Paul Roderick Noel Kellar

Born: 2nd June 1948, Cambridge, England

Nationality: British

Educated:

1957 to 1966: Christ's Hospital School[1]

1966 to 1971: Rolls-Royce Ltd., Derby

University Apprenticeship

1967 to 1970: St. John's College, Cambridge

Part I: Mechanical Sciences Tripos: 2:1
Part II: Electrical Sciences Tripos: 2:2

Career:

1966 to 1970: Rolls-Royce Ltd., Derby

1970 to 1972: Rolls-Royce and Associates, Ltd., Derby

Electronics Engineer

1972 to 2006: Micro Consultants Ltd., and Quantel Ltd., Newbury[2]

1972: Digital Design Engineer

1973: Manager, Video Unit

1975: Group Head, Video Systems

1982: Research Director

2006: The Taylor Kellar Partnership

Consulting Engineer

[1] I was presented to Christ's Hospital by Sir Barnes Wallis FRS

[2] These two companies were in effect a single entity, ultimately known as Quantel. I worked for both companies interchangeably. See Appendix II: a short history of Micro Consultants and Quantel.

Personal Honours and Awards:[3]

1984:	Appointed MBE for services to Industry
1988:	The MacRobert Award (team leader)
	"For the development of the Paintbox television graphics system and the Harry video editing system"
1992:	National Academy of Arts and Sciences
	Emmy Award
	NBC Technical Team Studio, Games of the XXV Olympiad
	"Paul Kellar Technical Director"
1994:	Fellow of the Society of Motion Picture and Television Engineers
1996:	National Academy of Arts and Sciences
	Emmy Award
	NBC Technical Team Studio, The Centennial Olympic Games
	"Paul Kellar Video Engineer"

[3] Micro Consultants and Quantel won many honours and awards during this time. The ones listed here are those associated with me personally; others (Queen's Awards to Industry and Emmys, for example) are listed in Appendix I: Quantel Honours and Awards.

Achievements: **P R N Kellar's contribution to Quantel's products**

Although as Research Director I was in overall charge of the R&D Department under the leadership of Richard Taylor, I list below only those products for which, at the time, I was solely or jointly responsible both as a team leader and as an engineer.

Patents referred to in this section are those in which I was a named inventor, and are listed on page 10 below. I should make it clear that many, if not all of the products described here are also covered by further patents from other Quantel engineers.

1973: I was appointed to lead the team which started with the working 8-bit 15MHz Analogue-to Digital converter and advanced it into the first viable production unit of this speed, resolution and aperture time jitter. One of the many fascinating challenges in this folding-amplifier technique was temperature stability of the bias across the Schottky diodes, and UK patent 1,477,842: 1975 reflects a design improvement in this area.

The Micro Consultants range of ultra high speed analogue to digital converters received a Queen's Award to Industry in 1975.

1975: With the direct technical leadership of R J Taylor, I designed the prototype 'Intellect' image processing system. This was the first framestore-based image analysis system which could accept and display live video, while at the same time allowing fast random access to the framestore from a read/write computer port. As well as the technical challenge of building a complete framestore in a practical size, the simultaneous access called for a very sophisticated store control and address mechanism. Richard Taylor's contribution to this area would prove immensely valuable to the later product developments.

Intellect was demonstrated in the Royal Society Summer Conversazione in 1980.

The Intellect range of image processing equipment received a Queen's Award for Technology in 1980.

1975: I created the DFS 3000 Framestore Synchroniser by combining Richard Taylor's Intellect system[4] with Quantel's video interface mechanisms. At a time when conventional wisdom declared that even a fieldstore was at least one six-foot rack full, a complete framestore system in only 8.75 inches was both a bold step and a very important engineering advance. All the possible advantages of small size were indeed achieved (low power, ruggedness, reliability, ease of use), and this device went into production in early 1976. Unaware that the encoded

[4] RJT had designed Intellect's framestore control to be inherently capable of asynchronous read/write cycling.

composite video in the store made such a demand unreasonable[5], creative users overruled engineering by requiring a small picture insert in the corner. It was in response to this requirement that I invented a video compression technique for encoded data (UK patent 1,576,117: 1976) which was installed just in time for successful use in the 1976 Montreal Olympics.

1976: After the success of the fixed quarter-size compressor in the DFS 3000, the demand for a continuously variable live electronic picture zoom became more strident. I designed and built the prototype DPE 5000 zoom machine[6], and it was launched in March 1977. I then led the team which made a production version for delivery in March 1978. Unsurprisingly, the challenges of moving from the technical miracle of a quality live image size change to a useable studio system required significant further innovation, such as the ability to track an incoming chroma key and freeze a live picture. Inventions to address these two problems are recorded in UK patents 2,013,488: 1978 and 2,030,419: 1979.

While 30 years later the DPE 5000 looks crude, several other companies' attempts had all failed to achieve picture quality, reliability or just plain usefulness, and the DPE 5000 was the first digital zoom machine in the world to achieve widespread use and commercial success.

Quantel received a Queen's Award for Technology in 1978 for general digital television techniques.

The DPE 5000 received an Emmy Award in 1980.

1978: The DSC 4000 standards converter was a development from the DPE 5000 which addressed the engineering challenge of a different frame rate at input and output and the need for temporal as well as spatial interpolation. As with the DFS 3000 Synchroniser, it was a world first for a Standards Converter to be a utility unit rather than a major fixed item of Plant.

1979: Once again responding to customers' demands, I invented a scheme which linked the key elements of five DPE 5000 mainframes into a new combiner to allow multiple video channel operation. This was the first realistic multi-channel video system (as with the single-channel DPE 5000, other earlier attempts were rejected by users for unreliability, poor picture quality and a total lack of flexibility: the three classic challenges which we had to face). A major challenge was the dynamic control of the relative priorities of five small pictures; the solution to this was protected by UK patent 2,063,616: 1979. This system, the DPE 5000 Plus, was first used by ABC for the 1980 Lake Placid Winter Olympics.

[5] At this time, the technique was to sample encoded video at an exact multiple (3 times) of the colour subcarrier. Hence the need for an analogue-to-digital converter with a very precise sample aperture (100ps).
[6] This prototype is in the possession of the Science Museum.

The DPE 5000 range of effects machines received a Queen's Award for Technology in 1983.

1980: I led the team which built the DLS 6000 Library system. This, like the DPE 5000 before it, needed both innovative hardware – three framestores were used - and software technology. As well as a proprietary picture-optimised interface to the rather basic Winchester discs of the time[7], a unique videotape-based archive system was invented which, for the first time, gave users a realistic replacement for the filing cabinet (UK patent 2,085,206: 1981) and an innovative control mechanism was created to achieve a product which replaced the use of 35mm slides in the broadcast industry. The DLS 6000, and its later replacement 'Picturebox' remain industry workhorses to this day.

Quantel received a Queen's Award for Export in 1980.

1980: The development of Paintbox started at this time. Richard Taylor clearly identified that the fundamental challenge was to create a system which would paint a line 'as if a camera had looked at a real painted line'. Without a solution to this issue real pictures could not be created live by real artists. The solution was twofold: a bell-shaped brush of colour was blended with the existing underlying image, and this 'stamping' was repeated rapidly, overlapping previous stamps, as the brush was moved by the artist. Interestingly, although this sounds more like the behaviour of a real airbrush, it also worked very well for a conventional paint, pencil, crayon or even chalk line. A further refinement added by another team member was to vary the power of each stamp in accordance with the artist's manual pressure on the 'pen'. After the initial major invention (UK patent 2,089,625: 1980) I remained very involved with the overall scheme, which proved quite demanding to implement, and I also contributed significantly to the block diagram of the system.

1981: Following the very successful launch of the prototype Paintbox in March, it was clear that major second inventive steps were needed. Having created a machine with which artists could paint original pictures, we now needed to enable graphics artists to use the system for creating graphics as well as original art. This meant that elements of existing images had to identified and added to a new graphic in a way which did not destroy belief in the new image. Our unique previous experience with multiple framestores in the DLS 6000 allowed us to envisage a successful solution to this problem, which was implemented during 1981 and is reflected in UK patent 2,113,950: 1982.

Paintbox development continued for many years and many generations after its initial realization. Many further Quantel patents reflect the continuing level of innovation in this, probably our best-loved machine. It was without doubt the first graphics machine which real artists really used.

[7] In those days, 80 Mbytes was state of the art.

Paintbox received a Queen's Award for Technology in 1985.

Paintbox received an Emmy Award in 1986.

1981: The next generation of live effects machines was my personal design project during 1981-1984. To be known as 'Mirage', it was to solve, for the first time, the problem of manipulating a live (2D) television image into a 2D representation of a real 3D shape (the now-familiar 'page-turn' was created for the first time by this machine). As usual, the engineering challenge, solved in UK patent 2,117,209: 1982, was only part of the problem; the shape generation and control required further invention (UK patent 2,158,671:1984).

Mirage received an Emmy Award in 1988.

1982: A second generation Standards Converter ('Satin') was produced, with improved temporal interpolation reflected in UK patent 2,129,651: 1982.

Satin received an Emmy Award in 1988.

1982: An advanced character generator, Cypher, was invented and developed over several years, culminating in its use by NBC at the 1988 Seoul Olympics. Although both technically (UK patents 2,137,856: 1982 and 8,707,088: 1987) and creatively innovative, we learned the hard way that it was almost impossible to break the dominant position of Chyron, Inc. in the large world of free-lance operators.

1984: As well as the broadcast market, Quantel was very active in non-broadcast image processing. Crystal (UK patent 2,138,245: 1984) was a development to attach our versatile framestores and image processing skills to the Scanning Electron Microscope, providing both a very high quality scan-converted image, and a suite of image enhancement tools[8].

1984: A major new series of inventions started in 1984, as we developed the skills learnt from Paintbox into the world of moving images. UK patent 2,156,627: 1984 represents the engineering invention which gave random-access real-time record and play capabilities, but as always, this was only the 'entry fee'.

A very sophisticated proprietary data management structure, and a very innovative display and control structure were needed to match the transparent intuitive use which Paintbox had made Quantel's standard. Further technical inventions (UK patent 0,318,149: 1987) were also needed to complete the digital studio with which, without coining the term, Quantel had introduced 'non-linear editing'.

[8] Crystal was the last machine for which I myself drew most of the circuit diagrams.

The first commercial incarnation of this idea was launched as 'Harry'[9].

In 1988, P R N Kellar and three engineers of his team won the MacRobert Award for the development of Paintbox and Harry.

Harry received an Emmy Award in 1986.

Harry received a Queen's Award for Technology in 1988.

1985: As well as continuing Paintbox development, I was involved in addressing another non-broadcast challenge. There was no way at that time of creating the sort of beautiful graphics which Paintbox presented on-air all the time in the world of print. The difficulty was, of course, image size. How was it possible to make a machine with print resolution (up to 10K by 8K images) and yet retain the underlying technical agility on which Paintbox's legendary relationship with the artist was built? It took many years and several attempts to solve this problem. UK patents 0,377,725: 1988, 2,231,471: 1989, 2,235,856: 1989 and other Quantel patents reflect this struggle, but we did persevere, and Graphic Paintbox was the successful result.

Graphic Paintbox received a Queen's Award for Technology in 1991

1989: These years were a busy and turbulent time for Quantel[10]. Paintbox and Harry continued to sell well, but it was clear to Richard Taylor and to me that we would need a new generation of products to maintain our position in the marketplace. We conceived a new machine which would move from Harry's graphics-oriented editing into 'real' editing. This was a huge technical challenge for me. It was clear that we would need more storage, but there was another more subtle problem, failure to grasp which would later stump and indeed destroy some of our competition. In a real edit room, a huge range of techniques is required. The conventional wisdom was that a parallel structure was needed to allow real-time access to all processes at once. What we saw was that a central processing engine in the midst of a fast disc system could be an alternative way forward. At first sight this causes as many problems as it solves, but the key new engineering element would be the data structure defining a 'clip' of video. The way we expressed this to ourselves was to define the new machine as 'Harry with a sense of history'. As long as any previous operation could be changed without starting again, then a serial processing engine could give unlimited flexibility. Effects, Paintbox and all the other processes could be included without having to build

[9] The product adopted the internal R&D code name in default of any better way preventing our competition from disparaging the system as 'just another disc recorder'. The name became popular with customers as the machine took off, and the later generation 'Henry' exploited this relationship.

[10] See "Greenfinger" by Raymond Snoddy (Faber and Faber 1996), Chapter 9, for a full account of Quantel's corporate position at this time.

everything as a separate engine. New processes could even be added during the life of the machine. This did prove to be the case, and Henry's ten-year life in the market place is the proof of how advanced this concept, in this context at that time, was.

This concept was not well protected by patents. I felt that it would be almost impossible to create a set of claims which would adequately describe what we were doing, and which would not be very vulnerable to a design-around non-infringement defence once studied by the opposition after publication.

1992: The new machine was launched as 'Henry'. Even in its initial form, it was powerful enough to be very attractive, and of all Quantel's machines, Henry probably had the fastest rate of customer acceptance. Its development continued over several more years (UK patent 2,306,750: 1995) and it led to a range of variants, such as 'Editbox', for different marketplace needs. Another variant, Micro Henry, was an identical system with the cost-effective capability of storing video in compressed form.

Micro Henry was included in the INTERLINKS '94 Exhibition staged jointly by The Royal Academy of Engineering and The Royal Society.

Henry received a Queen's Award for Technology in 1995.

Editbox received an Emmy Award in 1997.

1994: Henry's success pointed to another dual challenge: shared working and video servers. If we could create a central pool of our special disc technology, 'Dylan', as it was known, then I could see both shared editing and central playout as exciting opportunities.

With this as a goal, we developed the disc technology to give the extra speed, but, as always, the real need was a common data structure. Without it, we would be no better off than a computer system of the time, where, for example, it would be unthinkable to have two users typing the same Word document. This challenge was met in my R&D Laboratory, to create the first effective video server/editing system, 'Clipbox'. This proved to be a serious broadcaster's ideal machine ('Inspiration'), and we were able to respond to commercial pressure with new inventive ideas during the life of the system (UK patent 2,285,720: 1994).

Dylan received an Emmy Award in 1998.

Inspiration, jointly with ITN, received an Emmy Award in 2001.

1998: We were now able to consider the challenges for the next generation of machines. Key problems which no-one in the industry had solved, if indeed they had even been identified, were:

The spread of broadcast HD television. Without crippling cost increases, we needed to cope with the sudden spread of different HD standards.

A wish for a unified hierarchical control structure across all system levels. While the Henry interface was still very well liked by its users, we accepted that the training entry fee was too high.

A need to integrate standard operating systems and computer platforms without in any way compromising our record for on-air reliability, both technically and, equally importantly, operationally.

The need to allow more open access to outside developers for 'plug-ins' so as to allow users to keep up with a fashion-conscious industry.

Increasing cost pressures, both real and imaginary, on users.

I was able, with the huge experience of the R&D team, to establish a structure which would address all of these issues, and which could be created by our existing team augmented with a realistic amount of new outside experience and skills.

2000: The new product range, now named 'Generation Q' was launched in the autumn of 2005. Over the next three years, the range was filled in, expanding in the process to a much larger scope than Richard Taylor and I had originally envisaged.

We filed very few new patents during these years, for the same reasons as in the Henry era.

2005: By this time the new product range had become as advanced as anything which Quantel had ever done. We had met all of the technical challenges with innovative solutions, and Generation Q systems were in use across the board from top-end movies to fast newsrooms.

2006: I resigned from Quantel in early 2006 at which time Richard Taylor and I set up the Taylor Kellar Partnership, (www.taylorkellar.com).

Until Richard's untimely death in 2009, we worked together on several Patent cases, the last being the successful defence of a major Patent case for Markem and Herbert Smith.

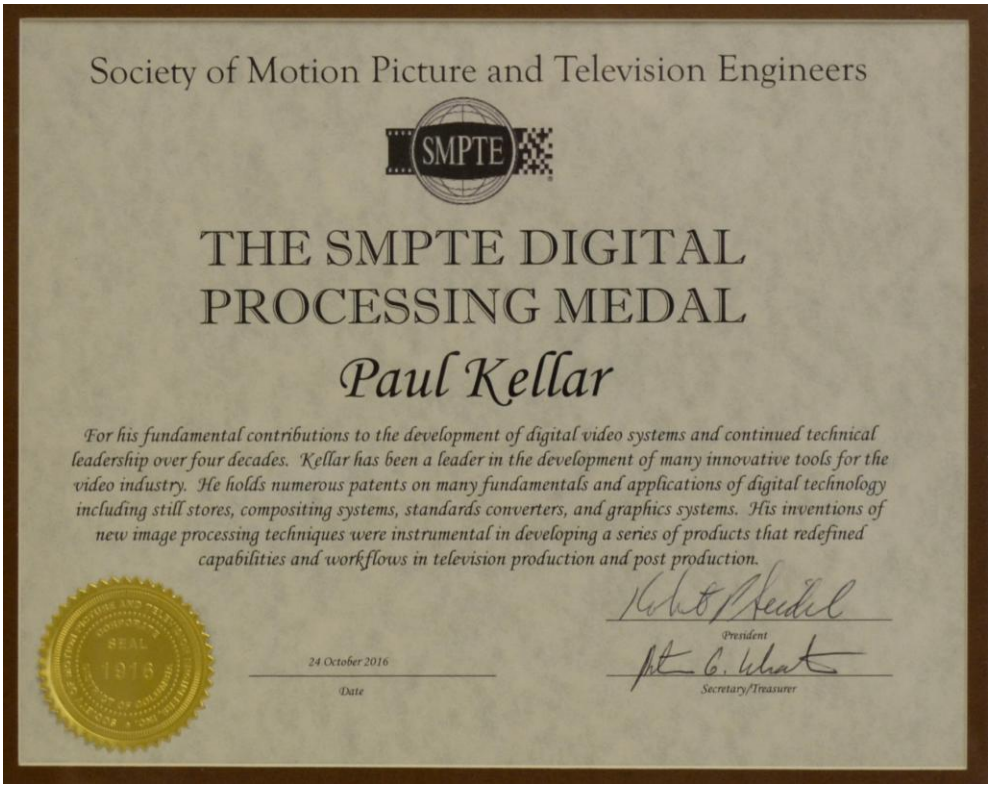
I returned to work as an engineer, albeit less formally than in previous years.

A major project is my continuing involvement at Bletchley Park as a volunteer in the rebuild of the Turing Welchman Bombe, led by John Harper. The Bombe is now a fully operational replica of its target machine, and a complete code-breaking process has been re-created. Successful live code-breaking Challenges with GCHQ have been undertaken.

Also at Bletchley Park, I have been involved with the tape drive mechanism of the aptly-named Heath Robinson, the fore-runner of the more famous Colossus.

Another ongoing successful project, working with Station Road Steam (www.stationroadsteam.co.uk), is the design and manufacture of an integrated indicator/dynamometer unit. In a faint echo of my earlier work, this represents the first time that digital technology has been applied to a traditional problem in a traditional industry, and once again has involved supporting major industry events with prototype equipment.

I was awarded the SMPTE Digital Processing Medal in 2016, in recognition of fundamental contributions to the development of digital video systems over four decades.


Society of Motion Picture and Television Engineers

SMPTE

THE SMPTE DIGITAL PROCESSING MEDAL

Paul Kellar

For his fundamental contributions to the development of digital video systems and continued technical leadership over four decades. Kellar has been a leader in the development of many innovative tools for the video industry. He holds numerous patents on many fundamentals and applications of digital technology including still stores, compositing systems, standards converters, and graphics systems. His inventions of new image processing techniques were instrumental in developing a series of products that redefined capabilities and workflows in television production and post production.

SEAL 1916

24 October 2016
Date

President

Secretary/Treasurer

Patents:[11]

1974: 1,477,842 PC Michael and P R N Kellar:
"Improvements in or relating to Analogue to Digital Converters"

1976: 1,576,117 P R N Kellar:
"Video Compression"

1978: 2,013,488 P R N Kellar, R J Taylor:
"Chroma Key Measurement"

1979: 2,030,419 P C Michael, R J Taylor, P R N Kellar:
"TV Picture Freeze system"

2,063,616 P R N Kellar:
"Multiple Image Manipulation"

1980: 2,089,625 I C Walker et al (inc P R N Kellar):
"Paintbox read-modify-write"

1981: 2,072,454 P R N Kellar:
"Processing of TV Pictures for subsequent freezing"

2,073,988 R J Taylor, P R N Kellar, N R Hinson:
"Video Picture Processing"

2,085,206 R J Taylor, P R N Kellar:
"Storage and retrieval of Digital Data on Video Tape Recorders"

1982: 2,113,950 A D Searby, P R N Kellar:
"Paintbox translucent stencil"

2,117,209 N R Hinson, P R N Kellar, R J Taylor:
"Image manipulation system (Mirage)"

2,129,651 S P Greenhalgh, P R N Kellar, R J Taylor:
"Frame rate converter"

2,137,856 P R N Kellar, A D Searby, R J Taylor:
"Character Generator (Cypher)"

1983: 2,144,607 P R N Kellar, R A Cawley, A L Stapleton:
"Moving Target Simulator"

1984: 2,138,245 P R N Kellar, R J Long:
"Image Processing System"

[11] Micro Consultants and Quantel are responsible for 185 patents.
Only those 33 are listed here which have P R N Kellar as a named inventor.
One of my duties as Research Director was to identify inventions and prosecute patents on behalf of the whole company; of the 185 patents, 135 were filed during my time as Director.
Most inventions were also protected by overseas patents. Only the GB filings are listed here.

1984: 2,155,729 R A Cawley, P R N Kellar, N R Hinson:
"Combining Video Signals"

2,156,627 P R N Kellar, R A Cawley, I M Stewart:
"Harry Disc Store"

2,158,671 P R N Kellar, B R G Nonweiler:
"Mirage Floating Viewpoint"

1985: 8,500,350 P R N Kellar, B R G Nonweiler, R N J Stone:
"Video scan converter"

8,507,449 P R N Kellar, A R Rae Smith:
"3D image from plane scans"

2,179,819 R A Cawley, P R N Kellar, I M Stewart:
"Read side interpolation"

1987: 8,707,088 P R N Kellar, D R Stone, A D Searby:
"Outline and Shade for Cypher"

0,318,149 R A Cawley, P R N Kellar:
"Wipe generator for Harry"

1988: 8,803,962 P R N Kellar, A D Searby:
"One Bit Plane to Video"

0,377,725 N R Hinson, P R N Kellar, A L Stapleton:
"Paintbox with D2 store"

1989: 2,231,471 P R N Kellar, N R Hinson, M T Mayer:
"Tiles for Encore and Graphic Paintbox"

2,235,856 P R N Kellar, A D Searby, R A Cawley:
"High Resolution Paintbox"

1991: 9,102,084 P R N Kellar, A D Searby:
"Paintbox with 'Z-paint'"

2,252,480 P R N Kellar, A D Searby:
"Pressure Sensitive Brush"

1992: 9,222,658 P R N Kellar, B R G Nonweiler, N R Hinson:
"High Definition Tape Recording"

1994: 2,285,720 P R N Kellar, A D Searby, N R Hinson, R A Cawley:
"Mixed mode Clipbox"

1995: 2,306,750 P R N Kellar, T J Beckwith:
"Henry Audio Editing"

2000: 2,373,118 P R N Kellar:
"Dual Process image rendering"

Appendix l: Quantel Honours and Awards

The MacRobert Award

1988: Awarded to a team from Quantel, consisting of:

P R N Kellar (leader), A D Searby, N R Hinson and R A Cawley

for the development of the Paintbox television graphics system and the Harry video editing system.

Honours:

1981: R J Taylor, Chairman and Chief Executive appointed OBE for services to Export.

1984: P R N Kellar, Research Director appointed MBE for services to Industry.

Queen's Awards:

1975:	Queen's Award	For advances in the field of ultra high speed analogue to digital conversion. (Micro Consultants Ltd.)
1978:	Queen's Award for Technology	General digital television techniques.
1980:	Queen's Award for Technology	Intellect range of image processing equipment. (Micro Consultants Ltd.)
1980:	Queen's Award for Export	Quantel Ltd.
1983:	Queen's Award for Technology	DPE 5000 series of effects machines.
1985:	Queen's Award for Technology	Paintbox development.
1988:	Queen's Award for Technology	Harry.
1991:	Queen's Award for Technology	Graphic Paintbox.
1995:	Queen's Award for Technology	Henry.

The National Academy of Television Arts and Sciences: Emmy Awards
Quantel:

1980: DPE 5000
Outstanding Achievement in Engineering Development…for "The Development and implementation of Digital Techniques for the Production of Video Special Effects".

1986: Paintbox
Outstanding Achievement in Engineering Development...for "Outstanding Achievement in Painting & Graphics Generation for the Quantel Paintbox System".

1986: Harry
Outstanding Achievement in Engineering Development...for "Their Outstanding Achievement in Digital Video Mixing Processing and Compositing Technology for the Quantel Harry"

1988: Satin
Outstanding Achievement in Engineering Development...for "In Recognition of Their Engineering Contribution of the Advancement of Standards Conversion Technology".

1988: Mirage
Outstanding Achievement in Engineering Development...for "Their Engineering Contributions in Real Time 3-D Digital Video Effects Leading to Development of 'Mirage' ".

1996: Dynamic Rounding
Outstanding Achievement in Engineering Development...for "Pioneering Efforts for Rounding Techniques for Multiple Generation Image Manipulation for Minimal Visibility of Truncation Errors".

1997: Editbox[12]
Outstanding Achievement in Engineering Development...for "Development of Real Time 3-D Manipulation for Non-Linear Editing".

1998: Dylan[13]
Outstanding Achievement in Engineering Development...for "Development & Implementation of Digital Un-Compressed Tapeless Recording and Playback Technology for Television Broadcast & Post Production Operations".

2001: Inspiration[14]
Outstanding Achievement in Engineering Development...for "Pioneering Effort in Digital Asset Management for Television News" (won jointly with ITN)

[12] Editbox was an alternative marketing name for Henry.
[13] Dylan was the marketing name of Quantel's proprietary video disc technology system. It was a key enabling technology for Henry, Editbox and Clipbox.
[14] Inspiration was the marketing name for Quantel's Newsroom system, based on Clipbox and Editbox.

The National Academy of Television Arts and Sciences: Emmy Awards
Individual:

1992:	NBC Technical Team Studio, Games of the XXV Olympiad "Paul Kellar Technical Director"
1996:	NBC Technical Team Studio, The Centennial Olympic Games "Paul Kellar Video Engineer"

Other Awards:

1981:	The Montreux Symposium Committee	Montreux Achievement Gold Medal (R J Taylor)
1982:	Tobie 'Exporter of the Year' Award	From Electronics industry (Electronics Times).
1984:	VPA Monitor Award	From the Videotape Producers Association in New York for Mirage.
1985:	VPA Monitor Award	From the Videotape Producers Association in New York for Paintbox.
1986:	BDA Award	Paintbox.
1987:	Monitor Award	Harry.
1990:	Excellence Award	International Council of Graphic Design Association for Graphic Paintbox.
1990:	Geoffrey Parr Award	Royal Television Society for Harry.
1992:	IABM Peter Wayne Award	Henry.
1993:	Royal Television Society	Paintbox.
1997:	Monitor Award	Henry.

Appendix ll: a short history of Micro Consultants and Quantel.

1968: Micro Consultants was founded as a private company.

1973: Quantel[15] was founded as a subsidiary to exploit Micro Consultants' expertise in the new field of Digital Television.

1981: Micro Consultants and Quantel became a public company by a reverse takeover of UEI plc.

Over the next years, Quantel and its products gradually became the dominant force, and the name Micro Consultants was dropped.

1989: UEI was sold to Carlton Communications in an agreed takeover.

2000: Quantel was sold by Carlton Communications to a Management team led by R J Taylor, with backing from Lloyd's Development Capital Ltd.

2006: LDC assumed control of Quantel.

During the period 1980 to 2006, Quantel's size varied from about 300 to about 600 employees worldwide, with the majority based in Newbury.

Significant overseas offices are maintained in USA, Europe, Australia, Japan and elsewhere.

Over this 30-year period, Quantel has supplied equipment to the majority of the world's broadcasters.

Quantel's current list of Broadcast customers for GenerationQ includes the BBC, ITN and Sky in the UK, ABC, NBC, Fox and ESPN in the USA, NHK in Japan, WDR and NDR in Germany, and Channel Seven in Australia.

In the non-broadcast market, over 300 movies have used GenerationQ for Digital Intermediate production work.

Annual turnover was in the range £40M to £150M.

[15] The name Quantel was formed from 'Quantised Television'