Introduction

Manufacturer's Description:

CZUR Aura Pro Book & Document Scanner, Capture A3 & A4, Auto-Flatten & Deskew Powered by AI (Artificial Intelligence)Technology, Foldable & Portable, Compatible with Windows & Mac OS.

Product Parameters

Sensor/Pixel	CMOS 14 megapixel (4320x3240)
DPI	240
Scanning size	420 x 297 mm or 16.5 x 11.7 Inches (Can do ledger size 11 x 17 inches) Note: the black scanning mat must extend beyond the document in all directions to be scanned.)
Scan speed	About 2 pages/second (or 4 seconds/scan)
Focus mode	Fixed focus
Light source	Top lights or side lights, glare free, non-flickering, 4 color temperature settings
Export format	PDF, Searchable PDF, Word, Excel, TIFF, TXT

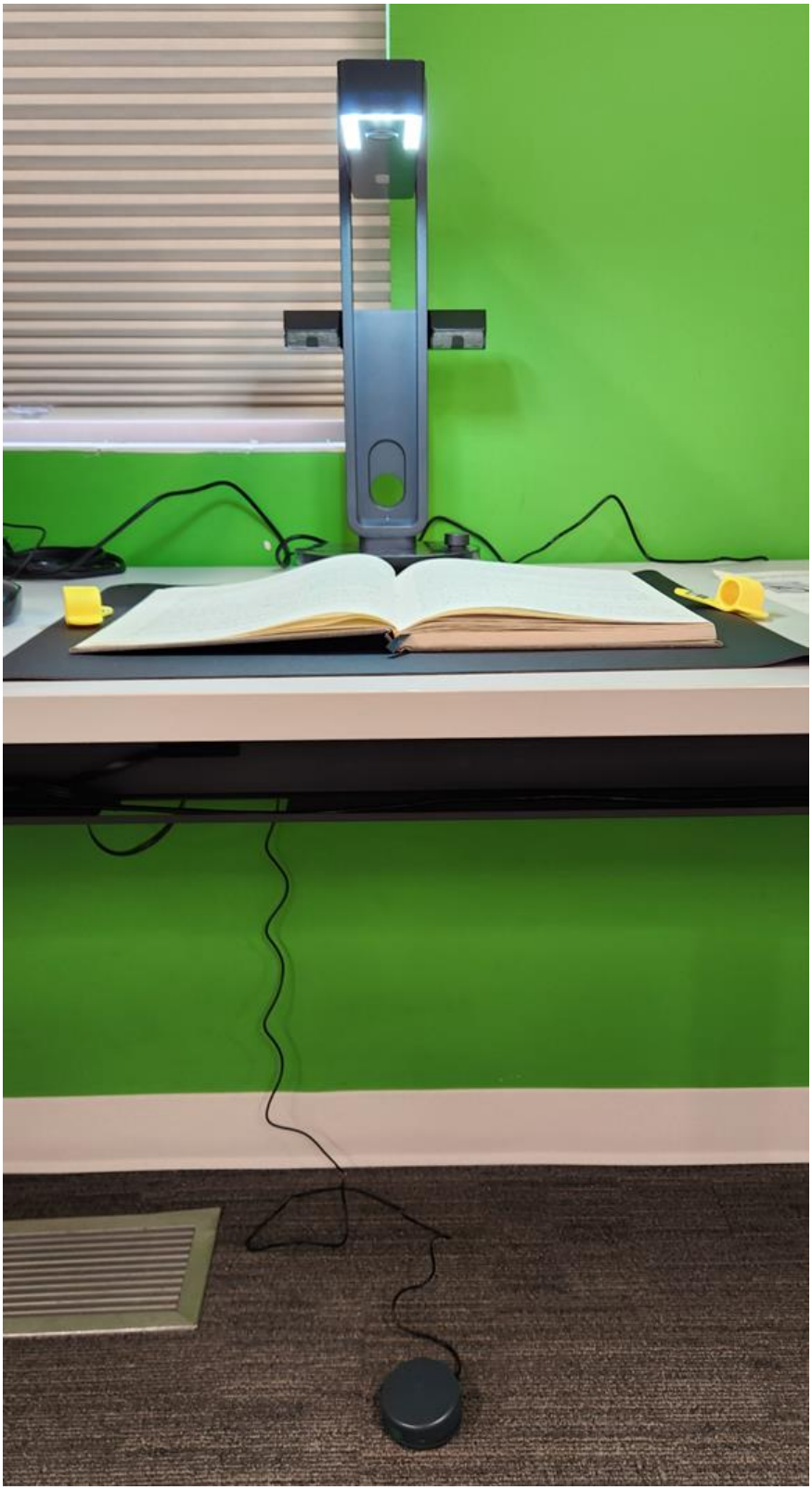
Product Features

Proprietary Technology, Exclusive Ingenuity + AI Algorithm: CZUR Aura applies CZUR-developed technology that can flatten the 3D curved surface after pixel transformation to complete flattening of the book page.

Overview: For book scanning, the operator places the book on the scan mat and lines up the spine of the book with a mark on the monitor. The scanner scans the book with 3 laser lines to measure the curvature of the book. Then it simultaneously scans the left and right pages. In the software, it flattens the image of the pages using information gathered during the laser scan. This enables scanning without damaging the book as is common with flatbed scanners.

The Scanner also includes OCR (Optical Character Recognition) to create a computer-readable text from a scanned image. This supports its ability to export files in Word, Excel, TXT (text) and Searchable PDF formats.

1. Hardware Components



The hardware components include:

Scanning tower
Black mat
Side lights
Finger cots
Power cord
Foot pedal (connected by USB)
Host computer (connected by USB)

The scanning tower includes overhead lights to illuminate the scanned document and the camera. Attached to the back of the scanner are the side lights which are used with glossy documents to minimize glare.

The black mat is essential to the operation of the scanner. The scanner looks for the black mat to outline the document and identify the scanning area.

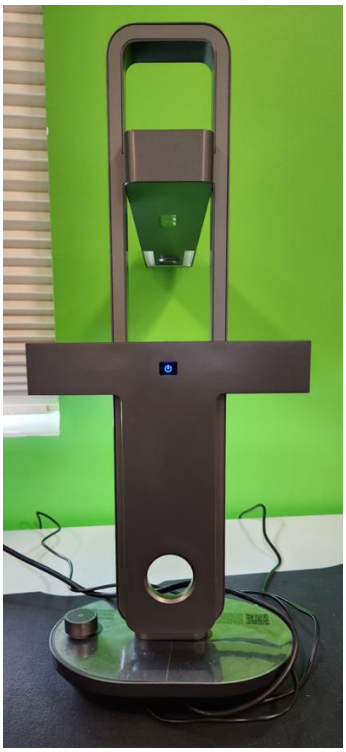
The yellow objects on the side are finger cots which are used to hold the pages down to keep the pages aligned and in place. It is not necessary to flatten the pages as the software will fix that.

The foot pedal is used to initiate a scan when both hands are busy with the finger cots holding down the page.

Here is the base of the tower. The knob on the right turns the scanner off and on with a long press (greater than a second). The LED on the left indicates that the scanner is powered up (the power cord is plugged into the wall socket). The scanner operates in two modes. When the center LED is illuminated, the scanner is in lamp mode and the scanner will not communicate with the host computer. Starting the software with the scanner in lamp mode will cause the application on the host computer to indicate it cannot detect the scanner. The scanner switches between lamp and scanner mode by a shot press (less than a second) of the knob. In scanner mode, the LED on the right will illuminate indicating the scanner is ready to go. The knob can be twisted to select different settings for the overhead light (see the next page).

Note that there is a small color LCD monitor on the top of the scanner arm which is visible in the photograph on page 17.





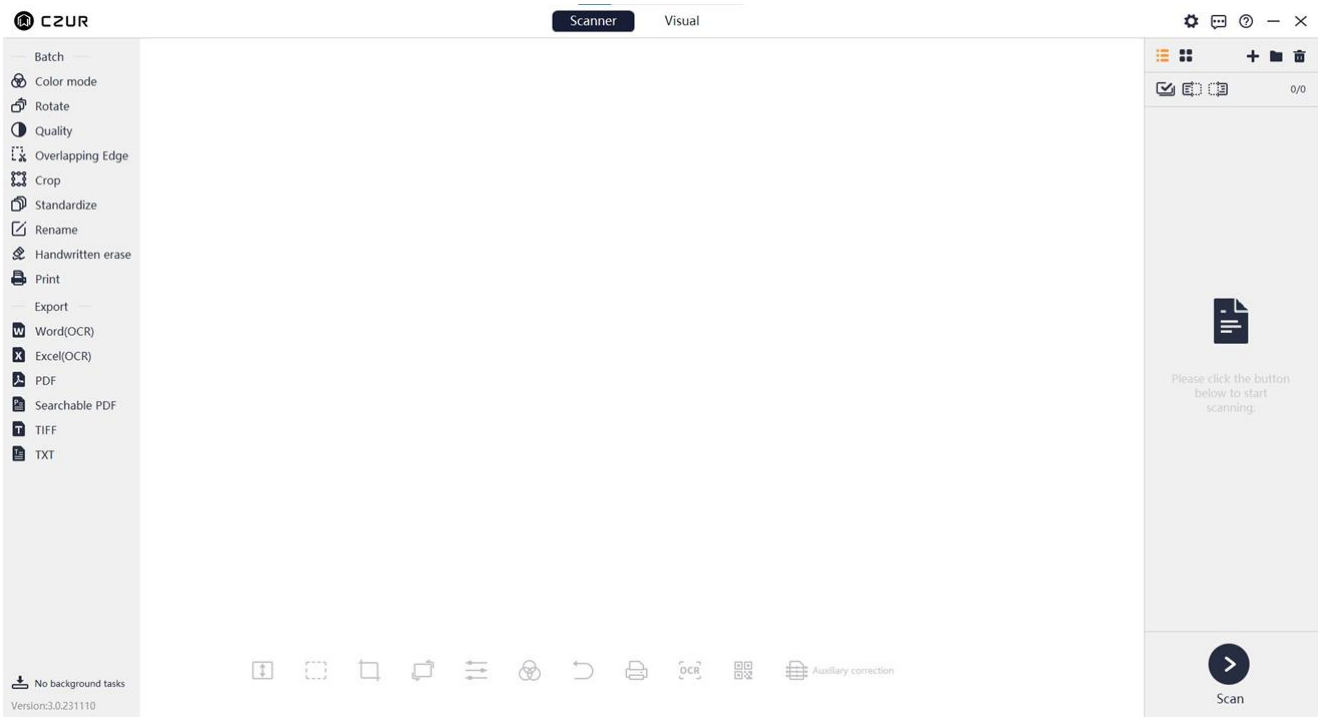
The scanner has provisions to minimize glare when scanning. The overhead light is adjustable by rotating the knob to choose one of four color temperature settings. The left picture has the overhead light on. The middle picture has the side lights on. The right picture shows the back of the tower where an illuminated switch on the back of the side light assembly toggles between the two light sources.

The side light is magnetically attached to the tower. When it is installed, the connector on the base needs to line up with the connector on the side light assembly for the side lights to work.

2. CZUR Aura Software

Start The CZUR Aura software by selecting this icon on the desktop of the host computer. The documentation provided with the scanner is pretty sparse. However, When you hover the mouse over a link in the software window, a text box appears with details about that selection. I have captured all of the selection options as displayed in the text boxes which are included in the descriptions in this user's guide. When the software is started the window below opens. This is the initial window.

Note that the software will fail if the software is unable to contact the scanner through USB. If this happens, check to see that the scanner is turned on, that the tower LEDs report that it is in scan mode not lamp mode, and that the USB cable is connected.

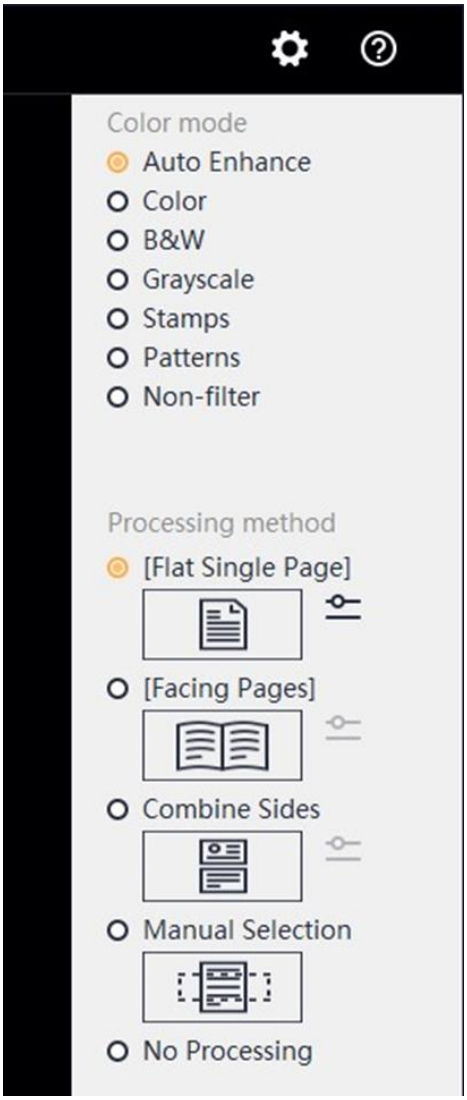


Note at the top of the screen are two links labeled "Scanner" and "Visual". The Scanner mode enables scanning operations. The visual mode displays the live image of the mat captured by the camera; we will want to make sure that Scanner mode is selected. It appears with the black background when selected. In the bottom right is an icon labeled "Scan". Select this icon to move to the scanning page.

When the scanning icon is selected on the initial page, we move to the scanning window.

This is the scan screen. The central portion of the window is the live image from the camera. You are seeing the black mat with nothing on it. On the left side, there is a status report and on the right are some controls. You can return to the initial window to process your scans using the Back button at the top left.

You can interrupt a scanning session by returning to the initial window, then return to the scanning window without losing your scanned images.



Color Mode: These are the scanning controls in the upper right side of the scanning window. Before scanning a document, we need to select a color mode. There are seven options with the description CZUR provides:

Auto Enhance: Auto Enhance can make image color brighter and enhance black and white contrast

Color: Maximum preservation of color information without special processing; suitable for colorful images.

B&W: Converts all colors to two colors in black and white in order to reduce file size; suitable for documents printed on white paper.

Greyscale: Converts color to various shades of grey. Greyscale color schemes can be used to retain color information while suitably reducing file size.

Stamps: Converts background color of the image to white and optimizes the colors of stamp markings; suitable for stamped official documents printed on white paper.

Patterns: Maximum preservation of watermarks and other markings while optimization to image color: suitable for documents that bear watermarks or stamps

Non-filter: Non-filtered

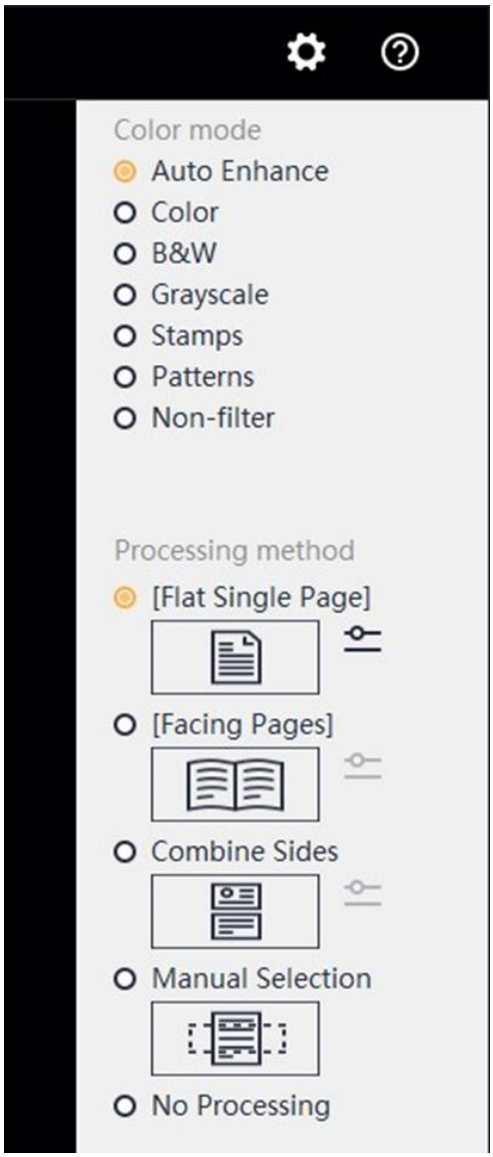
Comments:

B&W works for scanning text only documents and handwritten journals. B&W will not reproduce a shaded drawing. Auto Enhance works for mixed text and drawings.

Scanning a white paper with black text using the color setting will set a greenish cast to the paper while scanning in Greyscale will give a gray tint to the paper. Scanning in Auto Enhance gave a yellow tint to journal pages. Experiment to determine the best setting for your application.

Some legal documents have a physical stamp where the paper is deformed by a metal stamping device as a means to ensure authenticity. Another option to ensure authenticity is to use paper with water marks or other markings. This is the intent with Stamps and Pattern options.

Non-filter does no processing and doesn’t appear to be a useful choice.



Processing method is selected at the bottom on the right side. There are five options with CZUR's descriptions:

[Flat Single Page] Auto-cropping, tilt corrections, and other processing.

[Facing Pages] Auto-flattening curve, tilt correction, and cropping of black edges

[Combine Slides] Scan both sides of an ID onto the same side of one sheet of paper

[Manual Selection] Box select the desired area in the preview window. The resulting scan will only retain the selected area

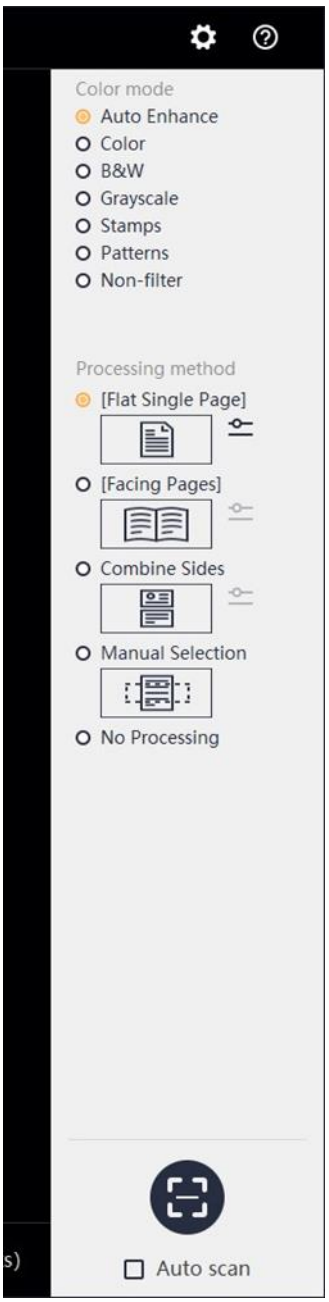
No Processing: Do not process and retain the original image.

Flat single page is used for scanning documents – that is flat loose pieces of paper.

Facing pages is used for book scanning. The scanner will simultaneously capture both the left and right pages of the book. CZUR advertises Ultra-fast scanning speed of just 2 seconds per page (which is 4 seconds per scan). With a little practice I scanned 8 images/16 pages in 1 minute – a little less than 4 seconds per page. The limitation was my time to turn the page.

The first two options are most useful. The Combine sides allows the user to copy both sides of a document such as a drivers license and display them in one scanned image.

Manual Selection allows the user to crop out a portion of a scanned document. There are other ways to do this that are probably better that we will see later.



Scanning is initiated by one of three ways:

1. Select the scan icon at bottom left of the scan window. This choice is well-suited for flat single page scans and is depicted in the control portion of the window and illustrated at the bottom here.

2. Use the foot pedal. This is particularly useful for book scanning when both hands are required to hold the book open.

3. Select the Auto scan Icon – also good for book scanning, described later. This is done by selecting the box by the Auto Scan label. A check mark appears when it is selected.

3. Scanning a flat single-page

1. Select a color mode: Usually B&W or Auto Enhance. Check the first scan to review the results with the selected color mode – results vary with the paper and print type. It may be good to try several options to find the one you like best.

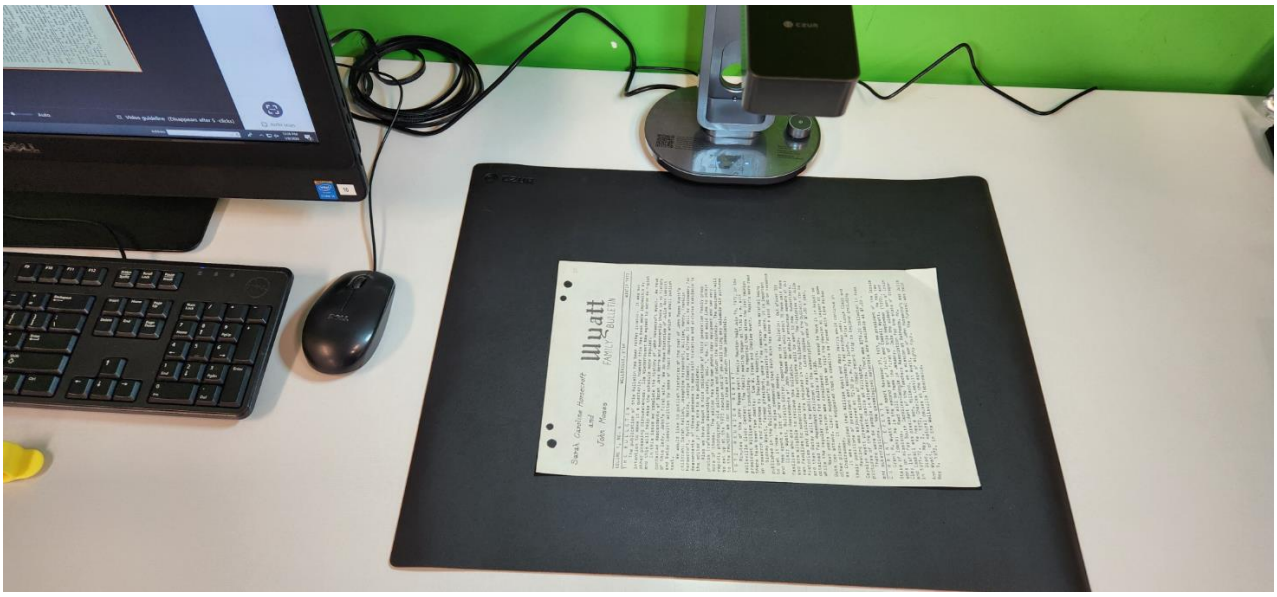
2. Select [Flat Single Page] and place the document on the scanner mat. The only placement requirement is that the black mat extends beyond the image in all directions. The document doesn't need to be otherwise aligned.

3. The scanner detects the paper and outlines it on the monitor with a solid orange line at the interface of the page and mat. This defines the image it will capture.

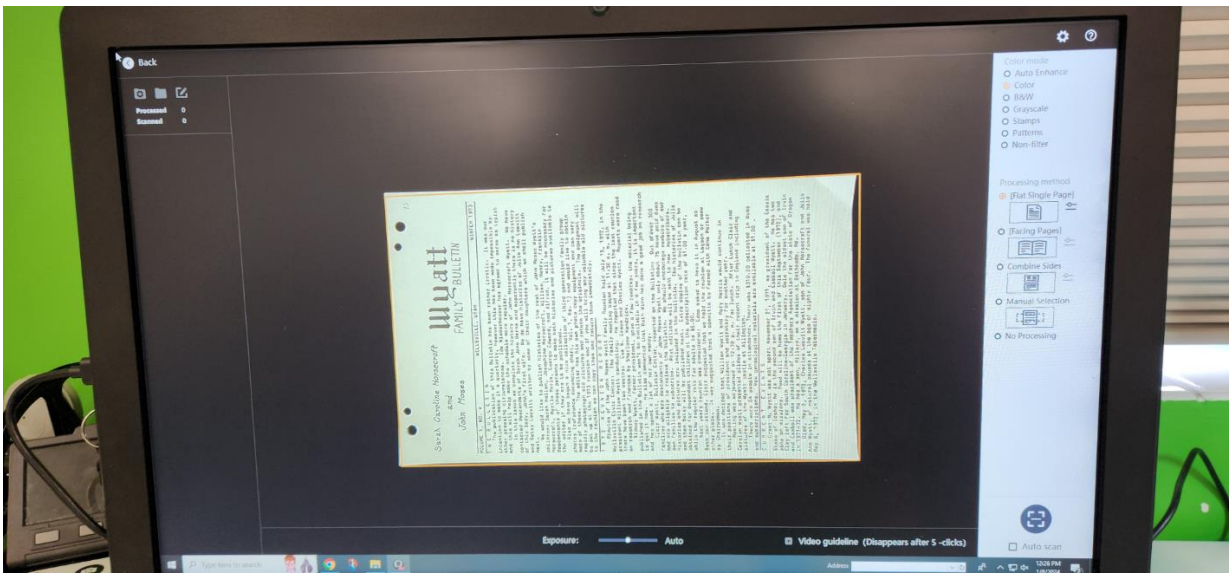
4. Select the scan button at the lower right corner of the scan window. The scanner captures the image and displays it as a thumbnail on the left side of the monitor and increments the processed and scanned report.

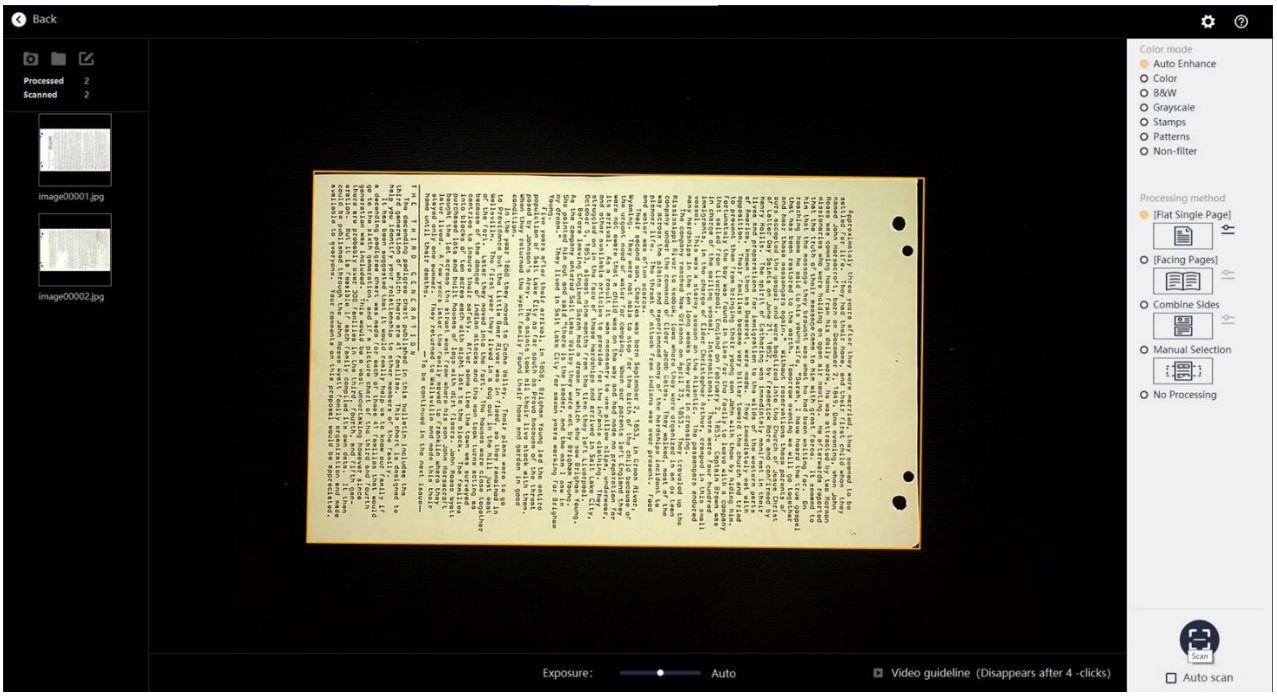
Issues: The CZUR software defines the scan area by seeing the black mat extending beyond the document. If a USB cable or any peripheral object is on the mat at all, the scanning algorithm will fail. In addition, if there is any dirt or dust on the mat, the software may fail to identify the scanned object boundaries. We once experienced a failure caused by a human hair on the mat.

Note the scanned document does not need to be aligned or oriented in any particular manner. The only requirement is that it be surrounded by the black mat. The scan software will orient the scan either vertically or horizontally. You can change it later as needed.



In the picture above you can see a flat sheet document placed on the black mat for scanning. On the left you can see the corner of the monitor with the document displayed bounded by the orange outline. The picture below of the monitor shows the captured image of the document bounded by the orange outline.





The image above is a screen capture of the scanning window. The next (third) page of the document on the scanner, ready to scan.

To the left is a closeup of the top left of the scan window where status is reported. The first two pages have been scanned and are visible as thumbnail icons. The status report indicates that the software has “Scanned” two images and “Processed” two images.

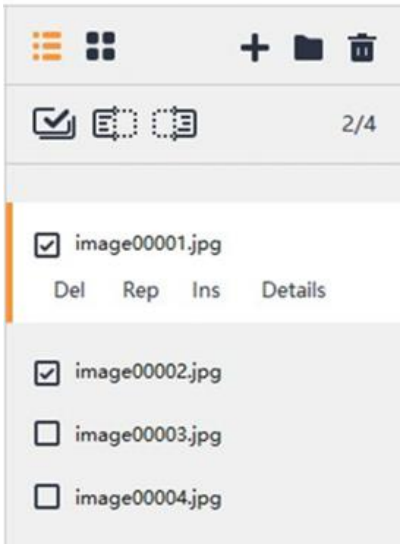
Once the third scan has been initiated. The Scanned count will increment. When the software has finished processing the image, the Processed count will increment. Finally, the thumbnail of the third scanned image will appear on the list.

This document had four pages. Once the four pages were scanned. We need to return to the initial page for further processing. We do that by selecting the “Back” icon at the top left corner of the window.

Processing the Scanned Images

We are back at the initial window. What the scanning window showed were scanned files as thumbnail icons on the left of the screen, the initial window shows them by file name on the right side of the screen. This document has four pages that have been scanned.

Double clicking on an image name selects that image for display. In this example, image00001.jpg has been selected. We have the options of deleting, replacing, inserting or getting details of that scan. Order of images is important for document creation.



For batch processing of a scan image, we select it using the check box. In this case image00001.jpg and image00002.jpg have been selected. Image00003.jpg and image00004.jpg have not been selected. The software reports that 2 of 4 images are currently selected at the top right.

The top left icon indicates we are displaying the scanned files in rows where the icon next to it displays the scanned files in an array. Note that the selected icon is orange while the unselected is black.

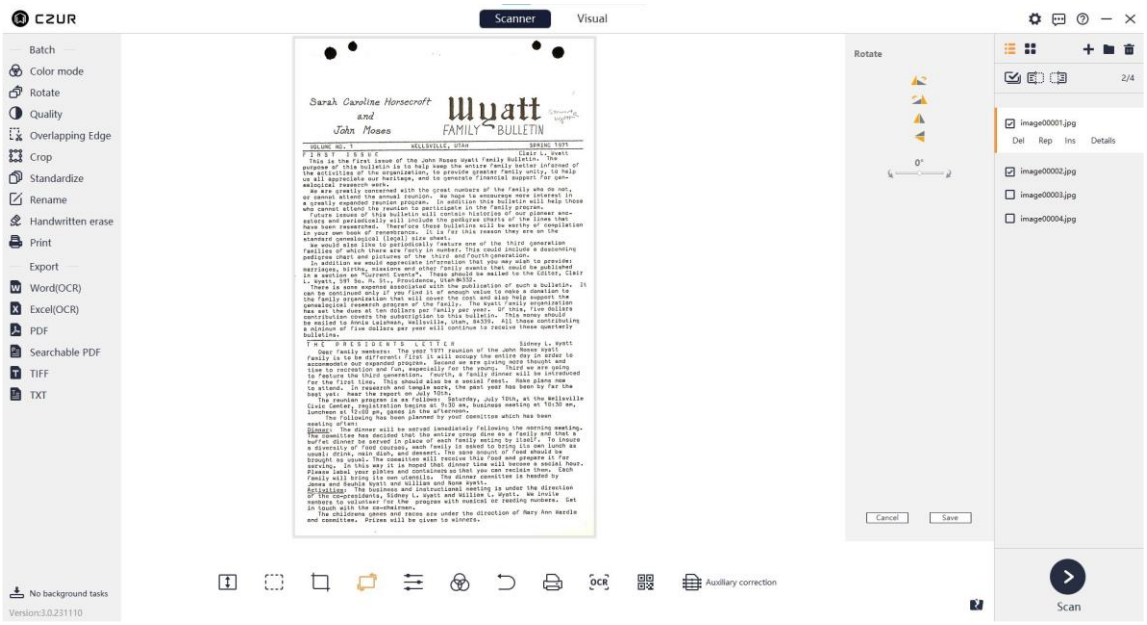
The plus sign adds a file, while the file icon adds a folder. The trash can icon is for discarding a file. (Not sure what the point of these operations are.)

Single Image Processing

Single image processing can be done via the icons at the bottom of the window. This editing only affects the displayed image.

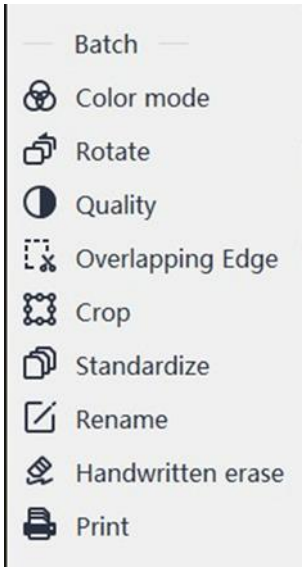
From left to right these processing options are:

Fit Height, Box Select, Crop, Rotate, Adjust contrast sharpness and thickness, Color Mode, Reset, Printer, OCR, Barcode/QR Code recognition, and “Auxiliary correction” is Manual correction of the unsatisfied image. (The last description looks like a defective translation from Chinese to English.)



Here I have selected the 4th icon from the left, “Rotate”. Selecting it causes the icon to change from black to orange and opens the rotate controls on the right side of the screen. I now have access to the four rotate options along with a fine adjustment. I have rotated the image so it stands upright. I then need to cancel or save the edit.

Batch Processing:



Alternately we can batch process the images by selecting the box by the images we wish to process (on the right side) and selecting the batch operation on the top left side. This will process the selected images in one operation

Color mode: Performs batch color conversion of the selected image file.

Rotate: Performs batch rotation.

Quality: Performs batch contrast and sharpness adjustments.

Overlapping Edge: Crop overlapping edges in batch.

Crop: Crops a single page or a scanned book

Standardize: Performs batch scaling and background color processing

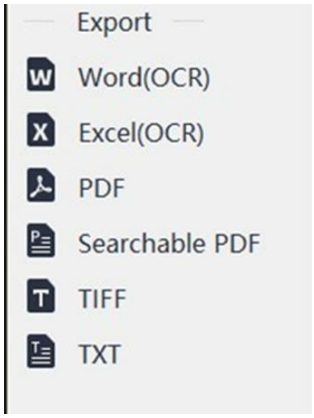
Rename: Performs batch naming, copying, and saving according to a preset rule of the selected image file into another folder.

Handwritten erase: Automatically erases hand-written strokes in images.

Print: Performs batch exporting of the selected image files for printing.

We will return to this menu when we process book scans.

Export:



So far all of the image data has been stored in the program's internal memory and is inaccessible to the user. To create a file containing the scans, we can use the Export options on the middle-left side of the window. The standard choice is to export the scan as a PDF. The only picture format is TIFF. We will talk about OCR (optical character recognition) later.

Here are the Export Options with CZUR's descriptions:

Word (OCR): Performs OCR conversion of selected image file to generate a Word Document.

Excel (OCR): Performs OCR conversion of selected image file to generate an Excel Spreadsheet.

PDF: Quick-saves the selected image files as a Portable Document Format (PDF).

Searchable PDF: Saves the image file as a double-layered PDF (searchable PDF). Enables copying text and searching for words in the document.

TIFF: Packages all selected image files and generates a TIFF file. Supports both color and greyscale images, and allows LZW, JPEG, and group r compression methods.

TXT: The selected picture file is converted into a TXT document by OCR.

Note: Most applications will use PDF (or possibly Searchable PDF). When you select an export option the software will ask what you want to name it and where you want to save it. This should be to the user's USB memory devise or to the host computer to upload the file to FamilySearch Memories.

4. Book Scanning

1. For Processing Method choose [Flat facing pages]. Select a Color Mode: Auto Enhance or B&W may be the best choices but try some experiments with the options to see which is best for your application.

2. Aura "Finger Cots" can be used to hold the pages down. If your fingers do not cover the finger cot markings, the software will remove the finger cot from the image. The book doesn't need to be flattened to scan. Use the finger cots to align the pages and keep the book open.

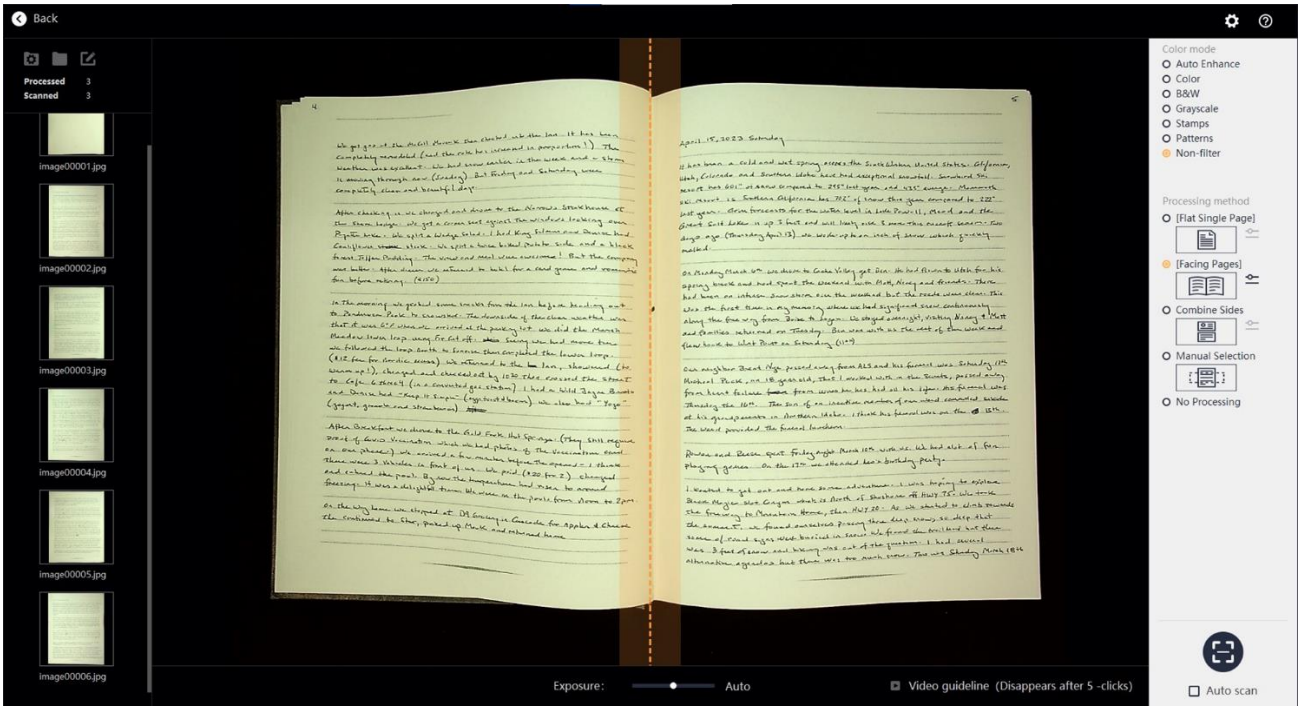
3. The spine of the book must align with a dashed orange line displayed in the monitor to identify the left and right-side pages.

4. With both hands occupied with the finger cots, use the foot pedal to initiate the scan. The camera will capture the left and right pages simultaneously.

5. The scanner will fire three laser lines to measure the curvature of the book. Then it will scan the book creating two images. Using the data collected from the laser line measurements, it will use its own software to automatically flatten the page image.

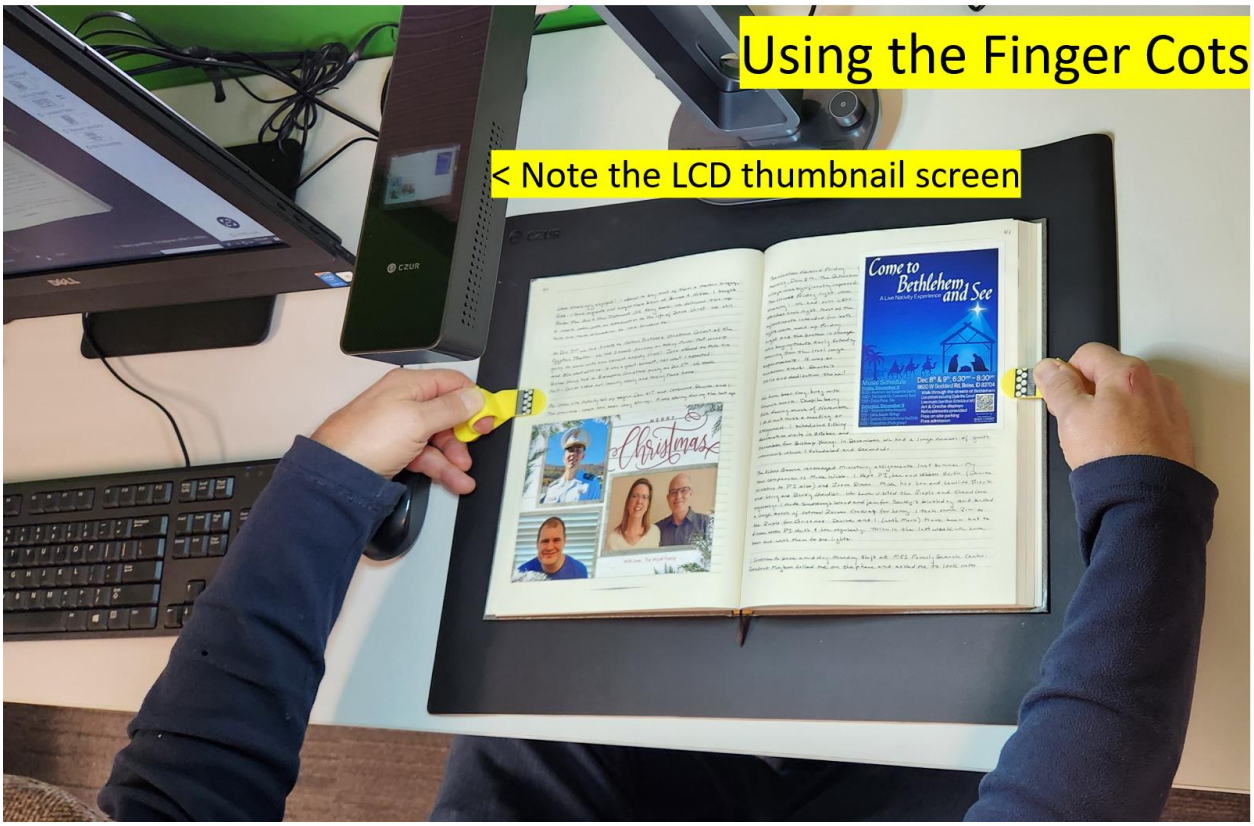
Scan as many pages as you like. The image thumbnails will be added to the list on the left.

In the image below, you can see the orange video guideline that marks the center of the open book.

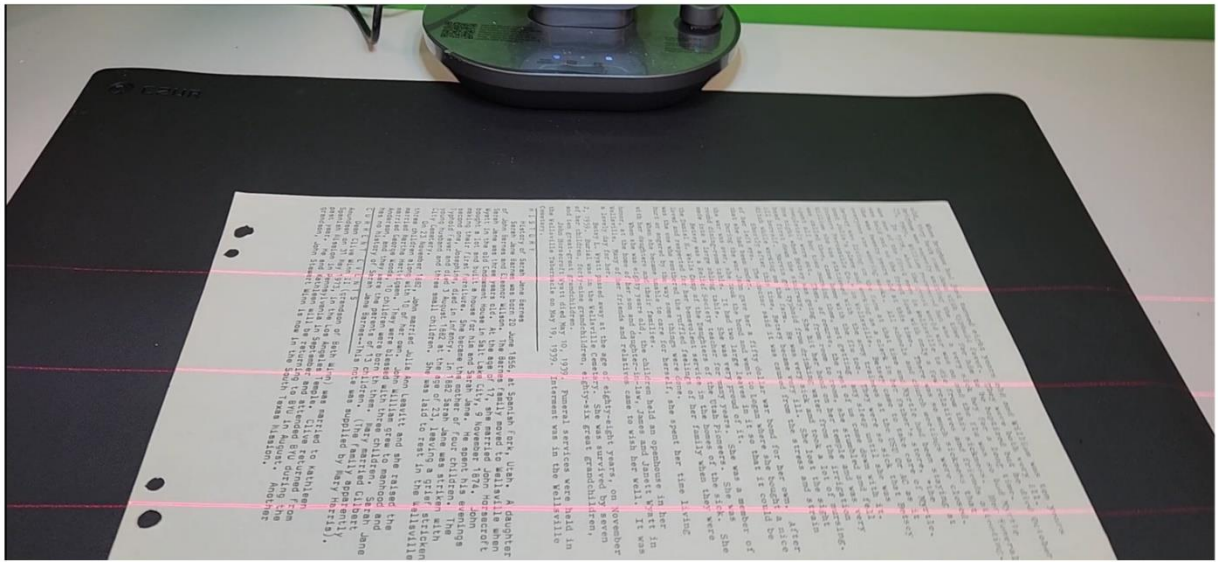


The status report indicates the 3 images have been scanned and processed. However, there are 6 images since each scan operation provides separate images of the left and right pages of the book.

Using the Finger Cots:

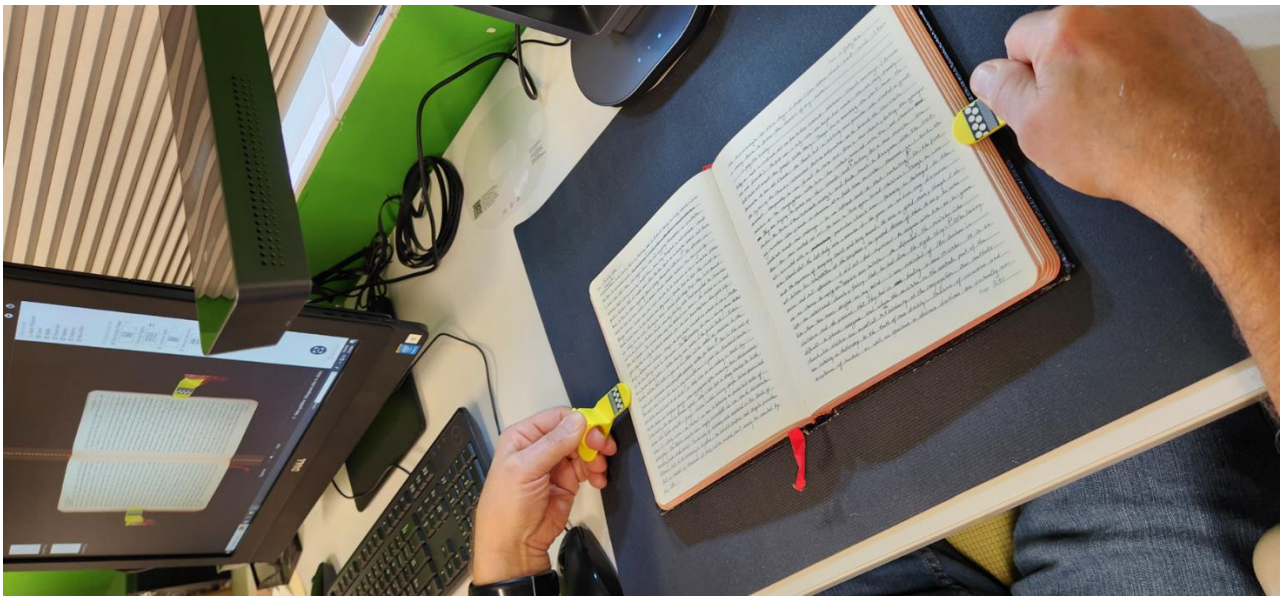


The finger cots are useful for keeping the book open. It is not necessary to flatten the book as the software will measure the curvature of the pages with the laser scans and then flatten the images using software. The picture below captures the laser scans.

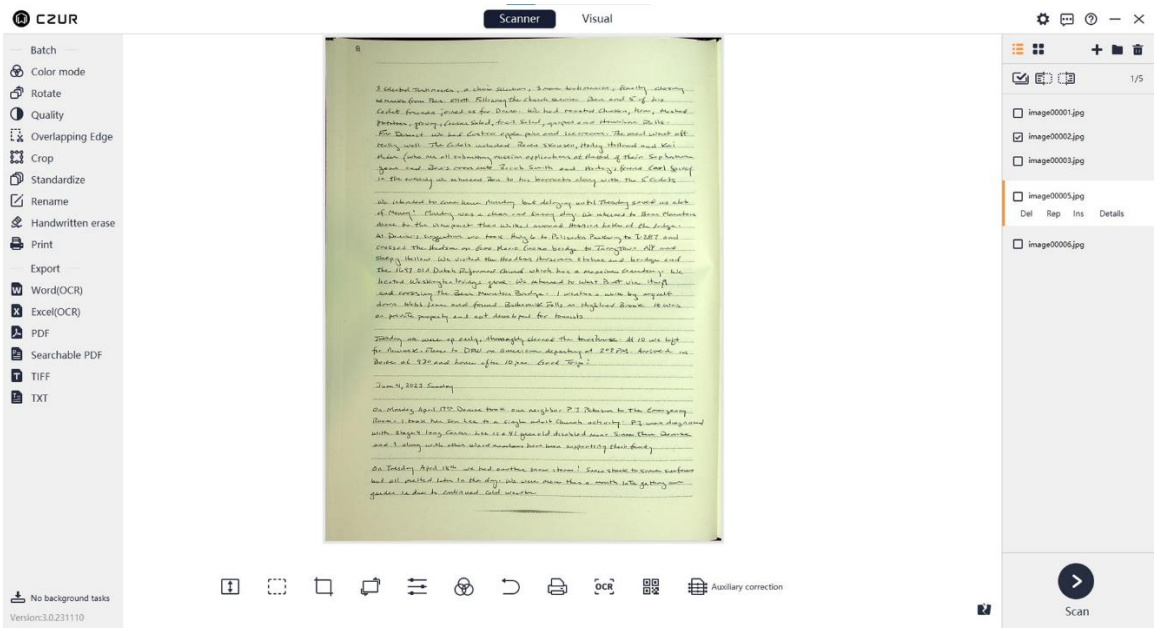


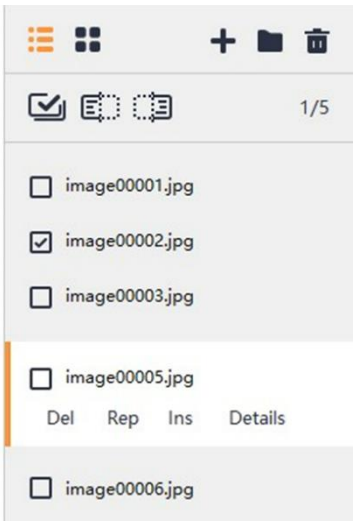
The finger cots are yellow with a black and white patterned area. When the software is processing the image, if it can clearly see the entire pattern, it will remove the finger cot image and replace it with the background color. It is important that the finger cots not cover any text or it will be missing in the scan. If the user's thumbs cover the pattern, it will result in the finger cots and thumbs being included in the scan.

Note the position of the finger cots in the image below. On the far left you can see the image on the scan window. You should see the pattern unobscured before scanning.



After 3 scans, resulting in 6 images, we can return to the initial screen using the back button.





Here we are looking at the menu at the top right of the initial screen in detail. The fourth image has been deleted. The second row shows three icons and reports that one of the five images is selected.

Selecting the checkmark icon on the left will select (or deselect) all of the scanned images.

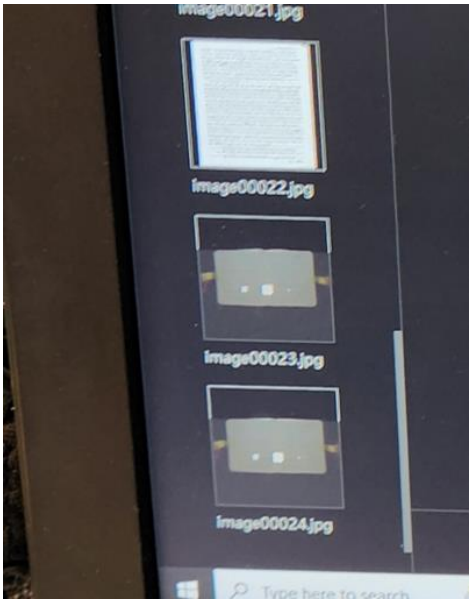
Batch processing revisited:

The left page icon (2nd from left) will select all of the left page scans, while the right page icon (3rd from left) will select all of the right page scans.

Selecting either right or left page options combined with batch processing provides a powerful tool for providing uniform cropping and editing of the scanned pages of a book.

For example, all of the left page images will have a consistent format, while all of the right page images will have a consistent format that is different from the left. You can crop the left side images in one operation and the right page images in a second operation to create a consistent page size for your document. The batch processing can be tricky and CZUR provides access to some explanatory videos when some options are selected.

Auto Scan Feature in Book Scanning Options:



Rather than using the foot petal to initiate a scan, you can enable the auto scan feature and the scanner will fire when it detects a page change. This is the check box by the scan icon (see page 9). This works well once you can catch the rhythm of the machine. After a page change, the scanner will wait for the page to be stable for a couple of seconds. You can change the pages as soon as the scanner shows the image is captured and is being processing.

In the screen picture to the left, image00022.jpg is the previous scan. Image00023 and Image00024 are the most recent scans. The image capture is complete when these outlines appear, though the processing is still in progress. This is when you can turn the page. The thumbnail image appears when the processing is complete.

Export:

Exporting a book is identical to exporting a collection of flat page scans into a single page document

Assembling a document from your scanned images:

When you have scanned a set of images and returned from the scanning window to the initial window, you can see the file names of each scanned image. Double clicking on an image file name opens the file for viewing.

All of the selected images will be placed in order in the exported PDF file. You can omit a page by not selecting the image. There doesn't seem to be a way to reorder the scans if you made a mistake in scanning order. In the detail image of initial page file list on page 13, you can see that once a file is selected for viewing, you can delete it (Del), replace it (Rep), Insert an image or images in front of it (Ins) or get details about the image. These are the editing options at the user's disposal.

How big of a book or document selection can you scan into a single document?

I didn't find an answer. The scanned images are labeled as images from 1 to 99,999 which implies a software limit of 99,999 pages. The size limitations may be based on the computer's internal memory and capability, as well as software limitations.

FamilySearch Memories has a limit of 15 Mbytes for files uploaded. I scanned a 22-page legal size document (Book of Remembrance format) which resulted in a 16.5 Mbyte file – too large to upload. In another experiment I scanned 50 pages (25 scans) of my mission journal which was under 15MBytes.

A single letter-sized typed page, scanned with Auto Enhance and exported as a PDF was about 50 Kbytes. However, repeated experiments did not result in a consistent metric for estimating PDF file size based on page size and count.

Note that you can export the same scans as many times as you like. When scanning a large document for uploading to FamilySearch, remember that FamilySearch has a 15 Mbyte limit for uploaded documents. As an example, if you scan a 20-page document, select all 20 pages, export them and find that the exported PDF is close to 30 Mbytes, then you can do a second export operation and export the first 10 pages and then the second 10 pages. These two files will be under the 15 Mbytes limit and you can name them "document part 1" and "document part 2." Then upload the entire document in two steps.

When you scan a large document, the software collects the images and stores them in internal memory until you export them. This puts the user at risk if the power goes out or the system crashes that the scan images would be lost. You would have a similar problem if you were unable to finish your scanning in one session. I would suggest exporting regularly while doing a large project to save your work. For example, in scanning a 100-page book, you could export every 20 pages as a separate document as a backup. When you complete all 100 pages you could export the entire document.

PDF files are the creation of Adobe Inc. Adobe developed the PDF (Portable Document Format) file and provides PDF readers for free. Adobe does sell PDF editors (including Adobe Acrobat Pro) to edit PDF files. This program would allow you to reorder pages and combine or separate PDF files. This is not available at the FamilySearch library, but a patron with a large scanning project could choose to purchase it on their own to help facilitate editing large book scan type projects.

5. OCR Optical Character Recognition

The CZUR Aura software provides 6 Export options, four of which include OCR capability. A file can be scanned into a word processor format (Word) or a spreadsheet format (Excel) as well as a Searchable PDF and TXT format.

Here is a definition from the internet: Optical Character Recognition (OCR) is the process that converts an image of text into a machine-readable text format. For example, if you scan a form or a receipt, your computer saves the scan as an image file. You cannot use a text editor to edit, search, or count the words in the image file. However, you can use OCR to convert the image into a text document with its contents stored as text data.

When we export an image file using PDF which is the most common way to capture text documents, we are taking a “photograph” of the printed page. When we run OCR software, the software sorts through the image and matches objects in the image with their text equivalent. In effect the software acts like a typist, reading a document and entering it into a word processor.

With the OCR output, the document can be edited or reformatted. For example, if the original document was printed on legal size paper (for a Book of Remembrance format) with OCR the document could be reformatted to “letter” size (8 ½ x 11 inches) to be stored in a three binder. Alternately, if more information was found to update an ancestor’s history, OCR could recover the original text in an editable format for correcting and expanding.

Many family history documents exist only as an image files and would require retyping them before they could be edited. Files were distributed as photocopies of photocopies and the quality of the document decreases as the generation of copies increases.

CZUR output options using OCR:

Word(OCR): This is probably the most useful option where the file is output as a Microsoft Word compatible file (.doc suffix) This format can be read by most word processors.

Excel(OCR): This options shows that CZUR’s targeted market is businesses rather than family history libraries. This option formats the data as a Microsoft Excel compatible spreadsheet (.xlsx suffix)

TXT(OCR): This option outputs the file as a text (.txt suffix) which can be read into a word processor. A text file has minimal formatting.

The Searchable PDF option uses OCR. With a Searchable PDF file, you can copy text from the pdf file and paste it in another document or search for words or phrases in the pdf file. You cannot edit or change the document.

Comments on OCR:

The CZUR OCR software will not work on hand written documents. OCR software can have a serious problems with faded or damaged documents. Typed (rather than printed) documents can be a problem. The OCR software is not near as capable as a human reader at discerning text from background marks or inferring what a character is from the context of the text. OCR may confuse the number one with a lower-case L and an upper-case I. The number zero and the letter O may be problematic. Reading an OCR document into a word processor with a spell check will find many of these errors.

Another problem with OCR Word documents is that the OCR software places a paragraph mark at the end of each line. When you see the output of the OCR software, it will look exactly like the printed page. Word processors use characters that are not normally displayed to indicate formatting functions. A word processor notes the end of a paragraph but automatically starts a new line according to the document set up. With the OCR document, the word processor will treat each line as an independent paragraph.

The FamilySearch computers have a free word processor called LibreOffice Writer. Here is an OCR document that is being edited. Using the View Drop down menu, we have selected Formatting Marks (9th line down) to display the paragraph marks which appear as a blue backward P at the end of each line. These need to be manually removed except for the one that marks the end of the paragraph. They can be removed by positioning the curser and deleting the character, the same as you would delete any unwanted character in the document.