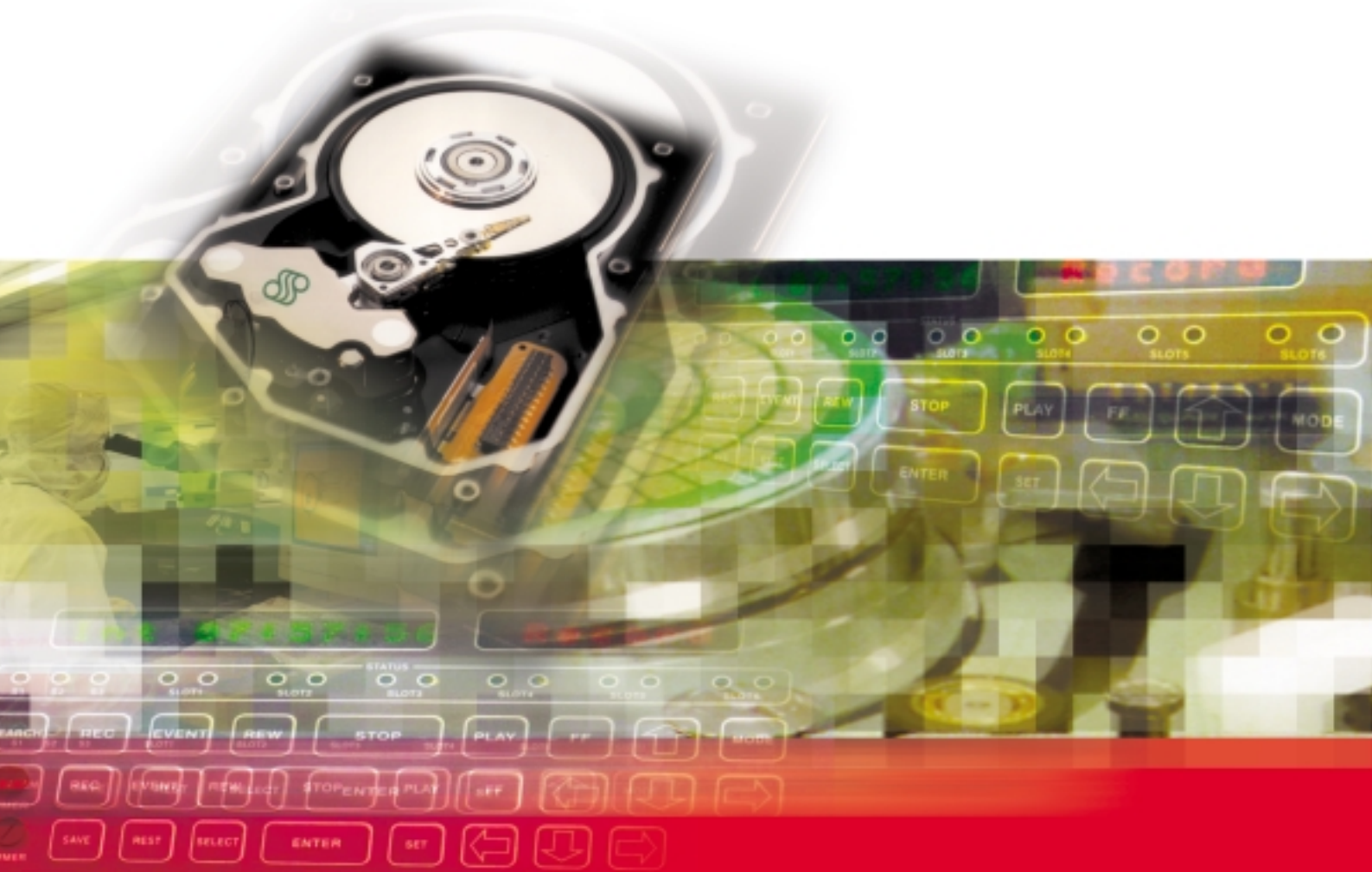


# Information Storage in the UK

a guide to research, manufacture and services



**dti**

Department of Trade and Industry



# Foreword

Only twenty years ago, Bill Gates was quoted as saying '640K ought to be enough for anybody'. While there were probably people then who felt he had underestimated demand, it is unlikely that anyone could have anticipated the huge demand for information storage that would develop over the coming years.

The information storage industry has become a vast - and vital - market. Current sales of storage devices worldwide are already greater than £25 billion, and are increasing by over 10% per year.

The UK has always been very active in the storage business, and over the last twenty years has made significant contributions to the disk and tape sectors in particular. Small form factor disk drives, DDS tape drives and modelling of the recording/replay process - all of which are parts of today's advanced storage systems - were pioneered in the UK. This pattern of innovation continues in numerous components and technologies that are used in the industry.

This publication outlines the involvement of UK companies and academic establishments, and it demonstrates the continued breadth and depth of our industrial and academic capabilities in storage technology. Through the information provided, we seek to encourage manufacturing joint ventures as well as collaborative research and development activities. As you will see, there have already been some very successful precedents involving the use of inward investment to set up UK-based R&D centres and manufacturing operations.

I hope you find the information in this booklet useful and I encourage you to make use of the contacts provided. There is much work to be done before the storage devices that we know today are superseded by revolutionary new technologies. We believe that our own scientists and engineers - in partnership with colleagues around the world - will play a key role in both extending the capabilities of current devices and developing new ones.

**Patricia Hewitt**  
**E-Commerce Minister**

## About this guide

The aim of this guide is to highlight the UK's industrial and academic capabilities in the information storage area. It briefly covers historical contributions before describing in more detail several activities which are representative of the work going on in the UK. It then lists academic institutions and commercial organisations involved in the storage industry, with brief descriptions of activities and primary contact points for follow-up discussions.

The guide is designed to be used by companies and universities, both at home and outside the UK, who may be looking for partners to further their own storage interests. The partnerships may range from simple licensing opportunities to joint marketing or manufacturing ventures. The British Government is keen to promote collaboration between UK companies and universities and inward investors: Invest:UK operates a comprehensive service for investors looking to establish facilities in the UK (see page 56 for contact details).

We believe that the UK is an attractive place to set-up both R&D and manufacturing facilities for storage-related activities. In the electronics sector, the UK is the largest European manufacturer of PCs, mobile phones and televisions, with the largest manufacturing services sector to support this activity. The global storage sector now boasts a turnover of over \$70 billion and employs over 600,000 people.

The UK has much to offer potential investors in other respects too. Britain gives fast and easy access to the European Union single market, with an excellent transport and utilities infrastructure. We have a workforce that is both skilled and adaptable. We have a stable government that promotes a dynamic market economy, and is committed to maintaining a highly competitive business environment that gives companies every incentive to grow. These are just some of the reasons why Britain has attracted nearly half of all US and Japanese investment in Europe.

We hope that this guide will be a useful source of reference for all people working in the storage area - in the UK and overseas - and that it will encourage broader interactions between those interested in this field. Copies of the booklet can be obtained from [steve.woodard@dti.gsi.gov.uk](mailto:steve.woodard@dti.gsi.gov.uk) or fax +44 (0)20 7215 1966. The guide can also be found on-line [www.photonics.org.uk](http://www.photonics.org.uk)





	Manufacturer	R&D and design	Support services	Storage systems	Magnetic disk drives	Optical disk drives	Tape drives	Heads	Media	Other materials or components	Consumables	Equipment
Hewlett Packard Ltd	●	●		●			●					
Hidden Analytical Ltd	●	●										●
Hirst Magnetic Instruments Ltd	●	●										●
Imation UK Ltd			●						●			
Index Data Systems Ltd	●											●
Informatic Component Technology	●	●						●				
Infotrend Tech Europe	●	●		●						●		
Kerry Ultrasonics Ltd	●	●										●
Kingswell Computer Company Ltd	●	●		●	●	●	●					
K-PAR Systems Ltd	●			●								
LaCie Ltd			●	●								
Landis Lund Ltd	●	●										●
Leeway Data Products			●	●	●			●	●			
Loadpoint Ltd	●	●								●		
M4 Data Ltd	●	●		●			●					
Mac&More Ltd			●	●								
Macarthur Stroud International			●	●	●	●	●				●	●
Mackintosh Consultants			●	●	●	●	●	●	●	●	●	●
Manton Industrial Seals Ltd	●									●		
Matrix Computer Engineering Ltd			●	●	●	●	●	●	●			
Maxoptix Europe Ltd			●	●	●				●			
Memorex Telex			●	●	●	●	●	●	●	●	●	●
Metron Technology (UK) Ltd			●							●	●	
Metrum Information Storage Ltd	●	●		●			●		●			●
NanoMagnetics Ltd		●								●		

	Manufacturer	R&D and design	Support services	Storage systems	Magnetic disk drives	Optical disk drives	Tape drives	Heads	Media	Other materials or components	Consumables	Equipment
Neato Ltd	•									•	•	
Nimbus Manufacturing (UK) Ltd	•	•							•			•
Nimbus Technology & Engineering	•	•										•
NICAM		•			•	•	•	•	•	•		
Overland Data (Europe) Ltd	•			•			•					
Peripheral Support Services			•	•			•					
Phi Laboratories Ltd	•	•						•				
Photo-Sonics International Ltd	•	•		•			•					•
Pilkington Micronics	•	•								•		
Plasmon plc	•	•		•					•	•		
Premier Source			•		•	•	•			•		
PTI Ltd	•									•		
Quantegy Europa Ltd	•	•										•
R&R Computer Diskdrive Technologies			•	•								
Racal Recorders Ltd	•	•		•			•					
Reactive Computer Services			•	•	•	•	•	•		•		
Ringdale	•	•		•								•
RK Distribution Ltd			•		•	•	•					
Ryford Ltd	•									•		
SDL Queensgate Ltd	•	•										•
Seagate Technology Media Ireland	•								•			
Seagate Technology Ireland	•	•						•				
Signal Computing Ltd			•	•	•	•		•				•
SingleSource Computer Services Ltd			•	•								
Solectron Scotland Ltd	•	•								•		



	Manufacturer	R&D and design	Support services	Storage systems	Magnetic disk drives	Optical disk drives	Tape drives	Heads	Media	Other materials or components	Consumables	Equipment
SomerData Ltd	•	•		•								
Speake & Co Ltd	•								•	•	•	•
Speedfam-IPEC Ltd			•								•	•
Stakesolve Ltd			•		•				•			
Storage Computer UK Ltd			•									
Storage Concepts (Europe) Ltd			•	•								
Tandberg Data (UK) Ltd			•	•			•		•			
Tap Systems Ltd			•							•		•
Tapemaster Ltd	•									•		
TDM Tape Services Ltd	•	•					•	•	•		•	•
The Data Business Ltd	•	•							•	•		•
Tiger Technology Ltd	•	•		•	•		•					•
Trace Services Ltd			•									•
Transitional Technology International Ltd			•	•								
Ultratec Ltd			•		•	•	•					
Ventura Computer Solutions Ltd			•				•					
Verity Systems Ltd	•	•										•
Vogon International Ltd			•									
Western Digital Corporation			•		•							
Westpoint Peripherals Ltd			•	•	•				•			
Westwind Air Bearings Ltd	•	•										•
White Knight Products Ltd	•	•								•		
Xuis Software Ltd	•	•								•		
Xyratex	•	•		•	•					•		•
Yamaha Kemble Media Technology Division			•	•	•							

# A background of excellence in the UK

Much of the important fundamental R&D work on storage devices has been undertaken in the UK, and British-based scientists and engineers continue to make vital contributions. In manufacturing, British companies have world-class reputations, with production located at home or at plants overseas.

## Historical perspective

The Department of Computer Science at Manchester University has undoubtedly the longest experience of storage in the UK - if not the world. In 1946, Dr Freddie Williams started active investigation into the storage of both analogue and digital information on a Cathode Ray Tube (CRT). The storage of analogue information could help solve the problem of static objects cluttering the dynamic picture on a radar screen, whilst the storage of digital information could solve the problem holding up the development of computers worldwide - the lack of a storage mechanism that would work at electronic speeds. By the autumn of 1947, working with Tom Kilburn at Manchester University, Freddie Williams had succeeded in storing 2,048 bits for a period of hours on a CRT, but had the problem of proving that the store would operate successfully inside a computer. In the end, they decided that the simplest way to test that the CRT storage system was suitable for use in computers was to build a small computer round it - thus starting Manchester's pioneering work in computer development which continues to this day.

Unlike competing technologies such as the mercury acoustic delay line store, the Williams-Kilburn CRT store had a number of practical advantages - it was made of standard components, was cheap and compact, and did not require temperature control or accurately controlled power supplies. But its most significant benefit was that it allowed fast random access to short strings of bits. It went on to be used in several models of computer, including the IBM 701 and 702, but was eventually superseded in 1955 by a cheaper random access device called the magnetic core store.

During the 1960s and 1970s, the largest overseas markets for the big US computer companies were in Europe, and three of them - Burroughs, IBM and Control Data - eventually established clones of their US captive disk drive assembly facilities in the UK. After discovering the ready availability of skilled and well-qualified engineers, all gradually added development teams to their manufacturing operations.

Control Data implemented some of this through joint ventures and spin-offs (Computer Peripherals, United Peripherals, Newbury Data), but independently set up a facility in South Wales to manufacture tape, hard disks and disk packs (eMag Solutions still produces tape there to this day). Burroughs manufactured large disk drives in Scotland and added high density floppy development to its existing hard disk programmes, producing the world's first double-sided floppy drive.

No discussion of the UK's disk drive pedigree is complete without mention of Rodime - unique in the disk drive industry as a successful (albeit briefly) UK-based venture capital startup. Formed as a spin-off from the Burroughs' disk drive development group, it developed and patented the world's first 3.5" hard disk drive and achieved great market success in the mid-1980s, before finally succumbing to competitive pressures in 1990.

Since the late 1960s, IBM has developed and manufactured state-of-the-art disk drive products in the south of England using innovative approaches and production methods. It led the industry with a number of innovations in read/write channels, mechanical assemblies, servo systems and manufacturing techniques. One example of this was the manufacture and testing of high capacity disk drives using revolutionary Magneto-Resistive (MR) head technology which began in the late 1980s. It took until the mid 1990s for the rest of the industry to begin successfully adopting this technology.

After a management buy-out in 1994, many of the activities have continued under the name of Xyratex, which successfully implemented a fully-automated disk drive manufacturing and test process in 1988 - leading the industry in terms of manufacturing quality and efficiency. The company was also a pioneer in the direct attachment of chips on to flexible connectors (chip-on-flex technology).

In the late 1970s, SE Labs, in conjunction with the Government Communications Headquarters, developed the first 42-track instrumentation recorder and also designed and manufactured the recording head. The company then entered the computer tape handler field and produced the UK's first streaming digital tape drive. Much work was also carried on high digital density recording, leading to a seminal paper on drop out anomalies with RSRE at Malvern in the 1980s.

In 1981, Hewlett Packard invested £20m to buy 68 acres of the Wallscourt Farm site near Bristol. After quickly outgrowing the first 12,500m<sup>2</sup> building with tape drive manufacturing, a second of equal size was constructed in 1986 and HP Labs and the European Response Centre (now SSE) took residence. In 1993, HP exercised the option to buy additional surrounding land, so that today the site covers 163 acres, with planning approval for a total of 130,000m<sup>2</sup> of office space

Since moving onto a green-field site in Springtown, Northern Ireland in 1992, Seagate has invested over \$500m in several phases to continually upgrade and expand its operation for developing and manufacturing advanced read/write head wafers for disk and tape drives. In 1997, the company also invested \$100m in a 17,400m<sup>2</sup> facility in nearby Limavady, which now converts disk 'blanks' into nickel-plated and polished substrates for the manufacture of hard disk media. The two plants employ over 2,000 people between them.

At Plymouth University, the Centre for Research in Information Storage Technology has been very active in thin film and MR recording heads, as well as many other aspects of storage technology. Over the last ten years, a range of devices has been made including a digital video 'matrix' head for Thomson CSF in France, a scanning high resolution Kerr-effect microscope for the Sony Research Centre in Japan, a magnetic security reading system for a leading banknote manufacturer and a prototype optical servo system for a leading computer disk drive manufacturer.

Data Recording Heads (DRH) was originally formed in 1958 and quickly established a significant presence in the market requiring magnetic heads for the computer industry. Subsequent market demands and technology advances led DRH to expand the business base into the instrumentation and CARD (Cash Access and Revenue Devices) market sectors. DRH continues to maintain the position of being the largest European-owned supplier of magnetic heads, serving magnetic memory markets on a worldwide basis.

## Current highlights

To illustrate the UK's continued innovation in storage, we have chosen some recent research and development activities that are presently undergoing commercialisation. Much of this R&D is already being undertaken in collaboration with partners from outside the UK - these partnerships range from straightforward sponsorship through to co-development, licensing and joint manufacturing arrangements.



HP's **Computer Peripherals Bristol** group (CPB) has for many years had worldwide responsibility for the design and development of tape backup products and media - including both DDS (DAT) and also DLT products (under a license agreement with Quantum). DDS was introduced in 1989, the first products having a capacity of 1.3 GB (based on the DDS1 interchange format) and transfer rate of 183 kB/s.

The site's 1,500 employees include a 140-strong R&D team whose latest development is the 'DAT40'. Based on the DDS4 format and having a capacity of 40 GB compressed with 6 MB/s transfer rate, this has a track pitch of 6.8  $\mu$ m and a linear density of 6,000 flux changes per mm.

With the ability to transfer 40 GB in under two hours, no other DDS-4 product can beat it for speed - ensuring the HP SureStore DAT40 stays ahead of fast-growing applications, documents and hard disks.

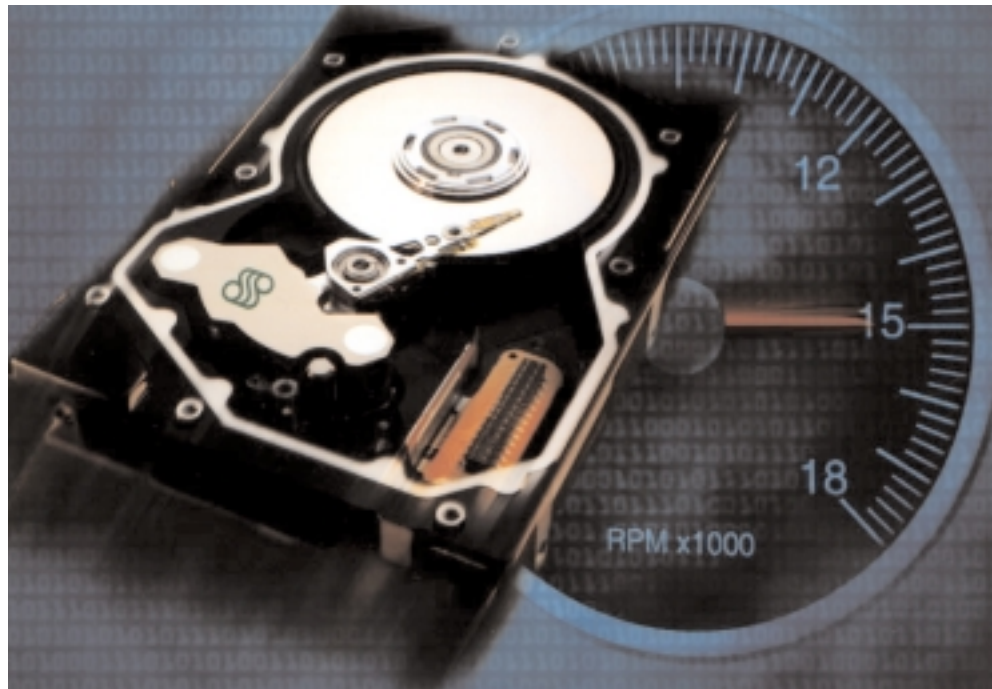
A series of important technical developments makes this the most reliable DAT drive yet. HP's patented Advance Sequence Detector increases data integrity by as much as ten times. Optimum read/write performance and data interchange is maintained over the long-term by Real Time Adaptive Filtering, which compensates for drive wear. Improved tape path cleaning means less reliance on user maintenance, and TapeAlert continually monitors backup status. One button disaster recovery is another new feature which enables users to restore their system in the event of major failure with just one push of a button on the tape drive. DDS5, the next product in the family, will have 40 GB native capacity (80 GB compressed).

HP has always been very keen on working with the large number of UK academics with interests in magnetic storage. Current collaborations include:

- University of Aston - a programme to determine the tribological challenges of the LTO family of products; how to meet the LTO roadmap and provide ever-increasing standards of reliability whilst recording at higher bit and track densities and with more channels
- University of Aston - sponsoring a PhD student in the study of the phenomenon of white stain in ferrite heads with MP tape - what are the physical and chemical causes; how can the formation be modelled, controlled and/or eliminated?
- University of Manchester - sponsoring post-doctoral research into the causes of changes to writing performance as a function of re-using media multiple times
- University of Oxford - a variety of thin film research, sponsored by HP Labs in Palo Alto (USA)
- University of Bangor - characterisation of MP and ME tape, relating the bulk properties to the recording properties.

**Seagate Springtown** is part of the Recording Head Group (RHG) which develops and manufactures advanced read/write heads for hard disk and tape drives. Seagate RHG is the world's highest-volume supplier of magnetic recording heads, currently producing more than 250 million heads annually. One in eight of all hard disk drives manufactured in the world contains a recording head from thin-film wafers made at the wafer fabrication plant at Springtown.

Set up in 1993, Seagate Springtown presently employs almost 1,000 people including research and development engineers, manufacturing engineers, production managers, technicians, operators and other professional/managerial staff. The workforce is expected to reach 2,200



employees during the year 2000 as part of a £150 million expansion of its existing wafer fabrication operations.

The recording heads for disk and tape storage devices are fabricated in a state of the art cleanroom using the very latest developments in MR and GMR technology. Heads are constructed in bulk on aluminium wafers, some 4.5 inches square - with each wafer containing thousands of heads. The wafer manufacturing process consists of several hundred individual process steps. The finished product is then shipped to Penang, Malaysia where the wafer is cut up and machined into individual heads which are then mounted on a head gimbal fixture prior to final disk drive assembly.

**Seagate Limavady** was formed in 1997 by the merger of Seagate Technology and Conner Peripherals and comprises the corporation's media manufacturing sites. The 17,4000m<sup>2</sup> Limavady facility manufactures super-polished nickel-plated aluminium substrates for use in hard disk drives.



After the closure of Rodime's R&D and manufacturing operations in 1990, a large part of the company's engineering team re-emerged in the guise of **Calluna Technology**, established to exploit the emerging market for very small disk drives in portable PCs, digital cameras and other hand held electronic devices where mobility and small physical size is paramount. The company is also active in the wider area of data security. Calluna exports over 95% of its production, and has major customers in the US, Japan and the rest of the Far East as well as a substantial business in mainland Europe.

Calluna has recently launched two new products. One, the 1 GB Callunacard, is the largest capacity disk drive in the world to have the same footprint as a credit card. The other is a radical new disk drive

product, the 260 MB moveIT drive, which is only 5mm thick. Both of these products are world firsts, and have important applications not just in all aspects of business life, but increasingly to a much wider market in the home. In addition, both products have been granted Millennium Product status by the Design Council in London.

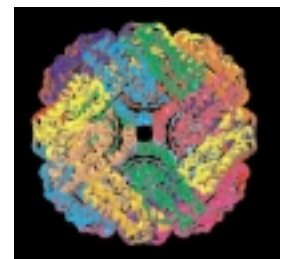
Another design group that spun off from Burroughs initially worked for SE Labs (EMI), then for Thorn-EMI Datatech following a change of name and then finally for M4 Data after a management buy-out in 1986. Historically, the team has been responsible for a number of 'world firsts' in the tape storage field. In 1979, model 8800 introduced the first tension arm half-inch tape drive with microprocessor control and dial up micro-diagnostics. The 8900 in 1982 was the first NRZ/PE streamer with 50 ips start/stop performance. Model 9800 introduced in 1984 won a Design Council Award and was the world's smallest half-inch reel to reel tape drive.

The thin film magnetics group in the Department of Pure and Applied Physics at **The Queen's University of Belfast** has had a wide range of experience in the optics and magneto-optics of thin film multilayer systems. Work has been both theoretical and experimental and has expanded recently into conventional magnetic data storage - particularly in collaboration with Seagate - where the use of in situ magneto-optics, for the dynamic study of the growth of magnetic layers on the atomic scale, is particularly noteworthy.

Current activities being pursued include magneto-optic recording beyond the diffraction limit, including MSR (Magnetic Super-Resolution) and MAMMOS (Magnetically Amplified Magneto-Optic Systems). Spin valve fabrication and exchange bias media are being investigated, and theoretical and experimental studies are also being carried out in an exciting new area of second harmonic magneto-optical effects. These effects are being used to study surface and interface magnetism in magnetic and magneto-optic devices and media.

**NanoMagnetics** has developed a novel solution to approaching storage density limitations. Commercial media currently consists of a sputtered continuous magnetic film with longitudinally recorded bits. In this form, storage densities near 40 Gb/in<sup>2</sup> are anticipated, but there are concerns of whether densities at or above 100 Gb/in<sup>2</sup> can be achieved. While a number of media and/or differing architectural solutions are being developed to extend storage density, few are easily incorporated into existing systems.

NanoMagnetics aims to deliver a media which functions as an ultra-low noise thin film, seamlessly blending into existing drives. The technology reduces media noise by producing thin films comprising isolated, single domain grains with an optimum size distribution. By using a natural and abundant protein to produce these single domain grains, the



technique delivers the further benefit of self-organisation or patterning, offering a potential storage density of 4.5 Tb/in<sup>2</sup>.

One recent major innovation which originated as a collaborative venture between the Applied Alloy Chemistry Group (AACG) at the **University of Birmingham** and **Philips Components (Southport)** is the Hydrogen Decrepitation (HD) process. The NdFeB alloy is exposed to hydrogen which is absorbed, causing an expansion of the surface layer. The expansion leads to internal stresses that cause the material to decrepitate into a fine powder. This eliminates several processing stages from the conventional powder metallurgy route, and the presence of hydrogen has added benefits with respect to subsequent processing and final magnetic properties.

The HD process has subsequently been adopted by the global permanent magnet manufacturing community, as it leads to enhanced magnetic performance with savings of at least 25% of the overall production cost. Over 50% of the world's production of NdFeB type permanent magnets is utilised in the production of data storage devices, particularly in voice coil actuators.

The Department of Physics at the **University of York** - which currently co-ordinates the Engineering and Physical Sciences Council's Advanced Magnetics Programme - has recently completed an investigation into the origins of negative delta-M curves in the new 10 Gbit/in<sup>2</sup> thin film disk media, showing that the improved performance of such films is due to Cr mobility on different crystal faces. This Group - like many others throughout the UK - is a major participant in the scheme known as 'The Seagate Plan', in which the company provides support for grants funded through the Advanced Magnetics Programme.



Two years ago, **Nimbus Technology & Engineering** decided to develop an electron beam recorder for optical disc mastering, realising that optical and optically-assisted magnetic disks would soon require feature sizes of 100 nm or less. Unlike electron beam lithography for semiconductors, optical disc mastering requires the ability to control the wall angles of much shallower features. The spiral pattern also has to be written as one continuous exposure, and a 100 GB disc contains about 58 km of track which must be accurate to a few nanometres.

To achieve this precision, Nimbus developed special air bearings and a novel, patented translation system which uses a direct driven, very heavily damped swing arm to move the turntable axis under the electron beam. The completed system has met with great market acceptance and is set to be an important enabler for very high capacities in both pre-recorded disc formats and magnetic hard disks.

During the last few years, **Xyratex** has become an industry leader in developing manufacturing and test solutions for the storage industry. One example was a range of development and test solutions for developers and



manufacturers of Serial Storage Architecture (SSA) devices and systems. SSA is a high-performance storage interface technology based on serial transmission technology and was the forerunner of the latest high speed digital serial interface technologies such as 1394 and Fibre Channel Arbitrated Loop.

The company's latest production test solution for the high-volume manufacture of disk drives was designed to address several major current industry issues:

- Improved disk drive quality and manufacturing yields for higher drive capacities and newer storage technologies, such as Magneto-Resistive Heads
- Increased efficiency of expensive factory floor space through high density packaging solutions that can test more drives per square foot than other offerings
- Greater flexibility in managing the test process using innovative network-based test control technology.

Customers have already reported considerable benefits in terms of yield improvements and reductions in manufacturing costs due to these innovations, and Xyratex expects almost 40% of the world's disk drive output in the year 2000 will be tested using its technology.

In June 1999, the Magnetics Division of Anacomp transformed into **eMag Solutions** and became an independent, media-focused company. Retaining all the management teams and manufacturing facilities in South Wales and San Diego, eMag Solutions has over 30 years experience in media manufacture. After great success with 3480 & 3490 products, the recent 3590 Magstar manufacturing programme is now enjoying even more investment in the UK and USA facilities. In response to customer demand, eMag has recently doubled its 3590 manufacturing capacity and launched a line of specific 3590 services and products, including silo attachments, Magstar 3590 drives and media cleaners.

At the Department of Computer Science in the **University of Manchester**, the Electronic and Information Storage Systems Research Group carries out a range of research programmes in magnetic and optical recording. The group has for many years been active in the understanding of the digital magnetic record and replay processes in thin film longitudinal recording media, perpendicular recording, recording on metal evaporated tape, recording on thick particulate media and on multilayered media.

More recently this work has been considerably enhanced by the development of micromagnetic studies of various types of media and the recording process. In all cases, the work has been directed towards finding out about the nature and width of recorded transitions as they directly represent the ways in which recording has taken place and the

contributions of heads and media to the limitations imposed by the recording processes. The results of these theories have been widely applied to studies of complete recording systems both internally and in industry.

At **Plymouth University**, the Centre for Research in Information Storage Technology has a temperature and humidity controlled photolithography clean room where thin films can be deposited and fabricated into devices for evaluation and test. This facility has been recently upgraded to a class 500 general environment and class 5 in the clean air flow benches. An emphasis on thin film head construction has recently evolved into work on high-saturation materials for advanced writing heads (iron nitride), sub-micron track width heads for disk drives and advanced dual GMR heads for reading. Optical recording activities includes a new project on 'near field' magneto-optics as well as work on piezo-actuators for nanoscale position control. Solid-state information storage is covered by a new project on spin tunnelling random access memory.

The Department of Physics and Astronomy at the **University of Glasgow** is active in micromagnetic and microstructural imaging for the study of hard disk media, magnetoresistive sensor elements and magnetic recording heads. Using advanced electron microscopy, it can study microstructural properties with a resolution in the range 0.3 to 1.0 nm, and micromagnetic properties with a resolution from 5 to 50 nm. Magnetic specimens can be subjected to applied fields and their temperature varied in-situ.

# Directory listing - Universities

## Coventry University

**address** Centre for Data Storage Materials, Priory Street, Coventry CV1 5FB

**tel** 02476 838163 **fax** 02476 838372 **web site** [www.coventry.ac.uk](http://www.coventry.ac.uk)

**contact** Professor Roy Carey **e-mail** [R.Carey@coventry.ac.uk](mailto:R.Carey@coventry.ac.uk)

The Centre for Data Storage Materials (CDSM) in the School of Natural and Environmental Sciences developed from an existing research group with a significant record of achievement in the area of magnetic and magneto-optic recording materials.

The objectives of CDSM are to broaden the scientific and engineering knowledge base of the data storage industry through innovative research and education, whilst striving to achieve the technology breakthroughs needed to achieve the long term goals of the information storage industry.

The research is primarily concerned with high density, rapid access information storage systems based on both magnetic and magneto-optic recording. The main effort is directed at the development of new materials for information storage from investigations of the physical, microstructural, optical, magnetic, and magneto-optical properties of both hard and soft magnetic thin film materials.

Current projects include: composite (fine particle) media for high density magnetic recording; diffraction at magnetic surfaces; studies of non-linear magneto-optic effects in thin films; characterisation of magnetic multi-layers using thermal waves; and computer simulation of multilayer structures.

R&D and design

Support services



## Queen's University of Belfast

**address** Department of Pure and Applied Physics, Belfast BT7 1NN

**tel** 028 90 273546 **fax** 028 90 236226 **web site** [www.qub.ac.uk/mp/con/](http://www.qub.ac.uk/mp/con/)

**contact** Professor Ron Atkinson **e-mail** [ronald.atkinson@qub.ac.uk](mailto:ronald.atkinson@qub.ac.uk)

The particular interests of the thin film magnetics group lie in the optical, magnetic and magneto-optical properties of thin films and multilayer systems. Such systems include conventional, thick, multilayered systems and systems fabricated from ultra-thin layers that have unusual magnetic and optical properties. Deposition techniques include rf/dc sputtering and pulsed laser deposition of magnetic oxides of complex stoichiometry. The group is keenly interested in the fabrication, design and characterisation of optical and magnetic systems and devices.

Deposition facilities include: a load locked seven-source magnetron sputtering system; two additional single chamber sputter systems each fitted with

R&D and design

Support services



magnetron/ionbeam sources; an excimer laser and deposition chamber for pulsed laser deposition of media of complex stoichiometry. Characterisation facilities include: a VSM with 12kOe field; Kerr effect hysteresis loop plotters; AGFMs; an MR measurement system; automated equipment for spectroscopic ellipsometry, Kerr MO polarimetry and photometry measurements; X- ray diffraction analysis; AFM and MFM; scanning auger and other surface analysis facilities; low vacuum SEM with EDX; and TEM and SEM.

As an academic institution, Queen's University offers services to local and national industry through the Northern Ireland Centre for Advanced Materials (see page 41).

## University of Aston

R&D and design

Support  
services

**address** Dept of Electrical Engineering and Applied Physics, Surface Science Group, Birmingham, B4 7ET **tel** 0121 359 3611 ex 5255 **fax** 0121 359 0156

**web site** [www.eeap.aston.ac.uk/ssrg/ssrg-home.html](http://www.eeap.aston.ac.uk/ssrg/ssrg-home.html) **contact** Dr John Sullivan  
**e-mail** [j.l.sullivan@aston.ac.uk](mailto:j.l.sullivan@aston.ac.uk)

The Aston laboratory is the only one in Europe specialising in the tribology of recording heads and media and it is the only one in the world which places so much emphasis on the application of modern physical and chemical methods of surface analysis in these studies. In current and future media, all the important interactions are surface specific and hence surface analysis is essential in the understanding of the dominant mechanisms of friction and wear.

Tribological studies are in progress in the fields of rigid, flexible particulate, metal powder and metal evaporated magnetic recording media in areas of environment, lubrication mechanisms, signal degradation, material transfer and head/media interactions. The work is funded by an EPSRC research grant and industrial support from Xyratex, Imation, HP and Philips. With the industry recognition of the importance of tribology in magnetic recording, it is hoped to set up a European Centre for this research at Aston.

Techniques available include ESCA, Auger Electron Spectroscopy, SIMS, LEISS, SEM, AFM, MFM.

## University of Birmingham

R&D and design

**address** School of Metallurgy and Materials, Edgbaston, Birmingham B15 2TT  
**tel** 0121 414 5213/5165 **fax** 0121 414 5247 **contact** Dr David Brown or  
Professor Rex Harris **e-mail** [d.brown.20@bham.ac.uk](mailto:d.brown.20@bham.ac.uk) or [i.r.harris@bham.ac.uk](mailto:i.r.harris@bham.ac.uk)

The Applied Alloy Chemistry Group (AACG) has been at the forefront of bulk magnetic material development for the past twenty years. These materials are ultimately used in the drive mechanisms of voice coil actuators in disk and tape applications. There is a growing number of further applications where the Group has been involved in producing prototype rare earth permanent magnet components.

A major innovation which originated from the AACG is the Hydrogen Decrepitation (HD) process which has been adopted world wide as a standard

production route for sintered NdFeB magnets (nearly 80% of the market for such magnets is in voice coil actuators). Industrial development of this process involved close collaboration with Philips Components and is an excellent example of effective University/Industry co-operation. It has been estimated that reductions in the processing costs of up to 25% are achieved using this route.

Recent interests include developing net shape manufacturing of magnet components, HDDR processing of rare earth magnet material for bonded magnets, high energy product sintered magnets, corrosion resistant coatings, application devices for magnets and hydrogen storage materials.

## University of Bristol

**address** H H Wills Physics Laboratory, Department of Physics, Tyndall Avenue, Bristol BS8 1TL **tel** 0117 9288709 **fax** 0117 9255624

**web site** [virgil.phy.bris.ac.uk/research/thinfilms.html](http://virgil.phy.bris.ac.uk/research/thinfilms.html)

**contact** Dr Walther Schwarzacher **e-mail** [w.schwarzacher@bristol.ac.uk](mailto:w.schwarzacher@bristol.ac.uk)

R&D and design

Support  
services

The Physics Laboratory has a magnetic materials research team which is primarily involved in the electrodeposition of nanostructured magnetic materials, but has a general interest in precision electrodeposition (as for thin film heads).

Examples of the team's work include multilayer films showing current-in-plane giant magnetoresistance (GMR) and multilayered nanowires having sub-micron diameters, lengths of several tens of microns, and room temperature current perpendicular to plane GMR of 55%. Recently the team has also started research into the electrodeposition of regular arrays of nanomagnets for application as patterned media.

The Laboratory also offers a basic magnetic materials characterisation service using its recently upgraded LDJ computer-controlled Vibrating Sample Magnetometer.

## University of Central Lancashire

**address** Centre for Materials Science, Preston PR1 2HE

**tel** 01772 893563 **fax** 01772 892996 **web site** [www.uclan.ac.uk](http://www.uclan.ac.uk)

**contact** Professor Phil Bissell **e-mail** [P.Bissell@uclan.ac.uk](mailto:P.Bissell@uclan.ac.uk)

R&D and design

Support  
services

The Magnetic Materials Research Group has a strong tradition of experimental measurements and micromagnetic modelling with linking themes, particularly interaction effects and magnetisation reversal in recording media. The Group was incorporated into the Centre for Materials Science in 1998 when Phil Bissell became Head of the Centre.

Current projects include experimental studies of recording media using VSM techniques, transverse susceptibility, noise studies on coatings and settling measurements on the wet dispersions. Experimental studies concentrate on techniques which complement other UK groups. The production of recordable particulate media, noise studies, transverse ac susceptibility measurements and vector VSM studies are seen as the 'local flavours'.

Computational modelling is focused on micromagnetic studies of the effects of interactions between particles or grains and on magnetic properties of media. Current work is aimed primarily at metal evaporated tape systems and their columnar structure and thin film structures.

## University of Glasgow

R&D and design

Support  
services

**address** Department of Physics and Astronomy, Glasgow G12 8QQ  
**tel** 0141 330 4462 **fax** 0141 330 4464 **web site** [www.ssp.gla.ac.uk](http://www.ssp.gla.ac.uk)  
**contact** Professor John Chapman **e-mail** [j.chapman@physics.gla.ac.uk](mailto:j.chapman@physics.gla.ac.uk)

The group's primary involvement in the information storage industry involves micromagnetic and microstructural imaging for the study of hard disk media, magnetoresistive sensor elements and magnetic recording heads.

The group has state-of-the-art electron microscopy facilities optimised for the study of magnetic materials. It also has a powerful magnetic force microscope along with a micromagnetic modelling capability. Using these it can study microstructural properties (with resolution in the range 0.3-1 nm) and micromagnetic properties (with resolution in the range 5-50 nm). Magnetic specimens can be subjected to applied fields and their temperature varied in-situ, thereby allowing detailed studies of magnetisation processes to be made. In addition, it is possible to observe directly tracks written in magnetic and magneto-optic recording media, once the underlying substrates have been removed.

## University of Manchester

R&D and design

Support  
services

**address** Electronic and Information Storage Systems Research Group,  
Department of Computer Science, Oxford Road, Manchester M13 9PL  
**tel** 0161 275 4551 **fax** 0161 275 4527 **web site** [www.cs.man.ac.uk](http://www.cs.man.ac.uk)  
**contact** Professor Barry Middleton **e-mail** [B.Middleton@cs.man.ac.uk](mailto:B.Middleton@cs.man.ac.uk)

The Electronic and Information Storage Systems Research Group is carrying out a range of research programmes in magnetic and optical recording. A number of these receive support from industry.

The Group is involved with high density recording on magnetic disks and is studying the signal and noise behaviour of advanced head-disk combinations. It has available high-performance spin stands and a contact recording system for experimental studies, and backs this up with a wide range of modelling studies of recording processes, media and heads. Similar studies on advanced tape storage systems for computer back up applications are taking place. Both these activities command support from industry.

Work is also being carried out on record and replay in optical systems and this work also commands support from industry. Scanning laser microscopes and optical disk recording facilities are available in support of this work. In both magnetic and optical recording, there are studies of the behaviour of complete systems with particular emphasis on equalisation and coding strategies.

Other studies which support the above involve the characterisation of magnetic heads, the design and development of magnetic sensors, and studies on magnetic thin films for application in sensors and as advanced recording media.

In line with its involvement in a number of projects in advanced recording systems, the Group continues in its belief that studies of the digital recording process at extremely high densities and data rates are an essential requirement to aid future advances in recording and products. To this end, it will continue to develop its knowledge of the recording process in a wide range of circumstances and formats, and use this as a base for contributing to new developments.

## University of Oxford

**address** Department of Materials, Parks Road, Oxford OX1 3PH

**tel** 01865 273656 **fax** 01865 273789

**web site** [www-magnetics.materials.ox.ac.uk](http://www-magnetics.materials.ox.ac.uk) **contact** Dr Amanda Petford-Long

**e-mail** [amanda.petford-long@materials.ox.ac.uk](mailto:amanda.petford-long@materials.ox.ac.uk)

R&D and design

Support  
services

The Magnetic Materials Group is concentrating on understanding the role of microstructure, composition and magnetic domain structure on the magnetic and transport properties of materials with applications in the information storage industry. Current projects include studies of spin-valves, spin-tunnel junctions, magnetic thin film media and optical phase-change media. Fundamental studies on technologically relevant materials are carried out with a range of industrial collaborations.

The Department of Materials has a wide range of scanning and transmission electron microscopes (SEMs and TEMs) for the study of the microstructure of materials. Facilities of particular interest to the Magnetic Materials Group include:

1. HREM - a JEOL 4000EX high-resolution TEM with a point resolution of 0.167 nm allows atomic lattices down to 0.12 nm to be resolved. A Jeol 3000F field-emission gun transmission electron microscope (FEGTEM) has also recently been installed, with a spatial resolution of 0.17 nm.
2. Composition mapping - the Jeol FEGTEM, equipped with an energy dispersive X-ray (EDX) spectrometer and a Gatan imaging filter (GIF), and a VG501 FEG scanning TEM (FEG STEM) equipped with both EDX and electron energy loss (EELS) facilities. These techniques allow the chemical analysis of all elements with a spatial resolution of 1.5 nm.
3. Electron holography - the Jeol 3000F FEGTEM is also equipped with a biprism to allow electron holographic images to be recorded.
4. Lorentz Electron Microscopy - a modified JEOL 4000EX TEM allows the specimen to be imaged in a field-free region above the objective lens. Both the Fresnel and Foucault imaging modes can be used to observe either domain walls (Fresnel) or entire domains (Foucault).

Current collaborative projects include spin-valve materials (Seagate, Nordiko), spin-tunnel junction materials (HP), magnetic media (Seagate, MMC, IBM) and optical phase-change media (Philips).

## University of Plymouth

R&D and design

Support  
services

**address** Centre for Research in Information Storage Technology, School of ECEE, Drake Circus, Plymouth, Devon PL4 8AA **tel** 01752 232570 **fax** 01752 232583

**web site** [crist1.see.plym.ac.uk](http://crist1.see.plym.ac.uk) **contact** Professor Des Mapps

**e-mail** [d.mapps@plymouth.ac.uk](mailto:d.mapps@plymouth.ac.uk)

The Centre for Research in Information Storage Technology is one of the largest in the UK, with industry-standard clean-rooms for research on information storage devices. The Centre offers an MSc course specifically designed for the Data Storage Industry: 'MSc in Data Storage Systems'

The group conducts leading-edge research on information storage systems including heads, disks, tapes, servos, optics and electronic data channels and even manufactures prototype MR heads for industry.

## University of Salford

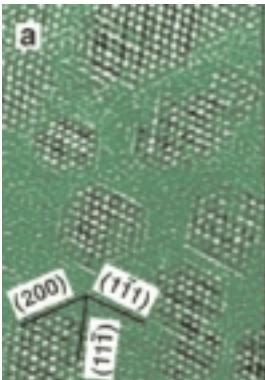
R&D and design

Support  
services

**address** Joule Physics Laboratory, School of Sciences, Salford M5 4WT

**tel** 0161 295 5404 **fax** 0161 295 5197 **web site** [www.salford.ac.uk](http://www.salford.ac.uk)

**contact** Professor Phil Grundy **e-mail** [p.j.grundy@salford.ac.uk](mailto:p.j.grundy@salford.ac.uk)



Salford is involved in the investigation of thin films and multilayer systems for potential applications as hard disk coatings. This research involves deposition of the thin film structures and their microstructural and magnetic characterisation. Research is also in place using novel deposition methods in the preparation of high magnetisation materials of interest in write-head fabrication and also spin tunnelling, multilayer structures. This latter work is complemented by new research on spin-dependent electron transport and spectroscopy, and non-linear optics and magnetic interface investigations.

The group's fabrication facilities include two UHV-compatible sputtering systems and an MBE system with XPS, STM and additional facilities for fundamental thin film investigations. Analytical services offered include transmission and scanning electron microscopy, atomic force and magnetic force microscopy, X-ray diffraction and reflectivity and magnetic measurements.

The group is a member of the University's Centre for Materials Research which includes physicists, chemists and engineers with expertise and facilities in advanced thin film and surface science.

## University of Ulster at Jordanstown

R&D and design

Support  
services

**address** Thin Film Devices Group, NIBEC Building, Jordanstown, Newtownabbey, County Antrim BT37 0QB **tel** 028 9036 8933 **fax** 028 9036 6863

**web site** [www.nibec.ulst.ac.uk/thinfilm](http://www.nibec.ulst.ac.uk/thinfilm) **contact** Dr James McLaughlin

**e-mail** [jad.mclaughlin@ulst.ac.uk](mailto:jad.mclaughlin@ulst.ac.uk)

Established in 1990 from initial research into flat panel display technologies, the Group has developed both expertise and facilities for research into generic thin film technology and its applications. Following a basic strategy of both fundamental



and applied research, it has been successful in attracting funding for a number of projects with academic and/or commercial support. In addition, the Group has played a major role in the creation of two collaborative research centres in materials and sensors - NICAM and the IFI BEST Centre.

The Group operates within the NI Bio-Engineering Centre of the University and has recognised the concept of interdisciplinary collaboration as a valuable contributor to its success as new applications/exploitation potential has arisen out of academic research and vice versa. On its own and in collaboration with other groups, its output comprises patents, licenses and academic publications as well as the detailed training of staff and students in advanced fabrication technology and analysis techniques. Areas of interest include the electro-optical properties of wide bandgap insulator/semiconductors, phosphor technology and flat displays, plasma processes and diagnostics, sensors, medical devices and diamond-like carbon (DLC).

Early work on DLC was inspired by flat display requirements for a thin film phosphor. The application of DLC to a range of problems related to medical devices, bio-functional coatings and hard wear low-friction layers is currently receiving attention, the latter with Seagate. Given the Group's concentration on researching this material, it has been able to build up a significant facilities, staff and student base.

On the facilities side, in addition to the thin film laboratory, the Group has a dedicated PECVD DLC system along with materials analysis equipment, which includes a confocal RAMAN system. This is complemented by expertise and facilities for electrical-optical testing, contact angle measurement, nanoindentation, AFM/STM, wear testing, LVSEM, etc.

## University of York

**address** Magnetic Materials Research Group, Department of Physics, York YO1 5DD **tel** 01904 432289 **fax** 01904 432214 **web site** [www.york.ac.uk](http://www.york.ac.uk)  
**contact** Professor Kevin O'Grady **e-mail** [kog1@york.ac.uk](mailto:kog1@york.ac.uk)

R&D and design

Support  
services

The Magnetic Materials Research Group in York maintains an unrivalled suite of magnetometers including three VSMs, an AFM, an MFM and the UK's only commercial AGFM. In addition to undertaking normal academic research, the Group also has a long-standing track record in undertaking collaborative projects via the programmes of the EC, EPSRC and Teaching Company Directorate on behalf of clients based in the UK and in Western Europe. Additionally, it has a very strong position with the rigid disk industry in the United States in this area.

In addition to normal academic work and collaborative research, it also offers a commercial and thus confidential measurement service and has a number of clients who are able to provide commercial references to its work. The Group is able to offer a magnetic measurement service with a turnaround time of the order of 24 hours for routine measurements and also undertakes longer-term projects on a commercial basis.

The facilities are unrivalled in the UK - and probably in Western Europe - and it maintains the capability of developing calibration samples and hence measurement standards equivalent to those available in the best standard laboratories.



# Directory listing - Companies

## ADC Technology

**address** ADC House, Broomfield Place, Coventry CV5 6GY  
**tel** 01203 715858 **fax** 01203 714462 **web site** www.adc-uk.com  
**contact** Alan Shepherd **e-mail** alan@adc-uk.com

Support  
services

ADC is a leading distributor of Mylex RAID storage systems and it has a strong technical department.

## Aeon Communications Ltd

**address** Aeon House, Acorn Business Centre, Ling Road, Poole, Dorset BH12 4LZ  
**tel** 01202 738738 **fax** 01202 738743 **web site** www.aeon.co.uk  
**contact** Roger Jarvis **e-mail** roger@aeon.co.uk

Manufacturer

R&D and design

Founded in 1988, Aeon is a specialist designer of SCSI extenders, switches and converters, combining SCSI and fibre optic technology to deliver SCSI performance over more than 40km.

The company works with integrators and sub-system manufacturers.

## Aerosonic Ltd

**address** Offa's Business Park, Buttington, Welshpool, Powys SY21 8JF  
**tel** 01938 556644 **fax** 01938 556645 **web site** www.aerosonic.co.uk  
**contact** Claire Backshall **e-mail** enquiry@aerosonic.co.uk

Manufacturer

R&D and design

Aerosonic develops and manufactures test equipment for the magnetic and optical media industries. The range of equipment includes: open reel pancake tester (for testing pancakes of blank or recorded tape); helical scan evaluator (for testing tape in cassette); vibrating sample magnetometer (for testing the bulk magnetic characteristics of tape and pigments); void processor unit (for optical inspection of coated products); CDQ (for testing CDs); birefringence tester (for testing CDs); bit for bit verifier (for checking CD-Rs against pressed CD product); and DVDQ (for checking the quality of DVD discs).

In addition, Aerosonic produces a servo track writer for the Magstar 3590 cartridge format. The company also offers an independent test facility including measurements made on any of the above systems.

## American Megatrends International Ltd

Support  
services

**address** 9th Floor, Hayes Gate House, 27 Uxbridge Road, Hayes, Middx UB4 0JN  
**tel** 0208 848 8686 **fax** 0208 848 8588 **web site** [www.amiuk.com](http://www.amiuk.com)  
**contact** Linda Ng **e-mail** [Lindan@ami.com](mailto:Lindan@ami.com)

AMI is a developer and manufacturer of high-end RAID controllers and server solutions. Products supplied in the UK include high-end server motherboards, tailor-made designs for motherboards, RAID controllers, BIOS licences, diagnostic software utilities, hardware diagnostics and clustering. The company offers sales, marketing and technical support services for these products through its office in the UK, which also support France, Ireland, Norway, Denmark, Sweden, Finland and Iceland.

## APH Industries

Manufacturer

R&D and design

**address** Anderson Works, Tongue Lane, Fairfield, Buxton, Derbyshire SK17 7LN  
**tel** 01298 25335 **fax** 01298 79945 **web site** [www.lea.co.uk](http://www.lea.co.uk)  
**contact** Kevin Thurlow **e-mail** [info@lea.co.uk](mailto:info@lea.co.uk)

APH Industries supplies abrasive and chemical products to the metal finishing industry. The range of products includes material to coat aluminium disks - the non-magnetic undercoat (electroless nickel) which carries the magnetic recording layer.

## Avalon Electronics Ltd

Manufacturer

R&D and design

**address** Langhorne Park House, High Street, Shepton Mallet, Somerset BA4 5AQ  
**tel** 01749 345266 **fax** 01749 345267 **web site** [www.avalon-electronics.com](http://www.avalon-electronics.com)  
**contact** Terry Mason **e-mail** [tmason@avalon-electronics.com](mailto:tmason@avalon-electronics.com)



Avalon Electronics is a designer and manufacturer of tape and disk array data recorders for intelligence gathering, telemetry, anti-submarine warfare, telecommunications and related applications. Its AE3000FL-series of compact S-VHS recorders represents a significant development in wideband analogue data recording. 12 MHz and 18MHz models offer outstanding performance for SIGINT and telemetry applications while 8 MHz and 3 MHz versions are recommended where long mission duration is a priority. The range includes single and multi-channel variants, plus digital and TCOM line code interfaces and IF/tape converters.

AE7000 is a general purpose 50 MHz/1 Gb/s disk array data recorder. With  $\uparrow$ 1 Terabit of storage and achieving more than double the data rate of today's fastest conventional tape systems, AE7000 is aimed at 'high end' data capture and simulation applications. Standard analogue interfaces offer performance to 20 MHz and 50 MHz (single channel) and 12 x 2.5 MHz (multi-channel).

## Berkshire International

**address** 122 Castelnau, London SW13 9EU **tel** 0181 748 8590 **fax** 0181 741 3058  
**web site** www.berkshire.com **contact** Matthew Stevens  
**e-mail** sales@berkshire.uk.com

Manufacturer

Berkshire designs and manufactures disposable contamination control products for critical environments world-wide. Products include clean-room wipers, swabs, mops, documentation systems, face masks and glove liners

## C&L Developments Ltd

**address** The Tyrrell Building, Long Reach, Ockham, Surrey GU23 6PG  
**tel** 01483 285300 **fax** 01483 285904 **contact** N Anderson

Manufacturer

R&D and design

The company develops and manufactures servo writers, fly height testers, durability testers and CD-R handling equipment (for de-mould). It also designs and manufactures automation and fixturing equipment for customers.

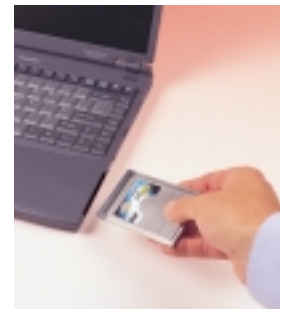
## Calluna Technology Ltd

**address** One Blackwood Road, Eastfield, Glenrothes, Fife KY7 4NP  
**tel** 01592 630810 **fax** 01592 630920 **web site** www.calluna.com  
**contact** David Ruxton **e-mail** druxton@calluna.com

Manufacturer

R&D and design

Calluna Technology was established in 1991 and designs, develops and manufactures PC card hard disk drives using 1.8 inch magnetic disk drive technology. Storage capacities range from 260 MB in a Type II PC card format to 1 GB in a Type III format. They are marketed under the 'Callunacard' brand name for the Type III PC cards and 'moveIT' for the Type II. They are used in a variety of mobile computer, digital imaging and industrial applications and are sold to OEMs and distributor channels in Europe, the USA and Japan.



## CMS Peripherals Ltd

**address** 24 Scrubs Lane, London NW10 6RA **tel** 020 8960 6000  
**web site** www.cmsperipherals.com **contact** Raymond Rice  
**e-mail** rrice@cmsperipherals.com

Support services

CMS Peripherals Ltd is a trade-only value-added storage distributor with an annual turnover in excess of £100 million. It offers free consultancy on storage implementations and by - utilising its fully kitted £250,000 storage demonstration suite which houses optical, disk and tape automation - CMS can provide 'proof-of-concept' for recommended storage solutions.

## Cristie Data Products Ltd

Manufacturer

R&D and design

**address** New Mill, Chestnut Lane, Stroud, Gloucestershire GL5 3EH  
**tel** 01453 847000 **fax** 01453 847001 **web site** www.cristie.com  
**contact** Tracey Vincentty **e-mail** traceyv@cristie.com

Cristie is a leading manufacturer of data storage and backup systems. Its customer base includes British Airways, Scottish Equitable, British Telecom & Thomas Cook. As well as its tape drive range of AIT, DAT, DLT, SLR, Travan & Libraries, the company also develops its own PC-BaX backup and recovery software for Windows 95/98, NT and OS/2, in-house.

## Data Recording Group Ltd

Manufacturer

**address** Premier Park Road, One Industrial Estate, Winsford, Cheshire CW7 3PT  
**tel** 01606 593424 **fax** 01606 558383 **web site** www.newburydata.co.uk  
**contact** John Moore **e-mail** jmoore@newburydata.co.uk



The Group's subsidiary, Data Recording Heads (DRH), manufactures magnetic heads, serving magnetic memory markets on a world-wide basis.

## Datastor Technology Ltd

R&D and design

**address** The Old Mushroom Farm, Cromhall, Wotton-under-Edge, Glos GL12 8AX  
**tel** 01454 299399 **fax** 01454 299400 **contact** Richard Stubbing  
**e-mail** sales@datastor.co.uk

Datastor is a specialist engineering repair house providing solutions for all media storage devices. With a high level of R&D, the company has been able to support all devices within a customer's installed base - old or new - from 8 inch and 5 1/4 inch hard drives through to the latest optical units or DLTs.

## Dicom Europe

Support services

**address** Andromeda House, Calleva Park, Aldermaston, Berkshire RG7 8AR  
**tel** 01189 815657 **fax** 01189 815658 **contact** Denis H G Dunham

Dicom supplies complete storage solutions such as CD recorders, library subsystems, tape drives, optical and CD libraries and disc RAID systems to the reseller market, together with installation and on-site extended warranty.

## Digital Interfaces Ltd

**address** 13 Headlands Business Park, Ringwood, Hampshire BH24 3PB  
**tel** 01425 478811 **fax** 01425 470366 **web site** www.diluk.co.uk  
**contact** Eric Lowe **e-mail** sales@diluk.co.uk

Manufacturer

R&D and design

The company designs and manufactures SCSI switches and converters, tape connection and tape duplication products, and 'legacy' connection products for use with telecommunications switches. The development of solutions for niche applications where special connections are needed is the company's focus. Products are sold throughout the world via OEMs and distributors. The generation of products currently under development makes use of fibre optic technology for faster and more secure data transmissions.

## DSK Technology International Ltd

**address** Marlborough House, Churchfield Road, Walton-on-Thames, Surrey KT12 2TJ **tel** 01932 223102 **fax** 01932 229380 **web site** www.dskti.com  
**contact** David Murray **e-mail** dave@dskti.com

Manufacturer

R&D and design

DSK specialises in real-time applications that involve data acquisition storage and replay. The company has a number of COTS storage systems using disks, tapes and optical systems, but also provides non-standard system solutions. The standard solutions include disk-based emulation for a number of tape systems.

## DynaTek Automation Systems

**address** Unit 4, Sun Valley Business Park, Winnall Close, Winchester, Hampshire SO23 0LB **tel** 01962 844000 **fax** 01962 890900 **web site** www.dynatek.co.uk  
**contact** James Butler **e-mail** sales@dynatek.co.uk

R&D and design

DynaTek offers resellers a comprehensive storage product range and excellent technical support. The company's product profile encompasses all the major platforms and technologies that resellers need to service, including both DynaTek's own brand integrated storage solutions as well as component mechanisms from integrators. Products covered include hard disk, CD-ROM, CD writers, CD re-writers, tape drives, CD mastering units, optical and tape libraries and media.

## ECD Magnetics

**address** Unit 26C, Brighton Road, Salfords, Redhill, Surrey RH1 5BX  
**tel** 01293 825566 **fax** 01293 825577 **web site** www.ecdmagnetics.co.uk  
**contact** John Keki **e-mail** John@ecdmagnetics.co.uk

Support services

ECD Magnetics specialises in the support of mature disk drive products from 14 inch SMD technology to 2.5 inch notebook drives.

## eMag Solutions Ltd

Manufacturer

R&D and design

**address** Intermediate Road, Brynmawr, Gwent NP23 4YA  
**tel** 01495 311000 **fax** 01495 312342 **web site** www.emaglink.com  
**contact** Mark Stephens **e-mail** Mstephens@emaglink.com

eMag - formerly a division of Anacom inc - has been meeting the media management needs of commercial companies of all sizes for nearly three decades. Plants in South Wales and Texas manufacture top quality tape media under the names of Graham(r), Storamaster(r) and Dysan(r).

Through a total media management programme, the company offers clients outsourced services and products designed to help significantly reduce error processing time and costs, extend the life of their media and migrate to new storage technologies.

## Enertec Overseas Holdings Ltd

Support services

**address** Waterwitch House, Exeter Road, Newmarket, Suffolk CB8 8LR  
**tel** 01638 565000 **fax** 01638 565010 **web site** www.enertec.avicore.com  
**contact** David Lazarus **e-mail** lazarus@enertec.avicore.com

Enertec provides a range of tape-based ID-1 standard recorders, ruggedised and laboratory disk based recorders, and solid state recorders. Providing sustained data recording rates in excess of 1Gbit/sec, depending on the application, Enertec can offer solutions to many of the most demanding requirements. In addition, the company provides terrabyte archiving systems, telemetry subsystems and complete data acquisition and real-time processing solutions.

## Engis (UK) Ltd

Support services

**address** 12 Crusader Close, Gillingham Business Park, Gillingham, Kent ME8 0PR **tel** 01634 261797 **fax** 01634 261815 **contact** Richard Drinkwater

Engis manufactures diamond powders, compounds, superabrasives, slurries and lapping/polishing machinery for the fabrication of magnetic heads and disk media. A superabrasive consultancy service is also provided to magnetic substrate and disk fabricators. The full range of products offered includes consumable materials, precision tooling, process equipment, process materials, production equipment/services, precision diamond powders, compounds and slurries for disk and magnetic head fabrication as well as flat lapping, polishing and texturing equipment and plated diamond tooling.



## Exabyte

**address** 1 Central Park, Larbert, Stirlingshire FK5 4RU  
**tel** 01324 564564 **fax** 01324 564500 **web site** www.exabyteeurope.com  
**contact** David Hamilton **e-mail** dhamilton@exabyte.com

Manufacturer

Exabyte is a leading supplier of tape storage devices and network storage solutions for the data intensive application and database market. Its products are available exclusively through a network of OEM, distributor and reseller business partners world-wide.

## Eyedot (Europe) Ltd

**address** Unit 12, Vansittart Estate, Vansittart Rd, Windsor, Berkshire SL4 1SE  
**tel** 01753 830046 **fax** 01753 830073 **contact** Clive Huntley

Support  
services

Eyedot offers a range of services in information storage - supplying many well-known names both in the UK and overseas. The company's key activities revolve around the supply, maintenance, repair and support of 1/2 inch tape drives, magnetic disk drives, 12 inch optical drives and RAID subsystems, and includes the integration of storage devices onto a wide variety of mid range processors. Services offered in the UK include onsite maintenance and support, repairs, exchanges, spare parts, training and brokerage.

## FACTS Precision Ltd

**address** Fullerton Road, Queensway Industrial Estate, Glenrothes, Fife KY7 5QR  
**tel** 01592 753512 **fax** 01592 752507 **contact** Martin Davidson  
**e-mail** mdavidson@factsprecision.co.uk

Manufacturer

R&D and design

FACTS is a high-precision engineering company with experience in CNC turning, CNC milling, precision grinding, assembly, test and vacuum brazing. The company services a variety of markets including aerospace, health care, hydraulics, fuel injection, telecommunications and disk storage. It is a manufacturer of bases, lids, spacers and clamp rings to the disk storage industry and has participated in the past with IBM, Rodime, Newbury Data, Hewlett Packard and Calluna. It has recently been involved with Calluna for the high-precision base for its new Type II PC card drive.

## Fluid Film Devices

**address** Unit 8, Greatbridge Business Park, Budds Lane, Romsey, Hampshire SO51 0HA **tel** 01794 514551 **fax** 01794 524116 **contact** Ron Woolley  
**e-mail** woolfler@aol.com

R&D and design

Fluid Film Devices specialises in the application of air-bearing technology to hard disk drive spindles and to spindles for testing components used in hard disk drives. Most of the company's work in recent years has involved US-based companies.

## Fortuna Power Systems Ltd

### Manufacturer

**address** Units E&F, Brickells Business Court, Oakley Lane, Oakley, Basingstoke, Hampshire RG23 7LU **tel** 01256 782030 **fax** 01256 783174

**web site** [www.data-storage.co.uk](http://www.data-storage.co.uk) **contact** Tina Hart

**e-mail** [Tina@data-storage.co.uk](mailto:Tina@data-storage.co.uk)



Fortuna supplies a range of data storage products to the corporate market, Government and education establishments. Each solution is tailor-made to meet the exact requirement of the customer - these include tape libraries, portable backup devices, CD towers, optical jukeboxes, standalone tape drives, backup media and CD optical products. The company is fully trained in many of the hardware and software applications that accompany the products and is available for consultancy, installation, training and maintenance.

## Headway Technology Group

### Support services

**address** Headway House, Crosby Way, Farnham, Surrey GU9 7XG

**tel** 01252 717071 **fax** 01252 741223 **web site** [www.headway.co.uk](http://www.headway.co.uk)

**contact** Mrs Insa Winkelbrandt-Greener

**e-mail** [insa\\_winkelbrandt-greener@headway.co.uk](mailto:insa_winkelbrandt-greener@headway.co.uk)

Headway Technology is a distributor of both software and hardware for the imaging, storage and document management industry. Products include scanners; optical, tape and DVD jukeboxes; development toolkits; document capture and storage software; document displays; and email security. The company also provides consultancy, installation and maintenance.

## Hewlett Packard Ltd

### Manufacturer

### R&D and design

**address** Filton Road, Stoke Gifford, Bristol, BS34 8QZ

**tel** 0117 979 9910 **fax** 0117 923 6091 **web site** [www.bri.hp.com](http://www.bri.hp.com)

**contact** John Hardwick **e-mail** [johnh@bri.hp.com](mailto:johnh@bri.hp.com)



HP is a major supplier of storage solutions, which are sold under the SureStore brand name. Products include online storage, network attached storage, storage management, tape back-up, CD, DVD, and optical library products, together with a complete range of branded storage media.

Computer Peripherals Bristol (CPB) has worldwide responsibility for the design and development of DDS (DAT) tape back-up products and media. DDS is the favoured back-up technology for small to medium sized network servers. There are over 8 million DDS drives in current use, and HP has over 50% of the worldwide market. CPB also develops and markets DLT products (under a licence agreement with Quantum) for Enterprise system back-up.

Since 1985, CPB has manufactured tape drives for system and network back-up, beginning with the Buffalo drive (65 MB native capacity), and most recently the Caesar DDS4 drive (20 GB native capacity), now shipping at tens of thousands per month.

## Hidden Analytical Ltd

**address** 420 Europa Boulevard, Warrington, Cheshire WA5 5UN  
**tel** 01925 445225 **fax** 01925 416518 **web site** www.hidden.co.uk  
**contact** Mark Buckley **e-mail** info@hidden.demon.co.uk

Manufacturer

R&D and design

Hidden Analytical is a leader in the design and manufacture of scientific instruments for research, development and production applications. Its primary involvement in the information storage industry is in the supply of process control and diagnostics equipment (particularly for gas analysis and end point detection).

## Hirst Magnetic Instruments Ltd

**address** Tesla House, Tregonigie, Falmouth, Cornwall TR11 4SN  
**tel** 01326 372734 **fax** 01326 378069 **web site** www.hirst-magnetics.com  
**contact** John Dudding **e-mail** dudding@hirst-magnetics.com

Manufacturer

R&D and design

Hirst designs and manufactures bespoke turnkey magnetising and demagnetising systems as well as machines to undertake pulsed field magnetometry. The company also manufactures and distributes magnetic instrumentation, including integrating fluxmeters and gaussmeters.

The company's customers include some of the world's leading suppliers of storage systems and components. It is the technical innovator and co-ordinator of a major European research project under the 4th Framework Programme.



## Imation UK Ltd

**address** Imation House, Bond Way, Bracknell, Berkshire RG12 1LQ  
**tel** 01344 402000 **fax** 01344 402299 **web site** www.imation.com

Support  
services

Imation is market leader in many data storage media technologies, supplying and manufacturing the 3M Brand. The company develops new technologies, working closely with hardware and software companies. Relevant examples are Travan minicartridges and the high capacity LS-120 diskette. In the mainframe sector, Imation worked with OEMs to develop the 3590 and SD-3 half-inch tape cartridges. Imation also has a CD-ROM plant, servicing the European market, and is closely involved in DVD technology.

## Index Data Systems Ltd

**Manufacturer**

**address** Crysnal House, Main Road, Westhay, Glastonbury, Somerset BA6 9TN  
**tel** 01458 860 393 **fax** 01458 860 693 **contact** Alan Bennetts  
**e-mail** alanbennetts@compuserve.com

IDS specialises in the integration of system components with standard and custom software modules, including specialist processing for noise and vibration analysis and dedicated acquisition from instrumentation DAT recorders. It provides a dedicated software package, nVision DAT, which works with the Racal-Heim DAT and AIT instrumentation data recorders and replay units. The software is geared to provide both control of the tape drive and advanced data analysis capability, with particular focus on the noise, vibration and harshness market.

## Informatic Component Technology

**Manufacturer**

**R&D and design**

**address** Shepperton Studios, Studios Road, Shepperton, Middlesex TW17 0QD  
**tel** 01932 572215 **fax** 01932 572465 **contact** John Crane  
**e-mail** jcrane@dail.pipex.com

ICT was formed in 1991 to meet the demands of a market requiring custom built, high quality magnetic recording products to advanced technical standards. The company offers magnetic heads for instrumentation applications, the video market, card/ticket readers, reel-to-reel and QIC drives. ICT supplies new replacement heads as well as designing and manufacturing magnetic heads to OEM specification. It has its own repair/reprofile facility.

## Kerry Ultrasonics Ltd

**Manufacturer**

**R&D and design**

**address** Hunting Gate, Wilbury Way, Hitchin, Hertfordshire SG4 0TQ  
**tel** 01462 450761 **fax** 01462 420712 **web site** www.kerry.co.uk  
**contact** Jeremy Humphreys **e-mail** sales@kerry.co.uk

A member of the Halma group, Kerry Ultrasonics is a manufacturer and supplier of fully integrated automated ultrasonic cleaning systems, supplying aqueous, semi-aqueous and solvent cleaning equipment to diverse industries including computer disk drive manufacture.

The Mk 4 version of the award-winning Microclean PE range of fully automated ultrasonic cleaning systems is designed for class 10 cleanroom installation and the precision cleaning of high performance disk drive components including GMR heads. The PE process satisfies the industry requirement for extremely low levels of ionic contamination and effectively removes organic residues and particulates down to sub micron level.

Microsolve cleaning systems designed for use with HFE and HFC solvents are also available. The solvent based cleaning process is particularly suitable for GMR type HSA's and spindle motor components.

The Hertfordshire head office contains laboratory, demonstration and clean room facilities, design engineering and manufacturing.

## Kingswell Computer Company Ltd

**address** Cornwell Business Park, Salthouse Road, Northampton NN4 7EX  
**tel** 01604 767636 **fax** 01604 767639 **web site** www.kingswell.co.uk  
**contact** Mike King **e-mail** mike.king@kingswell.co.uk

Manufacturer

R&D and design

Kingswell provides complete end-to-end storage management solutions that meet today's distributed storage requirements on UNIX and Windows NT platforms. Kingswell's mass storage vendors include ATL Products, ADIC, StorageTek and CLARiiON.

Clustering, file management, backup/restore and HSM software providers include Legato Systems, EMASS, Veritas and CA.

## K-PAR Systems Ltd

**address** 174 Cheltenham Road, Bristol, Avon BS6 5RE  
**tel** 0117 942 1141 **fax** 0117 942 0564 **web site** www.k-par.com  
**contact** Rachel Woods **e-mail** rachel@k-par.com

Manufacturer

K-PAR is a software development company specialising in archive and data management software for Windows NT and Sun Solaris. ARCHIMEDIA enables users to read and write files to DVD-ROM, DVD-RAM, DVD-R, CD-ROM, CD-R, MO and WORM drives and jukeboxes on the network as easily as writing to a hard disk drive. Standard file formats are supported so that the media can be read by other systems.

- CDcreation is pre mastering software for use with CD-R drives
- DVDcreation is pre mastering software for use with DVD-R drives
- UDF Master is a command line utility providing Sun Solaris users with the ability to read and write UDF file format systems used on DVD-ROM, DVD-RAM and DVD-R.

## LaCie Ltd

**address** 46 Gillingham Street, London SW1V 1HU  
**tel** 020 7872 8000 **fax** 020 7233 8338 **web site** www.lacie.com  
**contact** George Leptos **e-mail** sales.uk@euro.lacie.com

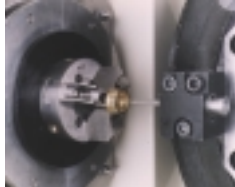
Support services

LaCie specialises in the development, manufacture and distribution of SCSI, FireWire, USB storage peripherals for Macintosh and Windows computers and workstations. Products include hard drives, CD-ROM, DVD-ROM drives, recorders and towers, backup devices (DLT and AIT), RAID, Network Attached Storage, monitors and colour management products. Extensive pre-sales and after-sales support is provided, as well as training seminars on new product ranges.

## Landis Lund Ltd

Manufacturer

R&D and design



**address** Skipton Road, Keighley, West Yorkshire BD20 7SD  
**tel** 01535 633211 **fax** 01535 635493 **web site** [www.cranfieldprecision.com](http://www.cranfieldprecision.com)  
**contact** Dr Keith Dobson **e-mail** [Kdobson@landis-lund.co.uk](mailto:Kdobson@landis-lund.co.uk)

Landis Lund is a division of the UNOVA Group and - with its subsidiary company Cranfield Precision - manufactures the DT40 Ultra Precision Lathe for turning precision spindle hub components for disk drive motors in soft and hard materials, and edge finishing machines for alternative disk substrate materials.

## Leeway Data Products

Support services

**address** Headway House, Crosby Way, Farnham, Surrey GU9 7XG  
**tel** 01252 717071 **fax** 01252 741214 **contact** Mike Harris  
**e-mail** [spoulter@leewaydata.co.uk](mailto:spoulter@leewaydata.co.uk)

Leeway Data products include optical and magnetic disk drives, recording heads for tape and disk drives, print heads for matrix printers, optical disk cartridges ranging in diameter from 3.5 inch to 12 inch and in capacities from 128 MB through 6.5 GB, worm and rewritable products for magneto-optical and phase change recording, and CD recordable disks (two and four times speed).

## Loadpoint Ltd

Manufacturer

R&D and design



**address** Chelworth Industrial Estate, Cricklade, Swindon, Wiltshire SN6 6HE  
**tel** 01793 751160 **fax** 01793 750155 **web site** [www.loadpoint.co.uk](http://www.loadpoint.co.uk)  
**contact** John Sweet **e-mail** [All@loadpoint.co.uk](mailto:All@loadpoint.co.uk)

The company is involved with the manufacture of air bearings and the development of an electro-chemical micro-machining capability. These are used in the disk drive business for the production of GMR heads, servo writers, certifiers and the manufacture of the bearing grooves for oil and air bearing drive systems. Loadpoint also manufactures dicing machines for GMR head production.

## M4 Data Ltd

Manufacturer

R&D and design

**address** Mendip Court, Bath Road, Wells, Somerset BA5 3DG **tel** 01749 683800  
**fax** 01749 673928 **web site** [www.m4data.com](http://www.m4data.com) **contact** Dave Cutler **e-mail** [davec@m4data.co.uk](mailto:davec@m4data.co.uk)

M4 Data designs and manufactures magnetic tape drives and mass storage systems for the computer industry. The company has its R&D facility, together with a small manufacturing plant, at Wells in Somerset, where approximately 40 people are employed. In addition, 100 people are employed in Gateley, Hampshire, at the principal manufacturing facility. As well as sales staff located at the Gateley plant, overseas sales offices are located in USA, Germany, India and China, supplemented by a world-wide distributor network.

Products developed include open reel tape drives, cartridge tape drives and mass storage robotic libraries and M4 Data offers repair and maintenance. In 1999 M4 Data was presented with the Queen's Award for Export Achievement.

The Twin Peaks 3490E half-inch cartridge drive, introduced in 1995, was the first low cost, automation ready, 36-track tape drive in an 8 inch form factor. Its features included air bearings, enabling mainframe compatibility and also purpose designed for automated tape libraries. The R&D was part funded by means of a DTI SPUR grant and, in 1997, M4 Data won a SPUR Achievement Award for the successful exploitation of the product.

In 1999 the company introduced Magfile 20, the first to be released of a new family of tape automation products containing two DLT drives plus 21 cartridges in a 19 inch rack mountable format, just seven inches in height. A distinguishing feature is the capability to exchange cartridges between Magfile 20 units by means of an interconnecting shuttle arrangement.



## Mac&More Ltd

**address** Unit 1, Churchgates, The Wilderness, Berkhamsted Herts HP4 2AZ  
**tel** 01442 870300 **fax** 01442 870707 **web site** www.macandmore.co.uk  
**contact** G Curzon-Berners **e-mail** info@macandmore.co.uk

Support  
services

Mac&More supplies a wide range of own-brand storage solutions based around CD-R, CD-RW, CD-ROM, hard drives and duplication systems. In the UK, the company specialises in build-to-order storage solutions.

## Macarthur Stroud International

**address** St James House, 9-15 St James Road, Surbiton, Surrey KT4 6QU  
**tel** 020 8240 6000 **fax** 020 8240 6006 **web site** www.macarthurstroud.com  
**contact** James Henderson **e-mail** msi@macarthurstroud.com

Support  
services

Macarthur Stroud International provides a range of technical, marketing and investment services. These include:

- Analysis of storage and storage management products
- Identifying partners to deliver market-ready solutions
- Placing new technologies in the market place
- Due diligent exercises for funding partners looking to invest in new storage technologies and solutions.

User requirements for storage and storage management solutions is a service offered by the company through its Storage Programme. It has been tracking changes in fibre channel for storage area networks and has been working with the Fibre Channel Association Europe to determine market opportunities.

## Mackintosh Consultants

**Support  
services**

**address** The Chase, Pinfold Lane, Northop Hall, Mold, Flintshire CH7 6HE  
**tel** 01244 819797 **fax** 01244 819796 **web site** www.ndmack.demon.co.uk  
**contact** Dr Nigel Mackintosh **e-mail** nigel@ndmack.demon.co.uk

Mackintosh Consultants is an independent storage industry consulting group, assisting clients in all aspects of the global storage industry. Active in the technical, financial, marketing, strategic, operational and logistic fields, the company has also been successful in obtaining sizeable grants for clients from the EC's funding programmes. Assignments have included sourcing funding, technical support, sales and marketing, inward investment attraction, intellectual property negotiation, personnel recruitment, project management, site selection, technology analysis, market studies, expert opinions, patent litigation and mergers and acquisitions.

## Manton Industrial Seals Ltd

**Manufacturer**

**address** Unit 5B, Bydand Industrial Estate, Little Paxton, Cambridgeshire PE19 4ES **tel** 01480 214300 **fax** 01480 218987  
**web site** www.mantonindustrial.com **contact** George Culley  
**e-mail** Gculley251@aol.com

Manton specialises in all forms of industrial sealing, gaskets and extrusion. The company's customers use its products in a wide range of industrial areas, including disk drives, tape drives, optical drives and storage systems of all types.

## Matrix Computer Engineering Ltd

**Support  
services**

**address** Matrix House, Langley Road, Chippenham, Wiltshire SN15 1BT  
**tel** 01249 660011 **fax** 01249 443534 **web site** www.matrix-net.co.uk  
**contact** Dave Lethaby **e-mail** Dave.Lethaby@matrix-net.co.uk

Matrix is an independent storage device specialist providing a sales and repair service on a wide product range encompassing: hard disk drives, floppy disk drives, DAT, DLT, Travan, AIT and optical drive products. Matrix also operates a data recovery service. It can offer immediate solutions with advance exchanges, emergency repairs or a standard three-day turnaround of equipment.

## Maxoptix Europe Ltd

**Support  
services**

**address** Maxoptix House, St John's Road, Woking, Surrey GU21 1SE  
**tel** 01483 776799 **fax** 01483 762679 **web site** www.maxoptix.com/europe  
**contact** Colin Smith **e-mail** enquiry@maxoptix.co.uk

Maxoptix' primary involvement in the information storage industry is the R&D, production, sales and marketing of magneto-optic disc drives, media and jukebox subsystems. The company offers a repair and exchange service in the UK, including an on-site service.



## Memorex Telex

**address** Prescott Road, Colnbrook, Slough, Berkshire SL1 0AE  
**tel** 0870 606 8780 **fax** 0870 606 8705 **web site** www.memorex-telex.com  
**contact** Anurag Patel **e-mail** apatel@memorex-telex.com

Support  
services

The company focuses on designing, implementing and supporting storage network solutions using high-end IBM tape and disc products. It provides storage network business solutions under IBM's Seascope Strategy, which includes Storage Area Networking (SAN) and storage management (Tivoli Storage Manager, formerly ADSM).

## Metron Technology (UK) Ltd

**address** 6/7 Grafton Way, Basingstoke, Hampshire RG22 6HY  
**tel** 01256 792000 **fax** 01256 792033 **web site** www.metrontech.com  
**contact** Russ Bird **e-mail** info.materials@metrontech.co.uk

Support  
services

The company's primary involvement in the information storage industry is the supply of cleanroom consumables for contamination control, disk carriers and shippers, polishing slurries and pads, and equipment for chemical distribution.

## Metrum Information Storage Ltd

**address** 2 Weller Drive, Finchampstead, Wokingham, Berkshire RG40 4QZ  
**tel** 0118 973 3000 **fax** 0118 973 4363 **web site** www.metrum.co.uk  
**contact** Chris Beeton **e-mail** chrisb@metrum.co.uk

Manufacturer

R&D and design

Metrum's high-performance data recording systems are used extensively in the aerospace, defence, manufacturing, power, automotive and medical research industries. To complement its own range, Metrum is also the main UK distributor for recording products from Sony, NEC San-ei and Dataq Instruments. In addition, the company also stocks consumables for these recorders. Metrum's service department repairs, services and calibrates most makes of recording equipment - either on site or at its premises in Wokingham, Wookey Hole or Newcastle. The company also hold current spares for most recorders, including 'hot spares'.

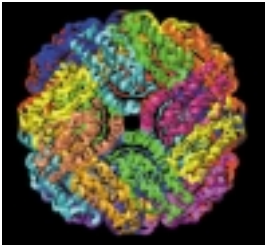
During 1997, Metrum purchased the business and assets of Penny and Giles Data Systems and also DATATAPE International, retaining both the staff and their expertise, and it continues to maintain, service and manufacture equipment formerly supplied by both companies.

The company's core products include: reel to reel laboratory recorders/reproducers; DAT & AIT tape recorders; IRIG standard 1/2inch and 1 inch format tape recorders/reproducers; ID-1 tape recorders/reproducers; VLBI systems; wideband analogue recorders/reproducers; cassette handling systems, including robotics; and flight qualified airborne tape recorders.

## NanoMagnetics Ltd

R&D and design

**address** 9 The Circus, Bath BA1 2EW  
**tel** 01225 355980 **fax** 01255 358920 **web site** [www.nanomagnetics.com](http://www.nanomagnetics.com)  
**contact** Eric Mayes **e-mail** [emayes@nanomagnetics.com](mailto:emayes@nanomagnetics.com)



NanoMagnetics generates intellectual property related to functional nanoscaled particles. It is currently developing a novel magnetic thin film media through the use of monodisperse magnetic nanoparticles to address the impending storage density limitations of sputtered thin films.

The company's facilities, located within Bristol University, allow the development of a prototype high-density media to be demonstrated through commercial partnerships. Following their demonstration, NanoMagnetics will license the intellectual property for this cost-competitive media while continuing developments in other areas of expertise.

## Neato Ltd

Manufacturer

**address** College House, 17 Kind Edwards Road, Ruislip, Middlesex HA4 7AE  
**tel** 01895 638999 **fax** 01895 639955 **web site** [www.neato.com](http://www.neato.com)  
**contact** Christina Websdale **e-mail** [cwebsdale@neato.com](mailto:cwebsdale@neato.com)

Neato is an electronic media labelling and packaging company offering a cost-effective, high quality package which includes everything users need to design, print and apply labels and personalised case inserts. The starter kit includes Neato's specially developed MediaFace design software compatible with both the Mac and PC.

## Nimbus Manufacturing (UK) Ltd

Manufacturer

R&D and design

**address** Llantarnam Park, Cwmbran, Gwent NP44 3AB  
**tel** 01633 465 000 **fax** 01633 867 799 **web site** [www.nimbuscd.com](http://www.nimbuscd.com)  
**contact** Emil Dudek **e-mail** [Edudek@nimbuscd.com](mailto:Edudek@nimbuscd.com)

Nimbus - a member of the Carlton Communications group - offers CD-ROM and DVD-ROM manufacturing services with a current capacity of 330,000 and 20,000 per day respectively. Associated services of authoring, formatting, printed parts, packaging, distribution and warehousing are also available. An R&D department is focussed on holograms, DVD and manufacturing equipment development.

## Nimbus Technology & Engineering Ltd

**address** Wyastone Leys, Monmouth NP25 3SR

**tel** 01600 890682 **fax** 01600 890988 **web site** www.nimbus.ltd.uk

**contact** Gerald Reynolds **e-mail** gerald.reynolds@nimbus.ltd.uk

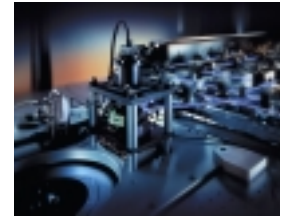
Manufacturer

R&D and design

Nimbus Technology & Engineering is a leading supplier of optical disk mastering systems. It develops and manufactures laser and electron beam mastering systems for current and future erasable disk formats -over 70 have been shipped worldwide. Nimbus was the first company to make a production mastering system for DVD and has now sold 30 such systems.

The company recently introduced a dual beam laser mastering system for CD and DVD recordable and rewritable discs. It is also developing new systems to master the next generation of optical and MO disks, including an E-beam recorder for track pitches down to 0.2 micron and feature sizes down to 100 nm.

To address the emerging market for CD and DVD replication, the company is launching a new small, fast, simple, more affordable, fully integrated mastering system which retains the high performance of its standard systems.



## Northern Ireland Centre for Advanced Materials (NICAM)

**address** University of Ulster - NIBEC Building, Jordanstown, Newtownabbey, Co Antrim BT37 0QB **tel** 028 9036 8339 **fax** 028 9036 6863

**web site** www.nibec.ulst.ac.uk/nicam **contact** Patricia Pepper

**e-mail** p.pepper@ulst.ac.uk

R&D and design

NICAM is a multi-disciplinary partnership between The Queen's University of Belfast and the University of Ulster. It brings together scientific and engineering expertise in advanced functional materials and surface science, which is crucial to the success of many products and processes today.

The research groups involved have pioneered advances in areas such as scanning probe microscopy, magnetic and magneto-optical recording, biomedical and environmental sensors, flat panel displays, diamond-like carbon, semiconductor and other thin-film devices, surface coatings and fabrication techniques.

Research areas include magnetic materials, ferroelectrics/ceramics, thin-films (metals, DLC semiconductors, bioceramics), surface morphology and corrosion analysis. Specialist facilities include pulsed laser deposition, UHV sputtering systems, a UHV CVD cluster tool system, a low vacuum SEM with EDX and scanning auger microscopy.

## Overland Data (Europe) Ltd

### Manufacturer

**address** Unit 3, Ashville Way, Wokingham, Berkshire RG41 2PL  
**tel** 01189 898000 **fax** 01189 891897 **web site** www.overlanddata.com  
**contact** Howard Rippiner **e-mail** hrippiner@overlanddata.com

Overland Data is a supplier of entry level to enterprise tape storage solutions and related technologies designed to meet the critical requirements of high-availability network computing environments.

The Wokingham base, provides sales and support services to a network of distributors throughout Europe. In addition, its manufacturing area provides full assembly and support for products.

## Peripheral Support Services

### Support services

**address** Unit 32, Portland Court, Kingsway, Luton, Bedfordshire LU1 4JF  
**tel** 01582 877333 **fax** 01582 877332 **web site** www.peripheral.co.uk  
**contact** Tony Woodley **e-mail** sales@peripheral.co.uk

The company is involved in the repair and supply of magnetic tape drives in the higher end of the market where the IBM standards are met. This includes the 1/2 inch open reel technology - though older, many of these drives are still in use. After the 1/2 inch open reel followed the 1/2 inch cartridge using 3480/90/9E format, most 1/2 inch open reel users followed the newer format. Most banks and similar organisation use this technology as the output is fast and interchangeability is available due to it being a recognised standard.

## Phi Laboratories Ltd

### Manufacturer

### R&D and design

**address** Lodge Hill Industrial Park, Westbury-sub-Mendip, Wells, Somerset BA5 1EY **tel** 01749 870525 **fax** 01749 870525 **contact** Denise Malyan  
**e-mail** philabs@saqnet.co.uk



Phi Laboratories is a leading manufacturer of multi-track linear instrumentation recording heads, offering a range of IRIG assemblies for all popular recording formats, track densities and applications. The range includes headstacks for direct recording to 600KHz, 2MHz and 4MHz (both standard and double density) and equivalent FM and High Density Digital Recording (HDDR) specifications. The company serves both the end-user and OEM markets, providing new assemblies and 'restacks' for almost all types of IRIG system including fully MIL-SPECed designs. Other specialist services include: rotary head mounting, precision grinding, spark erosion, bespoke precision sub-assembly, coil winding and sub-contract servicing.

## Photo-Sonics International Ltd

**address** 5 Thame Park Business Centre, Wenman Road, Thame, Oxfordshire OX9 3FR **tel** 01844 260600 **fax** 01844 260126 **web site** www.photo-sonics.co.uk  
**contact** Bruce Hefford **e-mail** mail@photo-sonics.co.uk

Photo-Sonics designs, develops, manufactures and supports ruggedised high performance analogue and digital instrumentation data magnetic tape recording systems. It also supplies and supports the products of Racal and Racal-Heim Systems throughout the UK, and is a supplier to the aerospace, defence, automotive, scientific, medical and education marketplaces. Photo-Sonics can also supply custom solutions wherever required, providing flexibility when integrating tape recording requirements into larger complex monitoring systems.

**Manufacturer**

**R&D and design**



## Pilkington Micronics

**address** Fourth Avenue, Deeside Industrial Park, Deeside, Clwyd CH5 2NR  
**tel** 01244 288337 **fax** 01244 288935 **web site** www.pilkington.com  
**contact** Kate Pike **e-mail** Jonesj2@pilkington.com

Pilkington Micronics is a manufacturer and supplier of precision glass discs (substrates) for optical storage and mastering (for CDs, LDs and DVDs).

**Manufacturer**

**R&D and design**

## Plasmon plc

**address** Whiting Way, Melbourn, Hertfordshire SG8 6EN  
**tel** 01763 261466 **fax** 01763 264444 **web site** www.plasmon.co.uk  
**contact** Nigel Street **e-mail** sales@plasmon.co.uk

Plasmon is an international group of businesses in the field of professional data storage solutions. It manufactures a wide range of jukebox storage solutions including both magneto optic and CD systems.

The Plasmon product range includes juke boxes, drives and disks based on tape, CD/DVD, 5.25 inch magneto optic and 12 inch worm technologies. It also develops software, enabling users to integrate data storage devices into a variety of computer network environments.

**Manufacturer**

**R&D and design**

## Premier Source

**address** Cott Abbey, Winstone, Cirencester, Gloucestershire GL7 7JT  
**tel** 01285 821599/821772 **fax** 01285 821444  
**contact** Ralph Reather **e-mail** ralph@premiersource.freeserve.co.uk

Premier's principal activity is the repair, refurbishment and sales of new and used disk drives. Diagnostic software is also developed.

**Support services**

## PTI Ltd

### Manufacturer

**address** Unit 5/6, Station Road, Guiseley, Leeds LS20 8BX  
**tel** 01943 877363 **fax** 01943 877585 **web site** www.pti.co.uk  
**contact** Tony Howard **e-mail** sales@pti.co.uk

PTI is a supplier of third-party enclosures for the computer add-on market, manufacturing desktop and rack-mount drive enclosures as well as SCSI cables, fibre channel cables, SCSI terminators, SCSI adapters and drive brackets. Services offered in the UK include environmental testing, subsystem integration, enclosure design and health and safety approvals.

## Quantegy Europa Ltd

### Manufacturer

### R&D and design

**address** Unit 3, Commerce Business Park, Theale, Berkshire RG7 4AB  
**tel** 0118 930 2208 ex 205 **fax** 0118 930 2235 **web site** www.quantegy.com  
**contact** Neil Watterson **e-mail** neil.watterson@quantegy-eu.com

Quantegy, formally known as Ampex, manufactures professional recording media for the instrumentation, data, audio and video markets throughout the world. The Theale office sells instrumentation, video, audio and data media to the MOD, DERA, British Aerospace, Rolls Royce, and many other customers throughout the UK and Eire, and it provides backup support in a variety of forms. Any problems relating to previous recordings can be analysed at customer sites, in Theale or at Quantegy's US test and evaluation.

## R&R Computer Diskdrive Technologies plc

### Support services

**address** Moorlands Manor, High Street, Arlesey, Bedfordshire SG15 6SX  
**tel** 01462 834546 **fax** 01462 835250 **web site** www.randrplc.co.uk  
**contact** Steve Hodges **e-mail** shodges@randrplc.co.uk

R&R offers a 'one source, one solution' service covering the distribution of new products, repair and the exchange of defective devices, data recovery, remarketing of excess inventory, warranty redemption from the manufacturer and on site maintenance on key server products. It is involved with all storage devices - including floppy, hard drive, optical, CD, tape, DAT, DLT, libraries, juke boxes - and on-site service for all tape-related products and RAID server installations.

## Racal Recorders Ltd

**address** Hardley Industrial Estate, Hardley, Hythe, Southampton SO45 3ZH  
**tel** 01703 843265 **fax** 01703 848919 **web site** www.racalrecord.com  
**contact** Phil Ingram **e-mail** pingram@racalrec.co.uk

Manufacturer

R&D and design

Racal Recorders develops and manufactures voice and instrumentation recorders using magnetic disk drives, optical disk drives and tape drives to provide highly specific functionality. Normally, this means that the operating system and the drive itself have to operate in a real time mode. Some of the company's mature products include tape drives of its own design and manufacture.

## Reactive Computer Services

**address** The Granary, Hose Hill, Sulhamstead, Berkshire RG7 4BB  
**tel** 01189 323499 **fax** 01189 323510 **web site** www.reactivecomputers.com  
**contact** Kerstin Probst-Wallace **e-mail** kerstin@reactivecomputers.com

Support services

The company offers repair services on all kinds of computer hardware to OEMs, third and fourth party maintainers, resellers and brokers. It specialises in storage equipment, point of sale equipment and networking equipment.

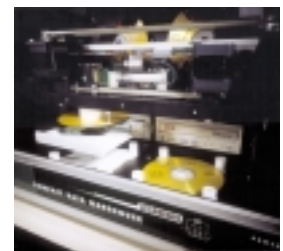
## Ringdale

**address** Ringdale House, 56 Victoria Road, Burgess Hill, West Sussex RH15 9LR  
**tel** 01444 871349 **fax** 01444 870228 **web site** www.ringdale.com  
**contact** Allan Large **e-mail** alarge@ringdale.com

Manufacturer

R&D and design

Ringdale - part of the Network Technology group - manufactures in the UK for the European and Japanese markets. Its storage server is a totally scalable, network data storage system providing high-density CD and DVD storage in a small space using patented technology. Network ready, Storage Server integrates seamlessly into Novell, Windows 95/98/NT, Apple, AIX, Linux or UNIX networks. Ringdale and its world-wide network of resellers and maintenance partners provide system integration and full technical support for mechanics, electronics and applications.



## RK Distribution Ltd

**address** Thame Park Road, Thame, Oxfordshire OX9 3UQ  
**tel** 01844 261226 **fax** 01844 261682 **web site** www.rkd.co.uk  
**contact** John Milner **e-mail** jmilner@rkd.memec.com

Support services

RK is involved with the distribution of storage peripherals such as disk drives, tape drives, optical drives and CD-ROM to the trade, offering warranty support, technical support and training.

## Ryford Ltd

Manufacturer

R&D and design

**address** Brickyard Road, Aldridge, West Midlands WS9 8SR  
**tel** 01922 454747 **fax** 01922 459429 **web site** www.ryford.co.uk  
**contact** Charles Allsop **e-mail** sales@ryford.co.uk

Ryford manufactures a range of disk storage containers and technical mouldings, product assembly and toolmaking.

## SDL Queensgate Ltd

Manufacturer

**address** Queensgate House, Willoughby Road, Bracknell, Berkshire RG12 8FB  
**tel** 01344 350 000 **fax** 01344 350 035 **web site** www.nanopositioning.com  
**contact** Richard Sleator **e-mail** sales@nanopositioning.com

SDL Queensgate is a leading company in nanopositioning solutions for disk drive, semiconductor and MR head testing and for microscopy applications. Products include position sensors, piezo translators and nanometer precision stages. SDL Queensgate manufactures the original DPT series of closed loop actuators - over 10,000 may be found driving the disk drive industry's test and measurement systems. As a solution provider for disk drive and semiconductor test and measurement, new designs are focusing on miniaturisation for MR and GMR head testing, scale-up for large wafer/chuck inspection and new nanosensors for DUV lithography.

## Seagate Technology

Manufacturer

R&D and design

**address** 99 Dowland Road, Limavady, County Londonderry BT49 0HL  
**tel** 028 7172 3000 **fax** 028 7123 163 **web site** www.seagate.com  
**contact** Gwyneth McQuiston **e-mail** Gwyneth\_K\_McQuiston@notes.seagate.com

**address** 1 Disc Drive, Springtown Industrial Estate, Londonderry BT48 0BF  
**tel** 028 7127 4216 **fax** 028 7127 4325 **web site** www.seagate.com  
**contact** June Coates **e-mail** June\_E\_Coates@notes.seagate.com

Seagate Technology is a leading provider of technology and products enabling people to store, access and manage information. Seagate is committed to providing best-in-class products to help people get information when, where and how they want it. The Company is recognised as the world's largest manufacturer of disc drives, magnetic discs and read-write heads, an innovator in tape drives, and a leading developer of Business Intelligence software. With significant manufacturing and product development operations worldwide, Seagate can be found around the globe and at www.seagate.com.

Seagate Springtown is part of Seagate's Recording Head Operations (RHO) which develops and manufactures advanced read/write heads for hard disk and tape drives. Seagate RHO is the world's largest supplier of magnetic recording heads.



Set up in 1993, Seagate Springtown presently employs 900 people including research and development engineers, manufacturing engineers, production managers, technicians, operators and other professional/managerial staff.

The recording heads for disk and tape storage devices are fabricated in a state of the art cleanroom using the very latest developments in magneto-resistive (MR) and giant magneto-resistive (GMR) technology. Heads are constructed in bulk on aluminium wafers, some 4.5 inches square – with each wafer containing thousands of heads. The wafer manufacturing process consists of several hundred individual process steps. The finished product is then shipped to Penang, Malaysia, where the wafer is cut up and machined into individual heads which are then mounted on a head gimbal fixture prior to final disk drive assembly.

Seagate Limavady – part of the Company's Recording Media Operations (RMO) - began producing advanced media substrates in July of 1997 and now produces 125,000 substrates per day. Some 900 people are employed at the plant. The finished product from the Limavady facility is shipped to the Far East where it is "sputtered" or coated with a magnetic layer before being assembled into finished hard disc drives.



## Signal Computing Ltd

**address** 20 Nugent Road, The Surrey Research Park, Guildford, Surrey GU2 5AF  
**tel** 01483 579900 **fax** 01483 562836 **web site** [www.signal.co.uk](http://www.signal.co.uk)  
**contact** Martin Orton **e-mail** [Martin.Orton@signal.co.uk](mailto:Martin.Orton@signal.co.uk)

**Support  
services**

Signal Computing specialises in the supply of instrumentation, test, recording, embedded and high-performance systems. It is a leading supplier to the major aerospace and defence electronics companies, and to DERA, of high performance data recording and replay systems. Signal has experience in the fields of radar, sonar and engine test, using storage based on tape, disk and solid state memory. It has close ties with the major storage system suppliers.

Systems range from specialist PC-based applications, to large test facility systems involving networked machines and custom-built hardware and software.

## SingleSource Computer Services Ltd

**address** Wintersells Industrial Estate, 14 Wintersells Road, Byfleet, Surrey KT14 7LF **tel** 01932 355685 **fax** 01932 355686 **web site** [www.singlesource.co.uk](http://www.singlesource.co.uk)  
**contact** Brian Holland **e-mail** [info@singlesource.co.uk](mailto:info@singlesource.co.uk)

**Support  
services**

SingleSource specialises in the sales, installation and maintenance of UNIX systems and storage devices relating to Sun Microsystems, Silicon Graphics, Hewlett Packard, IBM RS600 and AS 400. It offers field support and repair/exchange services.

## Solectron Scotland Ltd

Manufacturer

R&D and design

**address** Queensferry Road, Dunfermline, Fife KY11 5PX  
**tel** 01383 628255 **fax** 01383 622045 **web site** www.solectron.com  
**contact** Cliff Hargest **e-mail** cliff\_hargest@solectron.co.uk

Solectron Corporation provides contract electronic manufacturing services to leading information storage manufacturing companies on a global basis. The Scotland manufacturing campus was established as a result of Solectron acquiring Philips Electronics' circuit assembly operations. The focus is on low- to very high-volume manufacturing of PCB assemblies, subassemblies and systems, with eighteen SMT lines.

## SomerData Ltd

Manufacturer

R&D and design

**address** 3 Underwood Business Park, Wookey Hole Road, Wells, Somerset BA5 1AF **tel** 01749 671481 **fax** 01749 671482 **web site** www.somerdata.com  
**contact** Edwin Kayes **e-mail** edwin.kayes@somerdata.com

SomerData designs and manufactures a range of real-time digital data capture and recording products. Typical applications include surveillance and analysis, signal monitoring and logging, network fault monitoring, videoconference recording and digital audio broadcast.

The host system can be specified with the user's choice of processor speed, memory size, fixed and removable disk drives plus other PC options to suit individual applications. This enables users to benefit from the latest price and performance for their system components without being restricted by proprietary designs or sole source support requirements. For test and analysis applications, capturing the raw, real-time data on disk also offers opportunities for the development of innovative software solutions for application-specific data logging, monitoring, recording, analysis and processing.

## Speake & Co Ltd

Manufacturer

**address** Elvicta Estate, Crickhowell, Powys NP8 1DF  
**tel** 01873 811281 **fax** 01873 810958 **contact** Bill Speake

Speake & Co provides support services for computer magnetic media and - in particular - cleaning and certification services for open reel computer tape. It also provides cleaning/re-tensioning equipment for both open reel computer tapes and 1/2 inch magnetic tape cartridges as well as a range of cleaned, retensioned and de-gaussed media for sale.

The company also manufactures and supplies a range of cost effective magnetic field sensors. These can be used in customised applications such as gaussmeters, vehicle detectors, compasses, magnetometers and gradiometers.

## Speedfam-IPEC Ltd

**address** Brindley Road, Dodwells Bridge Industrial Estate, Hinckley, Leics LE10 3BY **tel** 01455 631707 **fax** 01455 611360 **web site** www.speedfam.com  
**contact** Rob Smith **e-mail** rsmith@speedfam.ltd.uk

Support  
services

Speedfam-IPEC supplies manufacturing equipment for Al/Ni-P/glass substrates including grinding, polishing and cleaning machines. The company also supplies a full range of consumables with sales and service backup.

## Stakesolve Ltd

**address** Min Y Nant, Llandyrnog, Denbigh, Denbighshire LL16 4HB  
**tel** 01824 790405 **fax** 01824 790405 **contact** Professor Ted Williams  
**e-mail** stakesolve@cwcom.net

Support  
services

Stakesolve is involved in various activities in the storage industry, including marketing studies, the preparation of proposals and management of Government contracts, the transfer of technology for new inventions and training courses on CD-ROM and DVD. Clients include Digital, Honeywell, BTG, Philips and Epichem, and the company has led several DTI missions to Japan on data storage topics.

## Storage Computer UK Ltd

**address** Business Park, 5 Cleeve Road, Leatherhead, Surrey KT22 7NB  
**tel** 01372 376221 **fax** 01372 376834 **web site** www.storage.com  
**contact** Bill Greenfield

Support  
services

Storage Computer is a leader in the design of intelligent, investment-protected information storage platforms that simplify the process of consolidating, managing, accessing, migrating and safeguarding fast-growing Enterprise data assets, regardless of which open systems hosts or applications are deployed. Its customers are global companies in sectors such as finance, telecommunications and manufacturing. The company's storage solutions are used for business-critical applications such as OLTP, billing and customer care solutions, data warehouses, internets and intranets.

## Storage Concepts (Europe) Ltd

**address** 9 Lancaster Court, Coronation Road, High Wycombe HP12 3TD  
**tel** 01494 442202 **fax** 01494 450281 **web site** www.storageconcepts.com  
**contact** Chris Cuthbert **e-mail** info@storcon.co.uk

Support  
services

Storage Concepts is a leader in real-time high-performance fibre channel RAID 3 storage systems for the commercial, video, Government and medical markets. Its fault-tolerant systems are scalable to achieve sustained data rates of 100 MB/s.

## Tandberg Data (UK) Ltd

Support  
services

**address** Davenport House, Bowers Way, Harpenden, Hertfordshire AL5 4HX  
**tel** 01582 769071 **fax** 01582 769025 **web site** www.tandberg.com  
**contact** Steve Smith **e-mail** Steve.Smith@tandberg.com

Tandberg is the largest dedicated manufacturer of tape storage devices world-wide, specialising in linear tape storage covering three product families - NS-Travan, SLR and DLT - and offering capacities from 2 GB to 2 TB. The products are also available as fully automated solutions including autoloaders (SLR & DLT) and libraries (SLR).

In the UK, the company's technical support department has on-line access to facilities to reproduce customer problems, evaluate software and hardware and undertake failure analysis.

## Tap Systems Ltd

Support  
services

**address** Lyons House, 2 Station Road, Frimley, Surrey GU16 5HF  
**tel** 01276 685761 **fax** 01276 691090 **web site** www.tapsystems.com  
**contact** Andy Piper **e-mail** tapsys@tapsys.demon.co.uk



TAP Systems is a distributor and supplier of fast affordable hard drive copy and software downloading systems to many of the large IT corporate organisations and PC OEM manufacturers in the UK and Ireland.

The test and diagnostics team not only provides test solutions for hard drives, tape drives, optical drives, juke boxes, tape libraries, etc, but also a sophisticated range of SCSI bus analysers. TAP has a comprehensive service and support programme and maintains all its supplied equipment.

## Tapemaster Ltd

Manufacturer

**address** King George's Place, 764 Eastern Avenue, Newbury Park, Iford IG2 7HU  
**tel** 020 8518 4202 **fax** 020 8 518 4203 **web site** www.tapemaster.co.uk  
**contact** Laji Lalli **e-mail** tapemaster@msn.com

Tapemaster manufactures jewel cases for CD, CD-R and CD-RW.

## TDM Tape Services Ltd

Manufacturer

R&D and design

**address** Oxford Street, Long Eaton, Nottingham NG10 1JR  
**tel** 0115 972 0949 **fax** 0115 946 1953 **web site** www.tdmril.co.uk  
**contact** Greg Ward **e-mail** enquiries@tdmril.co.uk

TDM provides a magnetic media processing facility for open reel and cassette based formats. Services offered are magnetic media cleaning, certification and product customisation including end-of-tape leaders, windows and markers, a data recovery service, and a service for the stabilisation of magnetic media containing live data. TDM's wide range of magnetic media processing equipment

includes tape cleaners, evaluators and bulk erasers which are sold world-wide direct to the consumer or via agents. TDM provides professional support and back-up service to media users and manufacturers.

The company is Quantegy's authorised instrumentation product distributor, and has agreements with other manufacturers including Sony, Fuji, Maxell, Imation and TDK. It is also a distributor of Sony DAT & AIT Instrumentation Recorders and accessories.

## The Data Business Ltd

**address** Bankside, Kidlington, Oxford OX5 1JE  
**tel** 01865 852100 **fax** 01865 842223 **web site** www.databiz.com  
**contact** Franky Marulanda **e-mail** sales@databiz.com



The Data Business offers a wide variety of digital manufacturing and information delivery services and products, both outsourced where the company handles the project for its customers and insourced where the company provides the means for customers to do the work themselves.

The Data Production Group provides comprehensive outsource services in the production of CD, DVD, CD\_Card, Diskette and other offline media, as well as encryption, presentation, packaging, malining, distribution and fulfilment. The Data Online Group supplies a complete outsourced internet distribution service providing managed, confirmed delivery and tracking of software and other digital file updates. The data Resources Group supplies and support information and audio production technologies such as CD duplicators, printers and analysers, as well as a large range of associated blank media, components and consumables.

The Biz is the UK's authoritative data production buyers guide.

## Tiger Technology Ltd

**address** Tiger House, Kingston Road, Leatherhead, Surrey KT22 7NT  
**tel** 01372 361360 **fax** 01372 361370 **web site** www.tigertec.co.uk  
**contact** Terence W. Wright **e-mail** terry@tigertec.co.uk



Tiger designs and manufactures high-capacity solid-state disks, recorders and emulators for use where speed, ruggedness, and reliability are the dominant concerns. SSD/SSR products, with high performance industry standard interface options, are used in critical systems where conventional technology is not adequate - aircraft mission memory, for example.

Tiger also offers design services to larger organisations, including Government agencies. Routine tasks include the design of emulating disk and/or tape controllers to allow the best data storage technology to be utilised. Obsolete technology may be emulated without impact on the legacy host system software, but with improved reliability and environmental tolerance. Tiger will also supply, configure and adapt conventional disk and RAID solutions for the more esoteric applications and environments, allowing the target host interface to use recognised industry or defence standards.



## Trace Services Ltd

### Support services

**address** Unit 9, Business Centre, West Avenue One, Letchworth, Herts SG6 2HB  
**tel** 01462 484248 **fax** 01462 484987 **web site** www.trace-services.co.uk  
**contact** Craig Jones **e-mail** craig@trace-services.co.uk

Trace is active in the software manufacturing equipment sales and service industry. Its business is based on the floppy diskette market, with products including high-speed industrial duplication systems, low-cost desktop duplicators and peripheral equipment. More recently, Trace has introduced a range of professional CD-R duplication equipment.

## Transitional Technology International Ltd

### Support services

**address** TTI House, Beaumont Close, Banbury, Oxfordshire OX16 7RG  
**tel** 0870 2400475 **fax** 0870 2400472 **web site** www.tti.co.uk  
**contact** Andrew Brown **e-mail** andrew@tti.co.uk

TTi develops a wide range of tape backup and storage subsystems and libraries. Its products integrate all main tape technologies - 8mm, 4mm, DLT & DTF single and dual drive subsystems.

## Ultratec Ltd

### Support services

**address** Ultratec House, 11/12 London Road Industrial Estate, Baldock, Herts SG7 6NG **tel** 01462 490082 **fax** 01462 490083 **web site** www.ultratec.co.uk  
**contact** Ian Turnbull **e-mail** ian@ultratec.co.uk

The company has over 10,000 storage products in stock, including hard disks, DAT and tape products and more recently optical drives. The company wholly supports the third-party maintenance sector in terms of supply and repair/exchange on all of the above items. Other services include a 'no fix, no fee' data recovery service and a facilities management service aimed at customers who require help in managing their resources. Also offered to customers is a 'Data Destruction' service and recycling facility for their storage products.

## Ventura Computer Solutions Ltd

### Support services

**address** Unit 12, Robert Cort Industrial Estate, Britten Road, Reading, Berkshire RG2 0AU **tel** 0118 931 4050 **fax** 0118 986 0727 **contact** Bob Bushell  
**e-mail** bob@ventura.tele2.co.uk

Ventura specialises in the sale and repair of tape drives, ranging from 1/4 inch to DLT. It stocks many makes and models, and most of the drives are second-user and come with a six-month warranty. The company can supply new drives and other peripheral products including controller cards, cables, media and CD-ROM drives.

## Verity Systems Ltd

**address** Verity House, 2 Eastern Road, Aldershot, Hampshire GU12 4TD  
**tel** 01252 317000 **fax** 01252 316555 **web site** www.veritysystems.com  
**contact** David Tucker **e-mail** sales@veritysystems.com

Verity Systems manufactures and supplies audio, video, data and hard drive degaussers (erasers), CD sleeves, CD-R duplicators, cassette de-labellers and cassette assembly equipment.

The manufacturing base is in the UK from where the European and Asian sales are handled. Sales to North America and the Pacific Rim are dealt with by Verity Systems Inc based in California.

Manufacturer

R&D and design



## Vogon International Ltd

**address** Talisman Business Centre, Talisman Road, Bicester, Oxon OX6 0XJ  
**tel** 01869 355255 **fax** 01869 355256 **contact** Stephen Bird  
**e-mail** sales@vogon-international.com

Vogon International is a leader in data recovery for hard disk, tape, optical and other storage media and offers a comprehensive data conversion service. It also has expertise in forensic computing, offering hardware, software and service-based solutions to interrogate computer data and provide computer evidence. Vogon is the main supplier of forensic systems and services to Government agencies, including the police and Customs and Excise.

Support services

## Western Digital Corporation

**address** Fairmount House, Bull Hill, Leatherhead, Surrey KT22 7AH  
**tel** 01372 360055 **fax** 01372 360389 **web site** www.wdc.com  
**contact** Tom Davis **e-mail** tom.j.davis@wdc.com

Western Digital is a US-owned company that manufactures hard drives in the Far East. In the UK, it has sales and support offices in Leatherhead and Glasgow offering OEM technical support.

Support services

## Westpoint Peripherals Ltd

**address** Felton Lane, Felton, Bristol BS40 9UX  
**tel** 01275 474740 **fax** 01275 474760 **web site** www.wpoint.co.uk  
**contact** Charlotte Boardman **e-mail** cboardman@wpoint.co.uk

Westpoint has been involved with supplying, maintaining and repairing tape drives for over 13 years. Tape drives distributed are by ODI, Fujitsu, M4 Data and Tandberg Data involving 9-track, 3480/90/90E, DLT, QIC, Exabyte and DAT. Westpoint also provides data conversion bureau services and also now distributes and supports CD jukeboxes from Pioneer, JVC, NSM, Sony and Kodak. It manufactures its own virtual CD tower that serves the CD information from its own hard drive and may be administered through a web browser.

Support services

## Westwind Air Bearings Ltd

Manufacturer

R&D and design

**address** Holton Road, Holton Heath, Poole, Dorset BH16 6LN  
**tel** 01202 627200 **fax** 01202 627202 **web site** www.westwind-airbearings.com  
**contact** Stephen Ratcliffe **e-mail** stever@westwind-airbearings.com

Westwind is a leader in the design and manufacture of air bearings and associated measurement and control systems. Equipment is supplied to the information storage industry for the servowriting and testing of components for disk drives which uses air bearings and the company's design and development expertise to achieve high yield for the drive manufacturer.

## White Knight Products Ltd

Manufacturer

R&D and design

**address** 4 Hawthorn Road, Eastbourne, East Sussex BN23 6QA  
**tel** 01323 410111 **fax** 01323 410017 **contact** M J Mead

White Knight is a major UK manufacturer of injection mouldings - eg CD jewel cases, maxisingle boxes and multipacks - and is also able to design and develop special packaging for CD or video products.

## Xuis Software Ltd

Manufacturer

R&D and design

**address** Epsom Business Park, Kiln Lane, Epsom, Surrey KT17 1JF  
**tel** 01372 728881 **fax** 01372 722245 **web site** www.xuis.com  
**contact** Michele Tough **e-mail** sales@xuis.co.uk

XuiS develops and sells storage management software to provide the centralised control of mixed platform systems (NT/2000, UNIX, VMS) for backup, archiving and lights-out disk/file monitoring plus multi-platform job scheduling. It has distribution outlets in mainland Europe and the USA. The software products provide secure centralised control of distributed storage and operate successfully in many medium/large data centres world-wide. Reference sites are available in most business sectors and CDs are provided for software evaluation.

Services offered in the UK include storage audit, storage consultancy, training, telephone help desk and software installation.

## Xyratex

Manufacturer

R&D and design

**address** PO Box 6 Langstone Road, Havant, Hampshire PO9 1SA  
**tel** 023 9248 6363 **fax** 023 9245 3611 **web site** www.xyratex.com  
**contact** Paul Wetton **e-mail** paul\_wetton@uk.xyratex.com

Xyratex is a technology world leader in developing OEM solutions for the high-speed networking, digital broadcasting and data storage marketplaces. Xyratex's portfolio of products and services includes:

- analysis technology for data communications and enterprise networks



- high performance storage subsystems
- advanced manufacturing and test solutions for disk drive OEMs
- value-added manufacturing services
- solutions for Gigabit-speed digital product development and field support
- monitoring systems for the latest digital broadcasting applications.

Xyratex offers a strong technology base and commitment to providing a highly responsive customer-focused service, investing significantly in research and development to help customers in the technology race.

## Yamaha Kemble

**address** Media Technology Division, Sherbourne Drive, Tilbrook, Milton Keynes, Buckinghamshire MK7 8BL **tel** 01908 366700 **fax** 01908 368872

**web site** [www.yamaha.co.uk/online](http://www.yamaha.co.uk/online) **contact** John Heckathorn

**e-mail** [John\\_Heckathorn@infomta.post.yamaha.co.jp](mailto:John_Heckathorn@infomta.post.yamaha.co.jp)

**Support  
services**

Yamaha's Media Technology product range includes CD-ReWritable drives. In the UK, its technical support group and services department is starting a local repair operation.

## General contacts

For more information about DTI involvement, including further copies of this booklet (also available online at [www.photonics.org.uk](http://www.photonics.org.uk)), contact:

Steve Woodard  
Communications and Information Industries Directorate  
Department of Trade and Industry  
151 Buckingham Palace Road  
London  
SW1W 9SS  
Tel: +44 20 7215 1375  
Fax: +44 20 7215 1966  
E-mail: [steve.woodard@dti.gsi.gov.uk](mailto:steve.woodard@dti.gsi.gov.uk)

For more information about investment opportunities, contact:

Invest:UK  
Marketing Unit  
Room 308  
1 Victoria Street  
London  
SW1H 0ET  
Tel: +44 20 7215 2501  
Fax: +44 20 7215 5651  
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