MCICR Technology FAQs

What is MCICR?

MCICR is a revolutionary technology for digital images computers that compresses and converts 24/32-bit (photo realistic quality) images with no loss in visual quality. Fast Eddie and Planet Color are based on the MCICR process, which was developed at Los Alamos National Laboratory, in Los Alamos, New Mexico. MCICR is true compression. However, using MCICR, compressed images are written in a standard 8-bit file format (using only 256 custom colors). MCICR has three advantages over traditional image compression:

- images converted with MCICR have the quality of 24-bit images, but the size of 8-bit images

- the physical size of converted images is less than one-third that of the original (disk space)

- images compressed with MCICR are written in standard graphic file formats

- MCICR'd images do not required decompression nor the processing overhead required by decompression.

MCICR is a set of computational tools that reduce the storage size of digital images (or image-like data, such as sound, digital video and animation) without perceptual loss in quality.

MCICR consists of two major parts. The first is the construction of an optimal palette (a color look-up table, or CLUT) by which high resolution images can be represented in a format acceptable by the lower resolution device. These lower resolution devices include 8-bit CRTs, color printers, etc.

The second aspect of MCICR involves the assignment of elements in the high resolution image to the palette of lower resolution, thereby completing the conversion process. In addition, human sensory perception models are integrated into this second aspect of the process, the resulting images being excellent representations of the original data.

Is MCICR a lossy or lossless compression process?

MCICR is a lossy process in that the original image data is replaced with the converted image data. However, MCICR does such a good job of representing the image, by minimizing errors in low frequency data, that converted and compressed images are virtually indistinguishable from the original.

Who owns the rights to MCICR?

MCICR was developed at Los Alamos National Laboratory over a several year period and at an expense of several million dollars. LizardTech holds exclusive rights to the MCICR patents for the life of those patents (to the year 2008).

Is LizardTech part of the federal government or Los Alamos National Laboratory?

No. LizardTech is a privately-held commercial company. LizardTech's economic and social goals are to bring enabling technologies to market. These technologies, developed by LizardTech or by public entities, are designed to allow consumer access to large data sets (such as high-quality image and sound data), increase user productivity and in general increase the quality of human life—all while making a reasonable and justifiable profit.

Does LizardTech get special consideration from the US Federal government?

NO. LizardTech pays a royalty for every copy and every sub license of MCICR. Although we have access to the original MCICR scientists at Los Alamos, LizardTech must rely on its considerable engineering, theoretical and marketing resources for its MCICR-based consumer products.

Why not make MCICR public domain?

Two reasons. MCICR was developed using tax-payer dollars. MCICR royalties "pay back" the federal government and allow Los Alamos to continue the Technology Transfer Initiative (under which MCICR was licensed, see Chapter 6, Save the TTI!). The second reason is the profit motive. The MCICR technology will only expand and become refined if LizardTech and its industrial partners can expect to collect a reasonable profit from its work for their shareholders.

How is MCICR different than JPEG/MPEG or other lossy compression?

Although useful in many different situations, the JPEG/MPEG standard compression schemes lack the optimization for low frequency data and low-resolution devices afforded by MCICR. Also, where as MCICR-compressed images do not require decompression, JPEG/MPEG requires considerable processing time and effort for this task.

Can MCICR speed up or increase the quality of existing lossy compression?

Yes. The vector quantization(VQ) algorithm within MCICR is optimized for both time (speed) and space (image detail).This low frequency image data is

the most difficult to maintain in lossy compression, yet the most important (the majority of image detail is contained in the low frequency range).

How is MCICR different than existing methods of creating indexed images?

Companies such as Adobe Systems and Equilibrium have made great strides toward enhancing indexed image conversion. However, they appear to use some variation of the standard Median Cut and/or the Most Popular method for converting images. MCICR merely manifests itself on personal computers in the form of indexed images. Both the way colors are picked for the CLUT and the method of projection are unique to the computing industry (so unique, that a patent was issued to protect the integrity of the algorithm).

What platforms will MCICR work on?

MCICR is platform independent. The process can be implemented in both hardware and software. Aspects of MCICR (such as the VQ) can be integrated into existing technology to enhance other methods of compression and conversion. LizardTech's MCICR-based products currently support Macintosh (PPC native) and every flavor of UNIX. C++ MCICR libraries are available for any computing device.

Is MCICR compatible with lossless compression?

Most of the compressible data within images is reduced to the point that lossless compression routines provide little or no additional reduction in image file size.

What products currently exit that use MCICR?

Fast Eddie for Macintosh, published by LizardTech was the first of many MCICR-based products. Planet Color, released by LizardTech in September of 1993, extended the functionality of MCICR and added many user features (such as palette seeding and manipulation, batch processing and popular graphic file formats). Planet Color is designed to convert and compress moving images and animation as well as single, still images. A myriad of software and hardware applications, including those developed by other firms, will utilize MCICR in the future.

Are converted images just like the original 24-bit images?

MCICR compressed and converted images are visually indistinguishable from the original images. Since MCICR is lossy, the original data is replaced upon conversion (although MCICR-based products do not over-write the original files).

Can converted images be reconverted to their original color space?

Yes. Although Fast Eddie and Planet Color do not support this feature, applications from other publishers (such as PhotoShop by Adobe Systems) have the ability to switch from an indexed color space back to the RGB or

CMYK modes.

Can images converted with MCICR be manipulated like the original 24-bit images?
Yes. However, applications that manipulate images by changing the structure of all three or four color channels require that images be converted back to either the red, green, blue (RGB) or yellow magenta, cyan, black (CMYK) color space.

Can images converted with MCICR be printed like the original 24-bit images?
Yes. Software applications (including device drivers) that fully conform to PostScript Level II convert the indexed to CMYK or RGB, depending on the printer. For example, Aldus PrePrint examines images and when it finds an indexed image it converts that data automatically to the CMYK color space for separations. Most all desktop color printers from companies such as Tektronics will print MCICR-converted images. In fact, since all color printers have to convert images to a lower resolution color space, printing MCICR-compressed and converted images is faster and usually higher in quality than using the original 24-bit image.

Can images converted with MCICR be displayed like the original 24-bit images?
Yes. However, a few applications (such as TeachText from Apple Computer) do not recognize index color information and/or must project 8-bit images using a generic (system) palette. Fortunately this the exception rather than the rule because the result is less than desirable.

What file formats and platforms does MCICR support?
MCICR is format and platform independent. The functionality of MCICR-based applications is being broadened to include support across several file formats and all personal computer platforms. Images converted with the designated platform and format can be further optimized within the software (for example converting a 24-bit Macintosh image to a 8 or 16-bit IBM-compatible PC color space).

Is it possible for other developers to license MCICR code and/or the patent itself?
Yes. LizardTech has several licensees and continues to work with other developers to license both code libraries (C class) and the patents proper. Although all license agreements must be royalty based, the actual figure is extremely reasonable and negotiable (depending upon intended use, projected unit sales and the terms of the license).

LizardTech is charged by our technology transfer license agreement to develop and enable other publishers in securing the use of the MCICR technology, for a small, reasonable fee. In addition, third party developers of CD ROMs, animation and multimedia presentations can display a small sticker (Fast Eddie Was Here) that assures consumers that their products were developed using the finest image conversion and compression

software available today.

Who uses MCICR?

Since the release of Fast Eddie in August of 1992, thousands of users world-wide have purchased the product. Although a complete list is impossible here, it includes Apple Computer, IBM, Microsoft, Paramount Pictures, MacroMedia, Wayzata Technology, Activision Studios as well as every major multimedia production studio and every major research university in the United States.

If MCICR is so revolutionary, why doesn't the entire industry use it?

Most users don't expect to get quality images using only 8-bits of color data. In addition, virtually all new technologies suffer from the Not Invented Here (NIH) and/or the Too Good to be True syndromes. Industry and market acceptance is rapidly increasing for MCICR as new products and processes are developed.

Where can I get more information?

LizardTech is responsible for development and marketing of MCICR-based consumer products and for licensing MCICR to other publishers. They can be reached at the following address:

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