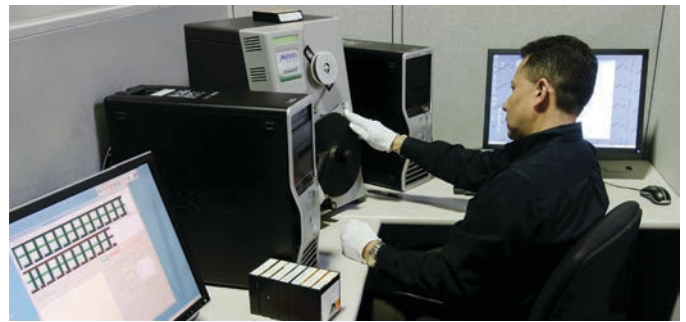


MEKEL TECHNOLOGY MICROFILM SCANNERS

Delivering consistent quality images with every roll,
every microfiche and every aperture card scanned



Service bureaus, corporations, financial institutions, healthcare and government entities and other organizations involved in converting microfilm images into digital files are continually challenged to deliver high-quality images. This is often difficult when microform (microfilm, microfiche or aperture cards) collections: a) haven't been stored properly; b) were created over many decades by many vendors or in-house processing labs; and/or c) were not filmed or processed under conditions meeting acceptable industry standards. Additionally, clients expect the value that comes with production efficiency. We are fortunate to be in an industry where emerging technology allows these challenges to be met – often far

beyond expectations. This paper will discuss the Mekel Technology brand of microfilm and microfiche scanners, featuring several organizations that have found them to offer a competitive advantage over other solutions in the market.

In an era where many practitioners of today's digital imaging technologies have never experienced microfilm, it may seem archaic to discuss bringing microform images back to life. The fact is that there are billions of images stored on microform. Why? Because – with an estimated life span of 500 years when stored properly – microfilm was, and still is, the most reliable preservation medium.

Even today, microfilm is included as part of many comprehensive compliance and disaster recovery plans.

These stored images contain everything from historical collections such as newspaper and personal archives to important membership, financial, land and health records to engineering and architectural renderings and more. While some may not have value to today's audience, others contain incredibly important information or enlightening historical reference materials that merit digital sharing or public access. The digitization process demands technology that can create images for import into ever-changing line-of-business software systems, dedicated ECM and other document management solutions.

Engineering Evolution

In 1989, Mekel Technology introduced the first commercial microfilm scanner to the market. This was followed by the first auto-load microfiche scanner in 1991. In 2003, the firm was acquired by The Crowley Company, which specialized in production and cultural heritage scanner resale and conversion services (Crowley Imaging). The purchase of Mekel Technology added a manufacturing arm to the company and the original products have been re-engineered into today's market-leading MACH-Series scanners. The daily use of these scanners by Crowley Imaging employees allows for continuous improvement as the service bureau reflects the same operating environment as that of Mekel Technology clientele. The focus is always on image quality, speed, ease-of-use, superior build quality and – ultimately – reducing the overall cost to scan.

It is typically a professional document conversion service bureau that is given the responsibility of conducting large-scale conversions of legacy information from microfilm. When security or other factors prevent organizations from outsourcing, an entity may elect to operate their own scanning department. Service providers – bureaus or in-house departments – can purchase Mekel microfilm scanning equipment that offers the latest technology. The MACH-Series scanners ship with custom-designed QuantumScan™ and QuantumProcess™ – Mekel's dedicated software suite that enhances

image capture, data and editing capabilities.

Microfilm

The technology of the Mekel product line sets the standard in our industry today. The units deliver quality and efficiency that go well beyond the descriptions and specifications highlighted in the MACH-Series literature. Following side-by-side demonstrations of a Mekel and a competitive unit in purchase evaluations, buyers most often remark on Mekel's ease of use and fast scan time from roll-in-hand to delivered image.

The MACH-Series **microfilm** product line includes the following scanners. Each scanner uses a focused LED light source, runs on QuantumScan and QuantumProcess software, creates quality bitonal and grayscale images from microfilm in various states of composition and scans up to 1,000 foot individual rolls.

MACH5

Digitizes up to 1000 images per minute at 200 dpi

MACH10

Digitizes up to 1400 images per minute at 200 dpi

MACH12

Specifically designed for production volume archival scanning, this unit scans to FADGI, Library of Congress, Metamorphoze, NARA and NDNP preservation specifications for both 16mm and 35mm film

MACH Mini

The MACH Mini, introduced in 2019, harnesses the image quality, editing features and efficiencies of the larger MACH models in a smaller footprint. Digitizing up to 350 images per minute at 200 dpi, the MACH Mini is portable



MACH5, 10 and MACH Mini have a true optical dpi range of 100-600; speeds vary depending on dpi. The MACH12 can exceed 600 dpi resolution.



and stackable, adding versatility to the MACH-Series product line.

It's worth noting that the units require no re-loading and no re-scanning and offer 100% accurate image capture. This allows for minimal time out of storage; the microfilm is scanned once and returned to the owner's inventory. Additionally, the scanners are driven by an external PC which is viewed as a competitive advantage (see "Reliability").

Microfiche

The MACH-Series product line also includes the MACH7 microfiche scanner:

MACH7

Digitizes up to 200 images per minute



In addition to the high-resolution camera used for image capture, Mekel's fiche scanners employ a separate prescan and title bar camera used for image location. With this unique configuration, the scanners skip the blank spaces on a fiche that is not full, allowing for a speed not seen in competitive units. As a bonus, these microfiche scanners have an optional load-arm that allows for the scanning of aperture cards.

With the latest generation of software, Mekel 2.0, the MACH7 offers serpentine scanning for even faster throughput, Optical Character Recognition (OCR) and opaque capture for aperture card text and title bar capture.

Productivity Improvements

Several imaging operations that use the MACH-Series scanners are benefiting from the advanced Mekel technology.

Ryan Candela, Project Manager with [Mountain States Imaging](#) notes, "We had previously used Wicks & Wilson and nextScan equipment for quite some time. When we received a large fiche and film conversion contract, it was obvious that our present equipment would not meet the requirements. Two factors led us to select Mekel Technology scanners for this project: the ease of use and the almost non-existent learning curve for our employees." He continues, "When we factored that in with the power of the Quantum software, it was an easy decision. We were up and running in thirty minutes and employ six people scanning ten to twelve hours a day – effortlessly."

Another services company, [ImageSource, Inc.](#), had very similar comments and experiences. Conversion Service Manager Ryan Ivie recalls, "We landed a very large roll film conversion job. The scanner we were using to convert fiche and roll film was outdated and would not have enabled us to meet the deadline. We had to look for replacement scanners that could keep up with production output requirements."

As part of the search, says Ivie, "We contacted numerous vendors asking for on-site scanner demonstrations. The Crowley Company was the only vendor that could provide a demonstration unit in a timely manner and delivered a MACH10. Once we had the equipment, Crowley allowed us to use the scanner for a week. After that week, we were sold. The learning curve was very short and it was easy for our temporary staff and four supervisors to operate the scanner."

It's not just service bureaus that are choosing the MACH-Series over competitors. Timothy Baker, State Archivist for the [Maryland State Archives](#), is responsible for a department that has been microfilming and scanning for decades. Baker notes, "At MSA, we believe we are in the forefront of digitizing records and making them available online. Unlike many states, we have an enormous microfilm collection because our central archives are responsible for state, county and municipal records. We have over 300,000 rolls of microfilm. We had used Wicks & Wilson and nextScan scanners for several years but switched to the Mekel scanners

several years ago because they could handle all our requirements, especially duplex film in cine mode. We have found the throughput better and our quality control process improved with the Quantum processing software.”

The Quantum Difference

When discussing post-processing requirements, Mekel customers often point to Quantum software as the reason they are replacing competitive scanners. Although the MACH-Series scans a “strip” or “ribbon” (the full roll) as does its competitors, Mekel’s technology scans the roll as small blocks of data while competitive units digitize the entire roll as one scan. The advantage is that Mekel’s smaller data will not negatively affect network speed when images are scanned across the network.

QuantumProcess and QuantumScan are compatible with both Mekel microfilm and microfiche scanners, giving users the ability to digitize and process multiple media formats using one software suite. For additional efficiency, operators can begin the quality control (QC) process while other rolls or sheets are being scanned in the background. When using QuantumProcess, bitonal and grayscale images can be output simultaneously without impacting speed and have the ability for document OCR.



With QuantumScan, the scanner automatically - and with no operator intervention - locates images on the roll and marks the boundaries with a box. QuantumProcess saves the boxes as images using operator-defined settings. A red box is an indication to the operator that the box is a different size than the average and may need to be manually adjusted.

As of this update, [Ancestry.com](https://www.ancestry.com) has purchased eight MACH5 microfilm scanners to replace twelve nextScan units for ongoing film scanning. They also own two MACH7 microfiche scanners, two MACH Mini portable microfilm scanners, three MACH12 microfilm scanners and numerous QuantumProcess software licenses.

In an Ancestry.com blogpost, Michael Murdoch, a senior software development manager, at the time of original print, gives a detailed description of the benefit of Quantum scanning and processing.

“The most interesting point here is that this process is creating fixed-sized image strips. In the past, the scanners we used would segment the frames from the film as it scanned. In other words, the scanner created the frames as it scanned and you were pretty much stuck with the segmentation it gave you. But with strip scanning the scanner produces fixed-sized strips and thus defers the segmentation to a subsequent framing step that is much more accurate in the way it identifies frames. More importantly, by deferring the segmentation we can involve a human reviewer who can be much more deliberate and thus more accurate in determining how the content on the film should be framed.”

You have probably never even once wished you knew more about microfilm scanning technology. Creating 35 mm rolls of microfilm is a nearly 80-year-old technology and microfilm scanners have been around for decades. But if you care (deeply) about producing high-quality images, getting this part of the process right is absolutely critical. Strip scanning is a fairly recent development, and the work we have done the last few years to do the stitching of strips into frames on our server farm has been something of a minor break-through, enabling the IPP to produce both higher volume and higher-quality images.” [Editor’s note: stitching is a method used by Ancestry.com; it is not a necessary procedure for Mekel scanners]

The conversion experts at ImageSource and Mountain States Imaging reported similar results when discussing the Quantum software and the competitive advantage it gave them in the marketplace.

MSI's Candela praises, "The Quantum processing software is incredible. On our COM fiche conversion project, we scan 200 fiche per day, per machine on-site. The Mekel scanners process better and faster than our former scanners because we don't need a server attached to each machine. We are able to save scanned images to an external drive that is transported back to the main processing center where multiple people do the post-processing with the Quantum software. This is a tremendous competitive advantage for our company." At 270 images per standard microfiche, this equates to an impressive 54,000 images per day per scanner.


Candela continues, "It's very easy to use on the fly. You get everything at once and multiple ways to correct image quality if needed. Our old scanners did not have this capability. Our scanning operator also likes not having to go back and 'mess' with density. We have five people auditing back in Colorado so that our production staff can concentrate on efficiency. Our old nextScan units have a delay and have to be audited as we scan. This slows you down when working against a tight timeline.

Pre-MACH7 Scanners	With MACH7 Scanners
150 scans/day	200 scans/day
x 270 images per scan	x 270 images per scan
x 3 scanners	x 3 scanners
121,500 ave. images/day	162,000 ave. images/day

Per MSI, the MACH7 technology resulted in:

- 25% more images per shift
- 25% less conversion time
- 25% more revenue

MSI, which specializes in document scanning, microfilm/microfiche scanning, eDiscovery and data entry and processing, notes that "the MACH7 vacuum automation is the primary reason for increased productivity. The vacuum auto-feeders have a very low error rate, increasing efficiency and production by 25% across the board."



(2015 data)

For this project, we would have needed twice the crew and twice the hard drive space to accomplish the same production we get from our Mekels."

ImageSource's Ivie feels similarly. "The Quantum processing software is amazing when one considers all of the options and functionalities such as image clean-up and being able to scan once without having to reload a roll to make an adjustment to an image. The Quantum software saves us time and money because we scan once and can have multiple workstations processing rolls in the background. With our old scanner technology, we would have had to purchase multiple scanners to achieve our current high output capabilities."

Reliability

Service companies rely heavily on their hardware and software vendors to maximize the revenue generation capabilities and deliver projects on time and on budget. The service providers we spoke to were all impressed with the responsiveness and quality of the service and technical support they received after purchasing Mekel scanners.

Candela at MSI said, "We just recently needed scanner maintenance for the first time. The tech support at Crowley was fabulous, incredible. If we have an issue they simply schedule an online meeting, troubleshoot and fix it on the spot. We don't have to send the unit back to the factory and lose revenue and customer goodwill when production schedules slip. Unfortunately, the nextScan comes with its own server and hard drive so there is no room for error. If there's an issue, the whole unit has to be shipped out for service. With Mekel, the freestanding computer is an easy fix and it reduces downtime."

When discussing Mekel service and support, Ivie noted, "We have come across some odd rolls of microfilm, such as film missing blips. We contacted Crowley and they were able to support us remotely. I've yet to find a piece of film from which the Mekels can't pull an image. Even with the original installation there was very little training needed because of ease of use. We have been using the equipment for two years without any issues."

Real ROI

The consistent performance of Mekel scanners also

translates into quantifiable savings and a proven ROI for the imaging operations that incorporate this equipment into their scanning conversion operations.

Ryan Ivie at ImageSource sums it up this way, “We would have to charge double or triple the price if we were using our old equipment because we would have had to purchase more scanners and add additional staff to meet deadlines. We have also been able to cut the cost of re-scans due to the higher quality images. We are saving \$144.00 per day, per person, since installing the Mekel products.”

Annual Savings using Mekel MACH-series Scanners

22 scanning days/month (average)
x \$144 savings per day/per person
x 12 months = \$38,016 saved per person/per year

With a typical industry technology refresh averaged at 3-5 years, this translates to an approximate \$114,000 - \$190,000 savings per scanner, more than paying for itself early in the cycle.



(2015 data)

The Bottom Line

Mekel’s success in the end-user and service provider communities is validated by the companies that have replaced competitive scanners with Mekel scanners to improve the quality of the product they are delivering to their customers...faster...with less equipment...and with less downtime. Each factor contributes to a robust bottom line.

As shown throughout this paper, the decision to purchase Mekel microfilm and microfiche scanners by organizations like Mountain States Imaging, ImageSource, Ancestry.com and the Maryland State Archives have yielded:

- Improved production efficiencies
- Reduced learning curves
- Reliable operation
- Comprehensive before, during and after sale training and support

“Our mission with Mekel Technology is to continue to set the standard by which all competitors will be judged,” says Crowley vice president, Matthew McCabe. “We do this by continuously challenging ourselves to simplify Mekel scanner operation while steadily improving digital image capture, post-processing features and workflow for maximum efficiency.”

This white paper was originally published in 2015 and authored by Bob Zagami. It has been updated to reflect new product developments.



About the author

Bob Zagami is a senior marketing executive focusing on the ECM and RV industries. He is an international author and lecturer on document management systems and is the principal consultant at IMAGAZ by ZAGAMI. He is a Certified Document Imaging Architect (CDIA+).

White paper sources:



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