

Scottish Archive Network

Testament Project – Digital Imaging Standards

This document demonstrates the basis on which decisions have been taken on digitizing quality standards. It also shows how the threshold of pixels per line segment was assessed and audited for those volumes that pass other criteria for inclusion in the programme of double page digitizing. It is therefore setting a quality threshold that all digital images must pass and one that can be quantified objectively, measured and subsequently audited.

We digitise the documents to a quality that meets “fitness for purpose”. The fundamental purpose is to ensure that the written text on the documents is readable. Our conclusion from the image assessment survey we carried out was that users showed a very high level of satisfaction with the product of both single and double page digitisation. Users could distinguish quality between single and double page but only really demonstrated a preference for higher quality where the original documents were in some way “difficult” documents to begin with. Where the text on the document was clear and legible to begin with there was no significant desire or requirement to see the documents at the highest achievable resolution.

1. Single Page Capture

- 1.1. The majority of the pre-1800 documents have been captured single-page using two Kodak Megaplus 6.3i cameras mounted on IKM BWE copy stands and 120° book cradles. These will provide images of approximately 13.5 MB file size.

The main reason for adopting single page capture for this material was that the originals, especially pre-1700, are written in a hand which is difficult for the majority of modern users to read. Higher image resolution for ‘difficult’ handwriting will enable users to view the text at very high levels of magnification, making the process of decipherment easier. It also provides additional resolution for image enhancement techniques which the user may or may not choose to use against the digital image.

- 1.2. Exceptions to this practice will be material (mainly post-1750) in a very clear hand, presenting few palaeographic difficulties to the non-expert user. The standard for selecting such material for double-page capture will be as set out in *Appendix 1* (see 2.2 below).

In addition to this were tightly bound volumes and volumes with text in the gutter, which were captured single-page. This was a decision made **in advance** of digital capture as part of the conservation assessment of the volumes. The proposal was made by Head of the SCAN conservation staff and authorized by the Testament project team leader and the assessment is recorded as part of the SCAN conservation assessment system.

2. Double Page Capture

- 2.1. The remaining documents were captured double-page using the Atmel 8M cameras mounted on IKM BWA copy stands and 180° book cradles. These provided TIFF images of 17-19 MB file size.

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- 2.2. There is a minimum PPLS (pixel-per-line segment) standard for double-page images (see below, *Appendix*). Any post-1800 (or selected pre-1800) text failing to meet this minimum requirement at the above resolution was captured single-page.
- 2.3. The initial decision to capture single or double-page images is a curatorial one (with advice from conservation). Within the guidelines and pixel-per-line standard the camera operators will have limited discretion: usually to opt for single-page rather than double-page capture.
- 2.4. Reasons for the SCAN decision to capture double-page images of post-1800 registers
 1. The text of the registers is easy to read by all users.
 2. The images were normally captured using SCAN's higher resolution cameras (with an 8 megapixel array).
 3. Double-page capture
 - minimizes the risk to documents by significantly reducing the amount of handling required;
 - allows for greater contingency in all aspects of quality control;
 - is a simpler process to digitise, quality control and link to indexes;
 - allows far greater throughput, well in excess of what was conceivable when the project was first proposed;
 - is based on a qualitative assessment of the requirements for access;
 - is based on the assessment of results from the User Survey.
 4. The resulting images complied with the pixel per line segment quality standard defined by SCAN as meeting "fitness for purpose".
 5. Double-page capture ensured that the project was completed on time and within budget.

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Normal Strokes

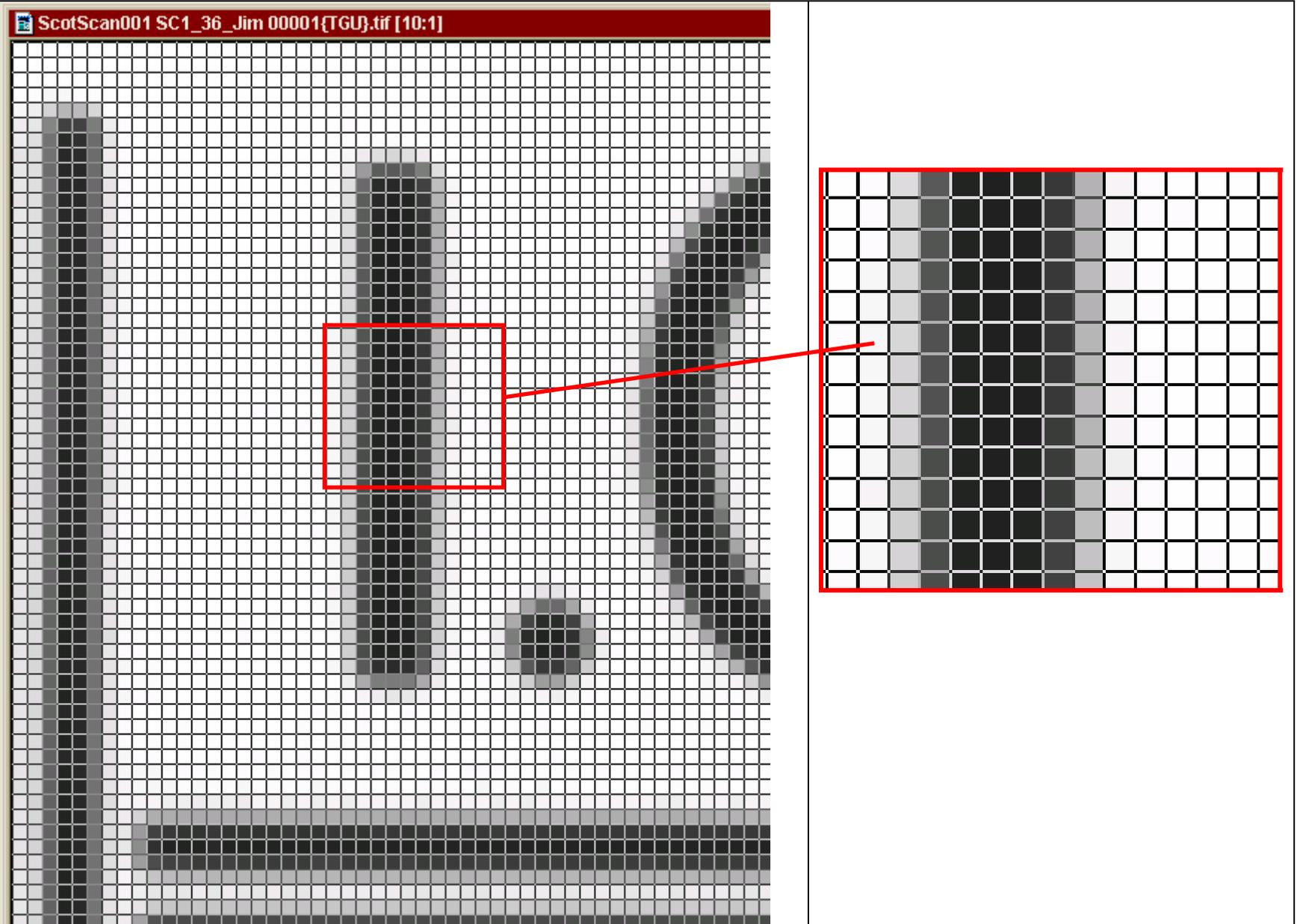
The image to the right is taken from the target image the GSU have used previously for microfilming work.

The upright figure 1 is captured to the same resolution as the subsequent images taken from manuscript pages.

The image has been taken into PaintShop Pro and zoomed in to a factor of 10:1.

A sample from the figure is then blown up further.

6-7 distinct pixels can be discerned



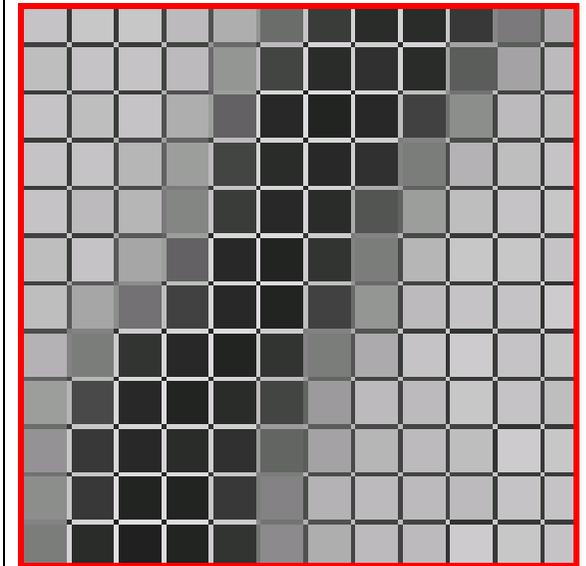
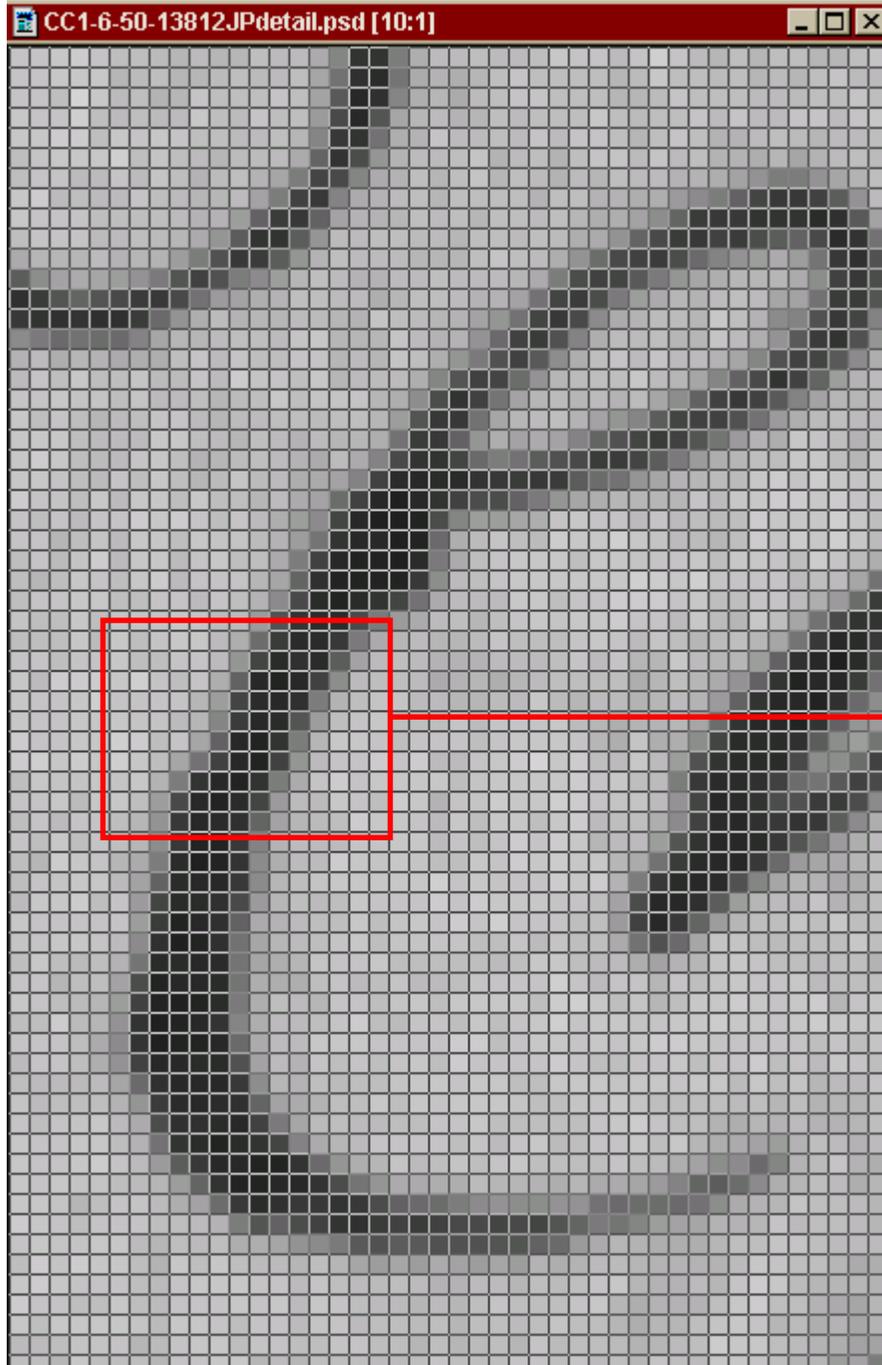
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This text is taken as being representative of the sort of text size and quality that normally appears in documents we intend to digitize double paged.

A sample letter is shown blown up to the same magnification as the control image in 1.1.

A segment is further blown up in the right hand frame

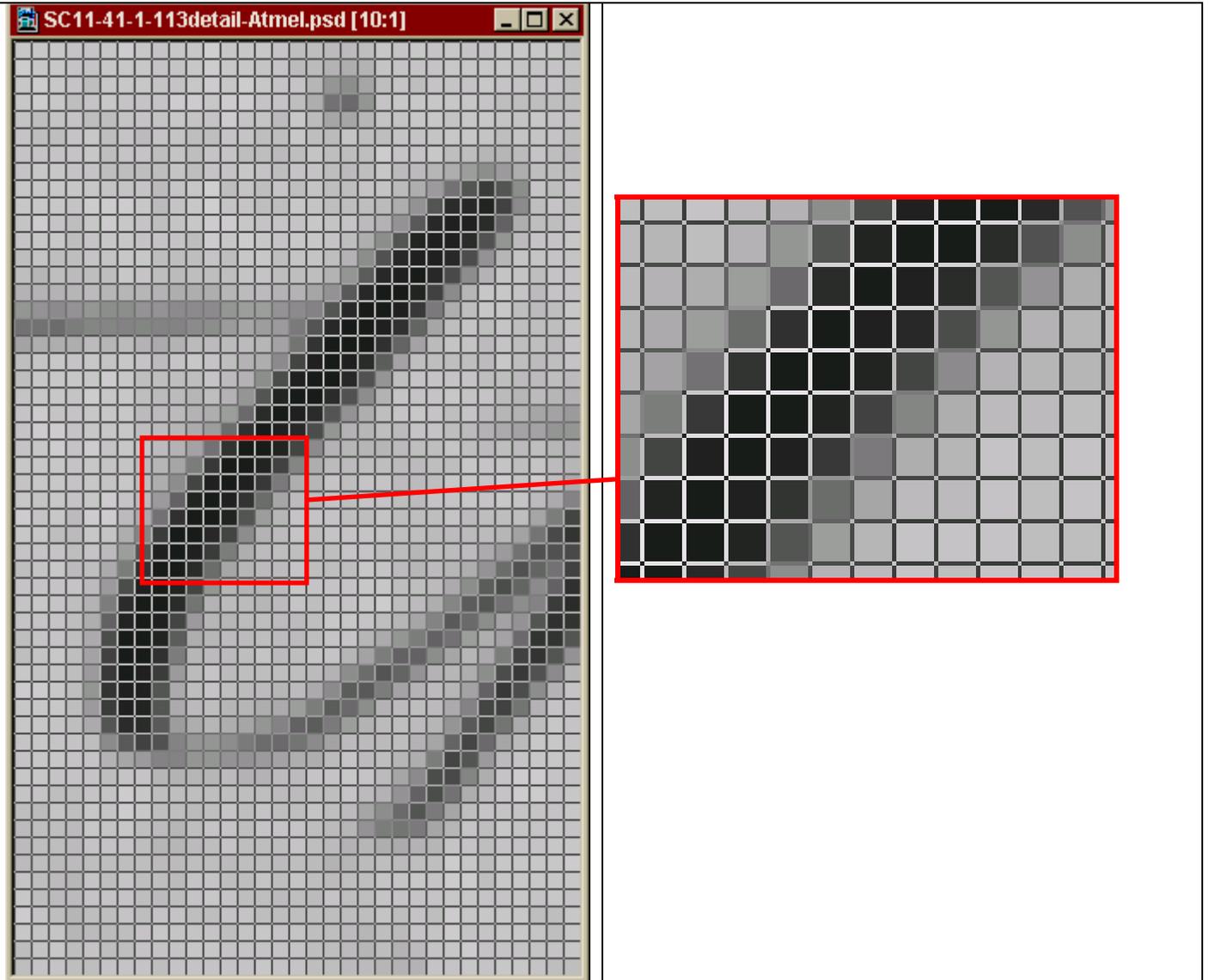
As with the control image it is possible to discern 6-7 pixels horizontally on this stroke. With 24 bit colour information available in the images this further enhances the quality of the pen stroke captured



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This example shows good, clear text captured with the Atmel model of camera we propose to use with the bulk of the double page capture program.

In this instance 7 pixels are normally discernable on the horizontal plane of this stroke

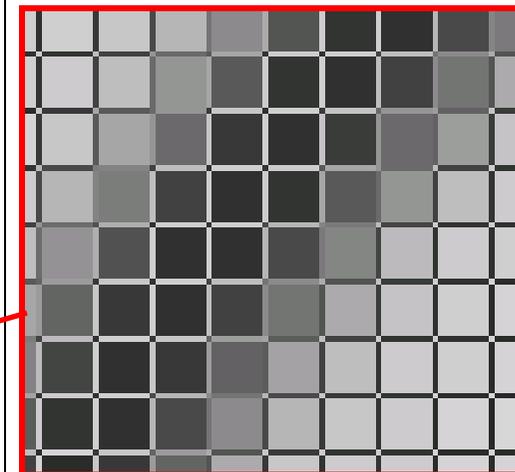
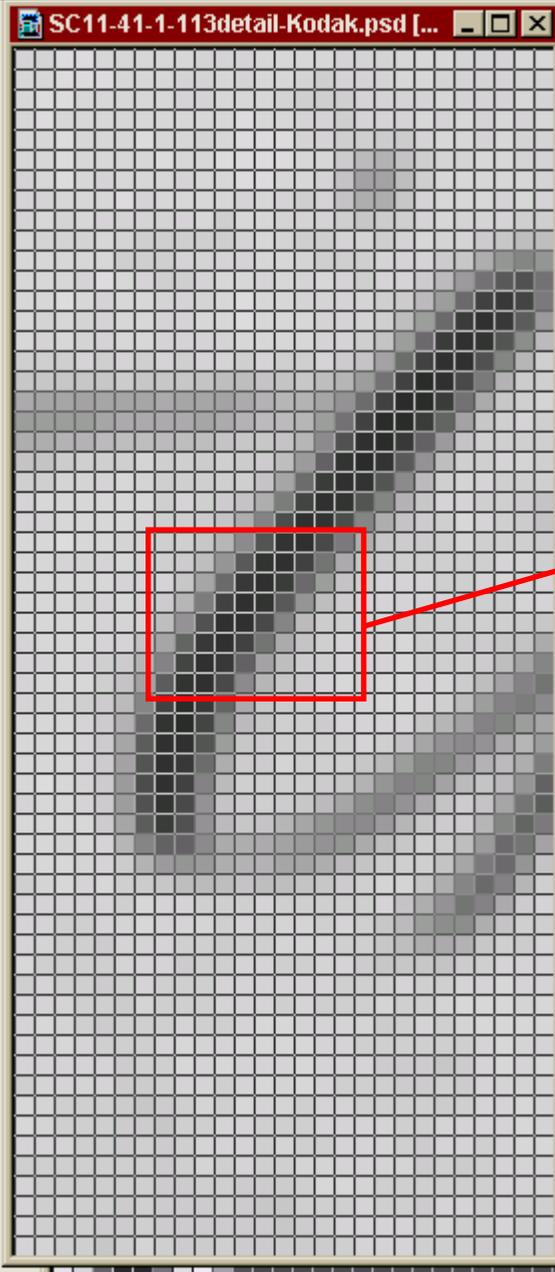


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This image shows the same penstroke as above captured with the current Kodak camera.

A difference from the above image is clear when counting the pixels as there are normally 6 pixels on the horizontal plane for the same pen stroke.

For this reason we will normally be using the Atmel range of cameras for the double page capture work.



Medium Strokes

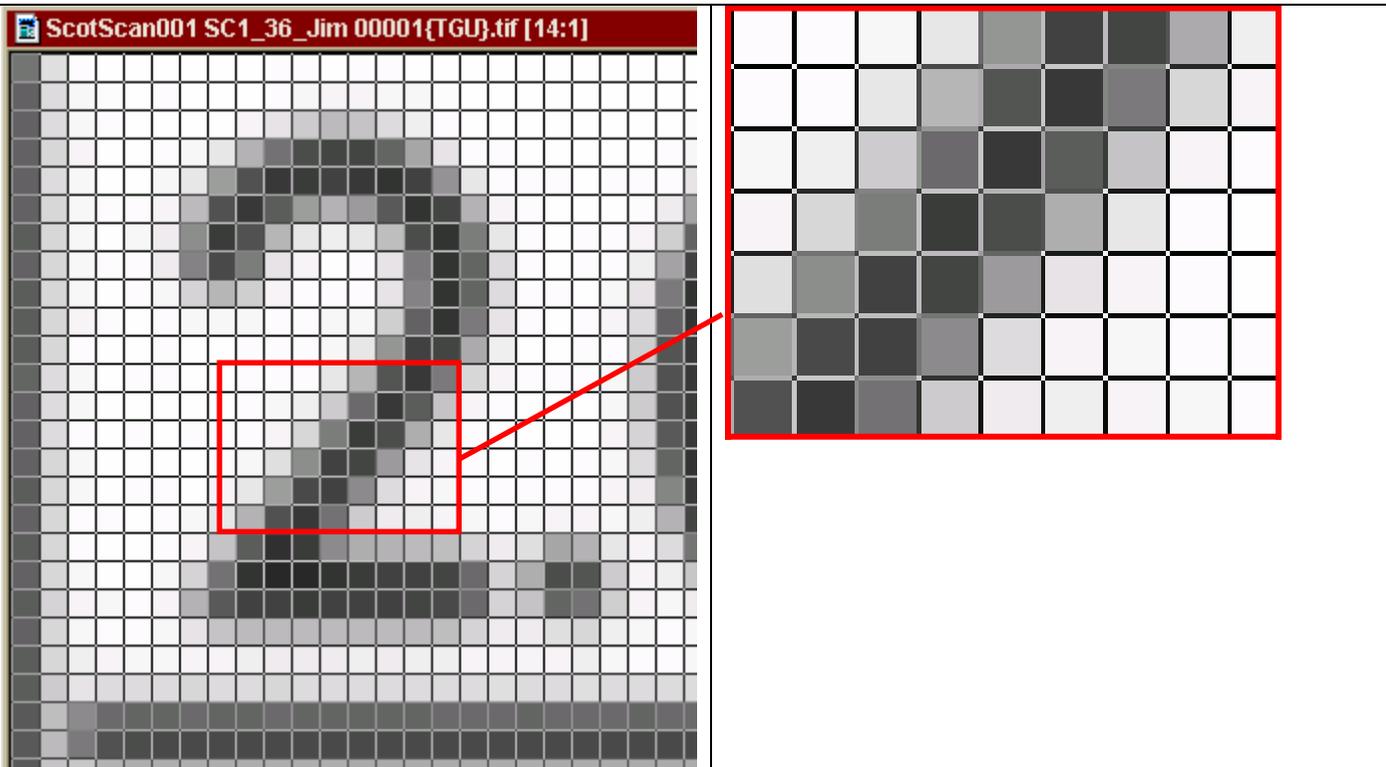
The image to the right is also taken from the target image the GSU have used previously for microfilming work.

The figure 2 is captured to the same resolution as the subsequent images taken from manuscript pages.

The image has been taken into PaintShop Pro and zoomed in to a factor of 10:1.

A sample from the figure is then blown up further.

4-5 distinct pixels can be discerned

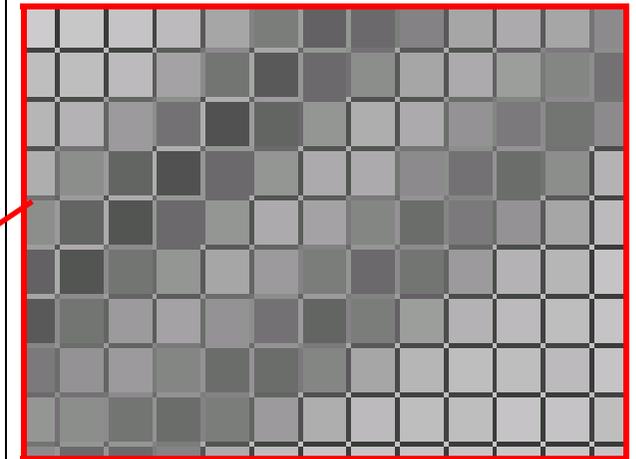
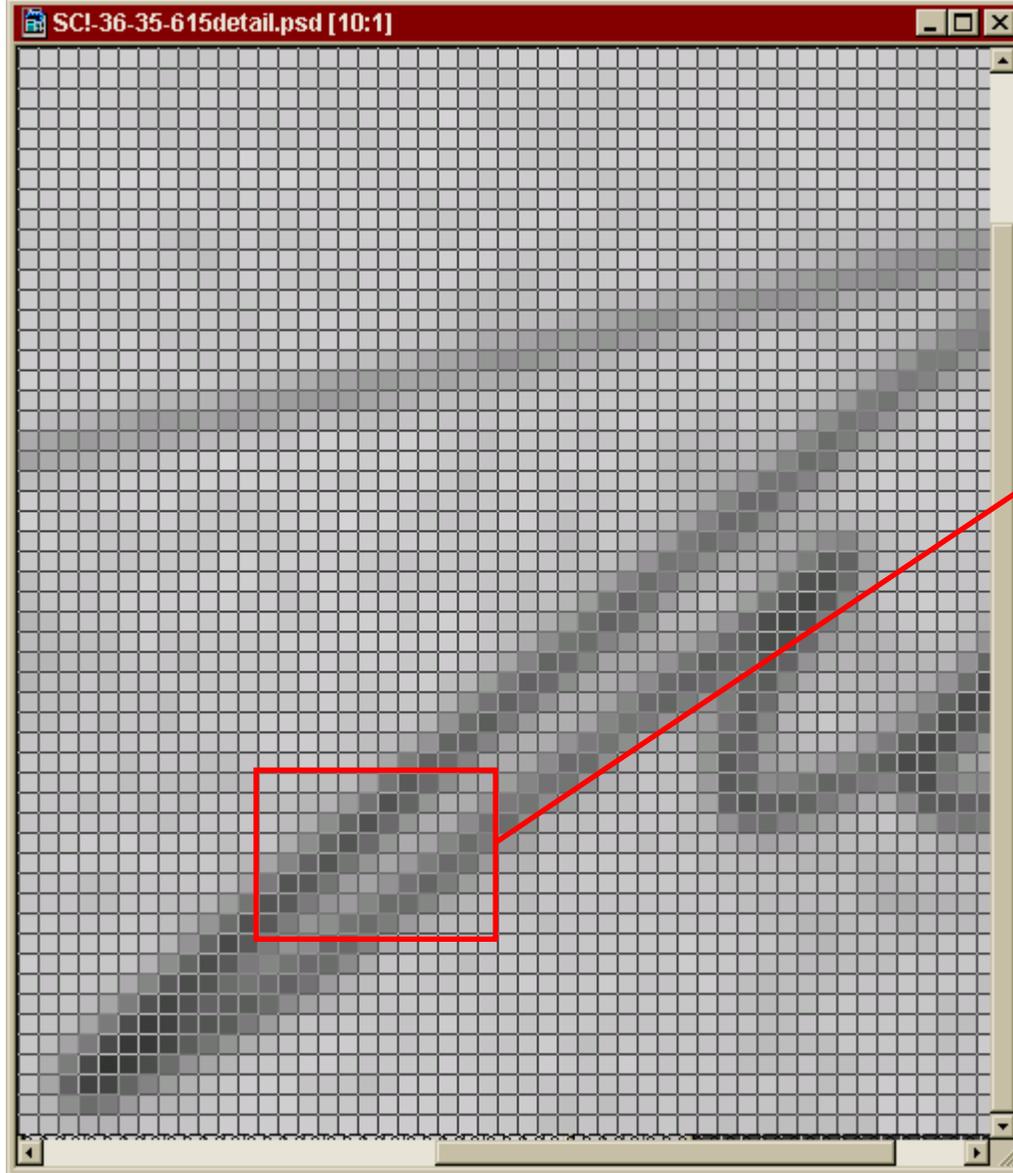


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Here are examples of slightly fainter or narrower penstrokes.

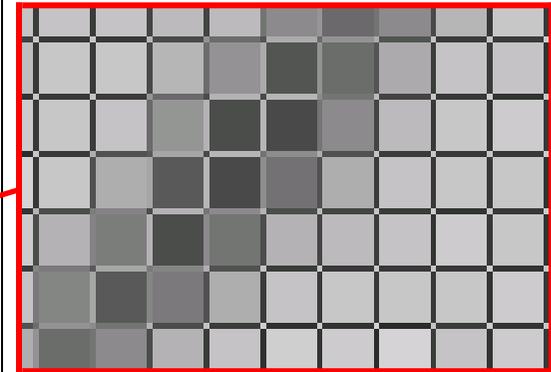
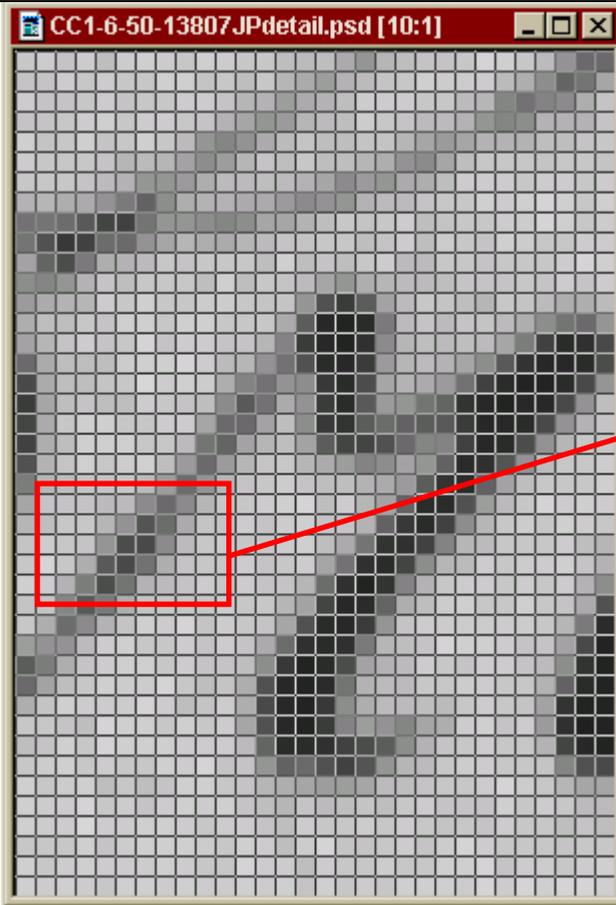
As with the control image above 4–5 pixels can normally be discerned (on both lines)

Both the thickness of the stroke and the contrast with the background page must be taken into account



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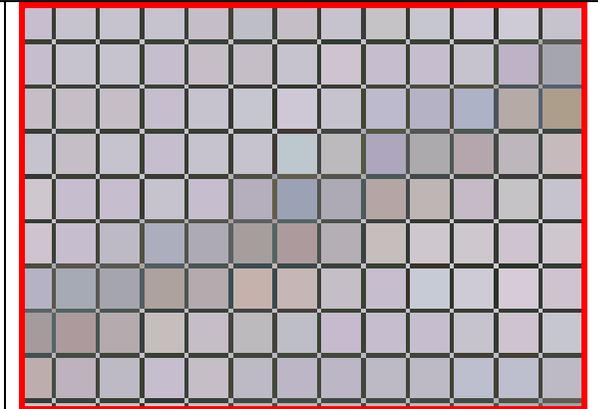
On this part of the stroke 4 pixels are normally visible



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This is a colour example that illustrates the point that zooming in close can sometimes make the information less clear. Along this faint line there are 4 pixels and along the vertical line 3 pixels that make up the pen stroke



Finest Strokes

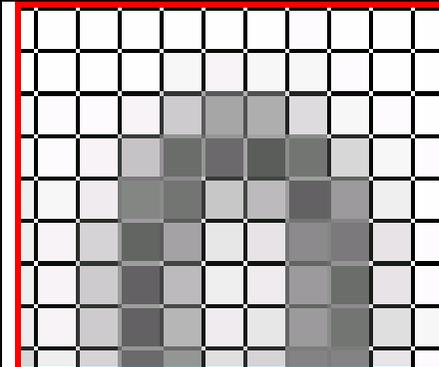
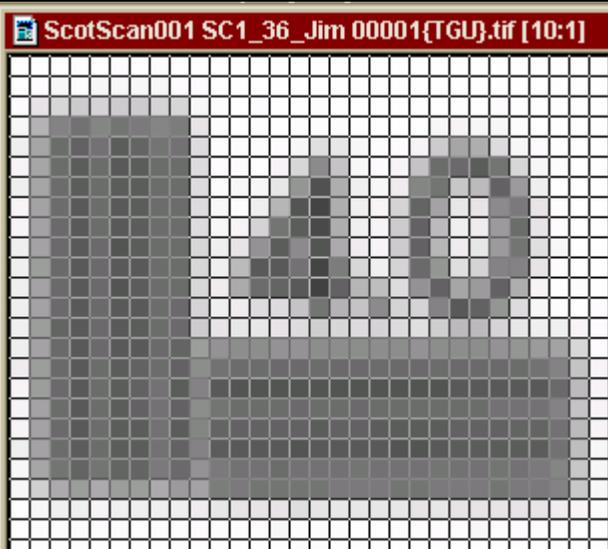
The image to the right is also taken from the target image the GSU have used previously for microfilming work.

The figure 4.0 is captured to the same resolution as the subsequent images taken from manuscript pages.

The image has been taken into PaintShop Pro and zoomed in to a factor of 10:1.

A sample from the figure is then blown up further.

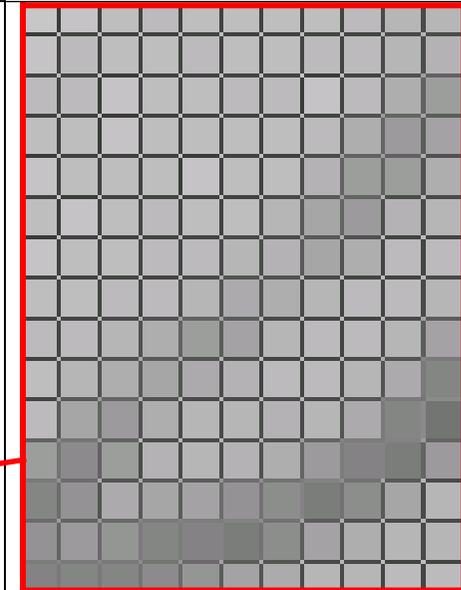
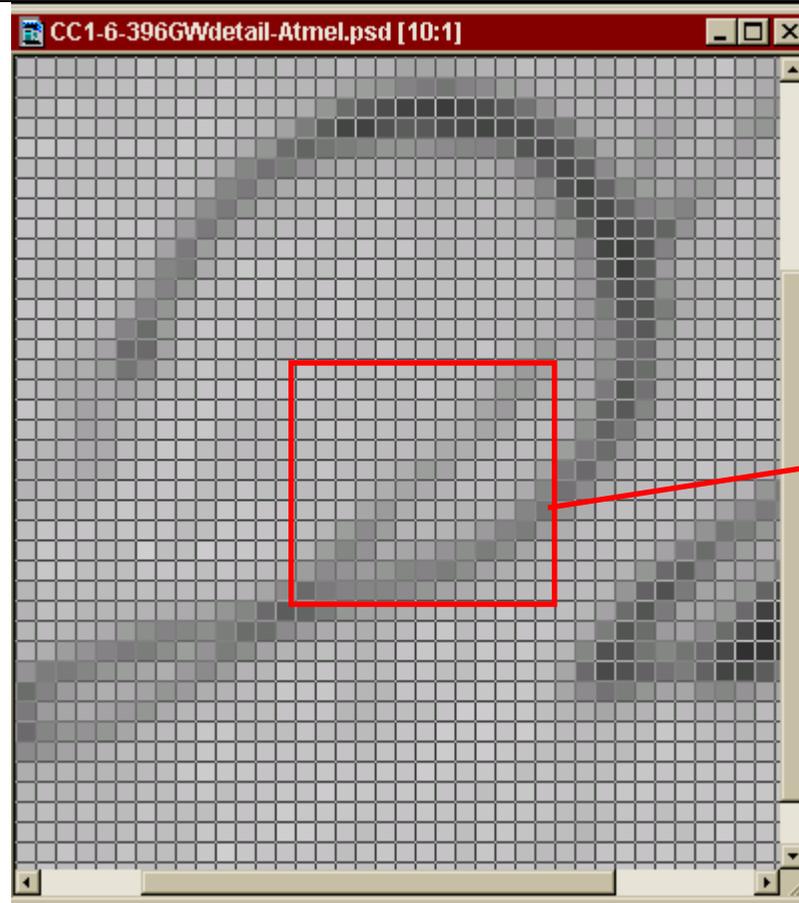
2-3 distinct pixels can be discerned



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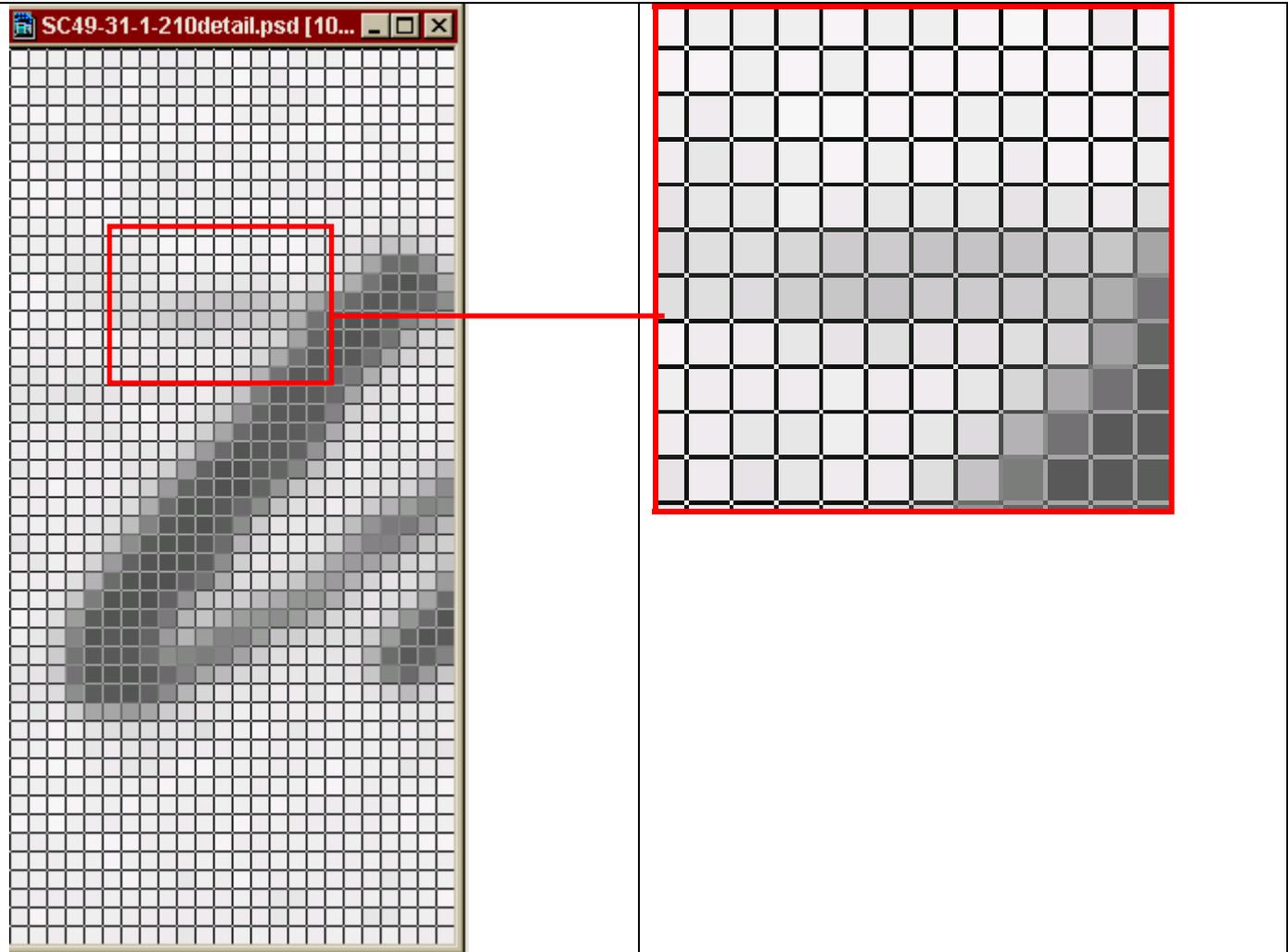
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This example shows that the text can be reproduced with 2 pixels where the line is both faint and narrow. With 24 bit colour there is an even better range of colours to choose from to represent the move from text to background.



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The cross stroke on the t is normally one of the faintest on the page. This example shows the cross stroke represented clearly by 2 pixels



Given the above examples it is our intention to continue with double page imaging in those instances where the text in the volume is clear and provides a good consistent contrast to the background paper. We will therefore check the same target text on the target image to check the number of pixels being captured and ensure that all subsequent handwriting can be captured to a reasonable and consistent standard.