

These are sections of "A Life in Space" as requested. They have been selected at random and edited slightly so they flow better.

On 12 April 1961, my mother, Marnie and I took a trip to London on the train from Epsom, Surrey to Waterloo Station. After doing some shopping, Mum and I went to a Lyons Corner House at the end of the Strand close to Trafalgar Square.

I ate a huge lemon meringue pie with a thick layer of meringue that seemed to be a foot tall. As the years go by, the dimensions of the meringue topping reach epic proportions in my mind.

Mum and I then walked to Leicester Square Underground station. Outside the station, the first editions of the Evening News and Evening Standard were being sold.

The billboards displayed the words: "MAN IN SPACE".

This 12 year old was hooked. This is the story of a space nut.

In the beginning, God created the heaven and the Earth - and I was born on the Ewell by-pass.

My blast-off occurred on 14 April 1948 at the Wilmer Lodge nursing home just up the road from Ewell village, near Epsom, Surrey, England. Margaret Josephine "Marnie" Furniss gave birth to a 10.5 pounder, her third son in a row. At the time, at White Sands, New Mexico, USA, a two stage Bumper Wac - a former German V2 missile with a Corporal upper stage - was being prepared for a 79 mile altitude flight on America's road towards exploring space.

My father, John, was an ancestor of Raffe (Ralph) Furnisse (Furniss), who was born in Ewell in 1585, during the reign of Queen Elizabeth 1 and two years before Mary Tudor lost her head. It is thought that the name Furnisse came from Furnish, an ancient Anglo-Saxon tribe in Britain. Furnisse has also been traced to Lancashire, at a time well before the Norman Conquest in 1066. Furniss could also be derived Furneaux, a name adopted in England after the Norman Conquest. Also, a Henry Furnace has been traced to Philadelphia in America in 1693. Amy Furness lived in Annapolis in 1719 and a Katherine Furnice in Pennsylvania, in 1772.

Some of the earliest Americans came from Ewell. Christopher Foster, his wife and two children left for the New World in 1634 and in 1682, George Palmer sailed on the ship, Ann Catherine but died on the journey, leaving his sons George, John, Thomas and William and their sister Eleanor, who purchased land in Pennsylvania from William Penn. It is possible that immigrants to America from Epsom and Ewell, gave their settlements the same names. There are towns called Epsom in New Hampshire and North Carolina and a Ewell in Maryland.

I always said my night prayers and kneeling by my bed I began a prayer that was to continue for many years. First, the next known astronaut or astronauts to be launched (you never knew the name of a Soviet until he had been launched) were mentioned to God and wished a pleasant flight and secondly, I asked God to let me go the Cape Canaveral, see launches, meet the astronauts and to have a job to do with space. I wanted to be an astronaut. The first step was to become a pilot so I decided I was going to join the RAF.Every Saturday afternoon after coming back from school, I got my pocket money from Dad, went down to the town and bought an Airfix kit of an aeroplane - the first was a Russian Mig - a quarter pound bag on Bonbon sweets and comics, including the Beano, Dandy and war comics, featuring we British beating the hell out of the Huns. The scene: British soldier pushing a bayonet into a nasty German: "take that you dirty Hun"! The German replies, "Gott in himmel!!....aaaaarrrrgghhh!!!!!!" All very politically correct.

In March, the National Geographic magazine published an article about the US plans to go to the moon and featured a cover picture of an artist's impression of an astronaut walking in space outside a Gemini spacecraft. This was absolutely fantastic and I made regular visits to the reference library to ask the lady there to let me have another look at the copy. The article Men on the Moon, by NASA's Hugh Dryden just whetted my appetite for the Gemini and Apollo flights, especially as it featured pictures of many astronauts.

I had managed to get hold of a second hand radio that could pick up some European stations and found the US Armed Forces Network, AFN. On 13 April, I tuned in for the news and heard that Gus Grissom and John Young had been selected as the crew for the first manned Gemini mission, Gemini 3 for later that year. Celebrating my 16th birthday the next day, after finishing my paper round, I brought all the papers and cut out the front page stories of the Gemini duo's selection and with much excitement and pasted them into my scrapbook. It was a memorable birthday. I can recall vividly sitting at the dining room table with GripFix, scissors, a spatula and bits of newspapers coming out of my ears. "US picks space twins". "US selects its moon rocket crew" (!) Actually, the selection of the Gemini 3 crew had been the result of lots of crew shuffles. Grissom had been down to command Gemini 6 - then a long duration flight - with Frank Borman. The thought of Gruff Gus and the intense and rather serious Frank Borman flying a 14-day Gemini 6 long duration mission is difficult to imagine. It would not have been a bundle of laughs, that's for sure.

My progress towards my goal was learning a lot about publishing processes and writing at Cockatrice Press. In April 1968 I had my first article published in Space issue No 15. It was about the NASA astronauts and I entitled it, "Many are called but few are chosen", which was rather prophetic. In May, in Space 16, I had an article with a review of the Gemini missions. The same month, I went on my first press assignment to the inauguration of a new radio telescope at Chilbolton in Hampshire and borrowed Mum's Ford Prefect for the job. I was rather overawed

about the responsibility and was as quiet as mouse, only managing to ask a technician after I had climbed up a ladder into the telescope's dish itself what the rigging was nearby. "For safety, sir", he said. When my report was published I had misspelt Chilbolton as Childbolton. Mr Henslow was not amused.

One of the best parts of working for Space was that I made good friends with Terry Franklin at the press office at the US embassy. I used to visit Grosvenor Square to collect press material and photos. Terry and his boss, Bill Dunne and another staff member "Kit" Carson, were very kind and often Terry would take me downstairs to the bar for a beer and burger. It was just like how I imagined America to be. I often left the embassy on cloud nine, probably due to a second Bud.

(Apollo 13) The white Apollo Saturn booster was just less than three miles away and looked as big (or small) as a matchstick held at arm's length. The sky was a milky-grey colour and the white rocket did not stand out that well against the background as it had done on previous launches, such as Apollo 11, which took off against a bright blue sky. A huge digital clock on the grassed area counted down the seconds and about three or so minutes before the launch, everybody got themselves ready and in position.

I sat on the edge of the lagoon with lots of other rather light-hearted people who were perhaps a little more nervous than they wanted to admit. Launching astronauts was a dangerous business. Someone said to me, "if it blows up, just turn and run!" And we were three miles away.

As the final seconds were being relayed over the loudspeaker, everyone fell silent, their eyes or cameras fixed at the white matchstick about to light up. T-10, 9, 8...ignition sequence start.....but I don't remember anything else! I was so busy looking at the sight through my 35mm Yashica that I saw the whole thing much smaller and continued to snap away until the rocket was a gentle murmur in the sky.

I can't remember the noise. The excitement. The drama. The spectacular blast off. I could have kicked myself. All this way and it was a complete anticlimax. One of my dreams come true. My prayer answered. I felt so disappointed. They say a blast off is like sex. I already knew a lot about anticlimaxes.

As I was on the mailing list for NASA press material, I received a huge press pack for the Skylab space station which was due for launch in May and wrote lots of articles for various trade and technical magazines about systems on the station, such as the lighting, biomedical machines and environmental systems. I tried to interest publishers in space books but the downturn in space interest did not help matters. I also marketed myself as Aurora Enterprises with a logo on my letterheads for a while. However I was chuffed when the "Source Book of Rockets, Spacecraft and Spacemen" was finally published by Ward Lock.Nothing that happened in space during 1973 set the world alight either, except perhaps Skylab but even that was not quite as big news as Apollo and didn't quite have the impact, despite a few dramas during the launch and three

manned missions. Only two pages of my latest scrapbook covered the first three months on 1973, reflecting the lack of activity that caught the eye of the popular press.

The highlight of planetary exploration was the first exploration of Jupiter by the legendary Pioneer 10 spacecraft, which had been the first to cross the asteroid belt en route. The craft made a 130,000km fly by of the largest planet in the solar system on 5 December, returning the first close-up images. Of course, the most famous payload on the craft is the 15 by 23cm gold-coated aluminium plaque etched with a diagram of a man and a woman, with their various vital appendages, the solar system and its position relative to 14 pulsars. Distances are reflected by the use of a hyperfine transition line wavelength of hydrogen. Pioneer will pass by the star Ross 248 by a distance of 3.3 light years in 33,000 years time.

I felt really settled and Sue and I spent a lot of time just being together. John's team at APL continued to work well together and things seemed to be good. My "Story of the Space Shuttle" book was published, followed by "Space Today" and I did some more work for Radio London. I developed a new mailer, which I started to circulate to publishers, mainly in the hope of getting some more books assignments. I was contracted to write a little book called "The Sun", for Franklin Watts and "Space Satellites" for Hodder and Stoughton, who had published the Shuttle book.....During 1980, I started work on another book, "Man in Space" for Batsford, my seventh book which was published in 1981, the year that my space career was at last to start to take off, aged 33 and 21 years after the day of the lemon meringue pie. It was the year of the Space Shuttle. Much of my writing was done in hotels as I travelled. I rarely socialised with APL colleagues on travel. I was regarded as a bit of a loner and peculiar, locking myself in my hotel room.

I sent out a new "postcard" mailer with a photo of me with my books laid out on a table and lots of magazine articles pinned to a wall behind me, thanks to Don Fraser's Academy Studios. I sent it to publishers and radio and TV stations. As the launch of the first Space Shuttle approached in April, I got invites to be interviewed by Capital Radio and BBC Radio London. A producer at BBC Radio 1 heard one of these and asked whether I'd like to be guest on the morning Radio 1 Playground programme one Saturday. I ended up doing five of these slots in 1981, not many but it gets your name around, particularly with other producers and radio stations.

I got more work on radio and did my first TV, as well as writing space articles for a number of magazines. My Tony Blackburn Show appearances on Radio 1 led to me being interviewed on the fledgling TV-AM breakfast programme previewing the flight of Space Shuttle mission STS 6. I had also been asked to do my second piece for Radio 4's Today programme. I was incredibly nervous the Bank Holiday weekend before. I can remember the sheer terror and fear of my first TV

- and "live" at that. A BBC car picked me up to take me to the BBC for the Today interview with Brian Redhead. What a lovely chap and one of life's caring persons. I think the interview was OK.

The next day, April 5, 1983, was to be the Big One. Again, a car came to take me to the west London TV-AM studio. I was so nervous when I arrived, I couldn't stop going to the toilet with the runs. Was it really worth all this? I thought, sitting on the bog wiping by ass for the umpteenth time. Finally, I was called into hospitality room next to the studio to await my call. Then came the moment: into the studio, where Angela Rippon was there to greet me on the sofa. I felt so relaxed that I soon lost that intense nervousness and was up for it - the interview that is.

Angela and I were sitting on the sofa together. Just as we went live, I noticed that the hem of her dress was upturned and she was showing her knee and a bit of her thigh. It looked untidy. As she started talking, my theatrical pre-curtain-up "make sure your flies are done up" experience came to the rescue. I instinctively and quick as a flash put my hand on her knee and unfolded the skirt. A real live TV first. Then she spoilt our intimate moment by calling me Jim Furness! After the STS 6 interview, I felt a veteran and was ready for more. I continued to do more Radio 1 and Radio 4 work through the year but no more TV.

As McCandless broke free from the Shuttle, he said, "that may have been one small step for Neil but it's a heck of a big leap for me". The astronaut "flew" as far as 300ft away from the orbiter and was later followed by another astronaut, Robert Stewart. Like Armstrong, McCandless became frontpage news all over the world but unlike Armstrong, was soon forgotten. "Free in Space!". "Look, no strings!" "This Great Voyage of Discovery". "Fastest Man in the Universe".

The mission also deployed two communications satellites using PAM-D upper stages both of which failed, stranding Indonesia's Palapa B2 and Westar 6 communications satellites in low Earth orbit. The Space Shuttle was not delivering a reliable commercial satellite deployment business. "Lloyd's to raise satellite rates". There surely had to be some reason that there have been so many malfunctions. Could it have been due to underestimated dynamic processes at launch? To make matters worse, an Integrated Rendezvous Target balloon to act a target for a Ku-band rendezvous system planned for another mission, burst. "Shuttle fails again", said the headlines. The programme was getting a bad reputation.

The final Shuttle mission of 1984 was in my estimation the greatest mission of all - the remarkable 51A mission retrieved and brought back to Earth two commercial communications satellites that had been left stranded in low Earth orbit when their apogee motors failed. The satellites, Westar VI and Palapa B2 were both deployed by STS 41B earlier in the year in one of the biggest embarrassments of the Shuttle programme and one which basically put the programme out of the commercial satellite launch business. NASA sold the idea of a salvage mission to Lloyds of London which had paid out \$180 million for the

their loss. Paying another \$10 million, Lloyds were in with a chance of re-selling the satellites and launching them again at about \$30 million each. STS 51A cost NASA \$125 million and earned it \$40 million. The agency planned to charge \$80 million per mission for satellite deployments.....

Visited Star City in 1964. I wrote a short story about my Star City trip for Flight International and sent it to Graham Warwick the technical reporter. I also wrote a piece for Jane's Aviation Review and a new US magazine, Space World, published by the National Space Society, which took me on as a regular contributor. Without my knowing, Brendan Gallagher, a former sub-editor on Flight and my Manned Spaceflight Log editor at Jane's, had suggested my name to Warwick and recommended that he use me more. Graham phoned one day and asked me to write some stories.

Each week, I used to drive into Sutton to the Quadrant House skyscraper overlooking the railway station - and with great views from the top floor from which I could just make out my house near Epsom Downs - to deliver the stories to Graham and he would give me a few press releases to turn into stories.

One day when I came into the reception Graham gave me a huge pile of stuff saying, "just do the space coverage, OK?" That's how I became the spaceflight correspondent of the magazine I dreamed of working for since I brought that first copy in 1962.

The Shuttle's major "sales" ploy was the flying of "payload specialists", many of whom were passengers getting a free ride and told to keep out of the way, while others had bona fide jobs to do. Garn's selection marked the quickest astronaut selection-to-flight sequence in history to that date and there was talk of more politicians being invited by NASA. If I was a NASA mission specialist selected in 1978 and who had worked his or her butt off for six years to get assigned to a mission and having to accompany a "passenger" who had a couple of months basic safety training, I would be very peeved off but I would also know that if I protested, I would be off the mission. So, the payload specialists were tolerated and some - not all - became very popular with the crews.....

12 April 1965. There was very low cloud, a slight drizzle in the air and it was dark and dingy for launch at 0804hrs. Discovery could have just made it but missed the slot because a ship strayed into the SRB impact area and by the time this had been moved away, the weather got worse. The main concern was that low cloud threatened the safety of a Return to Launch Site Abort and there was concern about the effect of water droplets hitting the reinforced carbon-carbon tiles. The window was due to close at 0900 and the weather forecast for the next day was dreadful. But Jake Garn who helped to pass NASA's budget was aboard. It had to launch! NASA administrator Jim Beggs was determined.

The reporters were packing up their stuff getting ready for a quick getaway. I knew that I could come back another day but a Swiss journalist I had been talking with and who had to fly home later in the day was very disappointed. I quietly said a prayer saying that I could come back but this guy was really

disappointed and asked God to give the launch a go. I rarely prayed before except in church and this sort of came out of the blue. Chief astronaut John Young was flying overhead in the clouds and reporting droplets on his windows. There was no way you could launch. Beggs wasn't having any of it. He strode into the firing room and ordered a launch. So, at T-9min 55s, the launch was on, reported NASA commentator Mark Hess. We were all amazed. Young was not impressed and he made his point later. So my Swiss friend would get his launch. The launch was quite an experience but a bit of an anticlimax, like a premature ejaculation. The SSMEs lit up, creating a cloud, which spewed out to the right of the pad, then at T-0 the SRBs lit and the vehicle lifted off. "It's going to crash!" I thought as the stack performed its roll programme. On TV this had seemed so graceful but in reality it was like watching a jet fighter doing a barrel roll at an air show. And that was it! Discovery went into the clouds, its rumble still heard but never to be seen again. It had taken all but 12 seconds. I came home with some great shots, however - and never saw another Shuttle launch, having been thwarted by weather and technical problems twice later.

THE SMOKING GUN

Abutaha had discovered flame emanating from the base of the orbiter Challenger at lift-off and had evidence of the massive leak from the SRB as seen from New Smyrna Beach at T+25s. He needed evidence of flame between these times. It was the "disappearance" of the flame after lift off that led NASA down the track concluding that the fire had somehow miraculously stopped.

Abutaha had shown his enhancements of the fire at lift-off to Jerry Hannifan, the Washington correspondent of Time Magazine who covered the space programme. Hannifan suggested that Abutaha contact Ralph Morse. As in previous missions, Morse's coverage numbered thousands of images for each launch. Thousands of Challenger images had been impounded and examined by the government. Abutaha flew to New York and spent a day with Morse in the photo vault with the eager permission of senior science editor of Time, Leon Jaroff. Abutaha was allowed access to dozens of trays of slides numbered in sequence.

He spent hours using a light box and magnifying glass and it was obvious he needed help, so Morse offered to set up a projection system and started to review some images himself. He was astounded to see an image of the lift-off showing a piece of white debris falling away from the top of the right hand SRB at lift-off. NASA had examined the images, so must have known about the objects, which explains why the agency images of lift off do not show the top of the SRB! Things got even better just as Abutaha was becoming tired and depressed. He asked Morse more about the location of the cameras and then requested a search of images that were taken by a camera on a boat north of the KSC, which would have looked straight up the plume. After a search of many images, Abutaha cried, "there is a fire!" It was between the belly of Challenger and the ET. ...well you know what happened then don't you? The most important image in the history of the Shuttle programme and Time refused to use it!. Abutaha told

me what he felt. Time Magazine was the major news organisation in the free world. Facts and evidence came first - "but apparently, they bend in the wind like everyone else!" (many other personalities were present and involved but for the sake of trying to keep brief will not list them).

Time let Abutaha have five photos with "Print property of Time Magazine". "Personal use only. Abutaha showed the images privately to congressional aides in Congress but nothing happened. He showed the pictures to some journalists including the most famous space correspondent in the USA. "Either out of fear of NASA or the Government or rejections by Time, no one followed up the story.

The images showing the debris coming off the top of the SRB at lift-off and the flame during the roll programme are 06 08-4NN2216 and 0608N111216 respectively.

Note: In 1996 I saw the pictures for myself and in 1997, Flight International published an artwork.

(PSFfrench on CS told me that very few space people read Flight International...French will have read the full story of this episode and I am sure he will enlighten you and CollectSpace. Well if they had they might have changed their minds)! See the synopsis of Flight's Challenger coverage in the thread earlier.

My second stint as the reporter on the Flight Daily News was at Farnborough in September 1988, a 45min drive from home in Epsom. Another bonus was that our office was part of the YMCA close the Farnborough airfield, which boasted a fantastic canteen where I pigged on great lunches, which included daily helpings of syrup sponge and custard, my favourite dessert. As usual, the work was great fun and arriving with some "pre-cooks", which could be topped and tailed with a Show angle was a good idea, to get you in the mood. Visiting company chalets for press conferences and rushing back to file stories before going out on the hunt again was great fun.

Quite often at Paris and Farnborough, I failed to mention the Show angle in my stories and I would hear sub-editor Brendan Gallagher shout across the office, "Tim, where's the Show Angle?" Soon, I had those words ringing in my ear every time I ventured out for more stories. The editor that year was Bob Rodwell, a Belfast-based aerospace journalist, who got a bit excitable at times. Bernie Fitzsimmons used to wind him up with sarcastic comments and a row usually ensued. You could see it coming and it was rather entertaining. Many stories at Farnborough featured Hotol, which had caught the imagination of the aerospace industry, despite its internal design including much classified technology, such as the air-breathing engine.

Later, British Aerospace at Stevenage invited "Saturday Superstore" to film a report from the factory. It was my first opportunity to report to camera. I don't think I had ever been so nervous as I took the various trains to Stevenage. I was shitting myself and almost trembling with fear when I arrived. The company's marvellous PR manager John Humby and his assistant Liz met me and within a

minute I was standing in the factory, close to a satellite, in front of a camera and expected to say something to the film crew at the first port of call of our tour. They gave me signal. I just opened my mouth and said, "welcome to British Aerospace at Stevenage where behind me you can see this communications satellite....." I just kept going describing it and what BAe did and was later signalled to wind up. It was all very "professional" and I was very chuffed and calmed down a lot. Everybody seemed to be pleased and we went off to record the next reports! I never told anybody that I had been a "virgin". I did more TV reports, including one from inside Apollo 10.

Soyuz TM7. I had been impressed at the scale of Cape Canaveral but Baikonur was enormous. The rocket had been assembled and mated to the Soyuz TM7 spacecraft in the MIK integration, checkout and assembly building and placed on its rail-mounted erector system and transported engine end first to Pad 1. The plan was for us to meet the rocket as it left the MIK but we were late and the coach drove further along the road towards the launch to catch up with it. On the way to the pad I saw a lady wearing a fur hat and with a shopping bag waiting for a bus and a dog peeing close to a small hut-like house. Ironically, what I remember most of the trip was that lady. It just seemed so incongruous. I couldn't help laughing. I just imagined what it would have looked like if that happened at the Kennedy Space Centre during a Shuttle rollout. The bus caught up with the rocket shortly after and we all baled out of the coach to follow it on the way to the pad, walking all over the railway track as it moved slowly along. Safety was not as high a priority as it is in some other countries.

We accompanied the rocket to the launch pad and at 7.53am the erector was almost immediately anchored to the pad and hydraulically translated from horizontal to vertical in about 30 minutes. This left the Soyuz suspended above the flame pit by four long mechanical arms clustered around the mid-body of the rocket. They would be released when the engines had reached full thrust. The journalists were left to mill around the rocket and walk all over the place.

Jeff and I walked underneath the pad and stood in the flame trench looking up at the engines. It was like a dream. I wondered what I would have thought if on that day on 12 April 1961 someone would have said to me, "Tim, in 27 years time you will be standing on Gagarin's launch pad". I had gone full circle.

As for Freedom, Japan signed up to join the project with a two-piece Japanese Experiment Module. Little did ESA or the Japanese space agency, NASDA realise how long they were going to wait. It was revealed that Freedom station would now cost \$250,000 per hour to operate and that was before the final configuration had been decided. By May, NASA was facing a \$1 billion budget cut. Senator Jake Garn, who flew the first space junket, said that Freedom should be eliminated. Thanks, Jake. Hope you enjoyed your trip!

Admiral Richard Truly was appointed the new administrator of NASA and soon took on Bill Lenoir as his manned spaceflight associate administrator. NASA said that the station would have to be redesigned. Thus began the slow dissipation of a big dream. The dual keel was abandoned and the new configuration was based

on a single keel, with solar arrays at each end and a cluster of modules in the centre. Lenoir was keen to get the project up and running as soon as possible in whatever configuration he could, just to get "the impetus going". He and Truly even went as far as designing an alternative, in case Congress ordered another review. The alternative included just one solar array, reducing power from 55kW to 37.5kw. These two men were to be involved in perpetuating the Challenger controversy. ESA began to get very tetchy with the autocratic approach of Truly and his sidekick. It was not being consulted nor taken seriously. ESA had heated exchanges with Lenoir. Americans really believed that there was only one proper space programme - and it certainly wasn't European. The others were hangers on.

The TM10 crew, Gennadi Manakov and Gennadi Strekalov, were launched on 1 August to take over operations and was followed by TM11 was launched on 2 December, the same day as NASA's STS 35 and as a result 12 people were in space at once. TM 11 carried the first journalist in space, Japan's Toyohiro Akiyama whose TBS TV company had paid the Soviets, \$12 million. The new TM12 crew were Viktor Afanysev and Musa Manarov.

Akiyama certainly did what he was trained to do - to report from space frankly. He was a joy, refreshingly ordinary and frank. "I feel like a bride before her wedding night, like a soldier with his target coming into view. I am calmly excited", he said before launch. He was 5ft 6in and at 10st 12lb, rather overweight, enjoyed his sake and smoked 80 cigarettes a day. He went on a diet and shed 1st 3lb and endured the gym. "This astronaut's village is the world's best health farm". He had no illusions. "I am a passenger, that's all...I'll just sit there and enjoy the flight". The 48 year- old TBS reporter described the launch as like "riding a dump truck down and rocky road". He lost his appetite and was constantly dizzy. His wife talked to him and asked "are you OK dear". He replied, "I am definitely not OK!" He was feeling sick and was desperate for a cigarette - but the views were good though, he said.

TM12 was confirmed for launch in May, carrying the UK's Juno cosmonaut, either Helen Sharman or Tim Mace with Energia providing a few jobs for the chosen space traveller to do. The "scientific value of the mission has been sacrificed in favour of staging a publicity stunt", said British space executives who couldn't be bothered to provide funding for experiments for astronaut to do! A former Juno associate said that the Juno mission would go down as badly as the "Japanese journalist and his green tree frog". Akyama's flight did not go badly. His TV company coughed up the full fare and Akyama did his assigned job, to report on the mission. Some British executives were talking about flying a "real science mission later". Well, they could have had one in 1991 if they took their hands out of their pockets! As expected, Sharman was selected and Tim Mace lost out. Helen was launched on 10 May aboard Soyuz TM12 with commander Anatoli Artsybarski and Sergei Krikalev. Sharman - "Woman from Mars is first Briton in space" - was the first woman to fly to Mir and in addition to being the first Briton in space, was the joint 248th person and 15th female in space. The

launch timed badly, since it was FA Cup day in Britain. It could only happen in Britain.

The Ballistic Missile Defense Organisation's SSTO technology demonstrator, McDonnell Douglas' DC-X made its maiden lift-off in August 18. The revolutionary hover flight, controlled by Pete Conrad - on the ground - but in his element, took off from White Sands and flew vertically to 150ft, then moved laterally 300ft, descended vertically and touched down after a flight of 60s. Conrad was at it again on 11 September, "flying" the DC-X for 66s, to 90m, hovering in place for 4s and then moving sideways for another 105m, before making a soft-touchdown. A third mission was made on 30 September, with the craft reaching 370m and performing a 180deg roll. However, the project was in trouble and the BMDO started to look to other agencies, such as NASA and the US Air Force to keep it afloat in order to allow the later tests of a double-sized Mach 5, SX-2 to fly in 1997. The DC-X was very similar to designs presented at an Aerospace Industries Association of America conference in June 1963 and patented in 1965 and 1967, specifying Philip Bono of Douglas Aircraft as the sole inventor. Interestingly, the BMDO revealed details of a pulsing-plasma engine for spacecraft which had been tested, demonstrating a 50% increase over the accepted steady-state 100% propellant performance thrust level using ultra-short pulses, using the dynamic overshoot phenomenon - or transient load - which exists on all engines. This of course confirmed the credibility of Ali Abutaha. NASA, the US Space Command and the Nuclear Research Commission took notice and actually "appreciated" Abutaha's work. By pulsing an engine, so that the dynamic overshoot is perpetuated, stored energy can be converted to increase performance. When switched on or ignited, all engines in varying degrees exceed their rated thrust. Abutaha was not named.

The much-anticipated Space Shuttle docking with the Mir space station was scheduled for June but the first Shuttle mission of the 1995 got pretty close. It seemed extraordinarily cautious of NASA to fly STS 63 Discovery to do a practice rendezvous - to within 11.2m (37ft) - but not the docking. The crew of the 8- day mission launched on 3 February, during a tight five min window, included the first female pilot, Eileen Collins and the veteran Russian cosmonaut Vladimir Titov. Also on board was Mike Foale, who was becoming a NASA favourite and who made the first "British" spacewalk. "The Walk of Wonder", said one Brit paper, while another found it a bore. "One small step for man but a giant yawn for mankind". Some of the crew took part in a Coca Cola experiment, which involved drinking fizzy drinks. "They're probably off somewhere belching their guts out", said a wag in mission control. The mission cleared the way for the STS 71 Mir docking planned for June.

The first stage of this mission was the launch of Soyuz TM21 from Baikonur on 14 March, carrying the first American to be launched by Russia. The rather dour and serious Dr Norman Thagard flew with Russians Vladimir Dezhurov and

Gennadi Strekalov, docking to Mir two days later. A record 13 people were in space as Space Shuttle mission STS 67 was in orbit and three others were on Mir, including the incredible space marathon man, Valeri Poliakov. He came home aboard Soyuz TM20 on 22 March, after clocking up 437 days in space. His space experience record was raised to a total of 678 days on two missions. Russia was looking seriously at flights to Mars flights. The much-delayed launch of the Spektr module for the Mir space station was launched in June.

A more gregarious astronaut may have enjoyed his stay on Mir but Thagard, who had a basic Russian vocabulary, reported after the flight that he suffered "extreme cultural isolation." Dezhurov and Strekalov were also getting used to the unusual working relationship, during which the crew "went days without talking to US colleagues on the ground and getting news from home," said Thagard later. He also told Dan Goldin that it was clear that "we need to take a look at the psychological well-being of the visiting astronaut".

The pace of change in space matched the revolutionary change in the former countries of the Soviet Union. The co-operation was also a significant milestone towards the nations working together in Alpha or Freedom or whatever it was going to be called. One of the highlights of the STS 71 mission was the undocking of Atlantis and also of Soyuz 21 - piloted by Solovyov and Budarin - during a joint photo session and inspection of Mir. The Russian duo came home aboard TM21 after a 79 day mission, to be replaced by TM22, launched on 3 September with a crew including German's ESA astronaut Reiter, who flew the first long duration mission by Europe lasting 179 days and became the first non-US, non-Soviet spacewalker.

Compared with operations at the vast Cape Canaveral, Kouou operations are very compact. The Ariane 4 pad is just a 1km away from Ariane 5's. The new Jupiter 2 launch control centre was inaugurated in 1996. Once an Ariane has been despatched successfully, "we begin preparations for the next mission three days later", said Bernard Donat, Arianespace's operations chief. Kouou is not an Arianespace site but is owned by the French space agency, CNES. In airport terms, Arianespace is the airline and the European Space Agency, the Government transportation department. In the evening I had a late dinner out with Mario and two executives and their wives. I just wanted to go to bed but before I did it was great to see a totally different perspective of the night sky with several "new" constellations. Seeing Orion overhead was amazing.

My final trip to the USA was made in January by courtesy of Alistair Scott of Astrium who invited me - with an entourage of many other journalists and guests - to the launch of Skynet 4D satellite by a Delta II booster from Cape Canaveral on 10 January. By a happy coincidence, NASA's Lunar Prospector was also due for launch from Canaveral, taking off on 6 January. I took my first ever laptop, an Apple, with me and was able to send a story and launch photo by "email" which was quite amazing. It took a lot of "wiring" and fiddling about but I could certainly see the future clearly. As usual, I had a couple of my own appointments with

NASA and spent a good time in the new International Space Station Processing Facility, where the Node 1 and Pressurised Mating Adapter to fly on the first Space Shuttle assembly mission, STS 88 Endeavour.

It was good to meet with Steven Young again. If I recall correctly, he was reporting on space for the Reuters news agency, covering all the launches. Sounds great! I added another notch to my modest launch experience four days later when the McDonnell Douglas Delta II flew from complex 17 on the first of 18 planned Delta launches and 11 Matra Marconi Space-built satellites planned in the year. It was another night launch and pretty spectacular. It also was good to meet with Craig Couvaut again, as we went to see the Mercury control room nearby. I had hoped to stay on a little longer to see a Space Shuttle launch that had been scheduled but it was delayed.

On 17 March, Iridium sank under a \$4.4 billion debt in the biggest space business failure in spaceflight history. The company planned to de-orbit the 88 satellites in a controlled manner. The saddest thing was that so many observers could see it coming. Its application base was just so singular and the system was overly complicated, with inter-satellite linking instead of ground switching. Later, Iridium offered a scaled down service to the US Government, including the Pentagon and industry and even suggested it would be launching even more satellites. The first ICO Communications satellite was lost when the Sea Launch rocket fell short after pressure valve was left open on the second stage due to a probable ground software logic error. ICO fell into the Pacific 4,000 miles downrange. ICO filed for \$1.2 billion bankruptcy. The 77-satellite Teledesic was heading the same way. Orbcomm also went bankrupt in September but hoped to continue with its data communications service, which was used to track and maintain contact with fixed and mobile assets such as oil rigs and trucks.

Meanwhile, the rapid increase of demand for wide-ranging Internet services using Ka band frequency broadband was giving birth to multi-application geosynchronous orbiting platforms. Suddenly, Iridium was forgotten and in came new names such as iSKY, NetSat, CyberStar and larger Telstar and Galaxy satellites. By 2000, the Internet accounted for 50% of all satellite traffic, with 225 transponders from zero in 1996. Large Ka-band satellites were required and satellite manufacturers were looking at larger spacecraft buses. Commercial ELV companies licking their lips, especially the US Air Force-underwritten "commercial" Atlas V and Delta IV launchers coming on line.

I travelled far and wide presenting many more lectures in 2002, just to get a big list to put on my next mailer. With the cost of petrol and accommodation, I did not make much of a profit but it was more important to create the credibility - and get the experience. Schools included Highgate in north London; Sevenoaks, Kent; Clayesmore, Dorset; Wellington, Somerset; Uppingham, Derbyshire and Woldingham in Surrey, which was for me, the best yet. The whole school attended and must have numbered about 400 pupils, some parents and the

teachers. The lecture theatre was fantastic with a huge stage. I was on fire that evening and loved the experience and got a standing ovation. I wish they were all like that. I planned to expand into Scotland to increase my credibility and experience.

I was asked to do the space reporting at Farnborough 2002. Having said to myself as I left Paris in June 2001, that that was it, I was attracted by that "one last time" feeling. I didn't fancy it - but the pay was good. Sadly, I went through the motions. I just didn't have the "right stuff" this time but did my usual professional job and even got to plug myself in the Daily News. "Flight space correspondent launches career in showbusiness". The story described my proposed "evening with" style Spacewalking presentation for theatres, telling the story of the 12 year boy in 1961 and his adventures. I didn't get any immediate bookings. In a way this was another nail in my Flight coffin as staffers could see that I was perhaps spreading myself too wide.

I drove up to Whitehaven to do a theatre job, while many of the family went to BeechTree to see Dad. On the day I was to present the "show", Dad was taken into hospital. Should I cancel the theatre job and drive home as quickly as possible? I thought about it and it was as if Dad was telling me, "Tim, the show must go on". Not many turned up for the evening performance but it went well. I went back to the hotel for a quick sleep then headed home very early the next morning, 26 September, driving non-stop to Oxford. I phoned BeechTree and my brother Peter picked up the phone. I told him I would be at the hospital within two hours. Pete replied, "Tim, Dad has passed away".

My sister Cathy and my Mum were with him as he fought to stay alive, his breathing becoming laboured and noisy and after a long struggle he gave up. I suppose we all worry what it will be like to lose a parent and my time had come. I got to the Dorking Road Hospital, Epsom absolutely drained. I went up to the ward and was taken to see Dad. The nurse asked whether I had ever seen a dead body before, just in case I would be shocked. I hadn't but I said yes. I don't know why. Dad was laid out peacefully with one arm down his side and the other across his chest. My instant emotion was simple. He was not there. His body was just a shell. He looked remarkably like a Pharaoh. He had departed his body. I sat there talking to "him" for about 20 minutes and then kissed his forehead.

Meanwhile, the early reaction to the loss of Beagle was not reported widely until the New Year because the lack of newspapers over the Christmas holiday. The aftershock of the "lost" Beagle 2 continued with no success in picking up signals. "Mother ship searches for Beagle 2". "Beagle may have dug itself a hole". "Beagle calling Earth. We're in a little bit of a hole". "Hunt for Beagle is getting desperate". Many academic scenarios were suggested, ranging from landing in a deep crater and a heat shield failure. The most popular theories were that the spacecraft collided with its heat shield as this was jettisoned after entry into the Martian atmosphere or that the parachute failed due to atmospheric conditions

during a Mars storm, which absorbed more solar radiation and expanded the atmosphere, making it thinner than planned. The recriminations began and knives were out but some newspapers were supportive. "How dare anyone call Beagle 2 a national embarrassment. This fine project showed the best of British spirit - I don't mean the school of heroic failure. The determination and drive of one individual pulled together the best scientists and engineers in the fields to create a miniature marvel". "Bring on the little green men". Only the Brits could react this way!

Beagle contrasted with what would become one of the most successful and durable Mars missions of all time. The two NASA Mars Exploration Rovers (MER), Spirit and Opportunity landed encased in airbag landing systems and rolled the rovers off on ramps. Spirit and Opportunity were still operating in 2006. Spirit landed in the Gusev crater on 3 January and its first image showed a surface looking like a sandy beach with lots of various sized rocks. "American rover lands on Mars as Beagle stays mute". "Spirit sends first postcard from Mars". "Rover beats Beagle in the 106 million mile space race". "NASA goes boldly where Beagle failed".

((107)A Flight International editorial ended with "For an agency for which failure is not an option, the vision for space exploration is rapidly becoming a mirage". Tributes from ISS to the fallen astronauts and all who died on space missions were made. Expedition Crew member, John Phillips: "From you we will carry the human spirit into space and we will continue the explorations you have begun. We will find those new harbours that lie out in the stars and of which you dreamed. We do this not because we owe it to you but we do it because we share your dream of a better world". Collins ended the tribute with a line from "The Fallen", spoken on the sixth sunset of the day. "At the going down of the sun and in the morning, we will remember them".

Meanwhile, the dependable Russia routinely launched two crews to the ISS in 2005. The first launch was made aboard Soyuz TMA 7 on 1 October carrying the 12th Expedition Crew, Valeri Tokarev and Bill McArthur. Also on board was the third space tourist, Gregory Olsen, who landed after a 10- day flight, with the 11th Expedition Crew, Sergei Krikalev and John Phillips after their 189- day shift on the station. The remarkable Krikalev thus became the new record holder for the amount of time spent in space, of 806 days in six missions.

NASA, however, was pushing on with the Vision for Exploration programme, which would first feature a new unmanned booster to replace the heavy work of the Shuttle. It would use an ET as the first stage fuel tank for two cryogenic engines, two Shuttle SRBs each with five segments and a cryogenic second stage. A smaller version using a single SRB was also planned. By October, NASA was outlining a 2018 return to the moon mission involving a lunar lander and Earth departure stage on the new booster and a second flight, carrying the Crew Exploration Vehicle looking like Apollo Mk2 and carrying four to six crew to

dock in Earth orbit, before heading out to the moon, 46 years after Apollo. The operational CEV missions would even end with an a la Apollo splashdown. The whole venture is likely to end in a painful splashdown, unless NASA gets a sustained, long-term mega budget to survive, rather than yearly budget decisions. Otherwise it will fizzle out.

On 22 November 2004, I was back in Epsom, again.

I walked from Beech Tree Cottage and down Church Street with the usual feelings of intense nostalgia. After passing under the East Street railway bridge, I entered the area that my Mum had so famously called the "wrong side of the railway". About a mile or so down Hook Road, I entered a little shopping precinct.

One premises was named Longhurst.

I entered the very pleasant reception of the business and was welcomed by the manager, who led me into a little room. He left and closed the door behind him.

I had a card in my hand. On one side was a picture of a lemon meringue pie cut out from a box I brought in a supermarket.

On the other side of the card, I had written:

12 April 1961

Thank you, Mum

Love, Tim

I laid the card by my mother's side. She looked so peaceful and had a slight smile on her face. Such a frail but well dressed little lady of 83.

Later that morning, we laid Mum to rest with my father in a joint grave at Epsom Cemetery, Ashley Road.

I felt that an era had well and truly ended.