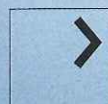


CYBER CINEMA

AT EIGHT STOREYS HIGH, THEFILMWORKS IN MANCHESTER BOASTS THE BIGGEST IMAX SCREEN IN THE UK AMONG A HOST OF OTHER HIGH-TECH FEATURES WORDS: NEIL CROSSLEY



Once, a trip to the cinema involved threadbare seats, billowing clouds of fag smoke and lots of frantic snogging. Alas, no more. Most cinemas today are plush yet characterless affairs, more akin to airport lounges than the fleapits of old.

However, cinemas are about to experience their most radical transformation yet. Silicon is gradually replacing celluloid, as the movie industry gears up to producing and screening films in digital format. What's more, films

will soon be just one in a diverse range of entertainment options on offer at your local cinema.

If you can't wait to experience this digital and multi-role future, you don't have to. Just hop on a train to Manchester, where you'll find thefilmworks, one of the UK's most state-of-the-art cinemas. The UCI-owned multiplex is situated close to the city's Victoria station, boasting a total of five floors and 20 screens. Its crowning glory is its state-of-the-art DLP (Digital Light Processor) projector, one of only three currently in use in the UK. ■

Developed by Texas Instruments, the DLP projector system differs from standard analogue 35mm in that it doesn't use film. Instead, a digital signal recorded on a server is projected onto the screen via the DLP projection head.

This head contains three image chips (for the colours red, green and blue), each containing 1.3 million micro-mirrors which flicker on and off several hundred times a second to form the image. Light from two xenon lamps is bounced off that image through a prism and a lens to form the movie image on the screen.

The result is a picture which, unlike 35mm film, will look the same on the 1,000th showing as on the first. No one is claiming the image is better than pristine-condition 35mm. But it does offer consistent clarity. "You notice there's no flicker or jumpiness," says Patrick von Sychowski, senior analyst with media research company Screen Digest and author of the report *Electronic Cinema: the Big Screen Goes Digital*.

"It's a rock-steady image. Is it much better than a brand new fresh print? No. But it doesn't get worn, scratched or dirty. *Harry Potter* on 35mm might look good on the first screening. But one month later it'll be a different story."

According to a report by Screen Digest, there'll be an estimated 10,000 digital screens worldwide by 2005 and a complete transition within 20 years. The report also predicts that almost 100 per cent of the major Hollywood studios' films will be available in digital and conventional (35mm) format by the end of 2004.

But digital or e-cinema isn't being developed in order to provide a better viewing experience.

It's being driven by the major Hollywood studios to cut costs. The Screen Digest report concludes that Hollywood will save 90 per cent on its film-print production and distribution costs by switching to digital cinema. Rather than making a physical print for each cinema and physically transporting them, movies will be sent digitally via satellite or broadband connections direct to individual cinemas. Film prints can cost £2,000 and as many as 700 could be needed just for a UK release.

"Just one film print can cost over £1,000," says Patrick von Sychowski, "whereas sending it via satellite or making DVD-ROMs costs just pounds. So there is a huge financial incentive."

Not that the vast profit margins of Hollywood execs will be of much interest to cinema-goers, of course. They simply want the best movie experience that money can buy. Fortunately, thefilmworks Manchester can deliver in spades.

MAMMOTH PROPORTIONS

In addition to its DLP projection system, thefilmworks boasts the largest IMAX screen in the UK. At over eight storeys high and 85ft wide, this cinematic colossus stretches beyond human peripheral vision, giving the viewer the sense of being in the film. Its projector is also a bit of a beast. Bigger than a Mini and weighing in at over 2 tons, the IMAX projector houses ten mirrors and two 15,000-watt xenon lamps. The result is a projector so powerful that the beam of light emitted could be seen from the moon.

In fact, everything about IMAX cinema technology is big. 3D films can be shown on the

IMAX screen at thefilmworks, which means the use of two projectors (or, if you prefer, two Minis) – one for each eye. It uses 70mm film – the world's largest stock – turned on its side to run through the camera and projector horizontally. The projector's Academy award-winning drive system advances the film past the lens at a staggering 5.6ft per second. And each frame is ten times the size of a regular 35mm frame.

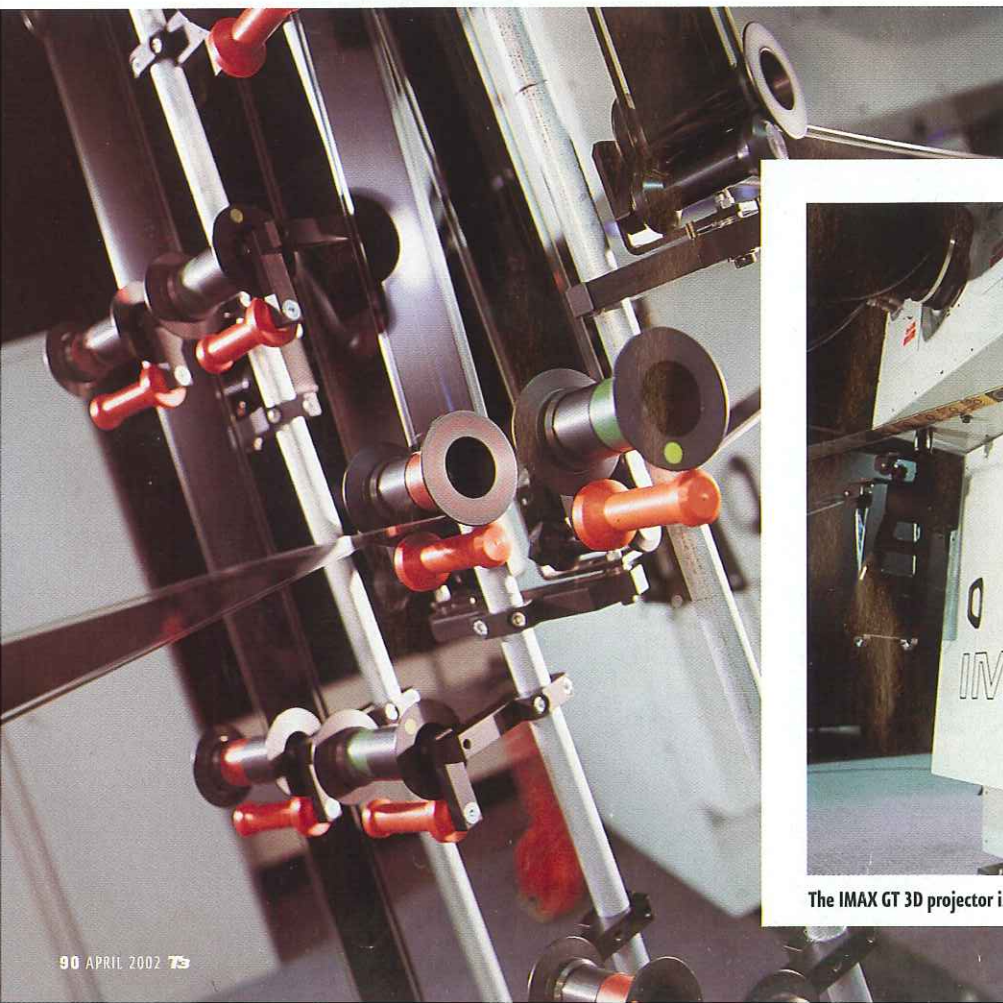
"That's why the definition is superb," says Ian Hickinbottom, projection chief at thefilmworks and national booth manager for UCI Cinemas, "because you're starting with a much bigger image."

A cool-and-control unit (CCU) supplies cooled water to the ends of the lamps to prevent them from overheating. And a chiller on the roof of thefilmworks supplies chilled water to re-cool the hot water that comes back from the lamps.

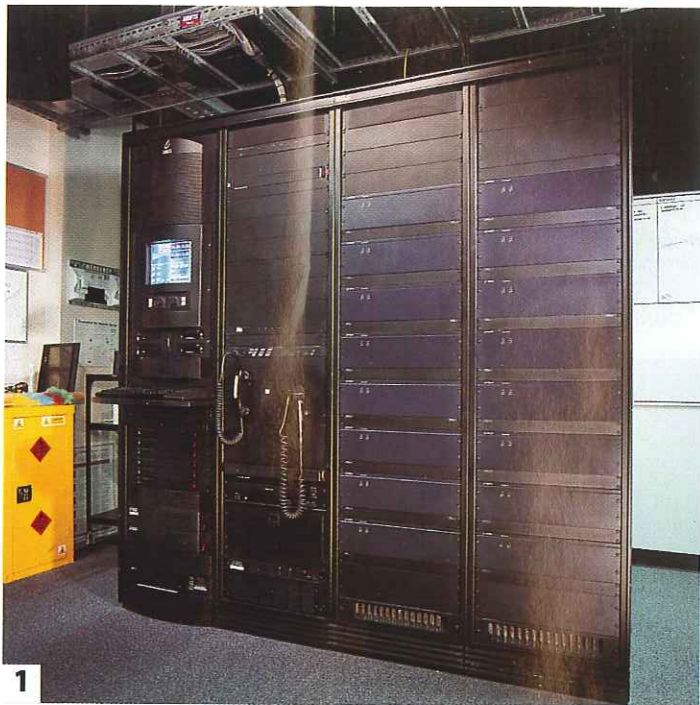
The accompanying audio system is also rather impressive. 16 amplifiers drive the 11,000-watt digital, directional quadrasonic system. The speakers, built by Sonics, are housed around the auditorium. Left, right, centre, upper-centre and sub-bass channel speakers are situated behind the screen, and two huge box units containing LF, MF and HF (low-, mid- and high- frequency) "surround" speakers are situated at the back left and right walls of the auditorium. "Voice of God" is how the IMAX Corporation humbly describes the sonic effect. But it has a point.

"It means you can have sound coming from absolutely anywhere and it's so pure," says Ian Hickinbottom. "It's films like *CyberWorld* that

AT OVER EIGHT STOREYS HIGH, THE IMAX SCREEN STRETCHES BEYOND PERIPHERAL VISION, GIVING THE SENSE OF BEING IN THE FILM



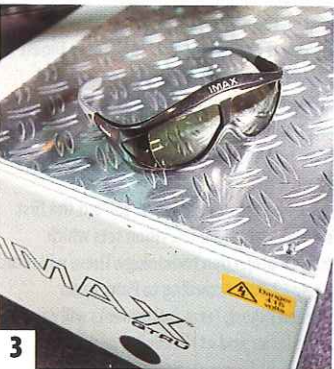
The IMAX GT 3D projector is bigger than a Mini and houses ten mirrors and two 15,000W lamps.



1



2



3



4



5

BEYOND THE SCREEN

IMPRESSIVE THOUGH IT IS, THE UK'S BIGGEST IMAX SCREEN IS JUST ONE OF THE MARVELS AT THEFILMWORKS MANCHESTER. HERE'S THE LOWDOWN ON THE REST OF ITS EQUIPMENT

1. IMAX AUDIO SYSTEM

If the visual impact of IMAX is impressive, then the audio system should have sound buffs pinned droid-like to their seats. While technically rated at 11,000 watts, the system typically knocks out 12,500 watts of power – “Not for loudness,” say the bods at IMAX, “but for clarity and freedom from distortion.” The sheer height of the screen at the filmworks Manchester (six times higher than a standard 35mm screen) also enables the inclusion of a top-centre or “voice of God” speaker in the system – guaranteed to scare the bejesus out of you just when you least expect it.

The configuration of IMAX speakers is also quite unique. These are designed in a “trapezoidal dispersion pattern” (which, in plain speak, means narrower at the top) to match the distinctive shape of IMAX theatres. Each cabinet contains four low-frequency loudspeakers with nested high- and mid-frequency horns. And unlike all digital and analogue movie formats, an IMAX soundtrack isn't recorded on the film itself. Instead, the sound is stored on a hard drive and synced together automatically.

2. (DIGITAL) ADVANCES WITH 35MM

In the midst of all the talk about digital revolution in cinema, it's tempting to assume that traditional 35mm celluloid is finished. It's not. Technological innovation has ensured that this analogue medium continues to develop.

The most ground-breaking advance has been a computerised automation system called Vector 1000 from Cinematica, which the projectionist can use to automatically programme a range of functions such as volume levels. This system also helps in the event of a projection failure by informing the projectionist exactly which part of the system has failed. “If the film breaks, for instance, it will diagnose exactly which element has failed,” says Ian Hickinbottom. “That's been an enormous advantage.”

3. IMAX 3D

Okay, so the extremely silly glasses might lend you the air of a chartered surveyor on acid. But the sensory-altering visuals of IMAX 3D more than compensate for any sartorial inadequacies.

Essentially, the IMAX 3D camera records images at variable rates on two 65mm-wide film strips, one for each eye. When the projectionist runs these two differently shot films in sync, the 3D image is created; although not before the entire audience have put on their daft bins, of course.

These glasses effectively fall into two

types – polarised and electronic liquid-crystal shutter glasses. While they work in radically different ways, the principle is the same – to translate the appropriate “left eye” and “right eye” images from the screen to the corresponding eyes of the viewer.

In the last few years, IMAX has taken the 3D concept one stage further by developing two 3D “space cameras” for use in deep space. The IMAX Cargo Bay Camera has been mounted in the Space Shuttle and was first used on a mission in 2001, while an in-cabin 3D camera was introduced into the International Space Station in September 2000.

4. DIGITAL LIGHT PROCESSOR PROJECTOR

If there's one thing rather difficult to get your head around about Texas Instruments' DLP projector, it's the fact that its three postage stamp-size memory chips house 1.3 million microscopic square, hinged mirrors. Discovering that these micro-mirrors are one fifth of the width of a human hair doesn't make it any easier to envisage either.

Thankfully, the projector's workings are far easier to grasp. Each mirror is equivalent to one pixel in the projected image, and each acts as a light switch which can be turned on and off several thousand times a second. Electrodes activated by incoming digital signals cause the mirrors to tilt ten degrees in either direction.

Mirrors tilted towards the light source reflect the light onto the screen as a white pixel, while a mirror tilted away from the light results in a dark pixel. And the length of time a mirror is switched “on” or “off” determines the shade of each pixel. This fast alternating of dark and light is interpreted by the human eye as a continuous tone.

5. AUDIO SYSTEMS

All 19 of the filmworks Manchester's conventional 35mm screens are fitted with Dolby CP500 processors, which offer Dolby Digital Surround sound. These processors decode the digital system into six channels of sound, which are then routed via six powerful amplifiers to speakers around the auditorium. The low- and high-frequency output per channel is 400 watts, while 600 watts is delivered by the sub-bass channel.

Three of the cinema's screens are also fitted with Sony SDDS 3000 processors, which offer eight channels of sound. “That gives us two more channels to play with behind the screen,” says Ian Hickinbottom. “It really helps with those really low volcano-type sounds that you need to feel through the sub-bass channel.”

really show the system off. Every single channel is used, so if they want someone to talk behind your left ear, that's exactly what they'll do."

Alternatively, it's equally capable of sonic assaults which could pulverise small furry mammals at 50 paces. "The sound is impressive," says Hickinbottom. "There are real, real lows to these speakers that'll give you that kick-in-the-chest, volcano effect. The speaker cabinets are huge. The sub-bass one is so big you could literally walk inside it, while the monitor we have in the booth is so heavy that it has to be supported on a steel girder with two chains."

All of which suggests a healthy sense of excess in cinema today. But films are no longer the only form of entertainment on offer. Thefilmworks is currently trialling a range of digital "events" on its screens. These include live soccer matches, concerts, online gambling and computer games played on a full-size screen against competitors at other cinemas via satellite link.

"THERE ARE REAL, REAL LOWS TO THESE SPEAKERS THAT'LL GIVE YOU THAT KICK-IN-THE-CHEST, VOLCANO EFFECT. THE CABINETS ARE HUGE"

The Screen Digest e-cinema report predicts the transformation of "film-only" cinemas into general entertainment centres to create new revenue streams. It's a view shared by Gerald Buckle, vice-president of business affairs for UCI Cinemas and digital projection manager at thefilmworks.

"Our view is that alternative content has got to sit right alongside film. So you'll be able to go along to a cinema on Saturday night and see a whole range of entertainment. We were thinking about doing some of the more prestigious horse races such as the Kentucky Derby, and making them black-tie events with bars and betting over the Internet. And I think you'll probably see that happening this year at some cinemas," he says.

The technical team at thefilmworks has already been trialling a range of projectors to help it deliver these multimedia events. Ideally, the picture clarity offered by Texas Instruments' DLP camera would suit this purpose. But it's not portable - an essential factor for moving projectors between the theatres. The £150,000 price tag is also a factor.

Instead, it's been trialling a range of liquid crystal display (LCD) projectors, and has recently bought two Sanyo XF30 projectors for their "versatility and portability". Gerald Buckle admits that the picture clarity of LCDs isn't as impressive as Texas Instruments' high-grade DLP projector. But then picture quality isn't as pivotal an issue as everyone believes, he says.

"Over the years, we've got very hung up on perfect picture quality, but the critical issue isn't what we think, but what the customer thinks about picture quality," he argues.

"Programming we've done over the last 18



Above: The platter for the IMAX system, which transports the film to and from the projector. Left: The Texas Instruments Digital Light Processor head.

months has shown that once the customer has got a certain threshold, they're quite happy to watch something on a slightly grainy projector. And when you start looking at the economics of a £5,000 projector versus a £150,000 projector, you quickly realise you can give your customers 30 screens as opposed to one film," he says.

MAYBE NOT TODAY...

Digital projection and IMAX are certainly the prime technological attractions at thefilmworks. And there seems little doubt that major studios will exert increasing pressure for digital production and distribution throughout the industry in the future. But despite such moves and the trend towards more diverse forms of digital entertainment in cinema, Ian Hickinbottom urges a degree of caution.

"I think it's important to quell this notion that digital is here and film is dead, because people like Kodak are very shrewd in constantly improving film stocks, and huge developments have been made in 35mm projection. Also, the studios have some concerns about the security in distribution. So I think these predictions are ten years away," he says.

Patrick von Sychowski believes that full digital transformation is at least 20 years away. But for him, it can't happen soon enough.

"We're still using the same basic cinematic technology that they used in the age of Queen Victoria. Yes, we've added colour, sound and made it widescreen, but the whole concept of a camera showing 24 frames a second hasn't changed since the Lumière brothers. For that reason and for the economic reasons, the change to digital just makes so much sense." □

• Thefilmworks Manchester can be contacted on 08700 102030.

FILM AND THE FUTURE

The digital cinema market is currently the focus of intense competition between Texas Instruments, JVC and Sony. All three companies are manufacturing rival high-grade projection technologies. But the new range of cinema entertainments, such as full-screen computer games, sporting events and concerts, will be delivered by lower-grade and much lower-priced "black chip" or LCD projectors.

"We're playing around with various different standards of digital projectors," says Gerald Buckle. "We're looking at creating a new market for alternative content like sports and music based on these technologies."

DLP technology is expanding also. The Screen Digest report predicts there'll be an estimated 10,000 digital screens worldwide by 2005 and a complete transition within 20 years. But for manufacturers, the real spoils of digital projection technology are to be found in the domestic market.

This summer, Texas Instruments will roll out the first rear-projection high-definition television sets which incorporate the DLP projection technology. These will retail for approximately £2,000. According to Patrick von Sychowski of Screen Digest, Texas Instruments will capture 55 per cent of the lower end of the digital projection market (with home and presentation projectors).

"These new sets will have 30- or 40-inch screens and offer a much bigger and sharper image than anything that's available on conventional cathode ray tube (CRT) screens," he says. "It's tapping into this plasma market which isn't really taking off."

In many ways, he adds, the advent of digital projection in cinema is merely a precursor to offering the same technology in the home. "Even if they capture all the cinemas in the world, that'll only be a market of 150,000 screens. Whereas the consumer market is several hundred million households. It'll be a bit like Dolby in cinema; it's a nice branding exercise for people to remember when they go into their local Dixons. And nice big television sets with DLP will have the same effect."