Imaging Station Set-up Using Lightbox with Copy Stand for camera mount

There are three practical image lighting set-up options in widespread use in the herbarium community. These are: 1) a copy stand with a light box, 2) copy stand with fluorescent lights, and 3) copy stand with strobe lights. This module is specific to the copy stand with a light box approach and emphasizes the use of the ORTech Photo eBox Bio photographic lighting system. Many herbaria have produced detail guidelines for setting-up and/or using the ORTech Photo eBox Bio set-up. Some examples are the University of Wisconsin (WISC) - (http://herbarium.wisc.edu/documents/TCN_equipment-Field_setup_manual_Dec15.pdf) and the University of New Hampshire (NHA) - (http://vimeo.com/user20813619/review/74466690/886a3c6226)

Task ID	Task Description	Comments and Explanations	Resources
T1	Select appropriate light box for your needs.	A light box is a photographic lighting device that lights specimens from four sides within an enclosed space to minimize shadows on the specimen. This lighting system is recommended for high quality image capture.	ORTech Photo eBox Bio photographic lighting system ("NYBG-modified", Model: 777000). IMPORTANT: Request that the middle feet are not installed upon ordering. The ORTech camera arm mount is not appropriate for herbarium image photography, so you will also need a copy stand (see T2). Another lightbox option is the Ortery Photosimile 50 (not easily used with a copy stand; therefore, modifications required to top of box to hold camera).
T2	Select copy stand.	The copy stand (without lights) is necessary for stability and adjustable camera height.	Kaiser Copy Stand RS 1 with RT-1 Arm, 40" Counterbalanced Column, 18 x 20"

		What is necessary is a copy stand that has 1) continuous adjustment for camera height (as opposed to pre-set heights with a locking clip system), 2) flexible (or extendable) horizontal distance from copy stand arm, and 3) stability on the benchtop.	baseboard. Bencher Copy Mate II Tabletop copy stand. This copy stand has a smaller footprint and a shorter arm than the Kaiser, so depending upon your camera and lens, it may not be tall enough to mount camera and capture the entire specimen within the light box. Other copy stands may work well, but are as yet untested by this group, and include OR-Tech CopyStand (42" max camera height) and Beseler CS-21 Digital/Photo & Video Copy Stand, which has a large base and appears to be tall enough. If you have a permanent suitable tabletop (and appropriate carpentry skills), you can purchase ONLY the column and carriage mechanism, and mount these to the table itself (thereby avoiding the possibility of your ebox being bigger than your copy stand base).
T3	Attach camera to copy	Make sure your camera is	Refer to "Selecting an

	stand arm.	centered over the opening of the lightbox. Test with live-view option on camera, and have a target on which to focus. Before attaching the camera, it may be necessary to insert the camera's AC adapter and USB cord, as the camera battery compartment and ports may be difficult to access later.	Imaging Station" workflow for guidelines on placement of imaging equipment.
T4	Place lightbox on copy stand.		
T5	Prepare internal platform of light box for herbarium specimen photography.	It is recommend that the shooting surface be covered with a black, light-absorbing material that is easily cleaned of plant debris and resistant to wear and tear (or easily replaceable). The background material can be adhered to the shooting surface with gaffer's tape. Background options include: ● Black velvetine paper background ● Black velvet material ● Flat-black poster board For the Photo-e Box Bio, one may want to remove the translucent light-diffusing plastic which covers the platform lights to use as a template for cutting the background paper.	Velvetine Paper Background - 52'x20' roll - Midnight Black: http://www.bhphotovideo.com/c/product/45657-REG/Savage_522020_52_x20_Velvetine_Background.html.
T6	Adjust camera height.	Important consideration: Is your camera full-frame or does the image sensor include a crop factor? Use the Focal Length Calculator to help. Camera height should frame an entire herbarium sheet with minimal extra space around	Focal Length Calculator: http://www.cambridgeincolour.com/tutorials/camera-lenses.htm.

		edges of sheet (to eliminate need for later cropping).	
T7	Place specimen guide in box.	This can be a blank herbarium sheet. NOTE: Use live-view on camera to position the specimen guide. This can be as needed, depending upon where you need the ruler and color separation guide. Whenever you decide on the location, use gaffer tape to tape herbarium specimen guide to velvetine. Another option would be matting material to create a square corner.	Herbarium sheet. Matting material.
T8	Position and affix color standard and scale bar.	These items should be placed along the short edge of the herbarium sheet. They can be placed at the top or bottom edge. Affixing these should be done with care so that they are squared and flat to create quality images.	Gaffer tape or strong double sided tape. Scale bar. Quarter-sized color standard: http://www.digitaltransitions.com/product/targets/colorgauge-nano-target.
T9	Configure imaging computer and install software.	Install camera control and image editing software, and any custom software or scripts. Create folder structures to facilitate image organization and processing (See Image Processing Module, T1). Connect camera to computer using USB cord, and test that camera is recognized. Configure camera control software and camera settings. Camera settings (e.g., F-stop, color balance) should be	Camera control software. Imaging editing software.

		chosen to produce an image that will require no or minimal post-processing. Can use information from the color standard to determine proper camera settings. The appearance of an image on a monitor may not be reliable.	