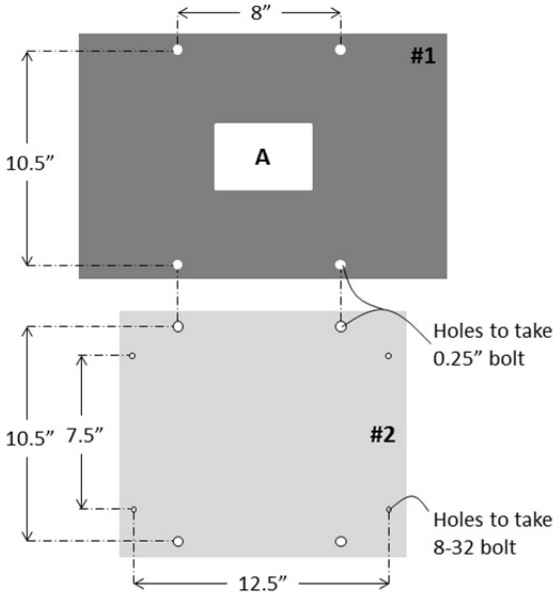
Multiwell plate/IR backlight holder for inverted videography

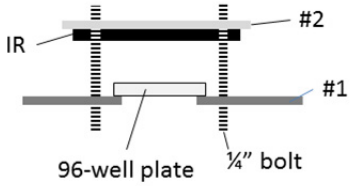
The holder shown in figure 2A is made from two pieces of 0.125” aluminum 6061 sheet (Onlinemetals.com, Seattle, WA):

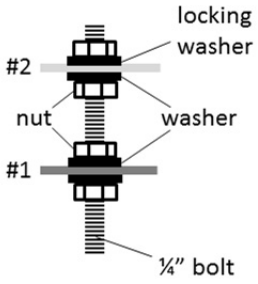
- Piece #1
  - 12” x 18” anodized black finish
  - Four holes for 0.25” bolts (to attach to piece #2)
  - Central aperture (**A**) 4 $^{5}/_{8}$” x 3 $^{5}/_{32}$”
  - The multiwell plate sits over the aperture so the wells are visible from below, transilluminated by the IR light source, which is mounted on piece #2 above

- Piece #2
  - 12” x 14” silver finish
  - Four holes for 0.25” bolts (to attach to piece #1)
  - Four holes for 8-32 bolts (to mount IR source)
  - The IR illumination source (8” x 12” infrared backlight, #BL812-880, Spectrum, Montague, MI) mounts to piece #2, which also acts as a heat sink

The two pieces are attached to one another by ¼” bolts, nuts, washers and locking washers as shown in the figure below, such that the IR panel is centered over the aperture and parallel to the 96-well plate.



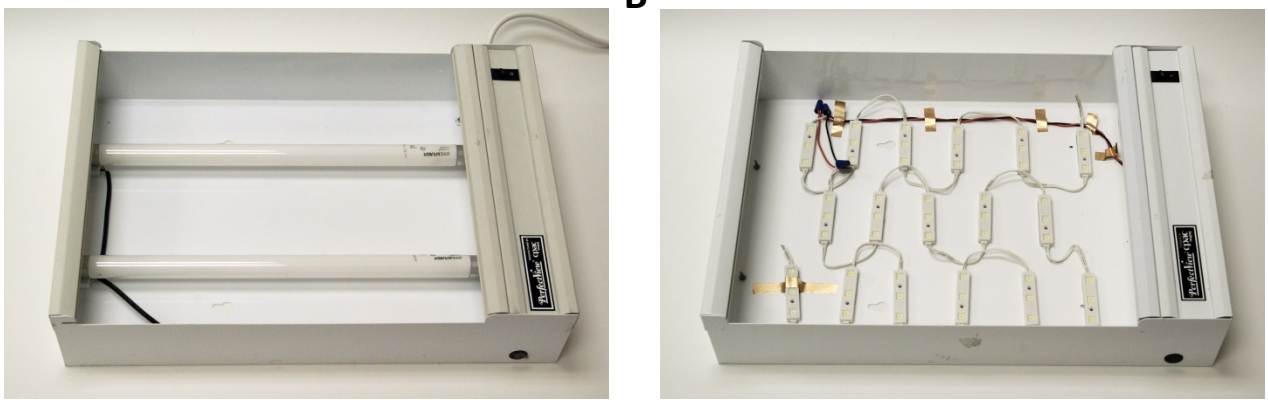




LED light box for adjustable white light illumination

To generate a calibrated visible light source for eliciting the larval responses to changes in illumination shown in figures 5B, 5D and 7D, an X-ray viewing box (CPAC, Leicester, NY) was modified by replacing the fluorescent tubes and transformer with LEDs (SuperBrightLEDs.com, St. Louis, MO; LED Sign Module #LSM-CW3X3: Cool White). The resulting circuit (see below) runs at 12V DC, thereby allowing: (i) automated on-off switching using a simple computer-controlled USB relay (EtherTek Circuits, Princeton, BC, Canada), and (ii) manual calibration of the illumination intensity using a 12V LED dimmer (LEDSpring, #3301, Amazon.com) and light meter (Pyle #PLMT56, Amazon.com).

A **B**



The photographs show X-ray viewing boxes with the diffusing screen removed. (A) The unmodified box employs fluorescent tubes for illumination; (B) after removal of the fluorescent tubes, connections and transformer, white LED sign modules (color temperature 5500K) were used as a source of illumination.

Circuit diagram for the modified light box: