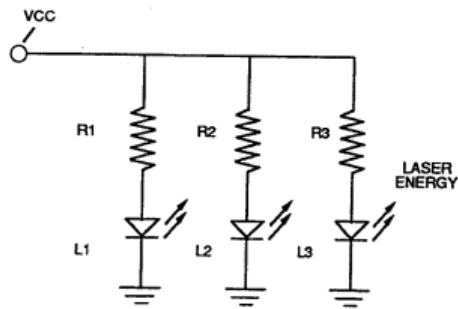
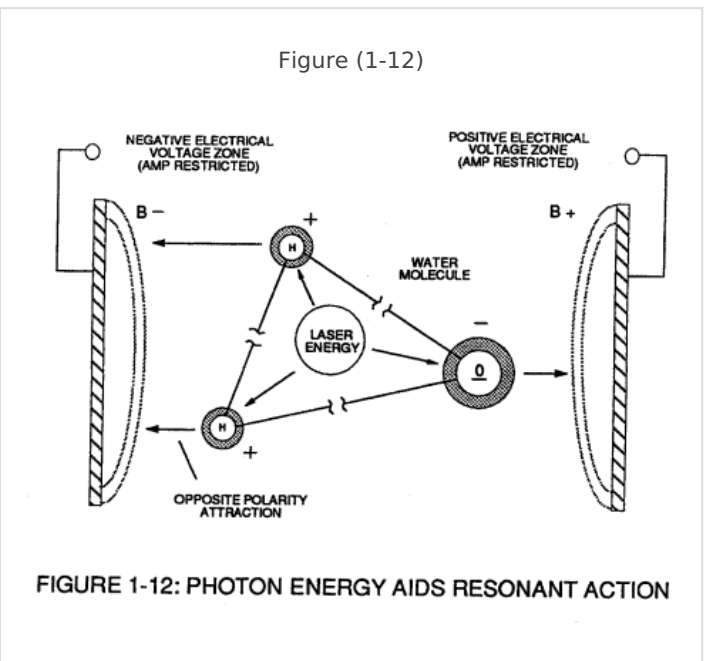
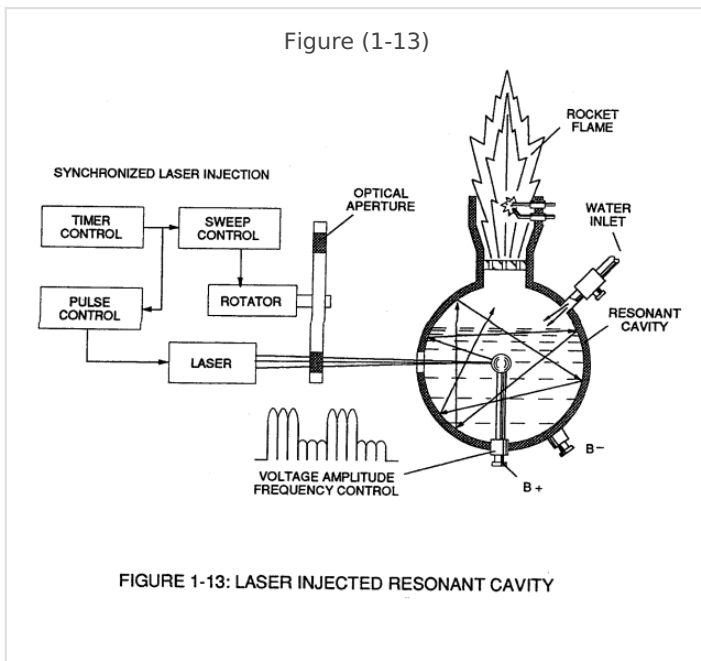


FIGURE 1-11: LED CLUSTER ARRAY

**Light-emitting diodes** arranged in a **Cluster-**

**Array** (see Figure 1-11) provides and emits a narrow band of visible light energy into the voltage stimulated water bath, as illustrated in Figure (1-13) as to Figure (1-12).



The absorbed **Laser Energy** (Electromagnetic Energy) causes many atoms to lose electrons while **highly energizing** the liberated **combustible gas ions** prior to and during thermal gas-ignition.

Laser or light intensity is linear with respect to the forward current through the LEDs, and, is determined by:

(Eq 15)

$$R_S = \frac{V_{in} - V_{led}}{I_{led}}$$

Where

$I_{led}$  is the specified forward current (typically 20ma. per diode);  $V_{led}$  is the LED voltage drop (typically 1.7 volts for red emitters).

Ohm's Law for LED circuit in parallel array, and is given by (Eq 16)

(Eq 16)

$$P_{watts} = V_{cc} I_t$$

Where

$I_t$  is the forward current through LED cluster-Array:  $V_{cc}$  is volts applied (typically 5 volts).

Whereby

Laser or light intensity is variable as to duty cycle on/off pulse-frequency from 1Hz to 65 Hz and above is given by

(Eq 17)

(Eq 17)

$$Le \sqrt{\frac{(ION)^2 \times T1}{T1 + T2}}$$

$Le$  is light intensity in watt;

$T1$  is current on-time;

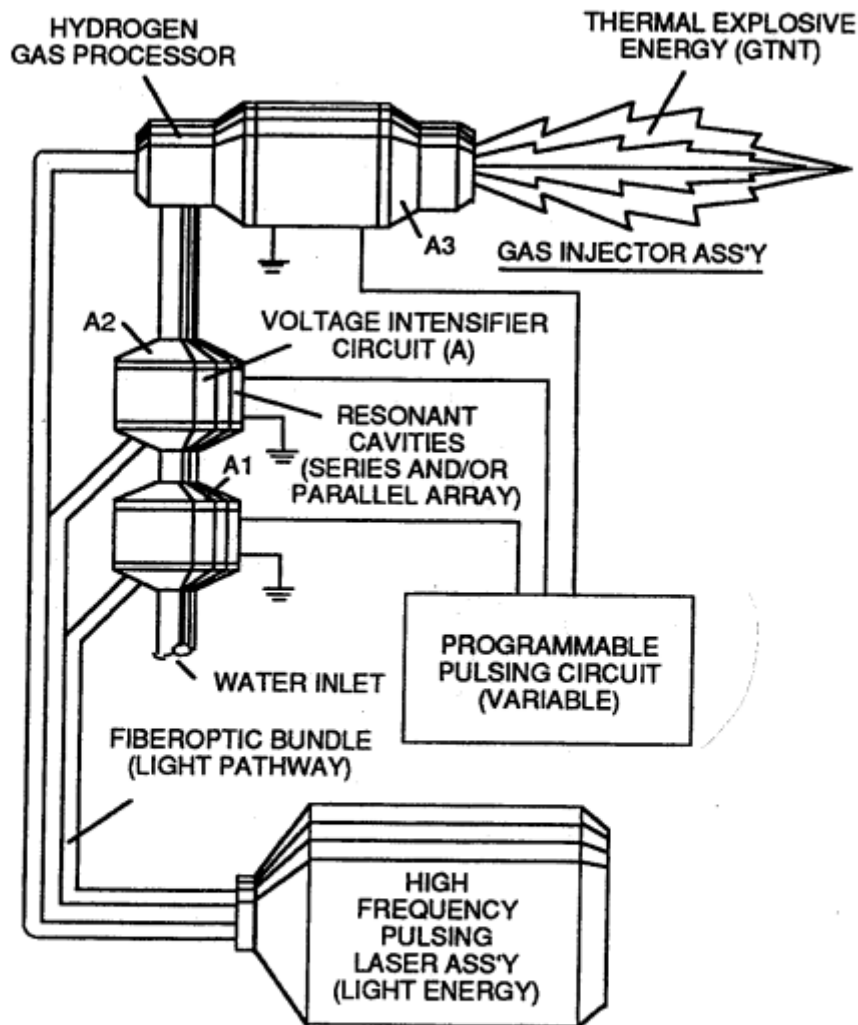
$T2$  is current off-time;

and  $(ION)$ =RMS value of load current during on-period.

Injecting **Laser Energy** into the **Electrical Polarization Process** and controlling the intensity of the light-energy causes the **Combustible Gases** to reach a **higher energy-**

**state** (electromagnetically priming the combustible gas ions) which, in turn, accelerates gas production while **raising gas-flame temperatures** beyond "normal" gas-burning levels.

Injecting "**Electromagnetically Primed**" and "**Electrically Charged**" combustible gas ions (from water) into other light-activated **Resonant Cavities** further promotes gas-yield beyond voltage/laser stimulation, as illustrated in Figure (1-16) as to Figure (1-18).



**FIGURE 1-18: GAS INJECTOR FUEL CELL**