



Shedding Some Light on the Matter “Monster Harmonica Workbench” with Kinya Pollard

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Last May at David Barrett’s Harmonica Masterclass Workshop, I conducted workshops on the fundamentals of harmonica maintenance. When listing the workbench “must haves” a few students were surprised that I had considered good lighting and magnification the two most important tools to invest in. In this issue I will “shed some light” on good illumination strategies.

See for yourself... think back to a time when you really, and I mean really needed to see something. Possibly you were trying to color match a chip of paint, or a swatch of fabric. Maybe it was the time you had to remove the small screws from that gadget to replace the lithium batteries, or simply match two socks of the same color!

It probably didn’t take you very long to move towards a brighter light source, and in extreme cases maybe you had to go out into the sunshine to actually “see” what you were doing.

In a trade journal that I read, a study determined that for every fifteen years we age, we require twice as much illumination to see. Speaking from experience, that article I read about fifteen years ago did not disappoint.

Referencing a 2004 GE Lighting manual, “... of the two light sensors in the retina, rods are more sensitive to blue light (Scotopic vision) and cones to yellow light (Photopic vision)...” What this translates into is that it requires less effort for us to see under bluish (bright), than that of yellow (dim) light sources.

Before I list viable lighting options for your Workshop, take a quick glance below:

Glossary of Terms

Footcandle (fc)

Is a unit of illuminance or light falling onto a surface. It stands for the light level on a surface one foot from a standard candle. One footcandle is equal to one lumen per square foot.

Footcandle Meter

Is an instrument commonly used by Lighting Energy Efficiency/Designers/Architects and photographers to measure footcandles. I personally use the Watt Stopper FX-200 Illuminometer (this is my profession).

Color Temperature (Correlated Color Temperature – CCT)

A number indicating the degree of “yellowness” or “blueness” of a white light source. Measured in kelvins, CCT represents the temperature an incandescent object (like a filament) must reach to mimic the color of the lamp. Yellowish-white (warm) sources, like incandescent lamps, have lower color temperatures in the 2700K–3000K range; white and bluish-white (cool) sources, such as cool white (4100K) and natural daylight (6000K), have higher color temperatures. The higher the color temperature the whiter, or bluer, the light will be.

Color Rendering Index (CRI)

An international system used to rate a lamp’s ability to render object colors. The higher the CRI (based upon a 0-100 scale) the richer colors generally appear. CRI ratings of various lamps may be compared, but a numerical comparison is only valid if the lamps are close in color temperature. CRI differences among lamps are not usually significant (visible to the eye) unless the difference is more than 3-5 points.

Your Workbench

Based on the IESNA (Illuminating Engineering Society of Northern America) Lighting Handbook (9th edition), and my personal experience, having 100~150fc at your work surface is ideal for performing the detail work that is harmonica mechanics.

There are two proven light sources that are available from most Home Centers, Hardware Stores and numerous on-line sources:

- Quartz Halogen
- T8 Fluorescent

Quartz Halogen lamps and fixtures are available in two distinct configurations: Track lighting with PAR lamps (90PAR38H) and double ended lamps (Q150T3/CL). Initially Quartz Halogen technology is inexpensive to purchase, but due to its short life (2,500hrs), “energy guzzling” ways, and incredibly HOT (Fahrenheit) design, most people opt not to spend their hard earned cash on Quartz Halogen.



Track Lighting with Quartz Halogen Lamps



Double ended Quartz Halogen Lamp

The best choice is to invest into *state of the art* T8 fluorescent technology—powered by flicker-free and non-humming electronic ballasts, and illuminated with lamps coated with narrow band rare earth Tri-phosphors (red, blue and green). This helps improve color rendition, color preference and improve light output. Pardon the pun, but this technology is light years ahead of the drab F40 Cool White fluorescent lights we all grew up hating.

With increased illumination, you will be thrilled to “see your harmonicas for the very first time.” But even more exciting is that you will be able to enjoy your new lighting system knowing that the long life attributes (20,000 hours) and energy efficient technology will be inexpensive and comfortable to own.

Installation

My workbench measures 3’ deep by 6’ wide. Installed 5’ above the work surface top (37” from floor), are two 4-lamp/F32T8/841K/120volt (each fluorescent lamp = 32watt, 86 CRI, 4100Kelvin “cool white”) evenly spaced luminaires that provides me with wonderful illumination. I prefer luminaires without lens (diffusers) for maximum 160+ fc light output.



Option 1: Each Luminaire has four T8 fluorescent lamps

Another option would be to install one 6-lamp/F32T8/850K 120volt luminaire centered over your bench to achieve close to 150 fc (37” from floor)



Option 2: Each Luminaire has six T8 fluorescent lamps

You decide which option works best for you and your workbench. Either way, you will not be disappointed with the results!

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