

## ***Virtual Reality, The Early Years – A UK Perspective***

***Prof. Bob Stone, UK***

January 2021

**1985-1990:** Jonathan Waldern developed an early manifestation of a VR system at Leicester Polytechnic before moving to the University of Loughborough to study for a PhD, supported by IBM's Research Labs in Hursley, UK. Waldern's experimental system, known as the "Roaming Caterpillar" consisted of a large monochrome display mounted onto a mobile base with the cables and support structure covered by a ribbed tube of rubber (hence the name). Wire-frame images of a room were presented stereoscopically using an early field sequential head-mounted display, whilst the spatial location of the "caterpillar" was tracked using an acoustic location system. The end user's fingers were tracked in a similar fashion, enabling very simple grasping gestures to be made.



**1986:** A nationwide competitive invitation to tender exercise was launched by the UK's Department of Trade & Industry (DTI) to establish a National Advanced Robotics Research Centre, a focal point of expertise in the United Kingdom for research and engineering in the field of advanced robotic systems and associated technologies, including human-machine interfaces.

**June, 1987:** Bob Stone, at this time an employee of the British Aerospace Sowerby Research Centre (Human Factors Department) in Filton, Bristol, was attending a Low Earth Orbit Space Maintenance conference at NASA Goddard Spaceflight Center in Maryland part of research addressing teleoperation for the European Space Agency). Whilst in the US, he was invited to visit NASA's Ames Research Laboratories in Moffat Field (south of San Francisco). Here he experienced one of the earliest variants of the NASA Virtual Environment Workstation (VIEW) Project, courtesy of NASA's Steve Ellis and Scott Fisher.



**July, 1987:** The success of a bid for the National Advanced Robotics Research Centre, led by Salford University Business Services Limited was announced by the DTI. The plans contained within this bid proposed the creation of a National Centre, run by a Company - Advanced Robotics Research Limited (ARRL) - to carry out generic and focused research areas central to the study and (ultimately commercial) application of advanced robotics. The Research Programme - a small part of which was, in 1989, to include Virtual Reality - was supported by DTI funding to the tune of £5 million, plus resources contributed by a number of collaborating industrial and academic organisations.

**October 1987:** W Industries was founded in Leicester by Jon Waldern, Al Humrich, Richard Holmes and Terry Rowley. Originally working from their garages in the early days, they later moved to a small building on an industrial estate on the outskirts of Leicester.

**June, 1988:** The UK's National Advanced Robotics Research Centre was officially launched in Salford.

**May, 1989:** Bob Stone left British Aerospace's Sowerby Research Centre in Filton, Bristol, to join the National Advanced Robotics Research and launch its Virtual Reality and Telepresence research project under the generic title of "GR6 - MMI" (Man-Machine Interfaces).

**1989:** Division Ltd was founded by Charles Grimsdale from Perihelion and colleagues from Inmos.

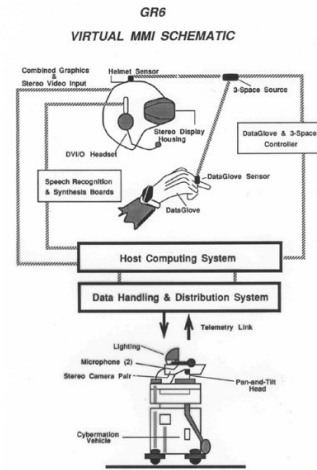
**March, 1990:** The world's first tactile feedback glove was tested. *Teletact*, developed by ARRL and Airmuscle, was a pneumatic prototype, initially consisting of 20 small "airpockets" distributed throughout the lower part of a Lycra glove and fed by micro-capillary tubes, was originally designed to be used in conjunction with VPL's *DataGlove*. In fact a commercial agreement along these lines was under development when VPL filed for bankruptcy in 1990.

**4-9 March, 1990:** The US Engineering Foundation staged one of the most important early events in the international history of VR - a conference entitled ***Human-Machine Interfaces for Teleoperators and Virtual Environments***. Held at the Sheraton Hotel in Santa Barbara, and co-chaired by Tom Sheridan and Nat Durlach (MIT), the conference drew together all of the "big" names to be in the world of VR - from VPL to Crystal River and NASA; from UNC to Exos and Fake Space Labs. ARRL's Bob Stone represented the UK with two poster presentations on the Centre's telepresence programme (including the first exposure of the *Teletact* concept to the world) and other development work in telerobotics for the European Space Agency. The *Teletact* feedback glove concept drew considerable attention from the American delegates.

**July, 1990:** Division's first commercial VR T800 transputer-based (36 in total) computing engine - *Vision* - together with the Company's proprietary parallel operating system, *dVS*, was commissioned by ARRL.

**July, 1990:** Howard Rheingold visited the UK to research VR/telerobotics work for his forthcoming book. Hosted by ARRL's Bob Stone, he attended demonstrations at the Atomic Energy Authority's Laboratories in Culham (to view a BAe-ARRL-AEA telerobotics test bed developed for the European Space Agency), Division Ltd (then based in Chipping Sodbury), ARRL and Airmuscle Ltd. Both Rheingold and Stone appear on a popular late-night Manchester-based Granada TV programme, *What's New*:

<https://www.youtube.com/watch?v=KN1TDd7gD70&list=PL3jwpz8y63iHy0CQHROxksJE4nvuilHDN&index=5>.



**September, 1990:** Division and ARRL held a joint UK press launch of the *Vision System* at the Royal Society of Arts in London.

**October, 1990:** BBC's *Tomorrow's World* ran a TV feature on the first prototype *Teletact Glove*, featuring a variety of vegetables and Henry the Angora Rabbit as a tactile subject!

[https://www.youtube.com/watch?v=jN1R36\\_4Jsw&list=PL3jwpz8y63iHy0CQHRoxksJE4nvuiIHDN&index=7&t=45s](https://www.youtube.com/watch?v=jN1R36_4Jsw&list=PL3jwpz8y63iHy0CQHRoxksJE4nvuiIHDN&index=7&t=45s)

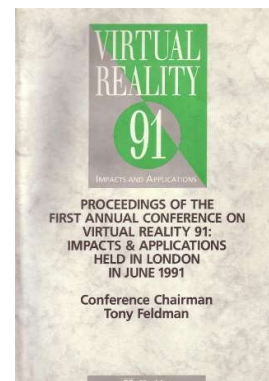
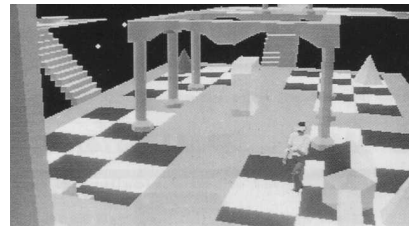
**November 1990:** W Industries' stand-up ("SU") VR gaming unit was launched at the *Computer Graphics 90* exhibition, held at London's Alexandra Palace. Early units had been sold to British Telecom for experimentation at their Laboratories in Martlesham Heath, after which the production of them began producing the arcade units began. The BT units were far from successful, as the researchers there discovered very quickly that the W Industries team had seriously locked down the supplied hardware and software, even going to the extent of reversing the on-screen code text in an attempt to dissuade purchasers from developing their own applications.

**1991:** W Industries' *Virtuality 1000CS* system, hosting the game *Dactyl Nightmare*, makes its debut at arcades (referred to by the company as "Location-Based Entertainment Centres") across the UK – beginning with the Trocadero in London.

**08 May, 1991:** BBC2 ran the UK's first hour-long *Horizon* TV programme exploring the past present and future of Virtual Reality. Produced and directed by Max Whitby and Ian Duncan of Windfall Films, the programme - *Colonising Cyberspace* - was the first thorough coverage of key developments in VR, particularly in the US, but with mention of the robotics and VR work of Bob Stone's team at ARRL as well. Other well-known names in the feature included Jaron Lanier, Tom Furness and Scott Fisher.

<https://www.youtube.com/playlist?list=PL0941D7A0A412CFB6>

**June, 1991:** The UK's first annual conference and exhibition on VR - *VR'91 Impacts and Applications* - was held at the Conference Forum in the East of London, featuring such speakers as Bill Bricken, Eric Gullichsen, Charles Grimdsdale, Bob Stone, Jon Waldern Myron Krueger and Ian Andrew. A "new" face appeared on the VR scene in the shape of John Hough. His company, Strategy In Computing (SIC; involved in the provision of bespoke accounting services), was investigating future technologies for involvement and investment, including VR. Another newcomer at this time was a company called Virtual "S", based in London and claiming to offer the world's first fully equipped VR studio for use by industry and others (this turned out to be a basement housing a Division VR system as part of an already-established music studio!). Official launch of the *Teletact 1* Tactile Feedback Glove and of a tracked handgrip



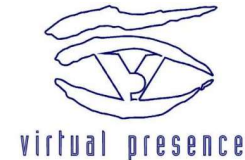
or “wand” controller with *Teletact* pneumatic “tactors” for VR applications (the *Teletact Commander*).

**June 1991:** Incentive Software (later to become Superscape plc) launched its *3D Construction Kit* using the company’s *Freescape* engine and available for multiple computer platforms/Operating Systems (including IBM PC/DOS, Acorn, Amiga, Sinclair Spectrum, Commodore and Atari). An upgraded version of the software - *3D Construction Kit II* was to be launched in November of the following year

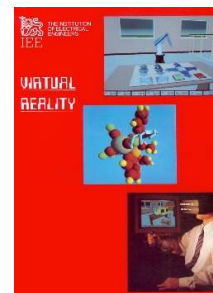
**July, 1991:** Division Ltd’s second commercial transputer-based VR computing engine - *SuperVision* - was commissioned by ARRL. *SuperVision* was based on a scalable communications architecture called a “High Speed Link” (200 Mbytes per second) between two Intel i860 image generation processors. These processors were controlled by the existing *Vision T800* architecture.

**November, 1991:** Computer Graphics ‘91 was held at Alexandra Palace in London. John Hough’s Virtual Presence Limited, the result of a measured investment by SIC (and to become the UK’s main user and reseller of Sense8’s WorldToolkit for many years), had its first public “airing” as part of the exhibition.

**February 1992:** The first UK “home-grown” VR newsletter, *VR News*, was issued by Cydata Limited (run by Mike Bevan), with items covering Apax’s investment of £2.4 million into W Industries, Division’s first sales by its Japanese distributor Matsushita Electric Works of Osaka, and the first use of VR (Superscape) in a school in West Denton (Newcastle) to teach French.

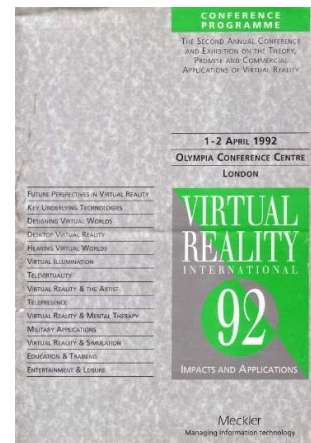
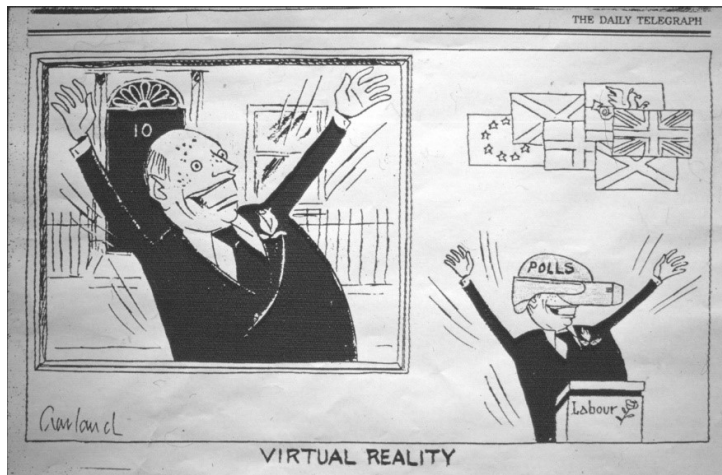


**1992 to 1994:** The IEE (Institution of Electrical Engineers – today the IET) invites Bob Stone to deliver their Silvanus P. Thompson lecture series, with the title “Virtual Reality”. The lectures, sometimes being presented 2 to 3 times a month over the 3 years, were held across the mainland UK, Northern Ireland, the Republic of Ireland and even Germany. For many, the talks were bolstered with VR demos, using ARRL’s *Vision VR* system.

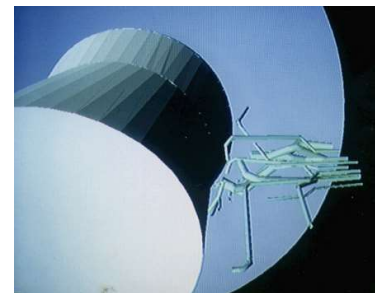


**April, 1992:** Rolls-Royce began a VR evaluation project with the ARRL Team, as a complementary interactive technology to its established aero engine computer-aided design practices. VR International '92 was also held this month, at the Olympia Conference Centre in London, featuring a now-familiar range of topics.

Also this month, VR started to appear in satirical press cartoons, including in *The Daily Telegraph*, suggesting that Neil Kinnock's ambitions to become Prime Minister were no more than a virtual reality.



**October, 1992:** Rolls-Royce's DPA CAD data were displayed in VR form for the first time. Some of the Company's Computervision CADD54X files of a Trent 800 civil engine were converted to run in Division's dVS on a SuperVision System. Although of a very primitive quality and low frame/refresh rate, the demonstration confirmed the feasibility of CAD data conversion and was well received by Rolls-Royce representatives.



**November, 1992:** With the DTI funding having come to an end, and in an attempt to raise the profile of ARRL and Division's work in the fields of telerobotics and VR, a demonstration was staged at the House of Lords, "sponsored" by the Lord Wade of Chorlton and the DTI. The presentations and demonstrations lasted all of 2 hours. One of the highlights of the event was the attendance of Edward Simons, Chairman of the Allied Entertainments Group and one of the Executive Producers of the film *Lawnmower Man*.



**December, 1992:** Bob Stone was invited to give a Christmas Lecture to the DTI (Information Technology Division) on Virtual Reality. The possibility of a VR technology transfer “road show” was discussed for the first time (only to be revisited during 1996 to 1999 when the DTI finally acknowledged the need for an awareness campaign!). Elisabeth Geake, Technology Reporter of the UK’s *New Scientist* magazine, published a small article mainly covering Division’s *ProVision 100* launch. In passing, statements were made about the lack of funding for VR research and development in the UK, especially as, in the main, companies had single-handedly helped to nurture the Country’s European lead through investment of their own scarce funds. The DTI event mentioned above were described with regard to Stone’s “intention” to deliver a few “home truths” to national research funding bodies. As with many press features, these comments were well-and-truly taken on board and the article appeared in the 12 December edition (*New Scientist*, No.1851; p.18)...

## NewScientist

The World's No.1 Science & Technology News Service

### Technology: Britain urged to coordinate reality research

12 December 1992  
From New Scientist Print Edition.  
ELISABETH GEAKE

Britain's lead in research into virtual reality will be lost without government support, according to Bob Stone of the National Advanced Robotics Research Centre in Salford. Stone is meeting with the Science and Engineering Research Council and the Department of Trade and Industry later this month and will tell them: "You back us up so that we keep our lead."

He says that although Britain is a world leader in some aspects of virtual reality, especially exploiting the technique commercially, there is a great deal of duplication of effort in research. Virtual reality in this country has largely developed in industry rather than in universities. And because of competition between companies results are not disseminated as quickly as in academia, so several research groups are doing almost identical work. Stone wants the DTI and SERC to fund and coordinate research, as they do for artificial intelligence and neural networks.

Although several British companies are selling computer systems and software to design and run virtual reality programs, almost all the peripherals that are necessary to control them, such as helmet displays, joysticks and gloves, are made in the US. Stone does not think this is important. "In Britain we have the talent to use the technology, whether it is indigenous or not. To do that requires national commitment. If we can get advanced manufacturing and industries to exploit virtual reality, that's where our forte lies."

Last week, the latest British virtual reality system was announced by Division, based at Almondsbury near Bristol. The ProVision 100 is a computer system with software which converts data such as simulations of drug molecules or architect designs from a two-dimensional format into three dimensions. The 3-D graphics are viewed and manipulated with displays and joysticks from other manufacturers.

Philip Atkin of Dimension claims that ProVision is the first system using a helmet display that comes ready to convert and run virtual reality programs. But Stone says it is not that easy yet: the simulation data has to be in the correct form first.

Silicon Graphics, a computer manufacturer which specialises in graphics, says 2-D simulations displayed on its ordinary computers need no conversion to run on the company's Reality-Engine virtual reality computer, which was launched two weeks ago. At £36 000, it costs almost twice as much as ProVision.

Division demonstrated an astronaut training program last week which it developed in collaboration with TNO, the Dutch government's research organisation in The Hague. It teaches two astronauts to manoeuvre themselves in space with small booster rockets, so that they can remove a part on the outside of a space module. The astronauts have to communicate and work together while they cope with the disorientating effect of zero gravity, and the problem of moving and stopping in zero friction.

Two of the company's directors gave a polished performance of removing the part, but the journalists who tried it were lost in space, tumbling away from each other and the mock-up of Columbus, the planned European part of the international space-station. Atkin says such a virtual reality system could be sent into space to keep astronauts trained during a long mission.

From issue 1851 of New Scientist magazine, 12 December 1992, page 18



*“...Stone is meeting with the Science and Engineering Research Council and the Department of Trade and Industry later this month and will tell them: “You back us up so that we keep our lead””.*

**January, 1993:** The BBC, having read the *New Scientist* article, decided to send a film crew to Salford early in January, with the aim of running a VR feature on the *9 O’Clock News*. Another coincidence helped to make the feature a success. It just so happened that, at the time of filming, ARRL was in the process of evaluating one of the first new Silicon Graphics *RealityEngines* in the Country. The feature was not screened immediately after the filming session, due to the Gulf War and Operation Desert Storm. Nevertheless, the piece was finally transmitted on 19 January. The VR feature, presented by the BBC’s Science Correspondent James Wilkinson, lasted for a substantial 3½ minutes (<https://www.youtube.com/watch?v=MA51LBTwiOk&list=PL3jwpz8y63iHy0CQHROxksJE4nvuiiHDN&index=3&t=5s>) and included an immersive fly-through of the Rolls-Royce Trent 800 Engine demonstrated 3 months prior, Silicon Graphics’ “Performer Town” demonstration hosted on the *RealityEngine*, simulated nuclear fuel rod recovery modelled using an American simulation product called IGRIP (Deneb Robotics Inc), and some early molecular modelling research carried out by the University of York for Glaxo. It also included an inaccurate statement by Edward Leigh, then a Minister for the DTI :



*“...If it is apparent that there is a market failure in this industry, then we will consider investing in this further. Certainly our colleagues in the Science and Research Council are still investing in this project and so the Government is committed to it and is committed to making it work”.*

**January, 1993:** Organised by Nautilus Projects, Europe’s “first” Virtual Reality open event (the “first” claim for the benefit of the European Commission dignitaries and visiting members of the general

public) was held at the Paleis der Congressen In Brussels. From the UK, Bob Stone, John Hough (Virtual Presence) and Barrie Sherman (co-author of *Glimpses of Heaven, Visions of Hell: Virtual Reality and Its Implications*) were in attendance.

**January-March, 1993:** The UK's first non-headset-based VR game show, *Cyberzone*, went live on BBC2. Hosted by Craig Charles (of *Red Dwarf* fame), the show was based on environments and challenges developed using the Superscape Virtual Reality Toolkit, together with one of the most primitive competitor navigation interfaces ever to be witnessed! The series ran for only 10 episodes.



**March, 1993:** Virtual Presence Limited separated financially from Strategy In Computing following a decision that the former company was now a viable trading entity.

**April, 1993:** VR International '93 was held in London.

**May, 1993:** Division Ltd became the first VR company in the world to receive a stock exchange listing.



**July, 1993:** Under the direction of Bob Stone, with technical coordination by Andy Connell, Advanced Robotics Research Limited launched its Virtual Reality & Simulation (VRS) Initiative. This was the first VR programme in the world that was fully funded by the industrial sector in an attempt to share experiences before committing to adoption. The "try-before-you-buy" Initiative was officially launched by the Lord Wade of Chorlton and was initially supported by Bell Northern Research (Europe), British Nuclear Fuels plc, GEC Alsthom Engineering Systems Limited, Hunting Engineering Limited, ICI Chemicals & Polymers Limited, M W Barber Group Limited (an SME involved in surveying and civil engineering), Multi-Design Consultants Limited (architectural design SME), North West Water Group, Rolls-Royce plc, United Kingdom Nirex Limited, University of Salford, Vickers Shipbuilding and Engineering Limited (today part of the BAE Systems empire) and Westlakes Research Institute.



**18 October, 1993:** Virtuality floated on the London Stock Exchange, raising £9.5m, followed shortly thereafter by the launch of the company's Sit-Down ("SD") system at Wembley Stadium in London.



**08 November, 1993:** Superscape VR plc (previously Dimension International and originally Incentive Software Ltd.) was founded.



**1994:** John Hough of Virtual Presence sold his interests in Strategy In Computing to concentrate on the trading activities of Virtual Presence Limited.

**February, 1994:** VR International '94 was held in London. This was the last annual conference under the Meckler banner in the UK, with many comments being made about the lack of any significant developments and presentations by the same old speakers giving out the same old tired messages.

**01 March, 1994:** Superscape launched its Virtual Reality Toolkit (VRT) product.

**14 March, 1994:** The first UK VR-SIG Conference was held at Nottingham University (<https://www.seanclark.me.uk/uploads/proceedings-of-the-1st-uk-vr-sig-conference-1994.html>)

**01 April, 1994:** Advanced Robotics Research Limited was renamed Intelligent Systems Solutions Limited (InSys), representing the final step in the separation of the company from the original DTI Advanced Robotics grant.

**28 April, 1994:** Shares in Superscape VR plc commenced trading.

**1994:** InSys was awarded a contract to set up a new Minimally Invasive Therapy Research Unit, co-directed by Bob Stone and surgeon Rory McCloy, specifically to evaluate possible VR solutions for the future of keyhole surgery training (this was a collaborative project with Manchester Royal Infirmary, the Department of Health and the Wolfson Foundation).

**1995:** InSys signed a strategic alliance with Russia's Advanced Simulation Research & Development Centre (Moscow) and the International Higher Education Academy of Sciences, with the aim of helping researchers there to enter the VR arena by developing the first interactive 3D model of the *Mir* Space Station.



**1995:** Following 12 months of intensive human-centred research by Bob Stone in collaboration with Manchester Royal Infirmary's Rory McCloy, *MIST<sub>VR</sub>* – the world's first laparoscopic surgical skills trainer was launched. *MIST<sub>VR</sub>* was about to embark on an intensive series of psychological and clinical trials by researchers in the US and Continental Europe which would culminate in the system becoming a *de facto* basic skill training standard for a decade to come.



**June 1995:** InSys was contracted by Salford City Council to develop and stage a live demonstration of a VR "fly-into" of one of L.S. Lowry's famous paintings, *Coming From The Mill* (circa. 1935), as part of a Lowry Centre project proposal meeting attended by Executives from the Millennium Commission, the Arts Council and the National Heritage Memorial Fund. The contract, which was awarded on 23 June, 1995 was scheduled for completion only 12 working days later on 10 July, 1995, the day of the Commission Executives' visit!



**July, 1995:** Sainsbury's unveiled its "Virtual Supermarket" project, completed as part of the InSys VRS project. Ensuing press coverage was calculated to represent circa £1.3 million in marketing terms.

<https://www.youtube.com/watch?v=LnEWO0h5Gjo&list=PL3jwpz8y63iHy0CQHROxksJE4nvuilHDN&index=10>



**03 July, 1995:** During the television advertisement break at around 21:20 on the UK's *Channel 4*, a shepherd was seen to don a VR headset and "fly" for a brief 4-second period across a virtual representation of fields in Cumbria, in the North of England, in search of a lost virtual lamb. This



sequence had been filmed in support of a TV commercial, “Where Science Never Sleeps”, advertising British Nuclear Fuels’ recently refurbished Sellafield Visitors’ Centre. The VR sequence was produced by Virtual Presence, under contract to BNFL. The model of West Water in Cumbria (covering some 15 square kilometres) was produced mainly by hand, using a graphical modelling package called MEDIT and hosted on a Silicon Graphics *RealityEngine*<sup>2</sup>.



**October, 1995:** InSys’ VR Division commenced trading as VR Solutions Limited.

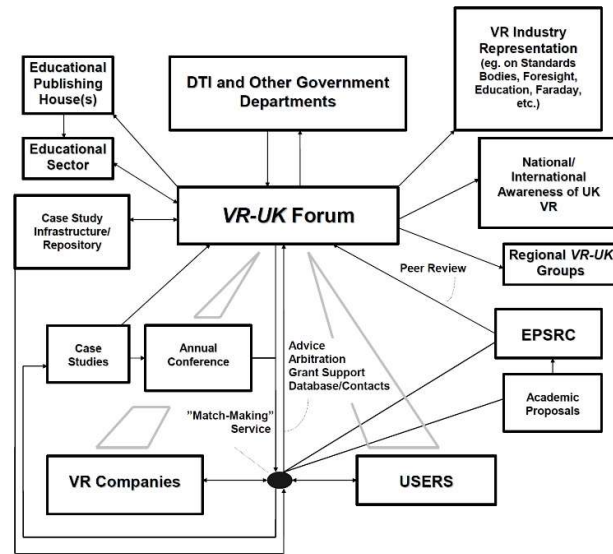
**March-May, 1996:** The UK’s first headset-based VR TV game show, *Relatively Speaking*, went live. With the VR technology and virtual worlds developed by VR Solutions, the show was hosted by Gordon Burns, star of another TV programme, *The Krypton Factor* and, more recently, a news presenter on BBC 1’s *North West Tonight*. *Relatively Speaking* was a show about families, each competing to demonstrate their verbal communication skills in a variety of challenges involving detailed description and precise instruction. The final challenge placed one family member in an immersive virtual environment and provided the remainder of the team with a partially accurate map of the area. By constantly exchanging information, the immersed player had to find his or her way to a pre-specified point, seize an object or find sets of clues and escape within a set time. The programme only survived six episodes!



**June, 1996:** The late Sir Patrick Moore hosted the Summer Solstice launch of the first ever *Virtual Stonehenge* demo at the London Planetarium. The Project was coordinated by English Heritage and sponsored by Intel Corporation (UK). The main VR model was developed using Sense8's WorldToolKit.



**July, 1996:** Under contract to the DTI, VR Solutions publishes the results of its "Competitive Study on the Virtual Reality Market", including proposals for the establishment of a VR-UK Forum, a cross-industry body, industry-led and underpinned by the UK Government. Such a Forum, it was suggested would comprise ... "...Virtual Reality practitioners and users in the UK whose main aims are: (a) to promote national and international business opportunities through a coordinated campaign of awareness, (b) to present itself as a body of competence in the field of VR, acting as a focal point for independent advice and guidance, (c) to foster consistent technical and commercial excellence through the coordination of research, development and educational programmes, and (d) to provide advice and guidance in the exploitation of the results of such programmes throughout the VR industry".



**April 1997:** Sponsored by BNFL (through the Greater Manchester Shrievally Police Trust), the *Crime Conquest* VR project was launched, an ambitious project to use VR to support Police engagement with over 300 secondary schools in the Greater Manchester area. The aim of *Crime Conquest* was to use VR technology to interest and involve young people in crime prevention, particularly in the areas of drugs, bullying, youth disturbances, criminal damage to homes and schools, vehicle theft, shoplifting and personal safety;

**11 February, 1997:** Virtuality Group plc obtained a High Court Order for the appointment of administrators.

**18 November, 1997:** Virtuality Group plc was declared bankrupt.

**June, 1997:** VR Solutions Limited was sold, to become part of Virtual Presence Limited (VP Northern Division).

**September, 1998:** the *Crime Conquest* VR package, developed using Superscape's VRT and published on a CD, was distributed to some 300 schools in ten local authorities of the Greater Manchester area. The package exploited VR by allowing

# Harsh realities hit Virtuality

BY ROGER NUTTALL

A WORLD-LEADING British virtual reality company last night tumbled on the edge of real bankruptcy, leaving a trail of shattered hopes, furious investors and unhappy City financiers.

Shares in the company, Virtuality, were floated three years ago. Excited punters bought them at up to 260p on the first dealing day, and 320p a few weeks later. They still fetched 250p last summer.

But huge and unexpected losses brought them crashing to earth last autumn. And yesterday they were suspended at 68p "pending clarification of the company's financial position".

Few expect to see them listed again.

Virtuality's brief and unhappy history is a sad tale of ineffable optimism betrayed by unfulfilled promise.

As far back as March 1994, the company talked of a prime-time virtual reality game show. To be produced in partnership with Central TV. It was shelved before a single episode was shown.

Then there was its headset for Atari games machines, abandoned before the planned launch in December 1995, and an ill-conceived decision to manufacture whole machines instead of licensing out the brilliant technology devised by Virtuality's boffin-in-chief, Dr Jon Waldern. Ingrid von Henschel

of brokers Beeson Gregory was bitter yesterday. "I made them a 'sell' a couple of months ago, half-expecting an angry telephone call to put me right," she said. "I didn't hear a word."

"Now I guess they have just run out of money. The announcement doesn't surprise me at all. I am rather surprised they managed to keep going this long."

Chairman Denis Orbyn's own credibility, already shaky, is now shattered. Last October, reporting unexpectedly big losses of £3.8 million — more than £1 for every £1 of Virtuality's sales — he said: "Prospects are better than at any time since flotation."

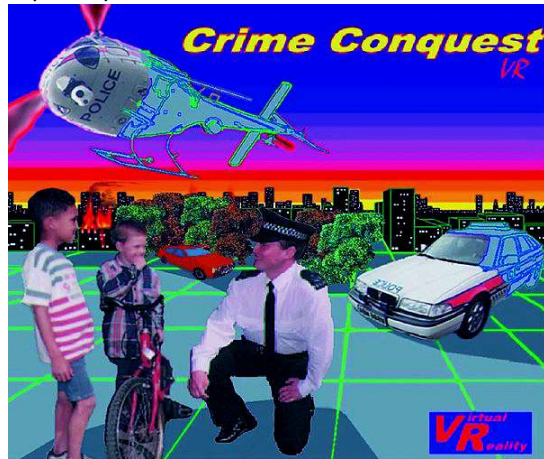
Few believed him then: nobody does now.

Yesterday, a few optimists talked of rescue bids from Philips or Motorola, who both own stakes in Virtuality.

But if they want to stay in the VR business, they are more likely to swallow their losses — and try to hire Waldern and his team.

WALDERN: Unexploited ideas

schoolchildren to “enter the bodies” of different virtual participants. Their decisions at crime scenes involving people and property would dictate what happened next. As witnesses, they had to be observant. For instance, having briefly seen the driver of a stolen vehicle, how close would their match be when invited to use the identikit computer within the VR town police station? When playing the rôle of a police officer, they would have to make fair and just decisions. For example, were teenagers outside an elderly person’s house causing a nuisance or, worse still, exchanging drugs? Although the system was originally designed for presentation to children of 11 years and older, children from 3 to 17 enjoyed using the software, which had been designed in keeping with some of the aims of the IT components of the National Curriculum



**March, 1999:** Parametric Technologies Corp (PTC) acquired Division plc for \$34.5 million and 591,000 shares (common stock).

**June/July 1999:** A change of CEO and focus for Superscape plc – Kevin Roberts (previously the CEO of a number of high-tech US organisations) took over the helm from John Chiplin with the aim of changing the company’s focus from VR to “3D e-commerce”, in collaboration with an extensive US network.

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## The Real Thing

By SAMANTHA HILL/LONDON Wednesday, Oct. 13, 1999

Defining virtual reality (VR) through its media image or from recent movies like The Matrix and eXistenZ, you might be tempted to conclude it is the dark side of technology, which will eventually take over the world in the last days of the military industrial complex. But the reality, of course, is that the evils that it turns out to be associated with the

**Game over? Not quite.** Mike Bevan, editor of industry newsletter VR News, says the annual global revenue from sales of VR hardware, software and services sits somewhere "between \$500 million and \$1 billion, and is growing at the rate of 50% per year." Over the last decade, while the world indulged its Internet obsession, VR has quietly found a lucrative niche in industrial research and prototyping. And the surprisingly practical ways in which VR is already invading our reality, from the design of our cars to the layout of grocery stores, will only increase as the cost of technology falls.

the uncomfortably heavy head-mounted devices and clumsy data gloves to graphical resolution so cartoonish and jerky it made people feel nauseated.

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