



Fine Art and Museum Scanning

using the Cruse Synchron Table Scanner



The Copper House,
Synge Street,
Dublin 8, Ireland.

T: +353 1 478 4088
F: +353 1 478 0241
leszek@thecopperhouse.ie

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At The Copper House we specialise in the highest quality digitisation of artwork, paintings and artefacts for printing, publishing and for archival purposes. We have a purpose built scanning facility which houses our Cruse 220ST Cruse Scanner.

The Copper House is one of a small group to possess a Cruse Scanner, other sites include the Vatican Secret Archives, Nasa, the Victoria and Albert Museum, the Rijksmuseum as well as the National Archives in London and Helsinki.

When planning the equipping of our new facility we undertook a rigorous evaluation of all techniques employed for digitisation of original artwork. We decided to install and commission a Cruse scanner as no other system we tested approached the capabilities of the scanner in terms of resolution, tonal range and lighting.

There are other significant advantages to the Cruse scanner in that precious and valuable artefacts can be scanned in complete safety with regard to physical security and exposure to UV light. Specific details of artefact protection are appended.

We found that there are seven key areas where our Synchron scanner enjoys significant advantages over traditional or digital cameras using CCD or scanning backs and these are discussed below:

i. Lighting

This is one of the most critical aspects of accurate digitisation as effective and even lighting using studio lights is extremely difficult. It is also impossible to maintain the same level of contrast across the entirety of a painting or artwork as light obeys the inverse square law with respect to fall off.

Our scanner uses a patented cold cathode lighting system providing even illumination across the area of capture on the original whilst subjecting it to a lower level of light exposure than studio lighting. (see appendix re. UV levels) This lighting eliminates glare and highlights and allows for the use of smaller lens apertures maximising sharpness and depth of field.

The lighting is adjustable and we can employ 'texture' lighting techniques to cast shadows in order to define brush strokes and knifing as well as raise canvas weave. This 'texture' lighting is especially useful when digitising and archiving museum artefacts as we can bring out and emphasise detail not usually apparent or visible.

Each lighting technique used is fully calibrated for white balance and tonal range and is then assigned a precise Colorsync profile.

ii. Image Resolution

Our Synchron scanner captures over 1 gigabyte of data in 24 bit RGB or 2.2 gigabytes in 48bit when scanning the full table size of 1220mm x 1830mm (6' x 4'). Smaller images can be scanned at a resolution up to 1000dpi and we can scan larger originals sized up to 1830mm x 2440mm (6' x 8') using 2 passes.

iii. Lens Resolution & Scan Sharpness

Most digital cameras employ a pixel spacing of 8 microns with standard lenses being unable to resolve such fine detail. Consequently, data is not accurately positioned on each pixel resulting in a lowered scan resolution.

iv. Light & Table

The Synchron table is operated by stepper motors and precision ball screws enabling exact repeatability when using differing scanning modes and lighting techniques. This facilitates the creation of extremely accurate colorsync profiles giving the most precisely mapped scans achievable.

v. Focus

When using a digital camera back focus is set visually by the operator using the camera's ground glass screen. Our scanner uses a computerised focusing system rather than a ground glass and focus knob. The complete elimination of human error ensures optimal sharpness for all scans.

vi. Squareness Of Camera Back & Camera Orientation

When using a camera and tripod or studio stand setup it is impossible to achieve pixel perfect squareness. As a result, the scan sharpness across the original is compromised. The Synchron's head is precisely mounted and aligned perpendicular to the scanning bed. The camera and scanning sensor remain stationary whilst the table passes beneath the lens and lights allowing the sensor to remain perfectly still and undisturbed. This provides for exact and precise corner to corner sharpness across the entirety of the original.

vii. Multiple Capability

The Synchron's unique design enable it to capture a wide range of originals including framed and unframed artwork (glazed or unglazed), rare documents and books, three dimensional artefacts, maps and textiles.

The scanners capabilities are complemented by our own skills and experience in advanced colour management, fine art printing and involvement in many museum projects.

We welcome discussion of techniques and capabilities and are delighted to invite you to bring an original to us for a demonstration of the scanner.

Please contact us at leszek@thecopperhouse.ie or call 01 4784088 to arrange a demonstration and run a test file.

Appendix A: Physical security of valuable artefacts or artwork.

The operation of the scanner provides a safe and secure process for scanning valuable originals which lie completely flat and undisturbed. We have provided an additional safeguard where particularly sensitive or delicate material can be scanned whilst housed in a purpose built acrylic case providing complete physical protection for the artefact.

Appendix B: Assessment of Light Exposure on the Cruse CS 220 ST

“Documents scanned on the Cruse take approximately 1½ minutes to pass under the scanning light. Light meter measurements indicate that the scanner operates at an intensity of 28,000 lux (2,800 foot candles) and emits UV radiation at the level of 40 microwatts per lumen.

The exposure experienced by a document during a single scan is therefore equivalent to 14 hours of exposure at 50 lux (5 foot candles) with tungsten or other low UV lighting.”

Lois Price , Senior Conservator, Winterthur

Original holder: 48" x 72" magnetic platform with vacuum table

Focus system: Autofocus

Scanner: 48 bit color

Max. resolution: 14.4k x 26.64k pixels

DPI: 48" x 72" @300dpi ; 23" x 45" @ 600dpi

Max. file size: 1.1 GB, 24 bit 2.2GB, 48 bit

Lighting: High frequency cold-cathode,
4 x 55 Watts with texture lighting effect



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