
Petrographic Image Capture and Archiving Tool (PICAT): Quick Start Guide

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Introduction

This system was designed to digitally photograph entire Petrographic Thin Section samples in both cross-polarized and single (plane)-polarized states. Microscopes do not have a field of view wide enough to image the entire specimen. The PICAT (Petrographic Image Capture and Archival Tool) provides an easy and versatile imaging process that captures a publication-quality image (8 x 10 inches at 300 DPI) within seconds rather than minutes.

Apparatus and Materials

The PICAT thin section imager consists of the following hardware:

- Kaiser Camera Stand and Photo Table
- Canon EOS 5D Mark II Camera and 65 mm 1×–5× and 100 mm IS macro lenses
- B&W 95 mm Diameter Linear Polarizing Glass Filter Element (2)
- Custom Filter Module with Friction Wheel (custom-designed for this system)
- Specimen Holders: standard (for 1 × 2 or 2 × 3 inch specimens) and X/Y (for nonstandard specimens)

Standard Operation

The following sections describe the standard procedure for imaging and cataloging a thin section aboard the *JOIDES Resolution*. Notations are made where alternate workflows may be substituted, but such workflows are not described in this document. Standard operation includes

- Starting up the system
- Acquiring an image
- Processing and uploading an image
- Shutting down the instrument

Starting up the system

1. Start the computer and navigate to the Windows desktop.
2. Ensure that the power strip under the monitor and the light power source are turned on.
3. Remove the lens cap from the camera.

Acquiring an Image

1. Select the type of specimen holder and load it if needed (see the PICAT User Guide for more instructions on changing the sample holders).
2. Load the thin section slide into the recessed portion of the tray. Slide the tray in and out as needed.
3. Two polarization filter holders, one above the tray and one under it, are coupled by a magnetic linkage. The entire assembly can be rotated out of the way as needed. The filters can be rotated independently or together (the former by turning the polarizing [bottom] filter while preventing the filter holder from rotating, the latter by turning the white linkage knob).
4. Start the EOS capture software.
5. After startup click on **the Live Image Preview** button to see a window that shows exactly what the thin section image will look like.
6. If you are using the 65 mm macro lens, adjust the Macro (a zoom effect) setting on the side of the camera as desired. The lens in this camera has a fixed focal point; to bring the image into focus, adjust the distance of the camera from the sample using the hand crank attached to the camera arm.
7. Adjust the filters for polarization mode as follows:
 - Single-polarization:** move the entire top filter assembly arm to the left (out of optical view path).
 - Cross-polarization:**
 - Ensure that both filter arms are engaged (in the optical path).
 - Turn the bottom polarizer while viewing the display on the monitor until a dark-field is achieved.
 - Turn the friction wheel at the top filter plate to rotate both filters and adjust the image as preferred.
8. As a matter of good practice also check the following before the image is captured:
 - Dark-field and cross-polarized state.
 - Refocus the image when switching polarization, as this affects the light path and focus.
 - If the camera is in auto-mode and is calculating the exposure properly, no further adjustment is needed.
 - If the camera is in manual mode, adjust the combination of aperture, shutter speed, and or ISO settings for the desired effect.
9. When the image on screen is deemed acceptable, press the **capture image button** in the cannon EOS software (large circle).
10. View the captured image in the preview window.
11. The preview window can be ignored/closed without affecting anything. If Adobe Bridge is already loaded, its icon will flash in the taskbar (burnt-orange square with the letters “Br”). If Bridge is not already loaded, it will open automatically after a few moments.
12. No action needs to be taken in Bridge at this point. Close/minimize Bridge at any time. The camera automatically creates and saves the JPEG and RAW files.

Processing and Uploading the Image

1. Start the IODP Image Capture software and login using LIMS username and password.
2. After software log-in, the upper left corner displays a list of images that were just taken (JPG files). Click on one of the images to select it for processing.
3. Associate this image with a sample:
 - Click on the Browse button.
 - Select a site/hole to select a sample (default type = Thin Section [TS]).
 - Select a sample from the list and return to main window.

4. Once a sample has been selected, the sample text_id field populates and a new label is generated in the top right that indicates the new filename, based on the sample selected. If multiple pictures were taken of the same sample, the filename is appended with _2, _3, _4, etc., based on the number of previous images taken *and processed*. Fill out the rest of the values based on the conditions when the image was taken.
5. Click **Upload** to open a window indicating the upload status. When the upload process is finished another dialog box will appear indicating that the process is complete
6. Once uploaded, the selected image is removed from the pending uploads list and loaded into LIMS. Continue processing additional images.
7. After upload, the images are moved to the archive folder (at the same level as the capture folder). Under the archive folder are 3 subfolders:
 - JPEG
 - TIFF (not generally created in standard workflow)
 - RAW
8. These folders contain a hierarchy in the form of `\{Expedition}\{SiteHole}\filename.ext` of all the files (essentially, images are organized by type, expedition, and site-hole when stored in the archive folder). These images do not need to be backed up (as they are already in LIMS/ASMAN) but can be selected by the photographers, etc., for alternate archiving if desired.

Shutting Down the Instrument

1. Shut down the Cannon EOS utility if it is still running.
2. Place the lens-cap back on the camera.
3. Turn off the light, but not the power strip. This is important to ensure the fan cools the light while it is still hot. The power strip can be shut down 15 min after light has been turned off.