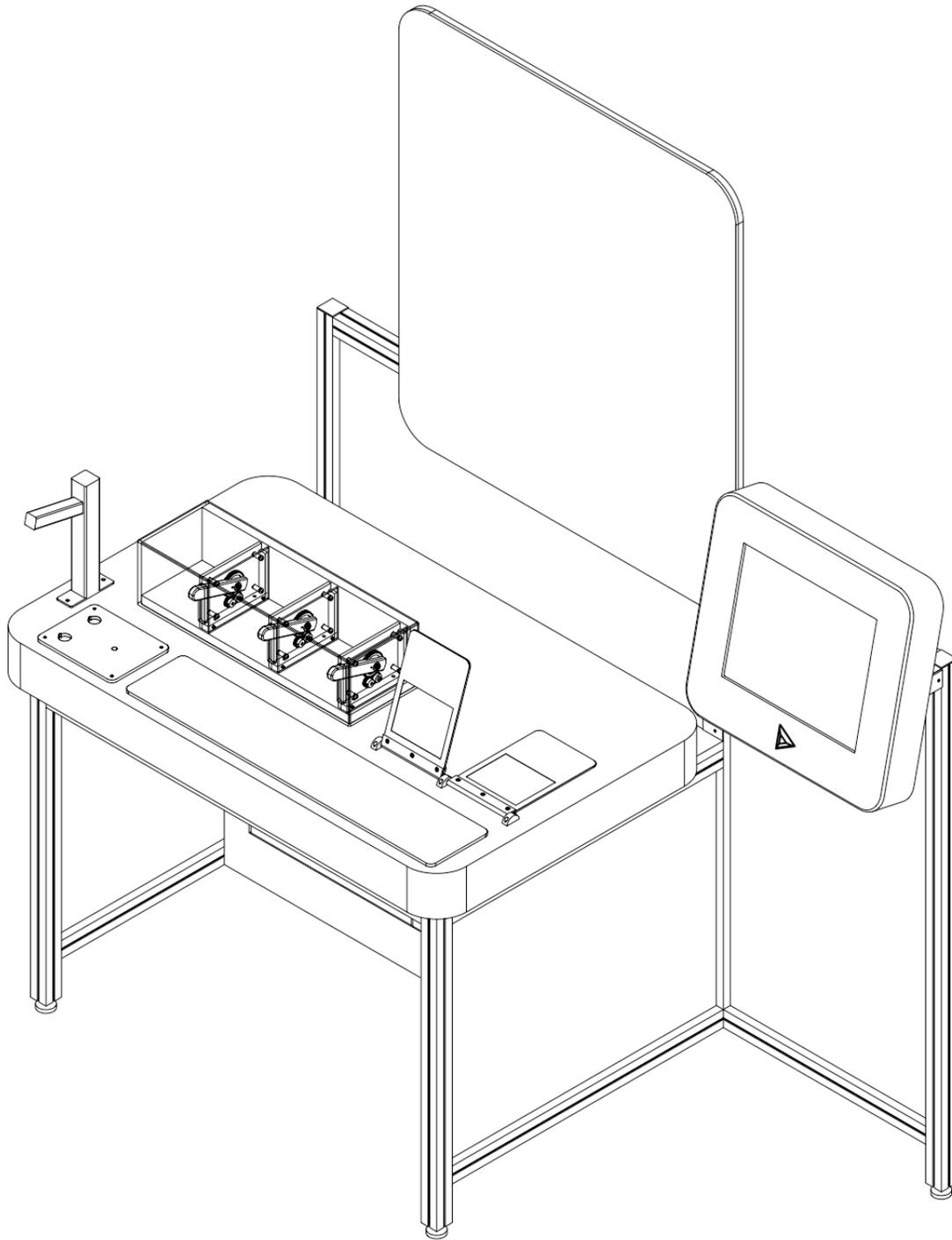


# Way to Glow

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# Exhibit Description

**Way to Glow** demonstrates and explains how similar nanoscale surface structures enhance the super-hydrophobic properties of the leaves of certain plants and new synthetic, water-repellant finishes.

On the left side of the table is a box containing three butterflies. The visitor manipulates levers to change the angle of the light on three different species of butterfly. The change in angle demonstrates the color shifts illustrative of butterflies with these color-producing structures.

On the right side of the table are two flips and a button. Each flip is covered with a dichroic film made up of hundreds of transparent layers that cancel out most wavelengths of light. When the light is off, the visitor sees the reflected colors—yellow or orange. The visitor can push the button to see the transmitted, or complimentary, colors—purple or blue. If you lift the flips, you can see a color shift.

To the left of the interactive a pair of headphones and two pushbuttons delivers an audio description of the exhibit in English or Spanish (or another 2<sup>nd</sup> language). To the right of the interactive is an LCD screen with changeable graphic content that may be scrolled through via a pushbutton.

Power is delivered to the exhibit via one power cord plugged into a single 120VAC receptacle at the host facility.

The exhibit has a “backside,” but may be approached from any direction.

## Installation

Assembly requires 2 individuals, each capable of lifting 75 lbs.

**Way to Glow** ships almost completely assembled. Once the location has been chosen, and the exhibit removed from its pallet, take a few minutes to level the table if necessary.

The graphic panel, which may be packed separately, should be secured to the top rail with the supplied hardware. Access to the base cabinet is via a National cam lock using a #415A key.



Check the internal electrical connections. All AV equipment is protected by a surge suppressor power strip. The power strip should normally be switched on. The following should not require any action, but take a few moments to verify that:

1. No wires at headphone volume control have come loose from their terminals
2. The Compact Flash Card is firmly and properly installed in the Roku Brightsign Media Player.
3. The monitor cable is plugged into the Roku Player
4. The DB25 interconnect cable on the rear of the Roku Player is securely plugged in.
5. The wires that run to the pushbuttons are plugged into the jack at the terminal breakout box.



**120 VAC power may now be connected to the exhibit.**

## Exhibit Cleaning

Proper cleaning of exhibit components is the first step in effective maintenance of any exhibit. Components need to be cleaned on a regular basis:

- Dusting of component exteriors with a dry cotton cloth or duster should occur weekly.
- Cleaning of horizontal and touchable wood or graphic surfaces should occur daily. We recommend Scotch Brite® 3M micro-fiber cloth, dry or lightly dampened with 12:1 dilution of water to Star Spray®, water only, or Dawn® dishwashing liquid very diluted in water.

- Polishing of Plexiglas® case vitrines should occur daily and on a spot basis as the need arises. We recommend a 12:1 dilution of water to Star Spray, or Novus® spray polish.

Substitute products may be used, but must be proven safe for surfaces to be cleaned. Do not spray cleaners directly on component surfaces. Apply to the cleaning cloth first and then wipe surfaces.

## Daily Inspection and Basic Troubleshooting

Each day, museum staff should check operation of the exhibit.

Verify that the HEADPHONES are working and that the Audio Description buttons (English and Español) trigger the appropriate audio file.

Check that the VOLUME CONTROLS are operable. Turn the KNOB fully counterclockwise. The volume should not go below an audible threshold. Turn the KNOB fully clockwise. The volume should increase, but should not become distorted or painful to hear.



Check that the LEDs illuminating the butterfly specimens are lit. Move each lever up and down several times and watch the gears for any slippage. Each light should be capable of roughly 90° of travel. One light travels from a vertical position toward the edge of the table to shine away from the visitor. The other two LEDs travel from vertical away from the edge of the table to shine toward the visitor. The LEDs should last a long

time. If the LEDs fail to light, the most likely problem is a loose wire or broken solder joint. This should be easy isolate with a multimeter.

Inspect the butterfly specimens for any damage. The specimens should last a long time, but may eventually require replacement.



Test the Orange button on the right side of the table. The light beneath the flipbooks should turn on when the button is pressed. Move the flips and check for any loose fasteners or unusual play in the hinge.

Verify that the slideshow on the side monitor started automatically. The triangle button should advance to the next image.

# Headphone Volume Control

The headphone volume is controlled by a custom amplifier built by SMM. (Actual board may be mounted in another orientation. The following positions refer to the photo.)



- Power In** is a standard 5.5mm DC connector.
- Audio In** is the 3-pin molex on the right hand side of the board.
- Audio Out** is the 1/8" stereo jacks on the left side.
- The **volume knob** connects to the 3-pin molex terminal on the bottom center of the board.
- Left and Right Maximum volumes** are adjusted independently with the two pots at the center of the board.
- Minimum volume** is set with the pot in the lower left corner. This can prevent the volume being turned all the way down so that visitors don't think the exhibit is broken.

# Parts:

Headphones  
AKG K-77

Head phone Amp  
Produced by SMM

Buttons (From Suzo-Happ)  
D54-0004-21 (Round)  
71-0004-T1 (Triangular)

## Butterflies

Dried specimens are available from a number of online vendors. They can be purchased either unspread or fully prepared. If you chose to prepare the specimens yourself, instructions are available from the vendor. The process takes several days. The species originally installed in the exhibit are the following:

- Morpho Didius Didius (male)
- Papilio blumei fruhstorferi (male)
- Troides magellanus (male)

Different species exhibit color shifts at different angles, and some experimentation may be required to mount them in the optimal position. The light mechanism is reversible to facilitate this. Originally, two lights flipped behind the specimens and one flipped in front of the specimen.

Butterfly LEDs  
Digikey: c535a-WJN-CU0V0231-ND

## Flip Books

3M dichroic films may be obtained from the manufacturer. SMM may have a small stockpile of film. The films in this exhibit are #500 and #590. The films are mounted to abrasion resistant polycarbonate with optically clear adhesive.

Flipbook LEDs:  
Digikey: 365-1504-2-ND

If you require any information not included in this document, more complete drawings and diagrams are available online at [www.nisenet.org](http://www.nisenet.org). With any other questions, please contact:

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