

PRESENTING: COMMUNICATIONS

CORPORATE PROFILE

From Rank Group to Digital Projection

Brian Critchley, Executive Director, Digital Projection, discusses the development since the '80s of DMD technology and of the marketing effort underway to use projection technology instead of film.

BY BRIAN CRITCHLEY

Digital Projection's life began within the Rank Group plc. Rank is well known for its leisure and entertainment interests in Universal Studios Florida, Deluxe Film Laboratories, Rank Cintel and Strand Lighting and a range of holiday and cinema interests in the UK.

In the mid-1980's, Rank encouraged Brimar Limited, a display manufacturing company within the Rank Precision Industries Group, to look for growth opportunities in the leisure and entertainment field.

At a time when projection technology was in its infancy, Brimar identified the large-screen electronic projector market as offering significant technological opportunity and a development platform was born.

A range of reliable and affordable high quality electronic projection systems would, it was felt, open markets in the education, leisure, entertainment, corporate and

advertising sectors. In addition, the ever increasing memory capacity of integrated circuits, CD ROMs, and video disc technology suggested that by the turn of the century, the technology to replace celluloid movie film (with some form of more advanced electronic medium) could exist, provided that an electronic projector of sufficient quality could be developed.

The Engineering Team

During 1988-89, an engineering team appointed by Rank-Brimar conducted a search for an electronic projection technology that was capable of offering image quality and brightness that would match the requirements of entertainment and ultimately the cinema market.

Lasing technology from Russia, deformable membrane technologies from Germany and the United States and the now very familiar Liquid Crystal Display (LCD) technologies were all investigated until, in 1989,

Rank-Brimar's team encountered the Digital Micromirror Device™ (DMD) at Texas Instruments (TI) in Dallas.

TI's development was meaningful.

This was so because in the 1970-80's a number of companies were manufacturing integrated circuits and wanted to create moving microscopic mirrors using conventional silicon integrated circuit technology.

However, difficulties in creating such mirrors with acceptable physical properties caused most firms to abandon their efforts. But TI had continued its work with the objective of producing devices that could be used in communication, printing and display applications.

'89 — Risk Assessment

In 1989, TI demonstrated simple DMD's where three mirrors were used to modulate red, green and blue signals. These devices demonstrated the physical behavior of such mirrors and the technology's great potential.

The fact that this type of device was based upon conventional integrated circuit



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technology was a tremendous advantage. It meant that the vast library of knowledge already developed by TI, as a major integrated circuit manufacturer, could be harnessed to develop the DMD and transition it to a production point - where many technologies have failed in the past.

In 1989-90, a risk reduction activity was undertaken by Rank-Brimar in partnership with TI. This was aimed at ensuring that DMD's could operate under the very high light levels required to deliver bright images to the large-venue marketplace.

Both parties were confident with the results and full-scale development ensued in 1991. From 1991 through 1996, Rank-Brimar and TI worked closely to develop the associated projection technology along with the DMD to assure that a high brightness projection system with superior image quality could be developed and manufactured.

Also during this period, Rank-Brimar established a development team with great expertise in optics and projector integration. To complement their skills, they turned to another Rank-owned company, Cintel Limited, a world leader in the film to video conversion process, to produce the 'state-of-the-art' video electronics that the projection systems would soon employ.

'92 Prototypes & Problems

In 1992, the first static DMD images were projected at TI and the first on a 3-chip DMD projection system were demonstrated at Rank-Brimar in Manchester, England.

In 1995 Brimar demon-

strated its prototype large-screen projection system and in 1996 Digital Projection Limited was established as a separate company to complete development work, manufacture and market the products which would soon be known as POWER Displays. A series of demonstrations in Europe, America and the far East were met with universal acclaim and the technology was recognized as providing the first all-digital, film-like images of the highest quality and brightness.

During this period many formidable hurdles to the manufacture of projection systems of this magnitude were discovered. The challenge of obtaining an ultra bright image from a very small DMD (0.24 sq. ins) was considerable.

New high-power lamps were required, with very small arcs, capable of focusing a compact and brilliant light patch onto the DMD.

The digital nature of the DMD, although exciting in principle, also presented unique challenges. A number of artifacts, associated with a

pulse width modulated system as seen by the human eye and interpreted by the brain, were encountered and progressively overcome with bit-splitting algorithms. In the DMD itself, TI had to establish — then prove— that the technology could be designed and manufactured essentially defect free; exhibited very long life; and offered mechanically stable and digitally repeatable optical characteristics.

Getting Down to Business

In April 1996, Rank conducted a strategic review and decided to focus on the leisure and entertainment components of its business. In December 1996, Digital Projection's management team purchased the company from the Rank Organization and began final preparations for the manufacture, sales and support of POWER displays. The management buy-out was backed by two of the UK's leading investment institutions, 3i plc and Phil drew Ventures.

Digital Projection estab-

lished its manufacturing facilities early in 1997 and sold its first product later that year. Today, Digital Projection has manufacturing facilities in Manchester, England and full-service support, sales and marketing activities in its subsidiary, Digital Projection, Inc. in Atlanta. Sales in Japan are managed by Marubun. Digital Projection now has a range of seven POWER Display products covering both SVGA and XGA resolutions with brightness from 2500 - 6500 lumens.

Digital Projection's extensive technical research and development has resulted in POWER Displays being used in nearly every conceivable segment of the large-venue marketplace. In June 1998, Digital Projection was awarded two Emmy Awards for Outstanding Achievement in Engineering Development by the Academy of Television Arts & Sciences for its POWER Displays projection systems. Texas Instruments also received an Emmy for Outstanding Achievement in Engineering Development for the DMD. PC

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