

# THE RANGER

Journal of the Defence Surveyors' Association  
Summer 2009

Volume 2 Number 19

Grytviken Harbour, South Georgia November 2009.  
Derelict whale catchers with the *Professor Multanovskiy*  
in the background. Photo: Tony Keeley



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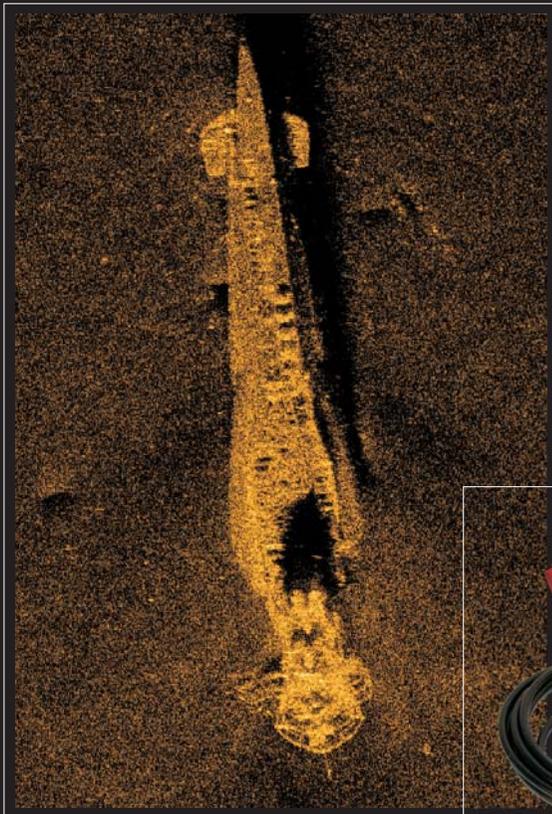
# Synthetic Aperture Sonar, HISAS



Synthetic aperture sonars combine a number of acoustic pings to form an image with much higher resolution than conventional sonars, typically 10 times higher.

The HISAS sonar is part of the HUGIN system solution for mine countermeasures, which has been ordered recently by the Norwegian Navy.

HISAS is a wideband SAS sonar with frequency range of 70-100 kHz, capable of producing ultra high resolution acoustic images as well as co-registered bathymetry. The sonar is tightly integrated with the INS navigation and motion sensing platform of the HUGIN AUV, and makes use of modern signal processing such as DPCA (Displaced Phase Centre Analysis) to process the raw data into images.



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## In this edition of Ranger...

.....we include articles from across the Defence geospatial community, both military and commercial, and indeed from across the world with a view from Colonel Jim Mitchell in the USA and not one but two submissions from New Zealand. All are looking at the issues that are facing the our discipline today and in the future and, despite the global financial situation, all are confident that the future, whilst presenting considerable challenge, does look good from those involved in matters geospatial. To highlight the importance of the defence commercial sector we have included views from three different companies, Envitia (formerly Tenet), Infoterra and a piece from David Swann who is now based in New Zealand where he heads up the ESRI distributor.

Not only is challenge a thread running through this issue but so is change. The mantra that the only constant in the world is change has never been truer. Captain Jamie McMichael-Phillips outlines changes at the MOD level and Colonel John Kedar tells us his vision of the next ten years which includes the recent confirmation that JAGO and 42 Regiment will move to Wyton in 2013. This will have a major impact not just on serving personnel but also on those retired from RE Geo/Military Survey as Hermitage has been their 'home' for over 60 years and is to all intents and purposes the current 'home' of not only the DSA which holds its Council meetings and seminars there but also the Military Survey (Geo) Branch of the Royal Engineers Association.

The senior military and business people who have written the articles in this issue have seen enormous change during their careers. Whilst they now write of integrated systems, web based imagery stored in terabytes and the like, they all started their geo lives by being taught how to make a map or chart which at the time was a very manual process as observers needed bookers and detail and contours/fathom lines were plotted by hand. Great change indeed. DSA Secretary Tony Keeley also writes about amazing change when he describes his two years in the Antarctic as a young man, a place at the time so remote that it is now difficult to imagine. 35 years later he returned in some luxury as a tourist— who would have thought it possible?

*Alan Gordon*

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# DEFENCE SURVEYORS' ASSOCIATION

*Formerly the Field Survey Association*

DSA is a registered charity which maintains liaison between officers, warrant officers and senior non-commissioned officers, both serving and retired, and civilians who are working or who have worked in the Defence domain where the focus is environmental information, hydrographic, oceanographic and geographic surveys, locating and target acquisition, navigation, and geospatial intelligence.

The Association provides a variety of services to its members which include:

- A copy of each edition of Ranger magazine, published two times a year.
- Visits to a wide range of technical, military and historical sites, often not available to the general public.
- Opportunities to attend technical and historical seminars.
- Opportunities to attend events organised by other professional organisations working in related fields.
- Opportunities to network with senior personnel in the Defence environmental and geospatial sector.

If you would like to join the Association please complete the application form at the back of this edition or visit the Association's website ([www.defencesurveyors.org.uk](http://www.defencesurveyors.org.uk)) where you can complete an application on line.

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HRH Prince Harry receives a brief on the RN's Hydrographic and Meteorological capability from Lieutenant Neil Prentiss, while being shown around *HMS Enterprise* by Captain Bob Stewart, Captain HM and Hydrographer of the Navy.

# MOD Joint Geospatial Information (GEOINF) Branch

By Captain Jamie McMichael-Phillips RN

In late 2007 the MOD Head Office Streamlining programme was implemented. This required the Defence Intelligence Staff (DIS) to review its key outputs in order to reshape to provide a reduced staff capable of maintaining core intelligence outputs from the MOD Main Building. Other Defence Intelligence functions were required to be identified for rustication to non central London locations or ultimately cessation. The provision of Geospatial Intelligence and supporting Geospatial Information was identified as an area for review.

To meet wider Defence output requirements, GEOINF elements of Intelligence Collection Strategy and Plans (ICSP) have been re-brigaded as a separate Joint GEOINF Branch, which stood up in September 2008. This remains under the command and control of Head ICSP. Constraints of space in the MOD Headquarters mean that this organisation will relocate, in the first instance, to Feltham. GEOINT elements of DI ICSP will be included in the new All Source Intelligence Branch located in Main Building. The new Joint GEOINF organisational diagram is at figure 1.

Key to the re-structured team will be its ability to continue the delivery of Joint Meteorology Capability (JMC) in the near term and to transition the Environmental Fusion Capability (EFC) from 'concept' to 'in-service' phase across all Defence Lines of Development in the medium to long term.

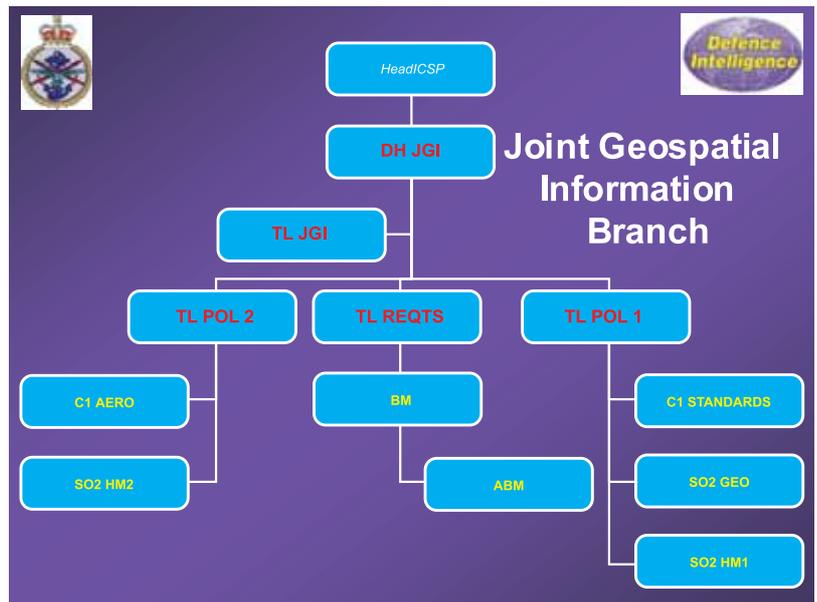


Figure 1.

Guidance and management will be maintained through ICSP and the extant effective governance structure of which the meetings of the Defence Geospatial Intelligence Management Board (DGMB) will continue to provide the core direction. The new structure will facilitate better integration of

GEOINT into an all source construct which offers the potential for better exploitation of information to meet Defence Intelligence outputs. The JGI Branch structure will continue to ensure the vital flow of information that Defence requires to enable Maritime, Land and Air systems to navigate effectively, and for their weapons systems to be brought to bear effectively, and with sufficient accuracy, onto targets. The key outputs from JGI Branch are summarised in figure 2.

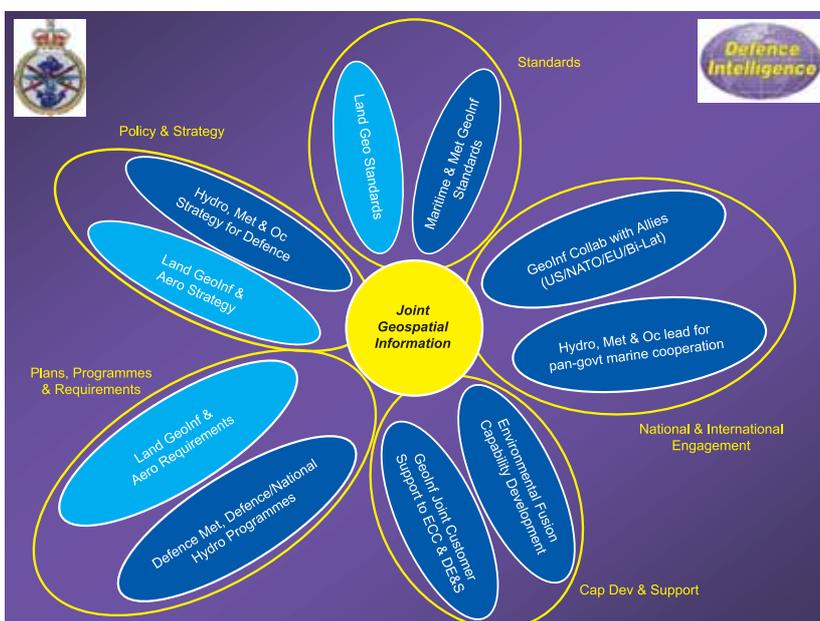


Figure 2.



# Joint Aeronautical and Geospatial Organisation – Where Next?

By Colonel John Kedar, Commander JAGO

## Introduction

*The Joint Aeronautical and Geospatial Organisation (JAGO), which in itself is a misnomer given that aeronautical information is an element of geospatial information (GEOINF), has now had three years in existence and is proving successful in a number of ways and has provided me with responsibilities far broader than ever.*

*The importance of the Geospatial community to Defence will not be underestimated by readers of this Journal, nor is it lost on Air Commodore Jon Rigby, Commander Intelligence Collection Group (ICG). More and more systems are introduced into service that need data and support; not only does that impact on Defence Geographic Centre (DGC) and 1 AIDU but on RE(Geo) personnel who have to deal with issues at the front line. My personal long term view is deliberately JAGO centric, and perhaps looks out 10 years to the achievable rather than the visionary, but is a view not a plan – readers will be well aware that MOD will be under significant resource pressure over coming years.*

## Long Term JAGO Development – The Personal View from Commander JAGO

**Engineer geographic support (GEO)** will remain a deployable Defence capability that directs, collects, manages, exploits and disseminates GEOINF and GEOINT to Force Elements across the full spectrum of operations. It is a combination of command support, military engineering (the ground) and ISTAR. The capability is a key enabler to understanding the increasingly complex environment in which the Armed Forces operate and to better exploit multi-intelligence and spatial information. Constituent parts of GEO delivery will remain HQ JAGO, delegated functional lead of the capability by Engineer-in-Chief (Army), 42 Engineer Regiment (Geographic) which is part of JAGO and the main Defence RE(Geo) force element, and organic RE(Geo) staff and capabilities embedded in formation HQs, units and other organisations. 42 Engr Regt (Geo) will continue to augment integrated geo staff and provide additional capabilities from unit to Theatre level, team to squadron in size. JAGO (less 1 AIDU) will move to WYTON in 2013 and be the functional centre for ICG deployed GEO and GEOINT teams. Our key linkage with DGC will remain the mainstay of JAGO operations and the delivery of geospatial support to operations.

*Basic Living Accommodation in Forward Operating Bases*





*Multi-national Geo Operations AFG*

As Defence moves towards better **networked capabilities**, greater numbers of Defence users, from the occasional to the expert, will have access to geospatial services, information and tools in both deployed and rear-based environments. At some stage the Defence Command, Control, Communication and Information System (C3IS) architecture will include deployed GEOINF servers, applications and output devices helping enable GEO capability but for the period prior to this the capability will largely remain standalone in procurement but linked to deployed Command and Control (C2) LANs. Aeronautical Information (AI) delivery will increasingly become web-enabled and already our first steps are delivering products electronically to customers worldwide.

The next 5 to 10 years will see a fundamental **shift in the entire AI industry** from services to AI management. This will become the key 1 AIDU activity although production will continue.

**Geospatial Information Management (GIM)** for the deployed force will be a significant GEO responsibility, under a Force Geospatial Information Officer (GIO), in order to provide a coherent in-theatre geospatial framework and Recognised Environmental Picture (REP) coordinated with UK and allies. This REP will also include all-source rectified imagery layers and will increasingly be delivered through a Service-Oriented Architecture (SOA).

Systems level GEOINF **data management** and information services will be delivered in the field for warfighter networks and applications and for GEOINT exploitation. 42 Engr Regt (Geo) teams will manage GEOINT layers in deployed C2 systems using geo-servers linked to Defence deployed LANs, thus providing GEOINF, GEOINT, products and services to users and applications on the LAN. This will include Army tactical level systems under COMBAT.

RE(Geo) personnel will remain the key **GEO staff focus** in all formation, SF and Joint/International HQs. In a similar model AI specialists will be located with all major AIR and JOINT AI users. This model provides command and user advice, coordinates scarce formation geospatial support assets, and determines reachout requirements including those to 1 AIDU, DGC and wider ICG. HQ JAGO AI and GEO functional leadership will become increasingly demanding as new Defence capabilities are delivered, Defence reliance on GEOINF increases and more integral RE(Geo) and AI posts are established across Defence.

**In Theatre GEOINF collection** will include precision survey, cultural collection, and georeferenced hand-held imagery, and largely be undertaken for DGC, 1 AIDU, the engineer information database and for platforms, weapon systems and units. A two-way flow of GEOINF between ICG and deployed forces will be facilitated by JAGO. Deployed GEO teams will have connectivity and direct access to a full range of GEOINF, including imagery, and GEOINT databases across national and international domains, deployed and baseplant. Collection platforms will enable LIDAR and other GEOINF collection against specific Theatre-generated requirements, particularly to provide



*One man Geo Cell in Helmand*

situational understanding in complex terrain. International collaboration will enable effective AI burden-sharing, information sharing and in-theatre deployed capability coherence.

GEOINF production, management and exploitation will be continuously driven to higher standards with **increasing accountability** and legal responsibility for output both within AI production and in the field - I will be responsible for meeting appropriate AI standards, including ADQ-IR. AI will be collected and exploited once, with outputs including web-services being generated from a single database. Combined with legislation this will lead to a step-change in AI capability during the 2012/17 period. Similarly, AI data-ownership and copyright will lead to complex data-management challenges.

**Geospatial exploitation** will include visualisation, presentation, terrain analysis (including within IPB) and spatial analysis, utilising the increasing numbers of spatial data sets available in the deployed space, including human, social and cultural. RE(Geo) will provide high-end geospatial analysis using GIS for all components, across J1-J9 and in Theatre for Other Government Departments to assist the comprehensive approach and will include integration of intelligence to deliver true multi-int outcomes. High end spatial/temporal analysis, using the power of leading-edge GIS technology, will prove a key effects-multiplier and will be supported by timely rear-based model development in JAGO to refine the analytical process in association with Operational Analysis, RSMS and other subject matter expert (SME) communities. Multi-spectral and other remote sensing sources will be incorporated into this exploitation and there will be greater focus on complex terrain such as urban environments resulting in more analysis of high resolution data and a closer relationship with engineer intelligence. Exploitation will increasingly encompass AIR and MARITIME environments in addition to LAND.

The **increasing requirement for Geo exploitation** will be met in part by users themselves with common GIS tools or other applications utilising the GEO maintained REP. However GIS training, staff time, complexity, quality and assurance constraints will leave GEO as the focus and SME for such activity in deployed space.

Deployed operations will require a capability that produces and outputs and delivers rapid-turnaround geo products, including in bulk and large-format AI products, for all scales of operation. Paper products will remain essential to warfighters. Dissemination of paper and digital information, allied to the management of GEOINF on systems, will be delivered by JAGO in partnership with

DGC using tried and tested Geospatial Information Officer (GIO) planning and procedures. A **deployable bulk reproduction** capability will remain an essential component of GEO capability, particularly for theatre entry and decisive operations at medium and large scale.

1 AIDU will become increasingly **data-centric**, allowing users fast access to data, products and services and building on the success of GOTHIC so far. DIGPAPs capability will remain a legacy requirement but organic AI Specialists will assist in AI requirements, management, and design of bespoke products. Legacy and paper requirements will remain, although the balance will shift with time. 1 AIDU will be the single UK Defence provider of AI, from wherever sourced.

**Web-services** will become increasing central to JAGO activity, both for AI and for improved situational understanding in the field. Service personnel are growing up with services such as Google Earth and Streetview; their resultant aspirations must be met.

### **Royal Engineer (Geographic) Short-Term Development**

**Current Operational Environment.** Much has changed in the last 12 months. We have seen an increase in activity, scope and numbers in Afghanistan reflecting the demand and increasing focus of the UK in this region. At the same time other operational theatres have been reducing. Junior soldiers are producing superb results in a very demanding environment, often in singleton posts and justifying the significant effort to transform the specialisation in terms of structure, equipment and training. The lessons learned in these operational environments are driving the changes that are described in this next section in a constant effort to keep pace with technology and the ability to support the commander in the best way possible.

**Doctrine.** Much of our doctrine is being reviewed due to the fast changing nature of the operational environment and from the high levels of experience that now exist within RE(Geo). For interoperability reasons, it is no longer acceptable that data extraction, management and exploitation is done in different ways in different places, although we must not bound analytical thinking, and so a series of technical techniques and procedures are being written. The majority of operational output remains 'map-product' focused, although some exciting analysis is taking place in addition to the more traditional terrain analysis. The capability can handle a range of work – it is clear that the geo soldiers can undertake a far greater proportion of the IAs work than vice versa.

**Establishments.** The traditional squadron structure, utilised about once every 2½ years on operations, will be restructured to enable greater delivery of small teams, whilst retaining larger capabilities that can be force packaged into geographic support groups. The Army's uplift to the Regiment in 2005 did not allow for the levels of support now given at battlegroup level, and thus a Regimental structure more agile in nature will enable risk to be managed.

**People.** Our people need to be high quality, questioning and self-motivated. They need to understand the contemporary operating environment (tactical and operational) and be technically astute. No longer is it a choice between being a 'technical' or 'military' soldier, our people must be both and must accept that Continuing Professional Development (CPD) is part of a career. RE(Geo) Officers should expect operational tours and postings in non-Geo roles which bring complimentary Intelligence, ISTAR or Command Support experience. This will also, in part, allow greater diversity during a career; we still have significant numbers of officers wanting to join the RE(Geo) roster. Soldier numbers are growing steadily, with current inflow above outflow (not helped by the large numbers of RE(Geo) soldiers passing the Regular Commissions Board). After a period of under recruiting and on current trends it is expected to reach full manning in 2013.

**Capability Development.** As ever development of our capability is competing for resources in a very tight fiscal climate. Whilst not easy, significant progress has been made but there is much work to do to bring in the next generation of equipments to replace our current fleet that is suffering from the effects of operating in the particularly harsh environments of Iraq and Afghanistan. The two programmes below have been the major focus for the last year but thoughts are turning to the rest of our capability including deployable production and data collection.

**Data Management.** DATAMAN is a deployable geoserver that has been developed and built by JAGO over the past several years. Whilst its initial purpose was to satisfy the needs of geo teams in theatre, DATAMAN can disseminate geospatial information, imagery, and products as web services either to consumers or indeed directly to web enabled applications. DATAMAN has been disseminating geospatial data for several years at the Coalition Warrior Interoperability Demonstration (CWID) and it is now supporting development activities at the Command and Control Battle Lab (C2BL), and the Future Carrier Maritime Integration & Support Centre (MISC). However, despite repeated attempts over the last few years,



*DATAMAN System in Helmand Province*

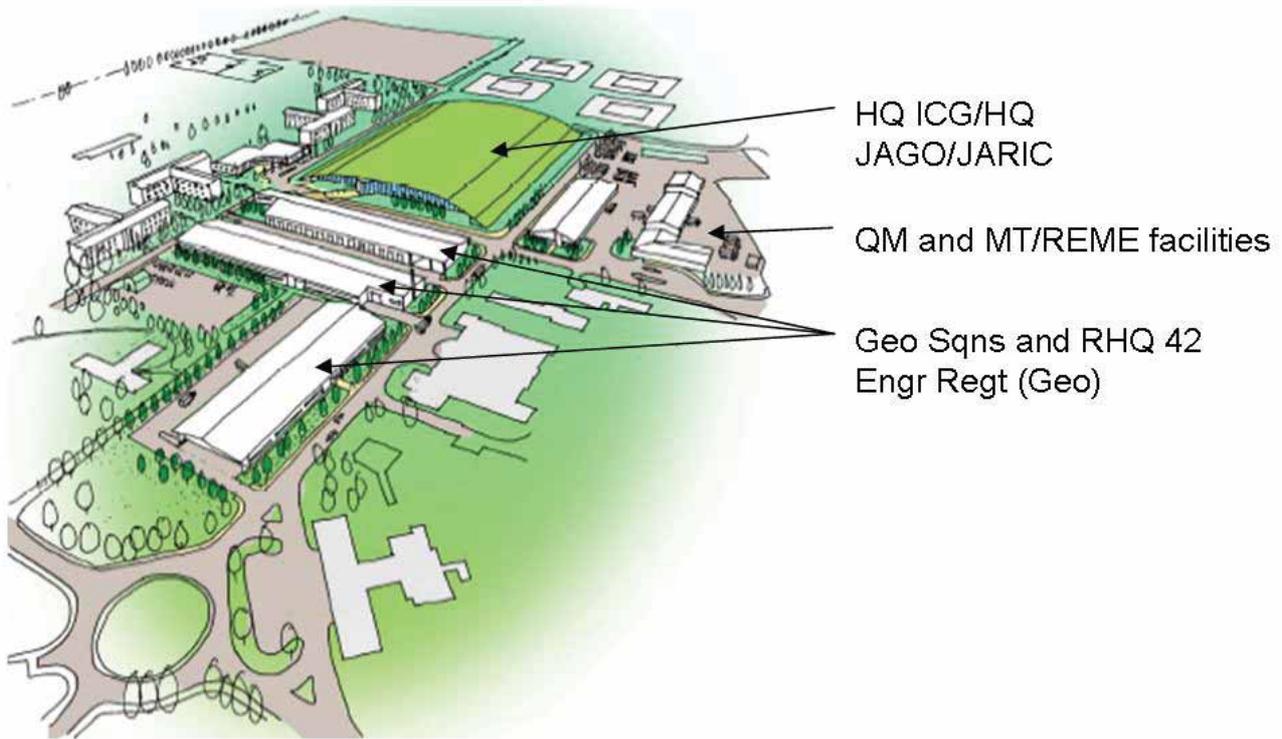
this capability still finds itself disconnected from command support networks in theatre. A number of initiatives are underway to capture the opportunity presented by an in service piece of equipment that has the capacity to cover this current gap in capability.

**Next Generation Equipment (GEOSYS).** The Geospatial Intelligence System (GEOSYS) is JAGO's programme replacing the majority of its deployable digital exploitation systems. Whilst suffering from a one year delay, it is bitter sweet. JAGO will have to keep its aging and rapidly deteriorating systems going for a little longer, but it will ease the pressure on the IPT and contractor to deliver a better solution for GEOSYS.

**Development of Geospatial Intelligence Msc Course.** A study is being undertaken of the Army Survey Course (ASC) run at the Royal School of Military Survey (RSMS), along with the advanced education and training sponsored by JARIC, and the Defence Geographic Centre (DGC), to explore how a Geospatial Intelligence (GEOINT) MSc might be introduced. The objective of the course is to prepare staff from all three Services and the Civil Service for a career in the provision of GEOINT so that they can provide GEOINT advice, analysis and support in its related disciplines of Imagery Analysis, Geospatial Analysis and Geospatial Information. The course will retain a study path to meet the advanced education requirements for RE officers entering the RE Geo Specialisation and will continue to offer geospatial studies leading to the MSc suitable for foreign officers who would have attended the ASC.

Development of the GEOINT MSc has been based on expansion of the current ASC, which is already accredited as a MSc by Cranfield University. The new course will be introduced from Sep 09, managed by RSMS, a part of the Defence Intelligence and Security Centre (DISC). Students will be able to complete individual modules, a Postgraduate Certificate (Pg Cert), a Postgraduate Diploma (Pg Dip) and the MSc. Modules will be run by RSMS at Hermitage and by Cranfield University at the Shrivenham and Cranfield sites. Modules will be mixture of full time and part time learning.

**Accreditation of Continuous Professional Development for ME Geo Techs.** JAGO is negotiating a contract with Sheffield Hallam University (SHU) to enable Class 1 ME Geo Techs (who either have an FDS or an HND) to undertake a study programme which will provide a means for them to develop their analytical skills and also achieve a Bachelors Honours Degree over a study period of up to 6 years. The majority of this study programme will be run by SHU through distance learning



*JAGO accommodation at Wyton.*

using modules which either already exist within other SHU degree programmes or which are being developed by SHU to meet specific Defence needs under a contract let by JAGO. This course will be offered from September '09 with all costs being borne by JAGO. The Geo Chain of Command has been asked to trawl its Class 1 ME Geo Techs to gain an understanding of the likely take up rate for this study programme. Initial responses are showing a high level of interest.

**Programme to Rationalise and Integrate the DIS Estate (PRIDE).** PRIDE is split into two elements with PRIDE (Wyton) encompassing the relocation of HQ JAGO, 42 Engr Regt (Geo), (including 14 Geo Sqn from Germany), HQ ICG and JARIC to RAF Wyton and PRIDE (DISC) which includes the relocation of RSMS and other elements of DISC.

After years of rumour and uncertainty regarding the future location of HQ JAGO, 42 Engr Regt (Geo) and RSMS as well as the future of the Hermitage site a major milestone was achieved in April when the PRIDE (Wyton) element of the programme achieved Main Gate approval. In a written statement to Parliament the Armed Forces Minister confirmed that PRIDE (Wyton) is considered to be affordable and value for money and that the funding was available for the programme to proceed. In the same announcement it was also confirmed that SKANSKA plc had been awarded the contract to build the new facility.

Preparation of the Wyton site has already begun with demolition of old unused buildings in full flow. The site plan has been agreed (see illustration) and HQ JAGO will be co-located with HQ Intelligence Collection Group while the Regimental Headquarters and each of the Squadrons will be housed in their own purpose built accommodation. The support facilities within the Regiment will also be a state of the art facility. Undoubtedly the main benefits for the move lie in the improved technical accommodation the programme will provide. Each Squadron area will include environmentally controlled garaging areas for the vehicle fleet with each troop having vehicle bays and a balance of technical and administrative office and storage areas. Another major advance will be the networking infrastructure installed in the building allowing for both a technical and administrative network to be in operation; the technical network will enable the networking in barracks of deployable systems leading to a much improved day to day training facility for soldiers. The current plan in the PRIDE (Wyton) programme is that HQ JAGO and 42 Engr Regt (Geo) will move from Hermitage and Mönchengladbach to Wyton in August 2013.

The PRIDE (DISC) project is not at the same stage as PRIDE (Wyton) with Main Gate approval not expected until October 2010. Only after the PRIDE (DISC) Main Gate approval has been achieved and it is confirmed that RSMS will be moving from Denison Barracks will the future of the Hermitage site be decided.

## **NOI AIDU Short Term Development.**

The AIDU is something of a misnomer in that, due to its name, the unit has long been associated with producing paper Charts and Flight Information Publications (FLIPs) – and little else. Visitors to the unit are often surprised to see that – although Charts and FLIPs are still a large part of what goes on at the unit – output of digital AI is where much of the effort is concentrated.

Dedicating so much effort to the digital product is a natural progression as the technological age catches up with the military. Modern Cockpits are pretty much paper free environments and where we once had Navigation Charts and indeed Navigators, we now have moving Maps and Flight Management Systems. All AI needs to be digitised to be fed into this equipment and this process follows the 28 day Aeronautical Information Regulation and Control (AIRAC) cycle the same way that all outputs form the AIDU must.

In terms of what has changed over the last 6 months – the biggest innovation for the AIDU is launching MilFLIP. The Military Flight Information Publication website now has all of the paper products – with the exception of the charts – available for download on the World Wide Web. This has come about for a couple of reasons. Firstly, the AIDU acknowledges the fact that many crews want instant access to the latest AI without having to carry around kilos of books and charts. MilFLIP enables this and is particularly useful when crews are down-route away from the base. Secondly, we see this as an opportunity for those who want to reduce the handling of the numerous AIDU products to do so. We do not see us ever going absolutely paper free, but we can certainly cut down in the transit of the paper product.

Our progress towards a single AI database from which products are generated, is slow but industry leading. The key now is to ensure that we deliver digital data created to demanding ADQ-IR quality standards, maximising safety in a digital world, and to common exchange standards to maximise burden-sharing with our allies.

### **Conclusion**

*The short term developments are all along the path towards my long term view for JAGO and wider RE(Geo) (the two cannot be separated and my role as 'head of arm for RE(Geo) on behalf of EinC(A) strengthens this). There is much that can pull the rug from under our feet, not that there is much rug to pull – and I am naturally envious of the additional resource being ploughed into the geospatial communities in the likes of Germany and the US Army Corps of Engineers. We will never have all the technical solutions of the US, but do have great people capable of delivering ideas that are leading in their nature. Two of our recent bottom-up developments, that of web enabled aeronautical information (AI) provision and deployable GEO data servers and services, are so obviously right and would start to solve many of Defence's geospatial information problems if embraced by Defence. But this requires a Defence lead – more so in the operations and command support arenas than Defence Intelligence. Geospatial Information Management (GIM) is key to Defence success, and we must deliver this, but likewise direction, collection, exploitation and dissemination are as vital now as ever.*

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# AGM and Visit to Military Museum, Aldershot

**Saturday 11th JULY 2009**

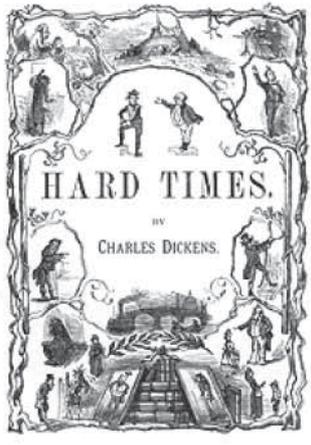
This year our Annual General Meeting and Award Ceremony is to be held at the Military Museum, Evelyn Woods Road, Queens Avenue, Aldershot GU11 2LG.

The AGM will take place in the Boyce Building commencing at 12 noon with coffee and biscuits being available from 11:30. The AGM is to be followed by the presentation of the DSA Annual Awards, before taking a sandwich/crudité lunch at about 1 p.m. After lunch there is a short presentation by the curator of the museum before allowing everyone to walk round and absorb the exhibits and video displays. The total cost of the day at the Military Museum, including lunch is £11 pp.

The Military Museum may not be as grand as many of the museums DSA has visited in the past, being housed in the only surviving barrack hut bungalows that were built in North Camp during the early 1900's. However, the small museum will bring back many memories to those who joined the services in more spartan days!

If you would like to attend please contact Mike Stanbridge on 07966 824943 or

email [mike.stanbridge@btinternet.com](mailto:mike.stanbridge@btinternet.com).



## HARD TIMES: Sowing, Reaping & Garnering

*By Bill Hodson, Managing Director, Envitia*

### **Mr Gradgrind, Where Are You Now?**

Charles Dickens would have understood the credit crunch. Like the rest of us, he would have to learn a whole new vocabulary (fiscal stimulus, quantitative easing, collateralised debt obligation, Robert Peston) but he captured the essentials in 1854. Too many people have lent too much money for too long to other people who have too little ability to pay it back and now we all have to pick up the bill.

Dickens built his classic moral fable around three books: sowing, reaping and garnering. We have certainly sowed the seeds of the current economic environment over the past fifteen years. Without any doubt, we will be reaping the results for years to come and the military geospatial community is far from immune to their consequences. The question is what the nature of those consequences will be and whether we can garner anything from them beyond black humour (Q: What is the capital of Iceland? A: About £3.50).

### **Another Difficult Day in Coketown**

The world economy has experienced unprecedented growth since the recession of the early 1990s. Alongside the USA, Japan and Western Europe, we have seen the emergence of China, India and the former Soviet Union as major economies. That growth has provided the backdrop – and the financial stimulus – for the growth of the geospatial industry. Estimates inevitably vary widely but indicate that the market may well have increased by an order of magnitude between 1995 and 2005. Whatever the precise numbers, it is clear that the technology produced by the geospatial industry has developed enormously during the good times. The pace of this development is bound to be



See the world as it really is

### **Geospatial technologies for Defence and Security**

Tenet Technology, leading supplier of Geospatial solutions, is changing to Envitia, a name that embodies our company ethos. Envitia realise that accurate, up-to-the-minute spatial information is fundamental to operational effectiveness and mission critical decisions. We are innovating the way in geospatial information, developing solutions and bespoke applications for a constantly changing landscape to help global Defence and Security sectors see the world as it really is.

hampered, if not actually brought to a standstill, by the credit crunch. The industry could possibly seek Governmental fiscal stimulus to avoid this outcome, but is likely to be some way down a very long queue of bankers, car manufacturers, retailers and other sectors all employing many more voters than the geospatial community.

At the same time, the economic crisis will put severe strain on the UK public purse. In the short term, reduced tax revenues will mean that continuing even with current levels of expenditure will require a major increase in borrowing. In the longer term, this debt will have to be repaid through increased taxation and/or reductions in spending. These realities are hardly going to reduce the pressure that the Ministry of Defence (MoD) budget has been under in recent years. Ongoing operational commitments combined with planned major equipment programmes for all three services implied a total expenditure that the Treasury could not fund before the economic storm broke. The developments of the last six months have only made things more difficult. We have already seen much re-profiling, deferment or outright cancellation of significant projects.

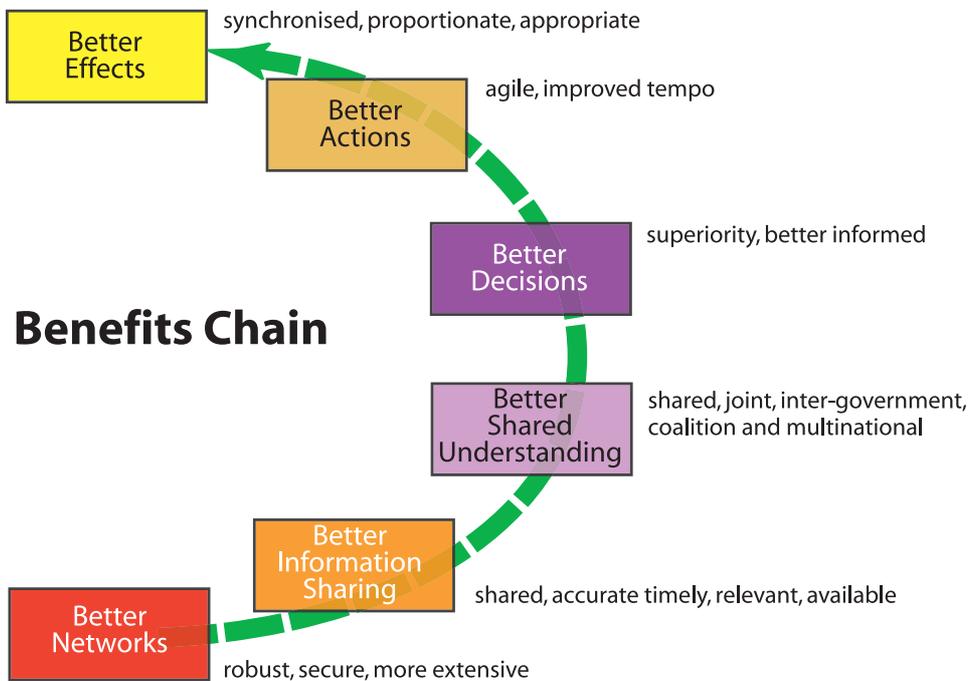
### **“Now, What I Want is Facts...”**

It is often observed that, when the financial pressure is on, the MoD procurement system is biased towards acquisition of platforms and hardware. The argument runs that the perceived value of a new AFV, frigate or missile is much more tangible than that of, say, a command and control system and that funding decisions inevitably follow these perceptions. Oscar Wilde’s definition of a cynic is frequently invoked. This argument may or may not be accurate, but it is definitely true that comparing the value of a £50M investment in a C4ISTAR system against an equivalent investment in platform hardware is not an easy, or even feasible, task.

Joint Services Publication 777 attempts to examine this value question in terms of a benefits chain for Network-Enabled Capability (NEC). This chain builds from an investment in better networks through to the production of better effects in the context of whatever mission is in hand.

The value of the investment in the technology enabling the effects is measured by the improvement in those effects set against the cost. This is notoriously difficult to assess, needing, as it does, evaluation of scenarios where a host of other factors beyond the technology come into play. However, only by keeping track of a complex chain of cause and effect can a true value assessment ever be reached.





Very large sums of money have been spent, and continue to be spent, on programmes such as the Defence Information Infrastructure which have made a massive difference to available connectivity. With those improvements in place, the next challenge is to move along and up the benefits chain to demonstrate value. We literally need to think outside of the box, specifically the box labelled “Better Networks”.

### “Tis a Muddle”

In straitened financial circumstances, any enterprise will seek to make the best possible use of existing assets. It is clearly the case that the UK public sector holds geospatial information assets that are not working as hard as they might. The MoD, in particular, has recognised that it has challenges in this area.

For example, the newly-published UK Location Strategy states that more than eighty percent of information held by the public sector has a location element. It also states that users of this vast quantity of information spend eighty percent of their time collecting and managing the information and only twenty percent of their time exploiting it. On a similar theme, MoD speakers at recent industry events have stated that only 3% of the ISTAR information collected during Operation HERRICK has actually ever been viewed by at least one pair of eyes and that, during the same Operation, more than 90% of requests for intelligence gathering could have been satisfied from information that had already been obtained. There is clearly significant business benefit in better sharing of geospatial information.

Moving beyond the “Better Networks” box in the benefits chain requires that all of the mechanisms needed for information sharing are put into place. As noted, a mountain of legacy information in a myriad of incompatible sources must be reconciled and harmonised to allow such sharing. Unlocking the business value of the investments made in the better networks relies upon it. Better information sharing does not require large expenditure on new systems. It does require more intelligent and sophisticated use of the systems that are already in place. The military geospatial community has already made strides in this direction. Open standards and Service Oriented Architectures have become central to our view of the future. More innovation and associated challenges will follow. None of them need imply large price tags. We can gain much from modest spending on better use of what we already have. The lack of money to spend on large new systems implied by the credit crunch could, perversely, be just the motivation that we need.

### The Moral of the Story

Dickens concluded *Hard Times* by assessing what each of the characters had garnered from the moral journey that he had put each of them through. The credit crunch will undoubtedly be a moral journey, and a character-building moral journey at that. Like the Ferrari-driving banker who suddenly started taking a packed lunch to work, we should use hard times as a stimulus to look at the world differently.



## ARMY BENEVOLENT FUND

The Army Benevolent Fund for Berkshire runs a programme of fundraising events each year. Forthcoming events include:

- **Evening of 3<sup>rd</sup> July 2009 - Reception & Concert (Band of the Royal Engineers)**  
at the Joint Aeronautical & Geospatial Organisation, Denison Barracks, Hermitage  
Reception & Concert - £20
- **Morning and Lunch - 14<sup>th</sup> July 2009 - Visit to Farnborough Air Science Trust (FAST)**  
"FAST" is a charitable trust set up to preserve the Aeronautical Heritage of Farnborough. The visit includes a short talk, partly guided, and finger buffet lunch.  
Numbers limited to 40 - Cost £15
- **Evening of 5<sup>th</sup> September 2009 - Concert – London Welsh Male Voice Choir**  
The Berkshire ABF is delighted to welcome you and your friends to a concert to be given at Eton College by the internationally famous London Welsh Male Choir under the musical direction of Dr Haydn James.  
Ticket Price - £22.50 (Confirmed Bookings made by 1<sup>st</sup> July - £20)  
(Price includes a brochure normally sold at £4)
- **Morning and Lunch - 29<sup>th</sup> November 2009 - Talk to be given by Ann Widdecombe**  
at School of Electronic & Aeronautical Engineering, Hazebrouck Barracks, Arborfield.  
Talk only (Incl coffee on arrival) - £10  
Talk, Reception & Curry Lunch - £25
- **Morning and Lunch - 24<sup>th</sup> January 2010 - Talk to be given by Lieutenant General Louis Lillywhite, Surgeon General, on Medical Support to the British Army of the 21<sup>st</sup> Century.**  
at School of Electronic & Aeronautical Engineering, Hazebrouck Barracks, Arborfield.  
Talk only (Incl coffee on arrival) - £10  
Talk, Reception & Lunch - £25

If you would like to receive information about any of these events or others run by the Army Benevolent Fund please contact us and we will add you to our supporters list.

**Major Alan Gower MBE**  
**5 Hornbeam Close, South Wonston**  
**Winchester, SO21 3EA**

**Tel: 01962-880859**  
**E-mail: [gower7559@talktalk.net](mailto:gower7559@talktalk.net)**



## The View From Across The Pond

*By Colonel Jim Mitchell, Defence Intelligence Liaison Staff  
(North America)*

Professionals in this business of ours have long known that we play in a rather complicated team sport. The world is a big place and there's a lot to know about it. There's also rather a lot to know about the business. Just collecting, sorting and storing the basic facts is challenging enough. Processing, analysing, exploiting, understanding and sharing the various by-products with governments, and intelligence and defence organizations is spectacularly difficult. This, then, is not a game for individuals. Regardless of nation, or professional sub-discipline, help is needed. This we know, too. The US and, in particular, the US National Geospatial-Intelligence Agency (NGA) gets this point. For the Brits assigned to NGA, watching the US confront these multiple challenges with its Allies – the UK included - is a fascinating and rewarding professional privilege. That may sound corny, but it happens to be true.

NGA is an organisation of some 16,000 US government and contracted staff operating out of 6 major production centres in the US and more than 150 locations worldwide. About 25% of the workforce is either deployed on operations or serves in intimate support of its customers. It has a rather large, devolved, budget that gives senior managers within NGA a coveted business agility and flexibility. It is one of the 16 US Intelligence Community members and, within that grouping, one of the so-called "Big Five" alongside CIA, NSA, NRO, DIA and the FBI. NGA has evolved from the National Imagery and Mapping Agency (NIMA) and its many contributing forbearers, including the Defense Mapping Agency (DMA), the CIA's National Photographic Interpretation Center (NPIC) and the DoD's Central Imagery Office (CIO), into an all encompassing geospatial intelligence agency of astonishing breadth, depth and power. This evolution has been neither easy nor quick and is a continuing process. However, years of perseverance have wrought propitious changes in organisational structure, culture, tradecraft, career structures and technology. The catalyst, common theme and driver behind the evolution has been the idea of geospatial intelligence (GEOINT) as a discrete community discipline and, if you like, brand name; with that, everything else has followed and, broadly, fallen into place. For the doctrinal wonks that like such things, the US has a definition of GEOINT enshrined in law:

*"The term "geospatial intelligence" means the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, imagery intelligence and geospatial information."*



*Erskine Hall, NGA's current HQ at Bethesda, Maryland.*



Director NGA, Vice Admiral Bob Murrett USN.

Suffice to say; despite the authority attached to the definition, debates have continued to flare up within the US and elsewhere about the content, quality and meaning of the words. My own view is that the words don't matter too much – it's the idea that's important. It's a Star Wars, "Feel the Force", thing. You either get it, or you don't. Lt Col Rupert Dash got it right in the Summer 2007 edition of *The Ranger*. He wrote: *"If we need to call what we should be doing now GEOINT, in order to shake off the Cold War Contingency Planning hangover and to orientate a new generation of technicians, analysts, planners and commanders then it is surely a worthy cause. In the broadest historic context, and as represented by the comprehensive and continually evolving operational support provided today, we are just getting back to basics, reconnecting with the operational end user and putting his needs before all others."* Well, that sounds OK to me.

To execute GEOINT the US has formulated a broad construct called the National System for Geospatial Intelligence – the NSG. In US words, the NSG is the combination of technology, policies, capabilities, doctrine, activities, people, data and communities necessary to produce GEOINT in an integrated multi-intelligence, multi-domain environment. That sounds complicated because it is. But the NSG Vision, quoted here, seems to accord directly with Rupert Dash's sentiments:

*"An integrated, collaborative community of GEOINT professionals embedded with our operational and national partners to meet their warfighting needs."*

The NSG comprises of members drawn from the US Intelligence Community, the Joint Staff, the US Services, and the Combatant Commands and partners including the UK, Canada, Australia and, most recently, New Zealand. Managing the 50 or so members, most of whom pack some considerable muscle – think CIA, US Army, US Marine Corps, for example – is a handful. These are all organisations actively engaged in GEOINT themselves, to an incredible scale and sophistication.

The NSG is led by the Director NGA, Vice Admiral Bob Murrett USN. He is the Functional Manager for GEOINT, empowered through a Presidential Executive Order (there are Functional Managers for SIGINT and HUMINT, too). That's some empowerment. In turn, he delegates authority to subordinate Functional Managers for specific activities such as Analysis and Production, Source Operations and Management, IT, R&D, and Workforce Development. The Functional Managers exercise these considerable responsibilities through an NSG governance mechanism of forums and meetings. At the senior-most level is the NSG Senior Management Council, a 3\*- and 4\*-level council chaired by the Director NGA, at which the UK has a seat occupied by ACDS (Intelligence Capability), now Major General Jerry Thomas RM. This is advanced democracy at work. At each level, with 50 or so members of the NSG pitching in, some more vocally than others, the Functional Managers can face a challenge. However, backed by a clear vision and intent, unshakeable support at the most senior levels, defined authorities, common purpose, and some clear operational imperatives, this is a process that is maturing fast. So whilst aligning, optimising and documenting



Predator and U2 – data collectors.

the NSG's considerable collective resources may seem ambitious and daunting, the potential benefits are huge. 50 or so members delivering aligned, optimised output is a lot of GEOINT. Resistance is futile; feel the force; harness the power; add your own cliché. But believe.

The governance provides the framework to get stuff done against priorities and need. It establishes the rules of the game and it maintains momentum. So what's going on in practical terms? Well, rather a lot, actually. And it's all about integration. Of everything. Integration of the "INTs" – SIGINT, GEOINT and HUMINT; policies to allow information sharing internally within the US, and externally with selected foreign partners; collection systems - space based, airborne and terrestrial; ground architectures to process, exploit and disseminate – and store and archive; tradecraft, training and career development; and R&D. This is not just a move to boil everything down to some insipid lowest common denominator; instead, it's a genuine belief that the whole is greater than the sum of the parts. And there's still a place for stovepipes. Stovepipes are good since they stimulate excellence and consistency, but the stovepipes need to be permeable and overlapping to stimulate invention, efficiency and sharing.

Getting the policy right is key to unlocking many of the barriers to integration. In the years since 9/11 and such natural disasters as Hurricane Katrina, the policy landscape has changed slowly but dramatically, for example becoming less compartmented, to the huge benefit of the UK and other Commonwealth partners. The UK team in NGA has access to most of what goes on within NGA. We play an integral role in the daily Ops Battle Rhythm, and in the Director's Management Board and our IT connectivity improves almost daily. It is no longer a challenge to find out stuff; the challenge is keeping up with it all.

Whilst policy issues progress inexorably but slowly, the technology is moving at break-neck speed and continually accelerating according to Moore's Law. The Global War on Terrorism and operations in Iraq and Afghanistan have generated an insatiable demand for timely imagery and imagery-derived data of all flavours, some almost too rich to digest. Massive volumes of data collected by US national and commercial space-based systems, manned and unmanned aerial vehicles such as U2, GLOBAL HAWK, CONSTANT HAWK and PREDATOR, (all developed separately, within acquisition stovepipes), has to be ingested, analysed, tagged and stored. Not only is the persistence, currency and coverage of technical collection improving but so are the analytical tools and the understanding and exploitation of the various, related, exotic phenomenologies. The pursuit of counter-insurgency, counter-IED, counter-narcotics, counter-terrorism, counter-proliferation and counter-everything missions places huge demands upon technology and people – and it's a challenge that we are taking head-on. The stimulus of operations has created a virtuous circle linking NGA deployed analysts – imagery, geospatial, cartographic and research analysts (and principally civilian) – experiencing the pressures, requirements and innovations of combat operations at first hand; with technology initiatives; with refined reach-back support; with enhanced tradecraft; and broadened employability and adaptability. Director NGA is calling the impact of these largely younger returning deployers upon NGA's broader business, the 'quiet revolution' – and it's beginning to show.

The heavy metal of the ground architectures is also evolving. Reliable connectivity, massive bandwidth, gargantuan storage capacity, now measured in petabytes (10<sup>15</sup>), and common tools, standards and services, are all underpinning a move towards Service Oriented Architectures, enterprises of enterprises, and cloud computing. So, the front end is getting lighter and easier for

*An impression of the New Campus East.*





*State of construction at New Campus East in March 09.*

analysts and end users, and the back end is getting...well, a lot more complicated. As a top tip if you're in this business, it would be wise to have a few people around who know about this stuff. (Like most heavy metal fans they tend to wear black tee-shirts, look a bit grungy and speak in an incomprehensible language, but it's worth making the effort to make these people your friend, that is, if you want anything to work)

The US is doing it now, and the continental Europeans are catching up fast (very fast) through the current overhead collection alliance of France, Germany, and Italy, and through the future 6-nation European Multinational Space-based Imaging System (MUSIS) project.

Integrating and updating the estate and infrastructure is a further crucial element. NGA consolidates its footprint in the Washington metropolitan area onto a single campus, New Campus East (NCE), at Springfield, Virginia, beginning in 2011. This initiative is part of a larger US DoD programme, the Base Realignment and Closure (BRAC) programme. For NGA it means a new home on a single site and a removal of the punishing friction of moving between dispersed work sites. The project offers opportunities for rationalisation, integration, efficiency and new ways of working. The UK's own consolidation project within Defence Intelligence, centred upon RAF Wyton in Cambridgeshire, has similarly ambitious goals.

Keeping all of this stuff broadly synchronised, whilst moving at excessive speed, takes engineers, analysts, managers and leaders of real quality (and NGA's leaders are a class-act: focused, professionally expert, thoughtful and, er., humble). The NSG is collectively taking considerable effort in developing the human capital necessary to confront both the current challenges and those of the future. There has been a rationalisation of multiple job roles and trade groups into 8 generic GEOINT analytic streams, for example, imagery analyst, geospatial analyst, cartographic analyst and research analyst, as already mentioned. The aggressive recruitment of talent, academic outreach, the establishment of professional competencies, the certification of specialists in analytical, engineering and acquisition fields, and the cross-posting of individuals between organisations both internal and external, taken together all seem to be deepening and broadening the skill sets of US GEOINT professionals.

If you don't believe me about all these strands of activity, I'd recommend a quick look at the NGA web site at [www.nga.mil](http://www.nga.mil). A quick rummage there will reveal the NSG Statement of Strategic Intent. This glossy 5-pager describes the goals and objectives of the NSG, which I've broadly written around already. The key point is that NGA and the NSG are delivering against these goals and objectives. It's not easy and it requires vision, drive, determination and nerve to juggle so many balls. For the Brits here, watching it all happen around us is, to partially repeat my earlier words, an awe-inspiring privilege.

So what does it all mean for the UK? Well, just to stay current with the grand scale of events and activities across the NSG is a challenge by itself. To do something about it and to adapt and respond in kind is something else again. Work continues to evolve Quintripartite (Q) governance mechanisms to ensure alignment and relevance with the NSG and, in a newly-coined term, the Allied System for Geospatial Intelligence (ASG).

All in all, there's a lot going on across the pond. The UK team in NGA are constantly learning about GEOINT and thoroughly enjoying translating it for UK consumption. We do it; and it's fun. If any UK GEOINT professionals – service or civilian - get the opportunity for a posting here, don't hesitate. Not for a second.



*The author - Kabul 2002.*

## Reflections of a Military Surveyor on the Other Side of the Base Line

*By Tim Buckley, GIS Officer British Embassy Kabul*

### **Kabul, January 2002 - ISAF's First Deployment To Afghanistan**

Back then I was a relatively fresh faced Lance Corporal. I had recently left the RSMS after completing my Class 1 Terrain Analyst's course. The previous September I had listened and watched as the events in New York had unfolded and many in the West saw the reach of radical Islamic terrorism for the first

time. My role on the initial deployment to Afghanistan was fairly confined; I was to be responsible for the production and maintenance of the mines and Unexploded Ordnance (UXO) database and subsequent map products that were generated from it.

Fast forwarding 6 and a half years and I find myself back in Kabul, doing Geo work but this time for a different part of the UK Government, the Foreign and Commonwealth Office, and more specifically the British Embassy Kabul (BEK). During the intervening years between my two stints in Afghanistan I had left the Army and gone out to the civilian sector, working for Infoterra as their Defence and Security Business Development Manager. It was during my time with Infoterra that I was first exposed to a part of the work I would later be involved with in Afghanistan. The company had won a contract to fulfil the capability gap left when the RAF's Canberra PR9 aircraft was decommissioned. Under the terms of the contract Infoterra was to provide high resolution, multispectral aerial imagery around the country for the specific purpose of identifying areas of poppy cultivation and associated eradication.

### **Kabul, August 2008 - Survey Monitoring Targeting and Verification (SMTV) Afghanistan**

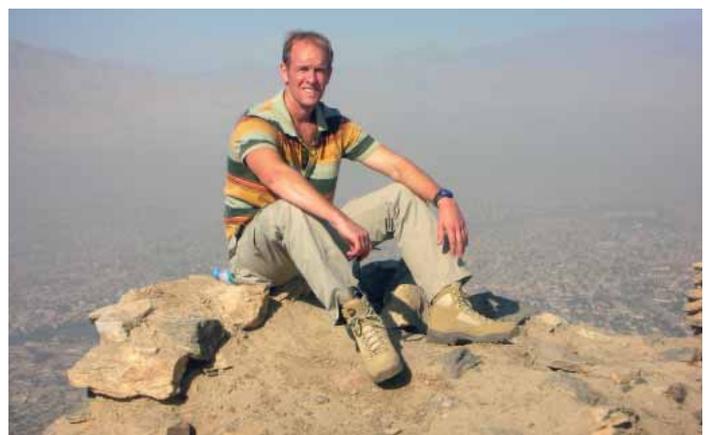
The change in career was something of a leap of faith, I knew one member of the team in country who I would be working with, another former Military Survey character, Simon "Paddy" Carroll, and had met the head of the company to whom I would be providing my geospatial expertise a couple of times. But at the same time I was about to throw away the security of being an employee, the pension, leave and other benefits and protections that come with it, for the promise of a formal contract "at some stage", living in a hostile environment without the physical security afforded by the military and the joys of local cooking but, as my boss at Infoterra said, "sometimes you just have to roll the dice". So roll I did and as I write this flying back to the UK for a 2-week break I firmly believe I hit double six.

#### **The Customer**

I am in Kabul to provide direct geospatial support to the Counter Narcotics Team at the BEK. Given the nature of the operations in Afghanistan and the size, extent and impact on the UK (90% of the UK's Heroin supply originated in Afghanistan), the CN team is one of the larger groups within the Embassy, it is headed by the equivalent of a 1 Star with seven other staff under him, reporting directly to the Ambassador and London. The UK was initially the lead nation on CN issues in Afghanistan however, due to capacity building efforts, this is now the responsibility of the Afghan Government and the UK along with the US is now classed as a "lead partner" to these efforts.

#### **The Problem**

Afghanistan has always had some form of opium industry providing for the indigenous needs. Opium has been used for centuries as



*Six years later and back again, the author - Kabul 2008.*

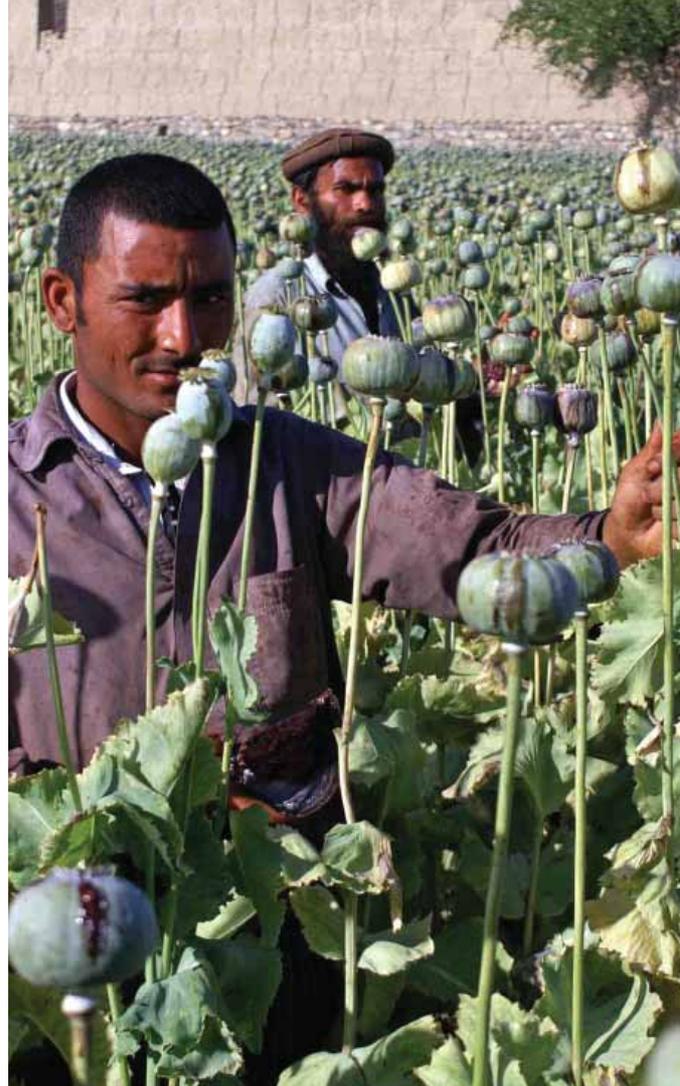
a local medicine for pain relief and to a far lesser extent as a recreational drug. It was not until the 1980s that the country really started to increase the cultivation of poppies to feed a growing export market. Over the years there was a small but sustained rise in production until the recent troubles when the uncertain and insecure environment made it an ideal crop for farmers.

In 2001, with the Taliban in power, a ban on opium production was introduced. Whilst the figures from the United Nations Office on Drugs and Crime (UNODC) show it had an impact on production, what it may also have done is dramatically raised the value of opium due to the continued demand, but lack of supply. Since then the graph for cultivation in Afghanistan has continued to rise steeply until 2007 when it topped out at over 190,000 hectares of land under opium poppy cultivation. There have been successes though, more and more provinces are now classed as poppy free, whilst the geographic extent of the problem is now currently confined to a few provinces concentrated in the south of the country, though some of the risks for a resurgence in cultivation remain.

### **Eradication – “Hit the greedy not the needy”**

The Afghan Government decreed in its National Drug Control Strategy that to combat the poppy problem forced eradication must take place. The purpose being to back up the message that growing poppy is illegal and introduce an element of risk to farmers; to try and influence their decision making process away from the poppy and towards legitimate crops. However, under the strategy, this eradication could only take place where there are opportunities for alternate livelihoods. This recognises that, yes, we need to eradicate, but it must be done in an intelligent way. To eradicate a very poor farmer who owns a limited amount of land, who cannot get his licit crop to market and generate cash from it, is not acceptable and is likely to have a negative future impact. This key tenet

*Eradication under way in a Helmand poppy field.*



*Poppy cultivation in Nangahar province.*

of the policy leads us to use a targeting methodology to provide some shape to where eradication can be carried out and that in turns leads to the need for the spatial analysis techniques we practice.

### **Tasks – Eradication Target Areas (TA)**

We use a 5-stage process to define our final target areas.

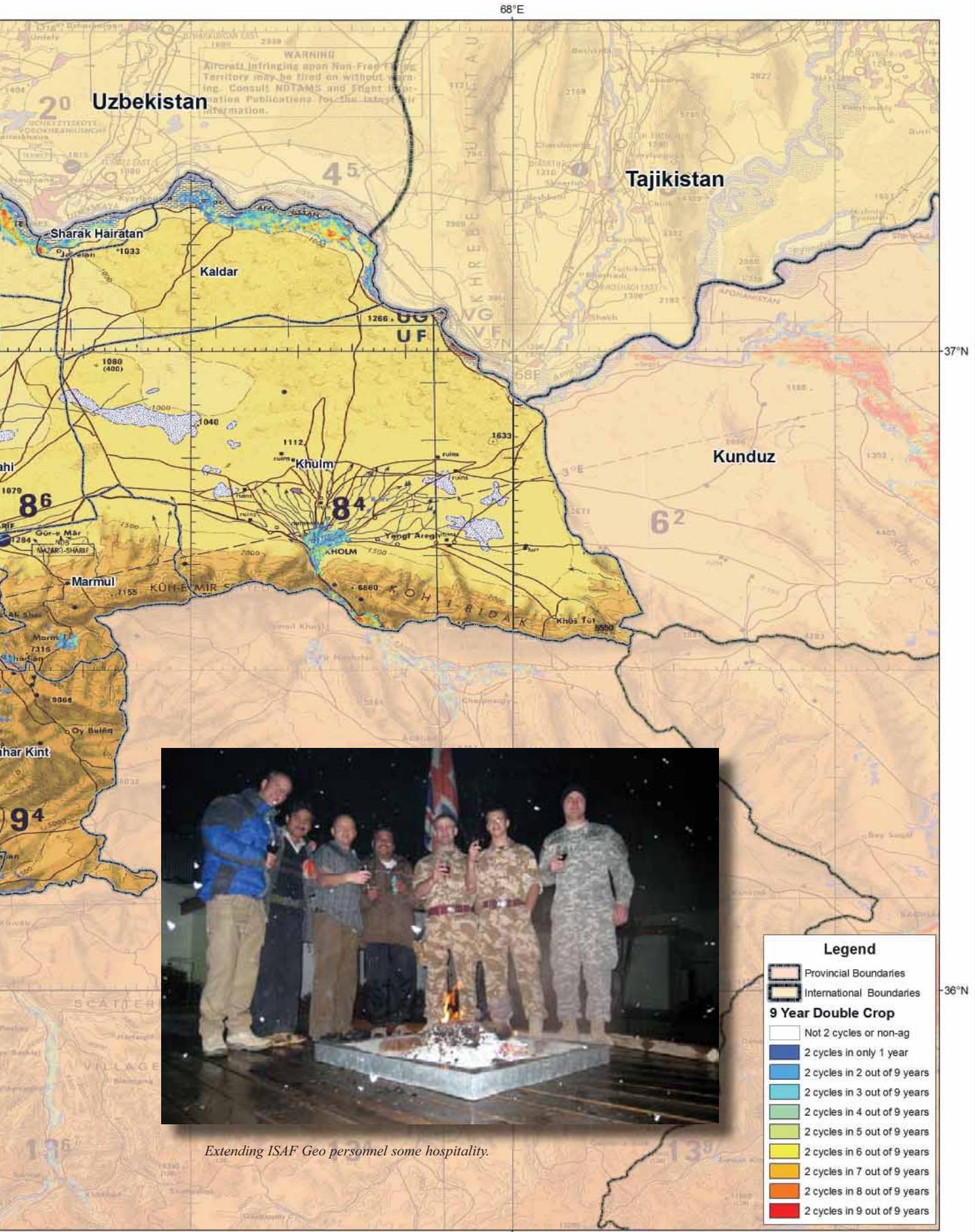
**1. Data Collection.** A lot of time between eradication seasons is devoted to acquiring the large amount of data needed to formulate the target areas. A broad range of national institutions, international donors and NGOs are visited and engaged with to provide updated information of value to the process.



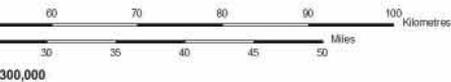
This map has been produced using Vector data supplied by AIMS, INGA and AGCHO.



Map showing agricultural reliability in Balkh Province.



Extending ISAF Geo persomel some hospitality.



Geographic Reference System  
Geographic  
World Geodetic System 84



Produced by Survey, Monitoring, Targeting & Verification  
British Embassy Kabul

12th February 2009



**2. Data Processing.** The datasets we collect are then re-processed so that they are suitable for inclusion in the targeting model.

**3. Province Selection.** Based on figures from the previous year's cultivation and intelligence and evidence from other sources, the provinces that will be targeted are decided and agreed with the stakeholders. At this stage we also quantify the area that will be targeted.

**4. District Selection.** The district level datasets are then interrogated to identify which areas meet the criteria. This year over 240 datasets were used to identify suitable districts. We then apply weights to the data to differentiate those communities most advantaged by development work, quality and reliability of agriculture, existing infrastructure and governance. The high scoring districts are carried forward to the next stage.

**5. Target Selection.** At this stage we use specific spatial datasets that show information about a range of different dynamics covering crop quality, poppy density, available agriculture, development programmes, access to markets and so on. The end product of this process is an overlay that is passed to the Provincial Governor showing him suitable locations to carry out eradication activity that meets the livelihoods criteria.

### Tasks – Verification

To encourage the governor to carry out this activity the US and UK government reimburses the costs for every hectare of effective eradication within the TA. With large areas of poppy growth and the significant sums of money generated from it, there is a possibility for unscrupulous dealings to occur. The UNODC deploy verifiers on the ground to check the extent and quality of eradication, whilst use is made of air and space borne sensors to confirm the ground situation. Understandably tensions run high on the ground, when eradication is happening and violence often results. Bribery and corruption are commonplace and some farmers take up the offer of armed protection at a price to local warlords or the Taliban. In these circumstances satellite imagery provides us with the greatest coverage of land for least risk to life on the ground. We can also make use of helicopter borne imagery and this year we are planning to utilise UAV assets to assist us and provide a rapid update on activity on the ground.

### Tasks – Other

As with any office that has a large format output and mapping expertise, there are a number of other activities that the Survey, Monitoring, Targeting and Verification programme regularly gets involved in relating to spatially attributed data and remote sensing work which are too many and varied to go into detail here.

### Lifestyle

Life in Kabul is pretty varied. A month after I arrived another ex Military Survey guy, Jon McCloskey, joined the team. We live in a decent sized house with a well-equipped office, very similar to any Formation Geo cell. The majority of the time we work from the house but also have a hot desk and standalone system in the Embassy itself. Work tends to be a regular mix of up-loading new datasets onto the server, processing and analysing data in support of targeting and production of maps and briefing products. We work within a very influential area of Government, during my six months in Kabul I have shaken hands and briefed the Ministers for Defence, the Interior and Counter Narcotics, the British Ambassador, the Deputy American Ambassador and actor Ross Kemp along with most of the Provincial Governors on where they can eradicate. We also get around the country a fair bit on trips to the provinces in support of CN work, providing expertise on location and past trends. I recently spent some time in Helmand carrying out a task to help with monitoring the progress of eradication for Governor Mangal.

### Play

The social scene for the 'International' is also quite varied. There are a number of very reasonable restaurants in Kabul, the Embassy has a very lively bar and there are agreements with other Embassies to visit their recreational facilities. The previous Ambassador was very keen on social events and with the Christmas ball and the run up and announcement of the new US Administration, I have had more use out of my tuxedo in six months in Kabul than in three years in the UK.

*We are always on the lookout for new people to join the team, if you feel you have the right mix of skills please get in touch via the editor.*

# What's New at DGI 2009 - Europe?

*Tony Painter attended DGI 2009 - Europe, the Fifth Annual European Geospatial Intelligence Conference, 19th- 22nd January 2009 as the DSA "media" correspondent.*

It is an unfortunate fact of life that major conferences such as DGI take a long time to organise and prepare for. This, coupled with the obvious timescales in developing Government and Defence solutions, can sometimes produce something of a mismatch between the applications presented and the actual issues of the day. Whilst the presentations at DGI2009 raised some consistent and familiar themes, the occasion was somewhat overshadowed by the sharp world economic down turn which had developed over the previous three months and which prompted uncomfortable fears that future events of this type may be aiming at a different set of problems.

It is essential to plan attendance of these events in detail in order to know what to get out of them. The customer is wary of the subtle entreaties of contractors (some of whom were only recently colleagues); the presenters cautious of exposing radical ideas and applications to potential competition and the contractors anxious to demonstrate just why their particular application of merged mapping and imagery is different from and better than that in the booth next door. The newcomer is in danger of receiving presentation and comprehension overload and an incoherent or superficial message. Clearly, however, all of the DSA stalwarts met on the day I attended were experienced presenters and attendees and none would have encountered any of these problems!

The event was very well attended and informative with a good mix of international Government and Defence professionals across the private and public sectors. The presentations and discussions covered a well-judged balance of technical capabilities and applications.

The terms "Geospatial Information" and "Geospatial Intelligence" have evolved over the time that DGI has been operating. MoD Capability Adviser Geoff Twentyman, provided working definitions as part of his introductory brief on Dstl's role in Technology Innovation:

## **Geospatial Information:**

Facts about the earth, referenced by geographical position and arranged in a coherent structure. It describes the physical environment and includes data from the aeronautical, geographic, hydrographic, oceanographic and meteorological disciplines.

## **Geospatial Intelligence:**

Intelligence derived from the analysis and exploitation of geospatial information and imagery to describe, assess and visually depict physical features and geographically referenced activities of Defence interest. GEOINT includes the integration of intelligence within a geospatial framework to establish patterns or to aggregate data to extract additional intelligence.

The themes that were strongly evident at the event, which was co-sponsored by Digital Globe and ESRI, included:

- Globalisation and the need for interoperability
- Enterprise architectures
- The need for rapid data processing and high speed communications
- Security and counter terrorism
- Deployed and rapid response capabilities
- Imagery acquisition and exploitation
- Technical advancements

The conference included some senior and influential contributors. Major General John Rose, Assistant Chief of Defence Staff Intelligence Capability's presentation covered Intelligence in complex situations and the vision of a Single Intelligence Environment through Networked databases and multi-national information sharing in five years time.

The following were among notable conference highlights:

John Day (Defense Business Development, ESRI), with his newly acquired American accent, spoke on the pace of GIS related change and its global impact on law enforcement, managing natural disasters and international security. John suggested a definition of Enterprise as:

- a community with a common set of objectives
- a designed set of processes, systems and people
- a flow of information among people and systems that supports the objectives

He suggested a code of best practice for designing and building an architecture and outlined a prototyping case study, emphasising the benefits of Enterprise GIS.

Jill Smith and John Allan of Digital Globe presented a comprehensive review of satellite imaging capabilities with some excellent graphics. Among the impressive statistics presented, were the data holdings of sub metre resolution for over half a billion square kilometres, 300 world urban mosaics and a potential collection of 8-band multispectral panchromatic imagery of almost 1M square kms per day.

Multinational operational capabilities were well represented. Dag Wilhelmsen and John Teufert emphasised the NATO imperative for interoperability and standards and the critical involvement of GIS at all operational stages from strategic planning to rehearsal and execution. Chris Dorman spoke on embedding GIS in Command and Control and its exploitation for deployment planning and logistics through sharing data and web services. Anton Bacic briefed on Swedish Armed Forces deployed geospatial activities.

Humanitarian issues were well covered by a number of presenters including Nigel Woof of Map Action with some compelling recent case studies in Myanmar and Haiti which highlighted the value of up-to-date base mapping and the dangers of imagery overload. Stuart Haynes complemented this with an interesting brief on the need for cultural geography – the non-physical aspects of operational requirements such as ethnic and historical factors - in planning and conducting operations.

At the technical end of the agenda, advances were briefed by a number of speakers, notably Kerry Phelps and Brett Rose who updated the audience on ArcGIS and military applications.

So, what was radical and new at DGI2009? Well, in truth, much of the technical content would have been familiar to most attendees but we are in an evolving business in which the pace of technological change must always be responsive to changing global and Defence needs. Not surprisingly, the last decade has emphasised the need for accurate and rapid response, however long term trend analysis is increasingly important and this is likely to increase as the effects of the economic downturn and climate change are felt.

A feeling expressed by some contributors was the event may benefit from broadening in scope. A frequently stated perceived need was to avoid the impression of a narrow Defence-Government trade show of geospatial applications. This would be in sympathy with the "joined up" interoperable messages being promoted and the obvious pan-Government and global context of many of the presentations.

There was still an impression that the "medium is the message", that imagery and networked communications are all that are necessary for operational success. However, this begs the question of where the information comes from in the first place and its reliability. Without the basic hard detail and the intangible layers of human factors, technology alone may be impotent or even dangerous. Relatively little comment was offered on the need for investment in information gathering and quality assurance. It is to be hoped that the current experience of multiple operations in a sensitive environment will counter this imbalance. However one suspects that it will be the market forces of the "credit crunch" which will also shape the capabilities of the next five years.

# Development of The Defence Surveyors' Association Website

*By Peter Walker*

The Association's website, which can be found at [www.defencesurveyors.org.uk](http://www.defencesurveyors.org.uk), has been significantly updated and expanded in recent months. The website includes information about future events and news about developments across the Defence Surveying community. It also has an expanding library of historical documents. Some examples are:

- **Survey on the Western Front** which deals in chronological order with the development of the various branches of the Survey organisation in France during the First World War.
- **Maps and Survey.** Brigadier Clough's extremely comprehensive work detailing all aspects of Military Survey's involvement in the Second World War.
- **Special Charts and Publications produced by the Hydrographic Department Volume I (Text) Admiralty 1949 C.B. 3200A** which records the work of the Hydrographic Department during the Second World War in producing special operational charts and diagrams additional to its normal work of producing Fleet navigational charts.
- **Z Location or Survey at War** which is the story of the 4th Durham Survey Regiment RA by Lt Col JT Whetton DSO, OBE, MC, TD and Lt Col RH Ogden MC, TD.
- A wide range of survey unit histories.
- A list of précis used by the School of Military Survey.
- An Excel spreadsheet listing in numerical sequence the allocation of GSGS numbers to series with their descriptive title and scale.

A variety of additional historical documents are currently being scanned which will be added to the website.

There is also a complete index of all the articles that have been published in Ranger and copies of those published since 2004.

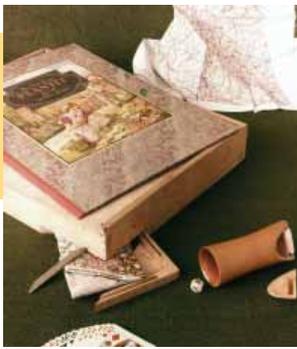
We hope that you make regular use of the website to find out about the Association's activities. Much of the website is open to all but additional information is provided to members. Any member who does not have full access and who wishes to view the entire site should contact John Knight to obtain a user name and password. John can be contacted at [knight.ja@o2.co.uk](mailto:knight.ja@o2.co.uk), telephone 01635 204243.

For those of you who have interests in our history, we also hope that you will find the historical documents section of interest. We would also welcome documents for inclusion on the website. Anyone wishing to publish such a document should contact Peter Walker at [peter.walker@zen.co.uk](mailto:peter.walker@zen.co.uk), telephone 01189 712409 (Home) or 01635 204433(Office).

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## Input to Ranger

As the Ranger has gained in popularity and reputation so the generation of articles has become easier although getting the copy by the deadline can at times be like pulling teeth. However, the editor still has area that poses problems with each issue and that is finding small items to fill the space, sometimes a quarter, sometimes a half page in size left when articles do not take an entire page. Short anecdotes, notices of relevance to readers or photos of appropriate subjects would all be suitable candidates and much appreciated by the editor at any time.



## Escape and Evasion Maps in World War II and the Role Played by MI9

*By Barbara Bond*

I was pleased to be invited by Alan Gordon to contribute this article and help “dispel the myths” (his words, not mine!) which have arisen about the silk maps produced for escape and evasion purposes in WWII.

My research started over twenty five years ago when I was employed as a researcher in what was then Military Survey. One of the responsibilities of my post in the Map Library at Tolworth was to arrange for the WWII archive to be sorted and prepared for deposit in the Public Record Office (now the National Archives). Amongst the projects on a rather lengthy list was to sort and identify the escape and evasion plans, many of which had been printed on silk. It was a task in which I became enthralled. Whilst the task itself was long since completed, I have continued to research the subject in my own time ever since and probably now have one of the most comprehensive carto-bibliographies of this largely unknown set of British military maps. I am also in the process of writing a book on the subject.

The production of military maps on silk is not, however, a phenomenon solely of the twentieth century. As long ago as the second century BC, the Chinese produced the now famous Garrison Map, excavated from the Han Dynasty tomb in Mawangdui in 1973. It is considered to be the classic military map on silk, showing as it does, the position and designation of troops, command posts, logistical information, frontier roads and distance indicators. Military maps on silk (or other fabric) were also produced during the American War of Independence and of Prussia at about the same time. The War Office Committee tasked to report in 1892 on the form that a military map of the United Kingdom should take made frequent mention in the report on the superior durability of linen over paper as a material on which military maps could be printed “for use in the field”.

It was certainly the case that by the twentieth century, the foldability and durability of silk and linen had long been recognised as of particular application for military mapping and it was these same characteristics which proved to be of particular use for escape and evasion purposes during war. In the foreword to MRD Foot and JM Langley’s definitive history of MI9 (i), Field-Marshal Sir Gerald Templer wrote “*escaping and evading are ancient arts of war*” and, at best, it must have been difficult to escape from or evade the enemy without a map. By WWII there had been a significant change in British official attitudes to prisoners of war. Previously, capture and captivity had been regarded as a somewhat ignominious fate but the little experience gained of escaped POWs during WWI, the valuable information which they often brought back, the extent to which they could prove a thorn in the enemy’s flank, caused an inexorable change in attitudes. These changes were officially acknowledged in British defence circles with the creation of a new military intelligence section, MI9, in the War Office in December 1939.

MI9’s objectives were set out as facilitating the escape of British POWs, facilitating their return to the UK, collecting and disseminating information on escape and evasion to British armed forces, denying such information to the enemy and maintaining the morale of British POWs. The head of MI9 from the beginning and throughout WWII was Brigadier Norman Crockatt. He and his staff started a programme to train intelligence officers from all three services at their training school in Highgate. One of Crockatt’s staff was Christopher Clayton Hutton who was essentially the ‘techie’ and he was the inventor of various gadgets to aid escape and evasion. Crucially, it appears to have been Hutton who pushed forward with the mapping programme. He enlisted the help of John Bartholomew of the famous Scottish cartographic family who contributed many small scale maps of Europe, waiving all copyright and insisting it was a privilege to contribute to the war effort. Crockatt initially attempted to find a paper which was thin, crease resistant and durable, but becoming persuaded that such was not available, he turned his attention to printing on silk. The first attempts were a disaster as he did not initially speak to people who had the technology to print on silk.

The earliest escape and evasion maps were undoubtedly those which MI9 produced on the basis of the Bartholomew maps which Hutton had been given in 1940 and they are easily recognisable as they are direct reproductions of that vintage of Bartholomew’s maps, although they carry no formal identification, date or production details (illustration 1). They are generally printed on silk, tissue or rayon, in three colours (black, red, grey or green), small scale (between 1:1M and 1:6M), undated,



Illustration 1. France north of the Loire, the Benelux countries and the Channel coast. Sheet C, 1:2,000,000, on silk.

rectangular in shape with average dimensions of 18" x 24"/406mm x 601mm and they carry an arbitrary numbering system (usually an upper case alphabet letter in conjunction with an Arabic number). To date I have identified forty five such maps and estimate that there are another twenty or so remaining to be identified, assuming that gaps in sequential numbering indicate maps which were produced but of which I have not yet discovered extant copies. Approximately 400,000 copies of these maps were produced and, since John Bartholomew had waived copyright, his contribution both financially and cartographically to the war effort was very significant.

The second group of escape and plans I identified were silk versions of thirty three sheets of GSGS 4090, Norway, 1:100,000 scale. These were produced in limited numbers (100 copies of each sheet) in 1942 (illustration 2).

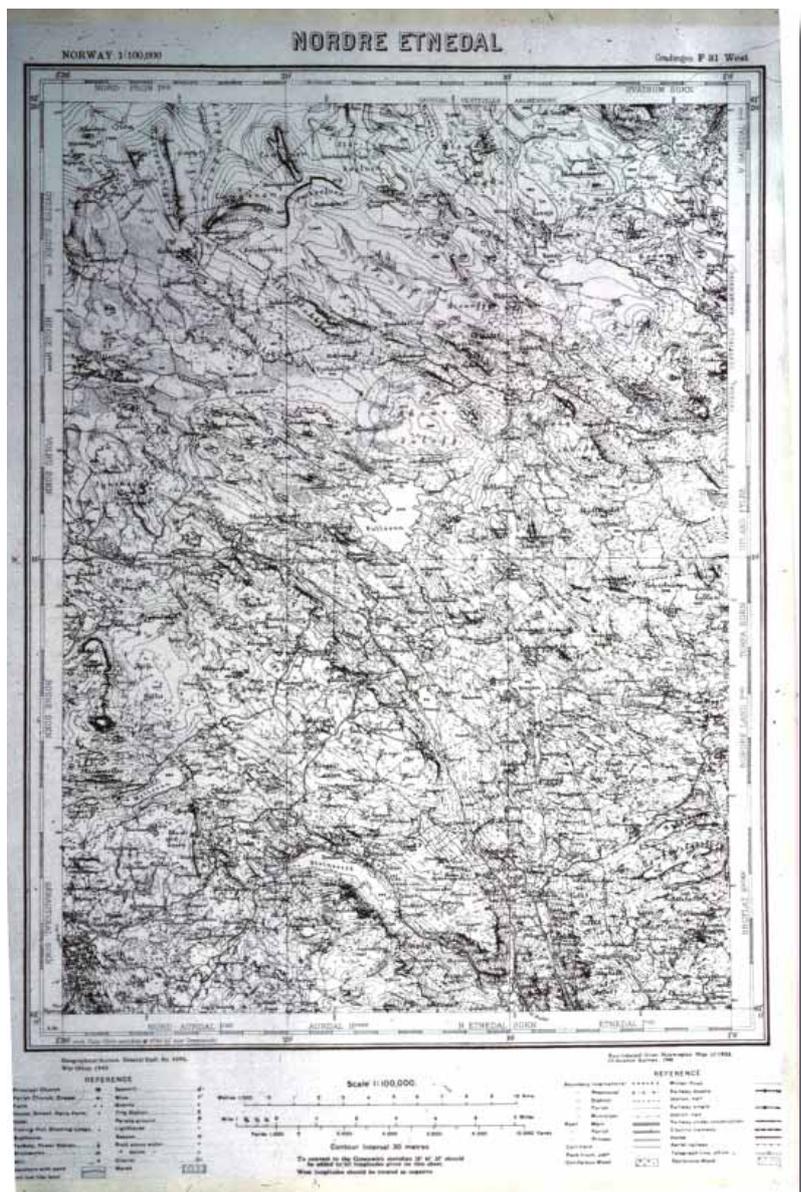


Illustration 2. Norway, 1:100,000, GSGS 3090, sheet F31 West, on silk.

The sheets are located in a block to the north of Norway, adjacent to the Swedish border and outside the area garrisoned by German troops.

Originally the escape and evasion maps had been printed on silk, specifically that deemed sub-standard for parachute production, and on tissue. By the time the USA entered the war in December 1941, little silk was available, so most of the maps produced after that time are printed on rayon. The material was specially treated to ensure that it would not be affected by any extremes in temperature or humidity and, as a result, these maps have a starched feel to them.

In 1943 a group of much larger format maps were produced to cover the European theatre. This series comprised 10 sheets, generally at 1:1M scale with larger scale insets of border areas (illustration 3). They were printed in 8 colours with additional layer colours affected by percentage variations in the basic colours. These particular maps are of an extremely high technical expertise in terms of the printing technology and were apparently printed by John Waddington Limited of Leeds, better known as a manufacturer of board games. These maps were followed in 1944 by a similar series of the Far East. Both these series were based on the International Map of the World (IMW) but with non-standard sheet-lines. They are of various dimensions but generally approximately 36" x 31"/901mm x 709mm, numbered with the prefix 43 or 44 (denoting the year of production) followed by an upper case alphabet letter. They are all printed double sided on rayon.

The rarest group of all the WWII escape and evasion plans were 1:500,000 scale reductions of

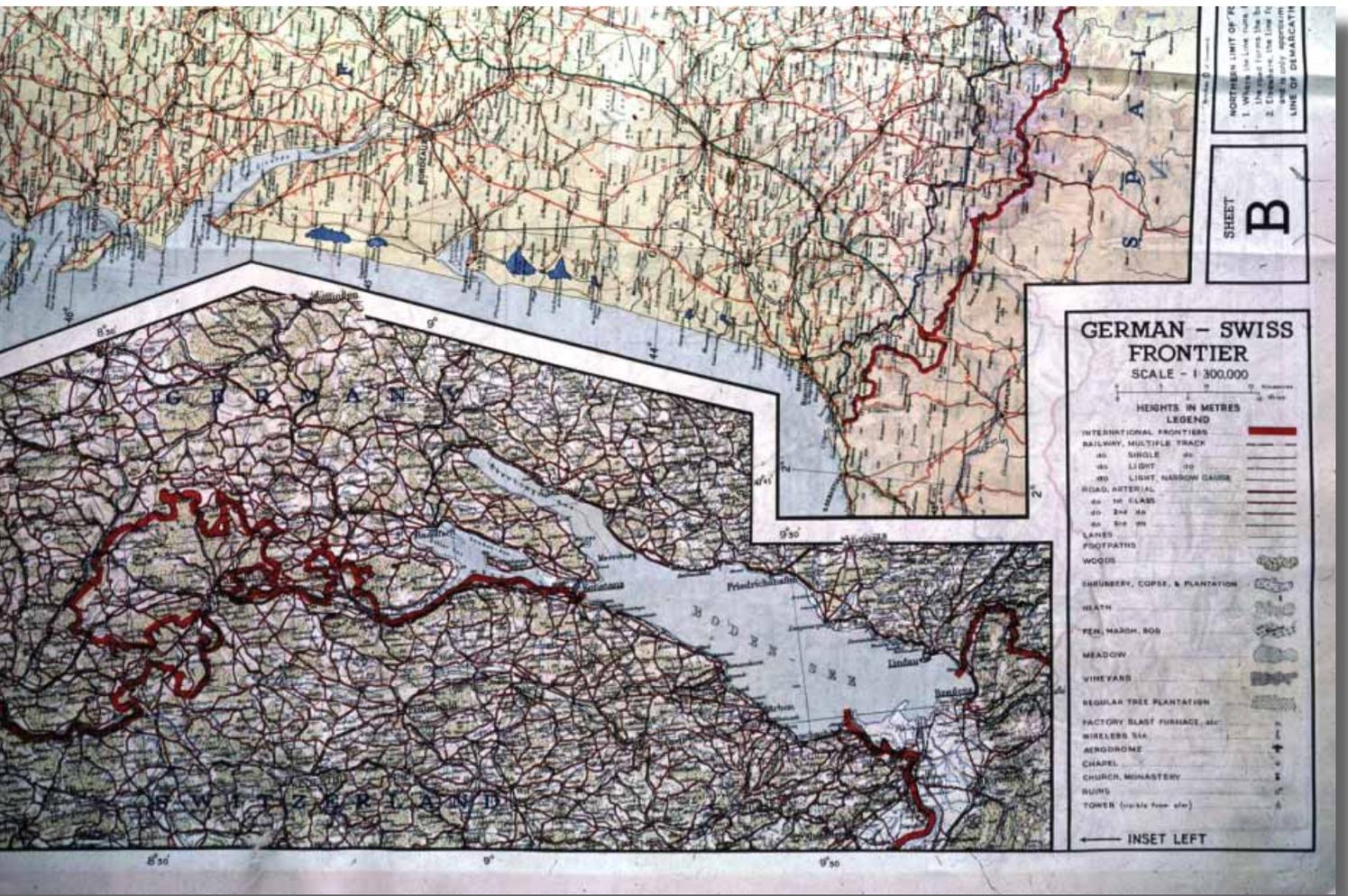


Illustration 3. SW France and N Spain, 1:1,000,000 and an inset of the border area at 1:300,000 Sheet 43 B, on rayon.

the 1:250,000 scale GSGS 3982 Europe (Air) series. These were the famous “handkerchief” or “miniature” maps, so styled because of their small format, their dimensions being only 13” x 15”/303mm x 308mm.

MI9’s philosophy of “escape mindedness” was instilled into the members of all three services and the practical application of that philosophy was seen in the production of escape kits which always contained maps. Initially the escape kits were in the form of small cigarette tins which contained concentrated food, tape, thread, tiny saw, compass and two maps. The RAF was also issued

with specially designed flying boots which had hollow heel compartments into which escape maps could be secreted.

The methods of getting the maps through to POWs were very ingenious. They were encapsulated in playing cards, pens, pencils, books, gramophone records and game boards (illustration 4). Along with dyes, compasses and currency, they were sent in parcels to the POW camps. It was a cardinal rule in MI9 that they never used Red Cross parcels as they had no wish to compromise that organisation. Instead they devised their own cover organisations, The Prisoners' Leisure Hours Fund and the Licensed Victuallers' Sports Association being two such. These 'organisations' despatched ordinary parcels containing clothes and special parcels containing escape aids. It was known that many got through because receipts came back (illustration 5).

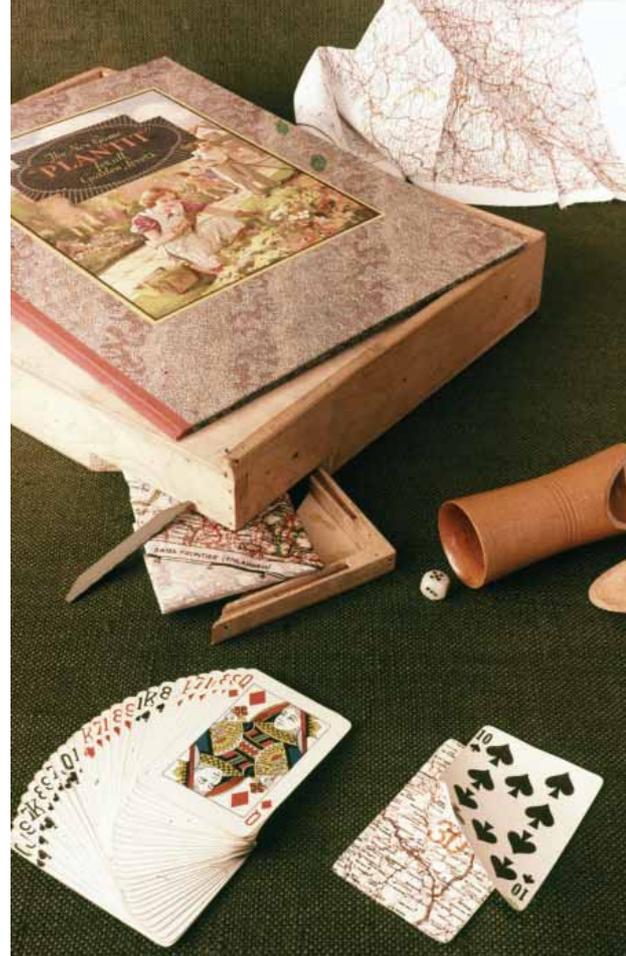


Illustration 4. Examples of the ways in which maps were encapsulated in playing cards and board games (courtesy of the RAF Museum at Hendon).

To  
**The Hon. Secretary,  
PRISONERS' LEISURE HOURS FUND,  
46 BOLT COURT, FLEET STREET,  
LONDON, E.C.4, ENGLAND.**

Date 29 Aug 41

Parcel No. 12313 Containing:  
5 Records

Very Many Thanks

(F.V. CORFIELD). 116 1217.  
OFLAG IXA/H)

has been received by me. F.V. Corfield  
(Signed)

To  
**The Hon. Secretary,  
PRISONERS' LEISURE HOURS FUND,  
46 BOLT COURT, FLEET STREET,  
LONDON, E.C.4, ENGLAND.**

Illustration 5. Receipt from Offlag indicating 5 records (and the maps) got through to the POWs.

The POWs themselves were equally ingenious in reproducing multiple copies of the maps which got through. They traced or even hand copied the maps (illustration 6) and, in some cases, they set up miniature printing works employing a crude but effective version of the collotype method of reproduction, using melted jelly from tins of cooked meat as a sensitising agent. Such reproduced copies are very rare: I have seen only two in the past twenty five years, both in a university collection and obviously an indication that the maps (and presumably the POW(s) using them) made it back to the UK.

In the years following WWII much became known of the successes (and the failures) in escape and evasion. Many fascinating books have been written and some very successful television series have made escape and evasion seem an almost commonplace occurrence in a war situation. It is, however, worth remembering that WWII was the first war in which

British service personnel who were captured came to view it as their duty to attempt to escape. Airey Neave (ii) described escape as "not only a technique but a philosophy" and it was a totally new philosophy of war which had been set down, implemented and nurtured by MI9. If numbers are an indicator of success, then it certainly was a very successful philosophy. More than 35,000 members of British, Commonwealth and US armed forces who were taken prisoner, shot down or cut off in enemy territory regained Allied lines before the end of the war. One cannot detract from their courage and ingenuity and that of the members of the resistance movements who helped them. Much is now known of their exploits. Far less is known of the staff of MI9 and the extent to which they successfully executed their responsibilities in providing, as Foot and Langley expressed it, "hope and a sense of purpose for those to whom the war might otherwise become quite pointless".



Illustration 6. POW manuscript copy of section of silk map secreted into the Offlag at Biberach.

(i) MRD Foot and JM Langley "MI9: the British Secret Service that fostered escape and evasion 1939 – 1945, and its American counterpart." Bodley Head, London, 1979.

(ii) Airey Neave "They have their exits." Hodder and Stoughton Ltd, 1953.

Barbara Bond spent her career as a civilian researcher in MoD, initially with Military Survey and latterly with the UK Hydrographic Office where she was Director from 1991 to 1998. She is a Past President and Silver Medallist of the British Cartographic Society and a Fellow and Past Council Member of the Royal Geographical Society. In 1997 she was awarded the Prince Albert I Silver Medal by the International Hydrographic Organisation, presented by HSH Prince Rainier of Monaco. She is currently the Pro-Chancellor of the University of Plymouth.



## David Wallis as a Guest of the DSA Council

On Friday 6th March 2009 the Council held a dinner at the Officers' Mess in Hermitage to mark the departure of David Wallis from the Council after more than 40 years of service to the DSA. During the dinner our President, Major General Patrick Fagan, presented David with the Ernest Ramus Prize for Outstanding Service to the Association.

The dinner was also attended by Peter Walker, Yo Hodson, Carl Calvert, Shaun Jones, Tony Keeley, Roy Wood, Kevin Lane, Graham Livesey, James Prain, Mike Nolan and John Knight.



*Left of the Survey centrepiece: Mike Nolan, Roy Wood, Shaun Jones, John Knight, Peter Walker, Yo Hodson.*

*Right of the centrepiece: David Wallis, Patrick Fagan, Carl Calvert, Tony Keeley, James Prain, Kevin Lane, Graham Livesey,*

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## The Revd Adam Scott OBE TD

DSA member Adam Scott has been awarded a civil OBE for public and voluntary service that complements the TD that he received 30 years ago.

The award reflects a combination of service over forty years in the Gunners, the Post Office and British Telecom, in church and other charities and latterly as holding trustee of the House and Chapel of St Barnabas in Soho and also as a member of the UK's Competition Appeal Tribunal where Adam applies his range of legal, engineering and economic backgrounds to competition law and communications cases, chair training and engagement with fellow European judges.

The Association congratulates Adam on a well-earned recognition of selfless service.

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### Bereavement

It is with regret that the Association announces the death of Lieutenant Colonel TR 'Ben' Burrows on the 14th April 2009 age 85. An obituary will appear in the next issue of Ranger.

## A Falkland Islands Veteran Remembers



*This article has been written as a result of telephone conversations in 2007 between Mike Nolan and Harry Calder and from Barry Calder's interviews with Harry (his father) and a few documents now in his possession. Harry died in 2008.*

At the beginning of World War 2 Harry Calder was reading for a Geography degree at Manchester University. He volunteered for service and was commissioned from Sandhurst into the Lancashire Fusiliers on 7 March 1942. Late summer saw him embarking on *SS Esperance Bay*, an ex-armed merchant cruiser with a 6-inch deck gun, and joining a large convoy headed south but to an unknown destination assumed by all aboard to be the Middle East.

On reaching Cape Town the main convoy went on into the Indian Ocean and the Red Sea whilst the remainder was left behind in port for three weeks. This force comprised the 11th West Yorkshire Battalion, some miscellaneous personnel, some RASC (REME) and about 100 Royal Engineers led by Lieutenant Daniel Sutton. Together they formed Force 122, under the command of Colonel Hines.



*SS Esperance Bay at anchor in an inlet south of Berkeley Sound*

On leaving Cape Town the *Esperance Bay*, heavily laden with personnel and equipment, was rammed in broad daylight at an oblique angle by a larger unladen Norwegian ship that slid the entire length of the starboard side of the ship. On their second attempt to depart Cape Town, after further deck cargo had been taken aboard, it became clear that the Falkland Islands was the destination since the cargo was so labelled and, after 14 weeks at sea, in September/October 1942 the Force arrived in the Falklands.

On landing at Stanley the infantry were engaged in assisting the field engineers to build the Force camp. At that time and for a period after, the Force had no maps of the islands and had to rely on Fitzroy's Admiralty charts of the 1830's. The Engineers soon produced an initial sketch map to remedy this deficiency.

Later in 1942 an 18-strong Section from 14 Field Survey Company RE arrived on the Islands commanded by Lieutenant TL (Tommy) Thomas, a Welshman, who had worked at the General Electric Company in Stafford. Harry described Thomas as "a brilliant mathematician" and recalled that he was later awarded an MBE and after the war took a lectureship at Imperial College, London. The 2 i/c of the Section was Sergeant Gilbert (Gil)



*Force disembarking from Government Jetty on to Ross Road, Stanley*

Holland whose role was mainly administrative with the field work being largely executed by the OC and Lance Sergeant W Lockwood. Apart from Holland and Lockwood, all the Section were wartime surveyors including two draughtsmen. With the agreement of his battalion commander Colonel Hines sent Harry on attachment to the Survey Section because of his university background in Geography.

The Section was accommodated in two Nissen huts, one for eating and sleeping and the other for use as an office. The office hut was divided in two: a small office for Lieutenants Thomas and Calder and Sergeant Holland, and the larger working space which served as the drawing office. The unit was equipped with two steel tapes: one used as standard, the other as the field instrument. The base was measured on Stanley Racecourse by surface taping in accordance with Winterbotham's manual and ten bays were measured ten times in one direction. The base was then re-levelled and measured again from the other direction. The maximum error was 1/10th of an inch.



*The Falklands detachment: 14 Field Survey Company RE  
Left to right: Back row far right Spr. Plews Gregory  
Middle row: Cpl. John Bunn, L/Sgt. Walter Lockwood, Lt. Harry Calder,  
Lt. T Lesley Thomas, Sgt. Gilbert Holland, Cpl. Suddaby*

The Section's first task was to address the projection. The tables supplied were for the US World Polyconic Projection Band 5 Zone South. They used the yard as their unit of measure but as the British army measured in metric units, the projection tables had to be converted. Harry was given the job. He used the Benoit Cheney conversion that had succeeded the Clarke conversion.

The next task for the Section was a reconnaissance of the ground. The datum was fixed at the west end of the base and latitude and longitude were derived from position line observations to appropriate

southern stars. On 1 April 1943 L/Sgt Lockwood observed for latitude and longitude by position lines in the vicinity of Stanley at about  $51^{\circ}41'30''S$  and  $57^{\circ}52'13''W$ . The booker was L/Cpl Suddaby, with Spr Morgan's name also appearing on booking forms. Cpl Bunn, another of the observers, eventually became OS Director of Surveys, Northern Ireland after the war.



*The Drawing Office  
Man operating Frieden calculating machine Lt. Thomas, L/Sgt. Lockwood chief draughtsman*

For the triangulation the Section was equipped with three Tavistock theodolites. The triangulation was based as far as possible on braced quadrilaterals with some

points fixed by intersection and resection. The base extension was to three points on the north side of Stanley Harbour. The trig point on Twelve O'clock Hill was concreted on the spot with an iron bolt as a fine point. An OS beacon was erected above it. The Hill was so named because it was due north of Government House. Heighting was by trig heighting methods. Initially a height was transferred from datum to Sapper Hill and back by levelling. Detail was surveyed by plane tabling. One surveyor was Spr Plews Gregory from Liverpool. He had been an artist before the war and was a very fast worker, once producing nine square kilometres of plane tabling in a day. His work



*Field surveyor at work*

for that day was checked by Harry and the OC and found to be without error. Large-scale plans, such as that of Falkland Camp, were surveyed by chain survey. The draughtsmen produced only one copy of each field sheet which were assembled together to produce a single map that was then sent back to the UK. Copies were only printed later.

One of the geomorphologic features encountered during fieldwork was the “Stone Runs”. These are rows or collections of boulders, some as large as houses. The largest was named on the map as Princes Street. It was about five miles long, near Berkeley Sound. Another, later visited by Harry, was at Impassable Valley near Mount Osborne. He was adamant that these were not glacial features and reported that a geologist on the Falklands at the time had written a paper on the subject.

In November 1942, on a week’s leave, Harry and two officers from the Force were invited to stay at Douglas Station by the Deputy Governor of the Islands, Robbie Greenshields. Their journey from Stanley to Douglas Station was made by jeep to Salvador Water, motor boat to Teal Inlet, motor boat from Teal Inlet, and finally on horseback to Douglas Station. On at least one occasion, the jeeps got stuck in the boggy ground between Stanley and Salvador Water.

The Survey Section of 14 Company departed in 1943 and Harry reverted to regimental duties until the battalion embarked on RMS Highland Monarch in mid-January 1944 to return to UK.

On disembarkation the battalion was accommodated temporarily in an empty housing estate at Huyton for about two weeks. They then entrained for a camp on Dartmoor, and arrived at Whitchurch Down near Tavistock marching through pouring rain. One bright spot for Harry was being sent to Okehampton to collect the £64,000 back pay that the battalion had accrued in the Falklands, after which a fortnight’s leave was granted.

Shortly after this, Harry was sent on a mine warfare course and took the top prize in sapper assault before becoming the OC of “a sort of pioneer platoon” in Support Company. On returning to his battalion Harry and two other subalterns were posted to a Reinforcement Holding Unit of 21 Army Group and shortly after, on D-Day +4 (10th June), Harry crossed to Normandy. He landed on Gold Beach and was posted to the Assault Platoon of Support Company of the 6th Battalion Durham Light Infantry “to fill a gap left by a wounded officer”. In the next few weeks Harry lifted 178 mines. On one occasion, not far from the site of his final accident, Harry was ordered to advance with ‘A’ Company. The route lay through a farm gateway. Harry was standing by the gate and the Company were advancing through it when one of the men spotted a three-pronged mine. Harry immediately ordered the men to lie down, and went to inspect the mine. It had six igniters; he unscrewed each in turn. When the mine was disarmed, the Company advanced.

On 3rd August 1944 Harry was sent out in a Bren carrier on a mine-lifting task somewhere north of Villers Bocage. It so happened that he was the driver that day and that, unusually, Sergeant Tom (‘Jackie’) Pease accompanied them. As the non-drivers were crossing over a ‘bocage’ stone hedge to look for mines, there was a huge explosion. Sgt. Pease and L/Cpl Charles Whitwell, who had crossed over the hedge, were killed instantly and Cpl Metcalfe, who was standing on the hedge about to cross, was severely wounded. Harry, wounded by



*Jeep bogged in on 19 November 1942*



*Farewell Parade, Force 122, January 1944*

shrapnel from the blast, managed to get Cpl Metcalfe evacuated on a passing jeep to the Casualty Clearing Station. Shortly after, he himself got a lift on a jeep to the CCS, his battle dress by now soaked in blood. He was then stretchered and ambulated back to Bayeux along a 'corduroy' road of railway sleepers before being transferred on a DUKW to a hospital ship.

On disembarking at Southampton Harry was transferred initially to Park Prewett Hospital and then, after three days, on a very full train to a former mental hospital in Sedgefield, County Durham. The wing in which he found himself held 200 walking wounded, all looked after by a single nurse who had to cope with treating all sorts of wounds. After a few days he was transferred to the 15-bed ward Officers' Ward of the Robert Richards Convalescent Home at Barnard Castle. He was allowed to get up for the first time and discovered he had 16 shrapnel wounds from the blast.

As a result of his work with the Survey Company, Harry had determined to try to transfer to the Royal Engineers and a subsequent move to a convalescent unit and depot at Kingston on Thames provided the opportunity at last for him to raise with the OC there the question of a transfer to the Royal Engineers. His application for transfer was successful and with several other officers he underwent training at the Survey Training Centre (STC) at Wynnstay Hall, Ruabon. While he was there, in December 1945, the STC moved to Longleat where it occupied a former American hospital camp. On completion of his training Harry was posted to 522 Field Survey Company, a holding company for officers. However he never saw it because he was employed in the Geographical Section General Staff (GSGS) instead. One section was then under Colonel Dowson; Harry was allocated to Major Jack Kelsey's Survey 2a(Air) alongside a civilian, Mr Long, who was in Svy 2a(Land). For much of this time Kelsey was in the USA where he was involved in the setting up of ICAO, the International Civil Aeronautical Organisation, and Harry never met him. During this period however he completed much work on deviant compasses in tanks, as well as doing some work on Italy for the security services.

Harry's demobilisation number was 40 and when it came due, on 4 October 1946, he was demobbed at Barton Stacey camp. At the time, Colonel Sanceau the Deputy Director-General of GSGS, offered him a majority and two years' employment in the Survey Production Centre, Southall. However, since completion of his degree was his top priority Harry declined and returned to university immediately to resume the final year of his degree course.

Harry completed his degree, graduating in 1947, but stayed on to get a Royal Town Planning Institute qualification which enabled him to become a town planner. Initially he was in private practice earning about £350 per annum. He later switched employment to the City of Manchester, where he was Assistant Planning Officer. While there the post of Officer I/C of the Survey Production Centre was advertised in the Guardian and Harry was short-listed for interview. He found himself with five officers whom he knew well from his time in the RE. The successful candidate was Major Quaipe, who had already been doing the job.

Later still he applied for and became Senior Assistant Planning Officer in Warwickshire, remaining there for 9 years until 1960. During this time he was instrumental in planning the Green Belt around Birmingham. He then applied for and obtained a position as Assistant County Planning Officer for Cornwall County Council. He retired in 1981, as Chief Planning Officer for the county.

*A. Calder*

Speech made by His Excellency, Sir A.W. Cardinall A.B.E., C.M.G.,  
The Governor of the Falkland Islands.

to

the Force Commander, Officers, Warrant Officers, Non -  
Commissioned Officers and Men of the Falkland Islands  
Force at the Ceremonial Parade held at Port Stanley on  
Saturday, 15 January, 1944.

-o-

I have long awaited an opportunity to address you. But hitherto that has been impossible. It would have been most pleasant to me to have been able to have done so on your arrival, but you know that that could not in the circumstances have been arranged. Since then there has been no occasion. And so it is that today I am only able to greet you and bid you farewell.

I do not do so on my own behalf alone but in the name of every single person in the Colony.

There are two matters I would wish to stress, a remembrance of which I should like you to take home.

The first of these is our thanks. We owe these to you for many things. Not only are we grateful for the sense of safety your presence brought us, but far more for the friendliness and affection that you gave. You entertained us who should have entertained you. Many of us have tried to repay this; our homes have been open to you. But there is no doubt that we have received more than we have given. Particularly is this so with our children, the majority of whom can never forget the kindness and love shown to them from their parents' guests from the homeland. You have re-forged and strengthened the already strong link that has always bound the Falklands to the Motherland.

Do not forget that; we shall not. You, who have, by the strange accident of this war, been stationed in the southernmost country of our Commonwealth, you, who for the first time in history have garrisoned a station on the very frontier of the Antarctic, you are about to leave us, your first duty done. Remember then that we think you have done more than that, and that you leave behind a deeper love for England and a greater loyalty to our King and Homeland than ever before.

Do not forget us when you are far away. Remember that here, in the most distant and isolated spot - further removed from another part of the Empire than anywhere else - we hold a love for you which is of your own creation. If ever some of you were to wish to return, he would be welcome, more than welcome. There are openings here, and in the coming time of peace it may well be that this land will so develop that she will require fresh blood. We should like it to be yours.

However, that is a dream thought. More practical is it to ask you to keep always in touch with us. There is one somewhat sentimental way that may appeal to those of you with small gardens. Why not ask us in the appropriate time to send you a few of our unique sweet-smelling flowers for your rockery? If they were to grow there would be a living souvenir of your short sojourn here, and you would have planted in the soil of Great Britain some of the soil of her most British and distant land.

The second point I would wish to make is to give you all a message of God Speed. It is merely to say goodbye in the name of every one of us. "Goodbye" is not final, nor is it sad. It is truly an inspiring expression. "God be with you" is its meaning, and from our hearts we wish that. No matter where you go, or in what task you may be called upon to partake, that wish is with you. It is the most sincere expression of what we have in our minds, that God may always be with you, at your side at all times, your Guide, Your Prop and your Protector.

So thanks once more for all you have done, and take with you our fervent wish that you leave us in the care and custody of God.

-o-o-

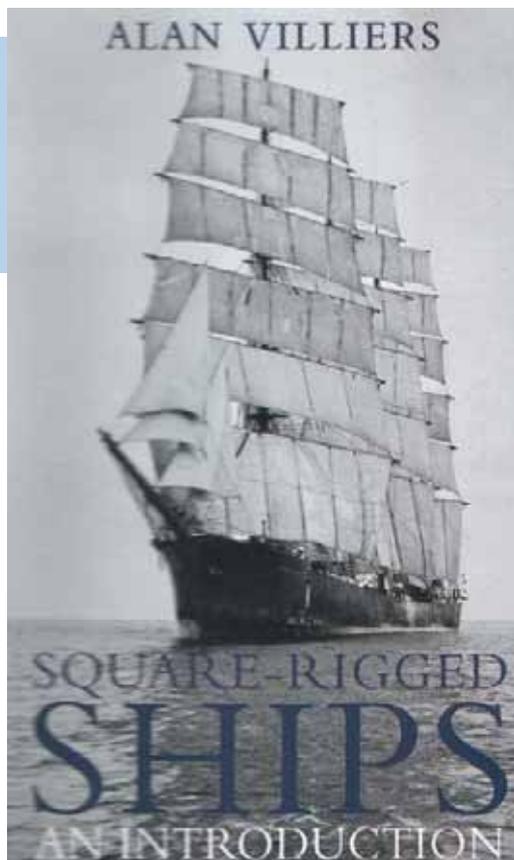
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## Survey Review is now on-line

The magazine 'Survey Review' was established in 1931 and its early issues should be of interest to students of colonialism, the British Empire, and the history of science and technology.

The articles from an early issue of Survey Review have been scanned and are now freely available online with the remainder to follow in due course.

They can be found at <http://www.ingentaconnect.com/content/maney/sr>



## Book Review - Square-Rigged Ships an Introduction

Published by The National Maritime Museum,  
London. Edition 2009.

Hardback.

Price: £9.99.

ISBN 978-1-906367-09-1

Available from The National Maritime Museum.

Telephone: 0208 312 6790

*Square-Rigged Ship An Introduction* is a reprint of the book by Alan Villiers *Voyaging with the Wind* originally published in 1975. The title aptly describes the contents. The author, Captain 'Alan John Villiers' (1903 -1982), was a square-rigged ship devotee, a Master Mariner, an author, voyager and photographer. His books are well written and display a complete knowledge of his subject.

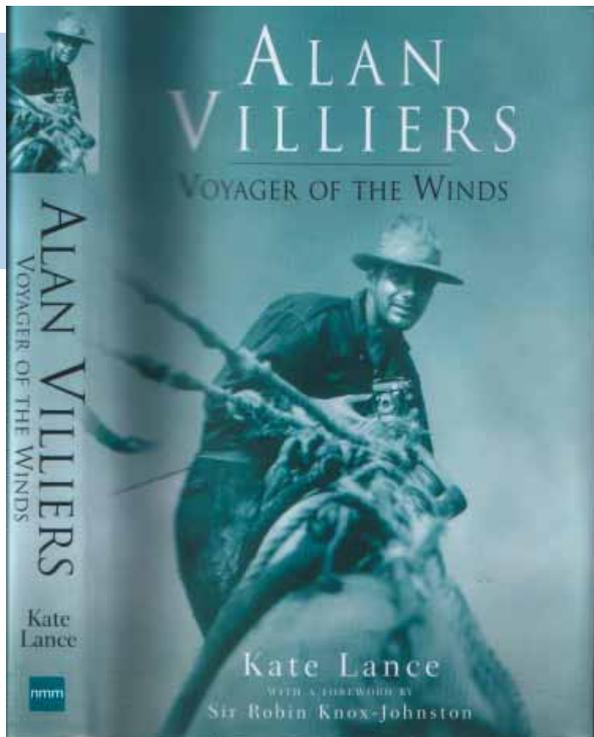
The "Square Rigged Ships" he writes about are Windjammers. These vessels operated mainly in the 1870s to the 1890s but some continued until as late as 1950. Their demise was steamships due to the economic benefit of their ability to keep a schedule regardless of the wind.

The Windjammer was designed for bulk cargo and handling whereas a Clipper, which too is a square-rigged ship, was a very fast multimasted sailing ship, generally narrow for their length and had a cargo capacity of less than 1,000 tonnes. A Windjammer could carry up to 6000 tons. They were not slow sailing cargo tramp ships but were capable of attaining great speeds; most four-masted barques were able to cruise at 15 knots on reasonable winds, some logged 18 knots regularly.

The Foreword, by his son Peter Villiers, is an admirable, very brief biography of Alan Villiers. For those who have an interest in sailing ships and for Alan Villiers fans who do not have a copy of *Voyaging with the Wind* this book with its easy to read style and the wealth of information contained therein makes it a book that should be read and added to one's personal library.

The author outlines basic ship-handling skills, techniques and traditional training practice. He draws on his own experiences of sailing around Cape Horn. Whilst the book explains clearly and concisely how the Windjammers were sailed the human dimension is not forgotten. The oft-long voyages, the immense toil needed, the risks and dangers, the reliance on a thorough knowledge of the vessel, coming on deck on a pitch dark night in the middle of a storm and having to go aloft, took courage and skill. The realism of danger and the hardships is discussed but as Alan Villiers says one can learn from books but must sail in the ships to experience the reality. And then there were the ships that did not make port and were assumed to have gone down with all the crew.

The overview of the era, the ships and the crews is fascinating. It is not simply an introduction to square rigged ships but it is also an introduction to Alan Villiers and should whet the appetite of those who are interested in sailing ships to read more of his works. Today, with a greater emphasis on health and safety and risk aversion it is probably safe to say that the Alan Villiers' "Windjammer" is in the past but for those with an interest in sailing this is an excellent but simple book. This is Alan Villiers' final book.



## Book Review - Alan Villiers Voyager of the Winds

*By Kate Lance*

Published by The National Maritime Museum, London.  
Hardback.

Price: £20.00.

ISBN 978-0-948065-95-8.

Available from The National Maritime Museum.

Telephone: 0208 312 6790

Alan Villiers, by and large, earned his living as a writer. He was a prolific writer as well as a photographer and filmmaker, using his voyages and experiences as background for his many books. In the main he wrote about the passing of the square-

rigged ships. In his book "The Set of the Sails" he outlines his life from 1903 until 1948. His writing has brought to many a great deal of pleasure in their reading.

For those who do not know of Captain 'Alan John Villiers' (1903 -1982) he was a square-rigged ship devotee, a Master Mariner, an author, voyager and photographer. His books are well written, very readable and display a complete knowledge of his subject – sailing ships - but square-rigged ships in particular.

In writing "Alan Villiers Voyager of the Winds" the author, Kate Lance, uses Villiers' own journals and notebooks. The book covers the whole life and thereby completes the Alan Villiers story. It is not simply an addition to *The Set of the Sails*, it looks into Alan Villiers the man. She explores the social, political and personal issues that were woven into the life of Alan Villiers.

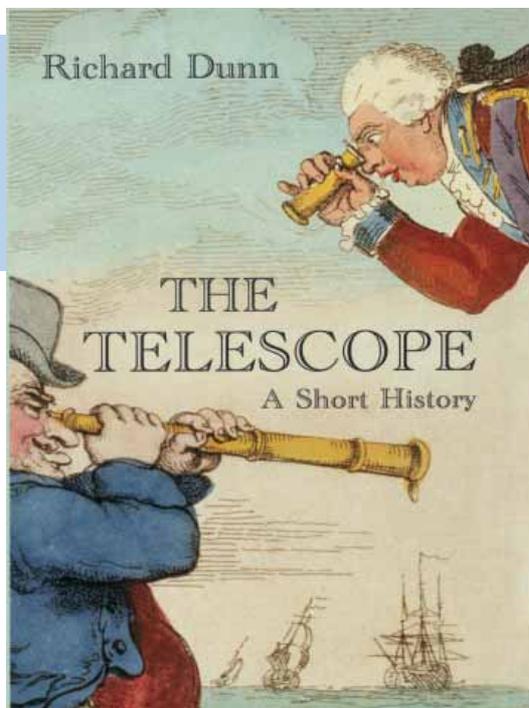
For those who have read many of his books it could be easy, when beginning this book, to fall into the trap of thinking that this is simply an update of *The Set of the Sails*. However it soon becomes clear that this is not about square-riggers but about Alan Villiers. Kate Lance writes, "his works will always be remembered for their passionate commitment to an extraordinary era. But despite its historic value, some of it lacks human depth".

Very early in the book one realises that his writings are shaded to enhance their commercial prospects. It is not that his books are misleading but he tells the stories against his view of reality. Additionally with the passage of time social values, prejudices and personal issues have changed and Alan and his writing is seen from a modern perspective. "He would often bend the truth to improve a yarn. But it became a habit."

The second half of his life, post World War 2 until his death in 1982, is covered in detail. He had a worldwide reputation as a writer and explorer and in his later years became involved in many initiatives associated with sailing ships. This part of the book is perhaps more interesting to his admirers than the first, simply because it is new writing and readers will already have covered the early ground. Nevertheless, as an exercise, reading *The Set of the Sails* in parallel with a second reading of *Voyager of the Winds* gives a much better understanding of Alan. The two books compliment each other.

This is an excellent biography of Alan Villiers highlighting various aspects of his life, including intimate facts of his experiences and scrutinises his personality in some depth. Kate Lance in writing *Voyager of the Winds* has more than presented the story of Alan Villiers, she has written a book that complements his writings and adds to the understanding of the age of the square-rigger.

*Christopher Nash OBE*



## Book Review - The Telescope: A Short History

By Richard Dunn

Published by The National Maritime Museum,  
London.

Hardback: 192 pages, 61 illustrations.

Price: £12.99.

ISBN 978-1-906367-04-6.

Available from The National Maritime Museum.

Telephone: 0208 312 6790

As the title suggests, this is a short history so that any reader looking for the details of the mathematics of construction of a telescope will be disappointed. On the contrary, the book sets out to trace not only the stages in development of

a sighting tube from the original design of an appropriate lens arrangement but to also indicate the multitude of uses that have been found for such a system. As such, whilst it obviously took considerable research, it is an easy read.

This volume has been published to coincide with the International Year of Astronomy (IYA09) organised under the aegis of the IAU and UNESCO. This special year will undoubtedly have many events designed to interest the Astronomer, some of which might well attract the Surveyor.

Six chronological chapters cover: The birth of the telescope 1608-1700; The telescope and the imagination 1608-1700; The reflecting telescope 1610-1800; Perfecting the refractor 1700-1800; Global domination 1720-1900; The telescopic view 1720-1900.

These skip swiftly through the various claims for the origination of the telescope circa 1608 with no one definitive inventor although the scales do appear to come down in favour of Lipperhey. Certainly by 1609 the possible uses were being developed and exploited by, among others, Galileo. The various individuals who built the picture over the years with gradual developments particularly in the quality of the lens both in its glass and in the grinding of the surfaces, are all briefly introduced and many are illustrated. By as early as 1840 the Moon was recorded by photography through a telescope and hence became an integral part of the study of the heavens. As such it became a means of eliminating the personal sighting error element that troubled not only the astronomer but also the surveyor.

Almost every conceivable use of a telescope or binoculars is mentioned but with little detail. For example the surveyor who has used a telescope in his theodolite or level since soon after its introduction, will be disappointed to find just five lines of mention spread over five different pages. It would have been appropriate to have something about the wide range of diaphragms including how to replace a spider web version, and indication as to how various versions could be used to determine horizontal and vertical distances in addition to angular ones.

Numerous references are made to publications in which the telescope featured in some way. These range from *Alice in Wonderland* to the *Young Gentleman and Lady's Philosophy* of 1759. Among the illustrations are several amusing cartoon type satirical examples of the use - or misuse - of the telescope.

An interesting easy read although even as a "short history" its worth throughout might well have been improved with a little more depth.

J R Smith

# 80 Years Ago

Mike Nolan's research has brought to light the following summary of the state of development in air survey 80 years ago. It is interesting to wonder what people in the year 2089 might think of today's 'cutting edge' technology.

## **SUMMARY OF ENGINEER AND SIGNAL INFORMATION 1929-1938**

**No. 2, 1929.**

### **SECTION V - SURVEY.**

#### **ARTICLE 18 - AIR SURVEY.**

The year 1928 has seen the consolidation of the position as regards plotting detail from air photographs by what is known popularly as the "Arundel" method. This is described in "Professional Papers of the Air Survey Committee-No. 3, Simple Methods of Surveying from Air Photographs" by Captain M. Hotine, R.E. (H.M.S.O.), and a further professional paper on the same subject is now in press.

The great point about this method is its simplicity and, given a topographical stereoscope anyone can, after practice and provided the stereoscopic attributes of his eyes are normal, plot contours from a pair of overlapping photos with the same facility as he could interpolate contours with a plane table, liberally provided with spot heights, by clinometer methods.

The accuracy of the contours so plotted by stereoscope, and of the detail in plan, is favourably comparable to that attained by ordinary plane tabling methods at topographical scales of the order of three inches to one mile.

The essential for the air photographs to be of any value for this method of plotting by a "control plot" is that they shall overlap at least 60% fore and aft, and that the pilot flies as straight and as level as is humanly possible. Provided these desiderata are attained, the distortion problem in country where variations of height do not exceed two to three hundred feet, is more or less solved.

Experiments in rapid plotting by this "Arundel" method lead to the conclusion that a small issue of maps in one colour, showing all essential detail over the enemy lines, may be expected within nine hours or so of the order to commence, provided conditions are favourable and the air photos well taken; and that the essential 60% overlap has been maintained. This premises a normal trig control and spot heights of the order of 3 or 4 per photo for stereoscopic contouring. Such an R.E. development will largely solve the R.A. Survey problem as regards range, but not as regards bearing, for which the artillery must still depend on ground instrumental methods.

#### **ARTICLE 19 - FIELD SURVEY.**

A.C.I. 65 of 1928 has settled the War establishments of the two types of Field Survey Company, R.E., which are to take to the field with an Expeditionary Force (Small War).

This year, Royal Engineer Officers have taken part as D.A.D. Surveys of a Corps, in every major exercise in which the R.A. Survey Company has been engaged, and valuable lessons have been learnt.

"Survey shooting" by the R.A. is greatly assisted by the production of essential data by R.E., and in consequence, this development in modern gunnery requires study and training by both arms in close co-operation.

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**RACING - HOSPITALITY - EVENTS**



## Tolworth - Block A

### Some Personal Notes Occasioned by the Demise Thereof

By "An Admirer"

The Directorate of Military Survey (D Mil Svy), including Survey 2b i.e. the MOD's Map Library, Movement Order from Eastcote to Tolworth was dated March 50. The earliest record held of the site was a Ministry of Works plan dated 1948. The Order consisted of just a couple of pages of simple instructions, unlike the paperwork for the shift to Feltham 53 years later.

Survey 2b, at least, moved from a former factory at Eastcote, north London. The Directorate had previously been dispersed and Survey 2b's 'temporary' move was the opportunity to bring it together until purpose-built accommodation was completed.

The movers were a troop of off-duty Irish Guardsmen gaining enhanced remuneration courtesy of Pickfords. The official alternative was that the Army (the same Irish Guards who were barracked in the vicinity) would move the Library. However "Security" specified that armed guards must be positioned within line-of-sight of each other over the entire route. So Pickfords got the job. Moving a plan press complete with contents was simple enough, one burly guardsman took a corner each and heaved enthusiastically and they were unloaded at Tolworth in the same manner. Again the "North American" move in 2003 was somewhat more complex and took current Health and Safety legislation into consideration.



*The main entrance shortly after closure.*

In the early 1960's it also developed a Reproduction Material (Repmat) Library based on material from the original store at Ascot.

In 1962 the Directorate moved away to Feltham, where it was joined by 2 Survey Production Centre RE that had remained at Eastcote and 1 Survey Production Centre RE that had been based at Bushey Park. Tolworth continued to be known as Survey 2b until 1967 when it became the Map Research & Library Group (MRLG) as part of the Mapping & Charting Establishment (MCE RE) that had been formed by merging the two Survey Production Centres. There was an uplift in 1978 at which point all the room numbers changed (some of the proper "old timers" still refer to Room 56 etc) to the recently well known 2/12, 7/01 etc based on the Spur/Room system. MRLG was split into Acquisition & Library Group (plus parts of Facilities Management Group) in 1992.

Almost from day one, new recruits were informed that a move to Feltham or, in the early 80s, even Glasgow, was definitely 'on-the-cards' and not to make firm plans when it came to areas in which to buy houses. However, the reins were finally picked up in early 2001 after the acquisition by MOD of the entire Tolworth site made it possible for MOD to sell it off.

The Directorate was based in Spur 1, the nearest to the Toby Jug pub, as was the US Army Map Service Liaison Officer and the entire "Secretariat", i.e. Surveys 1 to 4 and 6. Survey 2b took up the rest. "Map Research" took place within the Library as the maps were catalogued.

By the mid 1950s, "Tolworth" had developed the pre-war German concept of "map research" into a highly specialised process, primarily to generate targeting coordinates. However, this generated a vast amount of corporate knowledge of all aspects of map construction, cover, use and accuracy worldwide.

As an aside, sharing the site with the Ministry of Agriculture, Fisheries and Food (MAFF) to which MoD paid rent and the DHSS, all sharing a telephone exchange called Toby Jug, had it's lighter moments with calls being taken by MOD staff from zoos enquiring about the regulations for importing exotic animals and irate people on social security demanding to know why their giros hadn't arrived.

Once it was known that the MOD was leaving, the local rumour mill began within the building and the general locale. Firstly Whitbread, who owned the Charrington Bowl, were ready to buy the land from the MOD but this fell through when Kingston Council vetoed the move due to "underhand moves" by the MOD! Then Tesco got involved but only agreed to buy if the MOD were out by 30 June 2003. As Tesco had demolished the Toby Jug within a week of purchase and, it was rumoured, MOD would incur costs for every day it was in possession after then, minds concentrated wonderfully.



*The wreckers move in.*

Meanwhile, building work on the new MacLeod Building at Feltham, which was designed to house all the Tolworth facilities, started in mid 2002. The actual move of the hundreds of plan presses, other equipment and stores began immediately after the 02/03 Christmas/New Year break. It was planned and organised by Ron Shepcar with Paul Ayers masterminding the Library move by a company called North American - no Irish Guardsmen this time!

The first Spur to be cleared completely was 7/01 and gradually spur by spur the remainder was moved. I moved at around 10.30 on Tues 17 March 2003, having completed 16 years, 5 months and 16 days of an original '11 month' posting. The last to go were the Geographic Requirements Branch (GRB) from Spur 1 who in the weeks leading up to their move had used the opposite end of Spur 1, formerly Book & Doc, as an indoor cricket pitch.

I regret that I don't know who the actual last person out was, the day we left or where the front door keys went, but the original "MRLG" name board is in safekeeping although in two parts after the "RE" bit had previously been cut off for security reasons, the 'A' above the front entrance is in the MacLeod Building corridor leading to the current spur, sorry "Map Store", numerous 'Perspex' door numbers are secreted in drawers and office spaces; mine's under my bed and a fragment of brick is in safe-keeping awaiting a particular retirement in around three years time.



*A week later and the 'Tolworth Story' is over.*

However, it was felt that such a monumental occasion deserved slightly more than the usual send off so, after a huge amount of preparation, in February 2003 more than 200 "Old Tolworthians" attended the Knox Building Wake, a remarkable Saturday. Using the combined corporate memory of those present it was estimated that around 500 people had worked at Tolworth at various times although this figure is in some doubt. What isn't in doubt is that, until the mid 1960s, "Tolworth" led the way with

accurate long-range targeting, it housed the greatest concentration of graduate geographers in one place in the UK and the second most comprehensive collection of current topographic mapping anywhere in the world. Not bad for a nondescript little spider building next to the A3.

P.S. "Toby Jug" became the phone number because when the Directorate moved in there were no other specific landmarks except the Toby which was one of the 1930s "road houses" that everyone had heard of when driving out of London on the arterial roads.

**Post-script.** The above was written shortly after the move as a personal recollection of the building and recording conversations in the months before.

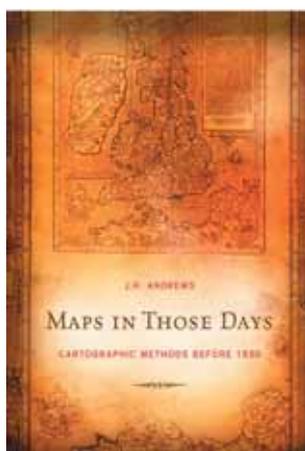
The almost unseemly haste to remove ourselves from the building soon subsided once we'd left as one planning wrangle or intervention by local MP after another scuppered plan after plan and so the old place struggled on. The strip light left on in the photocopying room in Spur 5 was finally extinguished in the Autumn of 2003, gradually the trees grew, windows were smashed (despite the film inside them designed to deflect shrapnel), more rubbish was chucked over the fence from Hook Rise South, the detritus of wooden presses left by the movers in the car park decayed, the front entrance was smashed in and the brambles outside Spur 1 (used annually for many years by one enterprising former SMRO for her excellent bramble jelly) took control.

Demolition finally loomed after the legislation governing payment of council tax on unused commercial property changed with the 2008 Budget. Suddenly all that unusable floor space was costing Tesco an awful lot of money and so in April 2008 the Metro Demolition bull-dozer moved in. First to go was Block B, the old MAFF building, plus a corner of the old Despatch Room in Spur 4, almost it seemed as a test. Then a creeping barrage advanced from Spur 7 down the building with everywhere west of the Main Entrance going in just over a week and the southern halves of Spurs 4 to 1 going one-by-one. Oddly enough the coup-de-grace was delivered to the former Deputy Director MRLG's office in Spur 4 North. By the middle of May 08 Block A consisted of three piles of rubble, pulverised brick, re-inforced concrete and roofing felt. The entire Government Buildings site was flattened when Block D, the Canteen, bit the dust in around June 08. As I write the site awaits its future.

HOWEVER I suspect, unbeknown to any of its former residents, that Block A had a very rare claim to fame! Its toilet windows were a very rare example of the genre and a window collector came and took some away to add to his collection, so the old place lives on!!



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## MAPS IN THOSE DAYS

*Cartographic methods before 1850*

**J.H. Andrews**

For some years the emphasis in map-historical literature has been either on traditional cartography or on various cultural, social and ideological aspects of the mapping process. By contrast, few recent books have described what early cartographers actually did. *Maps in those days* addresses this question. It deals with non-thematic maps of all kinds and of all parts of the world from earliest times to the mid-19th century, with particular reference to classical antiquity, the Renaissance and the Enlightenment in Europe and in countries of European settlement, especially Britain and Ireland. A brief introduction to map history is followed by a review of the scientific or pseudo-scientific presuppositions that cartographers have brought to their task. Later chapters deal with different phases of production - sketching, instrumental surveying, plotting and projection. The contents of topographical, military, exploratory and maritime maps are distinguished, and consideration is given to methods of relief representation and to placenames. Production then gives way to presentation as maps are seen in the course of being copied, re-compiled, edited and embellished. This book should interest researchers who use early maps as historical sources as well as connoisseurs of cartography for its own sake.

**J.H. Andrews** was formerly an associate professor in the Dept. of Geography, TCD.

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# GEOINT Omelettes in New Zealand - The Meaning of GEOINT for the New Zealand Defence Force

By Steve Pyatt, Director Geospatial Intelligence Policy and Plans for the NZDF

For those who remember my last article on Geo in the New Zealand Defence Force (NZDF) for Ranger (2001), forget everything except our relative size as it's all changed. We now have the 'Geospatial Intelligence Organisation' (GIO) and rather than outsourcing production, most military requirements are now met in-house. I may explain more of this another time but for now I'd like to share with you our understanding of the current phase of our professional discipline, Geospatial Intelligence (GEOINT).

To quote a famous (but now retired) NZ politician (Prebble), "I've been thinking"! Well several of us have in NZDF Geo management as we try to grasp what GEOINT means for us down here. I mention this because those involved in this new Intelligence discipline need to be clear what we mean by it as the term means different things in different countries and you can be talking at cross-purposes if you aren't aware of these differences.

The term was coined by General Jim Clapper when he was Director of the US National Imagery and Mapping Agency (NIMA) and transformed it into the National Geospatial-Intelligence Agency (NGA) in 2003<sup>1</sup> to embrace his desire to have a new intelligence discipline. He wanted to truly complete the combining of IMINT and Geo that NIMA started, so that this discipline could provide the 'eyes' to compliment SIGINT's 'ears' and their new building design reflects this 'watching' theme<sup>2</sup>.

The US definition of GEOINT is:

*"The exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth."*

This would fit how the NZDF treats it but NGA's definition is qualified by

*"The term GEOINT encompasses both the standard, or traditional, and the specialized (integrated) capabilities of imagery, IMINT, and geospatial information"*

and NGA do treat everything that they do as being 'GEOINT' e.g. traditional aeronautical and hydrographic chart production, and could be graphically viewed as seen in figure 1. But note that in the 'NGA History' they say

*"The combination of images with other information, such as geographic references, produces **geospatial intelligence**, an enhanced version of imagery intelligence."*

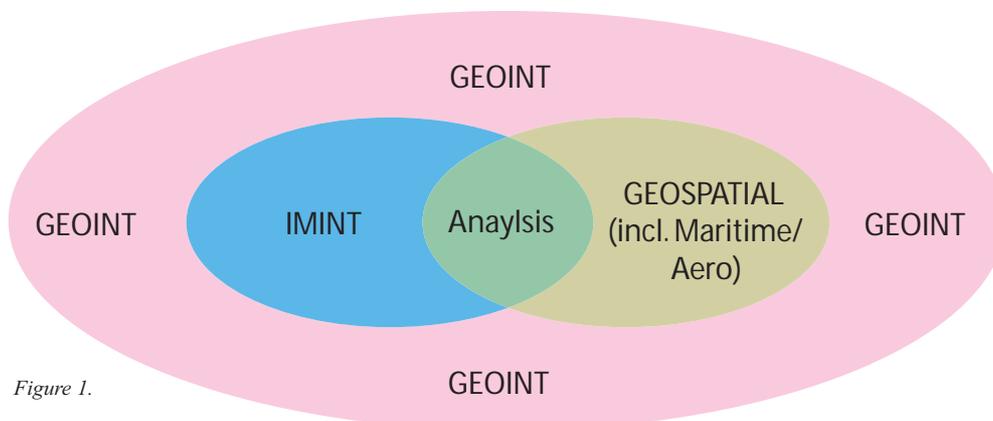


Figure 1.

<sup>1</sup> Nov. 24, 2003 the President signed the 2004 Defense Authorization Bill, a provision of which authorized NIMA to change its name to the National Geospatial-Intelligence Agency (NGA).

<sup>2</sup> The new NGA Campus East looks like a huge eye when viewed from above!

Which implies that it should be something ‘on top’ of Geo and IMINT and that’s how the UK sees it.

The Canadians have a similar definition but a slightly different view. Their definition is:

*“The exploitation and analysis of imagery (all kinds) geospatial information meteorology and oceanography to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. It consists of imagery, imagery intelligence, geospatial, meteorological and oceanographic information”.*

All products from their Mapping and Charting Establishment and Canadian Forces Joint Imagery Centre are ‘GEOINT’ products but not all activities within them are considered to be GEOINT. They have three progressive levels in their workflow: Foundation; Integration; Fusion. Most of their Geo, IMINT and METOC happen at the ‘integration’ stage. The ‘fusion’ stage is where they combine other intelligence information for further analysis.

The UK definition, and note - Defence only but in reality it goes beyond just MoD, is:

*“Intelligence derived from the analysis and exploitation of geospatial information and imagery to describe, assess and visually depict physical features and geographically referenced activities of Defence interest.”*

And this could be viewed as seen in figure 2.

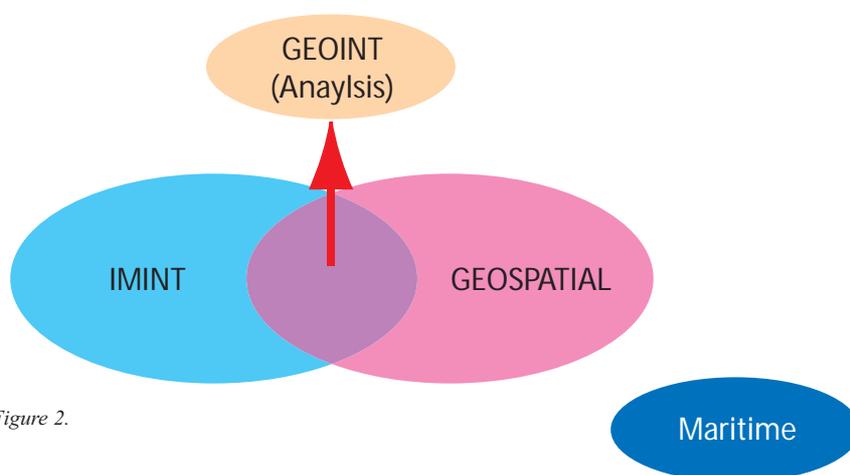


Figure 2.

The Australian definition is currently:

*“Intelligence derived from the exploitation and analysis of imagery and geospatial information about features and events, with reference to location and time”*

but this is about to change. This is similar in effect to the UK definition.

When we were trying to decide what it meant for us in New Zealand, my deputy suddenly said “it’s all omelettes and eggs!” and went on to explain that GEOINT is like an omelette. You can’t have an omelette without eggs but you can have eggs and milk/butter without them being in an omelette (she has just become Mrs Beaton so cooking is appropriate!). She explained her analogy with geospatial being the eggs, the critical ingredient of the ‘GEOINT’ omelette and the essential requirement for butter/milk (imagery). Using this analogy of how the NZDF views GEOINT, eggs aren’t omelettes; you might be working on an ‘egg’ that never ends up in an omelette. Some other nations view anything geo or imagery as being ‘GEOINT’. We like to keep the parts of the geospatial profession that are similar to any non-defence/intelligence application of geospatial skills<sup>3</sup> separate. These provide the critical foundation for GEOINT but are not GEOINT in themselves, or council GIS work would be ‘GEOINT’.

You can add other things to an omelette like ham (SIGINT)\*, mushrooms (HUMINT)\*, or anything else you choose (OSINT – Open Source Intelligence). This makes a further development of the basic (essential) omelette and in the Intelligence world is known as ‘Multi-Int’. Multi-Int is often

<sup>3</sup> E.g. Routine mapping, charting and GIS as used by councils etc.

\* I managed to resist the temptation to have ‘radio hams’ and spies kept in the dark!

conducted in GEOINT agencies by bringing other sources into the analysis phase.

So the current NZDF definition of GEOINT is:

*“Intelligence derived from the exploitation and/or analysis of integrated imagery and geospatial information about features or activities of defence, security or foreign intelligence interest, put in the context of location and time”*

Graphically we see this comparable to the other Nations as shown in figure 3.

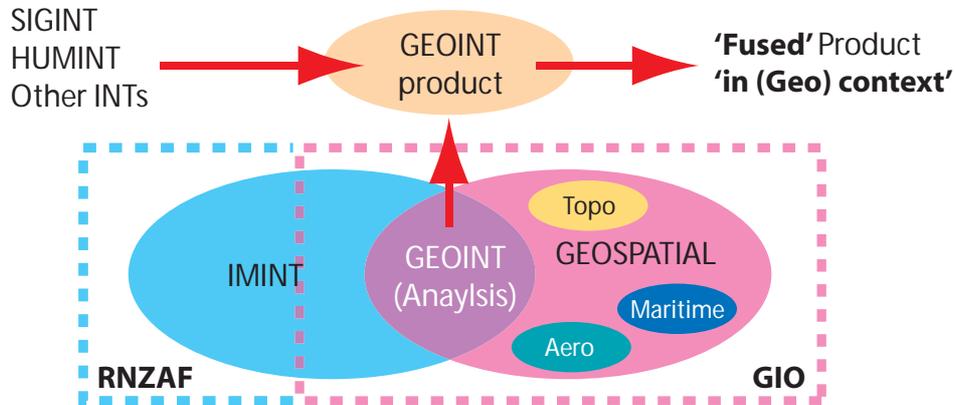


Figure 3.

Within military circles, the progression or hierarchy working up from raw data through the stages of refinement and analysis is:

Raw data > processed data > information > **intelligence** > knowledge.

So taking this logic, GEOINT has to be something above (geo or imagery) data and information to be 'intelligence'. This is why we are treating it as the 'bit on top' of geo/imagery and not including the underpinning disciplines.

Examples and exceptions:

A cartographer, doing traditional cartography in a similar way to civilian cartographers (even if using modern techniques) to produce a map isn't, for us, a GEOINT analyst.

A geo-referenced image isn't a GEOINT product until it has had some (geo) intelligence added to it e.g. geonames, contours etc. 'Image maps' are borderline, depending on how much enhancement the imagery has had.

What this does mean is that even though the term and discipline of GEOINT are new, some older products can be what we now call GEOINT even though the term didn't exist then e.g. WW1 imagery products where analysis and intelligence about enemy positions and terrain features has been added (like the Gallipoli ones) or the WW2 examples in books like "Adolf Hitler's Holiday Snaps". Some of the latter are 'IMINT' products but some clearly have the geo component added so are what we now call GEOINT.

Identifying military equipment in imagery, without any geo component other than location, is IMINT not GEOINT.

There can be other combinations of Intelligence disciplines and geospatial information e.g. 'Geo-SIGINT' and Geospatial Metadata Analysis (GMA), but these aren't GEOINT but may be Multi-Int.

Multi-Int is another level again and GEOINT often now feeds or even underpins Multi-Int. In the USA, Michelle Weslander said "Multi-Intelligence (Multi-INT) and horizontal integration are key concepts for unleashing the power of geospatial intelligence (GEOINT) and facilitating collaboration between personnel from the intelligence disciplines, including analysts and collection managers. GEOINT provides the contextual foundation for Multi-INT, which is the collaboration of two or more intelligence disciplines. An example is the signals intelligence (SIGINT) and GEOINT disciplines working together and sharing data to provide more complete information to customers".

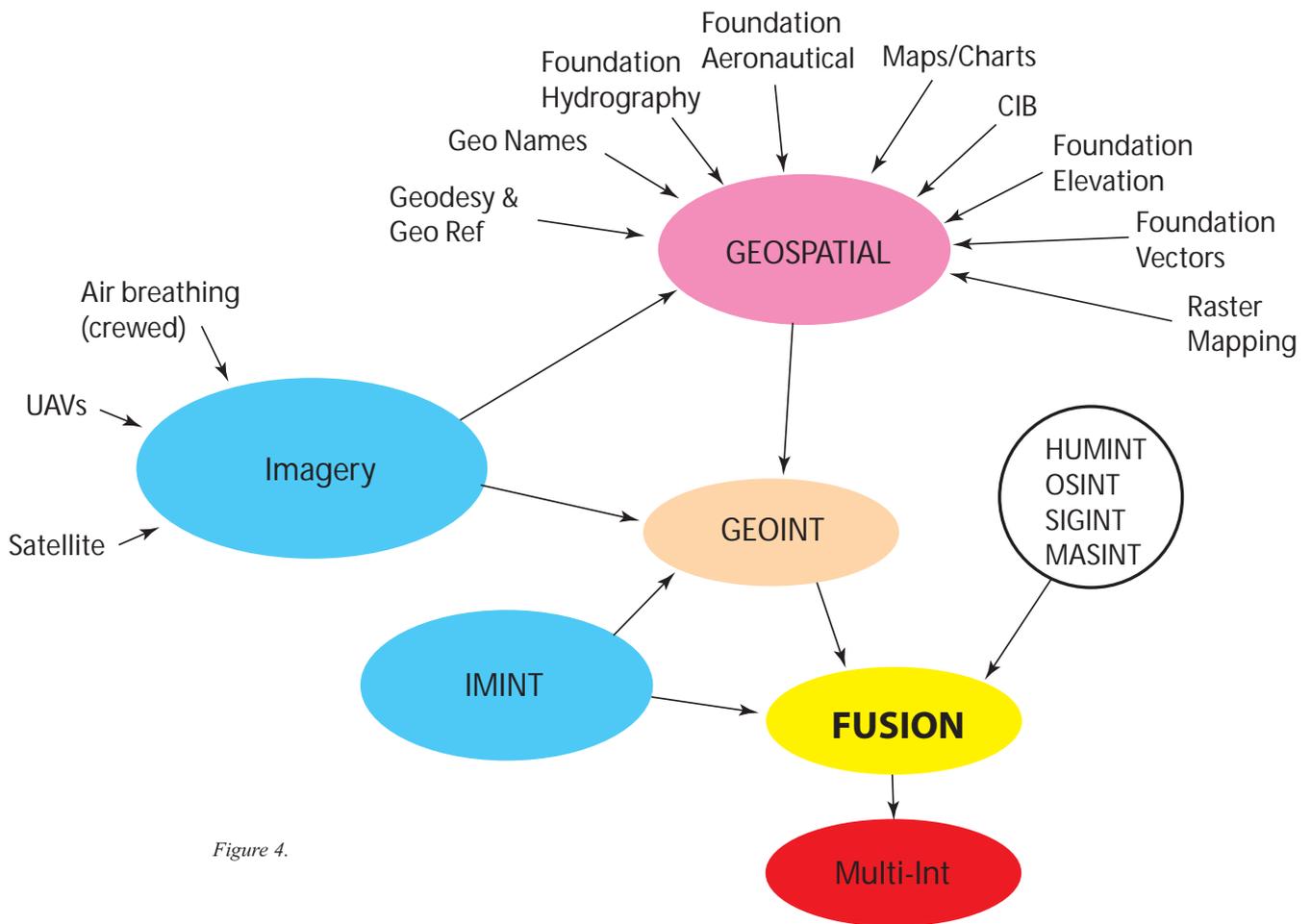


Figure 4.

Taking this and other thinking on GEOINT and Multi-Int, NZDF is treating GEOINT as a discipline above IMINT and Geospatial but below Multi-Int, see figure 4.

There is no ‘right and wrong’ in all this. It is just understanding that GEOINT means different things to different people. Within each nation it may be defined differently for budget line or political reasons and that’s fine if that meets the National need. For example, in NZ, the National lead for GEOINT does not do much geospatial processing, and relies upon the NZDF GIO for traditional cartography and other geo skills. So we need to be clear on the Geo/GEOINT division to enable defined roles to be agreed. It is appropriate for them to have the lead as they have the established foreign Intelligence links, partnerships and communications networks and already do some aspects of GEO-SIGINT.

So that is how we see GEOINT in the NZDF. We still have eggs and milk existing as they always have done but we are now trying to cook a nicely proportioned omelette that is full of flavours!

*The views expressed are those of the author and don't necessarily represent those of the NZ National Authority or overseas agencies.*

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## The Story of Military Surveyors

The project to tell the Story of Military Surveyors (note the possible change of title) is slowly but surely now underway. We are attempting to ‘personalise’ it as much as possible and to that end would appreciate any anecdotes that would enliven the story. It is intended that the final work will be generously illustrated but to do so we need photographs, particularly those showing people doing something technical that include the equipment. Additionally we are keen to obtain photographs showing the various camps and barracks that Survey units have occupied over the years. We are happy to receive images in soft or hardcopy format and will return promptly all originals. If you can help please contact the editor – details on page 2.



## The Sandham Memorial Chapel

A great artist records his memories of the First World War, and how the Memorial Chapel helped to redeem his 'lost self'.

*By Michael Gowlett*

*National Trust volunteer at the Sandham Memorial Chapel*

In rural north Hampshire there is a well proportioned but modest brick building situated in a garden with fruit trees, flowers and wild orchids. The central part of the building is the Oratory of All Souls, with wings on either side originally to accommodate the needy elderly of the parish but which now serve as accommodation for the National Trust custodians, one of whom must be permanently on site. The inside walls of the Oratory are decorated with a magnificent series of paintings by the war artist, Stanley Spencer.

The site is now known as the Sandham Memorial Chapel at Burghclere. It came about as a 'marriage' between individuals and circumstances. John Louis Behrend, a wealthy patron of the arts who lived in Burghclere wished to construct a memorial to his brother-in-law, Lieutenant Harry Sandham, who had died of disease contracted in the Great War in Salonika. Stanley Spencer, already a well-known artist, had seen images of the frescoes in Giotto's Arena Chapel in Padua, Italy, and he was ambitious to create his own interpretation in England. I have seen it in print that Giotto's chapel is 'perhaps the greatest work of art produced in the Christian era' – maybe an extravagant claim considering such as the Sistine Chapel and the David statue but its reputation is very high. Spencer's ambitions were more modest, but it is said that when he got the final go ahead for the Sandham Chapel he exclaimed "What ho, Giotto!" Anyway, with the input of a leading architect, Lionel Pearson, work began on the construction at Burghclere in 1926 and Spencer completed his work in 1932.

There is plenty of written evidence about its status as a work of art. It has been described as one of the top twenty British art icons of the twentieth century, there have been recent glowing tributes in the Guardian and Daily Telegraph, professors in art departments of American universities use their websites to encourage their students visiting England to go there. Perhaps most significantly of all, the chapel was featured in an episode of the BBC TV art series 'Imagine', hosted by Alan Yentob. This focused on people who look after great works of art, and a day in the life of Amanda Findlay, the charming Glaswegian who is one of the two custodians of the chapel, was featured along with people from the Hermitage in St. Petersburg, the Louvre in Paris, the Uffizi Gallery in Florence and Angkor Wat – pretty good company, you will agree!

An introduction to Stanley Spencer may be helpful. He was born in 1891 in Cookham, Berkshire, and lived most of his life there until he died in 1959. He never went to school as such, being taught in a potting shed in the family garden by his eldest sister. His promise as an artist was recognised early and he was eventually accepted by the eminent Slade School of Art. The narrowness rather than the quality of his education caused problems in his acceptance by the Slade, but it is to the credit of the School that his artistic promise overcame his limitations in some of the entrance exams. His principal training was in drawing and even his detractors, and there are some, appreciate his skill as a draughtsman. It caused great surprise, however, when he entered a painting for the Slade annual exhibition in his fourth year, which won first prize. He had always set off every evening for home, which earned him the nickname 'Cookham', and it was there that he painted. His professor wrote that '...he has the most original mind of anyone we have had at the Slade and he combines it with great powers of draughtsmanship'. High praise from someone who disapproved of his style! His reputation grew following the Slade, which developed further after he joined the Army soon after the outbreak of war. Being five feet tall and six stone in weight he was not considered suitable material for the Royal Berkshire Regiment and so he joined the Royal Army Medical Corps as an orderly, first at the Beaufort War Hospital near Bristol, then with a Field Ambulance unit in Macedonia. As physical standards were lowered he was later allowed to enlist in the Berkshires for active service in the last few months of the war. During his service he was appointed an official war artist, as he was in the Second World War. He remained a private soldier throughout his military service.

Pleasing though the architecture and garden is, the attraction of the memorial chapel is the wonderful series of paintings that cover the interior walls. Spencer worked at Burghclere from 1926 to 1932, though perhaps not continuously. Some of the paintings were completed in his studios at Cookham or in his rented house at Burghclere, and were later placed on the walls on wooden frames. But the huge pictures high on the north and south walls, and on the east wall, were painted in situ (using rickety looking scaffolding, from photographic evidence!). One group of paintings deals with Spencer's experiences as a medical orderly at the Beaufort War Hospital in Bristol, another records events with the Field Ambulance in Salonika (Macedonia). These are linked by a picture called 'Kit Inspection' where Spencer had basic training at Tweseldown Camp near Farnham before embarking for the Middle East. (This picture will bring back memories to many soldiers who experienced basic training in the 1950's or 1960's!) Another, 'Map Reading', will be of interest to military surveyors. It shows the only officer featured in all of the paintings sitting on horseback consulting a map, while soldiers sit or lie or pick berries all around him. The masterpiece, though, fills the whole east wall and it took Spencer a year to paint. 'The Resurrection of the Soldiers' shows dead soldiers and animals resurrected, with the men placing wooden crosses at the feet of Christ who is sitting in the middle distance, as a token of their sacrifice. There is religious symbolism, not immediately obvious, in some of the other paintings as well.

The theme, except for 'Resurrection' and to some extent 'Stand To', is of soldiers going about routine and menial tasks, but the viewer can detect a sense of tension in the posture and faces. "Here I am making beds, dressing wounds in a hospital, striking camp, but where will I be tomorrow?" they seem to say. The paintings, fulfilling a design which Spencer conceived while on active service, helped to purge his mind of the horrors he had seen. 'The Burghclere Memorial', he wrote, 'redeemed my experience from what it was; namely something alien to me. By this means I recover my lost self.'

So, DSA members and Ranger readers, I recommend that you visit the Sandham Memorial Chapel. You may have seen it before; if so, go again. As a volunteer I see new things on every visit. You may not like it – a few of the 10,000 or so annual visitors don't. Reactions range from '...is this all there is', discounting six years of work, to 'shock and awe', in the cultural sense! Now is the time to visit because it's at most twenty minutes drive from Hermitage. It will cost you nothing if you're National Trust members, £4 if you're not.



# What's New with GIS?

## Reflections from New Zealand

*By David Swann*

Those of you that have been following the Swann odyssey from Military Survey to ESRI in California in 1997 might now be interested to learn that the Swann family has now set up camp in New Zealand where I now head up ESRI's distributor in New Zealand – Eagle Technology.

It is extremely interesting to move from a focus on defence and intelligence applications of GIS to supporting GIS users from every domain. Of particular note is that in almost every domain, GIS is shifting from being a specialist technology on the periphery of an organization to being a cornerstone of the business – whether that business is running a city, running a government department or making a profit in the private sector.

To be a cornerstone technology, GIS has had to become a stable enterprise technology, able to support mission-critical applications. But for the organization to take full advantage of that enterprise GIS, the organization itself has had to change – and change is always challenging.

At ESRI I had responsibility for international Defence and Intelligence business development which provided a very privileged opportunity to travel the world seeing how GIS was being used. Meetings with users and prospects were often based on two lines of dialog:

- How can GIS fit your existing requirements?
- Is your (defence or intelligence) organization prepared to change to take advantage of the new capabilities of enterprise IT and enterprise GIS?

I can almost feel the bristling from the more staid amongst the readership. “How dare that young (all things being relative) man imply that the military should change to take advantage of computers... Bah! Humbug!”

That indeed was often the reaction from the front row of the seminar audience. But behind the glare of lights reflecting from thinning crowns, I'd often see the thrusting young officers in the back showing real interest.

One reason for the diverse reaction was the digital divide. Those in the front row were Digital Foreigners, those in the back row were Digital Immigrants and there wasn't a Digital Native to be found. For those puzzled by the terminology here's a little test. Which do you prefer?

	Digital Foreigner	Digital Immigrant	Digital Native
Reading the news	Newspaper	Use Both	CNN.com BBC.com
Viewing the news	Television	Use Both	CNN.com BBC.com
Visual Entertainment	Television	Use Both	You Tube
Deliberate communication	Written Letter	Use Both	E-mail
Ad hoc communication	Telephone	Use Both	Twitter
Planning your vacation	Atlas	Use Both	Google Earth
Map reading	Paper Map	Use Both	In-Car Navigator

(That last point is an interesting one. With the rapid growth of in-car navigation systems, this will be the first generation of children that has never had to suffer their parents squabbling over a map. Who says change is a bad thing?)

There's another test: You might be a digital native perhaps a digital immigrant if you get this message; if on the other hand you thought the editor just missed a random piece of nonsense, you're probably a Digital Foreigner.

Any time human beings are categorized; there is a risk of causing offence. If the purpose of categorization is to define exclusionary groups, the consequence will likely be divisive. My intent is to highlight the differing usages and expectations of IT in order to foster understanding. Only then can we address some of the human and technology challenges that arise when requirements and expectations are not aligned.

So what does it take to be a Digital Native? It is the Internet that has offered our children new ways of absorbing information. In the same way that learning a new language is so much easier before the age of ten, so those who accessed the Internet when they were younger than this will have learned the new 'language' of the Internet. Since broadband Internet connections only became commonplace about eight years ago, that suggests that there are few Digital Natives over the age of eighteen.

Fred Stein from Mitre Corporation is regarded as one of the fathers of Network Centric Operations – the revolution in military affairs precipitated by computers. He taught me a great way of starting a seminar. He'd look across the audience and say "there isn't one of you in the room young enough to understand how our children interact with the web."

He went on to explain why that's so important. Defence systems tend to be acquired, designed and built by 'senior' people. The bigger the system, the more senior. The chance of those senior people being Digital Natives is almost zero. Yet who will be using those systems? Increasingly, the young Digital Natives – who will then be utterly underwhelmed at the nature of the system they have to use.

The challenge is that this isn't just a philosophical divide. Go take a look at your child or grandchild as they use a computer. You'll be frustrated because they'll have many things going on at once. They'll have several 'chat' sessions going; they'll be 'twittering'; they'll have their 'blog' up; they'll have a 'You Tube' video running; they're listening to 'iTunes'; they'll have a couple of homework assignments under way. Your response is that this is madness: they can't possibly be learning anything; this is symptomatic of the state of schooling today; it wasn't like this when I went to school.

You missed an important point. Our children's brains are wired differently to ours. We were raised on information as a product: the page of a book; a television program; a paper map. Product-based information delivery is serial in nature: you have to finish one product before you can move to the next product.

Our children have been raised to handle information as a service; as a stream from the Web. This is a radically different model. They've learned to handle parallel streams of information and you'd better believe that they are absorbing this information far faster than we ever could.

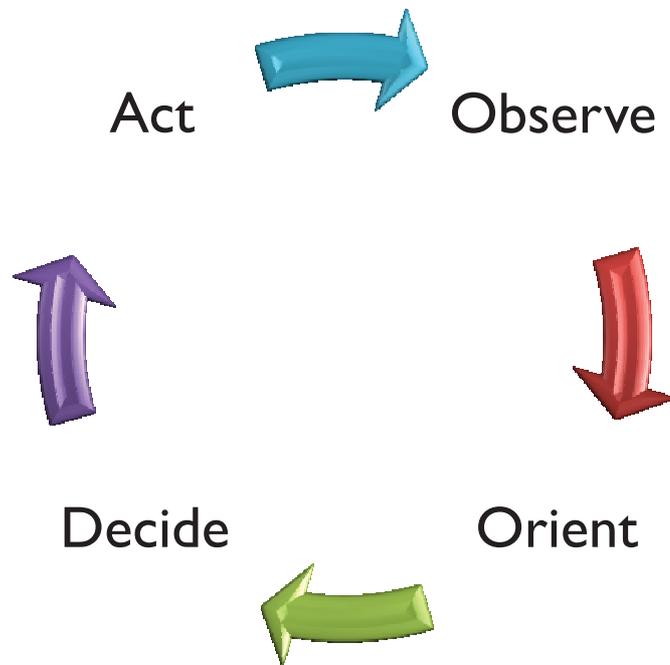
There's another important advantage of this parallel delivery. We needed to read the radio chapter of a physics book. Then we'd read a military history book. Then we'd look at the Atlas. To synthesise connection points between those disciplines was challenging.

Our children have a You Tube history video running (yes, you can be educated through You Tube!); as they're navigating using Google Earth to see where that happened; as they're 'chatting' with their physics class to understand why the radios of the time couldn't get that critical information through on time. All at the same time! So the synthesis is much easier; they see the 'big picture' more easily.

So what on earth has this got to do with GIS? Everything!

Think about the OODA loop – the classic 'Observe-Orientate-Decide-Act' cycle at the heart of the military decision making process. GIS has been increasingly applied to accelerate this product-focused cycle – fusing observation products (imagery, video, intelligence reports etc) in the context of a map; providing rich analysis tools to provide enhanced orientation; enabling better, faster decision making; and ultimately communicating plans as overlays.

This traditional application of GIS certainly accelerates the OODA loop; but only incrementally. The very nature of the OODA loop creates information products within and between each step. As we have seen, the serial nature of information products creates real limitations.



If we deliver military information in the same context as You Tube, iTunes, cnn.com, (this is called a 'services oriented architecture') this will allow the parallelization of information services. So there is a service-based stream of 'blue force tracker', intelligence information, imagery, mapping, terrain analysis, RF coverages, wargaming information all flooding into a map-based display where the Digital Native is 'mashing up' or fusing information on the fly.

Digital Foreigners will reject this since their brains will be overwhelmed by the flood of information. A Digital Immigrant can learn to cope with the barrage of information. Digital Natives revel in the flood of information and will be able to make or at least support better, smarter decisions as a result.

This supports a new approach to the military decision making process – 'Adaptive Planning'. Instead of the single OODA loop, adaptive planning involves two asynchronous loops. The first is a variable speed sensor-wargaming-analysis loop which is almost entirely automated and can run as fast as the sensors are gathering new information. The second loop is a more deliberate process of passing orders to subordinate units – a traditional passage of orders but using GIS-based information services to speed up the process and improve clarity.



GIS services are at the heart of adaptive planning since they provide the naturally integrating framework against which all other information can be readily fused. These GIS services are streams of maps and imagery (just look at Google Maps to see what this looks like – but imagine that with up-to-date military data sets) coming from defence geospatial intelligence organizations.

Adaptive planning works. It provides a framework where observation, orientation and course-of-action development are continuous which then enables commanders to be proactive – iterating their plans continuously based on the best possible understanding of the current situation. Adaptive Planning also ensures that the human dimension of command and control is maximized; it creates the time and space needed for command processes to work despite the IT-enabled acceleration of the sensor – war-gaming – analysis loop. With the OODA loop, the technology-enabled acceleration of observe – orientate part of the loop puts incredible stress on the human-centric decide – act parts of the loop. But adaptive planning also represents change at the heart of military organizations and is therefore challenging.

I am now able to contrast the pace and acceptance of change across a wider range of organizations. It is ironic that the concerns of defence about mission-criticality tend to stall the change that would deliver more assured mission success. Other government organizations appear more willing to embrace change; commercial organizations constantly demand change. These organizations have learned to balance risk against reward and regard change as inevitable.

GIS down here in New Zealand has become pervasive across both government and commercial sectors. It is both an agent of change and an enabler of change. As I hope I've shown, this isn't just about technology; it's about how technology empowers different generations in very different ways.

One certainty – as the Digital Natives graduate from university and enter our military organizations, the pace of change can only accelerate. That might be a depressing thought for some – for those involved in the delivery of GIS, these are exciting times!



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## The Challenges Faced by 135 Independent Geographic Squadron RE(V)

*By SSgt M Brown, Permanent Staff Instructor*

135 Independent Geographic Squadron RE(V) (135 Sqn) can trace its roots back 60 years. The then 135 Survey Engineer Regiment (TA) (135 Regt) was established by Lieutenant Colonel Collins CBE RE on the 5th of October 1948, with the first attestation taking place in the September of 1949. By the end of that year, 135 Regt manning had risen to 30 and comprised of a Headquarters, Topographic, Cartographic and Lithographic Squadrons. Two squadrons were co-located with the offices of Ordnance Survey at Chessington and Southampton with the third at the London School of Printing. Many of the issues faced by Colonel Collins in the setting up of the 135 Regt remain today.

The Squadron mission is 'to provide two deployable Map Supply Troops and individual reinforcements in order to allow 42 Engineer Regiment (Geographic) (42 Engr Regt) to meet Defence Geographic Requirements.' This role is designed to support large-scale deployment, a size which is very unlikely in the current operational environment. 135 Squadron would find it difficult to fulfil its mission and deploy two troops: current Sqn manning levels and the attrition rate when TA soldiers are mobilised due to medical, dental and fitness shortcomings limit deployable numbers. Despite this attrition, the unit has deployed 27 soldiers in the past 6 years, with 12 of those in the last two. These deployments have been in various roles within the Geographic community and Corps wide to various theatres. The vast majority have been map supply, however, technical and staff roles have also been filled, such as technical individual replacements within a Geographic Support Group and liaison officers with US commands.

The challenges faced by the Squadron are numerous and similar to those in 42 Engr Regt. Common challenges are those such as recruitment, retention, skill fade, demands of annual mandatory training and keeping within budget. There are also additional challenges that being a volunteer reservist bring, such as balancing the needs of work and home life while aspiring to forge a career with the TA.

Being an independent unit brings additional burdens and benefits. With independence comes a degree of autonomy with which to conduct business, secure in the knowledge that 42 Engr Regt support is also close at hand for training and equipment support. Conversely, independence requires all functions attributable to a Regimental formation to be conducted by a small team within the Squadron HQ. This requires many TA soldiers to have secondary roles such as recruiting and logistic management, leaving few soldiers to actually carry out the business of Geographic Support.

One of the biggest challenges is to recruit suitable individuals into the Squadron. As a regional TA unit the recruiting policy is based around unit location within its environs. The Squadron takes in locally recruited soldiers and then trains them up to fulfil a Geographic Information Dissemination (GID) (Map Supply) role. It is difficult to recruit technically qualified individuals from the geographic industry who may have skills beneficial not only the Squadron but the Regiment and Defence as a whole. One possible solution could be to attain part National TA status which would allow for recruiting direct to industry and the targeting of trained individuals in disciplines such as Global Navigation



*In addition to GID activities, 135 Squadron maintains trade skills to mirror geographic technician specialisations but limited availability of training days do not allow for advanced specialist training to attain the same degree of competency as their regular counterpart.*

Satellite Systems, Data Management, Geographic Information Science and Printing. It is generally felt that a national recruiting strategy could increase the technical bias within the unit and thus provide for the increased use of the TA to ease the operational burden on the Regiment. This option could potentially split the Squadron with the regional contingent concentrating on GID with the National element providing experienced and qualified technical assistance to the wider geographic community.

As with many other TA units, the issue of budget is high on the list of constraints, especially in the current financial climate. The unit has limited resources that it can utilise to fulfil its mission. This has impacts on everyday activities, such as sourcing vehicles and allocating ammunition and rations to the very real restrictions on the use of a limited number of Man Training Days (MTDs). The Squadron has only a certain number of MTDs allocated to each soldier to conduct his minimum training requirement each year. This restriction does have significant effect on the unit and individuals. Regardless of immense enthusiasm, TA soldiers, who are willing to give up free time, may find it difficult to understand why, due to restrictive MTDs, they cannot attend additional training beneficial to the unit. This situation has an impact on morale, future recruitment, retention and ultimately the Squadron strength of technical and military trained personnel.

Effective integration with the Squadron's regular counterparts is also a challenge. This year 135 is to exercise with the Regiment during its military phase of the annual camp in Germany. The greater the interaction between TA and regular soldiers where commonality exists, the easier it is to integrate individual replacements on operations. Failure to actively engage with the regulars would mean the TA soldier missing out on vital experience to prepare them for possible future deployments, whether in a technical or GID role.

135 has suffered a number of years of indifferent trade training. This is partially due to the recent trade review, which combined Data, Terrain Analyst and Reprographics trades to create a single Geographic Technician. Currently a significant number of the Squadron personnel have no Military Engineer Geo trade with another significant proportion only trained to class 2. To build up the trained pool a class 2 GID course is being run at the Royal School of Military Survey in the



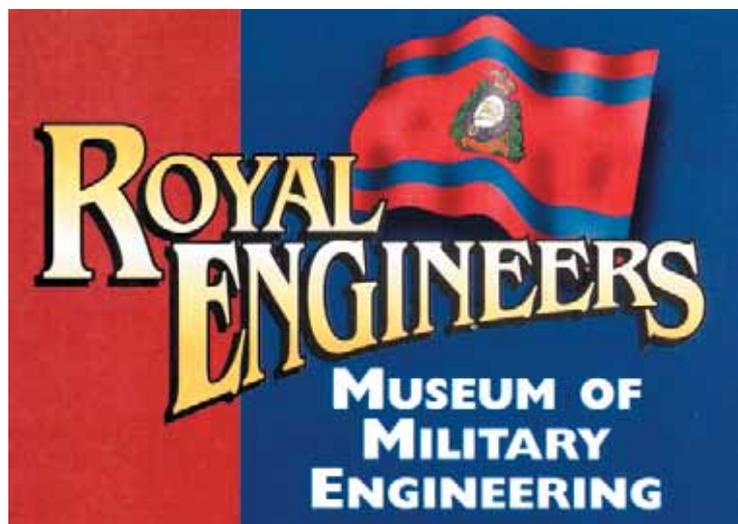
*135 Geo Sqn on parade prepared for deployment for the annual camp in 2007.*

summer. The current requirement for enduring support to operations is for class 1 trained individual replacements to work unsupervised. Coupled with this requirement, lessons identified from recent operational support show the requirement to have a fundamental understanding of geographic support and the use of geographic information technology. These requirements impact on training needs and significantly limit the available manning pool the unit can draw from. The aspiration remains to recruit technically capable individuals with equivalent civilian qualifications. Little has been achieved to accredit civilian qualifications and map these across to Geographic Technician qualifications. This invariably means availability to deploy individuals with sufficient technical qualifications is limited to those members of the Squadron who joined from 42 Engr Regt with previous geographic technician trade qualifications.

The current manning of 135 Sqn is approximately 50% of its established strength of 157. This disparity is due to the uplift in manning following the TA Future Army Structure review effective since April last year. This review also established detachments at Hermitage and Southampton and with these changes, came the problems associated with setting up, manning and maintaining these outposts from Ewell. Worryingly over 10% of the current held strength are quickly approaching the end of their TA careers, with a small number on extended service past 55. While many of these soldiers make a valuable contribution to the organisational needs of the unit, they cannot deploy in support of operations.

In common with the regular Army, the topic of recruiting is always a hot topic. The 'One Army' recruiting concept treats the recruitment of both regular and TA as one and is now employed by the recruiting fraternity with success. The joining standards for regulars and TA are now the same which affords more credibility to the military status of TA soldiers and officer when deployed. However, despite the TA's increased credibility 135 does suffer from an image problem. Attracting local recruits can be made challenging due to the preconceived perception of lacking military 'greenness' when compared to other regional units. To overcome this situation relationships have been fostered with local recruiting agencies to the benefit of the Squadron and ensure a steady intake of new recruits.

Despite the problems outlined in this brief article, 135 remains an enthusiastic, vibrant, and useful unit with a proud history and bright future. The establishment of detachments has been a success and those involved are now beginning to reap the benefits of recruiting activities and see an uplift in manning toward establishment figures. Many challenges remain and the Squadron needs to keep abreast of the ever-changing environment it finds itself in today and at the same time anticipate the needs of the future. Change is constant and to survive and thrive, 135 must embrace and use it to gain advantage. The key to meeting the challenge and securing its future lies with the people who form the Squadron and success will be due to the hard work, enthusiasm and dedication of all its soldiers and officers.



# Pigeons – The Original End-to-End GEOINT Service Provider



Figure 1: An early form of UAV

By Jonathan Shears, Infoterra Limited

According to history, by 1819 homing pigeons were developed sufficiently to fly 200 miles a day which, at a time when travel was either by foot or horse, was an impressive distance. For centuries pigeons were the fastest and most reliable means of communication and many leading newspaper publishers of the day used them to carry news of importance. The Carrier Pigeon Service established during World War I was used to relay messages about enemy troop positions up until World War II, when the introduction of wireless telegraphy meant pigeons could hang around roof tops all day instead. In an attempt to further exploit them pigeons were 'configured' to carry cameras for taking pictures behind enemy lines, a pre-satellite form of aerial surveillance. This is a far cry from the instantaneous global communication and the almost ubiquitous availability of overhead imagery from the Internet that we are used to today.

However I believe pigeons deserve their place in history for another reason, which is as one of the first technical concept demonstrations. Not widely recognised as such, but arguably it was the forerunner of many of today's MoD operational ISR assets. In light of current defence concepts of persistent wide area surveillance, information superiority and air power supremacy, the pigeon represents the ability to collect ISR data and disseminate it in a single air asset - equivalent to a Predator UAV with Link-16 tactical data link. As both content provider and communication bearer, pigeon anoraks might even argue that as an avian species they should be credited as being the first form of communication-enabled Unmanned Aerial Vehicle (UAV). And its relevance is that a key challenge for the MoD in supporting the British Armed Forces in theatre is to enable the co-ordinated collection of ISR data and its rapid dissemination to front line commanders and military planners.

## The Dissemination Problem

On March 31st 2009, Gordon Brown announced that the 4,100 British troops still serving in Iraq would stop combat operations on May 31st with all but 400 of them being withdrawn by July 31st. With the handing over of Basra operations to the US Army there are plenty of operational aspects of the six-year campaign that Major General Andy Salmon and the rest of the British Army can reflect upon. One of the Lessons Learned from TELIC centred on communications, where it was felt that the inefficient use of it and the lack of a cohesive co-ordination capability across and between active units, for example requesting air support from the ground, led to a much diluted military effect. Consequently new vocabulary and doctrine was introduced into the Ministry of Defence parlance, including EBO and NEC.

Figure 2: The UK MOD's Sentinel R1 ASTOR



Effects Based Operations (EBO) is a military methodology introduced into the MoD dictionary with the publication of the UK Defence White Paper in 2003. It describes the planning, execution and assessment of operations to attain an effect required to achieve a desired objective. As such it focuses on the end effect, be it political, tactical, strategic, economic or cultural and it requires a chain of many interrelated processes to execute it.

EBO was introduced at about the same time as Network Enabled Capability (NEC) and in fact is embodied within it, since EBO cannot be achieved without good communications.

## Intelligence Surveillance and Reconnaissance (ISR) Collection

It has been long recognised that the British Armed Forces today, through No 1 Group and No2 Group of Air Command at RAF High Wycombe, have more than enough ISR assets at their disposal. Current and future assets include the fast jet Tornado GR4 and Harrier GR7/9 squadrons, which are equipped with tactical imaging sensors such as Raptor and the Joint Reconnaissance EO/IR pods and the Nimrod R1 electronic surveillance and E-3D Sentry for airborne early warning. More recently the Sentinel R1 ASTOR, which features dual-mode Synthetic Aperture Radar for moving target identification, and the MQ-9 Reaper, a customised version of the US Predator-B, Unmanned Airborne Vehicle (UAV) have further enhanced the intelligence surveillance target and reconnaissance (ISTAR) capability.

But collecting ISR data is only part of delivering the military effect. As the DCPD Intelligence Cycle illustrates (Figure 3), ISR data also needs to be exploited and disseminated. In keeping with the DEC ISTAR mantra, military effect is all about delivering the right information at the right time and

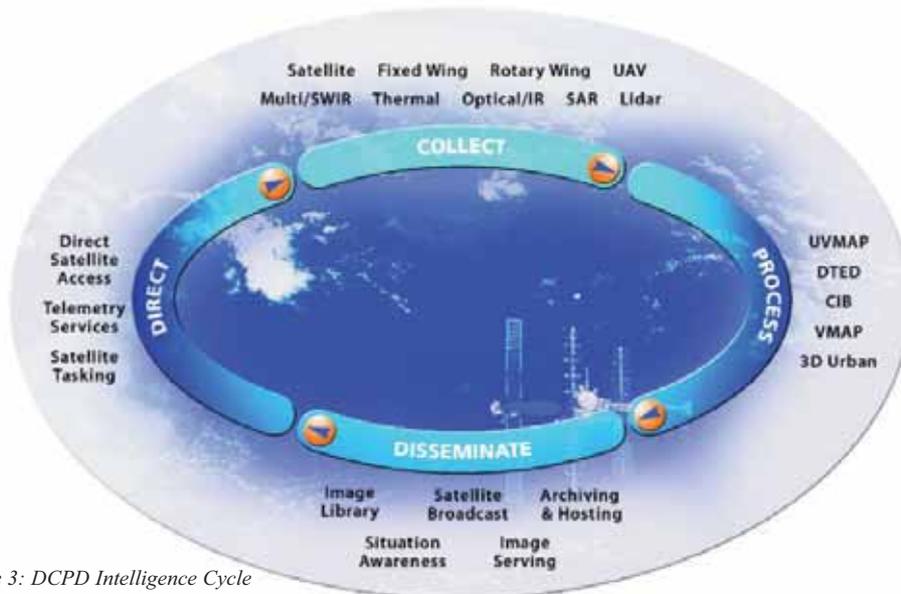


Figure 3: DCPD Intelligence Cycle



Figure 4: UK MQ-9 Reaper UAV data is relayed using Skynet5

to the right place. This means that spatial data practitioners, as the majority of the Ranger readership might claim to be, cannot begin to develop effective solutions without recognising the huge reliance they have on communications technology. In the case of an end-to-end service provision, the need to harness communications expertise and incorporate communications components in delivering any form of operational defence application is therefore paramount.

Astrium Services (part of EADS) has recognised this and has developed a growing services business that comprises both spatial expertise (Infoterra) and communications services (Paradigm), both being wholly owned subsidiaries of Astrium Services. Paradigm is best known for its operation of the Skynet5 constellation of secure X-band communications satellites through which it provides the backbone communication for all UK deployed military forces. Under contract to the Networks Integrated Project Team (IPT), formerly the Global Communication Services IPT, Paradigm provides a 'Beyond Line Of Sight' communications service under one of the largest MOD Private Finance Initiatives and which is operated 24/7 from a secure and hardened satellite ground station facility in the UK. This service is currently used to transfer GEOINT data between UK and various sites in Afghanistan including the dissemination of Reaper UAV Full Motion Video (FMV) over the Skynet 5 Information Dissemination Service (IDS). For those with longer memories, it effectively replaces the Pilot Direct Broadcast System (PDBS).

Infoterra specialises in the ability to develop and supply content-rich 2D and 3D datasets round the world, possible due to the ownership of Spot Image (now majority owned by Astrium Services) and Infoterra Germany who have exclusive worldwide rights to the high resolution TerraSAR-X satellite, both supporting Infoterra Limited's existing geo-intelligence service contracts to the MoD. Combining Paradigm's innate ability to disseminate high bandwidth content, service provision has moved into a dimension whereby relevant content can be delivered direct to theatre in a secure manner all as part of an end-to-end service.

### Intelligence Requirements Management

It is all well and good delivering data to the very last tactical mile, to the commander who needs the information for planning, briefing or de-briefing but to ensure intelligent ISR collection the communication needs to be two-way. Commanders need to be able to effectively request the data in the first place and then either receive data automatically or efficiently pull the data as required. Such Intelligence Requirements Management (IRM) is to be part of IDS in the future, whereby UK and deployed users will be able to manage and retrieve many forms of GEOINT data through the development of a coalition data sharing environment. Using a Coalition Shared Database (CSD) approach ensures that all subscribed users have maximum awareness of all data that is available



Figure 5: IDS based user portal for discovering and retrieving satellite imagery (Image courtesy Infoterra Limited)

across multiple units and thereby achieves data integrity and the potential for secondary exploitation of existing data.

This will not necessarily herald a bandwidth bonanza because the concept of the CSD is that to achieve a high degree of awareness, only the meta data index (catalogue) will be persistently published (synchronisation occurs every 20 seconds or so). Data only gets transferred across operational nodes if it is pulled by a requesting node. The CSD also features adaptive compression techniques so that segments of an image can be requested at high resolution whereas less relevant areas can be compressed to better manage bandwidth usage.

A prototype CSD user portal has been developed to show how data can be readily discovered and retrieved over IDS. In the first instance this was achieved using an Image Reference Library consisting of representative operational commercial satellite imagery.

Not only does an online archive of GEOINT imagery permit a more efficient way of delivering data files, but it creates a virtual knowledge base of prevailing GEOINT coverage that contributes to shared awareness. A huge benefit of establishing such a content-rich database as part of the IDS service provision is that the IDS network reaches the operational front line troops from the UK. As a fully security accredited system by CESG and operating at SECRET level it will enable the rapid dissemination of relevant data and Infoterra is currently working toward establishing an operational GEOINT library to support both IDS users and also those on Defence Information Infrastructure (DII).

One could say therefore that the Skynet5 dissemination architecture is a manifestation of the earlier Carrier Pigeon Service, whereby it combines geospatial and communications services elements. I am not advocating that a solution to the current fiscal crisis facing the MOD is to re-configure pigeons, but I think we should give credit where credit is due and recognise the clear lesson learned from developing an operational capability in direct support of front line troops is that geospatial technologies have to partner with communications technologies and that in so doing, the whole is greater than the sum of the parts.

And progression has been twofold because IDS also won't make a mess of your windowsill.

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## How It Was - Non-Stop Camping

Much has been written about the poor state of soldier's accommodation and huge sums of money are being spent to solve the problem. The project is just the next stage in the general improvement of conditions for the single serviceman or woman. The 1980 rebuild of Hermitage was considered a quantum leap forward from the wartime brick huts it replaced and even they were considered far superior to Barton Stacey's dilapidated wooden huts – built to last for the 'duration' of the War but still lived in 40 years after its end. However, these huts were in turn an improvement on 42 Regiment's previous accommodation in Cyprus and before that in the Suez Canal Zone where everyone spent their 3-year tour under canvas.

*In Egypt tents were excavated to allow greater headroom – problem when it rained!*



*The Cartographic tent lines at Zyyi in Cyprus.*



## Geo People

### Bill Hodson

*Managing Director, Envitia*

Bill Hodson was appointed Managing Director of Envitia Limited, the geospatial information and technology specialist, in October 2008. Bill had originally joined the Company, when it was still known as TENET Technology, as Sales Director in May 2005.

Bill was born in Lancaster and educated at Lancaster Royal Grammar School and then Emmanuel College, Cambridge where he read Engineering. On graduation, he joined a small subsidiary of VSEL, the erstwhile submarine builder, where he spent three years working on underwater combat systems and too much time sleeping on torpedo tubes.

In 1991, Bill moved to the fledgling UK office of Science Applications International Corporation (SAIC), a San Diego-based systems integrator that wished to develop a British presence. From small beginnings, SAIC Limited eventually grew to more than 1,000 people and Bill acted as Vice President for SAIC's Defence & Security Operation. This involved him in a wide range of activity covering C4ISTAR, port and border security, information security, ballistic missile defence, modelling, simulation, training, armoured fighting vehicles and UAVs. Imagery and geospatial intelligence played a central part in Bill's work at SAIC and he spent several years fostering trans-Atlantic collaboration on a range of projects in this environment.

Leaving SAIC in 2005, Bill spent two years working in the newly-formed Defence & Security Practice of PA Consulting Group. Whilst at PA, Bill advised both Government and industry on a range of defence procurements including the Defence Information Infrastructure. He also held responsibility for PA's work in corporate resilience and sincerely hopes that at least some of the results are helping PA's clients through the credit crunch.

Bill was offered the opportunity to return to a management role by TENET Technology in 2007. The Company had been experiencing a rapid growth and Bill relished - and continues to relish - the opportunity to apply the experience he had garnered from SAIC to a new environment. Since then, the Company has been renamed as Envitia Limited and continues to grow on the back of a range of work tackling some of the more difficult problems in the geospatial domain. Bill oversaw the opening of a US office for Envitia in 2008 and, despite the current economic storm, is looking forward to leading the Company to further growth.

He still lives close to Cambridge with his wife Melanie and their two sons. His long-standing affiliation to Cambridge United Football Club will, apparently, be a cross that he bears for the rest of his life.



## Geo People

### Commander M C JONES Royal Navy

*Commander HM*

Commander Martin Jones was educated at Hymers College, Hull and Aberdeen University where he gained an honours degree in Geology. With a slump in oil exploration at that time and a promise of a life of adventure at sea he joined the Royal Navy in 1984.

His Naval career commenced patrolling the coastal waters of Northern Ireland before specialising as a Hydrographic Surveyor. Early military data gathering ranged from bathymetric, oceanographic and geophysical surveying throughout the Atlantic, the Mediterranean, Belize and of course the SW Approaches, serving in HM Ships *Beagle*, *Hecate*, *Roebuck* and *Herald*.

He has been privileged to command the RN's smallest warship *HMSML Gleaner*, surveying the approaches to Devonport and Faslane, *HMS Quorn* conducting Mine Countermeasures operations as well as a period attached to

the Fishery Protection Squadron and in 2001 on promotion to Commander he assumed command of *HMS Echo*, bringing the state of the art, first of class new hydrographic and oceanographic ship from build to full operational status operating in the Northern Arabian Gulf.

He has had two tours of the MOD, firstly procuring surveying services and equipment, and then as the planning lead within the Intelligence Collection area of Defence Intelligence also responsible for delivering the programme of work from the Defence Training Funds, the United Kingdom Hydrographic and Meteorological Offices. As a graduate of the Advanced Command and Staff Course he has also served on the staff as Directing Staff to the course.

He is currently appointed to the Devonport Flotilla as Commander Hydrographic and Meteorological managing the survey squadron and driving Continuous Improvement within the military Maritime Geospatial environment.

He is a Fellow of the Institute of Marine Engineering, Science and Technology, a Chartered Marine Scientist and as a keen scuba diver is also an advocate for marine conservation. He is married to Jo with one teenage son, Sam.



## Geo People

# Wing Commander Charles Howard-Vyse

*Officer Commanding No. 1 Aeronautical Information Documents Unit RAF*

Charles joined the Royal Air Force despite a family history in the Royal Artillery and going to school at Wellington College. From an Engineering degree at Bristol University he completed his Navigator training on Tornado GR aircraft in 1988 in time to join IX(B) Squadron at RAF Bruggen in Germany and fight the end of the Cold War. This tour also coincided with the 1st Gulf War and he spent a total of 6 months in the AOR, flying combat missions out of Bahrain. From 1992-94, a short tour at RAF Boscombe Down followed before returning again to RAF Bruggen, again to IX(B) Squadron where, amongst other qualifications, he was an Electronic Warfare Instructor. In 1998, after some 1500 hours flying Tornado Charles was posted to Operations Squadron at RAF Bruggen and contributed from there to the Kosovo Campaign.

In May 2000, on promotion, he took up a NATO post in Combined Air Operations Centre 9 at RAF High Wycombe, in the Mission Analysis Cell. This was followed in 2002 by a tour at RAF Marham as Squadron Leader Operations, a large part of which was focused on the preparation, and post campaign support, for the 2nd Gulf War. A 2004 posting to A7 at HQ RAF Strike Command saw Charles running the operations side of the UK's Maxeval / Taceval and Collective Training events. This also included accreditation as a NATO Evaluator and working closely with the NATO Taceval Unit at Ramstein and across Europe. In mid-2006 he was detached at three weeks notice to Kandahar as Chief of Staff Operations for 901 Expeditionary Air Wing. The major role there was airfield support to the Harrier, Hercules and some of the UK's rotary wing fleets, as well as a supervisory role for Camp Bastion's airstrip. On his return to UK in Dec 2006 he took up an SO1 post at the Defence Academy engaged with developing training for Network Enabled Capability. In September '08 he commenced his command tour at No 1 AIDU.

He has described the leadership of AIDU as 'a practical MBA course', i.e. having a bit of everything thrown in. Despite being very familiar with the product after nearly 20 years in flying appointments, he has had no formal geospatial training or background. Early ambitions include trying to ensure that the inertia of such a bespoke and unique military unit is properly directed to meet today's requirements, and to ensure the substantial expertise of the cartographers and all who work at AIDU is fully utilised.

An accomplished skier, Wing Commander Charles Howard-Vyse is married to Clare and they have two teenage sons. When not busy with enforced gardening or DIY, he enjoys dinghy sailing on the Norfolk coast and looking fondly at his lightly used squash racket.



## Geo People

### Lieutenant Colonel Kevin Lane MBE RA

*SO1 Training Support Royal School of Artillery*

When originally asked to write this piece for “Geo People” in Ranger I felt a bit of a fraud as I have never been a surveyor. It was only when I reflected on what I had actually done in my career within the field of survey that I felt better about putting pen to paper.

I enlisted into the British Army in 1969 and during initial selection I expressed a desire to become a surveyor but was told that my knowledge of mathematics was not strong enough to support such a career choice. So, after basic training as a Junior Leader, it was off to 45 Medium Regiment for me where I was to remain for the next eight years.

In 1978 I was selected to attend the then 15-month long Gunnery Staff Course that was to start in January 1979. Amongst the many facets of technical gunnery that we were taught the course syllabus included both Regimental and RA survey. This was a fascinating time for me and I remember vividly the many hours spent taking my ten daily range finder readings in order to improve my accuracy and consistency figures and the equal amounts of time spent practicing pairs and quartets with the Precision Indicator of the Meridian (PIM) (for those that have used PIM you will know that doing this in the sterile environment of the Bearing Picket Lines is one thing; doing it on a gun position with the vibrations of 30 ton guns driving past is quite something else).

After graduating in April 1980 I moved to the Royal Artillery Gunnery Training Establishment in Germany where my first task was to be the lead instructor on the Class One Survey Course. This brought a wry smile to my face as I wished I could now meet again the officer from the initial selection board who had previously been so disparaging about my maths. It was during this time that the 1st British Corps Artillery Group was to hold a firepower demonstration on the Bergen–Hohne ranges; and it was decided that my survey course should be the ones to place the Corps Artillery on common survey. Here was a real task; thirty batteries to be surveyed in and, due to live firing on the ranges, only two weekends to conduct the initial observations and one weekend if required for re-observation (it was required). We completed the task on schedule and were able to witness the fruits of our labor as guests in the grandstand.

As an instructor that was probably my greatest survey achievement although there were many other occasions with interesting moments; like the Battery Commander who saw nothing wrong in attempting to claim Survey State Delta from a compass resection in the middle of a village, or the Position and Azimuth Determining System (PADS) operator who was ten kilometers out and did not see the need for a gross error check. But by far the best was the commando gunner who, after taping a distance, jogged back down the line as the check and tried to convince me that he had calibrated his jogging pace.

After commissioning in 1989 my hands-on experience with survey dwindled and it was not until 2004 when I commanded the Export Support Team Royal Artillery that the flame was rekindled and I worked intimately with industry promoting and demonstrating the Artillery Pointing System (APS) which is the Ring Laser Gyro and Inertial Navigation System used on the 105mm L118 Light Gun.

After being promoted to the rank of Lieutenant Colonel in 2007 I took up my current appointment and was asked if I would like to become the RA serving representative on the DSA council. I welcomed this opportunity with open arms and have thoroughly enjoyed my short but highly rewarding time in this role.



## Geo People

### Air Commodore Jon Rigby

**OBE BSc MSc MA CEng MIET RAF**

*Commander Intelligence Collection Group*

Jon Rigby was born in Sheffield, educated in Leicestershire and subsequently read Physics at Durham University. He joined the Royal Air Force directly from University, undertaking officer and engineering training at the Royal Air Force College Cranwell from October 1983 to June 1985. As a junior officer he served as the engineering officer on 63 Squadron RAF Regiment, a Rapier SHORAD Squadron based at RAF Gutersloh, and subsequently as a staff officer responsible for operational communications systems at HQ Strike Command. On promotion to Squadron Leader he completed a tour in the Defence Intelligence Staff, as a technical analyst responsible for foreign surface to air weapons systems and subsequently commanded 33 Signals Unit, Ayios Nikolaos.

He was promoted to Wing Commander in 1996 and returned to the Defence Intelligence Staff as the engineering officer responsible for military special signals. In 1997 he attended No 1 Advanced Command and Staff Course and was subsequently posted to the Permanent Joint Headquarters, with responsibility for CIS engineering on all UK deployed operations, including the Gulf, the Balkans, East Timor and Sierra Leone. On completion of this tour he was appointed OBE. In 2000 he was posted in command of RAF Oakhanger and 1001 Signals Unit, charged with providing UK military satellite communications.

On promotion to Group Captain in 2002, he completed a short tour at the Defence Communications Services Agency, before assuming command of RAF Digby and the Joint Services Signal Unit in July 2003, extending his span of command to the Joint Services Signals Organization in July 2005. In January 2006 he was posted to the Directorate of Equipment Capability ISTAR as the Deputy Director responsible for Intelligence and Information Operations Equipment Capability. From August to December 2006 he was assigned to the Enabling Acquisition Change Team, responsible for defining Through Life Capability Management policy. On promotion to Air Commodore in December 2006 he was posted to HQ Air, as ACOS A6. Shortly afterwards he attended the Higher Command and Staff Course, returning to High Wycombe in April 2007. He deployed on Op TELIC in November 2007, serving as the Deputy C2 (Forward) for Multi National Forces Iraq in Baghdad. He assumed command of the Intelligence Collection Group (ICG) in July 2008.

The ICG was formed within DIS on 1 June 2006 and employs a total of 3478 staff, of which 2231 are military. The Group has personnel distributed across 5 subordinate commands at 7 major sites.

Air Commodore Rigby is a Chartered Engineer. He holds a BSc from Durham University, an MSc from Loughborough University and an MA from King's College London. He is married with 2 children and lives near Stamford, in Lincolnshire. His hobbies include rowing and sailing.

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## REA Military Survey (Geographic) Branch

The Branch, now almost 400 strong, celebrates its tenth anniversary this year and to mark the milestone the AGM and reunion have been timed to fall in line with several other significant RE Geo events. On Thursday the 2nd of July there is a reception in the Sergeants' Mess after which the Corps Band will Beat Retreat and the evening will end with a curry supper and, no doubt, many 'warry' stories.

On Friday morning at 1100hrs 42 Engineer Regiment (Geographic) and the Royal Engineers Band will exercise the Freedom of Newbury accompanied a contingent from the Branch. Spectators should be in place along Northbrook Street or the Market early if they want a good view. During the afternoon members will have a tour of the RSMS, a briefing by Commander JAGO followed by the presentation of the annual award to a serving junior soldier for exemplary service and the AGM. In the evening there is a Band Concert in aid of the Army Benevolent Fund and the reunion will end with a supper in the Sergeants' Mess. Two very good days to mark ten years of the Branch. If you were a military surveyor but are not a member of the Branch why not join - contact Ken Hall on 01278 794 600 or email [kjhsurvey@aol.com](mailto:kjhsurvey@aol.com) for details - it's only £8 per year!



*The author when a Fid*

## Antartica Revisited - (The Tale of a Fid)

*By Tony Keeley*

From January 1971 to April 1973 I was employed by the British Antarctic Survey (they actually paid me) initially as a meteorologist on South Georgia and later as a base commander on the Argentine Islands on the Antarctic Peninsular. I always assumed that I would never return and especially not as a tourist. However, when the opportunity to join a tour organised through the Royal Geographical Society and their travel agent Far Frontiers presented itself, I jumped at the chance. Hence on the 17th of November 2008 I was on my way to Ushuaia to join the Russian cruise ship *Professor Multanovskiy*, formerly a research ship and named after an eminent Russian climatologist. I contrast this to my original departure for the South in January 1971 when I sailed from Southampton on the maiden voyage of the British Antarctic Survey ship, the *RRS Bransfield*, embarking on the what was then about a four week voyage to the Falkland Islands calling in for a night's dissipation in Montevideo.

While at University, although having little idea of the practicality of the dream, I conceived the ambition to 'go to the Antarctic' and so when BAS gave a presentation on its recruiting visit to Cardiff, I applied. As was common many individuals wanted to apply as a 'General Assistant' or GA i.e. accompanying the various scientists into the field. However, it was quite clear the job of a GA was very well sought after and often filled by a second tour Fid or very skilled climber hence I applied for a position as a meteorologist, was interviewed for a post as glaciologist and then accepted as a meteorologist! I hasten to say that most 'met' men with BAS were actually meteorological observers, very few being professional meteorologists.

At my medical, conducted by a retired Commander RN, the hearing test consisted of my standing in the corner of the surgery, facing the wall, repeating the insults whispered at me by the doctor! I was also offered the opportunity of having my perfectly healthy appendix removed along with a job lot of wisdom teeth, piles and tonsils! After attending a six week training course in June 1970 at the Met Office Training School at Stanmore, a wonderful summer seemingly spent lying on my back observing and identifying the clouds of the northern hemisphere, I was dispatched to Edinburgh University for follow on training, my fellow students from Stanmore going for radio sonde training at RNAS Culdrose.

I have to admit that at this stage I was somewhat disappointed as my initial posting was to be South Georgia, referred to rather disparagingly by those destined for Halley Bay as the 'banana belt'. I hasten to say that any sense of disappointment was soon dispelled on landing on that wonderfully wild island. The terms of service were interesting in that we all signed on for two winters i.e. in reality a tour of 2½ years depending on which base and the departure date from England, however with the proviso that in the event of unfavourable ice conditions there was no guarantee of relief after the second winter hence perhaps a tour of 3½ years. But more about this later and a rather extreme response to the situation.



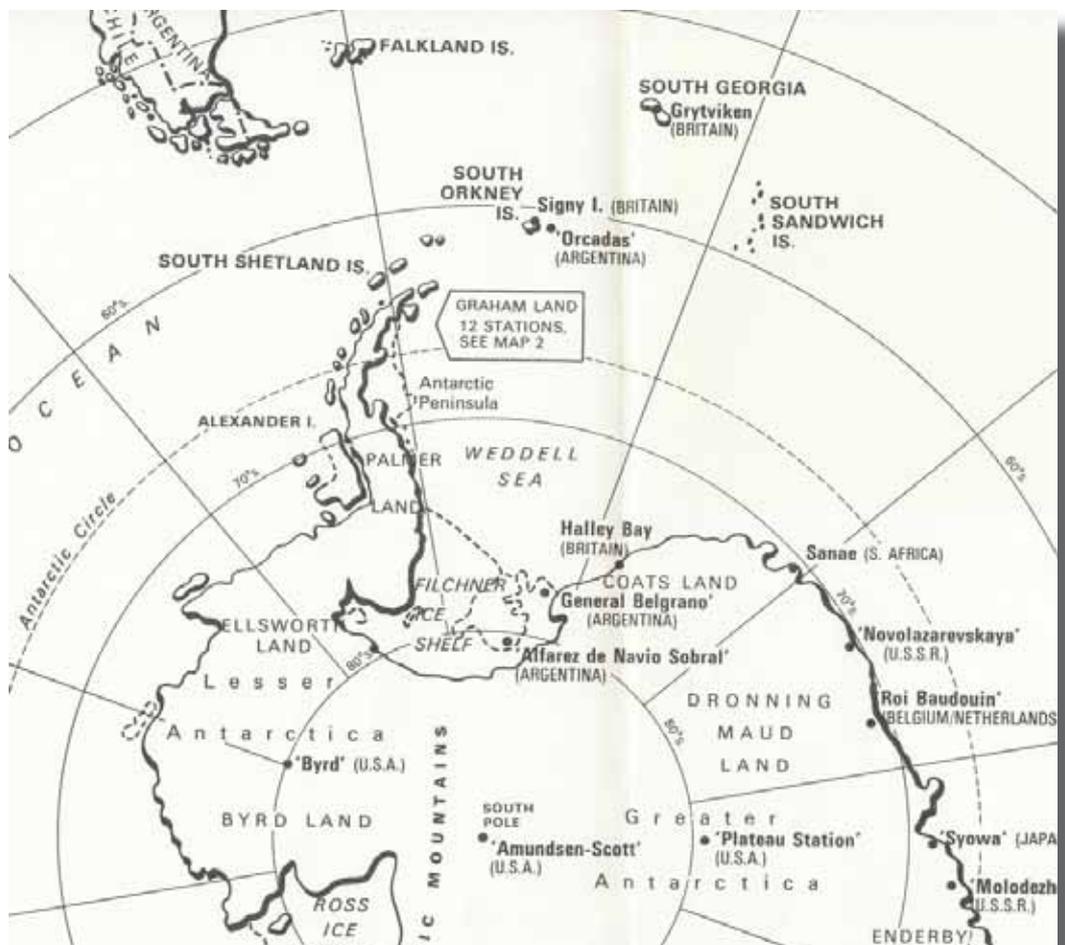
*RRS Bransfield in 1971.*

I was destined to sail on the newly launched *RSS Bransfield*, its departure date planned for December 1970 although we finally left Southampton early in the New Year 1971. I arrived on board the ship in Southampton on the Sunday evening before we were to set sail. The ship appeared to be deserted but I managed to track down the cook (they didn't have chefs in those days!), a villainous looking individual who could have modelled for Swelter in Gormenghast. To my statement "Hello I'm a Fid" he responded that with singularly colourful language that the only Fid he knew about was for splicing rope. Still he did show me to my cabin which I shared with another cook who did not emerge from his bunk till we were about four days out of port.

At this point it might be pertinent to explain the term 'Fid'. The British Antarctic Survey started in 1943 as Operation Tabarin under naval auspices. Two years later the organisation came under the control of the Colonial Office and was named the Falklands Islands Dependencies Survey i.e. FIDS. When in 1961 this became the British Antarctic Survey the term FIDS lived on, sometimes interpreted as 'Something' Idiots Down South!

We sailed south with the expectation of a return to England in 2½ years. Those aboard destined for the BAS bases were classified as supernumeraries and hence were expected to undertake some work on the way south. The ship was in a filthy state after leaving the dockyard and once we reached warmer climates we repainted it although only the professional seamen went over the side in bosun's chairs to paint the hull. This task took remarkably little time as there were about 40 Fids on board hence plenty of time for sunbathing. At this stage the only other mandatory work activities, apart from holystoning the decks – easy on the *Bransfield*, harder on the Biscoe with mostly wooden decks and perishing cold below the Antarctic Circle, were the occasional lookout duties and for the met men, routine three hourly observations. Of course in that era most climatological data was still gathered by ground based stations and weather ships. I then whiled away my time on board learning to splice under the tutelage of the boatswain. It was amazing what needed to be done. Handrails were covered in canvas, finished off with Turk's heads, strops were spliced in preparation for cargo handling and an amazing range of ropework prepared for a myriad of uses about the ship.

After our one night stopover in Montevideo, on which occasion a couple of crew members were discharged for rather excessive fighting, our next port of call was Port Stanley in the Falkland Islands where in those days the BAS research ships moored alongside. Here time was spent loading coal for the bases, an activity in which all took part. We were hosted to a cocktail party at the Governor's Residence after which our suits were put away for the next two years. Prior to leaving



Port Stanley a special service was conducted for us all at the cathedral, a very moving occasion. South Georgia, my home for the next year, was to be our next port of call and several days later we moored in the harbour at Grytvicken. After delivering mail and offloading cargo from the ship via scows, the grizzly business of sealing commenced. Several hundred elephant seal were to be taken to feed the dog teams on the sledging bases. After the crew dispatched the seals on the shore we, armed with flensing knives, gutted them in preparation for the carcasses being loaded on the deck of the Bransfield. Perhaps in those days the sight of the bay, red with blood, did not offend because of the lack of sensitivity of youth.

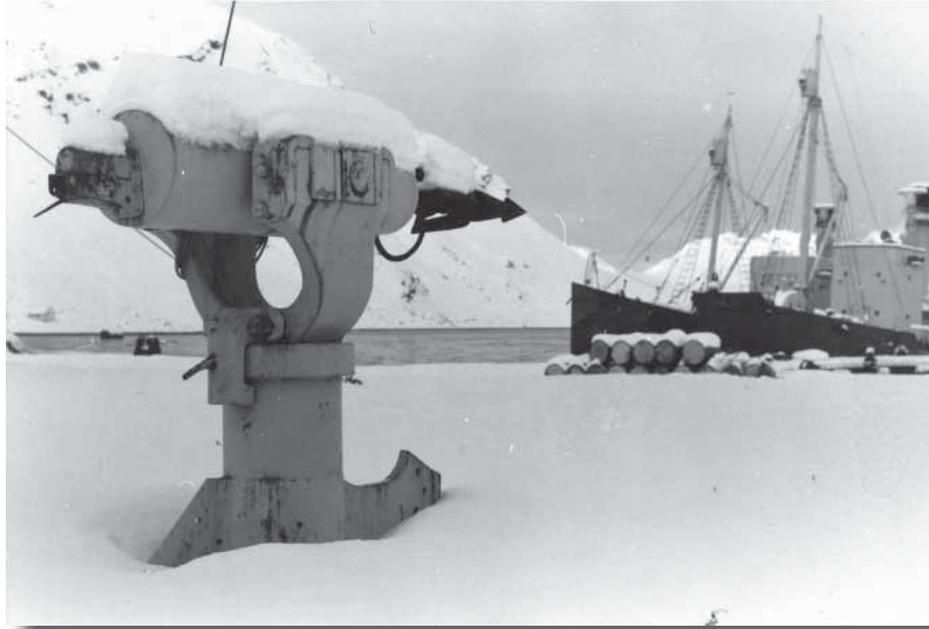
And now 37 years later on board a very different ship, the *Professor Multanovskiy*, there was a very different daily routine. As the *Multanovskiy* was an ex-research ship, accommodation could be somewhat basic and public rooms rather small but with two excellent Russian chefs and a self-service bar who could ask for more. The Captain operated an open bridge policy that made for a fascinating voyage. So on the evening of the 19th of November we set sail through the Beagle Channel for the Falkland Islands, a wonderful trip through the evening. On the morning of Friday 21st of November we arrived at the West Falkland Island making our first stop ashore at West Point Island where, after our first zodiac landing and a very pleasant walk, we had our first view of black browed albatrosses and rockhopper penguins nesting together in perfect harmony. This was followed by an enormous tea laid on for us at a local farm, tourism replacing sheep as the main contributor to the local economy after the revenue the islands accrue from issue of off shore fishing licences. After another similar trip ashore with an even larger tea in the afternoon we set sail for Port Stanley arriving there the next morning. Now Stanley had changed dramatically from my first visit in 1971 when there was one pub, the Upland Goose, and the Falkland Island Company reigned supreme: You could buy anything there. One change was that the Antarctic Survey ships no longer came alongside the town. A rather quaint museum was now in operation but the shops echoed a distant past in that they all shut for lunch. The changes after the Falkland War were very evident with a very moving memorial to the conflict and a totally different economy no longer based on sheep. I recall that in my time with BAS the bases were supplied with mutton from the Falklands, commonly referred to as 'Stanley Greyhound' but I'll leave that to your imagination. After a stormy embarkation at Port Stanley, the harbour launch rather than the zodiacs being employed, we set off for South Georgia. Three days brought us to our destination.



At this stage it might be of interest to contrast further the life on board compared to my original voyage on the Bransfield. As already stated on the *Bransfield* we, the supernumeraries, had a few duties. We all took it in turn as 'galley slaves' and served up the food and cleaned the kitchens. Food was plentiful and in those days quantity was the watchword. Now on board the *Multanovskiy* the food was of an exceptional standard, always three courses, generally starting with the most exquisite soup though in the latter stages of the trip much ending up on the decks. You can see that I'm struggling to use appropriate nautical terms! Originally our party from the RGS were to

be the sole passengers on board but in the event we mustered only seventeen, the remainder being from Israel, two from Finland and a German girl who adopted us, meals were being enlivened by singing from the Israeli party. The daily routine was bird spotting with our resident and highly respected ornithologist, Dr Malcolm Ogilvie, who never tired of us asking the same questions over and over again, interspersed with wonderful meals and occasional trips to the bar. A certain quartet of ladies in our party never failed to partake of their bloody marys at lunchtime. As we came close to South Georgia so the pattern of bird sightings changed; petrels, black browed albatrosses etc and eventually we crossed the Antarctic Convergence, probably representing about, at a guess, a 4°C drop in temperature and a change in sea life and consequently bird life.

A further three days brought us to South Georgia, 54° S, initially to Elesehul where we enjoyed a zodiac cruise in the bay before dropping anchor in glorious sunshine the following day in King Edward Cove off Grytviken. We were left to our own devices here to explore, within confines, the old whaling station, the whalers' graveyard (also the final resting place of Sir Ernest Shackleton) and the administrative complex on King Edward Point, part BAS and part 'Government of South Georgia and The South Sandwich Islands'. Things had changed dramatically. In 1971 three whale catchers moored at Grytviken appeared as if they could be operational within minutes, all gleaming brass and the smell of engine oil, even though whaling had ceased in 1965. In some, harpoon guns were still mounted in the bows. Interestingly the skippers of the whale catchers were also the gunners. On coming on a whale the captain would leave the bridge, dash along the runway direct to the gun and dispatch his prey. The cover picture shows the current state of one such whale catcher. Another rather quaint factor is that there is a museum being run by a couple who lead a totally normal life in quite extraordinary conditions. The BAS base is relatively small and geared to the fisheries. Rather sad for me is the fact that all meteorological observations are totally automated with no human interactions, no going in the dead of night, beating a path through the elephant seals to the Stevenson screen to take the observations! However, what is very heartening is the work being undertaken to preserve the fascinating heritage of man's occupation of South Georgia.



*Moored whalers and harpoon Gun.*



*The Whaling Station at Grytviken.*



*Commencement of tracking pilot balloon in the summer and tracking in winter.*

When I arrived on South Georgia in 1971, after the flurry of activity during the summer months including the geological survey, we settled down to a routine winter. We were thirteen in number, three meteorologists/geophysicists, two ionosphericists (the beastie men – more of this later), a botanist, a zoologist, a builder, a diesel mechanic, a radio operator, a cook, a general assistant and a base commander. After the summer activities including building, and fieldwork by a geologist (incidentally a fellow student and climber from Cardiff – we both applied independently for BAS at the same time but we did not come clean till we were accepted) the relief ship left us in March to our own devices. As a meteorologist I had a set routine of a week of days, a week of nights then a week off. Observations were taken every three hours and during the day, on an opportunity basis, pilot balloons were launched and tracked to determine wind speeds aloft at heights up to 70,000ft. Oh how I longed for the balloon to burst during the bitterly cold weather! The procedure was to fill the balloon with hydrogen to achieve a set rate of ascent, launch it, track with a theodolite and record azimuth, altitude, and measure the apparent length of the tail beneath the balloon using the graticule to measure the range and hence altitude. At the beginning all this seemed impossible, no separate bookers for us, but once we got the hang of it we did all the booking and all the calculations, on a 20 inch slide rule, by the time the balloon burst. This also included the calculation of wind speeds and directions at standard altitudes. Other activities included geomagnetism and ozone measurements, all seemingly involving the constant dodging of elephant seals.

We lived in what was quite palatial accommodation for BAS, a two-storied centrally heated building on King Edward Point just below Shackleton's Cross. Sleeping accommodation consisted of single rooms with bunks to allow for increased capacity. The working environment including the met office, boat shed, generator shed and workshop consisted of the old government administrative buildings left over from the time of whaling. There was even a jail, one prisoner, probably a whaler,





*South Georgia 1971 Winter Party - spot the RAF radio operator!*

who escaped, thought better of it and returned to the warmth of the jail. On BAS there were always a number of seconded servicemen, particularly as diesel/generator mechanics and radio and radar operators. To complete our little band we had an old English sheepdog called Ring who lived in the generator shed, doubling as an all purpose oil rag. I also whiled away some time helping the diesel mechanic, a REME SSgt, grind in valves on what seemed to be enormous diesel engines. The met office was down near the jetty with instruments in the Stevenson screen on the beach just where the elephant seals tended to congregate!

The great change from today is that of communications. Bases communicated with Port Stanley by teleprinter, no direct communication with UK. We were allowed to receive a 200-word telegram in from home and send one back of 100 words each month. It was also still an era when radio operators had to be proficient in the use of Morse code. Voice communication with Stanley was possible but only employed in an emergency, confidential matters being dealt with via 'one time' message pads. Dependant on atmospheric conditions, radio communication could be totally lost, an occurrence more likely at the more southerly bases. All this is a far cry from today with instant and almost guaranteed communication. After departure from Southampton there would be no voice communication until your return except for any transit of the Falkland Islands where a call could be booked through Cable & Wireless. Now for recreation we were issued with 12 films for the year and by the time we had watched 'Paint Your Wagon' for the 10th time we no longer needed the sound track. Slide shows and photographic competitions were also endlessly popular.

None of us were kept entirely busy on our primary roles during the winter so we had other duties. I looked after the hens and during the summer I attempted to identify the good layers, those that may be permitted to survive after midwinter, the rest enlivening our midwinter feast. This was not an easy task as the hens laid deep within the tussock grass. Once winter set in then activities included skiing, cross country mostly, rather badly on my part, and hunting reindeer on the nearby peninsular. We also had two work boats, a former whale towing vessel and a whaler with an inboard diesel engine both requiring refurbishment during the winter months. For recreational use we also had a dinghy with a half horsepower outboard. I personally enjoyed taking the whaler out with our resident zoologist as he laid nets for fish samples. Of rather less enjoyment was the task of gutting and cleaning surplus fish on our return to the jetty. Our botanist had a special responsibility of growing tomatoes, one for each of our birthdays but after managing to produce nothing greater in size than a pea this responsibility was handed over to the diesel mechanic with much greater success. I also recall accompanying our botanist on a collecting excursion by boat (dinghy with half horsepower outboard!) across Cumberland bay, a bad landing resulted in us being tossed ashore, we in one place, dinghy and outboard elsewhere! Our radio was none too happy hence when we could eventually re-launch we had to row all the way home. As we had no doctor, this responsibility devolved to the base commander and apart from the odd cracked rib, cut and sprain there was little call on his expertise. Needless to say there were no colds or sniffs until the arrival of the relief ship.

Reindeer figured rather too prominently on the menu, either that or mutton (Stanley Greyhound) from the Falklands however, we did eat well. We had a ration of beer, purser's rum – which we saved up for Tuesdays with lime juice. Copious quantities of cigarettes, tins of 50 Capstan, also came with the rations proving extremely useful for bartering. We were also issued with 'party boxes' for Christmas and Midwinter containing Bols, liqueurs and other spirits but it was amazing how many of these got 'damaged' by the dockyard workers in loading in Southampton. The relief

ships always went south laden with a years supplies of food for the bases. South Georgia had to maintain six months reserves of food and fuel stocks in case the relief ship did not arrive, a year for the more southerly sledging bases. This policy involved the periodic turn round of enormous numbers of boxes. Apart from frozen meat our food was invariably tinned except for eggs stored in flour, lasting about four months, and bread freshly baked every single day. As we all took a turn as cook for one day a week hence we all became expert bakers, though some of the results were rather bizarre. The menu for Midwinter's Day was rather exotic, appropriate rations (and my hens) being saved up for the event. As a chemist I was detailed by the base commander to provide fireworks for midwinter celebration. I raided the chemical laboratory at the whaling station and did manage to manufacture rockets and other fireworks, a highly dangerous occupation judging by the uncertain contents of the bottles in the lab!

Winter passed all too quickly enlivened by the arrival of two French yachtsmen, Jerome and Gerard, their boat having capsized off Cape Horn. Apparently they were overwhelmed by an enormous wave which brought down the main mast, coming into the harbour under a jury rig. I was on nights at the time and, arising at midday, I was astonished to see two new faces at lunch. The strain on their faces was all too apparent. Jerome and Gerard stayed with us for several months, during which time they shortened the main mast and sails and eventually set off again and I can't recall their destination or indeed the name of the boat. Shortly before the arrival of the relief ship, the *RSS Bransfield*, in December I was informed that I was to be transferred to the Argentine Islands as base commander. I had asked for transfer to a sledging base as a GA but I was more than content with this appointment and it probably set in train my future career. Before describing the next phase of my original tour I will return to the *Professor Multanovskiy*.



*Spectacular South Georgia and penguins with author in the foreground.*

At lunch time the ship set off for Fortuna Bay where most of us disembarked negotiating the usual bad tempered attentions of the fur seal on the beach. From there we had a wonderful walk over a peninsular to Stromness Harbour, part of the route taken by Shackleton in his epic crossing of South Georgia. After being collected, the ship anchored just off the abandoned whaling station at Stromness and during the evening we had a barbecue on the foredeck. It was utterly calm, the sun shining and the sea like glass. All the crew joined us for a wonderful evening's entertainment. It was great to meet the Russian seamen who piloted the zodiacs. I quickly identified those that would give us a comfortable journey and the one who produced the most bone shattering journey over the

waves. I will say that the seamanship of the crew was quite outstanding and I suspect the seamen loved the zodiac operations as a break from normal onboard operations, always something to paint! I will also mention our Ship Expedition Leader, Anja Fleig from Germany. She was not only extremely knowledgeable as a glaciologist but also highly skilled at the helm of the zodiacs. She always gave us a comfortable ride. I will say that in windy conditions there appeared to be a fine balance for the zodiacs between enough speed to maintain headway and avoiding excessive swamping. After further landings at Right Whale Bay on the north coast to the west, then travelling east to Gold Harbour, our final images of South Georgia were from the spectacular Drygalski Fjord at the eastern tip of the island. The retreat of glaciers was very evident as were the sightings of enormous tabular bergs from the Antarctic Peninsular, the like of which I had never sighted on my



*Relief of Signy Island.*

original sojourn in these latitudes. From here on the weather worsened and with strong winds our progress towards the South Orkneys was slow.

Now I return to 1971. On leaving South Georgia on the Bransfield our voyage also took us to the South Orkneys, to Signy Island, 60° S, another BAS base mainly dealing with marine biology and after relief of the base we headed for the Argentine Islands, 65° S with a mean temperature of -5°C and extreme lows of -33°C (still in the banana belt!). While on board I received my briefing from the BAS personnel officer, Bill Sloman, on my duties as a base commander. As far as I recall it consisted of a short conversation in which Bill said 'Well Tony my boy you have to decide whether you hunt with the hare or the hounds'. As there was to be no doctor on the Argentine Islands medical responsibilities also fell to me. My training was little more than having the dubious pleasure of watching the dentist extract a couple of teeth, not a pretty sight and the equally disturbing sight of the range of surgical instruments to be found in the typical base surgery. The final arrival at the base

was breathtaking as we sailed down the Gerlache Strait, off the Antarctic Peninsular, and finally the spectacular Lemaire Channel (generally referred to as Kodak Crack such was its photogenic qualities) to reach our destination.

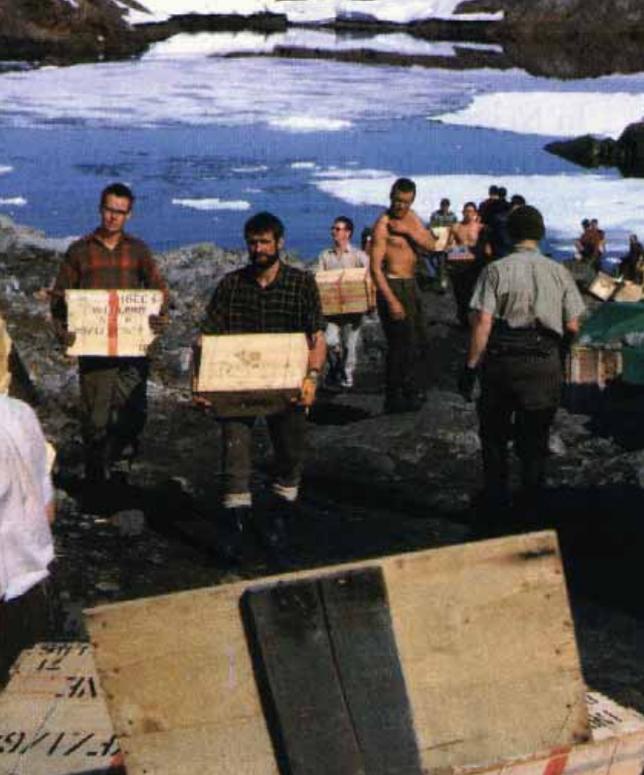
There was no mechanical transport on the Argentine Islands and the dog teams were being withdrawn, perhaps an early symptom of global warming as it was recognised that the winter sea ice between the island and mainland was no longer of a thickness to guarantee safe dog sledge travel. Relief was not a relaxing time. Stores had to be landed quickly, the Captain of the ship ever conscious of the need to up-anchor as ice built up with changes of weather conditions. All stores were landed by hand, a scow being used to move the cargo from the ship including over a thousand bags of coal, each of about a half



*The Argentine Islands.*

hundredweight, diesel for the next year in 44 gallon drums and food for the next year. As I was not to take over as base commander till January 1972 the organisation still fell to the outgoing base commander. Coal was landed via a human chain from the scow to the coal shed; fuel drums were rolled up the beach and all foodstuffs, in 'manageable' boxes, also went down the chain. Here I've pinched a photograph from the BAS Cub magazine and as I can recognise the individuals concerned I have no qualms about this course of action. There are for obvious reasons few photographs of these activities, in particular the landing of coal, as the photographer would not have been popular in shirking this communal toil!

The new electrolytic hydrogen generator was installed by the builders before they embarked on the *RSS John Biscoe* in January 1972. Sadly the two dog teams who had been resident on the



*Relief of Argentine Islands – food comes ashore.*

Argentine Islands were moved during the summer to one of the sledging bases further south. The beginning of March 1972 saw the departure of the last relief ship but not before we hosted the Governor of the Falkland Islands and his wife at a party on base. The wintering party consisted of twelve, four met men, three physicists, two ionosphericists, a cook, a diesel mechanic and a radio operator.

On the Argentine Islands the met programme consisted of the usual three hourly observations and the daily launch and tracking of the radio sonde suspended from a hydrogen filled balloon. The sonde sent back Morse signals of temperature, pressure and humidity and a reflector under the sonde tracked by radar enabled heights, wind speed and direction to be calculated; all from inside the met office, a far cry from the freezing activity of the pilot balloons on South Georgia. Initially we generated hydrogen from aluminium and caustic soda, a very messy business and a real environmental problem as the resultant slurry slid down the hillside. Again our routine as met men was a week assisting with launch and tracking the sonde, a week on day observations, a week on night observations and a week off. Apart from

the week off three met men were involved in the sonde operation. Once we got used to listening to the Morse code, it was only numbers, it was easy to track, plot and calculate while carrying on conversation over the noise of music. Occasionally problems occurred with the sonde blowing into the radio aerials resulting in a second launch with the new sonde being re-tuned i.e. the original kept transmitting from a height of 70 feet! This generally worked but once in summer 72/73 it didn't hence we were obliged to shoot down the old sonde with the base 303. Fortunately the radio operator, Brian Summers was a crack shot who famously went on to be part of the Falkland Islands Defence Force and was taken prisoner during the Argentinean invasion.

All this was carried on with gloved hands as the met office was cold in winter. Heating was by coal and somehow we were short changed in our coal ration at the December '71 relief. As we always had to keep a reserve I had to reduce coal consumption and that meant no fire in the stove in the met office which brings us back to the hatred of the met men for the beastie men (ionosphericists) – their equipment required a constant and fairly warm temperature hence their lab was heated! Again the strict scientific observations did not keep everyone fully employed but maintaining the base was time consuming. The post office was big business, much of the winter being spent attending to very precise philatelic instructions, just the tiniest corner of the stamp should be franked. As I was the base commander I was also appointed magistrate for the Argentine Islands and was supplied with official letters of protest should there be any infringements to the Antarctic Treaty, needless to say any visitors were more than welcome!

Water supply was a problem. In deep winter snow blocks were cut and put into a heated tank to be melted and pumped into the hut. During summer there was constant activity in collecting lumps of ice from the sea with our little dinghy, the interim period of blizzard involved shovelling powder snow to be melted. Such was the problem with water that base members were allowed a shower once a fortnight, also doing laundry at the same time as the washing machine was used to pump the water for the shower! During summer there was the inevitable hut maintenance involving re-painting with a thick tar and seals to be taken to feed our remaining dog Rachel. Various activities on improving the quality of the base hut were also undertaken such as building an extremely dangerous sauna (an insulated box with an electric fire inside) and making furniture.

Summer was spent in skiing, sailing our little dinghy (the sails being made from tea towels sewn together) and canoeing, the latter absolutely wonderful as we cruised past beautiful icebergs. We were conscious of the potential danger of leopard seals while in the water although I'm only aware of one incident when a girl from Signy Island was killed in 2004 while diving. As winter approached, the dinghies and canoes were stowed away in the boat shed and we settled into a regular routine initially mostly inside because of the constant blizzard. However, after midwinter cold clear temperatures were the norm and eventually the sea ice became stable enough for skiing. I recall our first foray on the sea ice when it was transparent and amazingly flexible however when a leopard seal swam underneath our skis we beat a hasty retreat. This was a wonderful time with the aurora in evidence at times.



*Base hut in winter.*



*Winter mail drop!*

This base quite a simple affair with workshops, a main lounge, dining room and kitchen and two bunk rooms, the latter not heated hence if you did not drink your cocoa at night it would be frozen in the morning. Nevertheless it was an extremely convivial environment, enlivened by the inevitable slide shows and photographic competitions; no film shows here! However we did have an endless supply of records from the Falklands Radio Service featuring such classics as 'Round the Horn', a good source of entertainment for the poor soul on night met duties. As an aside, the night met man had the duty of keeping the fires stoked, particularly in the kitchen so that the cook could be ready to bake in the morning and

the vital job of fire watch, the base buildings being tinder dry as was the outside atmosphere.

What should have been a peaceful period was rudely interrupted by medical matters. One base member suffered from what turned out to be kidney stones. On consulting with the doctor in Port Stanley I was perturbed by his seemingly lack of interest. On testing the poor patient's urine traces of blood confirmed the diagnosis. As it happened he passed the stones and after a good dose of antibiotics all was well. As it transpired there was a dire emergency at Fossil Bluff, a four-man base 70° S. One Fid had a broken femur and one had hepatitis. The BAS aircraft were in Canada and could not return. Sir Vivian Fuchs, the BAS Director contacted his opposite number in Argentina, all territorial claims/Falklands etc put aside, the result being the Argentine Antarctic Survey sending a small aircraft to the Bluff to evacuate the injured/sick personnel. BAS in the meantime contacted the parents of those based en route hence in deepest winter a single airmail letter was delivered to each person on base. As we had no airstrip, the sea ice being unreliable, there was a wonderful sight of the relief plane buzzing the base, the pilot tossing out a coke bottle round which were wrapped twelve letters, a truly marvellous event. In due course after the evacuation both patients recovered fully. After this excitement winter proceeded more peacefully. A further minor medical matter concerned a fellow met man who stepped on a nail, resulting in infection. This time the Port Stanley doctor had a little more time for us. On being informed that I was to administer a course of injections into the poor soul's nether regions I asked about alcohol, myself and the patient both having partaken of a beer or two, the doctor's response was to split another bottle between us before getting busy with the needle. Apart from the occasional stitch to a gash and administering a temporary filling my expertise was not called for again.

I feel I must mention some of the environmental matters. We obviously produced quite a lot of debris including the awful slurry from the hydrogen generator. During summer rubbish was tipped



*My home on Wordie Island for my last month south.*

over the end of the jetty and periodically we dredged it out to deeper waters. In winter it was easy. Pile it on the sea ice and come summer it would float away, however an awareness and unease was growing. Of course now nothing is left behind. And then the excitement of the relief in December '72 was upon us. What we craved was fresh food, fruit and vegetables that we had not seen for nine months. On relief we devoured apples and even whole onions. Now when the relief ship was in our vicinity they needed a sea ice forecast needless to say it was reported as being pretty thin cover! Shortly after relief I handed over to the next base commander and, to get out of his hair till the last ship left, I decamped to an abandoned base on Wordie Island with my typewriter, dinghy and skis,

where I stayed for about a month as I typed up my reports and looked forward to my return home.

Now I return to the *Professor Multanovskiy* and the South Orkneys. We landed on Laurie Island at the Argentinean Orcadas Base, looking pretty bleak in November. As the base had not been relieved we were made most welcome particularly as we came laden with fresh fruit and vegetables. I had the distinct impression that the military personnel on base were not exactly volunteers particularly by the response to my question "Would you like to come back". However, part of the base party were ecological wardens displaying a strong environmental responsibility.

After a very hospitable visit to the base accommodation we left and headed towards the South Shetlands, the original intention being to take a dip in the volcanic hot springs in the harbour at Deception. In the event we were behind schedule because of the strong winds and passed Deception in the night and headed south through the Gerlache Strait where we made our only continental Antarctic landing at the abandoned Argentinean base Almirante Brown. Conditions were not good but a landing was made though we did get rather wet. The base was abandoned in rather unusual circumstances. The doctor on base was looking forward to the return to his wife after his winter sojourn. However,



*Zodiac cruise in Paradise Bay – Antarctic Peninsula.*

when the relief ship arrived there was no doctor onboard hence he was forced to spend another winter in the south. The following winter the relief ship came in and again no doctor hence another winter. The next summer it appeared that once again there was no doctor on board. Enough was enough he wasn't about to stay for another winter so he set fire to the base and all were evacuated! I've never seen such dirty penguins as here. They normally make their nests with little heaps of stones and in this case they've used abandoned coal and charred timber from the burnt out buildings!

For us though it only remained for the long crossing of the Drake Passage to Cape Horn and Ushuaia in hurricane force winds, very exciting as the ship heeled to 40°. Unfortunately I did not get the opportunity to visit my old base, the Argentine Islands, which is now a Ukraine base but apparently all the old base photographs remain.

I have said little about the wildlife but the major pastime on my original tour was photography of the prolific bird, penguin and seal wildlife, with very few whales being spotted. On my visit last year what struck me most profoundly was the increase in fur seal almost to the extent of their being something of a problem and this has partly been caused, I believe, by the increased availability of food. The whales will recover but the life cycle is such that it will be many decades before results are apparent.



*The RGS party on the Multanovskiy.*

In March 1972, after leaving the Argentine Islands, I embarked on the RSS John Biscoe and, after a brief stop in the Falklands, headed for Montevideo where I left the ship to meander slowly home through South America. An abiding memory of my time as a Fid was that of the seconded service personnel on base. Many of us met men, physicists and scientists had come to BAS straight from university but the servicemen knew what they were about and that influence propelled me on my future career. And on that note the obligatory penguins!

*Obligatory seal – possibly Leopard.*



*Obligatory King Penguins.*



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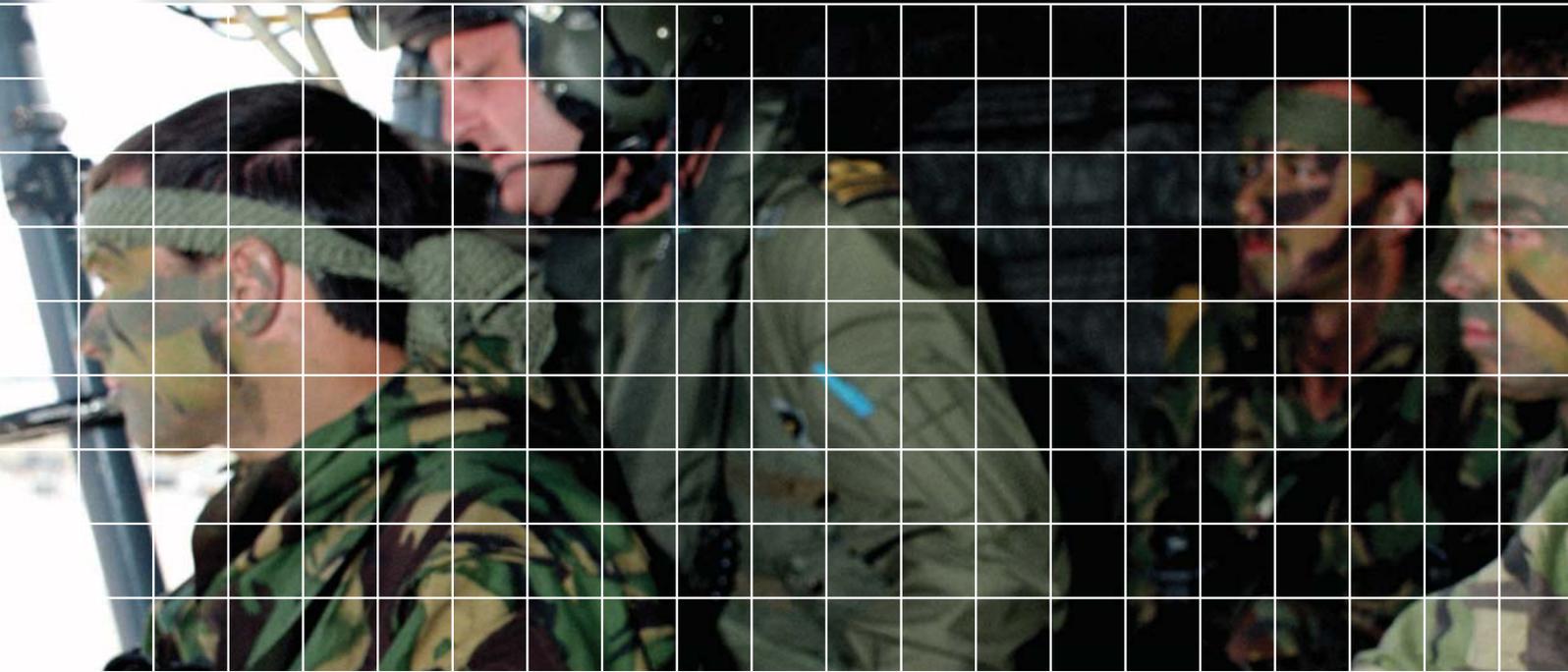
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