

Academic Imaging Associates

Digital Imaging, Technology & Services
For Libraries, Archives, Museums & Scientific Institutions

HOME

NEEDS ASSESSMENT

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Browse by Projected Budget

Vertical Capture Systems
\$30-45,000
\$46,000-60,000
Horizontal Capture Systems
Dual Capture Systems

A La Carte Search by Types of Equipment, Technology and Services

Outsourcing & Facilities Management, On-Site Training & Consultation, Color Management Service

Scanning and Photographic Equipment (e.g. Repro Stands, Copy Stands, Book Cradles, Easels, Vacuum Frames, Digital Scanning Backs, Digital Cameras, Low UV Low Heat Lighting, Lenses, Product Tables, Software)

LARGE FORMAT FLAT ART SCANNING SYSTEMS

GENERAL CONCEPT

[Start with a Needs Assessment](#)

Digitizing maps, posters, etc. (particularly those that exceed the size of flat bed scanners or are larger than 28"x30") can be done in a variety of ways. As in any digitization project the method will ultimately be dependent upon the end use of the digital image--publication, electronic dissemination, conservation, preservation, or print reproduction at "original size." Each will demand different standards of color reproduction accuracy, adherence to best practice standards, and productivity considerations.

AIA is primarily interested in providing technology and services that meet the highest standards of reproduction in the capture of the largest works with the greatest accuracy. These are Repro Systems that provide the highest level of safety for the originals in that machine parts never touch them, and the highest resolution and color fidelity is achieved via the use of photographic components.

Think of maps, posters, and other oversized reprography as a continuous line with publication at one end and digital preservation, digital files for conservation and research, and museum quality publication and reproduction at the other end. This is not a line expressing a hierarchical order of quality or difficulty. The line is a continuum of work products that require different sets of tools to meet the demands of specific tasks. Preparing maps, posters, etc. for publication may or may not require the highest level of color accuracy, may be reproduced at other than actual size, and usually does not require ultra high resolution unless for use in high end oversized coffee table books. But publication work for some textbooks, reference works and catalogs, etc. may require a great need for fast, deadline-sensitive productivity. Therefore, hi resolution cameras up to 60MP would capture enough detail for the intended purpose, and color interpolation and other artifacts associated with single exposure Bayer area array CCDs may suffice.

However, exacting tasks like preservation, conservation, and 1:1 reproduction do require meeting exacting standards for color--using uninterpolated color data and ultra high resolution 100MP to 400+ MP to reproduce images at full size or study fine detail (see every line and nuance). For a technical but highly understandable explanation read [this article](#).

Putting together a repro system for large format maps, etc., requires integrating the following components, not the least of which are photographic expertise, digital post-processing expertise, and knowledge of specific printing processes.

(A note of caution to those interested in pursuing career or business opportunities in large format reproduction; without a real commitment of time and finances dedicated to education, training, and experimentation, your investment in equipment and marketing will not work out. Build it and they will come? No, they may come enticed by the quality of the technology offered and possibly price for service, but they will not come again. Reputation is most important, and that has to be earned by producing quality work. Yes, quality tools are essential and there are no substitutions, but reputation is earned only by knowing how to use them.)

That is why the following list includes training and education:

1. Digital Camera Back
2. Camera and Lens System
3. Lighting
4. Reprographic Workstation
5. Image Post Processing Software
6. Color Management Software and Accessories

- 7. Computer and Monitor
- 8. Initial and Continuing Training and Education

CHOOSING A DIGITAL CAPTURE DEVICE FOR MAPS, POSTERS AND FABRICS

AVAILABLE CAPTURE DEVICES FOR MAPS, POSTERS AND FABRICS

BACK	TYPE	POTENTIAL RES.	RECOMMENDED USAGE
Better Light Super 6K-HS	Trilinear Line Scanner	6,000 X 8,000 216 MP 9,000 X 12,000 Extended Mode	High End Repro and Archiving
Better Light Super 8K-HS	Trilinear Line Scanner	8,000 X 10,600 384 MP 12,000 X 15,990 Extended Mode	High End Repro and Archiving
Better Light Super 10K-HS	Trilinear Line Scanner	10,200 X 13,600 794 MP	High End Repro and Archiving
Sinar 54H	1,4,16 Exposure PAD*	5440 X 4080 510MB via PAD	High End Repro and Archiving
Leaf Aptus AFi	Single Exposure		Publication Level

CHOOSING LIGHTING FOR MAPS, POSTERS AND FABRICS

Lighting controls the choice of capture device. Some camera backs can only work with continuous light sources like HMI, HID, Hot Lights (traditional Tungsten) or Flicker Free Fluorescents. Others can work with strobes. The difference is in how the capture device gains its resolution. If the CCD is moved, either in a line or x y micro scanning, it requires stable continuous lighting. If the CCD is used in conjunction with an electronic shutter and motor drive, it can use strobes as well as continuous lighting. After making that choice, there are the pros and cons of strobes vs. the various types of continuous lights, ergonomic factors, and of course the relative buy-in price for each.

Type of Capture Device	Technology Used	Lighting Requirements
Single real time exposure back	Bayer Filtered RGGB CCD	Strobe or Continuous Lighting
4 Shot exposure back	Bayer Filtered RGB, RGGB CCD is shifted 4 times either manually, or electromechanically by Piezo Aperture Displacement (PAD)	Strobe or Continuous Lighting
1,4,16 exposure back	Bayer Filtered RGGB CCD is shifted 4 or 16 times x and by no more than 1/2 pixel overlap. This is called micro scanning and is achieved by Piezo Aperture Displacement (PAD)	Strobe or Continuous Lighting
Scanning Backs	Line Scanner. A row of CCD's each filtered R, G and B is moved across the art work via an electromechanical device capturing each pixel 3 times R, G, B.	Continuous Lighting

TYPES OF LIGHTING FOR MAPS, POSTERS AND FABRICS

Type	Lamp	Pros	Cons
Tungsten	3.2K Tungsten	Hard focusable light	Hot

Dichroic Tungsten	3.2K Tungsten coated with a dichroic filter	IR filter to reverse flow of heat away from the art	Ambient heat still present. May be difficult to adjust and feather
HMI	5.6K Halide Metal	Pure Day Light	Cost and cost of maintenance
Fluorescent	Flicker Free	Smooth, even diffusion and low IR	Not adjustable. Large footprint to get required amount of light. Must be UV coated.
HID	High Intensity Discharge	Energy efficient. Produces more light than heat. Low UV, adjustable, long lasting lamps	No heat strike.

CAMERA FORMATS AND LENSES

Medium Format Equivalent to film size of 2 1/4 x 2 1/4 inches. Considered DSLRs and use Bayer Pattern Area Arrays. Each manufacturer has a specific type of lens mount that fits only their lens systems.

Large Format Equivalent to 4 1/2 x 5" film size. Referred to as a View camera because it has a front and rear standard that can be moved up and down, and gearing that can create shifts, swings, and tilts to ensure absolute parallelism and increase depth of field. Large format lenses are manufactured by specialty lens companies and usually represent the highest standard in lens manufacturing.

EASELS, COPYSTANDS AND REPROGRAPHIC WORKSTATIONS TO HOLD ART FOR DIGITAL PHOTOGRAPHY

The next decision is how to hold the art. The type of art being captured will largely dictate this. Stretched canvasses and framed works need to be held on easel-like devices. Unframed works have to be laid down against a flat surface. Therefore they require a Copy Stand or Repro-Workstation. The stands used in large format digital reproduction are massive stable precision instruments that not only hold art safely and securely, but also hold the camera in an exact position that remains parallel to the camera, and can move the camera and digital back up and down an optical in such fine movements as to actually effect focus. Such systems are usually not found in photography stores.

Types of Repro-Workstations suitable for Fine Art and Oversized Art Reproduction: Vertical Repro Systems--systems that hold the camera pointed down at a work surface holding the art. Main advantage is that you are working with gravity, and therefore, only one person is required to place art. Disadvantages include risk of dropping something on art, and difficulty of use depending on the height of the column and camera position.

Type	Features
Wall Mounted Columns	Column and camera arm only
Free Standing Vertical	Column supplied with integral base usually with magnetic or vacuum surface
Horizontal--camera mounted on rail, tripod or studio stand facing art mounted on wall or easel	Ease of use, greater variety of lenses, and use of longer lenses reduces "fall off," but sometime requires two people to place large art
Dual--allows use in both positions, offering the best of both worlds--vertical and horizontal stands	Can be used in either position. Can load in vertical (table position) then rise and flip to horizontal position manually or electronically.

Post Processing Software

Image Post-Processing Software such as PhotoShop, Silverfast, Digital imaging is like playing a piano with two hands. Mastery of post-processing software is

EquiLight

essential for enhancements, adjustments, and corrections that are easier to accomplish non-photographically.

Color Management Software and Accessories

Color Management

Software and targets sync your digital back to your monitor and printer through a process called profiling which is essential to producing consistent results.

Computer and Monitor

PC or MAC

You are going to be working with very large files. Whichever OS and hardware you choose there is no such thing as enough storage and enough RAM.

Purchase the best monitor you can. Do not skimp on the monitor

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