Imaging Workflow for Floppy Disks (3.5”, 8”)

Hardware: KryoFlux, floppy disk drive
Software: KyroFlux driver, GUI or CLI ***or*** Guymager [Not Yet Implemented]

I. Pre-imaging: Cleaning and setup
   a. Clean disk with Q-tip and mild isopropyl alcohol
      i. Risk of clouding disc
      ii. Solvent needs to dry sufficiently to avoid further damage in drive
   b. Disassemble and clean drive

II. Installing the Kryoflux and Software [First Time Setup]
   a. Kryoflux software can be downloaded from the Kryoflux Website for both Windows and Linux (works in BitCurator).
   b. Extract the files to the location you’d like them. Make note of this directory, and if possible, add it to your machine’s PATH. This will streamline CLI work.
   c. In Linux, open the command line and enter each of the following commands
      i. `sudo apt-get install libusb-1.0-0-dev`
      ii. `sudo apt-get install libusb-dev`
      iii. `sudo apt-get install openjdk-7-jre`
   d. In Linux, create a text file named “Kryoflux.rules” In the file, type:
      i. `ACTION=="add", SUBSYSTEM=="usb", ATTR{idVendor}=="03eb", ATTR{idProduct}=="6124", GROUP="floppy", MODE="0660`
   e. Move or save this file to “/etc/udev/rules.d”
      i. If you have issues or recieve a permissions error open the command line and enter the command “sudo bash” and then try again.
   f. For Windows Users. Follow the directions found here to install the Kryoflux Driver.

III. Connecting the Kryoflux
   a. Make sure write blocking is enabled. Digital Preservation Lab Kryoflux(s) have this enabled by default, but more information on how to do this can be found here.
   b. Elevate drive so it’s not sitting on the surface directly. Make sure that the spinning portion of the drive is not touching anything. This can also be achieved with an enclosure for an exposed floppy drive.
   c. Connect the floppy data (IDE) cable to the controller and the drive
   d. Connect the controller to computer via USB
   e. Connect power adapter for drive
   f. Check that computer can see drive
      i. Navigate to Device Manager and look for “Kryoflux Disk System” under “Universal Serial Bus controllers”(Assuming drive has been installed and machine recognizes device with correctly installed drivers) Calibrate drive

in GUI or command line. If the “Kryoflux Disk System” doesn’t appear, consult the troubleshooting steps here.

IV. Imaging Setup - Kryoflux GUI/CLI

a. Determine format based on original OS/hardware. If you are unable to do so, save a RAW stream, which can be checked for file system compatibility later.
b. Open up GUI (step V) or CLI (step VI)
c. Calibrate
    i. In GUI, select Drive>Calibrate, select yes when prompted
    ii. If there is an issue while calibrating, switch between Drive 1 and 0
    iii. If calibration is successful, GUI will report the maximum number of tracks for the drive
    iv. In CLI, navigate to the folder where the DTC software is and run “dtc -c2”
        1. Drive should run, and CLI should report back the max number of tracks it is capable of reading; this does not require a disk in the drive

V. Imaging in the GUI

a. Enter file name for disk image file in the “Enter name…” field, and select the type of file corresponding to the disk being imaged from the drop down menu (if multiple, select multiple and then select each image type while holding down ctrl)
b. Click Start. Process will run. Image and log will be saved into the location specified in the GUI settings

VI. Imaging in the CLI

a. Imaging in the command line interface uses the “dtc” command and runs the dtc program found in the Kryoflux install. Make sure to add this to your machine’s absolute path. An example command would be:
dtc -p -f<Path to Save Location> -i0 -i4
b. The <path to save location> can be a new path, but should end with the name of the disk image file you’d like to create. For example:
Dtc -p -fC:\Users\Workflow\Desktop\Imaging\Test.img -i0 -i4
c. The -i<#> commands indicate the image type. 0 is a raw data stream, 4 is MFM format, 9 is apple format. A full list can be found in the Kryoflux user manual. If unsure, save a raw data stream first. File system compatibility can then be tested on the imaged file. This reduces the need to handle/image the disk repeatedly.

V. Disconnecting

g. Unplug the drive power supply
h. Then disconnect the PC to controller USB cable
i. Disconnect the data cable/floppy drive cable

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Resource Links:

- Archivist's Guide to Kryoflux: https://github.com/archivistsguidetokryoflux/archivists-guide-to-kryoflux
- Kryoflux manual (download): https://www.kryoflux.com/?page=download