ALL CHANGE

INTO THE COMPUTER AGE

The overwhelming defeat of the Labour Government in the spring of 1979 and the arrival of Margaret Thatcher and hard-line monetarist ideologies brought with it an abrupt change of policy. Put simply the people over profits policies of the socialist 70's was overturned by profit over people policies of conservatism in an attempt to rescue the economy and the well-being of the nation. Failing industries were allowed to fail, non-productive workers were set aside. Energy was directed towards new fledgling industries and young incentivised workers. Innovation, competition and productivity became the mantra for a new age. The monopolistic world of the nationalised industries was rejuvenated by privatisation. The hold of the Trade Unions was shattered and restrictive practices were sacrificed on the altar of free enterprise. Few people escaped the upheavals of reorganisation as the economy adapted. It permeated almost every industry and workplace. Older workers and non-productive middle-managers suffered disproportionately. Re-skilling for new enterprises became essential. Working life became uncomfortable. Change or the axe seemed to hover over everybody.

The beneficiaries of the revolution and the front runners of the time were entrepreneurs and the researchers and developers in Universities and large companies who scrambled to exploit new ground. In the 80's this was primarily in the realm of micro-electronics as the huge potential became ever more evident. It witnessed the birth of the Personal Computer as we know it today along with a range of revolutionary gadgets which changed life irrevocably.

In 1980 computers were seen as data processing devices for scientists and big organisations. Full of expensive electronics they were rare and of limited use to ordinary people. They were seen as the toys for geeks and hobbyists. By 1990 all had changed. They were emerging as a must-have accessory to life offering a wide range of functions surpassing in convenience anything that had gone before. Developments can be charted by a number of milestone steps.

MICR0-CHIP TECHNOLOGY blossomed during the 80's in both design and manufacture. Every year the number of components per chip increased from a few thousand in 1980 to millions in 1990. Computers and other gadgets could be operated from single chip micro-processors with ever growing power and facility. From 1956 to 2015 computer power increased 1 trillion-fold. The computer that navigated the Apollo missions in the early 70's contained 32 bits of RAM (Random Access Memory) and 589 bits of ROM (Read only Memory). A modern smart phone has around 100,000 times the processing power! Similarly the operating and memory chips of the early Sinclair ZX personal computer (1980) contained just 8500 transistors. The INTEL 80486 computer (1989) held more than a million with the capability of executing 40 million interactions per second.

The arrival of **MS-DOS (DISC OPERATING SYSTEM)** in 1981 prompted a revolution that became the basis of all modern personal computers. Using **FLOPPY DISCS** as the command source for the operating and data storage systems to replace the manual input of coded prompts was the crucial step in making computers accessible to the man in the street. Within a short space of time they were joined by **HARD DISCS** increasing both efficiency and scope. DOS was also the basis of a **SOFTWARE REVOLUTION**. Up to the early 80's software had been manufacturer / machine specific. DOS opened the gateway for universal software capable of being used in every computer. It quickly led to a plethora of independent software companies and an explosion of programmes opening a broad range of utilities. The monopoly of the computer manufacturers was broken and software became more readily available on the street. At the same time huge steps were taken to improve the usability of the personal computer with the introduction of the **GRAPHICAL USER INTERFACE** (GUI) In 1984. This allowed the use of a **MOUSE** to navigate commands by clicking on on-screen icons and of dragging and dropping elements into new destinations and files. All was brought together in 1985 with the introduction of **MICROSOFT WINDOWS – a GUI for MS-DOS.** Designed as a fully-fledged operating system supplied programmes included Calculator, Calendar, Clipboard Viewer , Clock, Notepad, Paint, Reversi, Cardfile, Terminal and Write. Rapidly expanded and refined with a series of new versions from 1987 (Version 2.0, 2.1 etc.) it was not until Version 3.1 in 1992 that it achieved broad commercial success. Nonetheless it is recognised as one of the foundation stones of modern personal computing.

The pace of development, as fast as it was, was controlled by the design , capacity and manufacture of **COMPUTER HARDWARE**. A number of iconic machines illustrate key moments in the developmental cycle during the early 80's as follows:

Sinclair ZX (1980) Pioneer in micro-computing. First computer to sell for under £100. 70,000 sold in first year in the UK and Europe.

CPU = 3.25 – 3.55 MHz. 1 Kilobyte RAM. 4 Kilobyte ROM. Commands from keyboard. Video output to TV. Programme storage to cassette recorder.

No colour, no sound, limited memory. Excellent for novices learning BASIC. Games– Pacman, Space Invaders

BBC Acorn (1981) Designed for Computer Literacy Project in Schools. £400. Ran on BBC Basic and introduced children to the power of computing.

CPU= MOS 6502 2MHz . 8 Bit Computer

Games – Scramble, Defender, Pac-man

IBM Pc 5150 (1981) Considered the 'Daddy' of all Personal Computers. Cost: $1,565

Operating System – BASIC / pc DOS.

CPU- Intel 8088 at 4.77 MHz. Memory 16Kb – 640Kb. PC Speakers. Open architecture and expansion slots allowing others to create software.

Storage – 2 Disc bays for 5.25 inch floppy discs, 160Kb per disc. Port for Cassette Recorder.

COMMODORE 64 (1982) Highest selling single computer of all time. Compared with the Model T Ford for bringing new technology to the masses. Cost: $595

CPU- MOS 6510 at 1.02MHz. 64Kb RAM, 20Kb ROM. 16 colours, 3 channels sound. Ports for TV, Joysticks, ROM Cartridge, Digital tape. Peripherals: Cassette Recorder, Printer, External 170K Floppy Disc.

Approx 10,000 commercial software titles made for it including development tools, office applications and games.

APPLE-MACINTOSH (1984) Played a pivotal role in establishing desktop publishing as a general office function. Cost : $2,495

First PC to use GUI and a mouse.

CPU – Motorola 68000 at 7.8MHz. 128Kb RAM built in, 64Kb ROM chip. 3.5 inch Floppy disc drive containing system software. MacPaint and Macwrite were bundled, MacProject, MacTerminal and Microsoft Word also available.

AMSTRAD PCW 8256 (1985) Cost: £399 Influential, low cost Word processor, very popular in UK and Europe persuading many technophobes to venture into computing. CPU- 280 at 4Mhz. Memory 256 or 512 Kb Text based system. Dot- Matrix Printer.

COMMODORE AMIGA (1987) Cost: $1295

16 or 32 Bit processor, 256 RAM, mouse based GUI with significantly improved graphics and audio

CPU – Motorola 680X0 at 7 Mhz +

Wide variety of games and creative software. Desktop video and video production and Music Teacher software.

Though hesitant at first to embrace an alien technology, the steps made towards user-friendliness and the realisation that you didn't have to understand a computer to use one changed attitudes. People were soon seduced by the attributes and opportunities it afforded. Children, now introduced to computers as part of the school curriculum, went crazy for computer games, which by 1990 had become sophisticated and compelling. Their parents were equally inspired by the Word processor and the massive advantages it offered over the humble typewriter and were intrigued by the concept of the Spreadsheet. All was excitement and optimism as week by week the microprocessor made possible an ever expanding range of gadgets and opportunities. In an article written for the' Chronicle of the 20th Century' (Longmans) the surprise and thrill of the decade's early developments are described thus:

> As well as giving us new toys and tools, the chip has transformed everyday objects based on earlier technologies, like the watch and the hi-fi. Few watches are driven by clockwork now and where people on the move once listened to tinny transistor radios they can now carry a high quality personal stereo. The Video Recorder, once very bulky and the preserve of TV Studios, now transforms TV viewing in millions of homes.
>
> In the workplace the micro-processor is proving itself. Hair thin glass fibres are replacing conventional cables in the world's telephone networks. Carrying signals coded as pulses of light, a single fibre can carry thousands of simultaneous telephone conversations or dozens of television channels.
>
> On car production lines robots assemble, weld and paint tirelessly and precisely, displacing for better or for worse production line workers. Human operators have supervisory roles only.
>
> In offices secretaries with word processors can redraft documents painlessly, correcting mistakes and moving blocks of text with no need to re-type everything. When finished, the documents can be laid out with a sophistication quite impossible with a typewriter.
>
> Silvery discs like gramophone records, etched with tiny pits by laser beams, can store information so densely that one can hold the Encyclopaedia Britannica several times over.
>
> These are few of the developments in the workplace and what they all have in common is that they are based on the silicon chip which, especially in the form of a micro-processor or computer on a single chip, is now found in most industries,
>
> Complicated electronic controls used to be tailor-made for a particular job and so were very expensive. But the micro-processors have changed all that. They are general purpose devices which can be made very cheaply in huge numbers and then programmed to do different jobs.

In fact, the day is fast approaching when most complex control tasks in industry, from guiding coal cutting machines in mines and steel making at the heavy end, down to the production of new micro-processors themselves at the light end, will be controlled by micro-processors.

Not only are computers controlling industrial processes, they are also playing an even greater part in design too. A draughtsman working at a screen may now have computing power on tap in quantities that would have been unbelievable a decade ago. He can carry out many humdrum tasks semi-automatically. He can modify a drawing painlessly, rotate it to see it frim a different angle, zoom in on part of it to add detail. And he can have a huge library of basic and specialised engineering information ready to be called directly to his screen. One of the fields where computer-aided design is particularly advanced is in micro-electronics. Computers are helping to design new and better computers.

In the future the biggest changes are likely to come in the information field with link-ups between phones, TV and computers – all plugged into banks, shops, libraries and all dependent upon the chip.

Written mid-decade the author's speculation about computer communications rapidly developed well beyond expectations. Inter-computer communications within limited and closed networks via a 'SERVER' were well developed by the 80's. Pioneered by the U.S. Government in response to the defence needs of the Cold War ARPANET (Advanced Research Project Agency Network) was a system allowing the exchange of messages and information between a limited number of academic and research organisations. Other networks were quick to follow but had no means of communication with each other. 1983 saw the launch of a new communications protocol – the 'Transfer, Control Protocol / Internet work Protocol (TCP/IP). This allowed different kinds of computer on different networks to 'talk' to each other. It was the birth of the **INTERNET** from which Tim Berners-Lee developed the 'Hypertext Transfer Protocol (HTTP) in 1989 – the foundation of the **WORLD WIDE WEB** – the revolution of the 1990's.

Protocols were also developed to give life to the Mobile Phone. Developed in the early 70's it was not until 1983 with the approval and adoption of the 'Public Switched Telephone Network' (PSTN) that it became viable. The first commercially available hand-held mobile - the 'DynaTAC 8000X, the size and weight of a brick, was then launched at a cost of $3995. The first Mobile marketed in Britain was equally cumbersome, but like most gadgets in the 80's, it was rapidly miniaturised to pocket size.

DynaTAC 8000X

Cost : $3995

Vodaphone VT1 1985

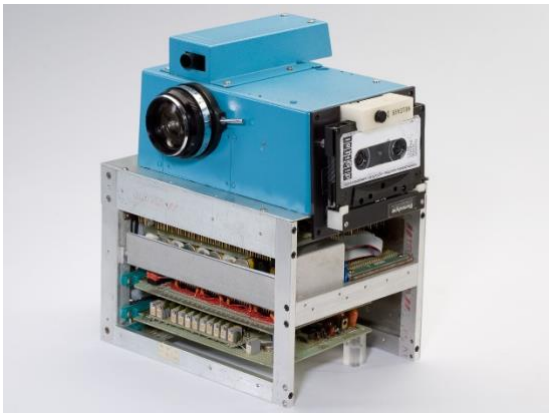
Britain's 1st Mobile Cost: £1650

Motorola Micro-Tac 1989

1st Flip Phone Cost: £1500

Like the World Wide Web, however, it took time to assemble the infrastructure of 'Service Providers' to support the roll-out and it was not until the 1990's that the mobile phone revolution began to bite.

Photography also took a massive step forward in the 80's. Like the mobile phone a prototype Digital Camera was produced in the mid-70's but it too took 10 years to reach the market. Refinement and back-up software was necessary to make it commercially viable. The first true hand-held camera – the FUGIX DS-1P arrived in 1988 along with Adobe Photoshop – graphics editing software which revolutionised photography and the fashion industry. Together they rapidly pushed film-based photography into obsolescence during the 1990's.



First Digital camera –Steven Sasson 1975

FUJIX DS-1P 1988

Motion photography also took a technological leap with the introduction of the hand-held Camcorder. Like the computer it too existed as far back as the late 50's but it was an immense machine mounted on a wheeled platform which was moved awkwardly around the TV studio. By the 1980's it too was transformed by the microprocessor. The first miniaturised camcorder, the Sony Betamovie BMC-110 using Betamax technology appeared on the market in 1983 followed in 1985 by the Panasonic NV-M1 offering an alternative VHS (Video Home System) of analogue recording on tape cassettes. The latter proved to be the more popular and eventually won out in the marketplace.

Sony Betamovie Cost 41500

Panasonic VHS

The advance over pre-existing 8mm film cameras was stark. Film cameras operated on 25 foot film reels providing 4 minutes of exposure time and required developing and processing. The new Camcorders recorded on magnetic tape cassettes and offered 2 hours running time with immediate playback via a Video Tape Recorder. Not surprisingly film died a sudden death!

A similar fate awaited the Vinyl Record when in 1983 the first Compact Disc Player, the Sony CDP-101 (Cost: $730) arrived, giving life and value to the Optical Laser disc developed during the late 70's. Used to store and play back sound recordings the early discs held about 700 megabytes, equating to 80 minutes of audio. Producing pure sound with no background hiss and being far smaller and more robust than vinyl records it was enthusiastically received and rapidly gained in popularity as mass production lowered costs. By 1988 400 million CD's were manufactured by 50 pressing plants around the world.

The magnitude of the unfolding digital revolution is now becoming clear. By the end of the 80's the micro-processor had wheedled its way into almost every operating electrical device improving functionality and reliability beyond measure. New gadgets emerged almost every week – all improving convenience and saving time. Everyday life was on the change and working practices were constantly being overhauled. But this was just the beginning. Nobody then realised that they were living on the cusp of a revolution every bit as powerful as the advent of steam or electricity. The pace of change was about to accelerate and move us all into an entirely new era. For most adults this was unsettling. Bit by bit they surrendered their routines to technology they did not understand and were reluctant to trust. The speed of innovation far surpassed their ability to adapt. Not so the young. They were not so impeded. They embraced every byte!

Not all fashion was driven by the silicon chip. The screen had not yet usurped pen and paper. It was a strange anomaly that the must-have item for the young aspiring professional (YAP's) in the mid 80's was the FILOFAX. This was a personal organiser, a leather bound wallet containing a loose-leaf diary, year planner, and forms for addresses, phone numbers, business expenses and charts of financial data, time zones and other useful information including maps of the London underground etc. It became an indispensable accessory to working life and was carried everywhere almost as a status symbol.

Both computer and Filofax were doubtless essential to the researchers who worked hard to push back the frontiers of medical science. The 80's brought a number of breakthroughs which extended life and wellbeing.

1980 Vaccine for Hepatitis B

First commercial MRI Scanner

` 1981 Aids identified. It became the urgent focus for research across the decade.

1982 First artificial heart transplant in a 61 year old patient by Dr. Robert Jarvik.

It became widely used as a temporary heart.

1983 Kary Mullis invented the 'polymerase chain reaction technique which revolutionised molecular biology

1985 First surgical robot – the Arthrobot used in orthopaedic surgery to manipulate and position the leg on voice command.

Capsule Endoscopy – micro-camera for the gastro-intestinal tract.

1986 DNA Fingerprinting

Gestational surrogacy allowing birth of child to somebody not their mother

1987 Statins used to lower blood cholesterol.

Prozac

Intra-vascular stent

1988 Cataract laser surgery.

1989 Gene therapy began

Life expectancy in the UK rose from an average of 73.68 years in 1980 to 75.88 years in 1990 – a measure of the continued improvements in medical services.

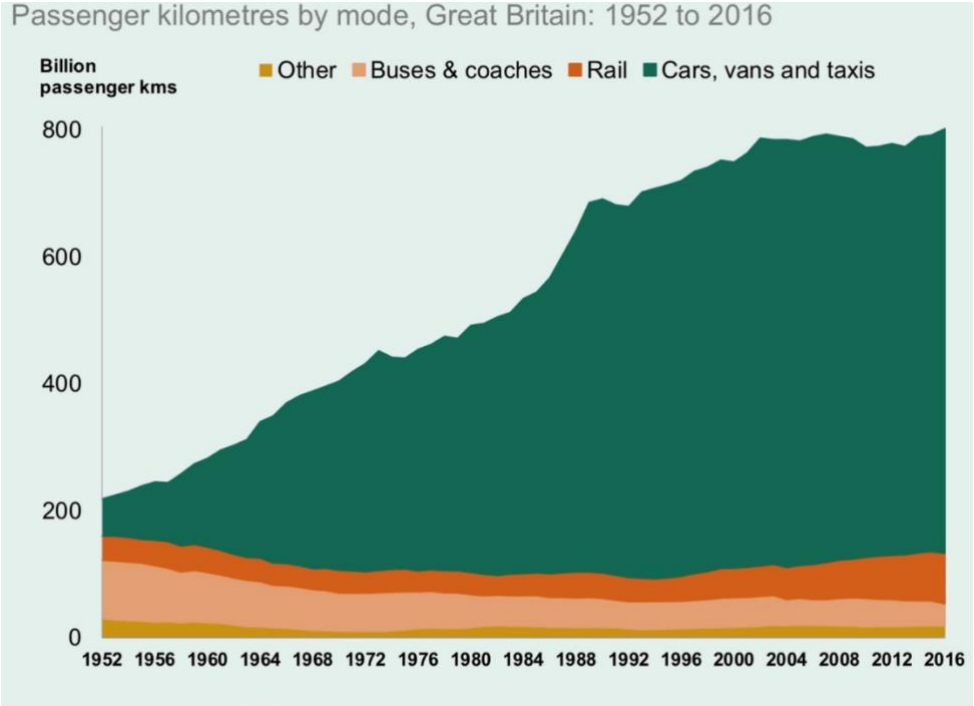
As always, political and social pressures also demand technological solutions. In the 1980's they went from the sublime to the not so practical. In the United States the need to maintain the balance of power in the Cold War and match the Soviet Union in the development of weaponry gave rise to highly secret research project in 1975. Increasingly sophisticated Soviet surface-to-air missiles which 'downed' heavy bombers gave an edge in the Vietnam and Yom Kippur wars. The U.S. response was the design and production of the Lockheed F-117 Nighthawk – a radar resistant plane which would go on to change warfare. With the ability to over-fly enemy territory undetected it had a top speed of 1,100 Km/h. With a cost estimated to have been between $42,600,000 and $111,200,00 it first flew in 1981 and went into service in 1983 but it was not publically recognised until 1988. 59 were in operation by 1990.

At around the same time an ultra-modern car, the DMC DeLorean came on to the market. Designed with the assistance of Italian designer Giorgetto Giugiaro it was a re-imagined, rear engine, sports car with gull-wing doors and brushed stainless steel body panels. It gained notoriety in the 'Back to the Future' movies. 9000 were built between 1981 and 1983 at a

base price of $25,000. Production ceased with the arrest of John DeLorean and the collapse of the Company.

At the other extreme, in Britain the ever growing pressure of too much traffic on too little road space was exercising the mind of high-profile scientists. In response Sir Clive Sinclair of

ZX Spectrum fame, designed a small one-person, battery electric car / tricycle. Designed primarily for the commuter it had a range of 20 miles at speeds of up to 15mph from a 250 Watt electric motor. In order to overcome range-anxiety the C5, as it was named, came with pedals while the handlebar steering was in an unusual position beneath the legs. Marketed in 1985, 14,000 were produced at a cost of £399 each. Unfortunately, with no form of weather-proofing and the C5's low, recumbent driving position drivers were left feeling exposed and vulnerable to traffic and it was not a success.



With rising population : 1980 = 56,209,171 (Urban = 78.14%)

1990 = 57, 250,000 (Urban = 78.48%)

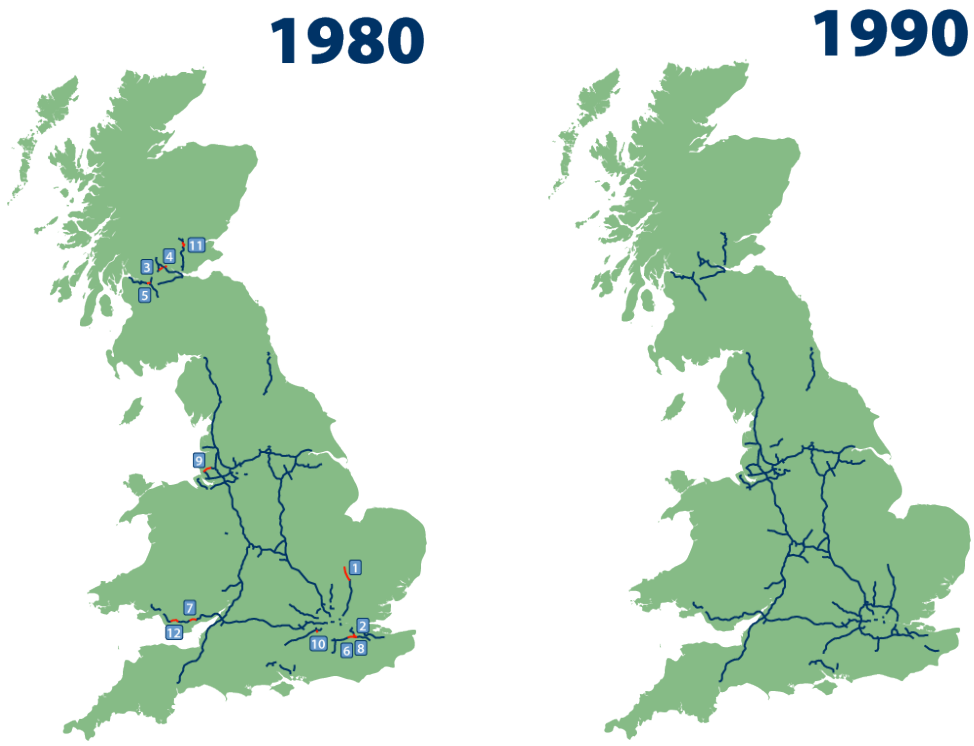
and rising car ownership 1980 = 19.1 million Cars per Household = .6

1990 = 24.95 million Cars per Household = .78

2020 = 31.7 million Cars per Household = 1.21

the predictions and fears of the Buchanan Report (1963) were becoming a reality. The graph illustrates clearly the overwhelming triumph of the motor car over public transport. By 1980

the negative impact of traffic congestion on the quality of life was more widely being felt. At peak commuting times there were serious pinch-points in most journeys and traffic delays became a way of life. Anger at the cost and inconvenience grew and 'road rage' entered the dictionary to define the behaviour of disgruntled drivers. Consciousness of the environmental impact became more vociferous. Air pollution noticeably worsened and parked cars littered and restricted movement on the streets. But few affordable solutions existed. The policy seemed to be to 'choke' people out of their cars. Efforts were made to make public transport more attractive but the volume of traffic continued to rise. The need to restrain public expenditure to rescue the country's economic woes meant that the 1980's saw little road improvement aside from patching up road gaps in the motorway network, some dualisation of main A routes, and local by-passes and street improvements. As the environmental issues rose up the agenda so progress was delayed by serious and prolonged protests to protect areas of natural beauty and of historic or scientific interest. At Winchester in Hampshire, where the proposed route of the M3 was hotly contested there were major setbacks and delays. New powers of land acquisition granted under the 1980 Highways Act inflamed the situation. Motorway construction therefore slowed though there were notable additions to complete the M25 (opened 1986) and the M4 and M11.



Within the conurbations efforts were being stepped up to improve transport for city dwellers. Tram networks and light railway (Metro) systems were returning to favour. The Tyne and Wear Metro, which opened in stages from August 1980, led the way. Described as the first modern light railway rapid transit system in the UK, it serves the metropolitan boroughs of Newcastle upon Tyne, Gateshead, North Tyneside, South Tyneside and the City if

Sunderland. A combination of over-ground and underground it now serves 60 stations across 48.2 miles of track.

It was followed in 1987 by the Docklands Light Railway in London – an automated light metro system serving the redeveloping Docklands.

Manchester Metro-link – a street running system came into service in 1992 followed by Sheffield Super-tram in 1994. Several others were in the planning stage in the 1980's, most notably the Midland Metro, Nottingham and Coventry.

The destination of commuters in cities and towns was changing. Far fewer were destined for the factory floor; many more to the office block. In the 1980's the deregulation and globalisation of the UK's financial services sector led to a dramatic increase in market activity and a wave of demand for certain types of workspace. The decision of the Conservative

Government to deregulate the London Stock Exchange in 1986 (The Big Bang) led to aggressive growth. London, well placed to deal with the Pacific market in the morning and the North American market in the afternoon, rose to the top as the financial capital of the world. There was an influx of foreign Investment Banks and computerised dealing replaced face-to-face trading. It led to changes in the financing of developments which attracted a lot of capital. In the business districts of Britain's metropolitan areas there ensued a surge in the building of prestigious office blocks designed to draw attention and advertise individual Banks and Multi-National Companies. With land limited and expensive building high, very high, was one way to achieve these aims. Following the lead of New York and elsewhere therefore, London joined the competition to build sky scrapers with architectural merit. The opening of Tower 42, commonly known as the Nat West Tower, in 1980 topped all other buildings built in the 60's and 70's. At 600ft it became the tallest building in the UK and offered Grade A Office space. It was the forerunner of a new breed of office building,

Whilst buildings continued to reach for the skies the 1980's saw the limits in the scale of both ships and aircraft. The 'Seawise Giant' – the largest self-propelled ship in history entered service in 1981. With a displacement of 564,763 deadweight tons, a length of 458 metres and a draft of 24.6 metres she was incapable of navigating the English Channel, Suez Canal or the Panama Canal. The rudder alone weighed 230 tons and the propeller 50 tons. Damaged and

sunk during the Iran – Iraq war she was resurrected and renamed the 'Happy Giant' and was finally retired in 2009.

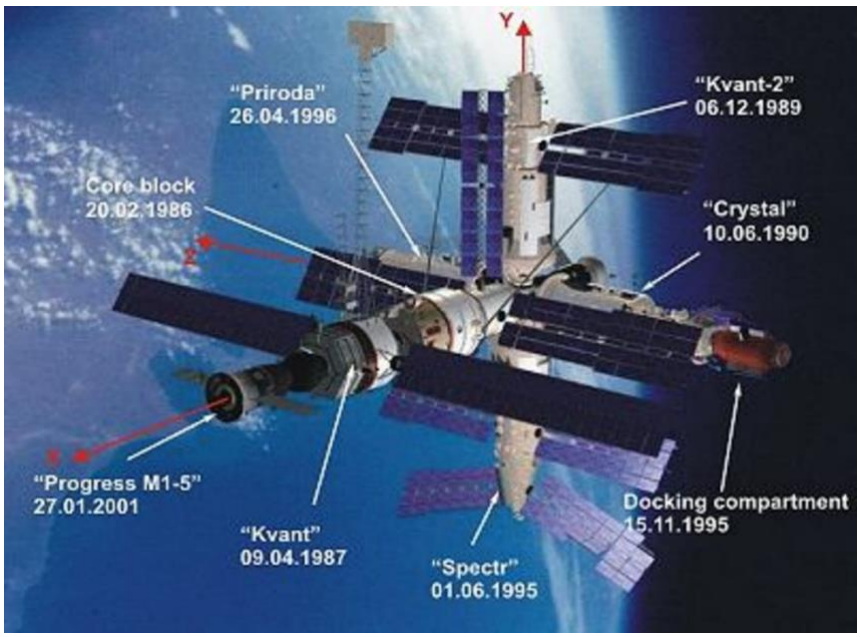
Aircraft too reached their maximum capacity in the 80's with the outsized cargo freight plane the Antonov An-225 Mriya built in Russia in 1988. Powered by 6 Turbofan engines it had the largest wingspan of any aircraft in operational service. Designed to carry over-sized payloads it was a record holder with a total carrying capacity of 559,580 lbs. Only 1 was built. Its take-off weight was, however, eclipsed by a modified Boeing 747 in the United States designed to transport Space Shuttle Orbiters for NASA. It came into service in 1977 and was used throughout the 'Shuttle' era.

Antonov An225

Boeing 747

The Space Shuttle – a reusable low-earth orbital spacecraft, came into use in 1982. Launched vertically with the use of a pair of recoverable solid rocket boosters and an expendable external tank containing liquid hydrogen and liquid oxygen, the Shuttle had three engines, I for the main ascent and 2 for orbital manoeuvring. Equipped with special thermal protection tiles to withstand the heat of re-entry the Orbiter glided as a space plane to a runway landing. Five Orbiters were built (Enterprise, Columbia, Challenger, Discovery and Atlantis) which flew 135 missions between 1981 and 2011 launching numerous satellites, inter-planetary probes and the Hubble Space Telescope. It was also used to conduct science experiments in orbit, participated in the Shuttle-Mir programme and participated in the construction and servicing of the International Space Station. The loss of Challenger in the disaster of 1986 which blew apart 73 seconds after lift-off with the loss of 7 crew members was a major set-back which grounded the programme for 32 months.

Whilst the emphasis of 1980's space science was on the commercialisation of near space. The construction of the Mir Space Station was also a major achievement. Of modular design it was assembled in orbit from 1986. In stages six modules were attached to the Core Module. Powered by photovoltaic arrays attached directly to the modules it maintained an orbit of between 184 and 262 miles travelling at an average speed of 17,200 mph completing 15.7 orbits per day. Mir was the first continuously inhabited long-term research station. Expeditions varied in length from 72 days to the record of 437 days of Valeri Polyakov but were generally around 6 months. The station served as a microgravity research laboratory in which crews conducted experiments in biology, human biology, physics, astronomy, meteorology and space-craft systems with the goal of developing the technologies for the permanent occupation of space.



The decade witnessed a number of other 'firsts'.

1982 First soil samples and sound recordings from another world – Venus (USSR – Venera 13)

1983 Ist Spacecraft to fly beyond all Solar System planets (USA Pioneer 10)

1984 First untethered space walk by Bruce McCandless (USA)

1986 First Uranus Fly-pass (USA Voyager 2)
First consistently inhabited long-term research Space Station (Mir)

1989 First Neptune Fly-by (USA Voyager 2)

Looking back to earth from space changed perspectives. The beauty and solitariness of our planet in the vastness of a universe showing little potential for miracle solutions highlighted its vulnerability. With world population growing ever more rapidly and with rising demand from the emergent under-developed nations of Africa and elsewhere the growing

pressure on expendable natural resources heralded imminent dangers ahead. The future was beginning to look bleak. Pressure was particularly acute on fossil fuels. Dependency was already such that the slightest hiccup in supply had the potential to bring the world economy to a grinding halt, as had already been demonstrated in the 70's. The situation was further exacerbated by the discovery from space of holes in the earth's ozone layer and the potential dangers this might pose to global temperatures. Attention then turned to air pollution most of which was attributed to the burning of fossil fuels. The evidence was clear for all to see in the smog build up in Cities. The link with cancers was then fully appreciated and an urgency for solutions gained traction. Unfortunately, alternative sources of power, Water and Nuclear Power, were no real substitute. Each offered disadvantages in costs, geography, environmental disturbance and disposal of waste. Nonetheless, moves were taken to increase their use to lessen the dependence on coal and oil. Four further Nuclear Power Stations were added to the 11 that previously existed in the 1980's at Hartlepool, Torness, and Heysham 1 and 2. Such was the strategic need that the Thatcher Government announced a long-term nuclear power programme to build at least one Pressurised Water Reactor per year for a decade. However, the commitment was overtaken by the privatisation of the electricity industry and only one was constructed, Sizewell B, which did not come on stream until 1995. Attitudes were also affected by the devastating Chernobyl Disaster on the 26th April 1986. This caused some hesitation in developments, not least the vulnerability of such plants to air attack and the possible consequences to large areas of the country.

The 80's, then, was a period of accelerating change. It was a time when the ideas and innovations of the 60's and 70's were refined, made user friendly and were commercialised. Uptake, however, took time to gather pace. Change never comes easily. The human condition is much like a ship laden with heavy life experiences. At first it is light, moves forward with ease and is vulnerable to being pushed off course by winds and tides. With age, as the load of life experiences begin to weigh it down, it becomes progressively more difficult to propel and is less and less prone to the vagaries of wind and tide. It is only moved by strong and persistent currents. During the 80's currents were gathering pace. Like it or not, ships could not hold out against it. They were sucked in and moved along. By 1990 they were in full flow towards a whirlpool. The momentum of revolution gathered pace!