

## Digitizing your Family History – Scan Basics

### 1. Pixels and televisions:

Pixel-basic unit of color in any image on a TV or monitor

Full HD TV                1920 pixels horizontal and 1080 vertical

Ultra HD (4K) TV    3840 x 2160

Aspect ratio: 16:9 (horizontal to vertical ratio for number of pixels)

Older TVs have a 4:3 aspect ratio

### 2. Scale and resolution:

Resolution is quantified as pixels/inch.

Resolution entered on scanner is always the output resolution.

Scale is a multiplier of that resolution for the input: Thus an output resolution of 300 and scale of 100% results in an input resolution of 300. A scale of 200% would result in an input of 600 so that the output is still 300 ppi. This yields the same result as a 600 ppi scan at 100%.

Scale is a tool used for the printer. 300 ppi output resolution is considered a minimum for a decent quality print. The scanner then takes your scale setting to automatically adjust the input resolution for whatever size print is planned so as to keep the output at 300ppi. For the TV scale can be ignored. Set scanner at desired ppi and 100% scale on the HP or "original" target on the Epson scanner.

In the Home mode the Epson scanner does not use the term scaling. Rather, it has settings for the resolution (output) and for the target size. Original target size means same size as original, thus 100% scaling. A target size twice the original would result in a 200% scaling.

### 3. Scanner resolution for TV viewing:

300 ppi scan on a 6x4 photo yields 1800 pixels by 1200 pixels, almost enough to fill an HDTV screen

600 ppi scan on a 6x4 photo yields 3600 pixels by 2400 pixels, enough to fill an HDTV screen and almost enough to fill the 4K screen

720 ppi (only on Epson) scan on a 6x4 photo yields 4320 pixels by 2880 pixels, plenty to fill both HDTV and 4K

2400 ppi scan on 35mm slides yields about 3400 pixels by about 2200, enough to fill an HDTV and almost enough for the 4K screen

Our goal should be to scan at a size sufficient to fill the TV screen. And all of us will have 4K TVs in the near future. Note that 4K TVs have an upscaler in them so that an image with too few pixels to fill the TV screen will be upscaled, but with a loss of resolution. HDTVs do not have this feature.

I generally use 600 (HP) or 720 (Epson) on a 6x4 photo, higher for smaller photos, and 2400 on slides. This would also allow me to print an enlargement of the photo; 6x4 could be printed as a 12x8 and still maintain the 300 minimum ppi on the output.

#### 4. File types:

**Jpeg** is the standard for web sharing of photos. It uses a “lossy” compression that reduces a scan size from 25 MB or so to 3 or 4 MB. The compression algorithm essentially discards data that the human eye cannot detect. But remember that each time you copy and save the same photo it goes through a “lossy” compression with some loss of resolution. There are different levels of Jpeg compression in the scanner settings: **always choose the highest quality/largest file size.**

**TIFF** is the other format most recommended for photo scanning and is used more in the commercial printing environment or by serious archivists. There is no compression and total detail is maintained. File sizes are very large and you cannot email them or upload to the web.

#### 5. Other scan settings:

HP: Restore faded color-great for old ektachrome slides. Adaptive lighting, sharpen, remove dust and scratches all can help. Scanning with higher bit depth and 6 color- much slower and I cannot see the difference. Set scanner for single or multiple photos (to single or separate files). All these settings can be saved in a shortcut. After preview scan you can add/delete, crop, rotate, change scale, lighten/darken, adjust color, and fix flaws. I will rotate here, but most other adjustments I will do in the photo editor.

Epson: has 3 modes... auto, home, and professional. Each one gives you additional control over the final image, particularly with the color adjustments. Of note is the digital ICE technology on the V600 for removing dust and scratches. The less expensive V550 does not have this feature. It does a good job but increases scan time. A can of compressed air from Office Depot also does a good job of cleaning slides. Again, I generally just do the rotation here if needed and leave the rest for the photo editor. Note that whenever you make a setting change the scanner retains that new setting, so remember to always set it back to whatever you use routinely.

Remember that if you severely crop a photo, either when scanning or in the photo editor, it is the same as scanning a much smaller photo so you may need to increase the resolution setting.

#### 6. What scanner can I use:

Do use a flatbed, not a document feeder.

It needs to handle multiple photos or slides to separate files.

Resolution settings of at least 600 ppi for photos and 2400 for slides. My HP and Epson are 4800 for both photos and slides.

Check settings on your all-in-one printer/scanner: Mine does multiple photos up to 1200 ppi with adjustable Jpeg quality. It will not do slides.

#### 7. Digital camera and Google photoscan

You may want to use one to record pictures too large to scan, or are in frames you don't want to tear apart. Camera should be set at highest resolution possible. Google's new photoscan app does a great job of taking glare free photos with decent resolution. It is easy to use and no account needed. It will take 4 “scans” of your photo and meld them together for a glare-free result.

Download photoscan from the Google playstore.

Only 2 settings: flash on/off, and (phone\*) takes single picture or (phone\*\*\*) takes 4 pictures. Turn flash on for best results. See in-app help menu for more info.

To scan a photo: open app, hold phone level above photo, frame photo in screen, tap button, move phone following the arrows to get the circle over each of the 4 dots, when processing finished tap thumbnail in lower right, you can now rotate, adjust corners, or delete, then tap save all to save to a photoscan folder in your phone's gallery.

