

Information Requirements Clearinghouse

Phone: 303-721-7500
E-mail: irch@irch.com

[Home](#) | [Products](#) | [Resources](#) | [Support](#) | [Web Store](#)

Friday May 6, 2005



PDF Version

The Legal Status of Optical Disk and Electronic Imaging Systems¹

Vendors have recently announced the availability of the new generation "electronic imaging systems (EIS)." These systems are capable of scanning an image, converting the image into electronic form, storing the image on optical disk, and rapidly retrieval of the image. Experienced observers expect this new technology to gain wide acceptance in the marketplace as a alternative to traditional microfilm or paper-based systems. Vendors and potential users alike, however, have expressed concern related to the legality of records maintained using this technology, including specifically the admissibility of optical disk records as evidence or the acceptance of this type of electronic record by administrative agencies.

At the time of this article, no statutes or regulations, or even judicial decisions, exist which specifically address this technology. The legal system has yet to be confronted with records and information maintained by these systems and may not even respond for several years, based upon the previous history with other technologies.¹

What should both users and vendors do in the interim period, until a body of law evolves similar to microfilm and computer records? Should purchase decisions be postponed until new legislation is enacted or the technology has passed judicial review in a number of test cases? Should we wait several years to recognize the improved speed of retrieval and information sharing offered by this new technology?

This article reviews the electronic imaging system and the use of optical disk as a storage medium within the context of existing microfilm and computer laws in the United States. It seems clear, at the minimum, that this new technology has certain reproduction properties of microfilm and yet utilizes data processing technology. The results of these observations may be surprising for those waiting for the legal "test case" to be firmly decided.

The Uniform Photographic Copies of Business and Public Records As Evidence Act (UPA)

The "Uniform Photographic Copies of Business and Public Records as Evidence Act (UPA)" has been adopted by 33 states and one territory and represents the mainstream of thinking within the United States related to microfilm and duplicate copies.² This law as it relates to microfilm is discussed extensively in a previous article.³

The UPA, as adopted by the federal government in Title 28, Section 1732 of the United States Code [US 128-0020-00], reads as follows:

- **§1732. Record made in regular course of business: photographic copies.**

If any business, institution, member of a professions or calling, or any department or agency of government, in the regular course of business or activity has kept or recorded any memorandum, writing, entry, print, representation or combination thereof, of any act, transaction, occurrence, or event in the regular course of business has caused any or all of the same to be recorded, copied, or reproduced by any photographic, photostatic, microfilm, micro-card, miniature photographic, or other process which accurately reproduces or forms a durable medium for so reproducing the original, the original may be destroyed in the regular course of business unless its preservation is required by law. Such reproduction, when satisfactorily identified, is as admissible in evidence as the original itself in any judicial or administrative proceeding whether the original is in existence or not an enlargement or facsimile of such reproduction is likewise admissible in evidence if the original reproduction is in existence and available for inspection under direction of court. The introduction of a reproduced record, enlargement, or facsimile does not preclude admission of the original. This subsection shall not be construed to exclude from evidence any document or copy thereof which is otherwise admissible under the rules of evidence.

While this law was primarily written to deal with the problems of microfilm or copier reproduction, the law can still be applied without change to the electronic imaging technology and optical disk storage of images. In order to qualify as a reproduction under this law, the reproduction must be produced "by any photographic, photostatic, microfilm, micro-card, miniature photographic, or any other process which accurately reproduces or forms a durable medium for so reproducing the original..." Since electronic imaging system can, in fact, "accurately reproduce" the original, it qualifies as an "other process" recognized by the existing UPA. Therefore, the electronic image stored on optical disk should be treated as a duplicate record, just like any microfilm record, under the UPA and extended the same status in the law.

Uniform Rules of Evidence

The Uniform Rules of Evidence have been adopted by the federal government and at least 28 states and two territories [US 128-0060-00].⁴ Since this is a fairly new, but widely accepted uniform law, we can expect that more states will adopt the Uniform Rules of Evidence in the future. This law contains the following two provisions which relate to electronic imaging systems and optical disk.

- **Article X. Contents of Writings, Recordings, and Photographs**

- **Rule 1001. Definitions.**

- (1) Writings and Recordings. "Writings" and "recordings" consist of letters, words, or numbers, or their equivalent, set down by handwriting, typewriting, printing, photostating, photographing, magnetic impulse, mechanical or electronic recording, or other form of data compilation.

- (2) Photographs. "Photographs" include still photographs, X-ray films, video tapes, and motion pictures.

- (3) Original. An "original" of a writing or recording is the writing or recording itself or any counterpart intended to have the same effect by a person executing or issuing it. An "original" of a photograph includes the negative or any print therefrom. If data are stored in the computer or similar device, any printout or other output readable by

- ▶ [News](#)
- ▶ [About Us](#)
- ▶ [Products](#)
- ▶ [Support](#)
- ▶ [Resources](#)
- ▶ [Web Store](#)
- ▶ [Contact Us](#)

sight, shown to reflect the data accurately, is an "original."

(4) Duplicate. A "duplicate" is a counterpart produced by the same impression as the original, or from the same matrix, or by means of photography, including enlargements and miniatures, or by mechanical or electronic re-recording, or by chemical reproduction, or by other equivalent techniques which accurately reproduce the original.

Rule 1003. Admissibility of Duplicates

A duplicate is admissible to the same extent as an original unless (1) a genuine question is raised as to the authenticity of the original or (2) in the circumstances it would be unfair to admit the duplicate in lieu of the original.

The Rules of Evidence deal both with duplicate records such as microfilm and with computer records. In terms of duplicate records, a duplicate would be considered any record produced "from the same matrix" as the original (i.e., dot-for-dot transformation from the original to the duplicate) or by "other equivalent techniques which accurately reproduce the original." Since electronic imaging systems meet the stated criteria, these duplicate records would be admissible in evidence under Rule 1003, just like microfilm records. The image stored on the optical disk would clearly be acceptable as a duplicate record under the Uniform Rules of Evidence.

The Uniform Rules of Evidence also deal with computer records (i.e., information recorded by "electronic recording or other form of data compilation"). Under this definition, the electronic image stored on the optical disk would also be considered a "writing or recording" under the Uniform Rules of Evidence.

Under the definition of original records, the original record of "data stored in the computer" (such as the image stored on the optical disk) would be defined as "any printout or other output readable by sight, shown to reflect the data accurately". In essence, the optical disk itself could not be introduced in evidence because it would have no legal status and was not readable by sight. Instead, either a paper printout, microfiche produced by a computer output microfilm device, or a display of the image on a screen would meet the requirements of the rule.

Due to the unique dual nature of the electronic imaging system, the Uniform Rules of Evidence would result in a bizarre and contradictory conclusion. Under the Rule related to reproduction, the optical disk would be considered a duplicate copy. Under the Rule as it applies to computer records, an original could be produced from this duplicate copy which would be admissible in evidence. Although, some courts may find it unpalatable to conclude that an "original" can be produced from a "duplicate" under the law, they still would be required to accept visible records produced from the image stored on optical disk which accurately reflects those images. Perhaps the Uniform Rules of Evidence could be revised to read "If data are stored in the computer or similar device, any printout or other output readable by sight, shown to reflect the data accurately, will be treated as an original."

Problems with Electronic Imaging Systems

In determining the impact of existing laws on this new technology, it is appropriate to first review the problems related to the technology which could potentially create legal obstacles. These problems must be dealt with in designing an electronic imaging system even once the legality of the technology has been established.

1. *The image stored on a optical disk may not be an exact reproduction of the original.* Most scanners will only detect a maximum of 200 to 300 dots per inch (DPI) across a page. While the resolution is adequate to fully reproduce the image, it means that some dots from the original will not be reflected in the duplicate. While this may seem to be a major obstacle, other technologies such as microfilm or other duplication methods also fail to reproduce every dot contained in the original, but generally reproduce enough dots so that the image appears complete and readable. In fact, the quality of a digitized image may exceed the quality of a microfilm image.

The reader should note that this problem does not exist when optical disk is used as a storage media for data similar to magnetic disks. In that case, the optical disk is considered merely a peripheral device and should be governed by the same standards now generally applicable to data processing.

Although the dot-for-dot transformation from the original document to the image on optical disk will probably be sufficiently accurate for legal acceptance, most systems will not store the image in terms of a series of "electronic dots" in order to conserve space. Instead, after scanning, the image is compressed ten or more times using a technique called "run length encoding (RLE)". Besides reducing storage requirements, RLE also enables the image to be transmitted to terminals or remote locations much faster. At any point, the RLE version of the image can, however, be reconverted back into the dot version through application of the appropriate decompression algorithm. Therefore, although the stored version of the image will have been electronically compressed and cease to have the same attributes as the original image, the information and visual qualities of the final displayed image will not be altered.

2. *The information maintained within an image (such as a signature or text) can be removed or modified without a trace.* Once the image is stored in computer memory (either after scanning or after retrieval from the optical disk) sections of the image may be electronically modified either through deletion of information, insertion of new information, or electronic transfer of information from other documents. The resulting final image can then be stored on the optical disk and the index pointers directed to the new image. For non-erasable optical disks, while the original image might still exist on the disk, the index would point to the revised image. With erasable optical disk, the previous image could be erased completely without a trace.

While the ability to alter the image may seem the "kiss of death" for this technology, the reader should consider the analogy with computer records. Computer information can be added, deleted, or modified on magnetic disk and the new version stored without any trace that changes have taken place. Yet, courts and administrative agencies have already established the legal acceptance of computer records in judicial or administrative proceedings. The result, therefore, does not pivot on the erasability of the media or potential for modification of the image. Instead, courts and administrative agencies will require an audit trail to indicate what actions have taken place to the information in the system. The concern will relate to the "trustworthiness" of electronic images. In this regard, microfilm records may still be considered more trustworthy than data processing or electronic images because the image cannot readily be altered.

3. *Electronic images cannot be certified in terms of authenticity like microfilm records.* Again, the analogy must be made to computer records which also cannot readily be certified. Instead, the courts or administrative agencies

will probably require that the procedures be documented and performed in the ordinary course of business.

- *The electronic image can be enhanced after scanning and prior to storage on the optical disk.* Image enhancement will create the biggest concern in terms of the legal acceptance of this technology. Image enhancement includes the capabilities of the system to actually improve the image by sharpening line edges, removing stains or colored background, removing specks from the background, and filling in broken letters. Although these problems might all exist in the original record, the purpose of image enhancement is to make the electronic image even more readable. This concern is just the opposite of the previous concern that the electronic image may not capture all the information (i.e., all the dots) of the original image.

The concerns related to image enhance has prompted some systems designers to suggest that the original images be microfilmed or an unaltered version of the original image scanned and stored on optical disk prior to image enhancement. While both procedures may facilitate the acceptance of electronic image, they both require substantial additional time and expense on the part of the user to create this duplicate copy for legal purposes. The argument can be made, however, that the image enhancement algorithms merely result in an improved image rather than different information. Since the information contained in a record ultimately is more important than its appearance, the courts or administrative agencies may not object too strenuously. An audit trail must be maintained indicating the types of image enhancement algorithms used and, perhaps, the percentage of change that resulted after the algorithm was applied. The key, again, will be the "trustworthiness" of the electronic image.

- *Optical disk is not considered an archival storage medium.* Some have expressed concern that the law requires information to be maintained on an archival media such as properly processed microfilm. In reality, the issue related to archival quality or longevity of the information has no relationship to its legal acceptance. The information must merely last as long as required by law or just long enough to be admitted in evidence. As stated in previous article, even the "Uniform Photographic Copies Of Business and Public Records As Evidence Act" does not require the microfilm to be archival but merely requires that the media "accurately reproduces... the original".⁵ Regardless, magnetic media is not archival and information maintained on magnetic media is generally accepted in both courts and administrative proceedings. Finally, even if the optical disk prematurely begins to deteriorate, the information can be transferred electronically with no loss of resolution (as compared to microfilm which loses 10 to 20 percent quality when duplicated).

Summary

Under the Uniform Photographic Copies of Business and Public Records as Evidence Act and the Uniform Rules of Evidence, images maintained on optical disk as part of an electronic imaging system would be admissible in evidence just like microfilm or computer records. The requirements for an audit trail, documented procedures, program documentation, etc. required for computer records would also be required for electronic imaging systems. These laws make it clear that this new technology would result in information which is legally admissible in judicial and administrative proceedings at this time, provided that its "trustworthiness" is not in doubt. Users in those states having adopted both these laws may not require any "test cases" or other court decisions in order to establish the legality of this technology.

Most other states have some provisions related to both reproductions and data processing records. These requirements should be reviewed carefully to ensure that they have broad enough language to cover images maintained on optical disk. Where the law is unclear, it may be appropriate to direct the court's attention to the major trends which exist in other states which would permit the use of this technology.

The key to admissibility in evidence of images and optical disk, regardless of the specific law, will relate to the trustworthiness of the information. When proper procedures are followed and meticulously documented, the courts and regulatory agencies will feel comfortable in accepting this new technology. When sloppy procedures are followed, even microfilm or computer records, which otherwise would be admissible under existing laws, can be excluded from evidence.

Besides these legal issues, acceptance of this new technology will also be dependent on the comfort level of the judges and administrators. It took several hundred years for the courts to even accept paper records in evidence instead of live testimony, approximately 40 years to accept microfilm in place of the original record, approximately 10 years to accept computer records, and it is expected that it will still take two or three years for courts to accept electronics imaging systems and optical disk. Those introducing the technology at this time should carefully establish and follow procedures designed to ensure the trustworthiness of the image information and to provide a detailed audit trail. The benefits of this new technology can be recognized today provided that the system is properly designed and implemented to meet the anticipated legal requirements of tomorrow.

¹ See "The Legal Status of Microfilm and Other Duplicate Records" [020-3020-00] and "Legality of Computer and Computer Output Microfilm Records" [020-3030-00]

² The "Uniform Photographic Copies of Business and Public Records As Evidence Act" [STATE 020-3001-00] has been adopted by the United States federal government and the following states:

- Alabama
- Alaska
- California
- Colorado
- Connecticut
- Georgia
- Idaho
- Iowa
- Kansas
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Nebraska
- New Hampshire
- New Jersey

- New York
- North Carolina
- North Dakota
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Utah
- Vermont
- Virgin Islands
- Virginia
- Washington
- West Virginia
- Wisconsin

³ See "The Legal Status of Microfilm and Other Duplicate Records," [020-3020-00]

⁴ The "Uniform Rules of Evidence" [STATE 020-3002-00] has been adopted by the United States federal government and the following states and territories:

- Alaska
- Arizona
- Arkansas
- Colorado
- Delaware
- Florida
- Guam
- Hawaii
- Iowa
- Maine
- Michigan
- Minnesota
- Nebraska
- Nevada
- New Mexico
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Puerto Rico
- South Dakota
- Texas
- Vermont
- Washington
- Wisconsin
- Wyoming

⁵ See "The Legal Status of Microfilm and Other Duplicate Records" [020-3020-00]