Product Review: ProArchive Eternity

Microfilm writing comes of age (again) with a hi-tech method of writing to microfilm

IDMi's John Baker travelled to Switzerland to see first-hand how the RGB Laser device operates, and spoke to the founder and CEO of ProArchive, Dr. Daniel Fluck.

Overview
The ProArchive range consists of two models of their successful Eternity RGB laser devices for writing to microfilm. The Eternity 105 and Eternity 35 equipment writes to 105mm and 35mm film respectively.

Both of these machines are of the same construction apart from the obvious film format differences. (It is possible to switch film formats but as this is a complex process which has to be undertaken by a suitably qualified ProArchive engineer, the machines should really be considered as single format.)

For the purpose of this article, the descriptions and operations remain the same for both machines unless otherwise stated.

First Impression
The ProArchive devices are large, mainly by virtue of the way in which the film is transported and the arrangement of the bay containing the RGB laser array. The sheer height and width gives these machines a presence not normally associated with digital to film devices. Along with that presence comes the appearance of a device which has been extremely well thought out, not only in terms of technical tasking and performance, but also in terms of the ease of access for operation and servicing.

Walk-Through
IDMi were fortunate to have the designer of the Eternity, (Dr Daniel Fluck of ProArchive,) available to perform a full technical briefing. The tour started with a presentation on the overall concept of why the machine was devised in the first place (covered in more detail in IDMi Issue 56,) and then continued with a description of the top part of the device.

To the left of the top section is the film loading compartment. This is the 'lights-out' part of the operation where the film stock is fed into a take-up mechanism and wound through the film path.

The film path takes a course through the centre of the top part of the machine, and follows a track similar what could be described as an inverted Omega sign. At this point when loading, the leader winds itself around a glass cylinder, within which the laser writer output housing is located. The film then exits to the right hand side and is wound onto a film take-up reel in another dark compartment.

Apart from the obvious hi-tech specification and the inner workings of the laser output housing, this top part of the machine is relatively simple in operation and appears very easy to use.

> **"…. a very innovative company who have produced a device which renders impeccable results."**

The digital files which are destined to be written to film are managed and formatted on a PC, then queued up ready to write. Using the proprietary software for the device, the film writing operation is then ready to begin.

The writing process is based on repeated scans across several 'frames' of film starting at a point x0, y0. (This is similar to the manner in which a television set 'scans' to the screen, and writes in strips from left to right and from top to bottom.)

The number of frames which are written to in a single line scan are determined by several factors. The format of the film dictates the number of frames accessible to the laser around the glass cylinder, and the format also dictates the depth (across the film from edge to edge,) of the writing sequence.

The other factor is the actual film format required for a job. This is chosen in software where the images can be manipulated to appear in a variety of layouts and reduction ratios. These options and choices would be pre-determined by the individual requirements of the job at hand.

Once the device has completed a sweep of the first row of pixel writing to the film, the laser is stopped, rotated to a position x0, y2, and the second row of pixels is written. This writing sequence is then repeated until the film section is completed. The film is then advanced in software and readied for the next writing sequence.

It is worth noting that although throughput may appear slow, it must be remembered that this device is rendering a pixel wide strip across several 35mm images and multiple 105mm frames at one time. This differs greatly to other devices utilising the copy-from-monitor technique, where a single exposure captures an entire 'frame' of data as placed on the monitor by the controlling software. Speed is however slightly faster than that of a standard production laser-writer for film.

Once the entire sequence of writing to film is complete, the film can remain in-situ, or be transported to create a trailer and then cut and removed for processing.

Processing
There are several quality processing manufacturers in the world, some have

come through the ranks of the microfilm industry, and others have their beginnings in movie film processing.

In the 1980's when Kodak produced a colour film, the only method of processing was proprietory to Kodak. Now with Ilford film and chemistry, this step in the colour microfilm production process is made much simpler. The film used in the demonstration was standard Ilford Colour Microfilm, which is a P5 (Ciba-Geigy/Cibachrome) process.

The processor in use at the demonstration was the AutoPan. This is a German manufactured machine made to an extremely high standard, and with virtually contact-less film handling throughput.

The resulting film provided excellent results and with true colour rendering. The quality of image upon the film, is tribute to the fine degree of control placed upon the RGB laser array used to create the image on film.

Once processed the film can be handled and finished in the same way as normal microfilm or photographic film, and the same handling characteristics apply.

Finishing can be to any normal film/fiche standard, although many will see this entire process as an essential part of a digital preservation or digital archiving exercise, and will therefore consign the film to the dark and deep storage which will befit the 500 year archival permanence certification which has been placed against the film stock.

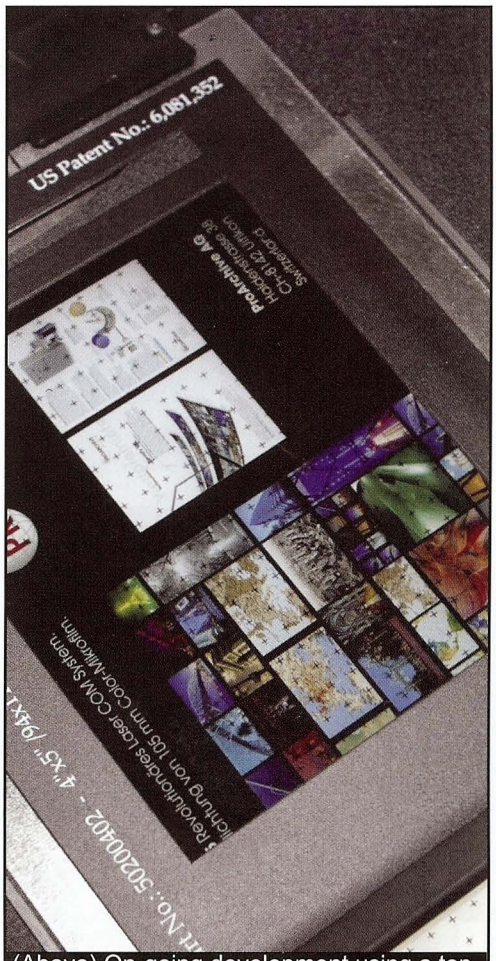
Technical
The RGB laser system is housed in a central pull-out tray which sits half way down the machine. This patented process allows ease of access to replace components or to align the laser optics. Instead of attempting to write to film via three laser beams, a fibre optic carries a composite signal to the writing head. This has the advantage of simplifying the drive mechanism at the point where the film is written to.

Below the laser array location are left and right compartments for electrics, power distribution and air compressor. An air compressor is required to maintain pressure at the camera head. This is to ensure a safe shut-down in the event of a power failure. As the writing head is moving extremely quickly, it needs to come to a halt in a controlled manner.

In the device viewed the compressor was located remotely to the device. This was to reduce noise, as compressors are by their very nature, quite loud pieces of kit.

Conclusion
ProArchive are a very innovative company who have produced a device which renders impeccable results. Writing to film either in mono or in colour is one aspect of their portfolio. They are currently performing tests on colour microfilm scanning to complete the cycle, and allow microfilm images to be brought into a digital system. There are also specialist projects in place researching the potential ofr producing devices similar to the Eternity, but which will write to more specialised formats such as aerial photography film stock. ■

More: www.proarchive.ch



(Above) On-going development using a top quality film scanner on colour microfilm originals. ©ProArchive

(Below) Dr. Fluck with examples of the output from the Eternity 105. ©ProArchive