Digitization Primer

Basic Scanning

In addition to providing drivers that control hardware, scanning software can be used to preview and optimize an image before you perform a scan. Controls may include color correction, sharpening, rescaling and resizing. Most scanners have modules that let you scan and perform post-scan processing from within programs like Photoshop or Microsoft Word. TWAIN compliant scanning software provide a standard interface for communications with different types of hardware, i.e., scanners and cameras.

Within applications such as Adobe Photoshop LE, in Figure 1 below, scanning software is usually accessed through the File|Import or File|Acquire menu, which lists the types of input devices available.
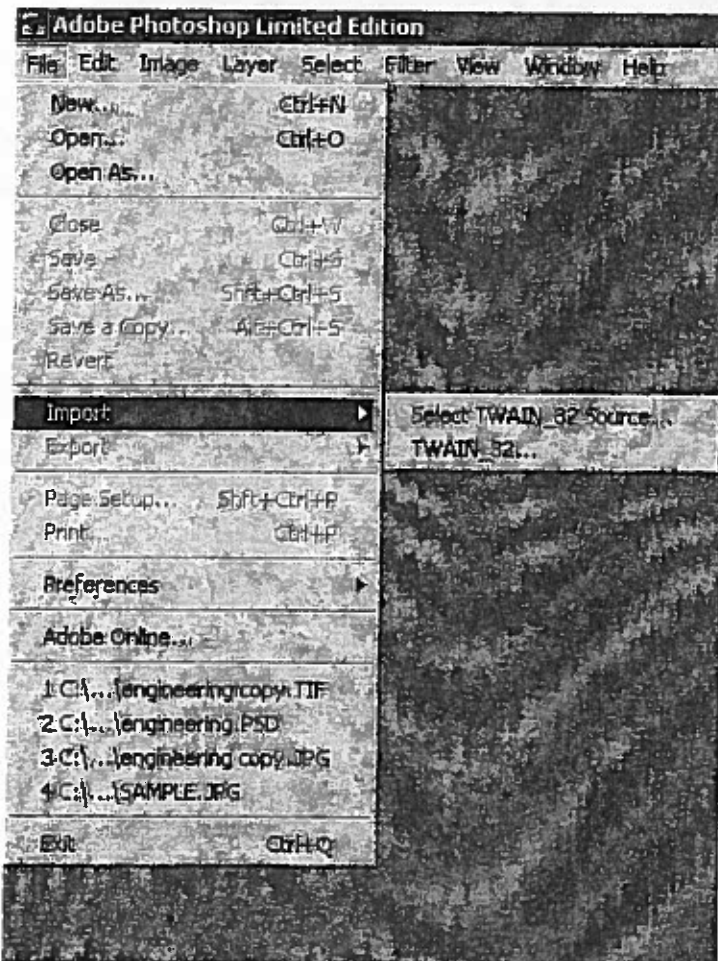

Figure 1. File|Import

Check settings for the image type (flatbed, document feeder, etc.), color depth (color, gray, line art or OCR) and destination (screen/web, prepress, printer, etc) before previewing the image. Marquee and zoom tools can be used to frame the image to before setting image size and resolution. Some good baseline settings include:

- Pixel depth = 24-bit
- Resolution = 300 dpi
- Image Dimensions = 100%

Once the Scan function is executed, the preview image is exported to Photoshop LE. In Figure 3 below, using options under the Image menu, we prepare to resize the image after having rotated it 90 degrees clockwise. The width of the original scanned image is being changed from 3822 pixels to 600 pixels. By checking "Constrain Proportions" in the Image Size window, Photoshop will automatically resize the height of the image from 2351 to 369 pixels.
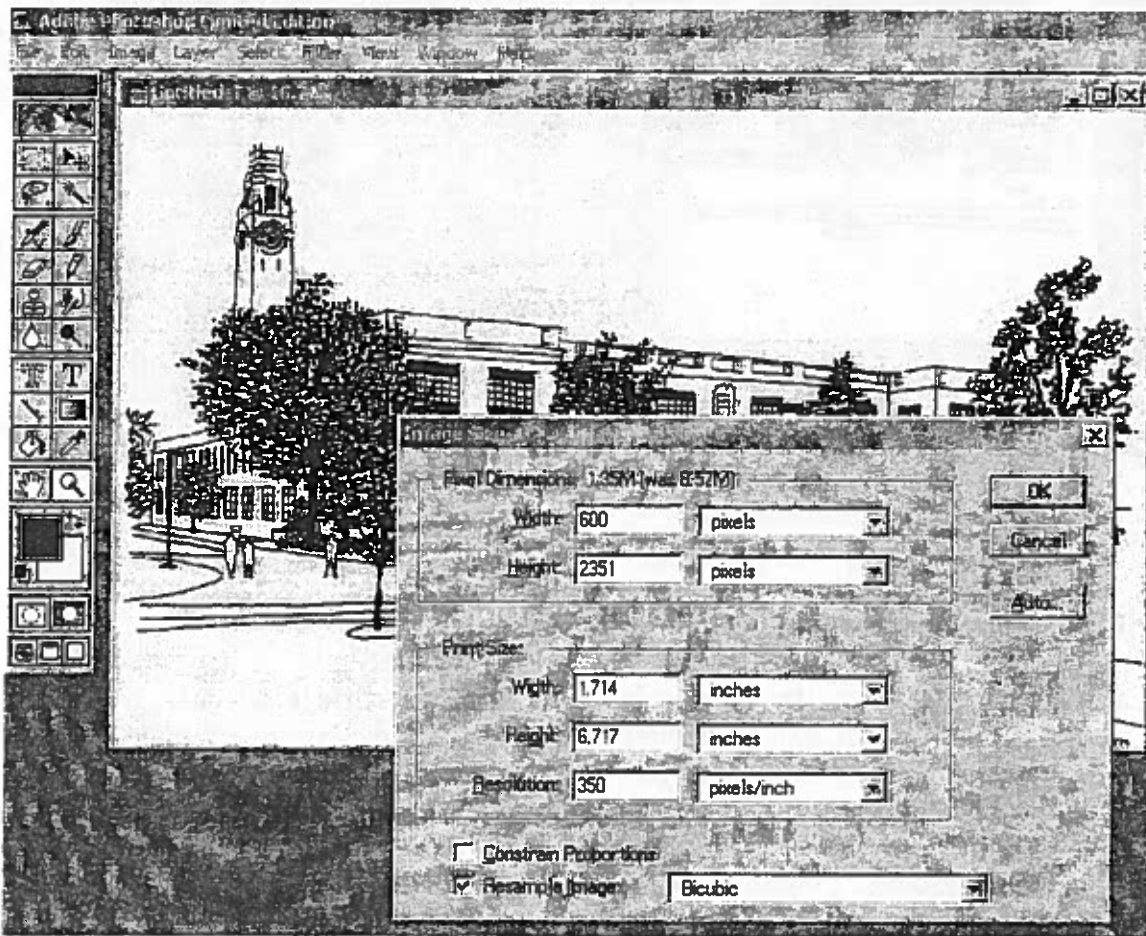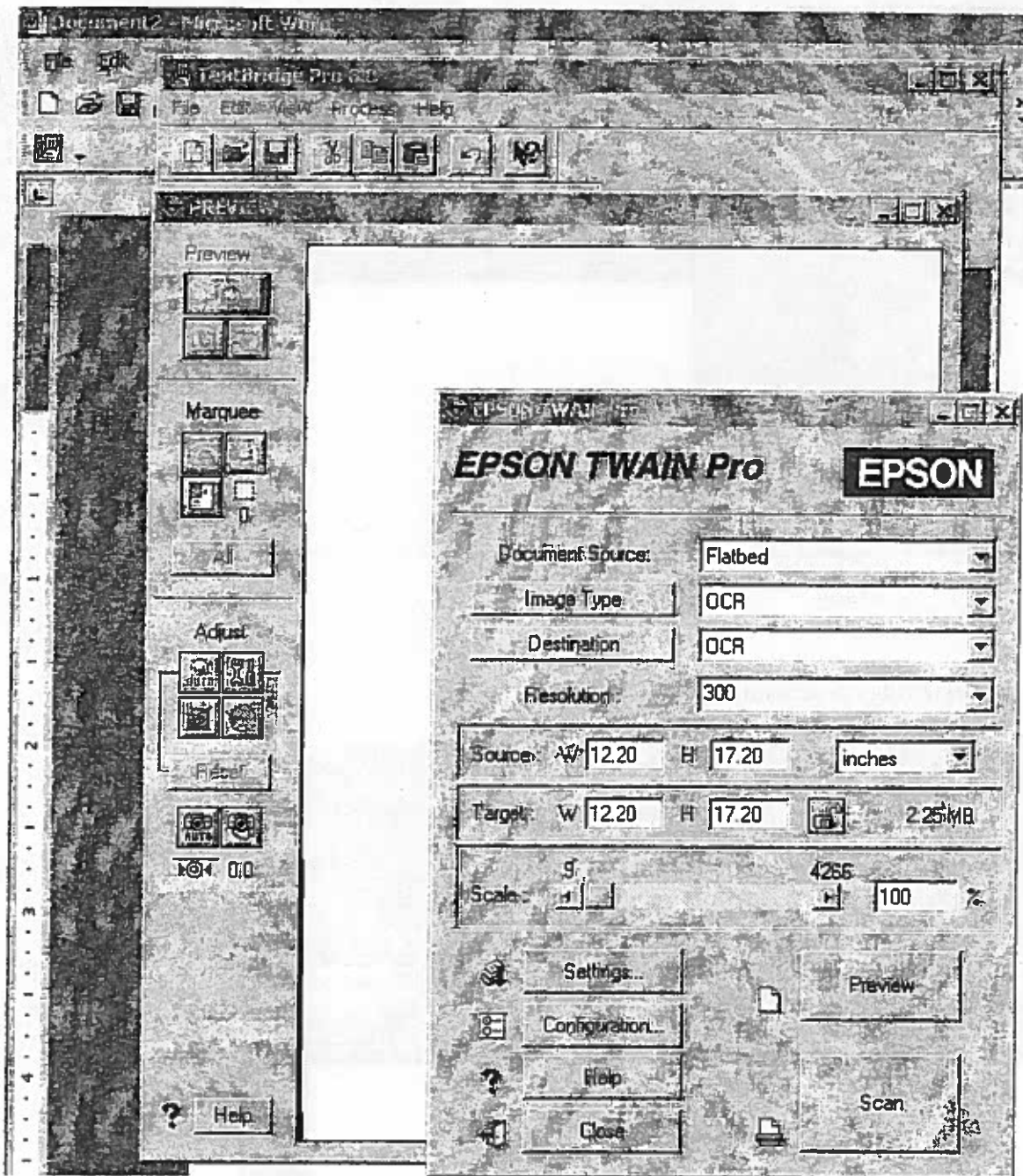

Figure 3. Image|Resize

Figure 6. Running TextBridge from Microsoft Word

If your software does not include an Image Type specification for OCR, as is shown above, choose an option for black and white or line art (one-bit color) not a grayscale. Then select Preview, draw a frame around your text, and then scan. This will import the OCR Preview into the TextBridge processing window, Figure 7, where you can choose to process the image automatically or manually. Choosing Recognize Page, Figure 8, provides an option to spell check the output.

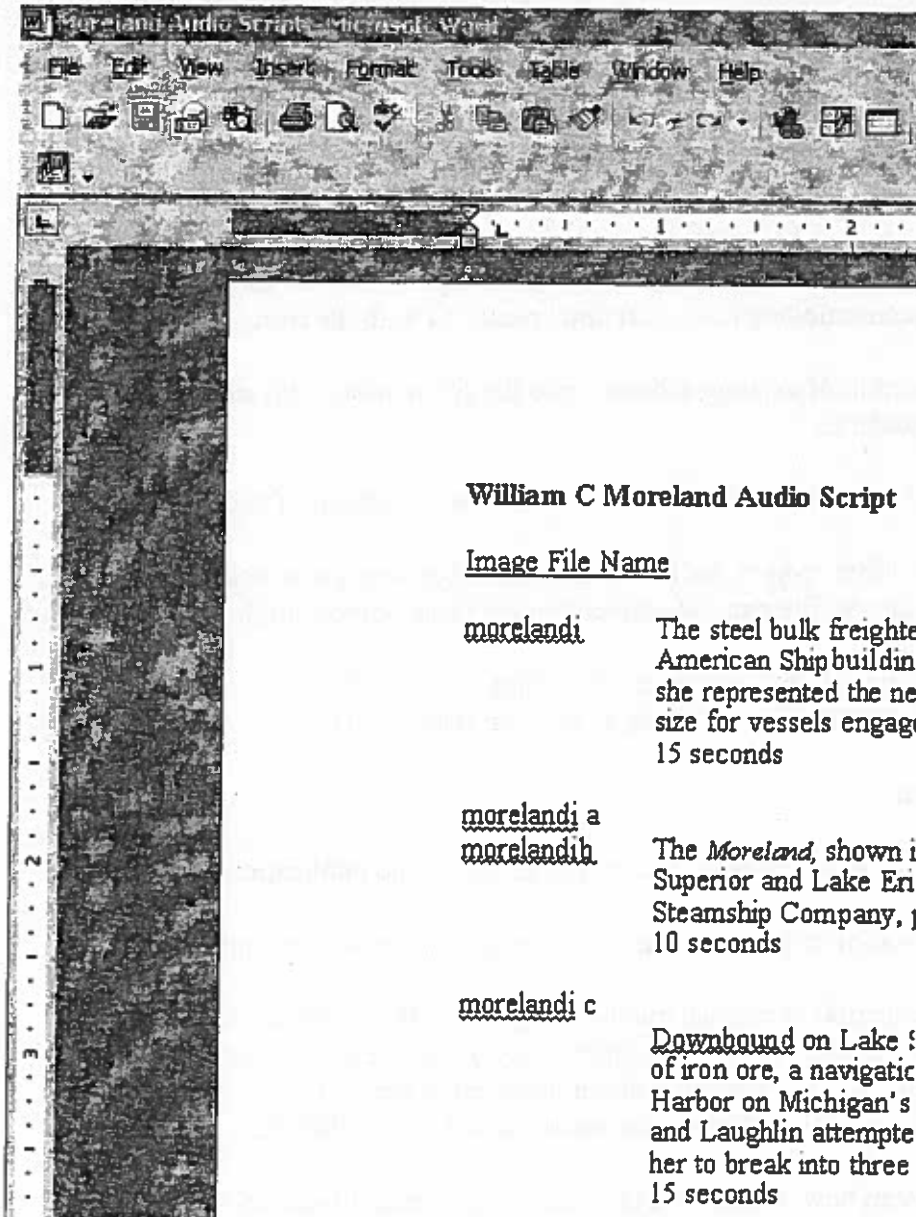Once the document has been proofed, select File Update Document and Exit to export the results to Microsoft Word.

William C Moreland Audio Script

Image File Name

morelandi   The steel bulk freighte
American Ship buildin;
she represented the ne
size for vessels engag(
15 seconds

morelandi a
morelandib   The *Moreland*, shown i
Superior and Lake Eri
Steamship Company, j
10 seconds

morelandi c

Downbound on Lake !
of iron ore, a navigatic
Harbor on Michigan's
and Laughlin attempte
her to break into three
15 seconds

Figure 9. OCR output to Microsoft Word

Scanners

Flatbed (> $150): Support scanning of 8.4 x 11 inch (standard) up to 12 x 17 inch (graphic arts) originals on a flat glass surface, at a resolution of 600 dpi to 25000 dpi and greater, including options for OCR, slides, transparencies, and document feeders

Transparency ($900 - $5,000): Support high resolution scanning of slides and/or large format transparencies

Book Overhead (> $5,000): Support scanning of bound or unbound documents, as they would be read, with output to industry standard files or high quality text, line art and photographic printers

Drum (> $10,000): Support high resolution scanning of large format documents or images attached to a revolving drum or cylinder, typically using a photomultiplier tube as an imaging sensor instead of a CCD

Hardware Interfaces

Parallel: supports scanning at up to 115 kilobytes per second, or 9 seconds per megabyte, through what is commonly called a computer's printer port

SCSI: Small Computer Systems Interface supports scanning at up to 5 MBps (SCSI-1) or 80 MBps (Wide Ultra SCSI) and up to 7 daisy-chained devices using a special adapter card that can be difficult to configure or incompatible with some devices or interfaces

USB: Universal Serial Bus supports scanning at only 1.5 MBps but can link up to 127 devices, daisy-chained or on USB hubs, and can be configured more easily than SCSI

FireWire: Apple-trademark name for IEEE-1392 interface supporting scanning at 50 MBps and up to 63 daisy-chained devices

Scan Rate

With computer and scanner as constants, the size of the original image and type of the interface affect the rate at which an image is scanned:

	FireWire	USB	SCSI
4 x 6 inch reflective art @ 100%	19 seconds	23 seconds	19 seconds
10.5 x 14.5 inch reflective art @ 100%	52 seconds	102 seconds	56 seconds
0.8 x 1.4 inch transparency @ 100%	19 seconds	19 seconds	18 seconds

Glossary (Cont)

MP3: MPEG audio format supporting up to 12:1 compression of audio at near CD quality

Sampling: converting data (media) into a digital form

Screening: converting data from continuous tones to half-tone dots

OCR: optical character recognition process that converts print media into editable text

PDF Adobe's Portable Document Format (readable via Acrobat)

Photomultiplier: tube sensor on a high-end scanner that performs the same basic function as a CCD

Pixel: smallest unit comprising an image

PPI: pixels per inch

Pixilation: distortion caused by over enlarging an image

RM: RealMedia file format supporting streaming audio and video over the Internet

RGB: default red, green and blue colors used by monitors and digital cameras

Raster: bitmap image

Resolution: the number of horizontal and vertical pixels, i.e., 1200 x 600 dpi, that a scanner can capture

Resolution, Horizontal: number of pixels of dots a CCD can capture, based on the number of photosites per horizontal inch of a scanner

Resolution, Vertical: the number of times a CCD stops to capture a vertical row of pixels

TIFF: standard Tagged Image File Format for bitmapped images

TWAIN: standard interface for imaging equipment

USB: standard Universal Serial Bus cross-platform equipment interface

Vector: in contrast to bitmap, an image whose curves and shapes are described mathematically, allowing it to be enlarged with little noticeable diminution in resolution

WAV: Microsoft Wave file format supporting 8 and 16 bit, mono and stereo audio

Setting project goals.

Why do you want to digitize anything?
Preservation issues.
Access issues.
Local or?

Criteria for selecting collections.

Preservation?
Access?
Publicity?
Donor?
Demand?

What is going to drive the work on the project?

Availability of money? Equipment?
Availability of staff?
Altruism?
External pressure?

Technical issues.

Standards.
Metadata.
Formats.
Display issues.
Text? Image? Sound? Video?

Equipment and software choices.

Proprietary formats.
Workstations.
Audio.

Graphic Sciences tour and demo