

Blue Steel Trials South  
Australia **1957 - 1965**

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# Welcome

## ***From the Committee***

The BS 2001 Reunion Committee extends a most hearty welcome to all of our erstwhile trials colleagues to Adelaide and earnestly wishes you a most pleasant occasion.



Figure 1 Reunion 2001 Committee Bert, Keith, Dennis, David , Bryan and Terry

### **Terry Clark - 4JSTU**

Terry joined the trials in April 1960 as a Guided Missile Fitter and was involved through to the end in April 1965 specialising in Auto Pilot, Flight Rules Computer (yes they had them in those days) and the Barometric Unit.

Today Terry is very involved with motor sport event photography around Australia and you may well have seen his work around the place

### **Keith Rendell - EMI**

Keith was one of a team of UK based engineers and technicians who spent 1961-1965 setting-up and operating the telemetry equipment which recorded the performance of the launched vehicle in flight.

Keith now spends his time variously with selective study, community work, grandchildren activities and doing all those things for which he has never been able to find enough time.

## **Dennis Pfeiffer - A.V.Roe & Co**

Dennis worked for AVRO as a Technical Officer (autopilot) and Air Electronics Officer in the V- Bombers. He later enjoyed twenty six years as a biomedical engineer .

Recently retired, he is actively involved in restoration work at the S.A.Aviation Museum including foraging at Woomera for useful 'body' parts

## **Bert Grove – *Huntings***

Bert's role was to test the telemetry senders and build them into a "pod" that was then fitted into the dummy warhead

Now retired, Bert is heavily into word processing on his PC and produces a number of monthly newsletters for various social clubs including the Robert Burns Society of South Australia

## **Gordon Mephram - *4JSTU***

Gordon was a member of Number 4 Joint Services Trial Unit (4JSTU) from April 1959 to November 1964. Duties during that time included working with Avro Autopilot, Flight Rules Computer and missile electrical power design and trials electronic engineers at Woodford UK and Weapons Research Establishment Salisbury South Australia.

After 12 years as Lecturer in the School of Electronic Engineering at Regency Institute of TAFE teaching a wide range of computing and electronic subjects he is actively 'covering' Australia in his caravan

## **David Lloyd - *Elliotts***

David was with the Inertial Navigation Division of Elliott Automation, as an Electronic Engineer. Duties on the Blue Steel project included analysis of navigation trials data and airborne flight observing.

David subsequently returned to WRE after a brief 'banishment' to UK home base, and retired after over 30 years working in various roles, mainly in Electronic Warfare Division.

## **Bryan Wetton - *4JSTU***

Although Bryan, as a Photographer, was only involved in the tail end <G> of the trials he feels he has become the 'de facto' chronicler of the project (particularly the Royal Air Force involvement).

Ironically he never saw the results of the films during the trials - it took 35 years for him to get his hands on some examples. Bryan's into Computers and Genealogy now and helps older people in the Unley/Mitcham area to get started on the Internet

With the invaluable assistance of

**Ray Harrison**

Compiled and Edited in Adelaide by  
Bryan Wetton and Gordon Meopham  
October 2001

Telling the world

## Press Release - 2 May 2001

From: Organizing Committee - Blue Steel Trials Reunion SA

Objective: To publicise as widely as possible the Reunion of those people who participated in the Blue Steel Trials in South Australia 1958 -1965

### Overview

During the post war years many Joint Projects between Australia and the UK were conducted at Woomera and elsewhere in South Australia and placed this State at the forefront of military research which it still holds today..

One such series of trials prepared for service the strategic stand-off missile named BLUE STEEL. This missile was a 35 ft long rocket airplane, computer guided and launched from Britain's famous V Bombers. The inertial navigation system was the forerunner of military and commercial devices used today as exemplified by the Global Hawk reconnaissance craft recently testing in South Australia

This trial brought together personnel from a number of famous British aircraft manufacturing companies and RAF teams to service and maintain the missile and the V Bombers.

During the period that these people spent in South Australia they commenced romances that blossomed into marriages that are still together today. Many such couples have been resident in this State since shortly after the trials finished. Some have been involved in further

Space related projects such as that portrayed in 'The Dish'.

The 'pull' of the BLUE STEEL project was so strong that many former participants have remained in touch through the 35 years since it finished and want to share even greater memories with those others that they haven't seen since.

An expedition to recover remains of the missiles from the test area was conducted in 1999 as a precursor to the Reunion and restoration of a Missile by the SA Aviation Museum. Details of this 'BIG STEEL' mission are portrayed on a number of pages on the WWW together with much more information on the missile and the Reunion. I t's a great site have a look at



From an oil painting by Rob Johnson

### **Our Web Site**

**South Australian Blue Steel Trials  
1958-1965 at**

**<http://bluesteel.cjb.net>**

## ***Lives after Blue Steel – personal reminiscences***

### **Leon Webke**

Leon joined the Blue Steel program in 1961. He worked in the facilities group, and then on the TSOM. After three years at AVROs, Leon moved across the road to EMI Electronics, where he worked on the sea trials of the IKARA anti-submarine weapon system, and later in one of the engineering laboratories, until 1971.

During those years in Adelaide, Monica worked for a large hardware store in Adelaide, which involved the inconvenience of a daily train trip, so after eight months commuting to the city, she found a position as secretary to the Accountant at the then de Havilland Aircraft Corporation, later re-named Hawker Siddeley Dynamics Australia, who were located in the same contractor's area of the Weapons Research Establishment as were Leon's firms, which was much more convenient. After four years at HSDA, Monica obtained a better-paid and more congenial position as Private Secretary to the General Manager of Pinnocks Ltd Figure 2 Test Set Overall Missile, a sewing machine manufacturer located in the Elizabeth South Industrial Area. Monica worked at Pinnocks for two and a half years, resigning in January 1969 to prepare for maternity.

Katrina was born in the Queen Victoria Hospital at seven pm on Good Friday, 4 April 1969. Our daughter was only four and a bit months old when we took her on the long car trip to Queensland to show off our pride and joy to our relatives.

In 1965 we built a house in Elizabeth East, just up the road from the flat, and planned to make South Australia our permanent home. After nearly eleven carefree years together, parenthood brought for the first time to Leon and Monica a concern for job security. But the weapons development industry was no longer booming, and cut backs in spending meant increased likelihood of redundancy, and little prospect of salary increases. At the same time, and for the same reasons, the prospects of gaining secure employment in the Weapons Research Establishment, where Leon had long wanted to make his career, were also diminishing. So, the best laid plans having thus been shown indeed liable to go awry, in 1971, Leon applied for, and gained, an appointment in the Department of Supply in Canberra, and we left the home that we had made in South Australia.

In Canberra, Leon worked as a Senior Technical Officer in the Aircraft, Guided Weapons and Electronics Supply Division of the Dept of Supply for three years, engaged mainly in the development and operation of one of the earliest computerised project progress monitoring and reporting systems, and providing PERT/CPM analysis services to the project managers in GWE Branch. During that period he studied systems analysis and design, and taught himself how to write COBOL programs.

But the early seventies was a time of much change and significant growth in the public service in Canberra. The transfer of several departments from Melbourne saw many of the older hands retire rather than leave their homes in the southern capital, creating many opportunities for ambitious young fellows in Canberra. So it was that in 1974, Leon left behind his technical work for a promotion as an Organisation and Establishments Inspector (Clerk Cl 7) in the Department of the Capital Territory. After only a few months, he got what must have been the fastest promotion ever recorded. Having been interviewed for a Class 8 position in the Dept of Health, he gave as a referee the name of his Branch Head in Establishments Branch at Capital Territory, who, divining that his recent recruit was about to be taken away, created a Class 8 position and gazetted Leon into it the same week as he was asked for comments as a referee, so Leon was promoted in Capital Territory one week and in Health the next! Electing to stay in Capital Territory, Leon worked on a major organisation review of the ACT Motor Vehicle Registry, at the conclusion of which he was persuaded to accept promotion to a newly established position as Assistant Director, Operations, a Class 9 position in the MVR. A few months later, he was elevated to Director, and made Registrar of Motor Vehicles, a post he filled until 1982.

During those early years in Canberra, Leon enrolled in the four year Management Certificate course at the Technical College, graduating in 1976 and winning the Australian Institute of Management prize awarded to the leading Graduated each year. In 1981, he was accepted into the prestigious Residential Management Program at the Australian Administrative Staff College, Mount Eliza. Returned to Canberra after that memorable experience, Leon left the MVR for a Class 10 position in one of the policy areas of Traffic and Transport Division, but much as he enjoyed the work, it was not long before his superiors decided his management abilities were more needed in an operational area, and he was transferred against his will to be Operations Manager of the ACT Bus Service, a job seen by many as a poisoned chalice. Unwilling to sip from that cup, Leon determined to leave

Capital Territory, and in 1983 gained a promotion as head of the Administration Branch of the Joint Intelligence Organisation in the Department of Defence, and held that position for seven years before his last promotion, to be head of the Branch that managed the five year contract under which Defence procured all of its computing requirements. He retired from that Senior Executive Service Level 2 position in 1992.

A keen golfer, as soon as he arrived in Canberra Leon joined the Federal Golf Club, and it was not very long before he gained selection to and a regular place in its senior pennant team. Playing off a handicap of three, he won nearly all of his matches, as well as competing in the regular club competitions on Saturdays and Sundays year round, demonstrating to Monica the meaning of the term golf widow for many years. Leon became Captain of Federal in 1979, and two years later took over the presidency, at a time when the club was in some financial difficulty. Solving those problems took all of Leon's executive and managerial skills, but by the time he relinquished office in 1986, the club was on a sound footing.

Katrina was just a little past her second birthday when we came to Canberra, and Monica continued as housewife and mother for our first four years in the ACT. But when Katrina started school, Monica was able to re-join the workforce, working school hours as School Secretary at Holt primary school. Holt is a suburb in Belconnen, some twenty kilometres from where we lived in Weston Creek, and when in 1988 the then Acting Principal at Holt was selected to open a new school at Isabella Plains in Tuggeranong, much closer to home, Monica elected to accompany him as a member of the foundation staff of the new school. She remained as Bursar of Isabella Plains until 1994, when she joined her husband in retirement.

Having decided to remain in Canberra in retirement, in 1989 Leon and Monica moved to their present home in Kambah, the third house we have had in Canberra. This house was not only close in design to what we wanted and nicely located, but was also within walking distance of the Murrumbidgee Country Club's golf course, which turned out to be fortuitously advantageous. After a long association with Federal, Leon had found some of the policies of his successors so distasteful that in 1990, he resigned his membership and joined Murrumbidgee instead. Ironically, Monica's golf widowhood was not to continue for long, because an old football induced rib injury began to deteriorate to the point that even a halfway decent swing became impossibly painful, and after only a couple of years or so of retirement, Leon gave the game of golf away, and his clubs to his brother Michael.

Retirement from full time employment does not mean the cessation of activity, and Leon and Monica have been as busy as ever, but on things that we choose to do rather than what some employer directs. In retirement, we have been able to see a lot of places in Australia, and in 1998 we undertook a pilgrimage to all the places from whence our ancestors had come, in Schleswig-Holstein, England, Scotland, Ireland and Wales, and came home via north America, where we visited New York, Niagara Falls and Washington before touring the Canadian Rockies, with a day in San Francisco before the flight home across the Pacific.

In between times we do casual work for the Electoral Office, and since 1998 Monica has been a member of the Board and Secretary of the Canberra Multiple Sclerosis



Figure 3 Monica and Leon in 1997

Society. Leon spent most of 1998 re-writing the Society's constitution and some of its operating procedures, and in 1999 was dragged out of retirement for six months to work as Contract Manager for a large Computer Systems company. In each of the years 1999, 2000 and 2001, we organised a Charity Dinner and Auction to raise funds for the MS Society, each occasion taking several months of hard work, but worthwhile, since we raised more than \$46,000 altogether.

But our main preoccupation in retirement has been the researching of the history of all of our Daughter's ancestors. Commencing in 1993, just months after we buried my mother, this great labour of love has been our consuming interest. *Aus dem Vaterland*, dealing with Katrina's German forebears, one of the three volumes that "Katrina's People" will eventually comprise, was published in 2000.

In September and October 2001, Leon and Monica will visit South Africa, where, in addition to touring that fascinating country, they will meet a host of Monica's relatives, descendants of the Scottish Kelman clan from

which sprang Monica's maternal grandmother who bore Monica's mother in Johannesburg just before she and her husband came to Australia in 1908.

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### Email from Stan Payne

It's a small world, isn't it!

I arrived at Woodford ex-GW Course at Henlow in late '59. I think about the time you (Gordon) went to WRE.

I then became O.C. Missile Handling and Loading Flight and also seconded to AVRO as a Deputy Trials Officer. Didn't you love High Test peroxide?

I was supposed to come out to Oz in '61 but Bill Stewart (another ex-boy incidentally) took my place when I decided to leave the Service.

My only claim to fame is that I designed the Blue Steel tie! We sent enough out to Oz and hope you still have one

Very much doubt whether I would be able to make your Reunion in 2001 as I would hesitate



Figure4  
4JSTU Tie

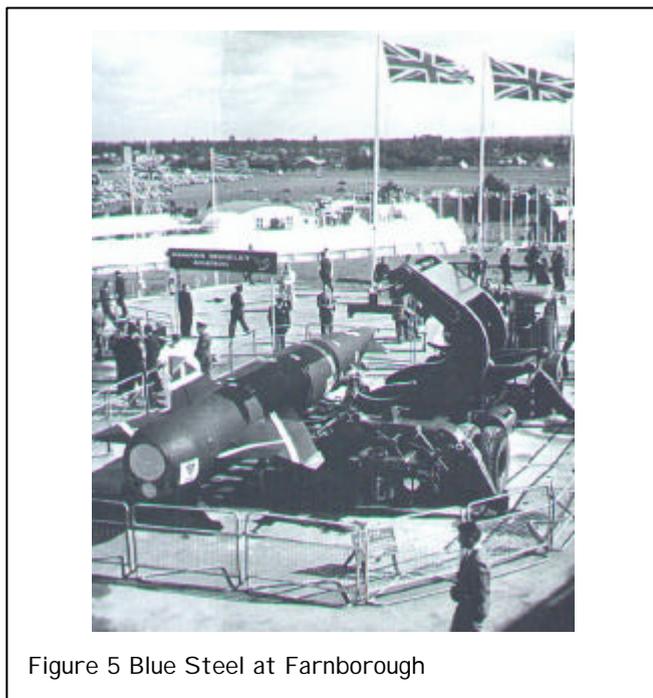


Figure 5 Blue Steel at Farnborough

to travel so far when approaching 83.

This quite apart from refusing to apply for permission to go to Oz. I taught RAAF pilots armament and aircraft recognition 1943-44, hopefully saving a few necks, and am hanged if I have to have a visa to come. When I can find it I have a photo of 4JSTU with Sqdn.Ldr. Neil Byron as C.O. which I will copy and send you.

In meantime am attaching a picture of Blue Steel at the Farnborough AirShow in 1961.

As O i/c demonstration I had strict instructions from Capt.(RN Ret'd) Crawford i/c AVRO Admin that I (and any of the team) was not, on pain of immediate death, under any circumstances, to divulge any info. on Blue Steel. However, when Admiral of the Fleet Lord Louis Mountbatten visited and asked I, at rigid attention, told him all he wanted to know. Reporting later to Capt. Crawford that I had given out a fair bit of information he went 'spare' until I told him **WHO** I had given the information to! He gulped and replied "Oh!". I heard no more about it.

On leaving the Service in Dec '61 AVRO (who in fact had offered me a job) gave me a large framed photograph of a Vulcan complete with Blue Steel fitted to it as a souvenir and a miniature Blue Steel model as well. It goes very well with the picture of a Westland 'Wapiti' beneath it!

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### Keith Rendell

Keith and Marion were married at Holy Trinity Church, Adelaide on 27<sup>th</sup> February 1965. The Blue Steel trial programme had ended and many of the EMI trials team had already left for the fledgling Space Tracking industry in Canberra or for once familiar shores in UK. A few remained to supervise the dismantling of the telemetry stations at Woomera and Mirikata but the opportunity of a four week honeymoon on the *Orsova*, travelling first class at company expense, was too good to resist. Keith and Marion arrived at Tilbury in April, 1965. It was snowing as they disembarked.

Keith resumed his interrupted activities, as an engineer at EMI, Feltham but it wasn't quite the same as he remembered. The days were too short, the roads were too crowded and it was too bloody cold for 10 months of the year. Apart from these minor impediments he was sort of glad to be home.

The straw that broke the camel's back was the shocking winter of 1965 and this inspired Keith to negotiate an offer of a transfer



Figure 6 Keith Today

back to EMI, Salisbury. Keith and Marion arrived back in Adelaide in January 1966 just in time to catch the third day of the Australia/England Test Match at Adelaide Oval. It was good to be back.

Keith's career at EMI progressed unspectacularly but happily, on a series of significant projects including IKARA anti-submarine weapon system, Sea King helicopter flight simulator, RAN tactical trainer and Laser Airborne Depth Sounder. Each provided its individual challenges and interests but, strangely, none seemed to offer that 'edge-of-your-seat' excitement of working on the periphery of a Blue Steel impact area.

During the period working attachments to Canberra, France, Brazil and UK provided interesting diversions to the routine of Salisbury activities but eventually the increasing demands of a growing family made the novelty of overseas travel rather less of a bonus than before. Inevitably, hands-on engineering activities made way for administration, supervision and management.

From the mid -1980s EMI was impacted by successive take-overs by Thorn, AWA and BAEA. Take-overs were followed by incursions by external consultants, new efficiencies, rationalisations, directional changes, team 'bonding' initiatives, 'downsizing' purges and the erosion of morale at the working level. Keith's position was eventually downsized on 16th September 1996 (the 609<sup>th</sup> birthday of King Henry V) providing him (Keith, not Henry V) with the opportunity to pursue other activities after 43 years continuous association with one company, albeit one which bore little resemblance to the one he joined in 1953. Keith and Marion still live in the Adelaide foothills where they enjoy the pleasures and problems of paternal (4) and grand paternal (10) life. Now that he is no longer gainfully employed (and he does miss the monthly pay cheque!) Keith has taken up studies in Geology and Aboriginal Studies both of which reflect back to interests which were conceived in the Blue Steel days of the early 1960s. His physical challenges are variously provided by junior soccer coaching, voluntary work at the Adelaide Women's and Children's Hospital and at a local Primary School and the maintenance of bush care sites in the Adelaide foothills.

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## **Bert Grove**

Bert started his working life apprenticed to the trade of radio and television servicing. On completion of his apprenticeship he was obliged to serve two years National Service. The RAF wisely trained him as an air

radar mechanic (CMS) and sent him to a bomber station in Lincolnshire. Here he did quite well maintaining the centimetric radar on B29s and mending the odd radio set from the married quarters.

Soon after completion of his National Service he got a job with De-Havilland Propellers at Hatfield where he was involved in flight trials of infra-red homing air-to-air missiles Firestreak and Red Top.

After five years with De-Havillands Bert, now married with one son, sought a change and went to Hunting Engineering at Luton Airport where he first worked in their Environmental Test Laboratory. During this period Huntings were advertising for people with Bert's sort of background to go to Australia. Bert volunteered and eventually, in October 1961, was sent to Aldermaston for on-the-job training.

Here he met up with Brian Banfield and an engineer called Les. (His surname escapes me after 40 years for reasons that will become obvious.) The intention was that the three should work on the warhead telemetry for a missile called Blue Water. However, on their arrival at Aldermaston there were no Blue Water warheads to work on so they became familiar with the warhead telemetry used on Blue Steel. They were assured that the principles were the same. It was January 1962 before the three saw the Blue Water warhead.

Brian was dispatched to Australia in early June. Bert stayed for another couple of weeks because he was taking some exams. Les agreed to be the last to leave as he was unmarried and could leave at very short notice. Bert, now with a wife and two sons, arrived in Adelaide on July 5th 1962. In August the British Government cancelled the Blue Water contract. Brian and Bert were absorbed into the Blue Steel project. All that time at Aldermaston had not been wasted. Les was never seen again!

Brian and Bert were involved with testing the telemetry senders and building each into a "pod" that was then built into the warhead. When the missile was mounted under the aircraft preflight checks were carried out in the Loading Bay. Bert's other duty was the charging of Venner nickel alkali batteries. With a lot of TLC Bert managed to coax some of the longest lives ever recorded from Venner batteries!

Hunting's participation in the Blue Steel project was completed in early 1965. Bert and his family decided to forego their return ticket to the UK. Tracking stations were all the go at this time. Brian secured a job at Ororral Valley. Bert worked for a while with Hawker Siddeley Dynamics where most of the staff were people he had worked with at De Havilland only a few years before.

In 1966 Bert left the bench for a desk and became a technical writer with EMI. He stayed there for 19 years. In 1985 he went to Codan where he was *the* technical Writer for a few years. He ended his full time career with four years with the Australian Submarine Corporation.

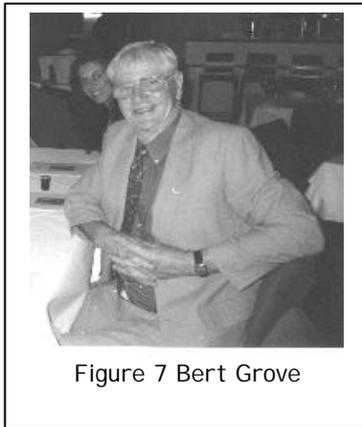


Figure 7 Bert Grove

Now retired, and divorced for many years, Bert is heavily into word processing on his PC. He still picks up the odd technical writing commission. But between jobs produces a monthly newsletter for a social club with which he is involved. A life-long lover of Robert Burns, he also produces a bi-monthly journal for the Burns Society of South Australia.

Of Bert's two sons: both are in their early forties and married. One became an electronics technician but discovered a bent for supervision so now has an MBA and is currently on a contract in America. David has two children in their early teens. The other son, Philip, is a musician, in Sydney, never quite making the big time but enjoying every minute of the mediocre time!

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## John Flaxman

Last of the Old Time Space Missions

Although it doesn't seem to show up much in books or television programmes about NASA space adventures, the 'Surveyor' spacecraft was all the rage when, after Blue Steel, I joined Bob Cudmore, Alan Bailey, Dave Arman, Roy Stewart, Jim Wells, Pat O'Connor and Co. at Tidbinbilla Deep Space Tracking Station, near Canberra. It was run by 'Spacetrack' a consortium of several companies, one of which was Elliotts.

Surveyor was an unmanned craft destined to touch 'gently' down onto the moon (in fact it sometimes bounced a few times) and send back to earth such good things as TV pictures, telemetry and data from soil samples obtained by digging holes with an on board scoop. It was quite a contraption. The great thing about this spacecraft was that it was manually controlled from earth, unlike more recent projects where the tracking stations have become more like relay facilities, passing on the data directly to the States with little interference from the locals. Then, it was different - you sat at a console and pushed

buttons to physically move the camera, change the focus or dig a deeper hole with the soil sampler - it was real hands on stuff and you could see the results almost immediately on the telemetry panel and the TV screen.

I remember returning from the States with the Hughes Aircraft crew and getting the Surveyor mini-control room installed and set up. Then followed seemingly endless count-downs and rehearsals, some of which were run from J.P.L. in the States. These latter were extremely comprehensive simulations of different phases of the mission, from count-down, launch and cruise through to injection and finally touch down. It was all go in the Surveyor area - every time a different set of information was needed it was necessary to change telemetry commutators and bit rates and this involved a fair bit of manual effort, like unplugging patchboards and discriminator units (rather like Tektronix plug-ins), inserting new ones and then adjusting the decommutators to re-synchronise the bit stream and finally, selecting the correct overlay (usually from a pile on the floor!) for the telemetry read out panels, so that the meters and digital read outs were correctly labeled and scaled. All this meant actually walking around and lifting things - no computer screens to veg out in front of in those days! And get this - the telemetry display unit included a row of beautiful *analogue* meters - you could turn something on or off on the spacecraft and actually watch the needles move - fantastic.

You can imagine the atmosphere in the control room when, for the first time ever, Man was going to act the tourist on the Moon's surface and start taking pictures. The command was sent to turn on the camera, then a few more to adjust the focus and then there it was - the first ever photograph taken on the Moon. Instead of the little green men we were all secretly hoping for however, there was nothing but a barren, rocky desert very much like some parts of Central Australia. - a bit of a fizzer really!

We took lots of Polaroid pictures of our TV screen as the camera was panned across the lunar scenery, and laid them out on the floor to form a mosaic. The more pictures we added the more impressive it became. I thought I'd stir things up a bit by inserting a cropped photo from one of our recent trips up the Birdsville Track - the terrain matched the lunar surface perfectly but for one small detail - it had a few old bones lying around in it! It was a little while before they were noticed and I heard some important people who were visiting the station making remarks like 'they ARE bones - just look at THAT' and so on. Soon the discussion got rather heated as excitement rose rapidly and since there was a gentleman from the press present I thought it better to own up before the situation got out of hand. The afore mentioned visitors were not very impressed at

first (were they Bob?) but after things had quietened down a little we all had a good laugh.

It was a great experience and I'm glad I was part of it just at that time - after Surveyor things on the telemetry side became more automated and people almost vanished from the loop, their main function being relegated to pointing the antenna and locking on to the spacecraft, after which the data flowed directly to the States. Since it was their data, this was fair enough I suppose, but the overall task was not quite as stimulating; the 'hands on' atmosphere was no longer there.

Just a couple of memories for what they're worth. Soon after I joined the tracking station, the Mariner spacecraft was about to arrive at Mars and the papers were full of stories to the effect that, since our antenna was pointing directly at Mars, and if there were Martians, this would be the time when they would detect our radio signals and fly back down the beam to see where they came from - wow! Although we weren't tracking that night, we were counting down for an early start, when we had an urgent call from the canteen, sited some distance from the main building and an excited voice told us to come quickly and hung up. We thought the place must be burning down but when we arrived we found all the kitchen staff lined up outside, watching some very mysterious lights moving around in the sky and dodging behind the hills. Considering all the media hype and the somewhat tense atmosphere surrounding the pending arrival at Mars, this was indeed a strange phenomenon and we were all extremely puzzled, if not excited. The truth was somewhat less sensational, however - we found out later that the lights were on a helicopter doing some calibration runs for Honeysuckle Creek, a tracking station a few miles away, and were definitely not flying saucers!

One Apollo mission 'The Tid', was assigned the task of tracking the main spacecraft (the CSM) as it orbited the Moon waiting to pick up the space tourists, while Honeysuckle looked after the LEM as it sat on the Lunar surface. Unfortunately the dreaded lurgy struck the crew and the shift began to wilt as, one by one, we all succumbed to this particularly nasty bug. Manfully we struggled on and fronted up each day, coughing and sneezing a bit more than before as reporting sick was just not on. The mission was in a critical phase - return to earth - and a whole shift gone AWOL could have been disastrous. The last shift finally came and the bunch of characters who showed up were not at all a pleasant sight to see - not that we were anything extra special normally, but this day, boy, we were rough! However, every cloud has a silver lining they say and so it was for us - I can still see in my mind's eye, the image of Bob Cuds roaming the Ops. Room clutching a

bottle of brandy and fortifying the troops for this last big effort. Somehow we all finished the shift (as well as the brandy) and departed for home a good deal happier than we started - nice one Bob!

Many exciting things happened while I was at 'The Tid', but I suppose the most memorable of all for me was when I met Sylvia - but that's another story. (I had to put that in somewhere or I would have been in deep trouble!)

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### **Email from Valerie Mosel (Glover)**

In 1963 Geoff and I returned to the UK. We went to Yatesbury where Groff was an instructor. When Yatesbury closed we moved to Cosford where Geoff again was an instructor. I worked in SHQ.

From there we left the RAF. Geoff became an instructor at Marconi College at Chelmsford and we lived in Braintree. In 1969 we returned to Australia to a town called Carnarvon in WA. Geoff worked for NASA on the Apollo program.

In 1963 our marriage broke down. Geoff and Dorothy went to Port Hedland, I returned to the UK. In 1974 I returned to Australia with my present husband Trevor Mosel. Trev and I married in 1978. Dorothy and Geoff married in 1976.

Trevor and I have traveled all over Australia with his work in electronics. Our eldest son Martin Glover married Margaret Rafferty and they have 2 daughters. Darryl Glover, our younger son lives in Victoria. Martin and his family, Geoff and Dorothy, Trevor and I all live in Perth where the older ones of us are now retired.

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Figure 8 Blue Steel on display

### **John Saxon**

It was Mid 1963 and the writing was on the wall - our 4JSTU and RAF friends were well on the way towards taking over the conduct of Blue Steel trials. There seemed to be no prospects of immediate employment (anything that seemed like fun) in Australia. But there were several Inertial systems trials getting underway in

U.K. Polaris submarines and the TSR-2 aircraft were two (I think Nimrod came along later?). I elected to go for TSR-2 as the work was above sea level, it involved more flying, and was based on 'sunny' Salisbury plain at Boscombe Down. But first I was asked to do some more work at Woodford with some night flying in B2 Vulcans. I vaguely remember that it involved mixing optical star navigation data with the Doppler/Inertial system. I think it was that it was related to the possible replacement of Blue Steel with the American Skybolt missile system? It was nice to return to the old haunts around Woodford, but not the same without many of the old crew. We did several night flights including one that ended at Manchester Ringway airport - we were probably not too popular, but I bet they would love to see a Vulcan flying there these days.....

TSR-2:

Finally the time came for the move to Salisbury (U.K!) and starting work at Boscombe Down. It was great to meet up with Clive Nicholas, Ted Everson and others from the Australian trials team again. Our job was to participate in the trials on the integrated Navigation control and terrain following systems - in particular to analyse the results. We got to fly with the equipment fairly regularly. The trials were conducted in a Comet 4



Figure 9 TSR 2

with real seats and a toilet etc! A definite upgrade in comfort over the Vulcans and Victors. I'm sure the pilot was ex- fighter type - he never seemed concerned that he was actually flying a large passenger plane. Terrain following was really exciting! There was also a great 'long distance' sortie, to Iceland, Malta and Germany, with over-nights at each. My guess is that some American's still remember our spirited take off from their Air force base at Keflavic, and the descent into Malta was so steep that condensation poured out of the air conditioning - looked suspiciously like smoke but luckily it smelt a lot better...

At Boscombe Down we saw some remarkable first flights including early P1127 (pre-Harrier) tether flights. The HS 748 - very tame - but the best was TSR2 itself flown by Roland Beaumont (the EE Lightning chief test pilot). The diamond shock waves in the exhaust were most impressive. Perhaps even more exciting was the day before when Beaumont had done some aerobatics in a Lightning to 'loosen up'. The sight of a large Lightning doing snap rolls in a vertical climb

with condensation pouring off every surface was most impressive. But all good things come to an end - and Harold Wilson put a stop to the whole project - goodbye



Figure 10 TSR 2

to a great aircraft... As a postscript - we were so disgusted that we placed an advert in the Personal columns of "The Times" for a recently redundant flight trials team as a package deal! Aviation Week magazine picked up the story on their page one! Several potential offers from the USA came in (including one from Grumman for Apollo Lunar module work), but in the end, we did not take them up.

By this time I was about to marry my Australian girlfriend and itching to get back down under, but still no potential job offers on the horizon - so it was back to Elliott's at Borhamwood for a stab at selling large mainframe computers to various export markets. I was singularly unsuccessful at this -never sold one in something like an 18-month period. That's the trouble with Sales - you have to lie too much Had a couple of nice trips to Holland and Czechoslovakia though! Dick Brown and Mike Michell (ex-Aussie Elliotts) were also working in Export Sales but they were much more successful (that does not necessarily mean that they were better liars!). About 12 months later I started to hear about a bunch of ex-Blue Steelers (mostly Elliott's troops) who had been instrumental in setting up a new NASA Deep Space Tracking Station at Tidbinbilla outside Canberra. Bob Cudmore had been "made offers he could not refuse" and was the company manager. The work sounded like an opportunity to get into the space business (a long time interest), and a great opportunity to get back to Oz. After an exchange of letters with Bob, he was kind enough to offer me an Ops supervisor position and also to sponsor my migration. Then I found there were two other tracking stations being built in the ACT. 'Honeysuckle Creek' was for NASA's manned space flight network (The Apollo project and beyond), and 'Orroral Valley' for the unmanned Scientific Satellite network. Honeysuckle maintenance and operations were contracted to STC, and Orroral to EMI. Both companies were recruiting in the UK... So (just in case) I went to interview with both and was offered an Ops Supervisor position at Honeysuckle. On reflection I thought that Manned Space Flight

sounded more exciting than Deep Space. Bob Cudmore was most understanding and still sponsored my migration!

Apollo/Skylab etc:

So began a great period for me. 30 plus years with



Figure 11 Honeysuckle Creek

NASA. I had always been interested in Space travel and technology, and I knew I would never make it as an Astronaut! So we emigrated to Australia and I started work at the Honeysuckle Creek station in what was to be over 30 years with NASA and the most exciting career imaginable. I was so lucky to have joined at what might be regarded for many years to come as the "golden age" of space exploration. I worked the main station operations console for all the Apollo missions (and we had the prime contacts for many of the most exciting times - including sending the Video of Neil Armstrong's first steps on the lunar surface). A real high point for me was having a 5 minute conversation with John Young and Charley Duke when they were on the lunar surface during Apollo-16 (due to loss of communications between Honeysuckle and Houston because of a major earthquake in LA). We mostly talked about beer! Swan larger in particular, and Swan sent us 48 dozen for our splashdown party! I finally got to present John Young with a Swan during our Apollo-11 25th Anniversary party in 1994. Perhaps the greatest mission of the series was Apollo-8. Everything was new - first time higher than 850 miles, a brand new Saturn-5, first time in orbit around another object. An incredible risk and it's doubtful if it would be taken these days. And Australia was prime for all the best parts of Apollo-8. Of course Apollo-13 was particularly satisfying - along with the work-arounds developed in the US, there were some very new communications problems to be resolved.

In some ways, the 2 year Skylab project was even more satisfying, with manned periods lasting up to 84 days our crews had time to really become a pretty slick act.

The data processing was at least as complex as anything done in "real time" today. During Skylab we had at least 16 intense activity hours out of each 24. Skylab 'passes' lasted between 3 and 15 minutes. During a pass, multiple real time and recorded data streams were down-linked, including telemetry, voice, TV, etc., and voice, commands, teletypes, etc. were up-linked. In between passes (for 60-70 minutes) the 'front end' (receivers/transmitters, etc.) supported deep space missions - Pioneer, Voyager and Viking spacecraft, while the 'back end' computers and other equipment tried to playback all the various data types to Houston before the next pass.

Eventually Honeysuckle closed and the 26M antenna was moved to CDSCC and after 14 years at Honeysuckle I moved there as well.

Deep Space:

At Tidbinbilla I became a Shift Supervisor, and after a few years - Operations Manager. Again I was lucky enough to take part most of the major mission events with the Viking, Voyager, Pioneer, Magellan, Galileo spacecraft, and numerous other projects. I like to think that with those projects and manned space flight, we were incredibly lucky to live through some of the "golden years" of space flight!

Finally retired in April 1995 and much to my amazement I was offered a small consulting contract with JPL (Jet propulsion Laboratory) in Pasadena California. I traveled there fairly regularly and was able to gradually "wind down" - it was nice to think that some consider that it's a shame to waste all those years of experience in Space flight operations.

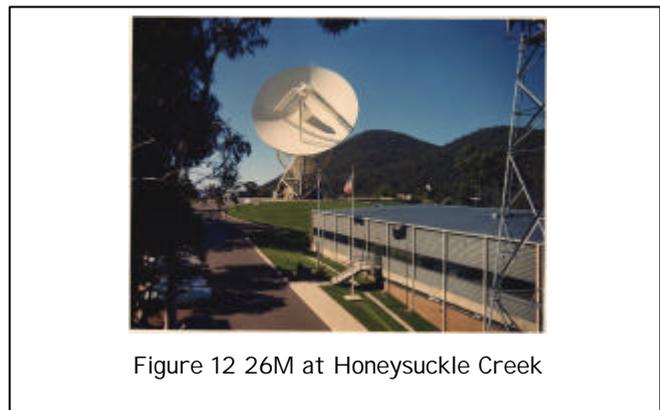


Figure 12 26M at Honeysuckle Creek

Personal postscript:

The foregoing has all been about me, and my jobs. But I would really like to mention a little of life outside work. During the Australian Blue Steel trials we had a rather good social life.... Many of us were reasonably young Testosterone driven singles! Nice cars and plenty of parties were the norm. Also we had managed to talk the U.K Elliott's Social club management into buying a ski-boat which proved

rather popular. It was while we were skiing from the beach at the Port that I first met my future wife. We were all reasonable skiers but had given up for the day due to rough seas. Betty impressed me no end by taking up the first time skiing challenge and stayed up for a couple of circuits, grimly hanging on when most would have given up! We met up again in U.K., and got married there. 36 years, 4 children and 8 grand-children later, we are now enjoying a busy retirement. But most of the above would not have been possible without Betty's constant support, encouragement and keeping the 'home fires burning' without complaint, while I went out and had fun at work!

PS Please forgive me if my hazy memories have some things wrong - all corrections most gratefully received.

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## John Evans

John S stirred me up again. When the media starts digging up the past they never seem to get the full or true story. Rekindling my thirty years' old embers, jogged my Nascom memories. Most will know that Nascom setup and provided the links between NASA facilities worldwide, headed by a formidable Vernon Stelter at Goddard, who demanded 99.99% uptime on all ccts.

DOS handled the Australian sector with Peter Trost as i.c and myself as his assistant. We were responsible for setting up tty voice, data, video links-both permanent and temporary- with Deakin switcher as the hub. This included contractual arrangements accounts etc with the two prime providers- Telecom and OTC.

During Apollo there was a lot of extra temp links- mostly video on the east coast-some duplex- which stretched the existing Telecom vid network more than somewhat, bearing in mind that the links demanded diverse backups always. A video switcher was set up on the upper floor of the old City South Exchange in Castlereagh St. Links from Honeysuckle {duplex} and simplex from Parkes. Outgoing to Moree and pacific cables via Redfern to stateside.

The Parkes link was a headache, the nearest point in the east coast net was Mt Canobolas...too far the cry...So a trailer mounted repeater with all the power supplies backups and all set up in the countryside along the way. During the mission{s} the two of us monitored both Honeysuckle and Parkes signals, recording both in duplicate {dreaded Umatics}.

The Parkes signal went back live to H/suckle. The premium signal going live to Goddard. The whole

exercise was pretty hairy. lack of stable 60 Hz supply and backup. Telecom had a small no break supply in the centre, but could only spare a few watts. Those early 1kW solid-state psu's were not that reliable! The next floor down was Telecoms' east coast video hub and switcher, which made it easy to pipe the signal into the TV net. The scan conversion was ghastly, an rotating opto-mechanical device to achieve the result, this is where the timely saying "all done by mirrors' bears more than a grain of truth

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## Ray Smith.

(4 JSTU-joined August 1958 at Woodford, relocated to Australia Oct 1960-April 1965.

Having left the RAF in July 1965, I migrated back to Australia and found that I had landed a Job at the Island Lagoon Deep Space Tracking station (The original Dish circa 1959) at Woomera.

One of the first activities required my attendance at a Induction course at Salisbury for Commonwealth Public servants-Also attending was David Lloyd of IN fame who had accompanied me on Trials Observer duties for the Blue Steel launches at Woomera.

I played a key role operating the 85 foot antenna on many missions to the Moon, Venus, Mars and lastly in 1972 to Saturn and Jupiter via the Asteroid Belt, (Pioneer 10-still transmitting after 29 years).

Surprise, I was joined on the Tracking station by Frank Williams, Harry Young, Cess Langdown and Harry Holdhouse. I even had dealings with Jeff Camp at that time the Admin Officer of Spacetrack.

I then found Lou Potter, Terry Clark had migrated to Woomera, and were working at Evetts field.

I left the Tracking Station in 1973 and joined British Aircraft Corporation on a Missile trial at the old Black Arrow site at Range E. Somebody then made me an offer in late 1973 that I could not ignore- to return to base e.g. Salisbury- located in the old English Electric building 64- only a stones throw from Building 215.

I then spent nearly 19 years engaged in testing avionics boxes, designing and commissioning test equipment for countries such as Egypt, Switzerland and Singapore.

My travels and the events that occurred while in those countries would fill a book-I had several near misses but made it home to Adelaide.

I then was responsible for the installation and maintenance of the FA 18 test equipment requiring travels to the USA. I became manager of the Calibration Laboratory and learnt Sales skills by selling our services to any organisation who had the money!

My sins were then rewarded by being appointed Quality Manager of the BAe Space Division building electronic control boxes for the AUSSAT and Radioastron spacecraft..

I then made a big decision to walk over the earth mound to AWA Defence Industries (since it was nearer to building 215). My Quality Engineering Manager role resulted in me becoming involved in Electronic Warfare, based in the old Autopilot Bay where I met Ron Prior, Keith Rendell and Tony Wickham again-Small world!

I also had responsibilities in Building 215 (at that time an AWADI building). NB The tall Fence has been destroyed but the gantries remain inside building 215.

I then became actively involved with the P-3C Orions undertaking the ESM update which involved several visits to Israel. These overseas trips can be interesting, I had a car blow up under me and several scares with bombings etc. Even so both Ann and I intend to return to our old spots when time permits.

I then became involved in the AIR 5276 program, which resulted in many visits to Montreal and then Greenville Texas.

After this I migrated to become Quality Manager of the Wedgetail program, (a Boeing 737 with MESA radar) with BAEA (subsequently BAE SYSTEMS Australia) where I still reside at the grand old age of 65+.

A year ago I had a real business visit overseas, UK, several days in Israel, back to UK for several days , then 2 days in Chicago, Seattle, Los Angeles and back to Adelaide -all in 20 days. What a way to earn a buck!

Imagine my interest when Keith Rendell and David Lloyd talked to me -I am glad to be a Blue Steel member after all these years and look forward to meeting all my old friends.

Footnote: I had worked with a young gentleman called Roy Mason since 1991-what a shock (wrong word) to find he was a 4 JSTU man located at RAAF Edinburgh air base during my time on the trials, we even found a photograph of the unit with a Valiant. We had several long talks over old times, easy since his desk is 20 yards from mine!

I shall give all this away in July/August 2001 and go fishing or something.

PS - Had a very interesting few years ! (Hope I got the names correct - the old brain cells are fuzzy, also sorry if I have forgotten anybody.)

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## **Bryan Wetton**

(and the ghost of Bluebell Hill)

After returning to South Australia in June 1966 (exactly one year to the day that I left ) I was fortunate to be accepted into the Public Service as a Drafting Assistant in the Photogrammetric Section (located in the basement of the Treasury Building- Adelaide). After some trials and tribulations with the plotting instruments (being a spectacle wearer) I starting studying for a Survey Draftsman's Certificate at SAIT. At this time Dennis Quantrill also joined the lands dept

As multi-skilling came in I was 'rotated' to a draftsman's desk and quickly attracted the ire of the Senior Draftsman as I unsuccessfully tried to use a scribe and a drawing pen. Luckily a 'new' piece of aerial photographic equipment was promoted by Kodak at this time and I was directed to 'prove its capabilities. It turned out to be a variation on the Cintel printer I had been trained as an RAF Photographer.

Soon a colleague showed me an Ad for a Photogrammetrists position with QASCO in Brisbane. This was sought and won and in December I drove to Brisbane in my 1952 Rover P3. In Brisbane I was quickly absorbed into long hours of plotting again, just leaving time to court Estelle and arrange to marry her in February 1970. A position became available in the Sydney Office and we arranged an early marriage in November and left immediately on a honeymoon trip to Sydney.

Unmatched shifts at work for us resulted in a return to Dept of Lands Adelaide in February 1971. This was a fortuitous move as a combined photographic and Photogrammetric machine ( an Orthoprojector ) was on order from Zeiss and needed 'dual' skills to get it operational. After a 'rocky' start the process was accomplished and with me becoming responsible for Sensitometry and liaison with the Govt Printer the product began to achieve world acclaim. Meanwhile I finished his Cartographic Certificate and was awarded the AIC Prize.

Soon the move to new premises at Netley was imminent and I was on-site for many extra hours as the Mapping building was built. Much of the photographic facilities were in advance of others in Australia and needed close liaison with the builder.

The Mapping Branch moved to Netley in 1972 and I became de-facto the Photogrammetrist in charge of Photographic Processing and OrthoPhotography.

The new equipment meant that the product improved greatly after only a short time and I was able to spend more time with my new son Paul.

By 1974 Zeiss were looking for an Assistant to Dr Berling based in Sydney and I was successful in getting this position. A highlight of the first year was three months at the Zeiss factory in Oberkochen in W Germany. As the family settled in a flat at Bellevue Hill I traveled around Australia for Zeiss helping the various state Mapping Organisations with their OrthoPhotography. In March 1975 doctors advised that a more steady family life would be necessary for Paul's health and the family moved back to Adelaide.

Luckily my successor at the Mapping Branch had just transferred to another Dept and I dropped back immediately into my old role. In the next year a 'Senior Photogrammetrists' position was created and I was successful in gaining that appointment.

My 'overview' role with all aspects of the Aerial/OrthoPhotography was very satisfying and I became a 'Member' of the Institute of Cartographers and (as Secretary) represented the SA Division at a number of interstate meetings.

Another son, Mark was added to the family and a Mini was acquired to get to work. The next years passed quickly and the boys' sports and Scouts occupied much of my time.

In 1977 I was successful in getting an Investigating Officer position with the Public Service Board and spent the next 13 years working with the Classification Consulting Unit becoming a Chief Classification Consultant in 1989.

Meanwhile I had become interested in Audio reproduction and learned some Electronics (also met Gordon Mephram and Chris Midwinter) to build an Active Speaker system from the ground up. At work, a Mac PC was introduced and immediately captured my interest - my son was keenly using an Apple at school and we had a ZX81 at home.

Soon an IBM PC was available to me and I started programming in Lotus 1-2-3 and then Dbase II. A number of work related systems were built using these tools and Clipper, and after-hours was spent in Studying computing at Adelaide TAFE college ( Paul jointly attended these classes from year 10!)

My deep involvement with PC User Groups ultimately led to me being offered a Partnership in SMS Consulting - undertaking PC training, System development and PC support tasks.

Five years in this role and development of ONAS - a Job Analysis' package sold around Australasia ended in a conclusion of paid employment in 1995 coinciding with a divorce from Estelle.

In the last few years I have spent many hours with fellow genealogists and their computer problems and am enjoying my first Grandchild - Mia Jade.

What of the Ghost of Bluebell Hill? Whilst in SA with 4JSTU I met Suzanne Browne and we were regular attendees at launches of the Sailing Club. Due to a twist of fate Suzie had planned to travel to UK in the same month as the trials finished and I returned just after she left. We planned to marry in November 1965 at Gillingham, Kent. On the night before the wedding the car Suzie was driving was involved in an accident on Bluebell Hill whilst driving to meet me whilst I was having my last drink as a single person. She and three others died on the Hill and today a much publicized 'ghost' has been seen at the site on numerous occasions and is said to be Suzie. A search of the WWW will provide many references

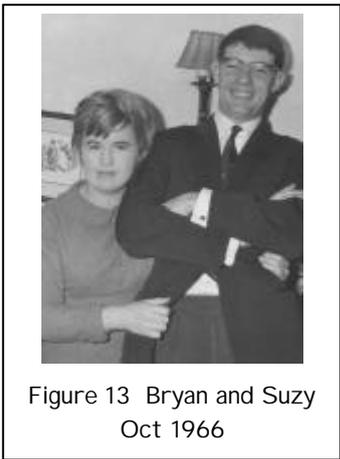


Figure 13 Bryan and Suzy Oct 1966

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### Note from Peter Evans

I left Avros near the end of 1963 to take a position with ETSA at Hilton as a electro-mechanical instrument fitter in the general meter branch.

After leaving Avros and returning to the city it was more convenient to buy a home in the city. Our two sons gained also by being more central for further education and tertiary education to follow their sporting and recreational activities.

At ETSA I could look personally look forward to permanency in employment as well as good conditions welfare and retirement fund. That ultimately gave myself and family a comfortable retirement. I can now look back on my period with Avros with satisfaction and good memories for the added work place experiences.

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## Email from Keith Harris

Chief Technician - RAF - 1949 - 1972

I was stationed at RAF Scampton with 18 JSTU working on the Inertial Guidance system of the Blue Steel. Elliot Bros trained me at Borehamwood. During my stay there I was instrumental in designing and building a "Stable Platform" for training purposes.

This consisted of three Gyros and three accelerometers, mounted in the three axis, vertical, horizontal and azimuth, the accelerometers measured minute amount of acceleration, this was electronically differentiated to produce velocity, and differentiated again to produce distance traveled in the three axis. In the IG the positional accuracy was updated by the positional radar. At take off the position to target was fed into the computer, and thus the Inertial Guidance system knew the distance to target. This system was so accurate that it was later fitted to commercial aircraft.

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## John Ison

17<sup>th</sup> September, 2001.                      A short note ?.

In 1964 Alan Fraser wanted me to return to U.K. and go to Autonetics in the U.S.A. to get familiar with the manufacture of their gyros which Elliotts wanted to make in the U.K. for the small inertial platform that they had developed.

Harold Wilson's sell out to the Yanks of the T.S.R.2 in favour of the F111 caused that line of work to be cancelled, so I was offered the opportunity to join the Space and G.W. Division at Frimley where the R & D of a stabilisation system for the Skylark upper atmosphere research rocket was taking place.

The R.A.E. had plans for a more accurate system which could lock onto the moon in place of the sun and hence extend the amount of sky that could be examined for stars having high x-ray emissions, the being one of the U.K. Universities proposed space exploration requirements. This required the development of space simulation test equipment which eventually was also bought by ESRO who had similar test requirements. I spent 2 1/2 years at Frimley on this and other projects involving some satellite design and then was asked to return to Adelaide to oversee the new test equipment installation at Salisbury and at the Range. While there I was asked to join the preparation team and so moved to Woomera in 1970 with my family.

During that time Elliotts were undergoing administrative changes and take-overs and in 1976 BAe offered me work as a Quality Assurance Inspector based at Woomera if they got the contract which they did. I also was the Wind Monitor part of the Skylark launch team. I was co-opted to help the experimenters on the payload recovery chopper flights downrange, as they needed to have access to their experiments quickly after the flight because most of the results were in photographic film form.

Skylarks were also launched for a number of other countries. The launch rate averaged at about 18 each year in batches of 6 every 4 months.

BAe also were involved in providing the launch team for the Falstaff rocket which was used to test the dispersal system of multiple warhead weapon systems.

In 1980 the range was to be shut down so I chose to leave for Port Lincoln at Xmas 1979 where we had a house. Terri, my wife and our boys had already left to live in Port Lincoln at Xmas 1978 because of the boys secondary education requirements.

I soon joined the Electricity Trust of South Australia as a Technical officer surveying and designing High Voltage power-line extensions and upgrades. I was also involved in the provision and upgrade of Public lighting throughout the Lower Eyre Peninsula.

In 1992 I was asked to take a package which I did as the taxation system was getting quite unkind to people like me where I was on call 24 hours/day on rotation shifts, so we were able to buy some waterfront units on Boston Bay which were for sale.

I then continued to service Bernina sewing machines and others makes which I had been doing since 1980.

Since then I have been retired but I seem to be caught up in what is called the Volunteer system in this community. I am involved in the student exchange between Port Lincoln and a Japanese town called Muroto which I visited in 1998 as a chaperone. I am on the committee of a community art and craft centre which planned for the refurbishment of the city's Civic Hall into a performance and gallery complex. This was finally achieved in May 2001.

I am a member of the Southern Eyre Group of the Australian Plant Society where we are recording the "At risk" plants in this area, and I ride with the Peninsula Pedallers who are part of Bicycle S.A. I am also on the Management Committee of the Lincoln Employment Service which is a community based job search/find organization aiding young people who have limited workplace skills. And so life goes on.

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## Ken Quinn

### From Missiles to Muscles

With the Australian segment of Blue Steel completed, The Elliott team dispersed like pollen on the wind. I elected to return to the U.K. to show off my brand new Aussie wife to The Queen and the rest of my family

Having arrived back in Australia after twelve months in England, again with Elliotts at Rochester, I was awaiting security clearance for re entry into the Weapons Research Establishment, which would probably, take a month or two to complete.

I met a tenant of my Mother-in-law; he had been working out in the bush as a field engineer in survey work. One month on and one week off didn't sound to daunting, so I took his advice and applied for a job, any job, with the outfit That is how I became the explosives expert with an Oil Survey Mob! Well, almost! I was flown up in a two engined six seater to a spot some two hundred miles north of Cook On the Nullarbor plain not far from the Musgrave Ranges The other seats were taken by returning workers after their week off. We arrived around three in the afternoon, hot, I don't think I've ever experienced such heat. It had been suggested that I be a 'Juggy'. The job was to lay out long lengths of cable strung with twenty or so Geophones or 'jugs', large egg cups with spikes. The field crew was just retuning to camp. The sight was awesome, the Juggies wearing speedo shorts only, black as hell from the combination of sun and carbon from the cables. The average age would have been twenty, and here was I, thirty-seven lily white and suddenly looking for a way out!

After Dinner I sought out the camp manager and told him that I didn't think I would last the distance as a juggy! I think he quickly came to the same conclusion. After a bit of juggling around the manager asked if I had any experience with explosives. With the recent vision of a day's work with geophones I replied, yes. I had indeed been indoctrinated into the dangers of explosives previously with W.R.E. The emphasis being on the potential problems rather than the safe handling there of. Key advice being duck or run!

I spent about a week with a very competent and experienced Irish team member. Equipment consisted of a Land Rover with canvas covered tray. In the back were containers of spare fuel and water, spare battery to run the recording instruments, coils of geophone strung cables and a cardboard carton of Geophex, the explosive currently used. Of course, digging tools were essential for the placement of the Geophex the only comment on safety was to recommend the separation of Geophex from the detonators. The procedure involved keeping the detonators, small pencil like

devices with two short wires, in a paper bag wedged between the driver's backside and the seat! A days ration of detonators was about twenty, not a very comfortable cushion!

With the site for testing predetermined, we would locate the site, the juggy would dig a hole selected by the driver, and then lay out the cable spiking the jugs in the desert floor as the Land Rover was driven slowly along stringing out the cable from a rotating drum. Then, 'The driver cum explosives man and instrument reader' would leave the juggy and drive back to the hole. A slice of Geophex was cut off a five-pound 'sausage', the size judged by terrain and experience. Detonator inserted into the slice and connected to the firing cable. The hole had to be back filled by the driver, as he was the only member of the team on danger money and the hole was now alive! Back at the end of the line all connections were made, instruments checked and the charge was fired! A plume of sand was sent up and the desert floor shook. The seismic shock wave bouncing between lower strata and the geophones was recorded on a pen recorder to be later analysed in camp by a Geologist.

One day, before the hand over, three of us were sent off up north to double-check a possible fault line. The Irishman drove expertly over numerous east west sand hills to reach our goal. Arriving around ten in the morning, we spent the worst part of the day under a tarpaulin, much to hot to work While lazing away the time, a small bird flopped into our lean to, wings apart, beak open obviously distressed. After an hour of R&R wallowing in and drinking from the bath we constructed in the ground sheet of our shelter, our drop-in decided to continue his journey. But no! A bird of prey must have been watching, for no sooner had our guest left us he was swooped! Luckily for him, three yelling, waving humans proved too much for the interloper who flew off with a few dry squawks. A further stay of half an hour and he was away! After two near-death experiences, I've often wondered about that little feathered friend! But I imagine that he never thought of us! Completing our task in the relative cool of the late afternoon, we retraced our tracks that night, a very hair raising drive due to the sand hills now presenting the steeper faces of their saw-tooth, prevailing wind shaped form. The deep shadows formed by our headlights were very threatening, especially to the passengers. The Irishman handled it all with aplomb!

The following day the Irishman left by plane for Adelaide. I was now it! It was always a five-oclock start after a huge breakfast of steak, eggs, bacon, sausages and beans. Sandwich in the field at lunch time and back in camp by three. As hot as it was by day, the nights were bitter. Tent flaps would be let down and blankets pulled up. There was quite a bit of heavy drinking by some of the crew, with the occasional fight! All soft drinks were

free so I made the decision, abstinence! Why spend hard-earned money on site when I could take it home!

Most of the seismic recording was achieved by using 'thumpers'. These were large trucks with huge hydraulic rams, which when lowered to the ground, vibrated, and the resultant shock waves recorded

In an air-conditioned instrument vehicle. A big team of juggies would be in action, moving the cables ever onwards. The pioneers of the team were the bulldozers. They moved far ahead of the crew blazing 'shot' lines across the desert, any trees in the straight line were sacrificed! In this way, grid lines were mapped with resultant seismic readings overlaid. The small Explosives crew worked alone for safety reasons, usually a couple of days after the main thrust, to re-explore prospects or to get deeper readings. So the days went by, a juggy and me. Sometimes we would repeat a bang if I judged the readings as at all suspect.

One end of day, as the crew came into the camp, there was an electric feeling in the air, every one was excited. I was sought out and taken into their confidence! During the day they had come across an Opal field! A huge deposit on the surface of the ground. They didn't have samples because the ground was virtually opalised rock. I was asked to go out early the next morning and blast out some samples. The excitement was infectious, I could hardly sleep that night and I'm sure half the outfit was mentally spending their private fortunes. Morning arrived; a snatched breakfast and we were away. Two passengers showed us the way. Bingo, there it was! An area the size of a football field was almost white all over but colour was evident. It took three surface bangs before a hatful of 'pay dirt' was gained. We then had to wait out the day before the opportunity was available after work for the Geologist to perform his alchemy on our little pile. He shut himself away; half the camp was pacing in the dust like expectant fathers! At last he emerged, but, no smile on his face. The field of potch was about two and a half million years too young we were informed. Huge disappointment all round. For a year or two after this incident I combed the daily papers for news of a new opal field, just in case our Geo man had cooked the results until a later date!

One evening I asked the Manager if there were any publications on the explosives we were using. I thought that I really should know a little more about the product! I.C.I. I think it was, had produced a very enlightening booklet. Of paramount importance was the isolation of the actual explosive from all possible contaminants. Wooden enclosures only! No water or fuels in the same vehicle. Detonators always in another vehicle. To slice the 'sausage' required a wooden cutting board and a bronze knife. The knife would have

a chain attached that must be spiked to the ground to earth out any static electricity. The chain and spike had long gone I had been advised to use a bare knee as a cutting board; a board could have sand particles, which, if rubbed together, could precipitate a bang! I was left in no doubt that we broke just about every rule in the book! My Land Rover's steel floor, by the end of each day, would be running with water and petrol, the soggy cardboard container of Geophex had collapsed around lunchtime! At this point, had my predecessor had only one leg and suffered a permanent twitch, I would have been out of there!

Having completed our grid, we moved camp by about twenty miles. The explosive dump was obviously located away from the camp, but always went with a move. It was noticed that most of our stock had deteriorated. New stock was on its way up from Cook railway so the minimum of suspect explosives was moved. The balance must be destroyed. When all personnel and equipment was well and truly gone the dump was destroyed! The accepted method was by burning, what a waste of 'bang' we thought! But, figuring that we didn't have a long enough cable to get far enough away, by fire it must be, but only after our own private Guy Fawkes display was performed. It wasn't as much a Big Bang as we would have liked, but the dense hell-black pall of smoke was a sight to be savored! Pollution as yet, hadn't entered our 1960's awareness! Not long after comparatively twitchless I resigned, my clearance for WRE was through.

Back in Adelaide I took up a position with Hawker De Haviland as Design draftsman and Technical writer. I'm afraid the journey from Morphett Vale to Salisbury every day was having an accelerated ageing effect on my old Peugeot and me. Much nearer to home, I accepted a position with Chrysler as Truck design engineer. A period I enjoyed very much.

Because of the low volumes involved, high tooling costs could not be entertained. Some very innovative designs evolved. Unfortunately for "Trucks", when Mitsubishi took over the complete Chrysler operation, Truck Division became assembly only. All components except tyres and batteries were unboxed from Japan. And so the demise of Aust. Truck design!

I then moved over to Quality control eventually taking responsibility for all-electrical / electronic components and some mechanical parts coming into the plant from around Australia. Vehicle wiring was the biggest single product. 95% of all wiring was Australian made. Eventually Yazaki Aust our largest wiring vendor, moved offshore to Samoa I had two periods in Samoa to help ensure and monitor the new processes and had a good time to boot! I was also sent to Fiji on a trouble-shooting mission. An irate customer, an expat Managing Director of a large well-known Australian Company with an offshoot in Fiji, was unhappy with his top of the line Magna. I did not

enjoy the first three or four days. But after the problems were solved life improved and so I became known as "Our man in The Islands" Others just accepted that I had gone Troppo!

After twenty-five years with Chrysler/Mitsubishi, I got my gold watch. A year later I passed my use-by-date, and retired, to be cosseted by Genevieve and our three sons,-- well something like that!

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## **Terry Clark**

I joined the RAF in September of 1953 as a 75<sup>th</sup> entry RAF Apprentice in the trade of Air Radio Fitter. Soon after finishing the apprenticeship I was retrained as a Guided Missile Fitter on the first Guided Missile Fitter Air course (G.M.F.A1).

My Australian experience started when I was posted to 12 JSTU for trials on Firestreak (Blue Jay) in November of 1959. Those trials finished in April 1960 when I was transferred to 4 JSTU. My first memory of 4 JSTU was on my first day at the unit when WO Maurice Wilson spotted me walking past his store and yelled at me to get my khaki socks changed at the clothing store because mine had shrunk and had trouble reaching past the middle of my calf. Not my fault if I had been issued with substandard sockets. My work in Building 215 on the Autopilot and Flight Rules Computer with 4 JSTU lasted until April of 1965. I was one of the first to join the unit in Australia and one of the last to leave.

RAF Lyneham was my new home in the UK where I reverted to my old trade of Air Radio Fitter. It was not long before somebody found out that I had worked on trials and recruited me to work on the "Midas" trials which was using Britannias at Lyneham as the flying test bed for the project, a sophisticated version of a "Black Box Flight Recorder" monitoring 270 items around the aircraft. At the time we were told it was for use in the soon to be built Concord. Despite me flying the equivalent of around the world every month for ten months with the "Black Box", I don't think it was ever used in Concord as it was an analogue system and by the time the trials had finished ten months later "digital" was becoming the buzz word in the electronics industry.

My experiences in Australia made me determined to return with my family as soon as I had finished my 12 years in the RAF. Some eighteen months before I was due for discharge I started looking for work back in South Australia. Within a few months I had secured a job with Short Brothers working at Woomera on Jindivik the radio controlled target aircraft. It

became obvious that it was well worth my while to purchase my early discharge from the RAF. I did this and we left England in January 1967 on the Castel Felice bound for Australia.

I worked on Jindivik until April 1974 by which time I had had enough of electronics, gave it all away and took over a position responsible for running all the entertainment and recreation for the 6,500 people who inhabited Woomera at the time.

During my stay in Woomera I spent some of my leisure time establishing an Insurance Agency and the rest of the time running a photographic business. Both pastimes were to stand me in good stead in later years.

The insurance agency I established in Woomera in 1967 became the basis of a full time business in the industry that I established when I left Woomera in late 1975 and moved to Adelaide. Eighteen years later at age 55 I "retired" from day to day insurance selling to pursue other interests and pastimes. I still have the General Insurance business which my number two daughter Paula runs for me from an office in Melbourne Street, North Adelaide. I call in once a week to collect my "pocket money" from my daughter. Now there's a good "roll reversal"

After retirement from the insurance industry I concentrated more on my photographic interests and developed a niche market producing multi image, computer controlled, slide shows for two specific markets - Insurance Conferences and Motor Sport. The insurance side of the business has resulted in me producing slide shows in Canada (twice), Hong Kong (twice), Bali, Hawaii, South Africa, Vienna and New Zealand (thrice) as well as all States of Australia. The motor sport side has focused mainly on The World Rally Championship in Perth where I travel after this reunion to cover my eleventh World Rally event.

The future - Who knows? As John Lennon said in his song "Beautiful Boy" "Life is what happens to you while you're busy making other plans".

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## **Roger Kenyon**

Roger was in the first of the EMI trials team to arrive in Australia in March 1961, followed by his fiancée Jenny in August. Roger and Jenny were married at the Elizabeth Methodist Church on the 9th September, well supported by the EMI team and many new Australian friends. Roger's Triumph TR3A was shipped out to Australia just 9 months later. Their return to the UK via the USA on the Oriana was a second honeymoon. Blue Steel had given

a unique insight into the world of multi-discipline multi-agency projects that provided a valuable basis for later endeavors.

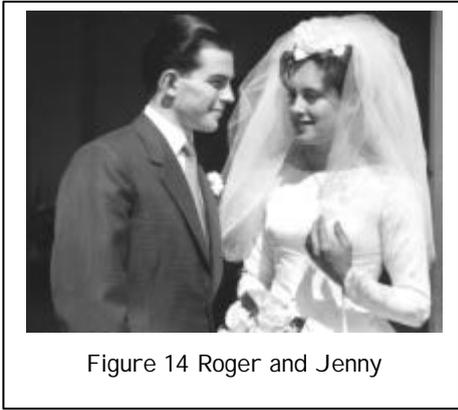


Figure 14 Roger and Jenny

Roger, who with Alan Breckon had been recruited from EMI Wells in Somerset, returned to Feltham in 1963, to find a very different working environment after Wells and Woomera. The traffic was manic. The assigned work was interesting and involved evaluating telemetry equipment using the Feltham and RAE environmental test facilities.

After a short stay at the family home in Cookham Dean, Berkshire, Roger and Jenny, with their first child on the way, bought a bungalow at Yateley, Hampshire, some seven miles from Winkfield. Winkfield?! a name often heard while a guest at the American tracking facilities at Woomera. Winkfield was also part of NASA's global Satellite Tracking and Data Acquisition Network facility staffed mainly by DSIR personnel from the Radio and Space Research Station at Ditton Park, Datchet.

In 1964, the year that son David was born, an open competition to enter the Civil Service saw Roger leaving EMI for the NASA STADAN (airfield) site at Winkfield, as an Operational Shift Leader. Data including instrument and housekeeping, from a vast range of American and European Satellites was acquired, some sent on in real time to GSFC. Commands were sent to control the satellites and instruments and tracking data was used to update orbital elements. NASA's voice network allowed occasional contacts with former EMI colleagues working at the Orroral Valley facility near Canberra. In 1967, DSIR, now the Science Research Council decided to put Winkfield out to contract and Roger joined the contractor as Operations Supervisor.

1971 saw the Skynet military communications satellites being bid for by UK industry and Roger and Jenny moved to West Wittering with David now 6 and Chris 4 to join the successful Marconi team at Portsmouth to build, test and launch the satellites. Roger's first task was to identify the huge range of test facilities necessary for this type of satellite. Visits to Europe and the USA resulted in proposals for company, UK funded and hired facilities as well as inputs to a study

for a National Space test facility based on the Concord building at the RAE Farnborough. Acoustic testing to the launch vehicle environment and solar simulation in a vacuum were the greatest challenge, the latter requiring the operation of the satellite 24 hours a day for a week or more. EMC and an antenna test range required huge screened anechoic facilities.

In 1972 Roger became the Assembly, Integration and Test manager for the second Skynet Flight model, ending in 1974 with a launch campaign at Cape Canaveral. Skynet was launched on a Thor Delta. The family, now with 18-month-old daughter Suzy came out for the launch. The scientific UK 6 project followed, with a launch on a Scout Rocket from Wallops Island, Virginia and then Meteosat with a launch on Ariane from Korou in French Guiana.

In 1982, Roger's son David joined the company as a student apprentice, achieved his degree and worked on ERS 2. He was at ESOC for the launch. He is now MD of a European Aerospace company and lives near Brussels.

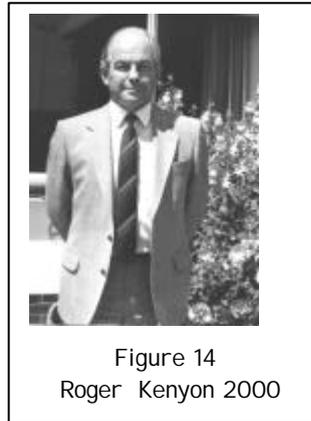


Figure 14 Roger Kenyon 2000

SOHO, Eutelsat and Inmarsat were among the many other projects that Roger worked on. He also had to become proficient in optical alignment and hydrazine fuelling.

Roger then took on the role of group manager for a range of in-house functional and support groups. In 1989 Roger was awarded the British Empire Medal (B.E.M.) in the

Queen's Birthday Honours, for his contribution to the National and European space effort.

Roger's son Chris is a video editor in London. His work is seen in various TV program's. His daughter Suzy is a director in a PR and advertising company, connected with promoting electronic devices. Just before his retirement Roger visited China on behalf of his company, now called Matra-Marconi, to see some of their space facilities. A truly memorable visit to a fantastic country and people.

Retirement has seen the arrival of six delightful grandchildren, a return to Australia in 1998 and a tour of the Canadian Rockies in 2000 with Australian friends. Roger is running a mini-bus charity, providing transport for the elderly and infirm. The driving and administration keep him out of mischief.

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### Email from David Hunt

After 4JSTU I stayed on and although I didn't see TSR 2 into service I did start off the introduction of the Victor SR2 which brought me back into contact with dear old XL 161. From there I was loaned to the R.N to be

part of the evaluation team to establish the suitability and final adoption of the Buccaneer for R.A.F. use. It was again one of those wonderful jobs. After seeing that into service, I was promoted and became, as a Flt/Sgt the SNCO i/c the Jaguar project team, another wonderful job. After that I was given a rest tour of 1yr as a training officer at Cosford, no not commissioned (I turned it down three times) but as a W.O..

It was there that I meet up again with John Binek. He was also a F/S in our section on the airfield. That rest tour lasted as I said 1yr before I was posted to M.O.D. to work directly for the Air Member For Personnel, a member of the Air Force Board, big time!! That lasted for 2yrs traveling all over the world. If there was an air force guy there we went. Two years was certainly enough. Talk about ,

After that I joined the TRI NATIONAL TEAM to introduce the Tornado into service. Working with the French on the Jaguar project was unusual but having the Germans and the Italians together was quite something.

When that was over I was posted to Boscombe Down as the J.Eng.O. carrying out advanced trials on Tornado development. What a cracking job that turned out to be.=

All good things had to come to an end with a posting to M.O.D. which sent me out to Saudi Arabia as part of the U.K. MOD Team to introduce the Tornado into RSAF service. That was one hell of a job, however I enjoyed it immensely.

When the time came for me to return home BAe offered me the job of Principle Engineer I/C flying operations, so it was with a lot of regrets bye-bye RAF.

However this satisfied the MOD requirement by having someone in that job that they knew. After a very short time I was promoted to Maintenance Manager i/c all engineering activities. Unfortunately after a couple of years I suffered two major heart attacks that should have killed me, but you know what they say about only the good dieing young.

So here I am 10 yrs on in my 10th year of retirement. You gather those wonderful years I spent on 4JSTU must have done me some good. Can't complain as I spent 16yrs in that wonderful rank of W.O. and enjoyed every minute in uniform , and meet some great people.

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## Tony Fry

Tony Fry and family (wife Terry and Aussie daughter Elaine) returned to UK in late 1963. The opportunity to travel the long way round across the Pacific was too good to be missed and was taken together with Alan Breckon and his family. The six week trip was a fitting finale to a thoroughly enjoyable experience of Australia.

On return to EMI at Feltham (and a taste of working on the effects of impact shock on electronic circuits) the cheaper housing and proximity of good sailing waters on the South Coast beckoned and Tony entered the employ of Plessey at Havant in early 1964. Plessey had just been awarded the Clansman project for military radios and Tony joined the group specialising in digital frequency synthesis, there to remain until the advent of the Mallard and Ptarmigan projects.

At this point an interest in electromagnetic compatibility (EMC) arose and by specialising in these techniques Tony was able to avoid the hassle of a management position. A brief venture into writing test software filled a slack period in the EMC field. Then Plessey acquired the Raven project - military radios for the Australian forces but sadly no trips down under. Tony was once more involved in the EMC aspects of the design to be followed by field testing.

Then the takeover by Siemens and GEC in 1990 saw the end of Plessey and eventually the closure of the Havant establishments. The Raven project was continued by Siemens at Christchurch entailing a daily commute by coach (supplied by Siemens) for ten months until redundancy and early retirement in 1992. Thus full circle, field trials on Blue Steel to field trials on Raven!

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## David Booth

Upon leaving Edinburgh Field in early 1965, I returned to RAF Wyton and 543 Squadron - a Unit of reconnaissance style Handley Page Victors. During that time XL161 - you all remember XL161 - was sent to 543 after having been converted from its Australian trials role into an SR version. The new Crew Chief was not amused to hear that XL161 had been involved in a supersonic stall 'down under'. Bryan Wetton tells me he was at Wyton at the same time as me but I don't think I came across him - 'Sorry I if we never met up'. Chris Midwinter (NBS) also came to 543 Sqdn were we worked together until we both went through the motions of 'buying ourselves out'. I finally succeeded in 1966 after having spent a few weeks on holiday in Morocco.

I went home to Slough (Slow, Slow, Quick, Quick, Slow!) and just walked into a job working on SEASLUG involving a computer and the warhead.

I was getting itchy feet and when in 1967 John Flaxman (Elliot Bros) wrote to me and said there was a job at TIDBINBILLA, just outside Canberra, I jumped at the chance. I resigned my job and virtually jumped on a plane back to the land of sunshine and cold beer.

I met Anna in Canberra in 1968 and we were married in Adelaide in 1970. Our children are Sarah (29), Adam (27), Sam (21) and Laura (dec.) resulting in three grandchildren. Sam is still experiencing the 'University of Life' by traveling the world. To date he has worked, and played, in Africa, Japan, Europe, Britain and North America where he is at the moment. Anna had traveled the world before we met and she did one more overseas trip, to W. Germany, before I plucked up the courage to ask her to marry me.

Tidbinbilla was a great job. It was great meeting a lot of the old Elliot faces again. I worked on the Command team sending commands to the Surveyor spacecraft that landed on the Moon. I shall be able to bore my grandchildren (3 at the moment - 2001) to despair with stories of sending a small spacecraft around in space trying to reseal a leaking Vernier control valve. Even taking, remotely, hundreds of photographs on the Moon's surface should get their interest. Those were the days!

After Surveyor (1967 - 1968) I was involved in the Apollo Project. Yet more stories with which to bore the Grandchildren - and any one else who will listen. Who can forget that moment when Apollo VIII came from behind the Moon and one of the Astronauts read "In the beginning . . .". Apollo 13 happened over Canberra, that was also exciting. Finally Apollo 17, the last of the Apollo spacecraft, in December 1972, landed on the moon. The early Pioneer X (launched in March 1969) and Pioneer XI, launched in April 1973 were really reliable spacecraft - Pioneer X is still going at the farthest reaches of the Solar System. Politics started to interfere at Tidbinbilla so it was time to leave.

I joined Control Data Australia in Canberra after a chance meeting. An ex Tid friend asked me to go over and look at a 'crook' plotter unit. Whilst examining the plotter, a fellow working for CDC said "Hello Ginge what are you doing here - do you want a job?" I couldn't think who the fellow was but he knew me from the RAF days. I said yes and within a week I was maintaining and fixing the then fastest computers in the country. I discovered that Chris Midwinter was also working for CDC and I came across him a couple of times. I stayed there for about three years getting lots of digital experience when Norman Moorhen,

formerly of Elliotts at WRE on BS, rang me and said I was to start work at CDSC the following week!

John Flaxman had left Tidbinbilla to eventually work at the Naval Combat Data Centre and so in 1976 I followed him there to work for EMI. I have been there ever since. It is a very interesting job, involving military computers and I have travelled to the USA a couple of times to do with new computers.

During the early days at Tidbinbilla, John Flaxman, a friend and I set out on an attempt to make the northern most tip of Cape York in Queensland. The three week trip ended at the Archer River (central Cape York) where my car, a Chrysler Wayfarer 'Ute broke down. After a lot of hard work we finally got the 'Ute back to Cairns. We had a very bad trip home with all of us tired and very sick.

In the early 90s we billeted, for three months at a time each, a Kuwaiti national who was intending becoming an Officer in the Kuwaiti armed forces. The agreement was that each one of them would spend around three months in the home of an Australian family. By doing this each Kuwaiti would become aware of the social mores that exist in Australia. It was an experience for both parties. The Kuwaitis were around the twenty mark so fitted in easily with my two boys. They had survived the Occupation of Kuwait by the Iraqis and were being allowed to re-adjust to 'normal' life before entering Duntroon.

The first young man, Nasser, had travelled the world - his father was a diplomat, so fitting in was not a problem. He finally graduated from the Navy College at Creswell and returned to Kuwait as a Navy Officer. The next two young men were intended for the Army so they attended the RMC Duntroon. Their staying with us was an exciting time considering the situations in which they found themselves. Suffice it to say the both became Officers in the Kuwaiti Army and I believe they are still serving their country.

My daughter married a Japanese fellow whilst she was living in Japan. They have one son, Jin, who is understandably bi-lingual. Anna went to the wedding that was carried out in both the Shinto and Christian traditions. I went to spend some time in Japan later on and visited many interesting computer companies and robot factories.

Fourteen years ago my wife Anna experienced Breast Cancer and instead of being overwhelmed by it she became a consumer advocate and support for women with Breast Cancer. By default I was lured into supporting the Breast Cancer Network of Australia and was instrumental in the design, management and supervision of the layout and construction of the giant 'Field of Women', on the lawns in between the new and old Parliament buildings, here in Canberra. The design made such an impact that comment was made of it at the European Cancer

gathering in Berlin the following year. Since then the design has been presented in other countries as well as annually in Australia.

More recently I have become a member of a tribunal that sits now and again to resolve conflicts between the Motor Trade (Maintenance) and members of the public. I feel it is a good way to pay back to society some of the things that I learned at public expense. I could go on about my experiences on the tribunal but suffice it to say that I would like to have put on the black cap several times!

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## The Roshiers

The Roshiers, John (Bill), Helen (Ella) and Karen (2 years old) left Elizabeth on the 11<sup>th</sup> November 1964. Stayed at Changi for 2-3 days and arrived in the UK in thick fog!!

We'd been posted to Halton and finally got a married quarter in February 1965. Bought a Dormobile (Ford Thames), travelled all over during the school holidays. Neil born at Princess Mary's 15<sup>th</sup> May 1966. Moved to Aylesbury.

Posted again to Malaysia (Kinrara) for 2 years from 1970 to 1973. Returned to Bicester in 1973. John demobbed after 22 years.

Returned to Australia September 1974 to live in Geelong from then until now. John worked at the Gordon Technical College as a teacher then ran his own media workshop making training aids, a job he loved. He started feeling ill at the end of 1992 and was diagnosed with immunoblastic lymphoma in January 1993. Underwent all types of treatment and never complained. Died 8<sup>th</sup> September 1993, 3 days after our 34<sup>th</sup> wedding anniversary.

Karen married/divorced has 3 daughters, Sarah 15, Emily 13 and Claire 10. Neil and wife Yvonne due to have their first child September 2001. Ella Roshier.

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## Memories of Mirikata

The settlement of Mirikata, from an Aboriginal word, meaning 'morning star' became an occasional centre of operations for the members of the UKAEA/EMI team during Blue Steel flight trials in the early 1960s. The complex at this outpost, about 200 km north west of Woomera Range E, had been established during the late 1950s to provide tracking, instrumentation and monitoring facilities for vehicles launched along the

range centre line. One of two FPS-16 'C' band radars – the other being at Red Lake near Woomera – was located at this site. These radars were later to play an important role in the Blue Streak and ELDO launchings of the late 1960s.

Mirikata provided accommodation for itinerant trials staff and had a nucleus of resident staff. The permanent residents included a number of self-imposed exiles whose individual backgrounds remained closely guarded secrets. Excellent food was provided in the mess and a bar was available for after work relaxation. Tennis courts and pool tables were available and films were shipped in by ASCO once a week for added entertainment. On film nights the population of the camp increased with the influx of families from surrounding pastoral properties, such as McDouall Peak, The Twins, Bon Bon, Mount Eba, Ingomar and Bulgunnia. It was not unusual for station families to make a return trip of 150 km to enjoy a film evening. Parents would arrive with their children, awake and in their pyjamas who, three hours later, would be carried back to their vehicles, out to the world, for the journey home. These were indeed significant social occasions and it is as well that booze buses and radar traps were rare in those days.

Mirikata had its own airfield enabling the rapid transit of supplies, provisions and people from Woomera. RAAF de Havilland Otter aircraft were mostly used with the occasional DC3 and on at least one occasion a Bristol Freighter. A helipad, close to the accommodation blocks, allowed access by RAAF helicopters which were occasionally used by staff designated to carry trial records back to civilization.

The designated impact area for Blue Steel rounds lay to the south west of Mirikata and a control centre for two telemetry stations in the impact area was established on a prominence at McDouall Peak which, at 210 metres above sea level, stood proud of the surrounding landscape and afforded excellent visual views and electromagnetic coverage of the surrounding area. McDouall Peak had been named after the explorer John McDouall Stuart who had traversed this area on his expedition in 1858 as a precursor to

his eventual successful south-north crossing of the continent in 1862.

Equipment installed atop the peak served the two purposes of monitoring and control. A high gain fixed dish antenna was pointed towards Woomera and enabled the performance of the BS payload to be monitored during the pre-launch approach. Combinations of aerial arrays, installed at the top of a 100ft mast were set up to receive telemetered data from BS during the final phase of its flight, prior to, and at impact. South west of McDouall Peak was the designated impact area. Two stations, M19 and M20, about 4km apart, were located in



Figure 16 Hey Ho, hey ho it's off to work we go

the impact area. At each of M19 and M20 was a 150 ft mast at the top of which were installed multiple aerial arrays and masthead receivers which had to be adjusted to suit the parameters of each trial. *(When we were recruited for this job and given our duty statements they didn't tell us about the mast-climbing bit!).* Telemetry receiving and recording equipment at each of these stations was set up for each launch after which the EMI people would hastily retreat by Landrover to the comparative safe sanctuary of McDouall Peak from where the M19 and M20 equipment would be remotely controlled for the duration of the trial. *(We had been told about the excellence of the Elliotts people and their inertial navigator but we were a sceptical lot!).* We would watch from our vantage point on the Peak, binoculars trained, stopwatches at the ready, eager to plot the impact point before returning to M19 and M20 to retrieve photographic records of another successful trial. Then back to Salisbury for R & R and preparation for the next trial, whenever that might be. If you were a designated courier for the trial records you were afforded very special treatment with guaranteed transport back to Salisbury, RAAF helicopter to Woomera and Ansett-ANA to Adelaide - none of this wait-listed nonsense. Lesser mortals just took their place in the queue and if you missed your chance you were stuck at Mirikata for another weekend. If this happened you had the option of commandeering a Landrover and driving to Coober Pedy, 100km to the north, to chance your arm in the opal fields. If that did not appeal you could always avail yourself of the amenities of the Mirikata camp bar.

For three and a bit years life was different from that to which we had become accustomed in the Old Dart. Daily driving to the office no longer proved to be a task to elevate the blood pressure. On the other hand, a vehicle breakdown between home and office would mean an appreciably longer wait for road service.

Memories fade with the passage of time and while names may not easily be recalled after 35 plus years

some events remain vividly clear. A couple, from Mirikata circa 1963, spring to mind:

One of the real characters on the station permanent staff, name forgotten but I'll call him Fred, had a colourful turn of phrase. Not only did he insert expletives between words but he regularly inserted them between the syllables of multi-syllabled words. On this particular occasion the Governor of South Australia, Lieutenant-General Sir Edric Bastyan and Lady Bastyan had flown into Mirikata with other dignitaries on a whistle-stop visit. We all assembled in the recreation hall where the cook had provided a sumptuous spread of delicacies and nibbles and freshly brewed tea in bone china cups which had never been seen before and were, to my knowledge, never seen again. The official party mingled with the assembled throng engaging in appropriate discussions. Mirikata hierarchy, being aware of Fred's conversational limitations, and not wishing to affront vice-regal sensitivities, had posted two guardians on Fred with instructions to keep him well out of range of the official party. The intricate and subtle manoeuvring was both effective and masterly as the groups circled the room, diametrically opposed.



Figure 17 Roger Stacey and Brian Whiting relax on the Otter flight to Mirikata oblivious of the drama in the cockpit.

Same day, same function. The Governor's party had arrived at Mirikata by air at about 1400 hours. A BS trial was imminent and the EMI team had flown

in by Otter which had touched down just before the official group. Just time enough to change into working garb of shorts and desert boots and, in the interests of decency, shirts. Sir Edric, genuinely interested in the longevity of service of these people at such a remote location asked Ron Longland how long he'd been at Mirikata. Ron, glancing at his watch, replied without hesitation, "Twenty five minutes". Ron was always the perfectionist with a great sense of attention to detail.

... and one from Roy Watts:

Roy recalls a particular incident which remains indelibly fixed in his memory. He was travelling from Woomera to Mirikata with EMI team mates one morning as passenger in the RAAF de Havilland Otter and had successfully eased his way into the prized seat next to the pilot. Ten minutes into the flight the pilot turned a noticeable shade of green and complained of feeling unwell. Roy,

with the bravado of a hero who had no other option, asked whether there was anything he could do to help, already regretting his eagerness to sit up front. The pilot, having quickly assessed the likely value of Roy's assistance and deciding against it, was able to make an emergency landing at Mt. Eba Station where a detailed inspection of his jocks revealed the existence of a large and voracious redback spider which had been the source of the trouble. During all this time Roy's EMI colleagues dozed, oblivious of the drama being enacted in the cockpit.

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### Mirikata Today.

Blue Steel veterans have made a number of pilgrimages to this region during the last few years enjoying the hospitality of Wayne and Sharon Rankin at The Twins station. Wayne was one of the youngsters who attended the film nights at Mirikata in the early 1960s and he remembers some of the genuine characters of those days - and there were many.



Figure 18 The Recreation Room at Mirikata in 1999. Still set up for Film Nights but the fridge is dry.

The Mirikata camp is now desolate and has suffered the ravages of neglect and desecration but the spirit of excitement which we shared can still be sensed by those who return to the site of their earlier endeavours.

The gardens between the accommodation blocks, once carefully tended by the resident manager have reverted to nature.

Roofing material from most of the buildings has been removed by wind and scavenging visitors.

There are still antennae on the roof of the 3-storey Instrumentation Building but access to them is made difficult by the condition of the stairways that remain.

McDouall Peak shows few signs of the activity which was evident in earlier days. A few foundations of earlier constructions remain and the shed which

previously housed the generating plant on the peak is now housing the generators which service The Twins station. Otherwise it appears much as the John McDouall Stuart party must have found it in 1858.

The aerial masts at M19 and M20 still stand as silent sentinels. They seem to sway rather more than they did when we daily scaled them with toolkits and AVOs in the 1960s, but I suspect that this observation is due to the deterioration of faculties with advancing age.

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### Gordon Mepham

Just before leaving Australia after the end of Blue Steel low-level trials Pat and I were married at Cumberland Park in August 1964.

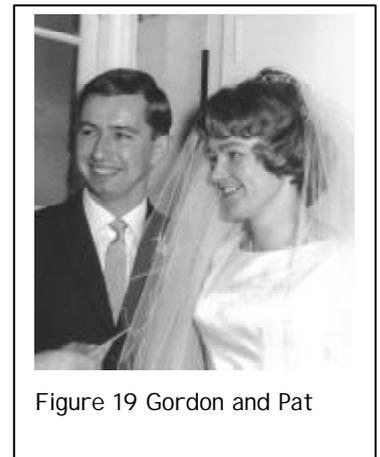


Figure 19 Gordon and Pat

We both left for the UK in November 1964, heading for an uncertain future at RAF Honington, near Bury St Edmonds. Several of us from 4 JSTU were redundant from a Blue Steel point of view because the squadrons in the UK were fully staffed with Missile Control Fitters so we returned to more active duty with Bomber Command. It was quite a return to the past working on Victor B1 and B1A aircraft after 5 years working around a Victor B2 (good old XL 161, which incidentally was one of the last tankers in 1992) and a Vulcan B2 (

After about 4 ½ years at both Honnington and Marham our family of three left the UK to return to South Australia, me as a civilian with a welcome addition to the family, our elder son Andrew born in 1967. Our first task was to set up home wherever there was work. We made a decision to be close to Pat's family in South Australia so began looking for a mortgage to build a house.

In those early days, I was not sure what work would be available to an ex RAF Aircraft Electrician so wrote many letters to companies that may make use of my skills. Nothing came of these, either there were no positions or the work was interstate. To "keep the wolf from the door" I helped make electrical switchboards with a prominent company in Adelaide. When the current contract expired I was asked if I had any electronic wiring experience and would I be prepared to work for a month or so in Western Australia. The money was good so my home for a month was in Carnarvon to help install the

NEC communications equipment at the OTC station. While there, Neil Armstrong walked on the moon. This was quite interesting work, being involved with satellite communications, the way of the future.

It was time to "move on" after a further 2 months working at the Ceduna OTC Earth Station. This time it was to Petroleum Refineries of Australia at Port Stanvac as an Instrument Mechanic/Fitter, another fascinating part of my working career. The job was sometimes hot and dirty or wet and windy climbing fractionator towers in the dead of night in a gale to change a thermocouple or gauge. The last year of my work at Port Stanvac was even more interesting. This was during the building of the Lubricating Oil Refinery. My task was to accept the newly installed instrumentation on behalf of the Mobil Oil Company. Sounds more grand than it was but was never the less an experience working with more modern instrumentation systems. During this last year at Port Stanvac I regained contact with Gerry Maidment and Tom Mercer. Gerry and I had first met when we were at RAF Yatesbury on the first non-radio missile fitters course in 1958. We met again at the Woodford Avro factory in April 1959 and both travelled on the SS Iberia to Australia in December 1959. Tom, one of the 4 JSTU radar fitters and I shared a room at RAAF Edinburgh.

During my time at Port Stanvac I spent four years studying electronics part time at the then Department of Further Education Kilkenny Technical College. This gave me a para professional Electronic Technicians Certificate with an appetite to move on from working with any tool from an instrument screwdriver to a pair of 48 inch Stilsons. Very tongue in cheek I applied for a position as a Technical Teacher at the Kilkenny Technical College in 1975. Much to my surprise I was offered the position, to start in January 1976. Nothing ventured nothing gained I jumped in with both feet and started teaching in February 1976 after a three week course on how to write a lesson plan and not make too much of a fool of myself in front of a class. Gaining more formal teaching qualifications meant another 6 years part time study. By now we were a family of 4, with the arrival of Scott in 1971.

Since my occupation seemed to change with every new job I decided to make teaching the last experience of having to start at the beginning. However, this did not mean settling down to the same routine every day. During my 23 years of teaching many new technologies were developed. In 1976 microprocessors were almost unknown and certainly not as common as today. The PC as we know it was about 8 years away, the CD was not even thought of and many other electronic "goodies" were only for people wearing white coats in laboratories with positive atmospheres. These

technologies had to be learnt on the run so we could teach them to people who were clamouring to know about these new gismos.

My most interesting time with the department of Training and Further Education, South Australia (TAFE SA) was during the early to mid 1990s. This was when TAFE SA was pioneering the use of multi point video conferencing for educational purposes. At that time there were 9 interconnected sites in South Australia delivering courses to people living in the Eyre Peninsula, Barossa and Clare Valleys, the Adelaide region and the Iron Triangle (Whyalla, Port Augusta and Port Pirie). Many people from all over the world came to South Australia to see how video conferencing could be used for education and later developed systems similar to the ones we were using. I understand there are now 39 TAFE SA sites in South Australia with video conferencing facilities that are used on a regular basis.

All things come to an end and in December 1998, TAFE SA and I parted company. TAFE SA made me an offer that they would pay me a certain sum of money if I promised not to come back to work. I took it.

Since retiring, life has been quite heck tick. Activities include Pat and I going away in our caravan as much as possible, running a web page for the Royal Air Force Boy Entrants Association, Neighbourhood Watch, Secretary for the South Australian Branch of the RAFBEA, a part time job and helping with organising and running this Blue Steel Reunion. Life aint dull!!!



Figure 20 Gordon 2000

On the family front, Andrew, after an apprenticeship with Telstra as an electrician is now living in Port Lincoln working as the Austbulk (grain handlers in South Australia) Safety Adviser for the Western Region. This region stretches from west of Ceduna to Port Pirie meaning he spends a lot of time travelling around the Eyre Peninsula and the top of Spencers Gulf. Andrew (34) and his partner Tania have a daughter Anastasia (5). Scott (30) is a Registered Nurse living in Rotarua New Zealand with his Thai wife Thip. Plenty of boiling mud and misty Winters.

The future? The car is fuelled, the caravan packed and there is a lot of Australia we have yet to see!!

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## Email from Bob Petch

Bryan, how can I thank you for such an interesting addition to the Blue Steel history. This is particularly interesting for me to hear of things that went on at the 'sharp end' so to speak. So far I have read about the Victor going supersonic and its dramatic aftermath. This is a story which is so well written that one almost feel one was actually there.

Thank you so much for keeping me up to date on your splendid organisation, and long may it continue. I cannot remember whether or not or not I told you that I figure in a new book on the Vickers Supermarine Swift aircraft which was written and published by Group Captain Nigel Walpole, OBE. The title of this book is 'Swift Justice' and is a vigorous defence of a much maligned aircraft. I worked on it on No 2 A/C Squadron, at Jever, North Germany, way back in 1959 - 1961. This was of course a few years before my Blue Steel days, and in it there is an actual photo of me taken for 'Good Show' I received for putting out a fire on one of the aircraft ! ! Perhaps your local Library could acquire a copy, as the book is an excellent read. Working on this aircraft put me in good stead to work on the Missile. These far off days were indeed pioneering in the Royal Air Force, indeed more so for the JSTU at Woomera, as is so amply described to me today.

Keep in touch, and many thanks for the latest information. Best Wishes to one and all.

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## Email from Tom Brown

From Blue Steel to Martel (2 years in England) and a short time with ELDO.

Joined Medical Applications as Service Manager (25 years).

Retired to hobby farm in Tasmania near Deloraine.

## The Final Few Minutes

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The EMI/UKAEA team atop McDouall Peak were witness to the last few minutes of the Blue Steel as it powered supersonically to its final destination and graveyard about 10 miles away to the south west.

At each of the two telemetry receiving stations on the periphery of the impact area, and also at the control station on top of the Peak, the early part of launch day had been spent setting up for the trial. Aerial arrays were adjusted to suit the projected trajectory and final event. Receiving and display equipment was adjusted to provide optimum recording of specific trial parameters and checked and double checked for correct functioning. Cameras to record monitor displays were loaded with film and test strips taken and processed at each site to validate the focus and brightness settings of the critical displays. Signal strength pen recorders were fully loaded and tested. Finally the ability of McDouall Peak to effect remote control of the recording equipment at the distant impact sites was demonstrated. The impact stations were then evacuated for the safe haven of McDouall Peak. Certainly not a job for sufferers of Obsessive Compulsive Disorder! Once the stations were vacated there was to be no turning back for last minute checks.

Although devoid of shade, McDouall Peak provided a splendid vantage point to observe the culmination of the lifespan of a Blue Steel - or, for that matter, anything else within an area of about 300 square miles! Not that anybody ever claimed to have actually seen Blue Steel on its final path to destruction. As we stood with eyes straining towards Woomera to the South East with the range countdown proceeding there was, on occasions, a glimpse of a contrail from the launch aircraft and everyone hoped that the release would occur so that we could get back to Adelaide for pressing domestic and social duties. Elation was experienced when the countdown moved from negative to positive and we knew that Blue Steel was on its last journey. For the next 3 minutes or so we listened to the Range Controller as the positive count continued and, with fingers poised on stopwatch buttons and magnetic compasses at the ready, we strained to detect the first visible evidence of impact so that the point of Blue Steel's demise could be located by range and bearing. We often wondered if our own



Figure 22 Blue Steel Debris at the impact site



Figure 21 XA-903 with test round in UK

basic prediction of actual impact point would have been helpful to the recovery team who were lurking out there, unseen, but somewhere in the protective shade of a convenient mulga bush. Probably not, because we rarely had to wait more than a couple of hours before the recovery team had cleared the area as being safe for our return to retrieve the records from the impact stations.

We had been witness to the final chapter of the story of a Blue Steel round. A life cycle which had begun in the north west of England and which had ended in the sand dunes and spreads of the north west of South Australia.

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## Email from Brian Lewis

Letter from America - to John Saxon

Dear John,

This is a "you don't know me, but....." e-mail. I'm Brian Lewis, 42 year veteran of Elliott Brothers/Marconi Avionics, and still employed by Marconi (as of today, anyway). I came across your Blue Steel website quite by accident and found it absolutely fascinating as it harks back to my early days with "The Brothers".

I joined the company in 1959 as a service engineer/flight test observer and spent the first four years working variously with Air Fighting Development Squadron at RAF Coltishall on the early development of OR946 (integrated flight display system) on Javelins; the College of Aeronautics, Cranfield (again on Javelins, flying with "Black Mac" MacDonald); then to Holme on Spalding Moor on the early days of the NA39 Buccaneer (the Blackburn Nana, we called it) with Sailor Parker and Derek Whitehead; and then to RAE West Freugh for the weapon aiming trials with

Ferranti's Colin Curtis as senior test pilot (happy days, an idyllic place).

I was scheduled to transfer to the TSR2 but asked to be transferred to commercial aviation - ended up at Weybridge and Wisley on the VC10, and latterly the BAC1-11 flight trials teams. The 1-11 flight trials were a tough time but the 1-11 was a good career choice because it brought me to the States, working with Mohawk, Braniff, and American, as well as a bunch of Central and South American and Caribbean operators. Marconi asked me stay on in the US and I worked the TSR2 replacement - the good old F-4K/M with McDonnell in St Louis, then came to Atlanta to help set up Marconi Avionics US branch here.

Worked on systems for the G5A, A-7, A-4M, G-130H/U Gunships, F-16, AV-8B, AH-1S Cobra, and a whole load of fascinating projects that came to naught. Long story short, as they say, I transferred to Marconi plc when Avionics was sold to BAe and here I am, way past my sell-by date, marketing supply chain management solutions

But all that is not why I contacted you. I read the list of names from your old Blue Steel team, and it nearly brought tears to my eyes: Ron Bristow, Staff Ellis, John Keeble, Ron Moseley, and Dick "Rounds Per Gun" Collinson, I knew them all from Borehamwood and Rochester days; Dick worked with us to sort out our OR946 integration problems at Cranfield. During the same websearch that led me to your site I came across a reference to a book by him; I've added the site reference at the bottom of this message.

Did you ever work with Ron Howard? He came to UK from Oz during Blue Steel days and I think he was on the program for awhile. I used to work for him. Ron ended up as MD of GEC-Marconi Avionics and was President of the SBAC for a term; he and his missus returned to Oz (Adelaide, I think) when he retired a few years back.

Gotta go. Best wishes and good luck with your reunions; may you have many of them. If you ever come Stateside on your consultancies and end up near Atlanta, look me up.

Brian Lewis

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## Searching for the Past- "The Big Steel"

— as printed in the 'Gibber Gabber' Woomera Newspaper

In the cool of a South Australian spring morning five former members of the Blue Steel trials team of the late 50's and early 60's, set out from Adelaide to search for remains of Britain's nuclear deterrent which had been fired from V bombers into the desert north west of Woomera.

Blue Steel was a "Stand Off Bomb" approximately 35 feet long and weighing almost seven tons. It was driven by two rocket motors fuelled by HTP (High Test Peroxide) and kerosene.

The search was prompted by the forthcoming reunion of Blue Steel project members to be held in Adelaide in October 2001. The search team consisted of persons with a variety of skills and experience from the original network of organisations that formed the Blue Steel project nearly forty years ago - David Lloyd, formerly of Elliotts, Inertial Navigation and Airborne Observer; Dennis Pfeiffer, ex AVRO, Airborne Observer and Missile Preparation; Keith Rendell, ex EMI, Payload Monitoring; and two former 4 JSTU RAF members Sgt Terry Clark, Autopilot and Flight Rules Computer and J/T Bryan Wetton - Photographer.

Base camp was set up on the first evening at The Twins sheep and cattle station, a 700km drive from Adelaide.

At first light the next morning, (well perhaps it was a little after nine), two vehicles headed off to McDouall Peak to calibrate the GPS against a known trig point. The Suzuki 4x 4 carrying David, Keith and Terry arrived after a short detour i.e. took the wrong road but eventually found the Peak. The Camry, with crew Bryan and Dennis, managed, despite the fact that they carried the GPS, to get themselves lost and bogged many kilometres off course in the general direction of Mirikata. It was after three in the afternoon before the two crews were reunited and some serious searching started!

During the delay in locating Bryan and Dennis, David took the opportunity to test the Minelab SD2100 metal detector kindly loaned by Minelab, a South Australian company. The trial turned into a text book search with early detection of a target followed by digging, splitting the dig into sections, and finally locating the target - a rusty nail which looked old enough to be called two inches and not 50mm.

Two 150 foot telemetry towers known as Mike 19 and Mike 20, still stand in the desert. These provided excellent navigation and reference points to assist in the search. Finding the towers still standing was a big surprise but an even bigger one was the amount of Blue Steel debris still laying in the desert undisturbed for over thirty five years, save for the occasional thump from a passing kangaroo or sheep.

Many recognisable pieces were found including transducers, control surface jacks and nitrogen bottles. One part which was not immediately recognised, was about the size of a computer keyboard. Attempts to lift it into the 4x4 proved too great a strain on ageing bodies. The mystery of its great weight was solved when it was eventually turned over and was found to consist mainly of lead, two to three inches thick. Discussion on its origin eventually favoured it being part of the dummy pod which very few people had security clearance to see back in the days of the trials. Being too heavy to lift, the prize was lashed to the tow bar of the 4x4 and dragged like a reluctant puppy through the bush to a small collection area that had been established. Subsequently two other parts of a dummy pod were found.

Over dinner that evening at the shearers quarters, which Wayne and Sharon Rankin, owners of The Twins had kindly allowed us to use, we decided that the many pieces recovered indicated that we had found the remains of an air burst round which had scattered debris over a large area.

On the second day, to avoid mishaps, we decided to all travel together to the search area in the 4x4, then split up. Three of the team did a pattern search over the area in the 4x4 while Dennis and Bryan walked some 5km through the bush using a compass and Mike 19 and Mike 20 as reference points.

The 4x4 was used to search for a series of craters that had been previously identified on aerial photographs obtained from the Lands Department in Adelaide. A number of craters were found and the backbreaking work of digging deep into the sandy ground was bypassed by the modern wonders of metal detecting. The Minelab SD2100 quickly proved that the rounds that had impacted to form the craters were not patiently waiting for us to find them but had probably been transported back to secure areas in Woomera soon after the trials.

The local terrain consisted mainly of mulga trees some eight to ten feet high. Fallen branches proved hard on the Suzuki's tyres. The trees had grown close together and in such random patterns that it made Hampton Court Maze seem like child's play as we threaded our way back and forth, excitedly locating more and more parts while at the same time having our enthusiasm dampened by three side wall punctures. Fortunately the spares we carried and the on board tyre repair kit and battery driven compressor kept us mobile.

Bryan and Dennis successfully navigated their way to lunch at Mike 20. The Suzuki crew, who had arrived some half hour earlier, were not sure if was the smell of coffee brewing or the 150 foot tower that eventually guided them to the pre arranged spot on time. They brought the good news that they had found some fairly large pieces from Blue Steel, including one panel which had a telemetry aerial still attached.

After lunch the 4x4 went back into the bush and with some smart compass work from Dennis located the largest of the panels which was over six feet high and some two feet wide. It was triumphantly loaded onto the roof of the 4x4 for transport back to the Twins. One twisted piece was found some eight foot up a tree. This of course generated the question. Did it fall into the tree or did the tree grow up underneath it? Or was it a bit of both!

Having achieved 90% of the search objectives we decided the next morning to head to Woomera via Mirikata which had been the residential and operational base for monitoring the missiles.

Mirikata was a sad sight. Although most of the buildings are still standing, almost without exception they have been stripped of floors, ceilings and doors. Venetian blinds chatter incessantly as the dust and hot north wind blows through broken windows. Desert plants push their way up through hundreds of cracks in the once well maintained tennis and basketball courts and the swimming pool is empty and cracked.

Woomera was a more positive experience and although low in population it had an air of order and pride. We visited the outdoor Missile Park to pay homage to the Blue Steel on display amongst some thirty other exhibits. The Heritage Museum, in the building which many old residents knew as St Barbara's Church, has a large collection of memorabilia from the trials activities that this once thriving, bustling town supported for so many years.

The trip was a success and it was decided to add the option of a similar trip to the programme of the Blue Steel reunion being planned for October 2001.

## Acknowledgements

The Big Steel team wish to acknowledge the support and assistance of the following in contributing to the success of the expedition:

Wayne & Sharon Rankin and family, for accommodating us in their shearers' quarters and giving us free access to their station property for the search.

Minelab, for the use of the SD2100 metal detector which proved invaluable in confirming or eliminating potential sites.

Neil Pollard and his Company, Applied Data Control, for many helpful suggestions and practical help in the loan of GPS locating equipment.

Wives and families of team members, for assistance in preparing for the expedition and in 'minding the store' during the trip.

Pictures and further details of the search and more information on Blue Steel and the 2001 reunion can be found on the Blue Steel Website

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# Geoff Glover

## CURRICULUM VITAE

**NAME:** GEOFFREY A. GLOVER

**DATE OF BIRTH:** 10 January, 1958

**ADDRESS:** 13, Parchoon Street,  
Langford, W.A.6147

**TELEPHONE:** 089 451 4244

**QUALIFICATIONS:** Associate Fellow of the Australian Institute of Management  
Member of the Institute of Personnel and Development (UK)  
Member of the Australian Institute of Training and Development  
Associate of the Institution of Electrical and Electronic Incorporated Engineers  
Serial Quality System Auditor

**From To**

Dec 1995 Dec 1997 **Employer:** GIS Engineering Group  
**Position:** Manager, Quality and Occupational Health & Safety  
**Details:** To develop, implement and manage a Quality Assurance system that conforms to the requirements of Australian Standard AS/NZS ISO 9002:1994 and to gain for the Company certification at this standard. To develop, implement and manage an Occupational Health and Safety system that conforms to the requirements of the Act in order to achieve a zero Lost Time Injury Frequency Rate.

Oct 1995 Dec 1995 **Consultant: Self Employed**  
The development of Quality Assurance, Productivity Improvement and Human Resource Development systems for various client organisations.

July 1992 Oct 1995 **Employer:** Pacific Industrial Company  
**Position:** QA Manager  
**Details:** To develop, implement and manage a Quality Assurance system that conforms to the requirements of Australian Standard AS/NZS ISO 9002:1994 and to gain for the Company certification at this standard. To develop, implement and manage an Occupational Health and Safety system that conforms to the requirements of the Act.

1989 June 1992 **Employer:** Manufacturing Australia Network  
**Position:** Manager Operations  
**Details:** To develop Quality Assurance, Productivity Improvement and Human Resource Development systems for various client organisations which included Aqua-Technics, Printers Trade Services, Bunnings, Timbercraft, Brittle Plastics, De Feu Metals, Bindoon Cottage Craft, etc

1988 1989 **Consultant: Self Employed**  
The development of Quality Assurance, Productivity Improvement and Human Resource Development systems for various client organisations of the Australian Design Council

28/09/87 08/08/88 **Employer:** Australian Productivity Council Western Australia  
**Position:** Training Executive  
Under the direction of the Manager, I undertook various Human Resource Developmental activities within client organisations.  
These activities were designed by myself and tailored to each client's needs and, in most cases, involved all levels of personnel within the enterprise.  
The objective of all the programmes implemented was at all times to enhance the productivity of the enterprise through the improvement of the management of quality and the quality of management.  
By training operators to recognise areas of waste, to identify and work up solutions to these problems and finally presenting an acceptable report to management, very large savings were realised.  
Other areas I addressed were Production Planning, Inventory Control Systems, Job Costing and Accounting functions, Training functions and Management Structures. I also have developed Job Descriptions and Performance Appraisal training.

08/08/85 10/07/87 **Employer:** Raduk Corporation Limited  
**Position:** Co-ordinator - Administrator  
I reported direct to the Managing Director and was responsible for all things administrative.

## Doug Cooper

Nov '77 May '85 **Employer: Self**  
**HISTORY**  
 I gained a six week contract with WMC Engineering Services as an Instrumentation Design Draughtsman. This contract was extended for 7 years.  
**Duties included:**  
 Artwork for printed circuits.  
 Build up boards and wire up a PACE processor based PLC system for Coke and Reverts feed to the Kalgoorlie Nickel Smelter.  
 Installation drawing, misc panel layout and design equipment cubicles.  
 INTEL 8080 based processor system to control the pneumatic feed system again at Kalgoorlie Nickel Smelter.  
 Latexes Feed Control system.  
 Maintain a Philips 1220 X-ray Spectrometer plus various other small items of analytical equipment.  
 Data Acquisition and Load Control Telemetry system which is in use at both the Kalgoorlie Nickel Smelter and Karibala Nickel Operations.  
 All of these above projects required the design of interfacing printed circuit boards.

June 1974 Aug 77 **Employer: MT NEWMAN MINING CO**  
**Position: Technical Training Officer - Electrical**  
 I joined this company as Technical Training Officer - Electrical, a new position. In this role I was responsible for the development and implementation of all electrical training. A Training Needs Analysis disclosed that the major training need of the company was Supervisory Development. As a result of my analysis my title was changed and I moved into Supervisory Training as Senior Training Officer, with overall responsibility for on-site training.  
 Further investigation showed that there was a great need for skills training across the spectrum of the workforce. To this end I began to develop a Training team which eventually numbered 10.  
 I organised the Training effort around the operational areas of activity with a Training Officer responsible for each area. My own efforts were still mainly directed at the management team. Eventually I was promoted to Training Supervisor and I continued the development of the Company's human resource. I instituted self-development programmes and also an overall company policy regarding the development of personnel. This plan was in operation when I terminated my employment.

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Dec '70 June '74 **Employer: AWA - NASA TRACKING STATION - Carnarvon**  
 Shift Supervisor responsible for the maintenance and operation of space tracking equipment. Due to the turnover of operators personnel my job also involved the training of new operators.  
 Jan '68 Dec '70 **Employer: MARCONI COLLEGE, CHELMSFORD U.K.**  
 Lecturer in the Radar Engineering Section, covering the computer peripherals which interfaced between the pure radar equipment and the computers.  
 Responsibilities covered the design and implementation of training courses to enable customer engineers and their own employees to install and maintain these systems.  
 Oct '57 Jan '64 **Employer: ROYAL AIR FORCE**  
 I joined the Royal Air Force direct from Grammar School as a Boy Entrant.  
 Duties included Research and Development.  
 Instructor  
 Syndicate leader in charge of 12 instructors and four laboratories.  
 It was on termination of my 12 year engagement that I took up my position with Marconi College.

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Following the return of the family to England, in 1963, I joined AMF International, Electrical Products Division as Sales Manager. When they moved to another area I chose the "golden handshake" instead of going with them.

Rejoined Elliotts as a Test Program Engineer working on head up display systems, for the American air force, and other military test equipment. This took me, on occasions, to Malta, Scotland and Cornwall RAF stations. The lure of Australia proved too strong with my wife, Linda, and I deciding to return, 1974 seeing us in Brisbane, after an "interesting" sea voyage. Fortunately we just missed the floods of that year. The two boys were unable to come with us at the time and it was to be another eight years before we were all together again. Well, at least in the same country.

Shortly after arriving I began working for Telecom with whom I stayed until retirement in 1982. My wife, younger son and I moved from Brisbane to Perth in 1985 driving over via Adelaide.

Following Linda's untimely death in 1986 I returned to England to lay her to rest 'at home'. She remains sadly missed. After a stay of some six months I came back to Perth. Life from then was fairly quiet. In 1990 I was fortunate enough to be invited by the RAAF to accompany them to England for the 50th anniversary celebrations of the Battle of Britain. A memorable trip, via Hawaii and Canada, which was later discussed in Federal Parliament and lives on in Hansard. Since then I have been able to travel, sometimes for extended periods, to New Zealand, Europe, and the Eastern States. In 1999 I finally sold my house and now live with my elder son and his wife, in my own "grandfather" flat, in Perth.

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## Why is it so?

Here is a look into the corporate mind that is very interesting, educational, historical, completely true, and hysterical all at the same time.

The U.S. standard railroad gauge (width between the two rails) is 4 feet, 8.5 inches. That's an exceedingly odd number. Why was that gauge used? Because that's the way they built them in England, and the U.S. railroads were built by English expatriates.

Why did the English build them like that? Because the first rail lines were built by the same people who built the pre-railroad tramways, and that's the gauge they used.

Why did "they" use that gauge? Because the people who built the tramways used the same jigs and tools that they used for building wagons which used that wheel spacing.

Okay! Why did the wagons have that particular odd wheel spacing?

Well, if they tried to use any other spacing, the wagon wheels would break on some of the old, long distance roads in England, because that's the spacing of the wheel ruts.

Who built those old rutted roads? The first long distance roads in Europe (and England) were built by Imperial Rome for their legions. The roads have been used ever since. And the ruts in the roads? Roman war chariots first formed the initial ruts, which everyone else had to match for fear of destroying their wagon wheels. Since the chariots were made for (or by) Imperial Rome, they were all alike in the matter of wheel spacing. The U.S. standard railroad gauge of 4 feet, 8.5 inches derives from the original specification for an Imperial Roman war chariot.

Specifications and bureaucracies live forever.

So the next time you are handed a specification and wonder what horse's ass came up with it, you may be exactly right, because the Imperial Roman war chariots were made just wide enough to accommodate the back ends of two war horses.

There's an interesting extension to the story about railroad gauges and horses' behinds. When we see a Space Shuttle sitting on its launch pad, there are two big booster rockets attached to the sides of the main fuel tank. These

are solid rocket boosters, or SRBs. The SRBs are made by Thiokol at their factory in Utah. The engineers who designed the SRBs might have preferred to make them a bit fatter, but the SRBs had to be shipped by train from the factory to the launch

site. The railroad line from the factory had to run through a tunnel in the mountains. The SRBs had to fit through that tunnel. The tunnel is slightly wider than the railroad track, and the railroad track is about as wide as two horses' behinds.

So, the major design feature of what is arguably the world's most advanced transportation system was determined over two thousand years ago - by the width of a Horse's Ass! THE END

## The last word!



Visitors to Aberfoyle Park at the home of Dennis and Margaret Pfeiffer last year were treated to an amazing sight during Christmas Festivities.

Whilst enjoying a Murphy's Stout on the veranda during the early evening a slow rumbling noise was heard from afar. The ever alert Dennis said " I don't believe it - that sounds just like a Vulcan!"



In just a few seconds the magnificent sight of what MUST be the last airworthy Vulcan B2 roared overhead. In the ensuing five minutes we were treated to a low level slow speed flypast during which the eagle-eyed Dennis jubilantly noticed the Blue Steel missile tucked cosily in its pouch under its mother.

Could this early outlined shape be the infamous XH539 flown by the intrepid crew from AVRO and 4JSTU?



As the Vulcan climbed away we sipped another Murphy's Irish stout and were convinced we had seen the true miracle of Christmas.

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Finally, we're there – roll on Friday!

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