

## **A Cheap LED Lamp For Vintage Microscopes (Puck Lights.)**

*David Young (USA)*

One of the problems with older model microscopes such as the American Optical model 160 student microscope, is well, they have old lamps. Using often special bulbs. No longer available. Or very hard to find today. Bulbs that produce a lot of heat. (Very detrimental when trying to observe living specimens. And even a hazard to the observer as well. If I had a dollar for every time I said 'Ouch!' while using my scope, I'd be able to purchase one of them scanning electron microscopes ... :-).

One common solution is replacement of the lamp with an LED based lighting system. Only this requires an understanding of wiring diagrams and tinkering inside the lamphouse of an otherwise priceless instrument. Wouldn't it be nice if somebody made a self-contained pre-assembled LED based lamp? That could simply be mounted over the old lamphouse and leaving the old lamphouse intact. That at most only requires the removal of the lamphouse lens from the microscope base. To make way for the new unit.

Well while watching late night TV I saw a commercial for some battery powered hockey puck shaped lights. Meant for use as under counter lighting, lighting up closets etc. Able to control light intensity and color via a remote control. And thought? God that thing looks almost like the lamp on my old American Optical model 160. So I ordered a set of puck lamps made by HONWELL. (Though any brand would likely work as long as the puck will fit between the microscope base and the condenser. I do suggest getting lamps with a frosted globe. So the light will completely fill the field of view without need of a frosted glass filter.)

To make the installation, I did the following...

First I removed the lens from the microscope's lamp. (Which was fairly simple on my American Optical model 160. An excellent microscope by the way!) So as to make room

for the puck light and also removed the base of the puck light. Which simply pops off so to allow insertion of batteries to give me some extra room under the condenser. And applied a piece of Scotch tape to secure the batteries in place.

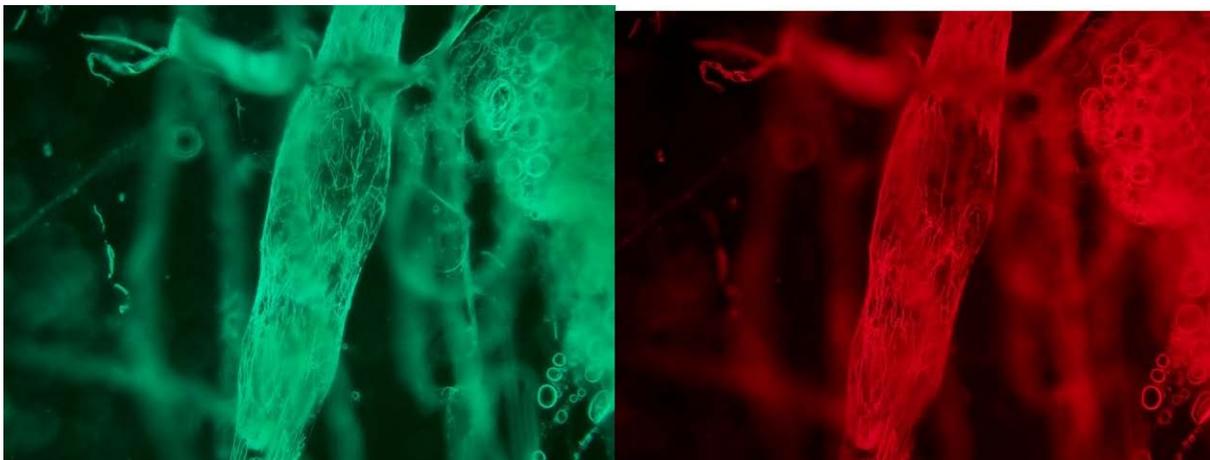
Then centered the puck light under the condenser. (Annoyingly, the original illuminator on the scope was slightly off-center.). And secured the puck light in place with Blu Tack putty. And that was it! One advantage of this method is that the original lamp remains intact. (The lens can easily be replaced if needed and remains available. as long as the bulb works.)

Some tips.

If the field of view is not fully illuminated, especially at low power, try placing a sheet of frosted glass between the LED and condenser. (Or better get puck lights with frosted globes.)

While the Honwell LED's produce a nice soft white light (along with other colors), many LED's tend to produce a bluish light. Especially during photography. Here is where manual color balance can save the day. (I make it a habit of resetting it every time I began a new photo session.) I have noticed that most of the newer LED's coming out today have much better quality light.

Following are some photos I have taken using a puck light as a lamp.

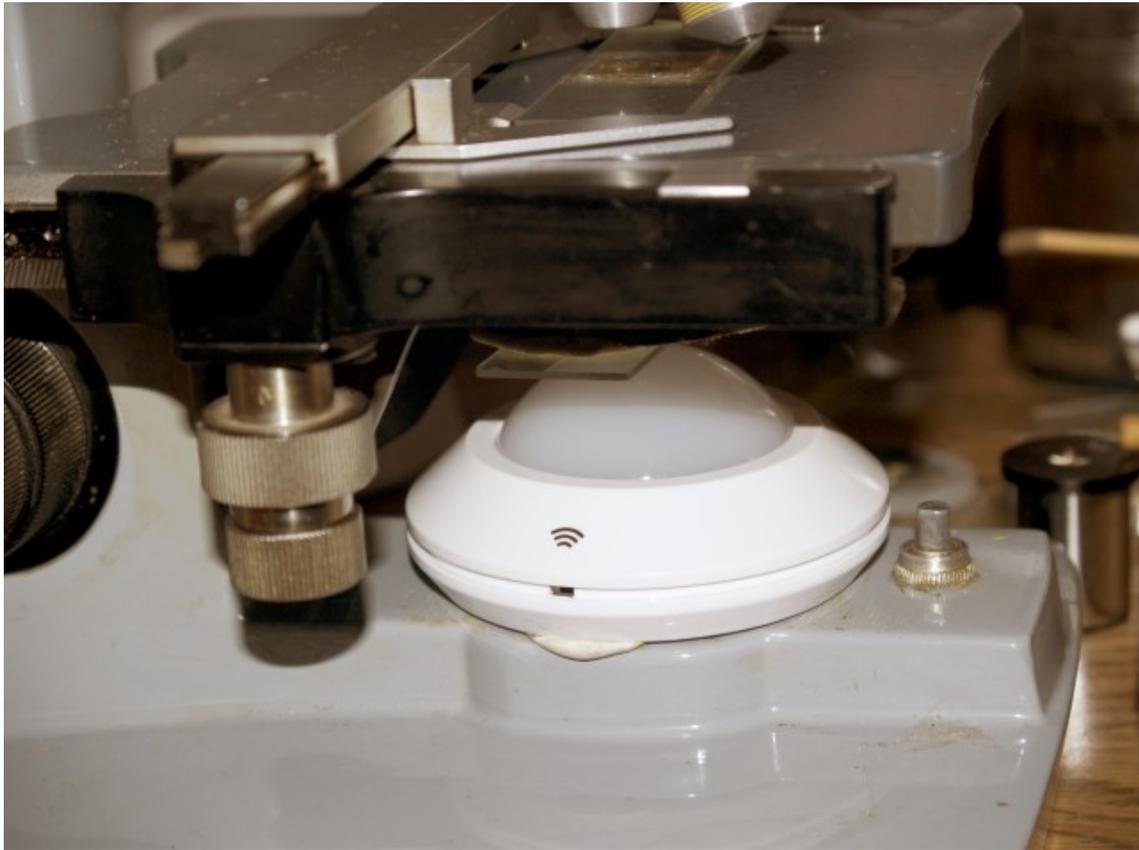


*Left. Tissue from the gaster of a wasp. 100x dark field. In green light.  
Right. Same view but in red light.*



My American Optical model 160 with Olympus E-420 DSLR mounted on eyepiece. The remote for the puck light is visible atop the slide box on the far right. (Yea it's pretty cluttered! But at least it's a good solid table.) You can see the puck light under the stage with the switch for the microscope's built-in lamp just to the right of it. Which in this setup still functions.

Close up of the understage assembly (below) showing the puck light. Held in place with sticky putty. The switch for the original lamp is visible to the right which is fully operational in this setup. Note the microscope slide fastened to the bottom of the condenser on which I have fastened a darkfield stop. (I find it easier to just stick it to the bottom of the condenser than use the filter holder. Since I can easily adjust the position of the filter by just moving the slide by hand.) The puck used in this setup can be controlled via a remote control and by simply pressing down on the globe. And cost me thirty seven dollars. (Including four lamps, about two dozen batteries and shipping.) On Amazon.com.



Comments to the author David Young are welcomed,  
Email: youngd123 AT comcast DOT net

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