

# THE RANGER

*Journal of the Defence Surveyors' Association*  
Winter 2009

Volume 2 Number 20



*42 Engineer Regiment (Geographic)  
exercising the Freedom of Newbury.*

*(Photograph courtesy of Newbury Weekly News Group)*



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## In this edition of Ranger...

..... our cover story is the exercising of the Freedom of Newbury by 42 Engineer Regiment (Geographic). RE Geo has had personnel deployed on operations continuously since Operation GRANBY was launched in 1990 to counter Saddam Hussein's invasion of Kuwait. Throughout the intervening years troops have come and gone to Iraq, the Balkans and Afghanistan with little awareness in Newbury that the local unit was so heavily involved in the headline grabbing events overseas. As deployments were often in relatively small numbers as distinct from complete formed units there was never a 'homecoming' parade. The Freedom Parade on the 3rd of July was therefore a chance for the people of Newbury to say thank you to the Regiment and .....did they do it well! The soldiers marched impeccably and the crowds cheered enthusiastically – a day to remember and one that cemented even further the link between town and barracks.

This issue also reached a milestone – it is number 20 and the last in volume 2. This volume started when I took over as editor and Dave Johnson took on the design and desktop publishing. The reasons behind the change in format and scope that were initiated with this volume are explained elsewhere in this issue. Ten years and twenty editions on and it is time for a change of editor to bring fresh ideas to Ranger and so volume 3 will be edited by Peter Walker who will hand over the chairmanship to Nick Rigby at the next AGM. However, it is not all change as Dave will be staying on albeit he, Peter and the Council are going to review the design to see if any changes are necessary – it is now ten years old and might benefit from a facelift.

It is now time for me to thank the many people, especially all those who have written articles and the companies who have sponsored and advertised with us, who have helped make Ranger a success. Special thanks goes to Dave who has not only designed and put together every issue but has had to spend countless hours on the telephone whilst I ask him to move odd commas and correct stray apostrophes – with never a word of complaint! Some authors have put pen to paper, or rather figures to keyboard, above and beyond the call of duty; Tony Keeley, John Knight, Mike Nolan, Jonathon Shears, David Wallis, Robert Dobbie and Peter Walker particularly spring to mind but there are a number of others to which I give grateful thanks for coming back a second time or even a third time.

And so, for the last time, enjoy a good read.

*Alan Gordon*

**Opinions expressed in Ranger do not necessarily reflect those of the DSA or the editor.**

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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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## “Maps & Surveys 2010” The Defence Surveyors' Association Seminar Royal School of Military Survey Saturday 19 June 2010

The Defence Surveyors' Association will run its next annual seminar at Denison Barracks, Hermitage on Saturday the 19th of June 2010. As for previous seminars there will be seven presentations on a variety of subjects presented in generally chronological order starting with the Napoleonic Wars and hopefully ending with something on the state of the art technical support to current operations.

Full details of the programme will be advertised later on the DSA website and in appropriate journals. We expect to have speakers from a range of disciplines and organisations, including the Hakluyt Society; Portsmouth University; the International Boundaries Research Unit, Durham University; the Medmenham Club and Intergraph UK.

The attendance fee is expected to remain at £15 to include coffee breaks and a finger-buffet lunch with drinks.

### Bereavement

It is with regret that the Association announces the deaths of Rear Admiral Sir David Haslam, Major Frank Hamer, Major Nathan Arnison, Major JC 'Mike' O'Leary, Donald Mills, and Ron Takel. Obituaries of Frank Hamer and Ron Takel appear in this issue and an obituary of Sir David Haslam will be included in the next issue.

# DSA Prizewinners 2008 and AGM 2009

The Association's Annual General Meeting, with Peter Walker in the chair, was held on the 11th of July in Aldershot at the quaintly old fashioned Military Museum. Twenty three members attended and after the prize giving and buffet lunch there was the opportunity to tour the museum whose exhibits covered a combination of Aldershot military and local history. Unfortunately this year very few of the prize winners were available to attend but those that did from the United Kingdom Hydrographic Office and the Defence Geographic Centre enjoyed the hospitality of the Association. Those who could not attend were presented with their awards later at appropriate venues.

## ROYAL NAVY



*CPO Jim Coles could not attend the AGM as he was on deployment on HMS Scott where his Commanding Officer, Commander Gary Hesling, presented the prize in front of the Ship's company.*

### Chief Petty Officer J Coles

Chief Petty Officer Coles has striven to raise the profile of geo-spatial data gathering onboard *HMS Scott* and indeed in every area in which he has served. A stalwart of the specialisation, he seeks to raise the profile of hydrographic operations not only amongst his peers, but also within the Service in general.

He provided a particularly useful and important service within the HM Stores organisation, personally undertaking a difficult reorganisation of all RN hydrographic equipment during its relocation from Taunton to Devonport. Jim Coles took this opportunity to upgrade to the latest equipment, proving to be an adept financial manager in the process, and to reorganise the equipment store to reflect a much more efficient and productive work practice. By liaising with many different companies he ensured that the Royal Navy was fit to conduct hydrographic operations in the 21st century. Whilst conducting this challenging management task, he also ensured that the ships and deployable teams had all the equipment they required for tasking and on

several occasions provided replacement equipment, spares and excellent advice at short notice with the absolute minimum of fuss.

He has proven his utility and practical application of his knowledge during his service in Naval Party 1008, working in far from ideal conditions and often in very challenging hydrographic conditions. Throughout this, he has consistently rendered products of the highest calibre.

Pivotal in the regeneration of *HMS Scott* he has produced and organised training programmes aimed at professionally developing all members of the department which resulted in an increase in the overall skill levels and hydrographic knowledge onboard.

## ROYAL ARTILLERY



*WO2 Lee Dandy receives his award from Major General Patrick Fagan.*

### WO2 (CIS) L Dandy RA

WO2 Lee Dandy's core role since arrival in 39th Regiment has been Warrant Officer (Communications Information Systems) an area where his extensive skills and deep experience are clearly marked. With the advent of Guided MLRS in 2007, the Regiment's focus switched to precision strike and targeting and with this came immediate exposure to the wide array the targeting systems now in use on operations. WO2 Dandy quickly identified the need to embrace these new capabilities and rapidly developed his knowledge and qualifications of targeting as a whole, and specifically SOCET and JADOCs. His intelligence and thirst for knowledge quickly saw him become the Regiment's subject

matter expert and de-facto lead for precision targeting and principal instructor. His initiative and rapid application of the necessary targeting training and techniques has led to extremely significant advances in the areas of precision targeting training with the Regiment and the competence of its targeteers.

Initially, WO2 Dandy attended his targeting courses to gain to get a better understanding of what was required of the MLRS BtyTac Party. He garnered the essential knowledge and expertise in the very technical targeting systems and products. He instructs the complexities and considerations of mensuration and geo-location excellently and then nurtures his students' ability to derive accurate target locations – absolutely vital for the delivery of precision strike capabilities. He also recognises that the evolution of the target is also important and has tailored his training to cater for this, which has led to some exciting and innovative training solutions.

Lee Dandy has made an extensive and critical contribution to the development and ethos of precision targeting within the Regiment, and integrated rapidly and imaginatively critical new capabilities into the operational capability of the Regiment.

Lee Dandy could not attend the AGM but instead he attended the DSA Seminar on the 20th of June where he gave a fascinating presentation on the Royal Artillery's use of UAVs, a daunting prospect with so many senior sapper officers in the audience. The President presented his award on this occasion.

## ROYAL ENGINEERS (GEOGRAPHIC)



*Roy Moulding was not available to attend the AGM as he was on exercise in the United States therefore his Commanding Officer will make the presentation on a suitable regimental occasion.*

### Sergeant R Moulding RE

Sergeant Roy Moulding is currently employed as the Data Team Leader within the Special Support Team, 16 Geographic Support Squadron. He is responsible for the training and delivery of the Team's high precision survey capability, which is a key element of the support provided to the Technical Response Force, which is the military response to certain terrorist Chemical, Biological, Radiological and Nuclear incidents within the UK.

Sergeant Moulding has used his experience and thorough technical knowledge to tackle long standing issues with the precision survey support provided to UK operations. He has taken an innovative approach and used his teams' skills and fresh ideas to deliver a practical solution that retains all accuracy and precision assurance demanded of Defence Surveyors everywhere. The new technique hastens the disarmament process as well as providing improved flexibility. As a result of this capability improvement the survey team will be less exposed to intimate danger and the likelihood of mission success has improved.

In conjunction with the change in technique, Sergeant Moulding has coordinated the development of new equipment with the Atomic Weapons Establishment, which allows solutions in the most complex scenarios. Sergeant Moulding's enthusiasm and pro-active nature has also been evident in his day to day management of Special Support Team personnel. He has overseen the management of the Team's geospatial information database and ensured data support to the many exercises which the team have undertaken. Roy Moulding has made an outstanding contribution to military survey capability by enhancing the precision survey support to the Technical Response Force disarmament process.

## ROYAL SCHOOL OF MILITARY SURVEY

### Major A Friend RE

Major Friend, on joining the Royal School of Military Survey in October 2006 as Senior Instructor of the Imagery Wing, soon found that he was required to merge two existing wings, Imagery and Geospatial Information Exploitation as the School underwent a fundamental reorganisation following the integration into the Defence Intelligence and Security Centre. This he did with considerable skill, recognising that the Geospatial Exploitation Wing could better meet Defence Requirements by exploiting imagery and geographical information in a more coherent manner.

Having already demonstrated his academic credentials by achieving an MSc with Distinction in preparation for this post, he enthused all those who worked with him by his passion for exploiting geospatial information and education. In his many briefings to senior defence personnel, Adrian Friend always took advantage of the occasion to promote ways in which Defence should be exploiting Geographic Information. Indeed on more than one occasion it was difficult to prise visitors away from him, so enthused were they on his presentation.

Always open to novel ways of developing the subject, Major Friend forged new and important links with academia, defence and industry. He can see innovative ways of exploiting information as evidenced by his work with the Jill Dando Institute to explore how crime pattern analysis can be

used in Defence. As a manager it was obvious the way in which this adventurous approach rubbed off on all who worked with, and studied under him. So much was his questioning approach that the MSc students would ask staff if they were about to ask a 'Adrian question'; one that was always challenging, thought provoking and unpredictable.

Adrian Fiend's assertion that 'the main limitation in the future, currently appears to be our imagination' has been the gauntlet thrown down to RSMS and the Defence Geographic community.

## **ROYAL AIR FORCE AIR CARTOGRAPHY**

### **Flight Sergeant M Simpson**

From 2004-07 Flight Sergeant Mike Simpson was the SNCO i/c Research and Development, a post with responsibilities so wide-ranging they have since been split into three other jobs. During that time he oversaw the installation of a 120-workstation Local Area Network which is now the backbone of the Unit. Another major project included the close liaison with ISpatial, a commercial company who are developing the database known as 'Gothic', the key repository for our AI data and the starting point for all AIDU output. The enduring nature of these two significant achievements is a testament to Mike Simpson's tenacity and technical abilities.

Since November 2007, he has been the SNCO i/c Large Charts, which is a return to more cartographic roots. While he has shown his continuing interest in technical improvements, Flight Sergeant Simpson has also demonstrated a genuine flair for leadership and coupled this with some excellent resource management. As a result his 16 staff has been given positive and intelligent direction which has allowed some real efficiencies to be implemented. For example, in the last four months he has, off his own initiative and largely in his own time, taken a software program already in use elsewhere on Unit and designed an emulator for our aging Lites2 workstations. At a stroke this removed ten bulky, temperamental and energy hungry CRTs from a cluttered office as well as improving the quality of output. Critically for a controlled data-handling environment, this new process has removed one complete stage of 'fat-fingering' data and thereby enhanced the Flight Safety aspects.

Mike Simpson is unfailingly upbeat, his pastoral care of the younger elements of his section is exemplary and he is quick to offer informal encouragement or to arrange more structured training and development opportunities as required. The payback is the cohesive teamwork and obvious pride of the Large Charts section as it integrates with the remainder of the Unit. He is also a qualified Mediator, a role he has held for a year and which has earned him praise from other elements of the RAF, well beyond his own base.

## **DEFENCE GEOGRAPHIC CENTRE**

### **Team Award: Helen Rabbitts and Stephen Whitehead**

DGS provides a stereo extraction capability which is able to exploit a wide range of imagery types utilising the Multi Function Workstations (MFWS) that were delivered as part of Picasso Increment 1. Over the last year the Section has been called upon to produce an ever increasing number of products in support of operations. Of specific note is the development and subsequent production of the 'Cross Country Movement' (CCM) product over areas within Helmand Province, Afghanistan; a product that required a significant contribution from Helen Rabbitts and Stephen Whitehead in terms of development and utilisation of a new production platform.

This product was born out of a requirement from theatre to enhance existing mapping with a specific range of features; e.g. escarpments, cultivation, crossing points and gradients, plus additional information that could support logistical transport and troop vehicle movements. In addition, the requirement was for a softcopy product comprising shape files which meant that the final output was a unique bespoke product not within the standard product range of the section.

The two team members selected to undertake the task of product development were chosen not only for their existing imagery analysis skills but more importantly for the knowledge and skills that they had acquired during their training and implementation of the new MFWS production platform, comprising both new hardware and software. This was a significant challenge to the team coming immediately after initial MFWS training. They collectively took day-to-day responsibility for the product, overcoming a number of issues, not least having to manage staff new to feature interpretation and terrain analysis while maintaining the Section's existing production programme on a new production platform whilst simultaneously undertaking development of the CCM product. There were numerous technical issues associated with product development which included exercising new software functionality which had not been fully tested previously, attribution

of the data and liaising with the customer to ensure that all requirements were addressed. The operational significance of the product also meant the staff were under extreme pressure throughout the development period to produce an accurate timely dataset. Following an initial trial dataset they successfully developed the final flow line and produced all associated documentation with extremely limited technical support from outside the section.

Through their hard work and diligence they have established the knowledge and skills required to produce the CCM product, providing a capability that has now been successfully integrated into the Sections product range. To-date 4 datasets have been produced covering an area totalling 8500 sq km within Helmand Province.

The CCM is a major new product capability for the DGC, one that is now part of its core range of products and one that has been briefed to a range of senior staff and stakeholders who have all commented on the importance and value of the product in support of operations within theatre.

## UNITED KINGDOM HYDROGRAPHIC OFFICE



*The UKHO team, less Amanda Field, with Major General Patrick Fagan.*

### Team Award: Mine Warfare Data Centre

Paul Grant, Steve Edlin, Lee Contreras and Judy Field are the team within the Defence Business Unit at UK Hydrographic Office charged with operating the UK's Mine Warfare Data Centre on behalf of MOD/RN. In conjunction with Amanda Field, UKHO's lead on Strategic Ports datasets, they have pioneered the successful migration from traditional hard-copy Mine Warfare Pilots to digital Mission Specific Datasets.

Through their close working relationship with the RN customer, and their appreciation of the possibilities offered by GIS technology, the team identified the opportunity to deliver critical reference information in an improved form, to better support operational mine warfare in the RN. The new method provides the customer with far more comprehensive data, overcoming the former constraints of the hard-copy medium.

Recognising that the customer community has limited appreciation of the technical possibilities for improvement, and was thus unlikely by itself to identify such opportunities, the team took the initiative to point the way ahead for development, engaging and partnering with the customer to develop and implement a specification for a prototype of the new style product.

The team actively sought opportunities to expose the new approach to various key elements of the customer community, through presentations and demonstrations, including provision of datasets for a key MOD exercise and also a successful at-sea live demonstration during a recent mine-hunting operation.

The new method provides an opportunity for a production approach much more closely dovetailed to the operational schedule of the customer community, moving away from a process of pre-planned production over a range of areas where operations were expected at some future time, and instead to an approach where up-to-date tailored datasets are produced just in time for each specific deployment. This provides for an improved quality of support even when operational schedules change at relatively short-notice.

Although the team's remit is limited to the data side of the operation, they recognised the importance of other aspects, and were careful throughout to highlight the implementation issues associated with bringing the new product into service. The team liaised particularly well with both MOD and its contractor to ensure that existing MOD systems can host and operate with the new datasets.

In summary, this initiative has opened the way to a much more effective way of providing relevant geospatial information for the critical mine warfare operations in the RN. It provides for a more responsive and flexible approach in meeting future requirements and has further enhanced the reputation of the team and the UKHO within the RN customer community.



# The Worshipful Company of Scientific Instrument Makers Annual Awards Dinner 5th February 2009

*By Tony Keeley*

In spite of the Arctic conditions, on the 5th February 2008, the Royal School of Military Survey was once more the recipient of the Livery Company's hospitality at their hall in London. The Livery Company is affiliated to the Corps of Royal Engineers and historically the Royal School of Military Survey has managed this link. The Company has endowed two prizes to the Corps, the best Royal Engineer officer on the Army Survey Course and to the best Royal Engineer soldier

Geographic Technician on the Class 1 Course. The Army Survey Course prize for 2008 was awarded to Captain Alan York RE who completed 93 ASC last September and the Geographic Technician prize was awarded to Sergeant Ryan Douglas Bell RE who completed his course in December 2007. Captain York was accompanied at the Awards Dinner by the Principal of RSMS, Mr John Knight, and the Training Coordinator, Major (Retd) Tony Keeley, Sergeant Bell being stranded in Wiltshire by the snow conditions on the roads.



*Captain Alan York RE receives his award from the Master.*

Captain York enlisted in the Army in 1982, spending his first two years as an apprentice cartographic technician at the Army Apprentice College at Chepstow. Following completion of his training he was posted to 42 Survey Engineer Regiment as a young Sapper. He then saw service with the 3rd Armoured

Division in Germany, where as a Corporal in 1990 he joined 4 Armoured Brigade during the first Gulf Conflict. Seeking a quieter life, the now Sergeant York was posted back to Regimental life in 1991 and later to the Royal School of Military Survey as a Staff Sergeant in 1995 where he saw active duty in Bosnia with the United Nations and NATO. In 1997 Staff Sergeant York served with the Allied Rapid Reaction Corps in Germany and deployed to Kosovo in 1999. On promotion to Warrant Officer in 2000 he returned to the United Kingdom to spend time in command on the Air Survey Liaison Section, based out of RAF Marham where he enjoyed deployments on numerous occasions in Africa and the Middle East. Returning to the Geographic Engineer Group in 2003 he was commissioned in 2005 and promptly deployed to Basra in Iraq. For his outstanding performance on No 93 Army Survey Course he was recommended for the Worshipful Company of Scientific Instrument Makers prize. He is currently serving with a Territorial Army squadron at Ewell and hence experiencing another facet of Army life.

Sergeant Ryan Douglas Bell grew up and was educated in Fife. His first interest in the Army was as a member of the Territorial Army (212 Battery RA (V)), and realising that the Army was the life for him, he enlisted in the Regular Army as a Geographic Technician in 1996. After completion of his basic training and then basic trade training as a Reprographic Technician at the Royal School of Military Survey at Hermitage he was posted to 13 Squadron undertaking an operational tour in Bosnia in 1999/2000. After further training at the School he deployed to Afghanistan as a LCpl. On his return again to the School he completed his Class 1 course achieving an HND in design Reprography followed by a further operational tour in Iraq. After promotion to Cpl he was posted to Germany and again deployed to Iraq. He then took the opportunity to retrain as a Terrain Analyst at the School, a further Class 1 course, where he achieved his Foundation Science Degree in Applied Computing in Defence Geographic Information in December 2007 and was awarded the Sheffield Hallam University prize for 2007, graduating at Hermitage in October last year. For his outstanding performance on his 2007 Class 1 course he was recommended for the Worshipful Company of Scientific Instrument Makers



*John Knight, the Principal RSMS, accepts the award on behalf of Sergeant Ryan Bell RE.*

prize for 2007. He is currently serving as Brigade Geographic Sergeant for 1 Mechanized Brigade at Tidworth, no doubt with more operational tours ahead.

After an extremely hospitable dinner, toasts and the ceremony of the loving cup the Master of the Worshipful Company of the Scientific Instrument Makers, Mr Brian J Lowings, presented prizes to a number of recipients including several from the services and the academic world. As always the Livery Company was solicitous in its welcome and hospitality to guests and prize winners alike.



## ARMY BENEVOLENT FUND

### The Soldiers' Charity

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The ABF was founded in 1944 to assist the millions of men and women returning to civilian life. It is the Army's National Charity, committed to the welfare of soldiers, ex-soldiers and their families in times of need. This has become particularly important with the ever-rising casualties in Iraq, Afghanistan and other operational zones. For over sixty years the ABF has worked tirelessly to provide financial and practical support to both the Regular and Territorial Army, and operates in partnership with Regimental and Corps Benevolent Funds, and in close co-operation with other Service Charities.

**Each year the ABF needs to raise, and in turn disburse, more than £6 million if it is to be able to fulfil its commitment to those in need.**

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

**Sunday 24th January 2010** - A lecture entitled 'The Cutting Edge of Medicine in the Front Line' by Lieutenant General Louis Lillywhite, the Surgeon General, followed by lunch at Denison Barracks, Hermitage.

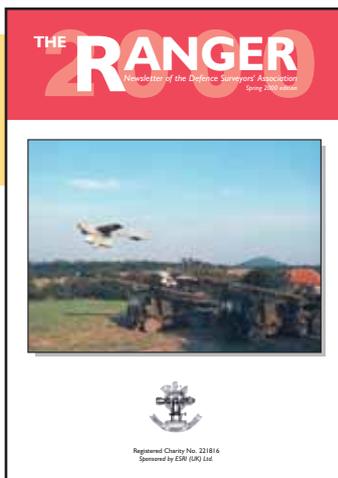
A variety of other events are being planned for 2010. If you would like to receive information about the lecture by the Surgeon General or other events run by the Army Benevolent Fund please contact us and we will add you to our supporters list.

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*Spring of the new millennium saw not only the Gunners launching Phoenix but also the DSA launching the new format Ranger magazine.*

## Why Ten Years of Free Ranger?

*By Alan Gordon*

This edition is number 20 of volume 2 and as such marks ten years of the current format of the journal. Increasingly over the ten years the editor has been asked why the DSA give its Ranger magazine away free of charge. The answer lies in Association's *raison d'être*.

Readers of this magazine, unless by some strange happenstance a copy has found its way into a dentist's waiting room along with Field and Country Life, have an interest in some way with how geospatial information is, or was, used in Defence. As a group this readership is spread across a remarkably wide area both geographically and as regards organisations. Ranger lands on the desks of people dealing with geospatial information matters from Singapore in the east to

the USA in the west and from New Zealand in the south to the Baltic States in the north. The jobs of these 'geo people' vary enormously; NATO policy makers, Geo technicians in Battlegroups in Afghanistan, hydrographic specialists charting the oceans, gunnery instructors on Salisbury Plain, members of an IPT procuring the next generation of technology and so on – in all a very disparate group and one without a unifying title to categorise it.

The working world can be divided in a number of different ways; sectors, communities, Special Interest Groups, specialisms and so on but our readership does not seem to fit neatly into any one of these. Some operate in the public sector and others in the private sector – all have an involvement with the Defence sector and some would also consider themselves to be in the IT sector. Many, but by no means all, are within the Intelligence Community, some attend SIGs as they are experts in a particular software package, but most don't. It would appear that the group could be classified as a specialism within the Defence sector and a relatively small specialism at that, and one where many members have little in common with each other bar the involvement in some way with geospatial information and - as recipients of Ranger.

Whilst all readers have this common interest that is about all they do have in common. They wear different uniforms, if a uniform at all, don't necessarily have English as their first language, use GIS and/or GPS or neither and, it may seem strange, but a large majority are not even members of the DSA whose journal it is – hence the question to the editor.

The DSA started life as a means of keeping the First World War sound ranging specialists in touch with each so that their hard-won expertise would be available should it ever be needed again. The scope of the Association was soon expanded to include all those who had been involved with survey during the Great War and subsequently over time its boundaries have widened to include hydrographic surveying, aeronautical charting and more recently, many of those who operate under the ISTAR umbrella.

The DSA is a charity and as such is required to have formal objects which are as follows:

1. *to promote the military efficiency of units of the Armed Forces of the Crown that form the Defence surveying community and are concerned with:*
  - a. *Defence surveying in any of its branches or*
  - b. *The production of maps or charts or the issue of geographical, hydrographical, oceanographic, meteorological and geological information by any other means for use by the Armed Forces of the Crown or*
  - c. *The location of targets and direction of military activity on targets by any scientific method.*
2. *To advance the education of the public in the history and science of defence surveying and related subjects (as listed in 1. above).*



*Major General John Rose CB MBE, then the Assistant Chief of the Defence Staff (Intelligence Capability), opened the 2009 DGI conference.*

A review of the state of the Association in 1999 decided that these objects were not being met as well as they might and questioned how meeting them could be improved. This brings us back to the scattered and disparate nature of the elements that make up the audience detailed in the Objects above. If there was some means of sharing thoughts, achievements and problems and of meeting and discussing these in an open forum then perhaps a ‘specialism’ could become a ‘community’ – the ‘Defence Geospatial Community’.

It was thought that there were two means of achieving this – through the written word and by gatherings of kindred spirits.

At the time there were a number of technical magazines that had some relevance but each of them dealt with a specific technical area for instance, GI News covered GIS across the board and the Hydrographic Journal dealt with hydrography world-wide, each contained some Defence relevant material but not a lot. The situation with face-to-face gatherings was similar; the Association of Geographic Information (AGI) held an annual conference and accompanying trade exhibition but the Defence content was very limited.

It was therefore agreed that the Association would produce and distribute a magazine to everyone with an involvement in Defence and geospatial information and mount seminars and exhibitions aimed solely at the same audience.

To that end it was decided that the then small internal DSA newsletter should be expanded into a vehicle that could be used to promote not just the DSA but more especially the dissemination of information throughout the Defence ‘geospatial community’. The content was to include not just current events but articles of an historic nature and also views of what the future might hold. What evolved is the high quality journal you are reading and, as a copy of each issue is lodged with the six National Deposit Libraries, it will be available to researchers in generations to come. Key to Ranger’s success is the very targeted distribution list that was originally put together by the official MOD representatives to include everyone with an interest in geospatial matters within the MOD and also many international organisations with interests in this field. This list is updated prior to distributing each edition, copies of which are sent to the current appointee by name rather than just appointment title – a unique ‘selling point’.

To achieve face-to-face meetings the DSA in conjunction with BAE Systems, thanks to DSA member Kevin Porter, mounted a technical demonstration in 2003 that was a huge success. It also showed that mounting a technical exhibition and seminar on a regular basis was beyond the capability of the Association. However, in 2004 Worldwide Business Research mounted the first Defence Geospatial Intelligence seminar and exhibition in London and this immediately met the requirement that the DSA had envisaged. The show has grown each year and the Association has been actively involved for the last two years as it sees DGI as meeting their Objects.



*Conference sessions at DGI attract full houses.*

Whilst the annual DGI event showcases current and future technology there was still a need to advance education in the history of military surveying. In 2000 the University of Greenwich held a seminar looking at military geography which was so successful that another was held the following year at which papers were read by a number of DSA members and the audience easily topped 100. There was clearly interest in the subject and so for several years the Association joined with the Historic Military Mapping Group of the British Cartographic Society to mount seminars. In 2007 the DSA held its own seminar titled 'Maps and Surveys' to mark the Association's 80th anniversary. It was an overwhelming success, as were the subsequent seminars held in 2008 and 2009. The seminar now looks to continue as an annual event offering an opportunity to showcase military surveying in the past, but also providing a look at current operational capabilities.

And so ten years on Ranger goes from strength to strength, the DGI event is a keenly awaited annual fixture providing the chance to see what's new, discuss problems and achievements and, above all, meet people face to face, and the Maps and Surveys seminar is a summertime date for those interested in historical matters. Between these three initiatives perhaps a Defence Geospatial Community has been forged and the DSA has better met its Objects.

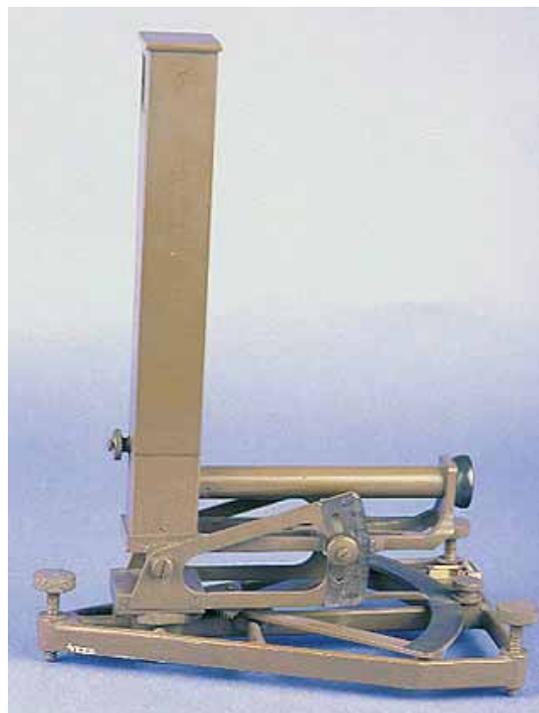
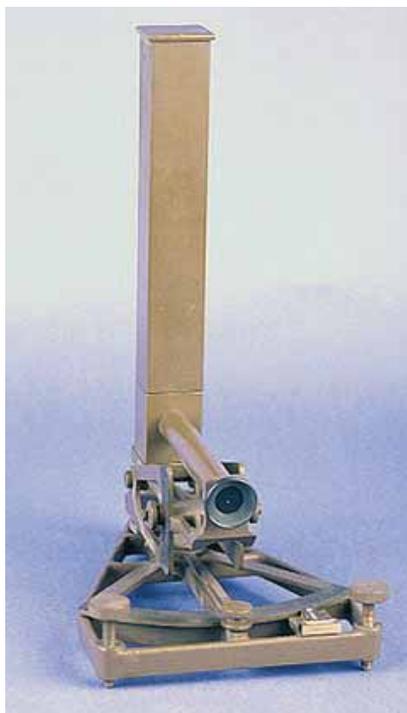
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## Mystery Object

The Whipple Museum of the History of Science holds an internationally important collection of scientific instruments and models, dating from the Middle Ages to the present. Among their many items is a small military periscope which was acquired by transfer from the Department of Geography at Cambridge. However, Whipple staff have not been able to identify its purpose. Approaches were made to the Imperial War Museum and the Royal Engineers Museum and, despite its maker, date, etc being clearly inscribed. The Corps Museum said that it was probably a trench periscope but the IWM said that it definitely was not a trench periscope, which were mostly hand-held. Its levelled base suggested that it was some sort of gunnery instrument and so it is hoped that a Ranger reader, Gunner or otherwise, may be able to solve the mystery.

The description is: Periscope No. 31. Made by A. Kershaw & Son Ltd, Leeds 1917. Metal alloy, khaki finish. Square shaft with window and cross-hairs. Diagonal mirror and sighting tube at base of shaft. Moves over scale of elevation and depression graduated 10 - 0 - 10 and azimuth scale graduated 40 - 0 - 40, both to 1 degree. The indicator arm for the azimuth scale is cogged from the base of the shaft. The instrument base frame has three levelling screws and two bubbles at right angles. Length 295mm, breadth 190mm, height 395mm.

Anyone who knows anything about the periscope, or indeed feels that they can even hazard a guess at its purpose, is asked to let the editor know and he will put them in contact with the Museum.



# Exercising The Freedom of Newbury



*42 Engineers Regiment (Geographic) marching through cheering crowds to the ceremony. (Photo: Mike Nolan)*

In 1997 Military Survey celebrated its 250th anniversary. This milestone was marked by many events throughout the year but the most significant and lasting were the bestowing of the Royal accolade to the School of Military Survey and the Corps of Royal Engineers being granted the Freedom of Newbury.

Towns and cities grant the ‘freedom of the town’ to military units with whom they have developed a close relationship over many years. As a symbol of their trust in the unit the town bestows the right for it to march through their streets with band playing, bayonets fixed and swords drawn – and 42 Engineer Regiment (Geographic) did just that on the morning of the 3rd of July, and did it with style and panache.

The Regiment has been providing detachments on operations continuously now for 17 years but as it never deployed as a formed unit it has not had a ‘homecoming’ – the Freedom parade served as such and the spontaneous rapturous applause from the crowds lining Northbrook Street were a clear expression of the town’s feelings for the unit.



*The Royal Engineers Band leads the parade down Northbrook Street. (Photo: Mike Nolan)*



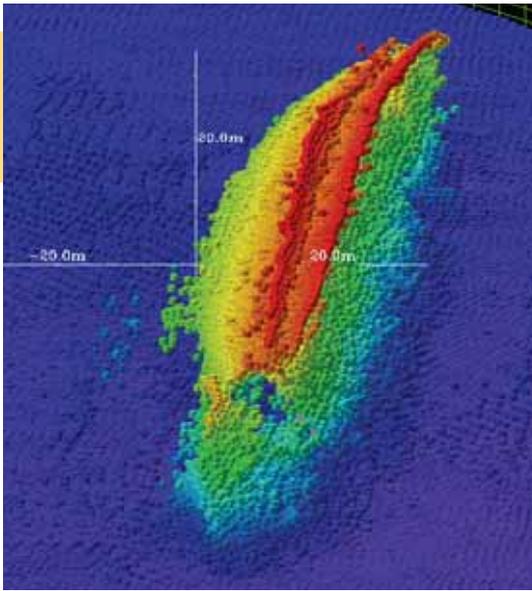
*Former Military Surveyors from the Royal Engineers Association were also on parade. (Photo: Mike Nolan)*

*Swords drawn, bayonets fixed – the Regiment awaits inspection in the market Square. (Photo: courtesy Newbury weekly News Group)*



# The Deep Gives Up One More Secret

By Lieutenant Nick Taylor RN



One of the most emotive moments during the course of survey operations is the discovery of a wreck. This combines a sense of history and nostalgia with the thrill of a detective mystery and the poignancy of the possibility of fellow mariners' untimely demise. Such a moment occurred in the summer of 2009 to the Royal Navy's Hydrographic Survey Vessel *HMS Enterprise*, commanded by Commander Adam James, while conducting survey operations on

the edge of the West African continental shelf. The story however started some sixty eight years earlier.

On 23rd of February 1941 a low grey shape decorated only by a small white flower, slipped out of Lorient harbour heading for the open ocean. She was a hunter, the *U124* the last of the Type IXB U Boats built in Bremen during 1940 and commanded by the veteran Kapitän-Leutnant Georg-Wilhelm Schulz for whom she was his third command. She already had nine kills to her name totalling 40,489 tons of shipping and now heading out on her fourth and what was to be her most successful war patrol.

Her course took her south out of the Bay of Biscay to the Mid Atlantic and to the coast of West Africa where she spent the next two months silently attacking shipping using the Cape trade routes off Sierra Leone gaining another five kills and adding 27,926 tons of Allied merchant shipping to her score.

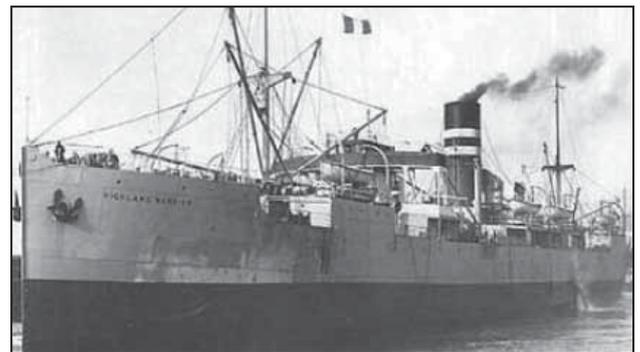
The 4th of April was an auspicious day for *U124* and her crew as it was announced that Schulz had been awarded the Knight's Cross. Then just after 1600 hours, *U124* sighted a British 6,507 ton cargo steamer the *SS Marlene*. She had been built in 1920 by Barclay, Curle & Co Ltd, of Whiteinch, Glasgow as the *Highland Warrior* for the Nelson Line of London. In 1933 she was sold to the Royal Mail Line, and in 1934 she was renamed the *Nagoya*. In 1936 she became the *Marlene*. On her final voyage her master was Henry Ellison Lascelles and she was en route from Calcutta to the UK carrying 8,700 tons of general cargo, including 1,500 tons of pig iron.

She was sailing alone without protection off Freetown Sierra Leone when the submarine sighted the smoke from her funnel. Lascelles knew she was not a fast ship and her only defence against submarine attack was to zig-zag to try and confuse the enemy's firing solution. However, this only slowed her progress down still further making her an easy target for an experienced U boat.

Schulz patiently stalked his prey for five hours before attempting his first strike on the unprotected merchant ship. The torpedo missed and another two hours were spent manoeuvring the submarine into a better position for another attack. At 2302, almost seven hours after commencing the attack, a torpedo detonated underneath the *Marlene's* bridge on the starboard side. The U Boat then surfaced with the intention of finishing her off with her 105mm deck gun. After a barrage of 12 incendiary shells the coup de grace was administered to the still floating *Marlene* by a third torpedo, hitting her this time in the stern. Within five minutes she was gone, sinking by the bows at ten minutes past



*U124 in harbour*



*SS Marlene in her earlier years*

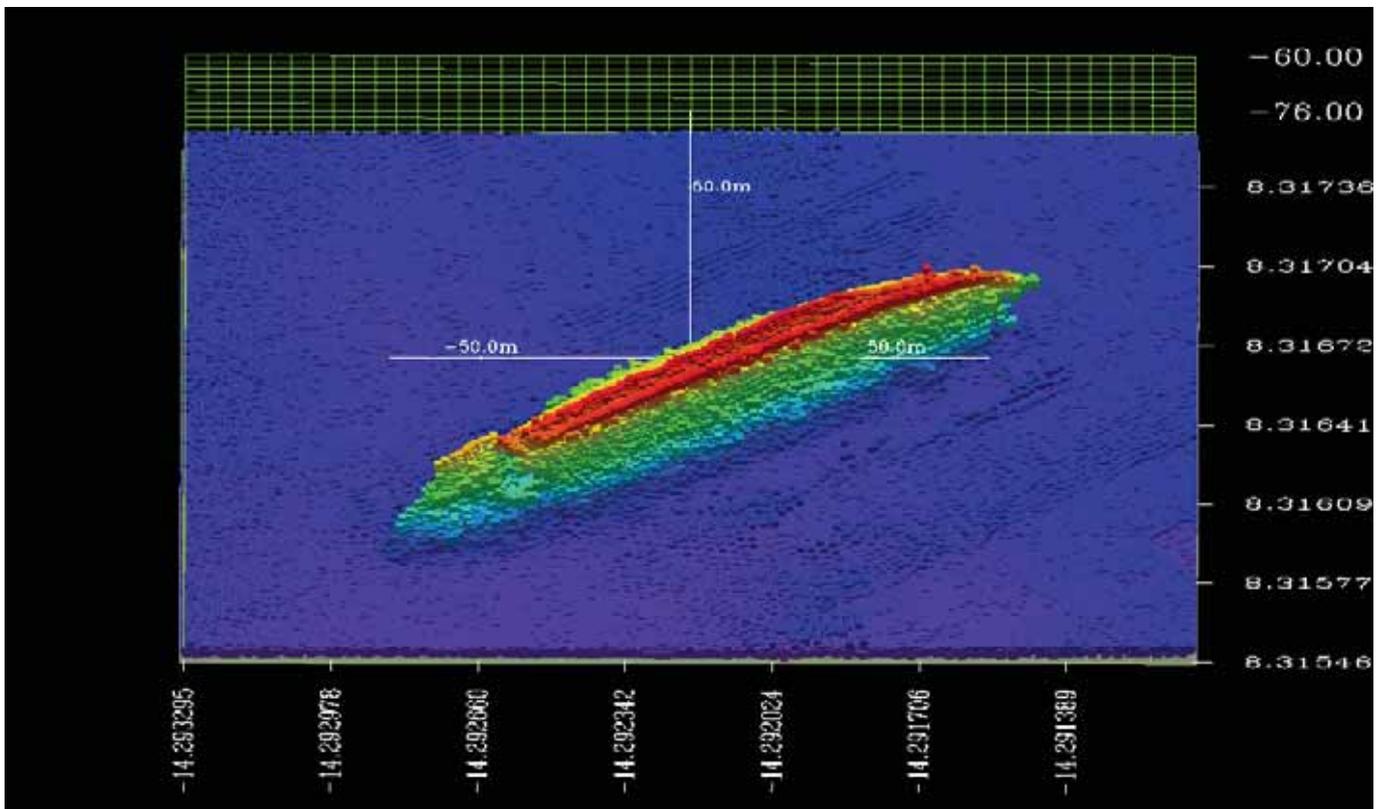


HMS Enterprise off the African Coast

midnight on the 5th April 1941. 13 crewmen were lost but a total of 47 survivors, including the Master, landed at False Cape just south of Freetown some sixty miles from the site of the sinking.

In July 2009 *HMS Enterprise* while utilising her Multibeam Echo Sounder (MBES) detected a large contact in 84 metres of water. *Enterprise* conducted an investigation went over the contact, 'pinging' it with her MBES and Sidescan Sonar (SSS) to obtain as much data as possible. On closer inspection it proved to be the

largely intact hull of a sizeable vessel resting on her starboard side. The wreck was 22.6 metres high, 20 metres wide and 140 metres long and had evidence of extensive damage at the aft end. The SSS indicated the presence of debris close to the wreck near the deck, possibly the remains of the masts and deckhouses. Comparison with the data supplied by the UK Hydrographic Office in Taunton determined that the vessel was the *SS Marlene*. It had not previously been charted as the position reported when the ship was lost had been deemed too vague. The wreck will now be included on the next edition of the Admiralty Chart for the area.



She may have lain broken on the sea bed for 68 years, but the *SS Marlene* had one final duty to perform, as a calibration target for *Enterprise* whilst conducting a patch test on her EM1002 Multibeam Echo Sounder, ensuring that the data subsequently collected met the stringent criteria of a modern survey prior to rendering the data to the UKHO.

As for the *U124*, she continued her patrol before arriving back triumphantly in the U Boat pens of Lorient on the 1st of May having sunk eleven ships with a total of 53,297 tons. Schulz commanded her for one final patrol before handing over command in September 1941 to the 1st Officer Johann Mohr (awarded the Iron Cross 1st Class for the *Marlene* Patrol) who was to become one of Germany's greatest U boat aces. Mohr commanded *U124* until she was finally sunk on her eleventh patrol by *HM Ships Black Swan* and *Stonecrop* off Oporto whilst attacking convoy OS45. She was the fourth most successful submarine in history, having claimed 48 ships destroyed including the cruiser *HMS Dunedin* and a further four ships damaged for a total of just over a quarter of a million tons of shipping.



# Report on 8th International Conference on Military Geosciences

*By Colonel (Ret'd) Ted Rose FInstRE*

The 8th ICMG was held at the Austrian National Defence Academy, in Vienna, from 15-19 June 2009: convened by the Institute for Military Geography of the Austrian Armed Forces (led by Brigadier Reinhard Mang) and the University of Vienna Department of Environmental Geosciences (represented by Professor Hermann Häusler, a colonel in the Austrian reserve army). The 9th is being planned for 2011: to be held in the USA, at Las Vegas, convened by Dr Eric McDonald of the Desert Research Institute, with support from the US Army Research Office.

This series has evolved both in name and style. The first meeting, in Seattle, USA, in 1994, was intended as a one-off one-day symposium, convened under the auspices of the Geological Society of America. However, its success led to a similar meeting in the UK, in 1996, under the auspices of the Geological Society of London. A half-day meeting in Toronto, Canada, in 1998, was back again under the auspices of the Geological Society of America. Each of these generated post-conference books, published by the respective geological societies (Underwood & Guth, 1998; Rose & Nathanail, 2000; Ehlen & Harmon, 2001).

In 2000, in the UK, the scope broadened from geology to terrain, attracting contributions from geographers and historians as well as geologists, and expanding to a three-day 'conference', sponsored by the University of Greenwich in association with the Imperial War Museum and the Royal Engineers Museum. The conferences adopted the title 'international' and expanded to four days in 2003, when the next was hosted again in the USA, at the US Military Academy, West Point, with an explicit geography and geology theme. Numbering was adopted with the 6th conference, convened at the University of Nottingham in the UK in 2005. The broader scope of these three conferences is reflected in the books they generated (Doyle & Bennett, 2002; Caldwell et al., 2004; Nathanail et al., 2008). The 7th conference was held at the Université Laval in Quebec, Canada, in 2007, and its book is currently in preparation.

With meetings thus alternating every couple of years between North America and Europe, in 2009 it was Europe's turn – and 'geology and geography' became embraced in 'geosciences'. A detailed analysis of previous conference books (Häusler, 2009) published to set the meeting in context revealed, inter alia, that although so far overall more first authors of published contributions came from the USA than elsewhere, surprisingly the three most prolific first authors all currently live in the UK.

The Vienna conference was the most ambitious so far, its programme extending over five days: four days of lectures plus a couple of half-day excursions, punctuated by a spectacular whole-day excursion in the middle. It was splendidly resourced by a team of 26 people, mostly drawn from the Austrian Institute for Military Geography but a few also from universities (of Vienna and Salzburg) and the Geological Survey of Austria: 5 to staff the organizing committee, 4 the daily information desk, 7 the excursions, 2 the poster sessions, 6 to provide technical and publication support, and 2 to function backstage. Many of these contributed oral and/or poster sessions during the conference, which attracted 57 additional registrants, most (as typically) from the host nation (21 from Austria); many (17), also typically, from the USA; 10 (an atypically large number) from Germany; 3 from the UK; and 1 each from Belgium, Canada, Croatia, France, South Africa and Syria.

First authors from the USA (17), Austria (11), Germany (7), UK (3), Canada (2) and France (2) generated in total 42 oral presentations. First authors from Austria (10), the USA (4), and Croatia, France, South Africa and the UK (1 each) generated 18 poster presentations. Together the USA and Austria led with a total of 21 presentations each. But add the 7 German presentations to the 21 from Austria and it is clear that the conference provided a uniquely significant insight into past and present terrain expertise generated by armed forces using the German language – almost invariably presented in excellent English. The British contingent was small and exclusively academic, the American larger and military as well as academic. Impressively, groups of uniformed officers from the German and Austrian armies were led throughout the conference by officers of one-star rank. Coffee/lunch/tea breaks provided ample opportunities for networking.



*The stunning view of the Alps from the Blackhawk helicopter during the Wednesday field trip.*

Oral presentations were grouped into major themes: e.g. theory of military geosciences, climate change and geohazards, and military mapping and surveying. Papers on military geosciences in general formed the core component of three sessions, and war in mountain (Alpine) regions another two. In scope papers ranged from the historical, and lessons learnt, to the application of state-of-the-art techniques.

The two keynote addresses were of particular significance: one by Colonel (Ret'd) Dr Werner Gillissen, who had led the former East Germany's Military Topographic Service at the end of the Cold War, the other by Colonel (Ret'd) Dr Ulrich Barner, who had led West Germany's Military Geographic Service at this time. Co-eval German cartography both east and west of the Iron Curtain could thus be compared and contrasted in lively discussion.

The programme was structured to provide a full day of presentations on the opening Monday and on Thursday, starting at 08.00. Tuesday and Friday had similarly early starts, but concluded with lunch, followed by a half day guided excursion: on one day to see some of the historical sites of Vienna, including the Globe Museum with its unique display indicating developments in understanding of global geography through time, on the other day to visit the Museum of Military History, whose extensive displays relating to the 1914-1918 and earlier wars were particularly impressive. Wednesday was the longest day, but devoted entirely to a choice of field excursions into the Alps. Some participants chose the excursion by coach: to the Semmerling area, to examine

sites of confrontation between German and Soviet forces in World War II – and the fall of the Iron Curtain in 1989. Most (about 40) chose the airborne alternative: flights by small aircraft and/or Blackhawk helicopter across much of southern Austria to demonstrate the main geological zones of this part of the Alps; visit to a World War I museum and cemetery near the Austrian/Italian border; and long flight east along the border to view former front line positions from the air, before continuing across the southern Eastern Alps back to the airfield near Vienna. The registration fee for the 5-day conference was a pricey €250, but from this trip, the excellent cooked lunches with generous allowance of wine/beer every day, and the wealth of publications freely distributed on and after registration, my impression is that everyone thought they received good value for their money.

The conveners of the 9th conference thus have a hard act to follow. However, the provisional theme of ‘desert warfare’ and proximity to terrain eminently suitable for field trips are likely to maintain the enthusiasm evident in this conference series so far. And by then, the conveners of the Vienna conference hope to have edited a selection of its peer-reviewed papers into a worthy book, potentially in the style adopted for their recent military geographical handbook (Mang & Häusler, 2006).

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# No 94 Army Survey Course Farewell (The last Army Survey Course or is it?)

*By Tony Keeley*

The Royal School of Military Survey's flagship course, the Army Survey Course (ASC) has continued to evolve over the years to meet the requirements of Royal Engineer Officers specialising in Military Survey and then RE(Geographic). In the early days the Long Survey Course catered for professional surveyors turning out competent field surveyors, also with the knowledge to manage all aspects of the survey business. The passing of No 94 Army Survey Course marks a fundamental change in that from now on the course will no longer be referred to as the Army Survey Course, its successor being the Royal Engineer Geographic Officers Course (MSc in Geospatial Intelligence).

94 ASC, though only a small course with five students completing on the 4th of September 09, had as usual the international flavour that is unique for this course. I say unique because though there are many service courses catering for international students, the ASC has at its very core the international student in mind and not just on a fill up basis. After the Cranfield University Examination Board in the afternoon of Tuesday 1st of September the ASC farewell party was held in the Mess that evening, combined with the welcome for the new course (No 1 MSc in Geospatial Intelligence) but more about that later. However, rest assured that the historical link with the ASC will not be abandoned.

Three Royal Engineer Officers, Captains Neil Lakin, Alex Mayes and David White completed the course and representatives from the international community were Captains Donghwan Kim, otherwise known as Kim from Korea, and Mahfoodh Al Araiimi from Oman. Though this was a small course it was quite clear that what it lacked in numbers it more than made up for in spirit. Anyway, some 70 mess members and guests gathered that evening to see the old course off. The event was also attended by Capt Phil Burrell RN, the outgoing DISC Director of Training on his farewell visit, and his replacement, Capt Peter Adams RN, and other individuals who have contributed to both the School and the Course.

The Principal, John Knight, and JAGO Commander, Colonel John Kedar, both welcomed and bade farewell to the appropriate courses which was followed by the formal prize giving. A number of prizes were awarded/announced at this occasion. Neil Lakin, as top student and achieving a rarely award A grade on his ASC, will be presented with the Cranfield University prize at his graduation at Shrivenham in July next year. He will also be the guest of the Worshipful Company of Scientific Instrument Makers at their awards dinner in February next year to receive his prize as the top Royal Engineer student on the course. But now back to the actual presentations that evening.



*Archie Hamilton and his dog.*

The Hamilton Prize was first awarded in 1969 as a personal gift by Mr Archie Hamilton on his retirement. Archie, after many years surveying overseas often accompanied by his family, became the Colonial and subsequently the Overseas Supervisor at the School of Military Survey from 1948 to 1969. He stipulated that the prize should not just be for academic achievement but the individual's personality, character and contribution to the course should be taken into account. He was adamant that the award should not be for some 'inky swat'. However, on perusal of the list of past recipients it is clear that they were in no way devoid of academic prowess, one former

recipient being present tonight in a senior capacity! Joanna Burrows, his daughter, once again graciously agreed to present the award. The recipient on 94 ASC was Captain Alex Mayes, a universally popular choice amongst both course members and staff. Archie set up the fund to provide the prize of £50, since added to by Joanna. For this year onwards Joanna has also kindly agreed that the Defence Surveyors' Association will supplement the prize with a further £100.

*Joanna Burrows presents the Hamilton Prize to Captain Alex Mayes.*

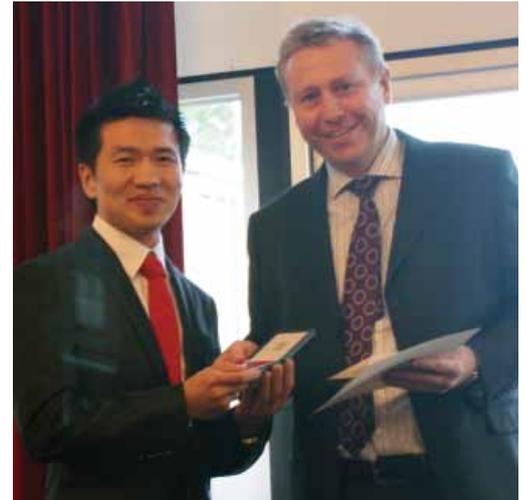




Major 'Stiffy' Simpson.

The Simpson Leica Prize was sponsored by Leica, now Leica Geosystems, in memory of Major Denis Jackson Simpson MC, generally known as Jack or 'Stiffy', a former sapper officer who won his MC at Arnhem in 1944 and subsequently held a regular commission attending No 14 Long Survey Course in 1954. After retiring in 1959 he began a long and successful career associated with the manufacture of photogrammetric instruments. The prize was inaugurated in 1992, again previously presented to a fairly senior person present tonight, initially for the best Royal Engineer Officer on the ASC, later amended to allow for Worshipful Company of Scientific Instrument Makers to present in this category.

The prize takes the form of a specially commissioned medallion struck by the Royal Mint and a cheque for £100. In its amended form the prize, first awarded in 1995, is now open to all ASC students and is for the 'Person Most Likely to .....'. Although a criterion a little, and perhaps deliberately' ambiguous, one interpretation is generally taken as being for the person most likely make a significant contribution to his or her chosen profession. This year the award was deservedly made to Captain Kim from South Korea. Rumour has it that he remained on Korean time for the duration of the course though still managing to play an active part in mess life! Once again this was a very popular choice amongst his classmates. We were very grateful that David Price, the current Managing Director of Leica Geosystems was able to attend and make the presentation.



David Price, Managing Director of Leica Geosystems, presents Captain Kim with the Leica Simpson Prize.

After all speeches and presentations the company sat down to a buffet supper prepared to the usual high standards by the mess staff. I had singular pleasure of accompanying Joanna at supper where she regaled me with tales of accompanying her father on extensive surveying journeys round the world, much of her early life being spent in the field, a truly remarkable woman.

The Leica Simpson medallion.





## Geo People

### Lieutenant Commander Karen S Fyfe Royal Navy

*Above Water Capability Branch – HM & Patrol*

Karen Fyfe was born in Barrow in Furness, Cumbria in 1977 and educated in Helensburgh, Scotland before entering Britannia Royal Naval College, Dartmouth as a Midshipman in 1997. Following Initial Training she completed Fleet Time in *HMS Illustrious* during Northern Arabian Gulf operations (OP BOLTON) and *HMS Chatham* in UK waters.

Short appointments in *HMS Dulverton* and *HMS Penzance* preceded specialist Hydrographic Survey and Meteorology (HM) training and the Tactical HM Course at *HMS Dryad*. Her first appointment as the Squadron HM to the 6th Frigate Squadron brought Anti Submarine Warfare (ASW) and bridge watchkeeping experience in HM Ships *Northumberland*, *Monmouth* and *Montrose* with time spent on deployment in the Mediterranean, South Atlantic and conducting operational and specialist Anti Submarine Warfare training.

In 2002 Lieutenant Fyfe was appointed to *HMS Echo* as the Oceanography Officer, taking the first of class vessel from build, through acceptance trials to commissioning. In early 2003 she was seconded for six months to the staff of Mine Countermeasure 2 during Operation TELIC, primarily as Staff HM and Met forecaster and later to include N5 Plans based in Bahrain. Returning to *HMS Echo* in time for her workup and maiden deployment to the Northern Arabian Gulf, the next nine months involved extensive hydrographic work around Iraq's oil platforms, including an independent survey of the oil pipelines from Al Fawr to the offshore installations.

HM Advanced Survey Course in 2005 was then followed by an 18-month appointment as Operations Officer of *HMS Scott*, which encompassed a challenging period of refit and return to survey operations in the North Atlantic and Indian Ocean. Lieutenant Commander Fyfe then joined the staff of COMDEVFLOT as Staff Officer HM where her responsibilities included managing the HM Mobile Teams and providing advice and expertise on operational, planning and personnel matters to the HM Division.

Assigned to Directorate of Equipment Capability - Under Water Effects in April 2008 she has been responsible for Hydrographic, Oceanographic and Meteorological data gathering capability. With a move to the Above Water Capability Branch in January 2009 under the MoD Streamlining initiative, she has increased her portfolio to include all Patrol Ships and small boats across defence, including Special Forces, MoD Police, Army, Royal Navy and Royal Marines.

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## Association Events 2010

The Spring 2010 event will be on Wednesday the 14th of April. Arrangements are now in hand to visit RMA Sandhurst to see the Commandant's Parade which is the final dress rehearsal prior to the Sovereign's, cadet passing out, Parade two days later. The outline plan is for a party, maximum of 40, to be seated by 10:45 to see the Parade and to follow this with a lunch in either the King Hussein's or the Quboos Pavilion. The final cost is not yet known but is expected to be in the region of £30 per person. A flyer will be sent out early in the New Year.

The Autumn Event 2010 will be combined with the AGM in either September or October. The location for this event is still to be confirmed.

DSA annual prize giving will take place during the 'Maps and Surveys 2010' Seminar planned for the 19th of June 2010.



## Geo People

### Mandy Warrington-Brown BSc

*Operations Officer, Defence Geographic Centre (DGC)*

I felt very proud to be asked to contribute to this edition of the Ranger magazine but I also suddenly felt rather 'old', particularly when I calculated that I will have been with the DGC, despite its numerous name changes, for 25 years in November. I had always maintained that I would only stay for a couple of years!

I joined DGC after studying for a Geography and Cartography degree at Oxford; okay I admit it was from Oxford Polytechnic and not the University. Originally, I had applied to undertake the two-year Diploma course with aspirations of joining the OS field office in Warwick. The summer preceding my starting the course marked the launch of a new modular degree incorporating Cartography with a discipline of your choice. Strongly encouraged by my parents to undertake a degree, which I later learned was prompted more by their concerns and disapproval of a long standing boyfriend, I embarked in September 1981 on the first degree course in Cartography with Geography under the watchful eye of Roger Anson.

With graduation looming in early 1984 I submitted two applications with the MOD, one as a Basic Grade Cartographer at Feltham and one as a graduate entrant as a Map Research Officer at Tolworth. I failed the interview at Feltham but did get an offer for a position at Tolworth! It was months before I was given a start date and like most students I was desperate for money. I took a cartographic draughtsman position at Bedford and Royal Holloway College based in Regents Park (which later moved to Egham) from June to November 1984. I spent my summer producing cartographic work to support geography lecturers and gazing out the window calculating the quickest route to Oxford Street to get as much shopping time in during my lunch hour.

My calling to Tolworth came not long after. I had not visited Tolworth until the morning I turned up at the gate to report to Block A. It was certainly a contrast to my home town of Warwick and student days of Oxford. I now appreciate why the interview was held at Northumberland House in central London - Tolworth Broadway is certainly no match for Oxford Street.

My first 18 months were spent in the MOD Map Library which, on reflection, gave me an excellent foundation for the rest of my career. I also feel privileged that I can remember the library pre-automation, with a corridor adorned with hundreds of grey metal cardex cabinets housing details of every series and associated map sheets. Little did I know at that stage, I would later return to run the map library for five years during the mid 90's during the intense data capture days to create the first MODMAP. My tour also coincided with some monumental occasions; for example the receipt of 60,000 sheets of Russian produced topographic mapping and the 250th Anniversary of Military Survey.

My roles have been numerous and varied, and since 1999 have been part-time straddling between two specialisms - HR and the geospatial world. Early 2000 was not a good time to find yourself in the HR specialism, with many HR practitioners facing early severance or redeployment. Fortunately, I found myself ring-fenced, in what has been my most enjoyable and rewarding posting to date; the training and development of geospatial analysts. In this role I produced the Mapping and Charting Skills Framework, oversaw the recruitment and training of over 350 staff, all attending the in-house delivered induction Geospatial Analyst Orientation Course. Alas, I have never been able to overcome the issues of staff retention.

Last year finally saw me take on my most challenging role of all, running the DGC Operations Room putting me firmly back in a strong geospatial role. I cannot thank my staff enough for their support and patience during this last year as they try to explain for the third time all the different digital data formats that may be required! In my first year I have visited three different countries, briefed at an international conference, directed the reprinting of 1 million maps to support the US uplift to Afghanistan, overseen the production of 350 products over Helmand and directed staff in responding to 250 requests for information – it certainly keeps me busy!! And, in addition to all that, I am the official DGC representative on the DSA Council.

All of the afore-mentioned would not have been possible without the support of my team at home; my husband of 20 years and our two children Ellie (11) and Marcus (8) who bear witness to the fact that whilst I can draw a map I certainly cannot read one and tease me incessantly about holding the road atlas upside down – I continue to blame it on being left handed!



## Geo People

### Ruth Adams

*United Kingdom Hydrographic Office*

I am a chartered surveyor and, professionally, am best known for having worked at the United Kingdom Hydrographic Office (UKHO) for over 18 years.

Maps, surveying, charting – basically anything geo-related - is my passion. My Mum is a geography teacher and my Dad very spatially aware so I grew up being surrounded by maps and atlases. Even now my kids despair that I find big lumps of concrete on hills fascinating objects to visit.

I studied Surveying Sciences at Newcastle University gaining a 1st class honours in 1990. I had a very brief stint in the real world of land surveying at South West Surveys (getting incredibly cold levelling tribrachs whilst sheep watched) before joining the UKHO in 1991.

I have had a great career at the UKHO to date. I spent a considerable time in Geodesy, providing geodetic advice for all UKHO products and appraising hydrographic surveys. I worked closely with the Royal Navy hydrographic surveyors and had periods of detached duty at sea. The most memorable trip by far was with HMS Endurance where I spent three weeks on South Georgia helping the surveyors with geodetic positioning. After this I worked in Air Charting (Nimrod and Sea King air radar charts) before returning to Geodesy to head it up, along with the Imagery Section.

In mid 2005 I led the Additional Military Layers section. I did this for a year, working closely with our NATO allies, before moving into project management and then led on vector charting. It was during this phase that I was heavily involved in AVCS, Admiralty Vector Chart Service.

Post AVCS I ran the VORF project (Vertical Offshore Reference Frame) and led Tides and HMNAO (Her Majesty's Nautical Almanac Office).

For the past year I have been Communications Manager for the UKHO. I am responsible for all internal and external (non-marketing) communications. This means I get involved with all manner of activity such as press releases, local media, staff intranet, Parliamentary Questions and even talking to the Sunday Express.

Although I'm enjoying my time in Communications – exposure to a role outside of your core skill gives you steep learning curves to climb – I'm very much looking forward to moving back to a more technical post. I move back into Defence next spring and will be heading up MEIC, Maritime Environment and Information Centre.

Alongside my career at the UKHO I am involved with the Royal Institution of Chartered Surveyors, RICS. I was the RICS UK delegate for FIG Commission 4, Hydrography, and co-chair of Working Group 4.2 from 2002 to 2006. During this stint I co-wrote the FIG publication on vertical reference surfaces, FIG Guide on the Development of a Vertical Reference Surface for Hydrography (publication 37).

I am currently chair of the RICS Geomatics Professional Group which I have enjoyed for two years. I love the challenge of non-UKHO activity and benefit from exposure to surveying issues outside of the international maritime world.

I am also external examiner for Plymouth University's MSc in Hydrography.



## Geo People

### Major Vicky Roberts RE

*SO2 Geographic, HQ Land Forces*

Vicky Roberts (nee Bealby) was born in Nottinghamshire in 1971 and was educated at Bramcote School, Gamston, and then Scarborough College. Vicky attended Loughborough University and graduated with a BSc(Hons) in Human Biology. Having completed her officer training at RMA Sandhurst and then engineering training at RSME Chatham, in 1994 Vicky was posted to 14 Independent Topographic Squadron at Ratingen, near Düsseldorf, as the Geographic Troop Commander.

Ironically, despite not being geo trained, she completed more technical work during that first post than since, including geodetic surveys of Norway, Sardinia and Bosnia. She is grateful to have had a good team of fellow officers, SNCOs and JNCOs to keep her on the right track - mostly!

On completion of the Army Survey Course, earning an MSc in Defence Geographic Information, Vicky was posted to 19 Specialist Team Royal Engineers and spent a busy year getting herself and a few select others into all sorts of scrapes in Senegal, Guinea Bissau and Madagascar. She also managed some liaison and technical work with *HMS Scott* and back in Norway, prior to doing the Army Junior Division of the Staff Course. Vicky then returned to 14 Topo, this time as 2IC, both in Mönchengladbach and also deployed in Macedonia as part of the Kosovo force.

For good behaviour (or was it to give Geo a break?) Vicky then spent two years at HQ 5 Division, dealing with the floods, the fire strike, the fuel “crisis” and foot and mouth disease. In 2002 Vicky started work as SO2 Operations at the Defence Geographic Centre and spent a very busy year preparing for and supporting Op TELIC. She was then detached for three months to help establish the DGIA Operations Room in RAF Brampton – sound familiar?

Due to a postings error, the Army desperately needed someone with a technical background to go to France for a year and Vicky leapt at the chance. So, having spent a year at the Defence School of Languages, Beaconsfield learning French, she did a Masters degree in Systems Engineering and Management, taught in French. She then worked at Defence Logistics Organisation, Andover, putting the teaching into practice as SO2 Integrated Logistic Support and then SO2 Requirements Manager for the C Vehicle PFI Project.

Vicky returned to the Geo community for her Squadron Command tour, as OC Geospatial Science Task Group at JARIC, a busy and interesting post in which she learned more about how the Intelligence community does business and tried to influence the greater integration of geo analysts. She has recently taken up post as SO2 Geo at HQ Land Forces.

Vicky is married to Jon, a former Geo officer, and they have one son, aged 3. Vicky is an enthusiastic Christian and also enjoys wildlife, tennis and Series One Land Rovers.

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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.



## Geo People

### Dr Yolande Hodson

Yo Hodson's interest in maps and topography emerged at an early age when she began drawing what would today be called cognitive maps – childish graphic representations of the Welsh countryside that surrounded her home in Dinas Powis; rather in the fashion (though hardly as accomplished) of the endpapers of *Winnie the Pooh*. Years later, having taken part in a British Girls' Exploring Society Expedition to the Faroes, a degree in Geography and Geology (1967) from King's College, London, led to employment (after a brief spell with the Second Land Utilisation Survey of Great Britain) as an Assistant Map Research Officer with what was then SPC RE MRLG [Map Research and Library Group]. She thought she had died and gone to heaven: miles of plan chests containing acres of maps from all the countries in the world.

Brigadier Arthur Walmesley White was Director Military Survey at the time; Peter Clark was Chief Map Research Officer, and Ian Mumford was one of the Senior Research Officers. Yo was surrounded by people whose knowledge of maps was unimaginably profound and wide ranging and they were all able teachers. From Arthur Walmesley White she gained an interest in maps and survey of Palestine which led to her being a member of the Palestine Exploration Fund, sitting on the Executive Committee for almost thirty years, and serving as the first lady Hon. Secretary. Peter Clark and Ian Mumford introduced her to the finer historical points of Ordnance Survey mapping from which she has never recovered, remaining completely addicted to our national survey institution to this day.

One of her lunchtime visits to the Book and Document Section (in those days the repository in MRLG of all things, in all languages, that might conceivably be useful in map compilation and analysis) was to change the orientation of her cartographic life. She noticed, along one wall, an old wooden plan chest. On opening one of the drawers she discovered a cache of old manuscript mapping. It turned out to be a large collection of operational mapping from the Peninsular War. It had been created under the auspices of the Depot of Topographical Knowledge (formed 1803) and had survived all the organisational changes of the following century and a half, to end up in the corner of a room of its successor, the Directorate of Military Survey. So began a deep interest in historical military mapping which has lasted for over forty years.

In pursuit of the operational mapping of the past Yo moved from Military Survey to the British Museum Map Room (later the British Library Map Library). Here she was responsible (with others) for the exhibitions on Chinese and Japanese Maps, and the mapping of the American War of Independence. But it was her research into the history of Ordnance Survey which led to her contributions to the 'Seymour' History of the Ordnance Survey and the Margary facsimiles of the Old Series one-inch map (with Brian Harley), to the curating of the exhibition 'William Roy: Pioneer of the Ordnance Survey and, particularly, to the founding in 1980 of the Charles Close Society for the Study of Ordnance Survey Maps (her own collection of maps approaches 5000, a mere fraction of some of the Charles Close members' map caches), serving as its Secretary, Treasurer and Chairman in its early years.

Since leaving the British Library in order to bring up her son (who is now a barrister) she has acted as historical consultant to Ordnance Survey, curating the bicentenary exhibitions at the Tower of London and at the Royal Geographical Society. She was also historical consultant to Military Survey (as it then was) and curated part of the 1994 D-Day exhibition at the Royal Engineers' Museum and, with Alan Gordon, was responsible for the exhibitions to celebrate the Survey's 250th anniversary in 1997. A highlight for her was the personal invitation from General Filatov to join the UK Defence Geographic Intelligence delegation to Moscow as part of the UK/Russia Army bilateral co-operation programme (Military Topography), in May 2005. For the last ten years she has developed her own business as an expert witness in highways.

She has lectured and written extensively on the history of cartography, with particular reference to the Ordnance Survey and military mapping, and on highways and rights of way matters, and has served the Councils of the British Cartographic Society, Royal Asiatic Society and the DSA among others. She is currently in the throes of finishing the cataloguing of King George III's collection of military maps at Windsor Castle. Her spare time is spent in countryside pursuits (she is the holder of both shotgun and firearm certificates).



*A Bosnian Serb soldier*

# The Dayton Peace Agreement and its Implementation Operation Joint Endeavour

*By Brigadier (Retd) Nick Rigby and his trusty knight – Mr Andy Fagg*

## Background

This article is based on a presentation that was delivered at the Maps and Surveys 2009 seminar. It is some 14 years ago that the author, ably assisted by Mr Andy Fagg, deployed to Bosnia Herzegovina on the staff of the Allied Command Europe (ACE) Rapid Reaction Corps (ARRC) headquarters to co-ordinate the geographic support for the implementation of the Dayton Peace Accords. At the time (1995) Andy Fagg was the Military Survey Liaison Officer based in Headquarters United Kingdom Support Command (UKSG), the previous HQ BAOR, in Mönchengladbach, Germany and the author was the ARRC's Chief Geographic Officer (CGO) based in the same location. The Rigby/Fagg partnership began when Andy was in Survey 4 and the author was in Survey 1 when Major General Patrick Fagan had the reins. Currently Andy is working in MoD Main Building as deputy head in the Capability ISTAR Branch and the author now works for ESRI (UK) Ltd as both their non-executive director and defence and national security advisor.

Following the break-up of the Former Republic of Yugoslavia in 1991, which then comprised of Serbia, Slovenia, Croatia, Bosnia-Herzegovina, Montenegro and the Former Yugoslavian Republic of Macedonia (FRYOM), Serbia tried to assert its influence on the region. This eventually led to war in Bosnia in 1992 and, under a United Nations mandate, the deployment of a Peace Keeping Force - UNPROFOR. At its height the UN had over 30,000 troops drawn from 19 nations, 5000 of them British, deployed in the region. Geographic support was provided to the UNPROFOR on a very much grace and favour basis, largely via the UK who also provided a succession of CGOs to the UN headquarters.

HQ ARRC was instructed by the then Supreme Allied Command Europe (SACEUR) to monitor the crisis and draw up contingency plans for the withdrawal of UN forces should the war in Bosnia dramatically deteriorate. For three years, the headquarters saw the situation ebb and flow and was involved with the development of a number of plans – Stoltenberg, Vance/Owen and so on, all of which sought to bring peace and stability to the region. It was really only in the summer of 1995, following the mortar attack on the Sarajevo market place that killed over 40 people, followed by the fall of the so-called UN Safe Areas of Zepa, Zebriniska and Goradze that the West decided 'enough was enough' and Mr Richard Holbrooke and his MA, General Wes Clarke, began to broker a plan. As the plan developed at Wright/Paterson Air Force Base in Dayton, Ohio, the ARRC had to rapidly change its plans from one of extracting the UN force to one of providing one for peace enforcement. Throughout the autumn of 1995 there was a flurry of 'traffic' to the Pentagon and to Dayton, amidst an air of complete secrecy, trying to find out what was going on.

## Geographic Support prior to Dayton

With the deployment of UNPROFOR, as well as naval and air force elements, it became abundantly clear that much of the mapping which had been designated for the region was out of date and inappropriate for the mission. Much of the charts and mapping had been produced by the US and was non-releasable to many of the non-NATO nations that comprised UNPROFOR. There were also, as is so often the case, some fundamental cartographic problems; complications existed because the operational area crossed a grid zone boundary as well as the region straddling the junction between designated operational spheroids. Whilst not immediately apparent to many users, the potential operational impact of an all arms conflict was significant enough for Military Survey to make some fundamental decisions.

UK troops deploying as UNPROFOR were supplied with topographic mapping based on the indigenous Topografiska Karta' or TK as it became known, previously used by the former Yugoslavian National Army. Mapping had been 'acquired' from a variety of sources as was, and is, the mission of Military Survey. The TK mapping was planimetrically accurate and reasonably up to date, as were the place and feature names but, more importantly, it was compatible with that



*Military Survey overprinted Yugoslavian 1:100,000 TK map*

used by the warring factions and therefore far more appropriate for use in the peace making process. Selected sheets of the TK mapping were overprinted by Military Survey with the NATO operational grid (UTM) and on a single spheroid and datum (WGS 84), while power-lines and significant changes to the road network that could be identified from commercial imagery such as SPOT, were highlighted. The international boundaries between the former Yugoslav republics were also added, as best as could be discerned – though this proved to be a problem later.

Initially two series, at scales of 1:100,000 and 1:500,000, were produced in this way. The recommendation to use TK mapping was made for the right operational reasons, though there remained a potential problem over copyright – who owned the indigenous mapping? It was determined that the original ‘owners’ were the Army of the Former Republic of Yugoslavia, and as the country no longer existed, copyright could no longer be claimed. However, this didn’t stop a subsequent enquiry by Croatia about the issue, which was robustly rebutted and never resurfaced again! Military Survey agreed to supply their mapping to other NATO and non-NATO nations participating in the UNPROFOR mission and it rapidly became the de facto standard.

### **Dayton Peace Agreement Process**

The Accords were signed on 21st November 1995 after six weeks of solid negotiations. To support the process, the US Defense Mapping Agency (DMA), as was then, deployed a team of mapping specialists and equipment to Dayton. The team of approximately 40 technicians worked around the clock producing the ‘map’ and accompanying overlays that were to define the partition of Bosnia-Herzegovina.

The first thing to be agreed was the Agreed Cease Fire Line (ACFL) which marked the final front lines at the time of the cease fire. Even this was contentious. A Zone of Separation (ZOS) was further declared some two kilometres either side of the ACFL – effectively a demilitarised zone based on the capabilities of the warring factions. Having agreed the ACFL the Parties had to negotiate the lines their respective forces would withdraw to that would split the country. This became known as the Inter-Entity Boundary Line (IEBL) which also had its own Zone of Separation. To draw these lines the technicians employed two key capabilities; PowerScene and a Remote Replication System. PowerScene was at the time a state of the art aviation simulation package based on Silicon Graphics hardware using digital elevation data on top of satellite imagery with two screens, one showing the imagery, the other depicting mapping. When the operator ‘flew’ and drew a line on the imagery,

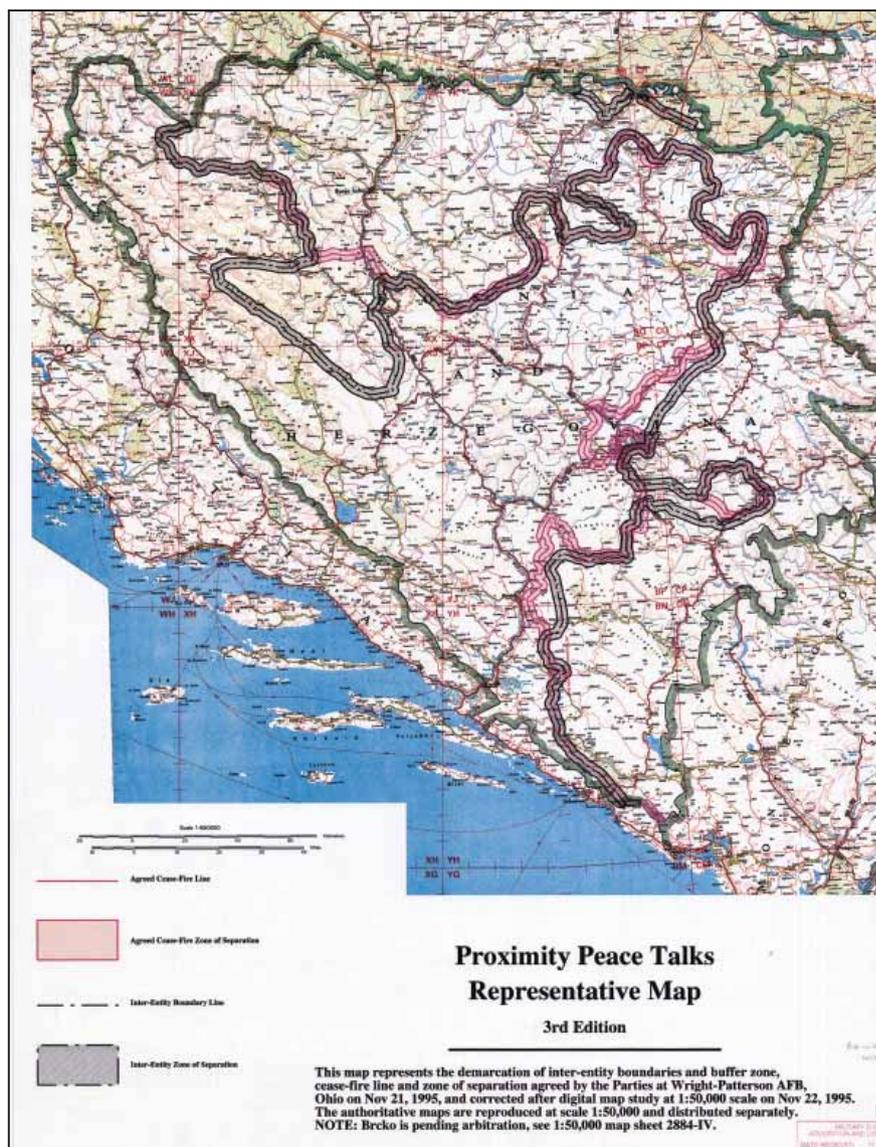
it would automatically draw a line on the mapping. This information was then keyed to the Remote Replication System and plotted and, via a secure link, was sent back to HQ DMA in Bethesda where sufficient copies were produced for military planning purposes. Following that process a plan had to be devised to bulk produce the mapping on standard series products with a further twist. That was that immediately after the peace process was agreed, the warring factions had 90 days to withdraw from the ACFL to the IEBL – this meant producing an edition of mapping depicting the ACFL and 90 days later the edition was superseded by an edition depicting the IEBL.

However, there was the vexed issue of what mapping should be used to depict the various boundaries. DMA had produced a 1:50,000 line map over the region (Series M709) but the Parties were more familiar with their own TK products. In addition there existed a small-scale 1:600,000 planning map of the region that had been commissioned by the UN

because at that scale it showed the entire region on a single sheet. Originally produced as a tourist map by Austrian publishers Freytag and Berndt, the product was not planimetrically accurate. In a decision which defied all logic the Parties agreed to use the tourist map to redefine their national boundaries. Upon the agreement signed on the 21st November, the alignment of the ACFL and IEBL was transposed from the 1:600,000 map to the M709 1:50,000 series with all the inherent inaccuracies and which later came back to haunt HQ ARRC and the former warring factions.

A total of 35 countries including NATO and non-NATO members contributed troops to the operation, all under command of the ARRC. Many of these had never worked together before and some certainly had never used NATO mapping, policies and procedures. Their respective MoDs required planning copies of the relevant mapping, some nations wanted their bulk stocks delivered to them before departure, others wanted to pick their mapping upon arrival in theatre and some nations already had troops in theatre who wanted to transition from UN to ARRC command. Map distribution couldn't have been more complicated and therefore flexibility was the operational by word!

Mapping depicting the ACFL and IEBL became known as the 'golden maps', the definitive article and initially on deployment were in relatively short supply and thus were treated like gold! The international boundary issue was never formally resolved at the time. The breakup of the former Yugoslavia occurred so rapidly that international boundaries of the new country of Bosnia-Herzegovina were never formally agreed or ratified. In the absence of any definitive boundary information Military Survey decided to show alignments based on an 'official' 1:500,000 scale Yugoslavian administrative map produced in the 1980s and termed them "approximate alignments". The US DMA was faced with the same problem and in some cases came up with different solutions in the same areas. As the operation progressed and with numerous queries as well as several



*Produced by Freytag & Berndt – the planning map that caused so many problems*

Croatian troop 'incursions' into Bosnia-Herzegovina, the UK and US were forced to rationalise portrayal across all the designated map series and products, prompting another edition of numerous map sheets.

### **Deployment of NATO Forces**

HQ ARRC was designed and did operationally split into three separate headquarters: HQ ARRC MAIN which is where the operation was planned and directed from; HQ ARRC REAR which is the headquarters that sustains the leading elements of the Corps's area of operations and HQ ARRC Rear Support Command (RSC) which sustains the rear part of the Corps's area of operations and controls the inflow (and outflow) of manpower and material. Each of these headquarters had 'Geo' staff and capability:

- HQ ARRC MAIN based in Sarajevo contained the CGO, mobile printing press, terrain analysis section, map store and graphics support.
- HQ ARRC REAR based in Kiseljak provided graphics support, map store and geo advice.
- HQ ARRC RSC based in Split, Croatia provided graphics support, graphics and geo advice mainly provided by Mr Fagg.

There were also three assigned divisions under command: Multi-National Division North, a US Division based in Tuzla; Multi-National Division South East, a French Division based in Mostar and Multi-National Division South West, a British Division based in Gornaj Vakuf. Each Division was provided with a mobile map store (MASPSP) and mobile printing press vehicle (TACIPRINT) from the UK's 14 Topographic Squadron. The rest of 14 Squadron deployed to theatre to support the ARRC and was known as the Geographic Support Group and waxed and waned in strength from 80 to 120 officers and soldiers depending on the operational activity. For the first time it deployed with two TACISYS vehicles with a bewildering array of digital capability to produce terrain analysis, the forerunner of geographical information systems (GIS) in the field. Additionally there was a Remote Replication System and staff in Taszar, Hungary, a Map Depot in Germany, a Corps Reserve Map Depot in Split and a Map Store in Zagreb. So the geo operation was complex and geographically very well distributed.

*Soldiers from 42 Engr Regt (Geo) distributing gifts and toys to local school children*



## Map Supply

As mentioned earlier, the UN forces had been operating principally with overprinted mapping based upon the Yugoslavian TK series. The change from the UNPROFOR mission to the NATO-led mission resulted in the first widespread involvement of US forces and therefore an insistence that the US-produced and NATO designated 1:50,000 mapping was used by and available to all participating forces. This meant that complete coverage of a new map series had to be prepared and distributed, while much of the existing TK mapping had to be withdrawn. Not surprisingly many of the transferring units didn't want to give up their marked maps which were all extensively covering the walls of ops rooms and the like. In total some 252 sheets of the new M709 series and 62 sheets of the existing 1:100,000 as well as numerous other maps were distributed however; there were inevitably delays and problems. Not to mention that the deployment was in the grips of a severe winter and the mountainous terrain made many roads/tracks impassable.

The US forces deploying had even greater problems to contend with. They choose not to use the HQ ARRC map supply system and put their faith of their quartermaster supply system, which gave mapping a supply grading the same as socks and lower than fuel and food. No small wonder therefore that the Division entering the operational theatre from the north via Hungary had problems navigating the right way – when all they had were Shell road maps!

As well as supplying mapping to the NATO forces, HQ ARRC provided mapping to the former warring factions, to ensure that all peace enforcement was well co-ordinated and implemented. They would also use these maps to submit numerous changes to the IEBL post the Dayton Agreement. Mapping was also provided to the provincial authorities to plan and implement the municipal elections as well as copies to the many international observers and supervisors.

Many of the troops from the contributing nations also rotated through Bosnia after 14 to 6 month tour of duty. In most cases, the incoming troops required a complete re-supply of mapping to satisfy their new role and in some cases, their use of the mapping was unusual to say the least. There was the battalion who, after being issued with their maps, promptly sold them and the Hungarian Engineer battalion who took such vast quantities of mapping that it was suspected there must now be some rather unusually decorated Army quarters on the outskirts of Budapest.

## Field Survey

The requirement for field survey was apparent from the start of the operation and principally this was to demarcate the IEBL. A requirement from the Dayton Agreement was to produce a Technical Document that described the IEBL – a description in terms of latitude and longitude. Although this task was placed upon the Warring Parties, they had no geodetic capability (the Mapping Agency had been ransacked and looted) and certainly no GPS equipment. After many false starts largely due to the Parties being unable to agree the terms of the survey to be conducted, it was begun in June 1996 and took three months and was the model of international co-operation with a total of 17 survey teams from the UK, France, Canada and US, all controlled by a Canadian topographic section. Each team deployed with their Federation and Serbian municipal surveyors and produced their results both in the local grid system (Hermanskogel and Gauß-Krüger) and the NATO system of WGS 84 and UTM. The Federation wanted to mark the boundary with a ground mark for administrative purposes only, as they viewed the IEBL as something akin to a British county boundary, whilst their Serbian counterparts would only settle for an extension of the Berlin Wall! The compromise was a simple marker very similar to that which is used by British utility companies i.e. a pole with a brightly covered apex hat.

Upon departure the ARRC bought ten geodetic survey equipments and software and donated them to the local survey departments as well as delivering four weeks of intensive training.

## Map Production

As mentioned earlier, 14 Squadron deployed a mobile printing capability to Bosnia which comprised seven large ISO containers that housed two single colour medium format printing presses and the supporting ancillary equipments such as photo, carto, pre-print and print finishing. The Divisional TACIPRINTS were used for the production of smaller format products. The concept of printing in the field was not new to Military Survey and goes back to the Boer War and Charles Close and previously had been used during the first Gulf War. Following that conflict Military Survey had embarked on a modernisation programme that culminated with the deployment to Bosnia of the then state of the art mobile printing systems, which rapidly became the envy of the other NATO nations.



*Blown up bridge across the Drina River*

Map production tasks included reprinting the standard designated 1:50,000 and 1:100,000 map series (when in-theatre stocks were too low and the supply system wasn't reactive enough), minefield mapping and products designed to win the hearts and minds of the local population as part of the Psychological Operations campaign and for the elections. Products ranged from small minefield awareness cards to medium format mapping in up to seven colours as well as some products in seven languages.

### **Terrain Analysis**

This subject should more accurately be titled 'digital mapping' as the majority of terrain analysis for the operation had been conducted in Germany prior to deployment. Probably for the first time on such an operation the ARRC had the right equipment, hardware and software, all the datasets required and fully trained and staffed complement. Unix workstations by Sun Sparc and Silicon Graphics were the essential hardware and at ARRC MAIN running a variety of ESRI and ERDAS software as well as a US terrain visualisation package called DrawLand. A wide variety of products were produced such as fly-throughs, dead ground plots, assistance in the siting of radio relays, terrain visualisation models as well as assistance in the location of mass graves and depiction of deforestation. Minefield mapping was developed digitally with the ability to plot mine fields directly from the minefield databases – a novelty at the time. HQ ARRC technicians began to push the boundaries of the military use of modern GIS.

### **Geographic Advice to Headquarters**

Of the various demands placed upon the Geographic Branch of HQ ARRC, none was greater than supporting the IEBL Commission. The Dayton Peace Agreement contained a provision for the Parties to amend the IEBL and following a visit to the Pentagon by the ARRC COS and CGO to meet with General Wes Clark, it was agreed that the ARRC would provide the facilities for a Sub-Commission to be chaired by COS ARRC and CGO to be the chief technical advisor, as a qualified Chartered Surveyor. Why was there a provision to do this in the Agreement and why were the Parties so keen to participate? The simple answer goes back to the previously mentioned transposition of the IEBL from the 1:600,000 tourist map to the designated operational map series – the IEBL was inaccurately drawn. The ARRC hosted some 40 meetings which resulted in 42 changes to the IEBL and again new editions of the maps had to be produced. The meetings were long, tedious, conducted entirely in Serbo Croat, bad tempered, smoke infested and thus at the time, typically Balkan! The longest meeting was 11 hours and the shortest 15 minutes. The Parties representatives were Vice President level, mainly criminals/murderers and who are now either locked up or dead, yet it proved the point, that to get a negotiated settlement, sometimes you have to do business with the 'bad guys', an unpleasant reality but the truth.

## Conclusions

The provision of geographic support to the operation JOINT ENDEAVOUR was complex and was only achieved through a mixture of detailed planning, international collaboration and hard work and, on occasions, a slice of good luck. There was no joint or combined doctrine, NATO Geographic Policy at the time was all about map production and stock quantities around a Cold War scenario, however, many of the procedures were plagiarised and made to fit the operational requirement.

Most importantly, the operation had demonstrated that the geographic community is truly worldwide both in terms of people, training, equipment, data and techniques. Yet it is perhaps the people who are the most important, as against the odds, they made the operation a success and, to this day, long lasting. JOINT ENDEAVOUR became the model upon which future deployments took place, either in total as in Kosovo, or in part as elsewhere and has been modified and developed to the extent of the success 'geo' has in Iraq and Afghanistan. The geographic support group also became the capability model for subsequent deployments.

For the author, as a newly promoted Lieutenant Colonel in a re-badged HQ 1 (BR) Corps, surrounded by a group of highly talented geo technicians and supported by the 'best back office' in the form of what is now the Defence Geographic Centre and Hermitage, with a full train set to play with, using all the components of Military Survey guided in their use by an outstanding Principle (who even joined us on the Op), it didn't get much better. Except, that is, for the major b\*\*\*\*\* the author got from Commander ARRC and COS ARRC for .....

*This article is based on a presentation given at Maps and Surveys 2009.*

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## Surveying Under Difficulties

*By Haydn Williams*

Most, if not all, field surveyors have been in this position at one time or another. In 1958/1959 I was a member of the Directorate of Overseas Surveys (DOS) field party working on the reconnaissance of the primary triangulation of the Southern Cameroons, then a British administered UN trusteeship.

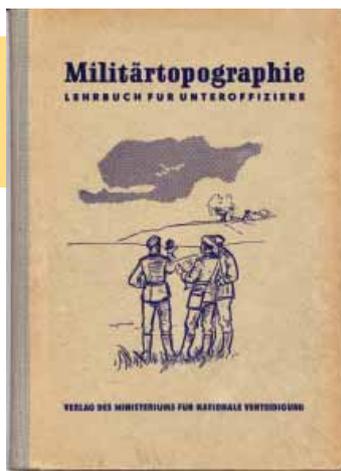
Mount Cameroon c.13,500 ft above sea level in the extreme south of the country would be key station in this network. It is an active volcano which has erupted several times in the last hundred years with varying periods of quiescence. With a base of about 30 miles by 20 miles it dominates the local landscape. Just four degrees north of the equator it has a great variation in rainfall. Debundscha on the coast at the southwest periphery of the mountain has had 390 inches of rainfall recorded.

Our reconnaissance, confirmation of station position, and its construction had to take place in a climatic "window" of good visibility. The heavy rainfall for several months was one problem. Another was the extension south of the Sahara high pressure system which brought the dust laden Harmattan wind towards the coast. This limited visibility from the mountain. The period between the heavy rains and the onset of the Harmattan constituted our "window".

February/March 1959 was identified for the Mount Cameroon job. Two of us were needed, myself and Harry (the party leader), to organise and take a party up with all our survey gear and building materials, staying at primitive huts erected by the Germans before World War 1 when they were the rulers of the area. Water would have to be carried for over 4,000 feet to the summit area.

A further complication was that the mountain had chosen to have an eruption, with associated earth tremors, just before we had planned to start our job. The local administration had issued various regulations about access and were concerned about a lava flow cutting the only north-south road. The chief geologist, however, "*had everything under control*" and monitored the situation, usually from a stool in the bar of a local club. The African population was very uneasy and worried about Ju Ju. Surveyors climbing the mountain could exacerbate the situation. However, our own men from the north despised the locals. If the two European surveyors led, they would follow. If we missed this "window" we would have a year's delay.

Because of these difficulties Harry decided that he would have to contact our HQ at Tolworth and composed a detailed cable over 150 words long (if my memory serves me correctly). The five word reply came back promptly. It read: "*Earthquake immaterial. Press on. Hotine*". We did and completed the job between the 27th of February and the 4th March.



*East German Military Topography for NCOs (1957).*

# Mapping For A Multi-Lingual Military Alliance

## The Case of East Germany

*By John L Cruickshank*

The military topographic mapping produced by the German Democratic Republic (the GDR or East Germany) was, like all Warsaw Pact mapping, kept highly secret until the fall of the Iron Curtain in late 1989. After the fall, this secrecy was not only removed but formerly secret maps and documents were suddenly released into the public domain in large numbers. Since almost all East German public bodies were replaced with West German pattern ones, the personnel, stocks and records of the former organisations were abruptly discarded in huge quantities. The rate of disposal was such that even records that should have been retained for central archives were discarded. The huge stores of East German military maps and other military geographic documents were dispersed within little more than a year.

The result of this has been that while there are relatively limited official records of the mapping produced by East Germany, a surprisingly large number of documents and maps have survived in private hands. In consequence a considerable German language literature has built up, retrospectively describing and analysing the maps and their makers. Little of this has so far however appeared in English, and the very important inter-relationships of the East German maps and organisations with those of the other Warsaw Pact nations have so far only been considered to a very limited extent in any language. These inter-relationships remain of interest, because they illuminate the complex systems that were used to produce the extensive Soviet mapping of the world. This mapping continues not only to be an important Russian resource but also remains the foundation of the present-day mapping of a number of NATO and other countries.

When the GDR was formally established (without an army or navy) in 1949 maps and mapping organisations already existed. These organisations were the very-much-disrupted remnants of pre-war civilian bodies. The topographic maps were versions of pre-1940 German mapping, which itself largely reproduced pre-1914 mapping with little or no revision. The topography was generally long out of date, the specifications were antique (at 1:100,000 and 1:300,000 relief was still shown by hachures or hill-shading), and the original plates and stones had either been lost at the end of the war or were in western hands. Nevertheless, reproduction material was available and new editions of some maps, and reprints of others, were produced by East German civilian organisations. Until 1952-1953 there seems to have been a presumption that new East German mapping would be developed within the existing German tradition and, for example, a new East German version of the sample-sheet for the existing 1:25,000 map was produced. However, in 1952 a conference of the geodetic organisations of the Socialist countries of Europe took place in Sofia, Bulgaria. At this conference a proposal was accepted that all these countries should produce their maps to a common specification matching the existing Soviet specification and in March 1953 an East German Decree incorporated the conference resolutions into East German law.

Nevertheless it was not until May 1955 that the Warsaw Pact was signed and not until March 1956 was an existing Soviet Army formation recruited from German nationals transferred to East German command to form the nucleus of the new National People's Army (NVA). Only then was it possible to recreate in the German Democratic Republic the interlocking system of civil and military mapping organisations originally developed in the Soviet Union in the 1930s and already copied soon after the Second World War by the other Socialist states of Eastern Europe. Thus only from 1956 onwards could East Germany take its place as a producer of maps for the Warsaw Pact alliance, but from that time it rapidly developed its role.

The organisational framework in the USSR was claimed to have been created by a Decree signed by Lenin himself in March 1919, less than six months



*Soviet Conventional Signs Specifications for Maps at the Scales of 1:25,000, 1:50,000, and 1:100,000 (1983).*



East German ACD 13-16  
 Conventional Signs and Editorial  
 Instructions for Topographic Maps  
 [...] (1984).

after the October Revolution. In actuality Stalin had established the structure in 1935 at a time when opponents of the regime were being sought and purged in enormous numbers, especially in the senior ranks of the party and the armed services. A structure was created in which the Red Army's military cartographic service (which had parallel military and political-commissar command structures) printed and stored maps that were surveyed and prepared for printing by a civilian organisation working under Security Service (NKVD) direction. No one organisation below the Politburo had sole control of the production, storage and use of topographic maps, which were treated as a highly secret resource. At all levels there was tight external oversight of any individual or group of individuals who might be tempted to be disloyal.

In implementing this system in East Germany a very complex structure was created. The maps of East Germany itself were made by a civilian organisation, the *Verwaltung Vermessungs und Kartenwesen* (VVK) which, although a department of the Ministry of the Interior, was closely regulated at all levels by the Ministry of State Security. Training and assistance was

also provided during the 1950s by two Soviet military topographic officers permanently attached to VVK. The maps made by VVK were however printed by a military unit, the *Militärkartographische Dienst* (MKD), under the command of the *Militärtopographische Dienst* (MTD) of the East German National People's Army, which also had responsibility for the main map store. Maps of areas outside East Germany were entirely prepared by the MKD, rather than by VVK. Written military geographical reports and studies were prepared for the MTD by the East German equivalent of the Staff College, although the information available to the College about western European countries was surprisingly limited. At several levels there was close cooperation with (and therefore effective supervision by) equivalent units of the Group of Soviet Forces in Germany. The chains of command, cooperation and reporting linking all the bodies interacting in this system inevitably became extremely complex.

The re-mapping of East Germany to Soviet standards began in 1954. Initially this was based on the recompilation of older material but during the later 1950s and the 1960s the country was progressively re-surveyed at 1:10,000 and new editions were prepared. Thereafter a five-yearly cyclical revision and reissue programme was established and seems to have been maintained until the end of the GDR. Although the specifications of the maps were closely matched to those of the Soviet Union and the other 'Socialist' countries, there were some specific differences. In particular, the basic scale of survey was anomalous. In the Soviet Union the basic scale had only recently been increased to 1:25,000; 1:10,000 surveys were restricted to urban and industrial areas and to some specific areas of intensive agriculture. The East Germans had wanted to continue the 1:5,000 survey of the *Deutsche Grundkarte* but this was vetoed on cost grounds. In any case there was no Soviet precedent for topographic survey at this scale. From the Soviet point of view a 1:10,000 survey of the whole country was probably seen as a compromise and as a concession to local wishes. Where diversity was permitted was in the choice of scripts and languages to be used, both for the writing on the face of the map and for the marginal information. Although the graphical map symbols were rigidly standardised, it was accepted that the Cyrillic alphabet was not widely understood outside the USSR and Bulgaria. Thus each Warsaw Pact country used its own distinctive typefaces, had its own standard terms and abbreviations amplifying the symbol set, and used its own language to lay out the standard marginal information slightly differently.

Soviet specifications for their topographic maps did not remain constant, although changes were evolutionary rather than revolutionary. During the late 1940s and the 1950s there was quite rapid change as the lessons of the Second World War were absorbed and the post-war demands for new symbols with which to map features of the remoter reaches of the USSR were accommodated. Thereafter change slowed down but revised specifications were still issued every ten years for the 1:25,000, 1:50,000 and 1:100,000 maps, and the specifications for other scales were also periodically updated. The knock-on effect of this was that each of the other Warsaw Pact nations had to update their specifications to stay in step.

Despite this, in East Germany there was a desire to maintain some independence and to maintain Germanic procedures. A seemingly tidy system of numbered East German specifications and regulations was created. However, the combined effect of successive changes in the Soviet



The issue of the Soviet Technical  
 Information Collection of the  
 Military Topographic Service  
 containing a review of the East  
 German Military Topography for  
 Officers manual.



East German 1:500,000 sheet M-30-A Cardiff, compiled in 1963 from Bartholemew's Revised Half-Inch Contoured Maps, editions of 1958.

specification and a separate series of alterations in the German element of the maps was that frequent new editions of these specifications were required. There was even a new series of editions issued after the fall of the Berlin Wall, but before the end of the GDR, purely to alter the printed security classification on the maps.

The predominant users of the topographic maps were the armed forces, since civilian official organisations had very limited access to them indeed, and private individuals had none. Teaching 'Military Topography', including basic map-reading and land-navigation for beginners, was thus an inevitable part of initial military training, both for officers and for other ranks. This teaching was coordinated across the nations of the Warsaw Pact, in that the Russian textbook that set the Soviet syllabus also set the framework and content of teaching in the other 'socialist brother-states'.

The Soviet army textbook *Voennaya Topografiya (Military Topography)* was very much the equivalent of the British War Office *Manual of Map Reading, Air Photo Reading and Field Sketching*. Even its format was not unlike that of the inter-war editions of the British manual. From 1933 to 1977 the lead author of this book was the head of

scientific educational works for the Military Topographic Directorate, Major-General of Technical Troops Ilya Alekseevich Bubnov. In the post-war period new editions of this book were issued every five or six years. Following Bubnov's death in 1976 there was a pause in publication, until in 1986 a fully rewritten manual was produced by AA Psarev and others. This remained current far into the post-Soviet period. Although a profusion of subsidiary manuals and teaching aids were produced, all of them were based on the material and structure of the Bubnov (or Psarev) manuals.

There was an obvious need for equivalent German-language material as soon as the NVA was created. In 1957 *Military Topography for NCOs* was produced. This manual was explicitly based on the Bubnov book and as such it clearly conformed to Soviet practice and precedent. It went through several editions with minimal change. A corresponding manual for officers was the obvious next step. This was conceived as an equivalent to *Bubnov* but as an independent production. Published in 1960, it was reissued in 1962. During the Khrushchev era some local autonomy and initiative was encouraged and the GDR officers' manual can be seen as one aspect of this. Following the fall of Khrushchev in 1964 the political climate changed and central direction of activity in the periphery (and tighter security control of maps and topographic information) was re-imposed. In 1966 a review of the GDR officers' manual was published in the *Informatsionno-Tekhnicheskii Sbornik (Technical-Information Collection)* of the Soviet Military Topographic Service. This included the damning passage:

*"In contrast to the textbook on Military Topography for military colleges of the Soviet Army, in this book is set forth in considerable detail the essence and also the technique of making of topographic maps by modern aerial-photographic methods, and an idea of the geodetic foundation is given. This material broadens the knowledge of teachers in the area of topo-geodetic science."*

The GDR manual had revealed material that Soviet officers were not permitted to know. The manual was not reissued and only after a long delay was a replacement manual authorised in 1971 as a limited circulation document for instructors. Only in 1982 at the very end of the Brezhnev

period was East Germany permitted once more to produce a military topography manual for open use.

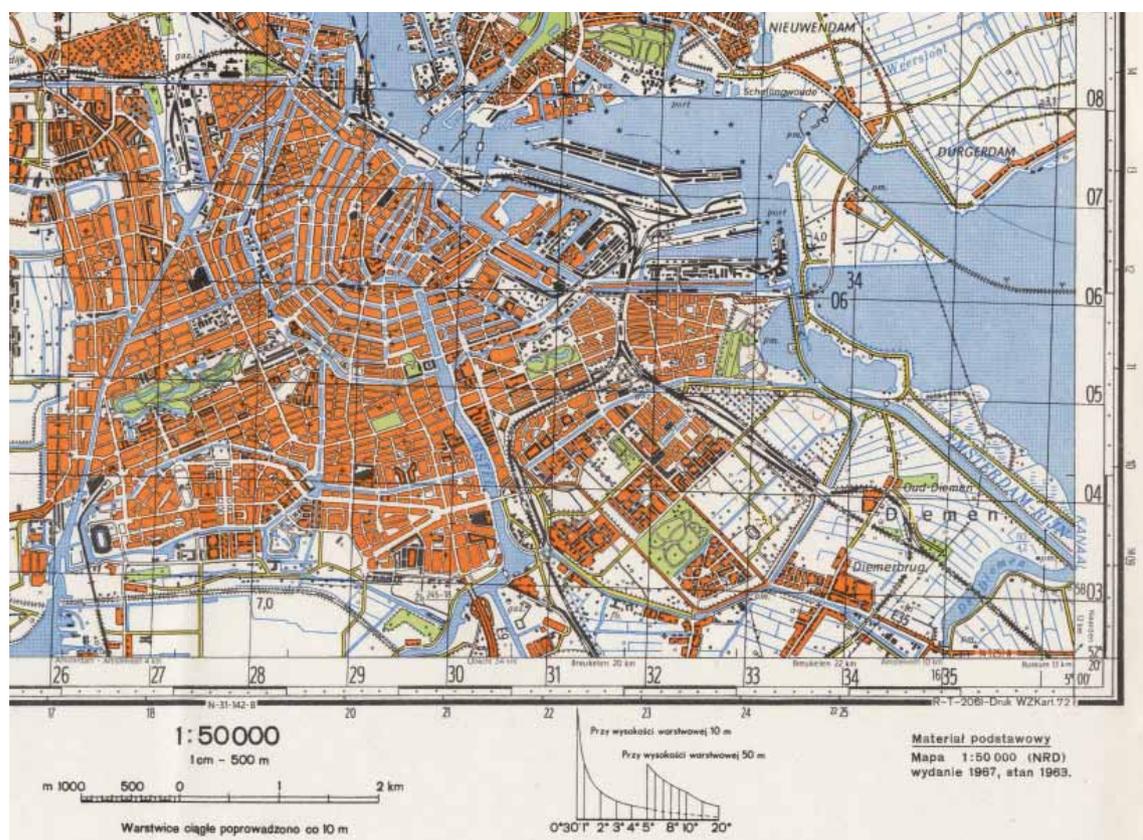
The exertion of control of the East Germans by the Soviets was nevertheless only one aspect of the relationship between the military mapping authorities of the two countries. After the Second World War the USSR had embarked on ambitious programmes to map the whole of its own vast territory, initially at 1:100,000 and then at 1:25,000. It also began progressively to map the whole world at topographic scales. To achieve this the resources of the entire socialist bloc were required. In effect, segments of the overall task were subcontracted to other Warsaw Pact nations. As with the maps of their own countries these maps were made to a common graphical specification but with the alphabet, typeface, and language of the originating country. What made the system practical was that reproduction material for these maps was exchanged between the different Socialist countries. With this material recipient countries, and in particular the USSR, could then produce parallel versions of the maps with their own alphabets, typefaces and languages combined with the common graphical base.

From the late 1950s East Germany became an active participant in this system. While most of Western Europe had been mapped at the million scale by the Soviets before and during the Second World War, only odd sheets with propaganda value (like the London sheet) had been produced at 1:500,000. The remaining 1:500,000 sheets were produced during the very late 1950s and early 1960s; those of Great Britain were compiled by the GDR from Bartholemew's half-inch maps. At the same time the GDR compiled a set of 1:200,000 maps covering all of West Germany from pre-war material. Larger-scale maps of potential European areas of military activity were however obviously required by the Warsaw Pact armies. During the later 1960s, while Poland was compiling 1:200,000 maps of Britain from 1940s OS material, East Germany compiled up-to-date 1:50,000 mapping of the Netherlands and the northern part of West Germany. This was then shared with Poland, Czechoslovakia and the USSR.

The areas of responsibility of the different Socialist countries shifted with time. When a new 1:500,000 series was prepared in the 1980s, the GDR was not permitted any role in its compilation, even of the sheets of the GDR itself; and by the 1980s the topographic mapping of southern Germany had become the responsibility of the Czechs. Nevertheless until the end of the Warsaw Pact the GDR retained responsibility for the compilation of 1:50,000, 1:100,000 and 1:200,000 mapping for the whole area from the River Oder to the English Channel, including the Benelux countries and France north of Paris. In the context of the times, this zone was centrally important in both NATO and Warsaw Pact planning. In essence the key role of East Germany's military cartographers within the Warsaw Pact alliance was to map the expected theatre of military operations in north-west Europe.

*This article is based on a presentation given at the Maps and Surveys 2009 seminar.*

*Polish edition of the 1:50,000 map N-31-130-D Amsterdam printed in 1972, based on the East German edition compiled in 1967 from sources dated 1963.*

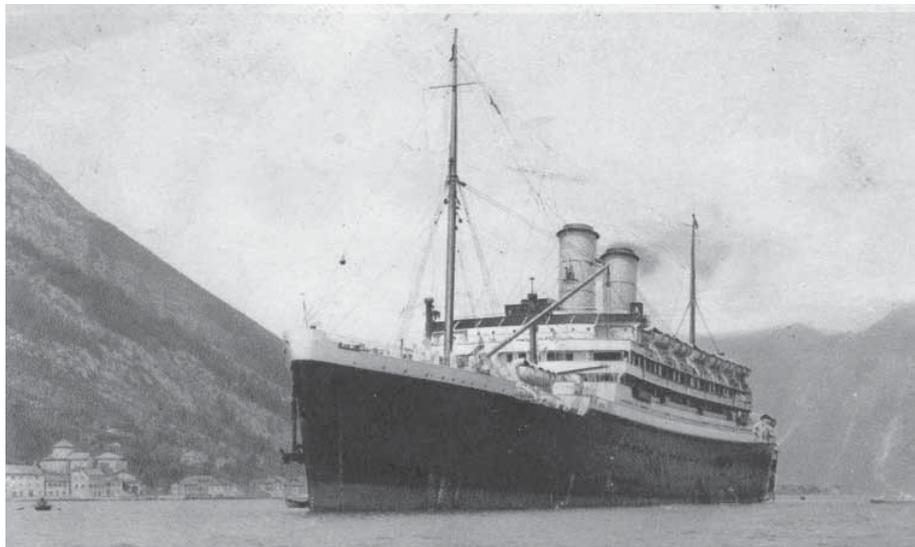


# The Far East in the Forties

By Bill Saunders

*Bill Saunders has written the story of his time in the service for the benefit of his family but the period through which he served make his tale one that will interest many of our readers. Bill first donned uniform in 1936 when he entered the Duke of York's Military School in Dover. His introduction to Military Survey came five years later when he moved to Barton-on-Sea and joined the Ordnance Survey Apprentice Tradesmen Boys RE. The unit moved in 1943 to Bryn Howell in north Wales where he met Betty, his future wife. Mans service followed starting with Sapper training, a six month engineering course at Cambridge University and survey and draughtsmen courses at the Survey Training Centre before posting to a unit. Below Bill tells the story of his first overseas posting which details well life at a time before the soldier's world shrank with the introduction of air trooping and the widespread availability of the telephone.*

In January 1945 a small group of us was posted to Halifax where all RE overseas drafts were processed. I was given a temporary promotion to Draft Sergeant as there were no other NCOs in the party and someone had to be responsible for the party en route. After a few days' embarkation leave during which I managed to visit my mother in Portsmouth and Betty in Llangollen we embarked on the troopship *TS Ormonde*, a former P & O liner, and after forming up in convoy in the River Clyde, we set sail.



*The Troop Ship Ormonde, formerly P & O liner SS Orontes.*

The conversion of a former liner to a troopship consisted of ripping out many of the cabins and substituting mess-decks in their place. Each mess-deck held about 200 men with long tables and benches bolted to the decks where we ate the meals brought in large containers from the ship's galleys. We slept in hammocks slung above the tables and as we were sailing through potentially hostile waters, the portholes were tightly locked all the time. Fortunately, once we had crossed the Bay of Biscay the weather brightened up and we were able to spend much of the day on deck relishing the warmth and new sights. We stopped briefly at Gibraltar and then after transiting the Suez Canal and Red Sea finally reached Bombay.

We went ashore at Bombay in order to stretch our legs after being cramped on board for six weeks. This was a very enlightening experience with the colourful crowds, the noise of street vendors, the beggars and the splats of red betel juice on the pavements - rather like the blobs of grey gum we now have, but more colourful. After food rationing at home, it was a new pleasure to sit in a restaurant where a good meal for four cost 9 rupees (or twelve shillings = 60p). The next day we boarded the Frontier Mail Express for Delhi where we spent a few hours looking around the city before catching our final train for Dehra Dun. This town is situated in the foothills of the Himalayas and is the Headquarters of the Survey of India: there was a small RE detachment in a tented camp who were supervising the printing of military maps and acting as a staging post for incoming drafts.

I was there for about three weeks awaiting orders and took the opportunity of visiting the Survey of India museum where they had a fine display of old surveying instruments including the 36" theodolites used by Colonel Everest amongst others in the Great Triangulation of India. I also looked around the large print room where the presses were turning out thousands of military maps; I was intrigued to see the paper being fed into the machines sheet after sheet by men standing at the top of long feed boards. During this time the other members of my draft were despatched to various units around India until eventually I was posted on my own to Fort William in Calcutta to await further orders. As usual, I was dressed in what was called FSMO - Field Service Marching Order

- which meant carrying all one's gear including large pack, small pack, gas mask, steel helmet, rifle and bayonet and to cap it all, a large kit-bag. A long train journey took me to Calcutta where I was initially processed, the night I spent in Fort William was one of the loneliest of my life - in fact to quote the old army expression, I felt fed up, f.....d up and far from home!! I had no idea of my eventual destination and fully expected to be sent on to a survey unit in Burma but apparently they were waiting for a fully-fledged sergeant to turn up so instead I was sent up the road to Barrackpore where there was a vacancy for a sapper with survey training.

This unit was Advanced HQ, Allied Land Forces, South East Asia, the headquarters that was backing up the 14th Army under the inspired leadership of General Bill Slim. Having lured the Japanese Army to the borders of Assam and fought them to a standstill at Imphal and Kohima the 14th Army was now pursuing them down the length of Burma. I joined the A/Q Plans Section which was mainly staffed by members of the Royal Army Service Corps who were organising the procurement and allocation of the stores required for the troops in Burma. One of my tasks was to read the incoming reports and update the situation maps that were used around the HQ. Another task was to draw the draft maps which showed the allocation of areas and buildings in soon-to-be occupied towns such as Mandalay and Rangoon.

Barrackpore was a pre-war cantonment about twenty miles north of Calcutta and our HQ was housed in the former Viceroy's country house. Our accommodation was in a tented camp where we had the services of the usual band of camp followers such as barbers, char and dhobi wallahs etc. We worked a six-day week and on my day off I was able to use the army bus service to go into Calcutta where there were, in addition to the usual exotic sights of a great Indian city, canteens and air-conditioned cinemas. The latter were very welcome as at this time of year the heat and humidity were very oppressive. One film I remember seeing was "Bathing Beauty" and as the shapely figure of the star, Esther Williams, stood on the high diving board in gorgeous Technicolor audible sighs arose from the assembled squaddies!

In Burma, Meiktila was occupied at the end of March and Mandalay shortly after and we were now standing by to relocate nearer the action. However Rangoon was occupied without a fight in May 1945 and then we heard that the war in Europe had ended and we could now look forward to the arrival of reinforcements to assist in the forthcoming invasion of Malaya (Operation Zipper). As the theatre of operations was now moving further south, we were relocated to Kandy in Ceylon where we would be closer to the Headquarters of Lord Louis Mountbatten who was the Supreme Allied Commander, South East Asia. This entailed a five-day voyage to Colombo across the Bay of Bengal in the *TS Derbyshire* and a train journey climbing up through the hills to Kandy.

Everything about Ceylon seemed brighter and cleaner than the Calcutta area we had left; Kandy was a delightful town, so much cooler and fresher with a picturesque lake and the Temple of the Tooth alongside which there was a NAAFI canteen. We were housed in a camp about three miles from the town in "bashas" made of woven palm fronds within a coconut plantation and one hazard we learnt to avoid were falling coconuts. The office area was on an elephant freeway down which they were led at the end of their daily labours to the river below - which I now see on holiday brochures as one of the main attractions around Kandy. We were now working flat out in preparation for the invasion of Malaya and I drew the draft plan for the occupation of Singapore. As this was "Top Secret" I was given a truck and driver in order to take it to 62 Map Reproduction Section at Kurunagala to be printed.

Then it all came to a sudden halt. We learnt on Radio SEAC that a new type of bomb had been dropped on Japan and that they were suing for peace thus sparing the Allies the long slog and innumerable casualties we had anticipated in the reoccupation of Malaya. In the unexpected lull I was offered the chance to have a few days leave at the rest camp at Nuwera Eliya which was a hill station in the highlands. This camp was run by the NAAFI and was very basic but the change was very beneficial. I was able to visit a tea plantation and to climb to the top of Mount Pidurutalagala (2524 m.) the highest point on the island. On return to Kandy I found that a transfer had been arranged for me to return to a Survey unit in Colombo.

The unit was No 2 Air Survey Liaison Section RE (2 ASLS) and happily I found myself amongst my contemporaries again. The unit was originally set up in North Africa to prepare beach gradient maps for the invasion of Sicily and Italy. It had been transferred to SEAC in the autumn of 1944 in order to prepare beach maps for the invasion of Rangoon (Operation Dracula). It was then involved in the preparation of maps for the invasion of the Malayan coast although in the event these were not required.

The military authorities now decided that they would take advantage of the availability of aircraft and skilled manpower to take complete aerial photograph coverage of the whole of the RAF HQ South East Asia Command, a remit that covered virtually the whole of South East Asia. The units involved were 684 Squadron RAF flying De Havilland Mosquito PR 34s, the latest and best of all the available aircraft, and 888 Squadron, Royal Naval Air Service who flew American Grumman "Hellcats" together with 2 ASLS who had the necessary experience of



*Japanese POWs at RAF Seletar.*

working with the RAF. This operation would be based mainly in Singapore so while we waited for our transport we prepared the necessary flight diagrams. This involved using the largest available map series (mainly the Hind Series at 1:253 440 scale) of the whole of South East Asia from the tip of Sumatra in the west to Timor in the east and northwards to include what was then Siam and French Indo China - a total area of some 1 million square miles - to use as the base maps and overlaying them with sheets of tracing linen. In the meanwhile we were housed in two bungalows to the south of Colombo and enjoyed a couple of weeks of comparative ease.

We embarked on a Tank Landing Ship (LST) for the voyage to Singapore praying for fine weather, these LSTs were seagoing craft but they were reputed to be skittish in heavy weather. We were lucky however as the Indian Ocean was like a millpond and we had a good crossing and were well looked after by the Navy. On arrival at Singapore (where we were greeted on our first night ashore by having our Jeep stolen) we were stationed at RAF Seletar which had only just been evacuated by the Japanese. We soon got used to the sight of Japanese in working parties, so lately our enemies but now docile little men busy clearing up bomb-damaged buildings whilst awaiting repatriation.



*The barrack block at Seletar – typical of the pre-war blocks throughout the East.*

We were accommodated in a pair of empty married quarters - there were no wives and families yet of course - and our offices were on the edge of the runway. Our duties consisted of briefing the aircrew with flight diagrams of the areas required for a particular sortie and plotting the resulting coverage. Once a month I went round the various HQs in Singapore and updated their wall maps with the coverage achieved to date. With demobilisation now under way the older members of the Section were being replaced by newly called-up personnel and in no time I was promoted to corporal.

888 Squadron, RNAS (Royal Naval Air Service) was based at Sembawang about ten miles from us where we had a small briefing room. They had previously been aboard an aircraft carrier, *HMS Ameer* which was part of a fleet operating in the Indian Ocean. Their aircraft

were American Grumman Hellcats. These were single-seat aircraft with poor forward visibility but although they were not a particularly suited to the photographic role they had been able to take pictures of the proposed invasion beaches when these were beyond the range of the land-based Mosquitoes. Now they were mainly used for lower level photography of towns and other strategic targets.

Life was not all work of course, as the base had been built before the war there was a cinema and swimming pool and we also had the use of a yacht of sorts in which we sailed across the Straits to the Malayan shore and explored the mangrove swamps. Singapore town as a short truck ride away and we had many a pleasant evening there. Families were starting to arrive so we vacated our married quarters and moved into one of the large barrack blocks.



*Off duty – this soldier accommodation including the bed will be familiar to all who served in the Far East until British withdrawal in the early Seventies.*

In March 1946 my turn came for UK leave and I sailed on the *TS Winchester Castle* for Southampton. I made a quick trip to Portsmouth to see my mother and my sister, who had just been demobilised from the WAAF, and they accompanied me to Llangollen. The following day Betty and I were married in the parish Church. She and her mother in those dreary post-war years had the unenviable task of gathering clothing coupons for a wedding dress and yet more coupons for a decent wedding meal at the Bridgend Hotel. Mr Grainger “the trains” (a family friend) wearing his Stationmaster’s peaked cap saw us into an empty compartment and arranged for detonators to explode on the track to see us on our way to London for

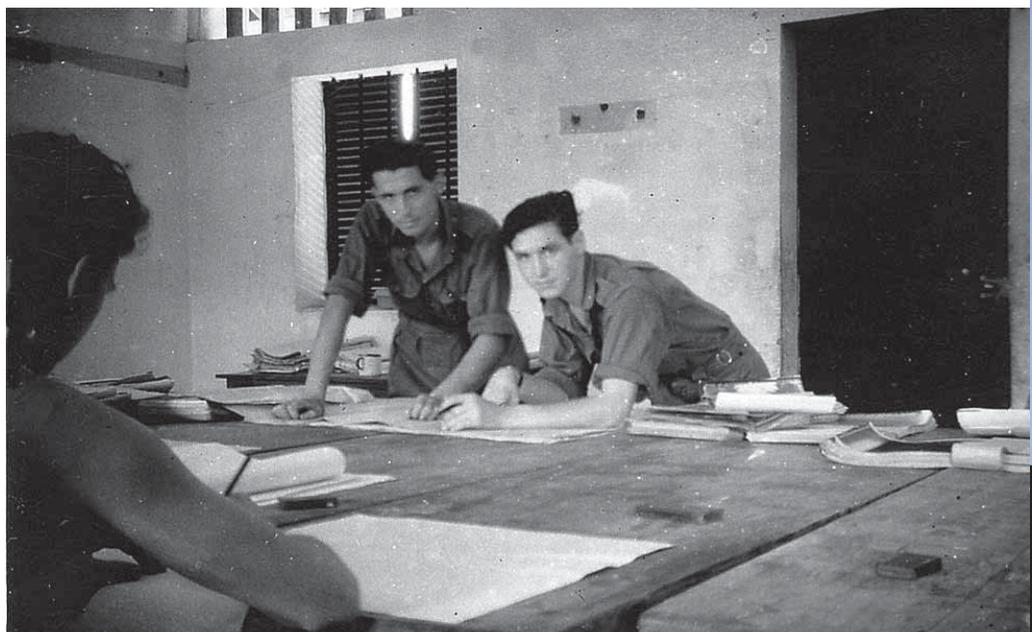
our honeymoon. Whilst there we saw the Victory Parade and visited the first post-war Derby ran at Epsom.

All too soon my leave was up and I returned to the transit camp on Southampton Common where I met up with several other Survey types while we awaited a ship. Someone at that camp either had a warped sense of humour or a poor grasp of geography as we were embarked on the *TS Britannic* bound for Bombay where we disembarked and spent a few days at Kalyan, a notorious transit camp. Next we entrained for Calcutta where we spent a further few days in the transit camp at the Racecourse. We then embarked on the *TS Empire Pride* for the short voyage to Port Swettenham in Malaya. Here we spent a couple of days in yet another camp at Kuala Lumpur and then onward by train to Singapore to rejoin our units at last.

The work with 684 Squadron (now renumbered 81 Squadron) continued and perhaps it is time to explain the details of this work. Firstly the aircraft, the De Haviland Mosquito had two Rolls Royce Merlin engines and being built mainly of plywood was fast and had a range of about 3,600 miles which made it ideal for the large area to be covered. It had a crew of two, a pilot and a navigator/camera operator, who were very experienced having flown in the area during the late hostilities with the Japanese in Burma. In addition to their photographic duties the Squadron was also responsible for courier services in South East Asia and in the course of these duties, Wing Commander John Merrifield DSO, DFC who was in charge of the squadron enjoyed setting speed records between cities some of which stood for many years.

The cameras used, were the American Fairchild K17’s which had a 6” lens and a format of 9” x 9”, the magazines held (from memory) 120 feet of film which gave about 150 exposures. In order to cover an area for mapping purposes it is necessary to fly in a series of parallel overlapping lines with each exposure overlapping the previous one by 60%, which gives the stereoscopic effect and each flight line overlapping by about 15% in order to achieve complete coverage with no gaps.

*2 ASLS plotting office.*



The height of the aircraft above mean ground level and the focal length of the lens determines the scale of the photos so with a six-inch lens a height of 25,000 feet will give a scale of 1/50,000. It is necessary for each exposure to be level within about 3° so

it is vital for the pilot to hold the aircraft level for each exposure - no easy task in warm tropical skies. Large areas of cloud over the target area could cause the sortie to be aborted so it was always desirable for the pilot to be briefed on alternative targets. On return from a sortie the crew were debriefed by an RAF officer with a member of our unit in attendance then the films were processed and two sets of prints passed to us.

Our job then was to assess the prints for quality and if they were satisfactory to plot them on tracing linen overlays located on the relevant map sheets. This was interesting work as the terrain would include every type of tropical landscape from coastlines, large areas of swamp (in Sumatra), paddy fields (on most islands), volcanoes (in Java) and dense forest (most of Borneo). My tour in Singapore came to an end in April 1947 when I embarked on the *TS Andes* for return to the UK.



*Sailing home on the Troop Ship Andes.*

*Bill then served at the Survey Training Centre and in Egypt with 42 Survey Engineer Regiment and left the service in 1952 when he put on a civilian suit for the first time since 1936. His civilian career included time in Sudan, work with DOS in Uganda and then with Lovell Johns and finally as Production Manager for the well known cartographic company, Cook, Hammond and Kell.*



# HELP *for* HEROES

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H4H is a charity set up in response to the desire of ordinary people to do something practical to help our wounded Servicemen and women get back on their feet.

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[www.helpforheroes.org.uk](http://www.helpforheroes.org.uk)

# Hermitage 1949-2009

*By Don Procter*

In order to catch something of the spirit of the School of Military Survey (now of course the Royal has been added) and the way in which it became a sort of second home to me and probably many other military surveyors I thought a few brief notes on the various times I was there might be preferable to more detailed descriptions of one event. Many contributors have spent longer than I at SMS, having done two or more full three-year appointments; mine at least have been varied, as I will now try to enumerate.

When Sandhurst opened as the Royal Military Academy Sandhurst (RMAS) in January 1947 it combined the functions of the former RMC at Sandhurst and RMA at Woolwich. The first two intakes were commissioned in July and October 1948 and the RE contingents were combined for their Young Officer training at the School of Military Engineering (then temporarily at Ripon) to learn the basic Sapper Officer requirements (about half of us having done sapper basic training before Sandhurst but also needing a new perspective) after which (April 1949) the 49 of us were scattered around the various Training Regiments to train either regular or national service recruits. There was still uncertainty about our own training except that those who qualified would start a Degree Course in Oct 1950 and the remainder a Supplementary Course at about the same time. However, part way through this period we were asked if any of us were interested in Survey or Transportation and I applied and was lucky enough to be one of six selected to visit 42 Survey Engineer Regiment in the Middle East for six months and to be briefed at Hermitage first. Thus about late January or early February 1950 I went to the newly relocated SMS for the first time for a two day briefing. I remember little of it but the Commandant talked to us about Military Survey, its history, organisation and functions and the Chief Instructor outlined the techniques and equipment; we were shown round the three training wings, filled in various forms and travel docs and had some inoculations. My main memory is that the Officers' Mess had not been opened, the spider was not even built till some years later, we were accommodated at the RAOC Mess at Thatcham, travelling in a truck with the sides up morning and evening (very cold) and consuming a packed lunch in the nearest hut on the left side of what became the mess lawn. I do not think anyone lived "in" at that time. Anyway, soon on the *Empire Windrush* (sunk some five years later) to spend a couple of months with each of The Topographic Sqn (in Jordan), The Cartographic Sqn and The Lithographic Sqn at Fayed in the Canal Zone (these squadrons later to become 19, 22 and 32 respectively). A happy and interesting period!

My degree course at the Military College of Science duly started in October 1950 (Royal being added a few months later: so RMCS). In July/August 1951, during the first long "vacation", all the RE officers went to Hermitage for three weeks doing detail survey (chain) of part of the camp, some levelling and a bit of tacheometry; this was much the same as those on a Supplementary Course would also do and similar to what most universities would have included in a Civil Engineering Degree. The camp had improved considerably since my earlier brief visit. During this visit I met Barbara Heys, who is now Barbara Procter.

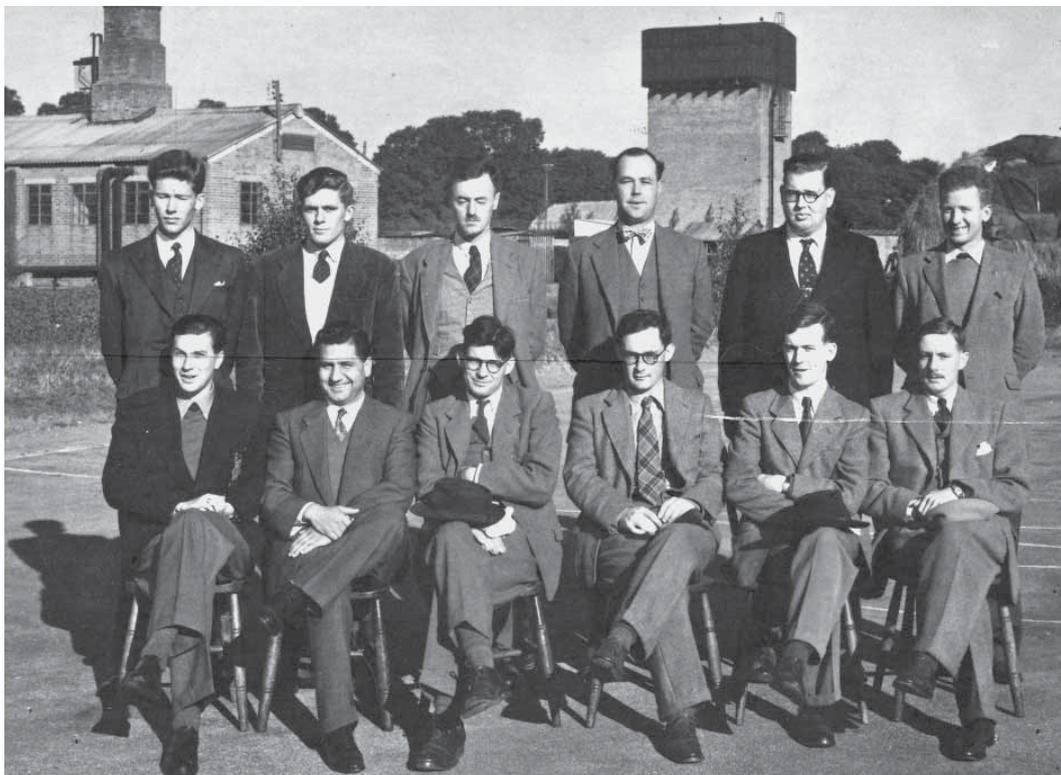
My next visit to Hermitage, only two months later, was very brief indeed and though I would probably rather forget it I am sure I never shall. Early in October, and the first rugby match of the new season, I was playing for RMCS against SMS and was injured just before half-time. The MO came promptly but at that time the ambulance had to refuel at RAOC Thatcham and was doing so; I gather the driver had a girl-friend in Thatcham and stopped "for a cup of tea". It was about 2030 hrs we arrived at Wheatley Military Hospital where fortunately the duty doctor was a surgeon who correctly diagnosed a ruptured intestine and repaired it; this apparently was potentially fatal if not repaired very soon so I was lucky to be only four days on the dangerously ill list and two months on the seriously ill list.

The following summer those who had chosen Survey as one of their subjects for Finals again went to SMS to do the required coursework; though Kit Bourne who lectured to us at Shrivenham was more than competent to do so the equipment needed was not available, it would have been very little used and with Hermitage only 20 miles or so away it was the logical solution; besides the coursework involved did not lend itself to the allocation of one afternoon per week. So for another four weeks in August/September 1952 we observed and computed a small third order triangulation scheme with a base and some resected and intersected points, all to be used as control for a 1:10560

plane table survey. Then with the calculation and setting out circular and transition curves and quite a bit of astronomy and including what we had done the previous year we had enough (and probably more than enough) coursework to satisfy London University.

No. 16 Long Survey Course started at Hermitage at the end of September 1955 with 12 students, fairly typical, of whom six were RE officers and the other six either Colonial Probationers or DOS recruits. Much has been said about this course which provided (and no doubt still does as the ASC not LSC) a really sound background education in surveying with a concentration on the practical side. Our course, like most of them, was harmonious, we worked well together and helped each other and it says much for the atmosphere of the School that this is normally the case. Memorable events were few though we were “privileged” to be the work force to mix and lay the concrete for the foundations and pillar, to OS specifications, built in the South West corner of the camp (after all six of us were, first and foremost, sappers and some of the others lent a hand also). Then our Estate (later Trial) Survey was in Broadclyst, Devon, and Archie Hamilton, with his wife and daughter Joanna, stayed in the Sprydecote Guest House as did those members who had taken their wives; Barbara did not accompany me as we had a one year old daughter at the time. However the guest house was in my area and Joanna was kind enough to act as my booker a couple of times; we were not surprised to have several visits from SI Field (Ben Burrows) and were all delighted when he and Joanna announced their engagement shortly afterwards. At the end of the Survey Course I was sent on the first Geodesy Course at Oxford University to study under Brigadier Guy Bomford and Dr. Allwyn Robbins, two very formidable intellects who kept us on our toes. For this period I remained on the Student Strength of SMS and as I had moved into a quarter in Curridge Piece half way through the LSC I was able to remain there whilst at Oxford, travelling daily for the first term but the Suez Crisis and petrol rationing reduced that to weekly.

After that lengthy spell at Hermitage, and having been eleven years in the army with eight and a half of them on courses or training, I was ready for my first survey appointment. After a year with 89 Field Survey Squadron in Kenya, two years with 42 Regiment in Cyprus and a bit over four years with OS at Chessington I was posted back to The School in January 1965, the intent being to be SI Field but to fit other moves to do AI Field for three months and then, two months later, to combine the SI post with OC Trade Testing. However this was not to be as I decided to retire from the army to go to UCL as a lecturer in the Dept of Photogrammetry and Surveying, so Dick Scott who was then in charge of trade tests had his posting delayed to effect the planned combination of the two jobs whilst I remained as AI till my retirement that October. I was in the slightly humiliating



#### **16 Long Survey Course**

Butler Miller Capt Proctor Capt Barwell Pratt Evans  
Rogers Christofi Lt Sturgeon Capt Davies Capt Fortescue

position of filling a Captain vacancy but it was my own fault and logical. I continued with the AI duties but also took over the teaching of some SI aspects (geodetic astronomy and gravity to name but two). An unmemorable nine months except that they included my last games of cricket and the last time I refereed a rugby match (on the same pitch as my last game, or rather half a game, of rugby 14 years and a few days previously).

My next association with The School was not a particular event but a period of a few years when I was the External Examiner (sometimes referred to as the Moderator) for the ASC; it was about three years, at a guess I would think 1967-69. For Military Survey it had to be someone who understood the technical requirements and would look for a consistent standard of marking, but the course also provided exemption from some or all written exams of the Land Survey Division of RICS so the external examiner needed to be satisfied that the required standard was maintained and was free to report back to the LS Examinations Committee to this effect (I was a member of that committee). This involved seeing and assessing the scripts after they had been marked by the respective instructors who were also asked to provide model answers (perhaps this was because the external might not have known the answers! I trust that was not the case). Then I would attend the Examination meeting with the Commandant, Chief Instructor and Archie Hamilton. This gave a new, behind the scenes, view of the process which was interesting and, on the whole, enjoyable. I only recall one disagreement when I had to point out that the model answer, and all those produced by the students, to one question were entirely erroneous, but to mitigate this that the correct answer was probably outside the syllabus. Fortunately Robin Gardiner-Hill, who was then Commandant, immediately saw my point and an argument was avoided.

As Assistant Director (Survey) at DOS from 1975 to 1984 I was responsible for all the surveyors working in DOS field parties in various locations and this also meant an involvement in recruitment and, if necessary, training. These exercises were usually timed for recruits to start in the autumn on completion of their first degree. Those whose degree included enough survey both for our purposes and to exempt them from the RICS exams could be posted to field parties almost straight away, others went to Hermitage to join an ASC; there were never more than two in this situation, and not every year. However when we had students there I would visit from time to time to check on progress and performance and try to sort out any problems they had. During this period the rebuild was taking place so I saw progress at intervals. Of course I was always interested to see how things were going and frequently amazed to see how The School was functioning so normally (apparently) despite all the upset.

Even since my final retirement in 1988 from OS Southampton I have been back to Hermitage for meetings and lectures, usually RICS or DSA several times. The only one I can remember with any certainty was the memorial meeting to commemorate the life and work of Guy Bomford who had served in the Survey of India, then Military Survey and finally as the Reader in Survey and Geodesy at Oxford University (whose course I have already mentioned attending 1956/57). On so many occasions over the sixty year period I have been to Hermitage for a variety of reasons, and an equally great variety of durations. I have always been made to feel welcome and at home and I have always enjoyed them, with the notable exception of my rugby injury, and I enjoyed the first half of that game and it was whilst being visited in Wheatley Hospital that my association with Barbara got really serious so I could say "it is an ill wind...."

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## Book Reviews

Readers knowing of newly published books or cds that might be of interest to Ranger's readership are asked to let the Editor have the details so that a review can be published in Ranger.



# Farewell to a Good Old Workhorse

By Paul Sleep, Senior Instructional Officer Print, RSMS

Before

July 2009 saw the final demise of the Heidelberg printing press from RE Geo. The machines came into service in 1975; not a bad investment in light of current trends! *“Okay ‘Capability Development’, what we want is equipment – field deployable, to last 30 years with only one minor upgrade required – that we can sell for a reasonable amount at the end of its life”.* Hmm!!

The total number of machines was four single colour (Sord) and three double colour (Sord Z) in RSMS with 13 and 14 Squadrons each having two single colour machines container mounted and 135 Squadron with a single colour machine.

The machines supported all major operations from the Falklands and the Balkans through to Iraq and Afghanistan. They averaged around 12 million impressions per machine, in commercial terms about a years work! They were supported for the last five or six years with the Digital Pre-Press CTP (Computer to Plate) technology, a far cry from the pre-sensitized plates, negatives and positives of earlier days.

Going



Going

Gone



So for the first time since the 1930’s Military Survey/Geo does not have the capability to print “medium format” oversize B2 (for Cold War warriors that is about M745 size) in bulk in the field.

The presses, less the 135 Squadron machine which is still awaiting disposal, were sold at MOD auction with 13 and 14 Squadrons’ going complete with containers. Deemed to be in superb condition the presses were enthusiastically bid for by a number of interested parties. Their final destinations were reported as Africa and the Far East – quite appropriate in terms of Military Survey/Geo history! Their replacement for the next 30 years is eagerly awaited - clearly not plotters!

After



## An Assessment of How the Geospatial Intelligence<sup>1</sup> Business Could Develop Over the Next Ten Years

By James Prain and colleagues of the Geospatial Intelligence Team at DSTL

### Introduction

We all like to reflect nostalgically on events, relationships and technologies of the past. What is more challenging is to imagine what the future has in store and the timeframe in which changes will occur. In this article I and my DSTL colleagues briefly reflect on the past and then gaze into the future of the Geospatial Information Business. Whilst we can see tantalising technologies and possibilities, there are also challenges to the way we, the Geospatial Community, seek to embrace the *Information Age*.

There have been many excellent articles already published in *Ranger* charting the developments in technology and working practice since the end of the Second World War. To summarise these, and thus provide some context to where we are going I shall consider the epochs of: the immediate Post War period; the height of the Cold War; post Cold War, and today. I shall then extrapolate into the future.

In technology terms the driving force for change over the past 65 years has been the computer and its relentless increase in power and sophistication, and decrease in size, which has enabled us to progress from the Analogue Age, through the Digital Age and now into the *Information Age*.

### Historic Reflection

The Post War era is set against the political ramifications of the End of Empire. Data collection for mapping was stimulated by advances in aerial photographic mapping and intelligence techniques developed by all sides during the Second World War. The provision of ground control needed in order to ortho-rectify all this imagery was revolutionised by the advent of the tellurometer microwave distance measuring device used in conjunction with the theodolite. Overnight this invention transformed the manner and the time it took to provide such control. However, these distance measurements and associated angles still needed to be computed using log tables and mechanical calculators. Production technology at base plants and in the field, provided by the Print Train, included cartographic light tables, graining and plate making, and lithographic printing, delivering a bulk print capability close to the front line.

The Cold War era was epitomised by the Space Race. Low earth orbiting satellites now collected high-resolution imagery over most parts of the world in a non-intrusive manner no longer constrained by international borders. In addition, navigation and surveying satellites such as Transit Doppler provided a global coordinate reference system. Surveyors were now able to fix control points at any time of day or night, in all weathers, in locations of choice, no longer constrained to hilltops and other vantage points. Meanwhile on the ground, surveying techniques were further increased by the advent of electronic distance measuring based on infra-red and laser systems thus increasing the productivity of the surveyor. The advances



MRA5 Tellurometer



Manual Scribing



Magnavox Transit Doppler Receiver

<sup>1</sup> The term Geospatial Intelligence is used as an all encompassing term covering information and intelligence gained from data collected across the environmental domains of geography, hydrography, hydrology, meteorology, oceanography and airspace management.

in computing underpinned changes to all our lives. In the Geospatial Information business, computers enabled the simultaneous adjustment of the national geodetic framework and underpinned the development of analytical photogrammetry thus freeing this science from the constraints and limitations of opto-mechanical plotting machines. Map production also began to exploit computers and revolutionised cartography, with so called automated cartography or auto-carto, while the introduction of large format scanners generated digital raster mapping.

The fall of the Berlin Wall 20 years ago signalled an end to the tight control of the Super Powers on nation states and radical organisations. The UK suddenly found itself deploying armoured formations from northern Germany to the sands of Saudi Arabia and Kuwait. One of the most successful technologies that ensured a swift and effective conclusion to the liberation of Kuwait was the use of the 2nd generation of satellite navigation systems – the Global Positioning System or GPS. Overnight, every vehicle on land, at sea or in the air had an immediate position fix to the order of 20m. Meanwhile the surveyor could post process the GPS data and obtain centimetre level positional accuracies. This was truly a revolutionary technology. On the data collection side, the volume of satellite imagery available continued to increase particularly from commercial providers who could now offer imagery at 1m resolution. In support of front line forces, geographic staff deployed computer based analysis tools. Geographic Information Systems (GIS) were part of the range of computer applications provided by the Tactical Information System, or TACISYS as it was better known, which worked alongside the more compact mobile printing capability TACIPRINT. At the national level, mapping agencies embraced more sophisticated data formats, moving from raster to vector, enabling data to be held in an intelligent manner supporting exploitation in a range of intelligent, as opposed to dumb, products. In the printing domain, new technology enabled large format scanning and lithographic printing plates to be created directly from computers. Densitometers also improved quality control and consistency.

As well as advances in analysis capability, the impact of digitisation so far has been to improve the production of paper maps and charts. However, digital products were principally in the form of basic map images as a dumb picture backdrop to mission planning, and command and control systems. The next step forward would come with the wider exploitation of intelligent data by both specialists and end users.

### So what does today's technology offer us?

Today we are in the so-called *Information Age*. It is most powerfully characterised by the Internet and the mobile phone. In barely 10 years these technologies have become ubiquitous in everyday life. At the same time computers continue to grow in processing power and shrink in physical size.

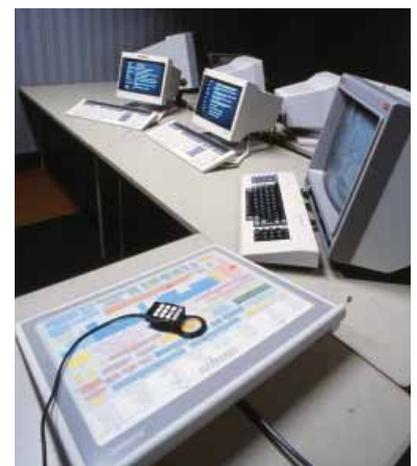
In the surveying and mapping domain a series of technologies continue to have significant impact. In the air, unmanned air vehicles ranging from hand-launched planes to executive jet sized systems provide all levels of command with immediate real time imagery across a range of spectral bands. The advent of terrestrial laser scanning systems (LIDAR) now enable complex urban structures and landscapes to be rapidly captured with the associated data point clouds being readily processed, enabling the master database currency to be maintained in a timely manner. GPS continues to improve in terms of higher accuracy and is complemented by other systems such as Russia's GLONASS system and anticipated systems including China's COMPASS (or Beidou Navigation System) and the European Union's GALILEO. These complementary systems provide integrity monitoring, or the independent check, and greater coverage. On the ground, Total Station Systems now integrate the functions of theodolite, EDM and GPS providing both accurate absolute and close range relative positioning with data downloaded into data loggers. In the case of the Ordnance Survey, data collected during the day by its army of local surveyors is then uploaded to the Headquarters overnight and added to the national database.



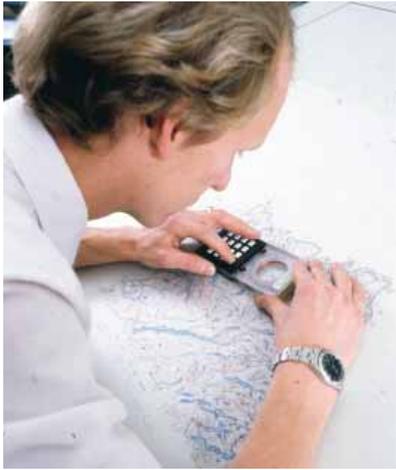
*Infrared Distance Measuring Attachment*



*Wild A8 Plotting Machine*



*Auto-carto suite*



Manual Digitising

The ways in which the national database is now viewed has changed. In-Car Navigation Systems have taken the stress out of navigation and Google Earth now provides a highly sophisticated, yet intuitive and user-friendly interface, to imagery and mapping of anywhere on the globe. This trend is continuing as we can now access terrestrial views of many of our main roads in urban areas.

However, the challenge for Defence is that though it has a myriad of sensors and collators, it lacks the data and information management systems to allow the maximum exploitation. Much of the data collected is held in localised data stores with little or no connectivity to the wider community that might seek to exploit this valuable material. Furthermore, the Armed Forces operate in places where there is often limited national infrastructure in terms of power, connectivity and bandwidth and hence service personnel on the front line do not receive the same level of information services as they now expect at home and in the office.

### So what are the themes of the future likely to be?



Hell Scanner

The biggest change will be in the skills and expectation of the end user. Today's servicemen and servicewomen now have mobile phones with GPS and Google Earth in their private lives. The MOD will need to provide comparable capabilities if the Geospatial Intelligence Community is not to be by-passed; at least in the land domain. Front line commands will demand nothing less. Furthermore, with greater confidence to exploit geospatial data in their personal lives, service personnel will be keen to do much more themselves, such as basic analysis of the ground. Whilst a major advance in technical terms, in conceptual terms this is only reflecting what soldiers did in the paper map era when they studied the map in order to gain an appreciation of the ground. What is exciting is the power of GIS that will give the user the ability to view the landscape in three spatial dimensions, plus the temporal dimension, from any direction and even undertaking a virtual helicopter tour. The landscape will be represented by an optimised mix of imagery and



# 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.

cartography with added dynamic diurnal and seasonal variations as well as the weather and the tide state. As in the paper era, service personnel will have the tools and training to undertake basic analysis such as route planning and line of sight analysis. This wider provision to GIS applications could be delivered in the next three years.

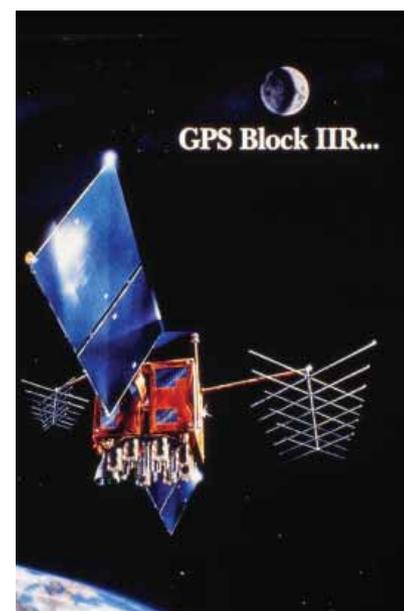
Over the coming years the data used in training systems and simulators will come from the same global model (see below) as data used for mission rehearsal and mission execution; unlike the current situation where these former systems require specifically generated data.

Again, the way in which service personnel will exploit Geospatial Intelligence will change. Through simple optics such as head up displays on platforms or helmet mounted eyepieces, the model of the world (or selected features) can be superimposed on the real view the warfighter has; the advantage is that the model would show what is in 'dead' ground and can display features and attributes such as names as well as coordinates, report lines, objectives and other threats electronically relayed to them. This is immersive 3D technology or Augmented Reality.

The result of the greater access to Geospatial Information is that service personnel at all levels will have a far greater understanding of where they are in the battlespace and what is happening around them – the so called Shared Situational Awareness.

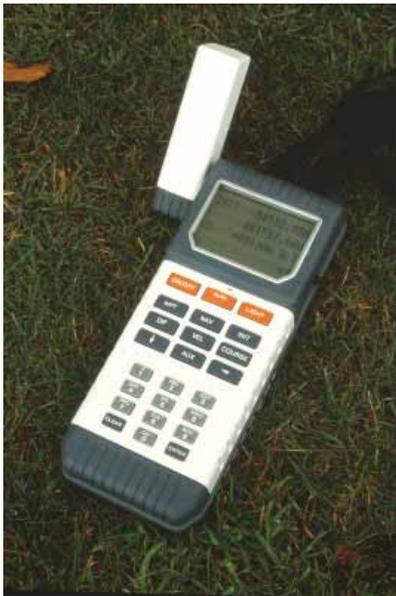
One of the downsides posed by more empowered end users is the lack of control of cartographic representation possibly leading to a lack of standardisation, leading to increased cognitive effort to use products. Whilst standards are constraining they do ensure interoperability and the rapid assimilation of information as the picture looks familiar (the underpinning reasons for military staff work). There is a strong role for those responsible for doctrine and training to ensure effective techniques and procedures are embraced to prevent information exploitation anarchy.

Reflecting the manner in which companies like TomTom build up their road network database by having members of the public driving around the road network with dataloggers, Defence will do



*GPS Block IIR Constellation*





*Magellan Hand Held GPS Receiver*



*Trimble Geodetic GPS*



*High Resolution Commercial Satellite Imagery*



*Total Station comprising theodolite, EDM and GPS functions*

likewise. Every ship, aircraft, land vehicle and soldier on the ground is a potential data gatherer and will be harnessed accordingly collecting data about the topography, the weather, the infrastructure and the people.

### **So what is the role for the geospatial specialist?**

The first task is to develop and maintain the master Global Geospatial Intelligence Model which will include below ground level aspects including underground services. This model will not exist in a single location but will comprise complementary elements maintained by the principal Geospatial Intelligence agencies. Research is currently going on into the development of a single geospatial data architecture that will support the concept of holding data about real world items once and uniquely within the model thus reducing data inconsistency and conflict.

To build and maintain the model, mapping and charting professionals will draw on data coming from the plethora of sensors now available mounted on a wider range of dedicated and opportunity platforms. Whilst electro-optical imagery will continue to provide the principal source of data, radar, thermal and polarimetric imagery together with airborne and terrestrial LIDAR will also become sources that Geospatial Intelligence specialists will be confident in exploiting on a routine basis. This will be supplemented by the data collected by deployed platforms and personnel as well as from commercial sources, third parties and the Internet. Google's plans to generate models of the world's major cities will provide one such source of information; many other organisations are also creating 3D databases. This latter category of information is referred to as Open Source Intelligence or OSINT. For the specialist, another obvious task associated with all these ad hoc sources will be data validation and verification.

To assist with the exploitation of the mass of imagery, automatic feature recognition and change detection will be required. Dstl's own MATISSE application testbed is providing assistance in rapidly identifying changes and, by an optimum mix of sensors, specific features become more obvious thus aiding identification and information extraction.

The resolution of the fundamental model will increase. The parapets, the types of windows, door opening and even the internal design of buildings will be held. The current need to operate within defined scale bands in order to handle aggregation and representation issues will disappear as automatic symbology and generalisations techniques mature; though this is still some years away.

At the enterprise level, the MOD will be providing a range of tailored applications to users from the soldier to the geospatial specialist. This will be delivered as a Services Orientated Architecture<sup>2</sup> with Geospatial Intelligence being pulled and tailored by the user as needed as opposed to being supplied as 'products' generated by Geospatial Intelligence specialists.

The second principal task for these specialists is to derive Geospatial Intelligence from various data and information sets to undertake complex analysis of the terrain and its changing properties due to the changing seasons and weather. Increasingly the geospatial specialist will be working with colleagues in the other intelligence fields of human, imagery and signals intelligence (HUMINT, IMINT and SIGINT) to provide a more complete assessment of what is happening and likely to happen. Geospatial and temporal analysis will become routine tools in the broader intelligence business supporting decision makers at all levels. The intention is to create a multi-intelligence working environment, with GEOINT acting as the foundation layer and GIS tools offering powerful, mature and adaptable analysis and visualisation tools. This should be achieved by 2012 when elements of the Intelligence Collection Group co-locate at Wyton.

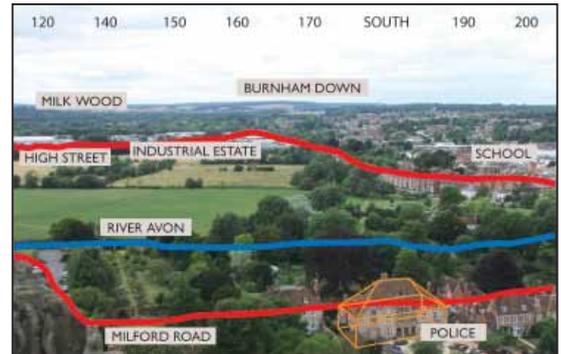
<sup>2</sup> Under a Service Orientated Architecture users will call up applications and information as required as opposed to hosting these on local computer platforms.

### So how long will it take?

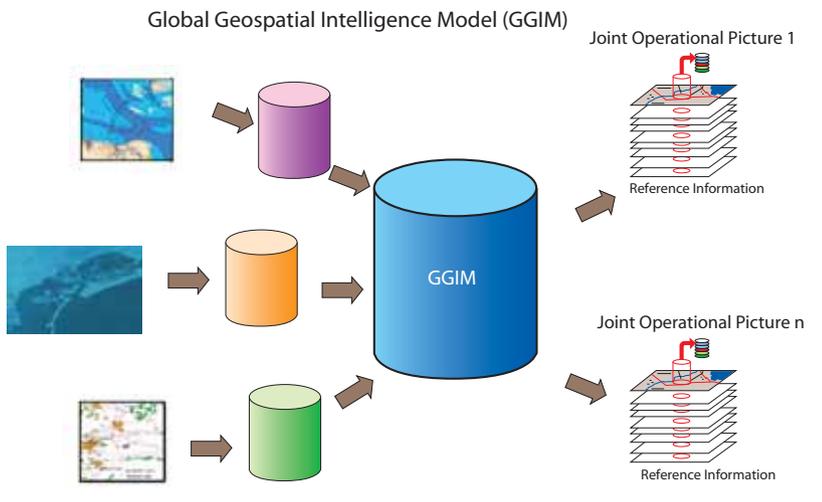
Whilst we can predict the rate at which the civil sector is developing, it is more difficult to predict how the UK Defence community will fare under increasing domestic pressures on the budget due to recent and ongoing economic pressures made worse due to the ongoing operations in Afghanistan. The backdrop must be realism.

The MOD is still evolving its acquisition process to cope with the dynamic nature of the information technology industry and continues to adapt processes originally designed to deliver major programme such as airframes and ships that can remain in service for up to 30 years. The MOD has recognised the need to exploit civil developments and increasingly embraces civil standards. Open architectures based on so called ‘Open Standards’ enable components from different manufacturers to be connected together. The Geospatial Community is still very active in promoting standards in order to improve the exchange of data and information between nations, organisations and systems. A major player is the Open Geospatial Consortium (OGC). The challenge for the Geospatial Community is to ensure that there is strong governance in place to enforce these standards.

Defence seeks to embrace a more holistic approach. It is developing architectures of its various systems in order to ensure compatibility between programmes. This is part of



*Immersive 3D technology or Augmented Reality (a. as normally seen and b. with Geospatial Intelligence added via head up display or helmet mounted eye piece)*



*Master global Geospatial Intelligence Model*

its approach to view the true cost of a system or capability throughout its lifespan – so called Through Life Capability Management. This ensures all aspects are covered including the equipment itself, its concept of use, its running costs, and the associated personnel issues including training.

Linked to the unknowns about future Defence spending is the rate at which the underpinning communications infrastructure and the bandwidth available to provide a near real-time environment will grow. The role of the communications infrastructure cannot be underestimated.

### Summary

So to summarise, in the coming years the end user will become more skilled in handling Geospatial Intelligence which will be accessed as a flexible service opposed to being based on fixed products. The challenge for the MOD is to ensure that technology available at home and in the office is also available to support operations. The Geospatial Intelligence specialist will be kept busy sustaining a Global Geospatial Intelligence Model and answering more sophisticated Geospatial Intelligence questions. This can be achieved provided there is adequate funding and a capable underpinning communications infrastructure.

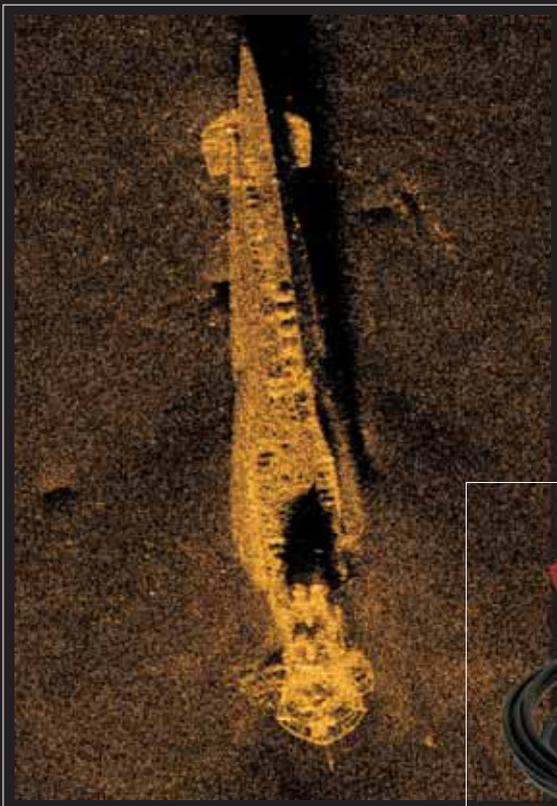
# Synthetic Aperture Sonar, HISAS



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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# Paddling Frantically?

## 42 Engineer Regiment (Geographic)

### – Op Herrick Update November 2009

By WO2 Simon Crago, Operations Warrant Officer

#### Introduction

You may wonder what is meant by the title of this article ‘Paddling frantically?’, simply put, a recently returning Geospatial Officer on Operation HERRICK 10 compared the geospatial support being provided across Task Force Helmand to that of a swan, ‘...*graceful and elegant on the water’s surface, yet paddling frantically under the water*’<sup>1</sup>. In his opinion, the ‘graceful and elegant’ swan on the waters surface best described the performance of the geospatial analysts and the continual high standards being met under demanding circumstances. However, the ‘*frantic paddling*’ suggests that perhaps all is not what it seems and certain elements of the geospatial support being provided is being done so at risk. But is that the case? Reports from theatre suggest that the geospatial analysts of 42 Engineer Regiment (Geographic) continue to ‘punch above their weight’ and provide the level of geospatial support required of them; this article serves to address some of the successes and difficulties experienced on recent deployments to Afghanistan on Op HERRICK.

#### Laydown

November of this year marks the 8th anniversary of the UN authorised NATO-led military intervention into Afghanistan. From 2001, members of 42 Engineer Regiment (Geographic) and the wider geospatial community, in one guise or another, have continuously provided geospatial support to all levels of command, from strategic to tactical, throughout Afghanistan.

In Kabul, LCpl Leitch from 14 Geographic Squadron is instrumental, with the capability that she provides, in ensuring that Geospatial Intelligence (GEOINT) is fused with other intelligence sources at the Theatre Operational Intelligence Support Group (T-OISG) in support of Headquarters, International Security Assistance Force (HQ ISAF).

In Kandahar, SSgt Sargeant from the Joint Air Reconnaissance Intelligence Centre (JARIC) along with Spr Feeney and Spr Lloyd from 13 and 14 Geographic Squadrons respectively form the UK component of a multi-national geospatial team providing support to the intelligence, operations and planning branches of Headquarters, Regional Command South (HQ RC South). Additionally in Kandahar, LCpl Parker from 13 Geographic Squadron provides geospatial support to the joint US/CAN/UK Operational Intelligence Support Group in the Kandahar Intelligence Fusion Cell (KIFC) and Sgt Ashcroft from 14 Geographic Squadron leads a joint UK/CAN team as the NATO Theatre Map Depot commander ensuring the rapid delivery of hardcopy mapping not only in RC South but throughout Afghanistan.

The geospatial support to Task Force Helmand (TFH) in Helmand province continues to be extremely challenging with the requirement to support the high tempo of operations currently being conducted there. Capt Underhill (SO3 Geo) and LCpl



*Working conditions at BG(NW) in Mūsá Qal Ah*

<sup>1</sup> Geographic Support Group – Post Operational Report dated 06 September 2009.

Atkins, both from 14 Geographic Squadron, along with Sgt Ward from 11 Light Brigade provide geospatial support and advice to the Brigade Headquarters, Task Force Helmand (TFH) in Lashkar Gah. LCpl Frank from the Operational Intelligence Support Group Troop at RAF Brampton is key in providing a GEOINT capability at the Provincial OISG and Cpl Hackshaw from 14 Geographic Squadron provides critical geospatial support to the C-IED Task Force, also in Lashkar Gah.

Camp Bastion continues to operate as the primary logistic node for Task Force Helmand (TFH), SSgt Gomez from 14 Geographic Squadron and his team provide geospatial support to this continually expanding facility. Camp Bastion also acts as the administrative hub for the geographic technicians (Geo Tech) who provide geospatial support to the Battlegroup (BG) Headquarters throughout Helmand Province.

Junior technicians from both 13 and 14 Geographic Squadron are located at the forefront of operations at BG(N) in Sangin, BG(NW) in Mūsá Qal Ah, BG(C) in Gereshk and BG(CS) in Shawqat.

## Challenges

Geographic technicians from 42 Engineer Regiment (Geographic) continue to be spread widely throughout Afghanistan; many of the technicians are being deployed to singleton positions and are regularly working in challenging environments reporting directly to senior officers and Battlegroup commanders. The deployment of relatively inexperienced technicians, particularly in Helmand Province, suggests that the current level of manning is capable of sustaining the level of geospatial support but not necessarily advancing it. The actual amount of 'detailed' analysis being conducted, particularly at the BG locations, is kept to a minimum by the demanding requirement for basic products, usually image based products with a minimal amount of valuable additional features.

The additional support required to compensate for the lack of experience relies heavily on the in-theatre training procedures and the ability of the analysts at the singleton locations to liaise with more senior and experienced personnel at Camp Bastion, and Lashkar Gah. A certain amount of responsibility is placed on Regimental Operations in ensuring that the right person is chosen for the right job but that is often taken out of their control as manpower at the right rank and trade class is often unavailable for deployment.

In addition to the issues regarding manpower, the harsh environmental conditions in Afghanistan are somewhat unsympathetic to the fragile and often temperamental equipment being used by the geospatial analysts and question its durability.

Although much of the equipment is now housed in air-conditioned offices it is still subjected to excessive levels of dust in the air. Where hardened containers such as the Tactical Information Systems (TACISYS) are being used to house the equipment the systems are often still subjected to extreme temperatures and excessive amounts of dust despite the use of Air Conditioning Units (ACUs). Despite the best efforts of the Field Support Section (FSS), maintaining the equipment is often demanding, the majority of the equipment has been deployed over an excessive period of time, from 2007 to 2009, and has resulted in a variety of systems with differing specifications and with performance varying from system to system.



*The effect of dust and sand on the equipment.*



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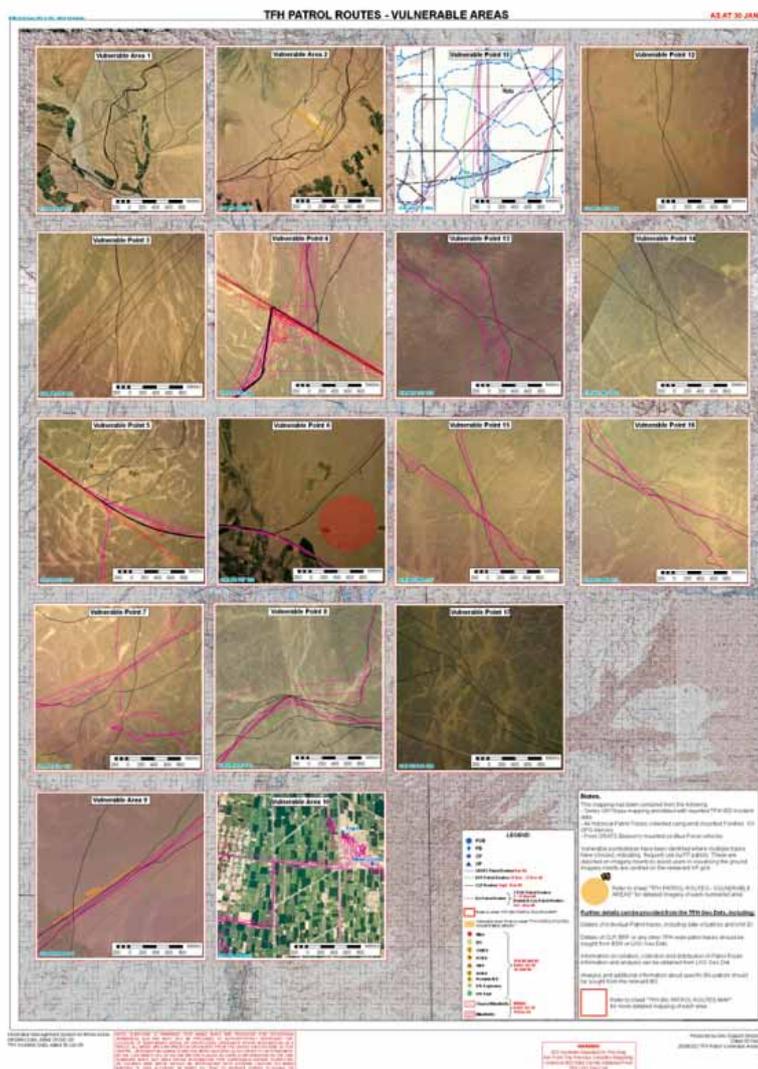
All images are subject to copyright.

## Successes

A recent area of success, particularly within Helmand Province, has been in the field of database management. The importance of accurate, current and consistent geospatial data is paramount in the provision of GEOINT to the Task Force. Recent practices have ensured that the data created, analysed and then disseminated is both standardised and DIGEST<sup>2</sup> compliant. Failure to effectively manage geospatial data in theatre has the potential to not only affect operations but also damage the highly regarded reputation of Geo support throughout Afghanistan.

Success in the Theatre Capability Review (TCR) will see the deployment of a data manager in early 2010 who will enable the population and maintenance of a geospatial database server (DATAMAN) for connection to the in-theatre Command and Control (C<sup>2</sup>) system. The DATAMAN capability will be connected to the OVERTASK network in order to provide Geospatial Services, data and products directly to users. OVERTASK is the UK extension to the NATO Mission Secret WAN in Afghanistan. DATAMAN provides 42 Engineer Regiment (Geographic) with the ability to store, manage and disseminate data and products. Where it differs from previous practices is by offering a complete dissemination service using open standards which before now has only been available to the Geographic Technician via a 'GeoNet' Local Area Network (LAN). Once connected to OVERTASK, these services will be available to the wider user community for use either through a browser or through other applications on the network. To the layman, DATAMAN on OVERTASK will give a similar capability to the web services that utilise mapping and imagery that are available on scores of internet sites such as Google Earth and MultiMap to name but a few.

The ability to collect, collate and analyse electronic patrol data was provided by the deployment of Garmin Foretrex 101 GPS units (DATALOGGERS) to Op HERRICK in May 2009. Combined with the latest mines information and Improvised Explosive Device (IED) data the DATALOGGERS enable the geographic technician to inform commanders and formations of any patterns and trends in their patrolling and allow vulnerable routes and areas to be identified.



<sup>2</sup> The Digital Geographic Information Exchange Standard (DIGEST).

Operational support provided by the Defence Geographic Centre (DGC) in the form of ‘reachback’ remains critical to the success of operations in Afghanistan.

The rapid turnaround of products by DGC, of particular note recently has been the production of the compound mapping series, has relieved the extensive reproduction burden of in theatre geospatial assets associated particularly with this product. The compound mapping series is vital to the commander and is used extensively to plan, monitor and execute operations.

Ultimately, the main success on Op HERRICK sits with the quality of the geographic technicians from throughout the ‘Geo’ community who continually ensure that the level of support remains uninterrupted and constant whilst battling against, more often than not, unwanted external pressures. The ‘Geo team’ in Afghanistan continue to uphold the high standards expected of them, repeatedly meeting tight deadlines, often working extended hours to ultimately provide support to the high tempo of operations.

## Summary

Many of the difficulties being faced by the geospatial analysts on a day-to-day basis in theatre are far beyond the control of the in-theatre Geo team. Admittedly, support is spread thin throughout Afghanistan and particularly in Helmand Province, however, endeavours by Lt Col Page and WO2 Andrew at Permanent Joint Headquarters (PJHQ) to increase the presence of geographic technicians on Op HERRICK may go some way to not only sustain the current level of geospatial support but may also to assist in advancing it.

The challenging environment will continue to take its toll on the equipment and personnel and with the frustrations of in-theatre restrictions on manning and movement, geospatial support throughout Afghanistan will continue to be tested. The success of the data management in Helmand Province must be replicated throughout theatre and embraced by HQ ISAF so that the data is standardised throughout Afghanistan and not just in specific areas. The roll-out of GEOSYS in 2010 will provide the necessary refresh of the in-service equipment currently deployed on Op HERRICK. The modular, scalable, transportable and easily dismountable system will allow for a more flexible approach to operational deployments. Small achievements and a sense of reward can be claimed by the Geo team by continuing to perform to the highest of standards and by providing essential geospatial support to the war fighter despite the unwanted pressures.

So is the geospatial support on Op HERRICK ‘*paddling frantically*’? The geographic technicians deployed on Op HERRICK continue to ‘produce the goods’ and the reputation they have gained is a testament to the quality of the individuals deployed and the effort they make in ensuring the necessary support is given. However, as with anything, the support could be better. With more manpower and more equipment the aspiration to advance the level of geospatial support on Op HERRICK rather than merely sustain it, could become a reality.

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## The Tellurometer

The Tellurometer was invented just over 50 years ago and had an impact upon the surveying world equal to the arrival of GPS decades later. Both the Royal Navy Hydrographic Service and Military Survey quickly adopted the instrument that revolutionised field surveying. Our photograph shows the DSA President when a captain explaining the tellurometer to a visitor at a 42 Regiment Open Day at Barton Stacey in the Sixties.

Now two books have been published in South Africa, one telling the story of the development of the tellurometer and the other a biography of Trevor Wadley its inventor. Both have been reviewed by John Knight, Principal of the Royal School of Military Survey, who concludes that they will make an interesting addition to Ranger readers’ bookshelves.



# Maps & Surveys 2009

## The Defence Surveyors' Association Seminar

20 June 2009

By Michael Gowlett

Another year has gone by and members attended another excellent DSA seminar. We ranged from Elephant Island to the hi-tech world of the Unmanned Aerial Vehicles, via other interesting things and places. The day was introduced by the Chairman of DSA, Brigadier Peter Walker, at Denison Barracks.

John Elder warmed us up with *In The Footsteps of Shackleton*, a talk with pictures on two Antarctic expeditions; one in which he participated in 1970/71 and the other the epic of endurance and survival that was Shackleton's odyssey in 1914/17. The connection was Elephant Island, where the later expedition was based and where Shackleton's party headed when their ship Discovery sank in the sea ice.

The survey aim of John's expedition was to provide ground control for aerial photography so that the mapping of DOS 610 sheet covering British Antarctic Territory could be completed. The methods included tellurometry for distance measurement, and trig heighting and altimetry for height control. Some difficulties were to be expected in those latitudes; the cold, the Southern Ocean wind so familiar in TV pictures of round the world sailors. Chinstrap penguins were familiar visitors to the survey stations and, far from their cuddly image, they were *'smelly and vicious'*, providing a less predictable hazard.

John went on to describe Shackleton's 1914/17 expedition which failed in its objective of crossing the Antarctic continent but left a memorable legacy of leadership and endurance. One can only imagine the feelings of the party as they watched their ship being crushed and finally sinking in the Antarctic ice, with no means of communication to the world. They trekked across the ice, dragging boats, to Elephant Island, from where Shackleton and a few companions made the epic voyage to South Georgia. In the end the entire party was rescued with not a man lost. John finally compared the qualities of the great Arctic explorers: *'for scientific results, Scott* (when the bodies of he and his companions were recovered a great weight of scientific samples was found which must have slowed their progress); *for swift efficient travel in polar regions, Amundsen; for getting you out of trouble, pray for Shackleton'*.

I would add a fourth category to this: for polar travel in comfort and luxury, P&O cruise liners! Pauline and I had returned that very week from a cruise which included visits to Tromso and Spitzbergen – both places well known to Amundsen. We enjoyed the dramatic polar landscape without danger or discomfort. I almost felt guilty – but not quite!

Cold and wind were not hazards faced by the model-makers described in Dr. Alastair Pearson's talk on *Models in Camera – Allied Model-Making in World War 2*, but there were other difficulties. Initially military commanders were reluctant to entrust secrets to 'unreliable, individualistic artists'. A group including 'sculptors, architects, artists, watchmakers, art students, engravers' was assembled in 1940. Models of Bruneval and Dieppe showed the potential, and the capacity was increased, eventually incorporating a group from the American Engineer Model Making Detachment. This in itself caused friction; the Americans perceived a lack of recognition and complained about the quality of food, the British resented the regular promotion of American servicemen within the section! However the abundant levels of skills and creativity overcame these difficulties, and a significant contribution to strategic planning, air bombing targets, assault landing and target interpretation issued from the model-makers. Alastair traced the history of model-making and showed many examples of models for military purposes.

The impact of model-making has been brought sharply to life in the recent book 'Dambusters' by Max Arthur. This brilliant account, which reads like a thriller, consists of a collection of interviews and conversations with all concerned with the raid, including Germans. The models of the dams, produced to the crews when they were briefed the day before the raid, made a deep impression on the men, and were invaluable for planning the sort of low level, high precision attack required.

There followed two excellent presentations which have been included as separate articles in this issue of Ranger. Dr. John Cruickshank, a practising medical consultant, displayed an astonishing

knowledge of maps and mapping and the political undercurrents behind the Iron Curtain in *Mapping for a Multilingual Alliance – The Case of East Germany*. Nick Rigby and Andy Fagg described the intricate and doubtless frustrating negotiations with the previously warring factions to finally determine *The Inter-Entity Boundary Line in the Balkans 1995-96*.

I don't know if table top models would have been much use for the trench tunnellers in the Great War! Phillip Robinson interesting talk, *Survey of Tunnelling*, took us underground to the dangerous and claustrophobic world of the military miner. The scale of operation was astonishing. At the mining peak in 1916-17, there were between '30,000 and 40,000 men involved in the British Expeditionary Force, and about 125,000 and 150,000 in all belligerents'. The senior British Controller of Mines estimated that 'BEF miners drove 125 miles of tunnels in the war'. In a series of slides titled 'From the Part to the Hole!' Phillip showed examples of the initial surface surveys. Moving underground, the problem was that the only known co-ordinates of a tunnel were at its entrance or 'collar' and it was a problem to measure azimuth and drop at intervals along the tunnel. The geophone in conjunction with the bar compass helped to locate enemy activity. Phillip ended with a diagram of a 'camouflet' mine, dug underneath the enemy's tunnelling and filled with explosive, and detonated 'at the right time'. Determining ones own position underground, and the enemy's, was vital for survival, and to me it looked a pretty grim job.

The final two presentations brought us back above ground level and were perhaps the most significant of the day. DSA prizewinner WO2 Lee Dandy presented *Current Operations/Techniques - Royal Artillery Unmanned Aerial Vehicles* and Squadron Leader Dex Halpin told the RAF story with *Current Operations/Techniques – Royal Air Force Unmanned Aerial Vehicles*. For obvious reasons I can't go into detail about the presentations, but the advanced technology and deployment of strange weapons called UAV's, MUAV's fascinated us all!

Obviously the main theme of the seminar lay in the title, *Maps & Surveys*. But what sub-themes emerged? Leadership was clearly one. John Elder's expedition was clearly no picnic and it would have required leadership, and he was able to reflect on the great qualities that enabled Shackleton to enable his team to survive appalling hardships – clear goals (but changed as needs must), selection of the right people, courage and stamina, ability to inspire and encourage the team. The model-makers were a disparate, creative international group of many personality types, some not suited to team working. As Alastair Pearson pointed out, strong but appropriate leadership was needed. The Balkan boundaries must have severely tested the negotiation skills and leadership of Nick Rigby and his group. Leadership was evident in the presentations of the Royal Artillery and Royal Air Force officers. Another theme of the day was the variety of purposes to which surveying techniques could be applied; in Great War mining, in model-making (I was interested that aerial photography was rescaled and stretched to cover relief models), as well as the more familiar purposes at Elephant Island (though in hostile terrain) and in boundary determination (with hostile participants)!

This was another interesting and successful seminar, and I'm sure members will look forward to the next.



*The presenters' Nick Rigby, Andy Fagg, Sqn Ldr Dex Halpin, Dr John Cruickshank, Phillip Robinson, Chairman Peter Walker, Dr Alastair Pearson, WO2 Lee Dandy.*

# Flash Spotting on The Western Front

## An Extract From G.C. Andrews' Memoirs

We left Harfleur camp at 9 p.m. on the last Sunday in July, 1916, and proceeded to 4th Army headquarters at Querrieu, near Amiens. The H.Q. was in the chateau and we were accommodated in huts in the grounds. Next morning, we paraded under a Lance Corporal of the East Lancs., who, under the supervision of a Royal Artillery officer was to instruct us in our duties as observers and flash spotters. The course was to last a week. It was chiefly confined to the reading of the instruments we were to use. Speed was an essential factor.

Observation Groups had their own headquarters up the line. A group was commanded by a Captain, with one or two junior officers. The personnel of the H.Q. comprised: -

- Telephonists.
- Draughtsmen or plotters.
- Linesmen (from R.E. Signals).
- N.C.O. in charge of plotting room (Sergeant or Corporal).
- Sergeant doing Q.M. duties and clerical work.
- Horse transport A.S.C.
- A motorcycle and side-car for the use of officers. This was later replaced by a two-seater car with driver.

The equipment at Group headquarters would include: -

- Flash and buzzer board.
- Telephone switchboard with lines to outside units such as - Corps Counter Battery H.Q.; "Maps"; Neighbouring Observation Groups.
- Watches.
- Plotting charts.
- D III telephones for the linesmen.

There would be three or more Observation Posts to a Group and these would each be staffed by: -

- Six or eight Observer/Telephonists (They were trained in both duties).
- A cook.
- N.C.O. in charge, a Sergeant or Corporal.

The N.C.O. in charge had a responsible job, as with his nearest officer sometimes two or three miles away, and telephone communications often cut, he would have to make a quick decision in case of emergency.

The equipment of each Observation Post included: -

- Observation of Fire instrument or a Mark 5 Director.
- Two D3 telephones.
- Binoculars.
- Watch.
- 1/100th second stop watch. Flash key and batteries.
- Resistance board controlling lighting in instrument telescope.

The posts were linked to a Group H.Q. by telephone lines, and keeping these lines intact during heavy shelling was one of the problems.

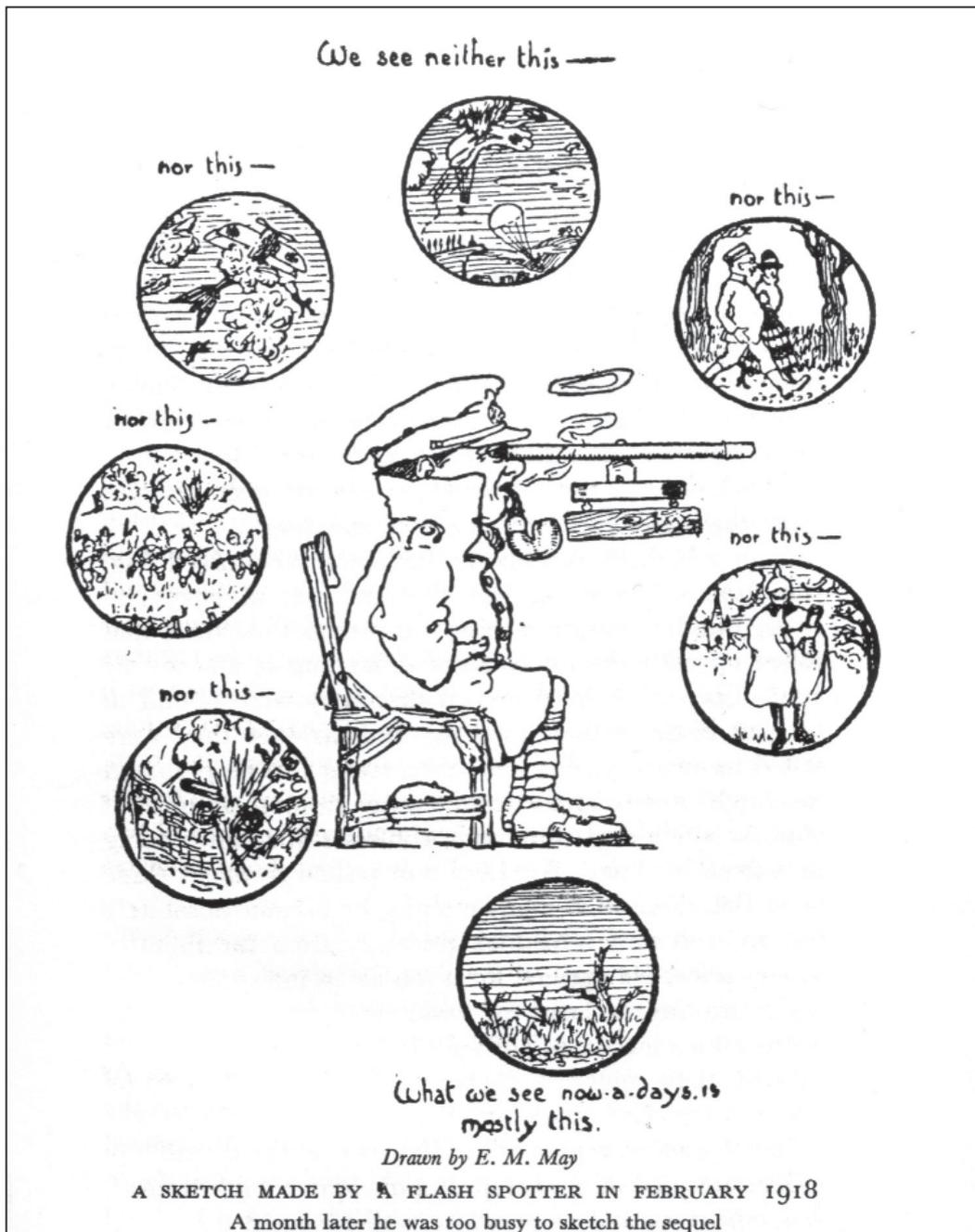
Our principal job was to locate the positions of enemy guns from their flashes, but also general observation work such as movement of troops, road and rail transport etc. We also observed shoots by our gunners, giving them the necessary corrections.

The observation instrument used on the post was a sort of theodolite. It was set up with North (grid north on the map) as zero. The revolving plate of the instrument, which carried the telescope, was graduated in degrees 0 to 360 and there was a slow-motion drum to indicate minutes. The telescope could be used with eye-pieces of two different magnifications, giving field of view of 2 degrees or 4 degrees. Inside the telescope was a circular frame with strands of spider's web fastened across it. The thick vertical strand in the centre of the lens corresponded to the bearing in degrees and minutes

at which the instrument was set. There were other vertical strands of different thicknesses to denote bearings of 5 minute up to 60 minutes right or left of the centre. To obtain the exact bearing of anything seen at a position left of the centre, an appropriate number of minutes would be deducted from the instrument reading. For anything to the right, an addition would be made. There was also a horizontal line through the centre of the lens. If the low power lens was in use, there would be a blank space of one degree left and right of the gratitudes.

The reason for using a spider's web was for night work. A small electric bulb was screwed into the telescope, and was lighted by a three-volt battery. This light shone on the webs which then appeared like golden threads. Included in our equipment was a resistance board. This was wired in the light circuit and the brilliance of the light could be controlled. On a dark night, a gun flash could be very brilliant. A bright light in the telescope would subdue it and so a more accurate reading could be made. On the other hand, on a bright moonlit night, a flash from a small gun would be very faint and a bright light in the telescope would make it invisible.

Looking back, the procedure for the location of the enemy guns was rather crude. It was not until the Flash and Buzzer board was installed that we became really efficient. This instrument was something like a telephone switchboard. It was connected by telephone line to each of the



observation posts. When an observer saw a flash he would press his flash key and a bulb would light on the Flash & Buzzer board indicating the post that was on to a gun. At the same time a buzzer would sound. The plotter having been given an approximate bearing would tell the other posts the direction in which the battery was thought to be. They would hear the buzz when the leading post observed subsequent flashes and would get on to a flash which was seen at that moment. The F & B board could be operated so as to isolate one or more posts either in the speaking circuit or the buzzing circuit. The bulbs would still light up if a post pressed its flash key. So, if all the bulbs lit at the same time when the posts had been isolated, it was almost certain they were observing the same gun. The operator in the plotting room would normally isolate the posts when asking them for particulars as to the calibre, gun or howitzer, and area shelled. Group H.Q. was something more than an administrative headquarters. It was the “nerve centre” of the Group. All information from the posts was recorded here.

An essential part of the equipment was the plotting board. This was equivalent to a large scale map, ruled in squares to correspond with the squares on the map for the area covered. The position of each O.P. was shown. An arc was drawn at a certain radius from each of the posts. The arcs were graduated in degrees and minutes. A small hole was drilled at each post position and a length of cat-gut was passed through and weighted on the under side. A heavier lead weight was attached to the gut on the face of the chart. By this means the gut could be pulled up through the hole and stretched across the appropriate arc when the flash bearing was received from a post. When bearings had been received from two or more posts, the point of intersection was the gun position. All known gun positions were marked on the chart and they were given their individual code numbers. New positions were added as they were located.

Another important item of equipment was a set of pigeon holes containing numerous rolls of tracings, used when observing shoots by our gunners. The appropriate tracings (one for each post and one for the battery) were pinned down on the plotting board so as to intersect at the target. From the lines shown on the tracings, the position of the burst could be read as so many minutes L or R and so many yards over or short.

*A fascinating account of Flash Spotters on the Western Front is contained in “Flash Spotters and Sound Rangers” by John R Innes – available from Mike Nolan on 01635 253 167*

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## Ben's Chilli Jelly

Foremost amongst memories of Ben Burrows, who's obituary appears on page 70, must be the picture of him drinking beer in the Officers' Mess from his personal one-litre jug. Ben's time in the Far East left him with a love of curry and eastern food. So, for those not lucky enough to have sampled Ben's chilli jelly, here is his recipe. If the quantities involved seem large, Google chilli jelly and other alternatives will be found.

In a large preserving pan:

1. Place 10 lbs of peeled and chopped apples including pips (for pectin).
2. Add 10 pints of water and boil gently to produce a pulp. This could take about 3 hours. Use a potato masher or electric mincer.
3. Decant the pulp into large muslin bags and allow to drain over night.
4. Measure the drained juice and pour back into the (cleaned) preserving pan. You could expect about 7 pints. Raise the heat.
5. Weigh 1 lb of sugar for each pint of juice, in this case 7 lbs. Warm the sugar in the oven to help it to dissolve.
6. Stir the sugar slowly into the juice until completely dissolved.
7. Weigh about  $\frac{3}{4}$  lb of Jalapino chillies, put on a pair of rubber gloves, chop and de-seed the chillies.
8. Boil the juice and skim off all the foam, then add the chopped chillies, carry on boiling and skim off the foam - but not the chillies. Then add the juice of 4 limes and 4 tablespoons of commercial ginger syrup. Carry on boiling, this could take up to 4 hours.
9. Test and finish in the usual way. Decant into pre-heated jars. You could expect about 4 large and 6 small jars.

# Historic Documents on The DSA Website

*By Mike Nolan*

For some time the Defence Surveyors' Association website has included a section on historical documents. Readers of *Ranger* with an interest also in military surveying and cartography may like to know about some new accessions to the website at [www.defencesurveyors.org.uk](http://www.defencesurveyors.org.uk).

## **Notes on Maps of Various Theatres in World War Two**

In preparation for the invasion of Sicily, which took place in July 1943, the Geographical Section, General Staff, War Office, London produced a hard-bound, foolscap format illustrated guide to the mapping situation in the Central Mediterranean theatre of operations entitled "*Notes on the G.S.G.S. Maps of Italy, Sicily, Sardinia and Corsica, 1 May 1943*".

As the war progressed the G.S.G.S. produced further guides for subsequent theatres of operations, "*Notes on the G.S.G.S. Maps of France, December 1943*", "*Notes on the G.S.G.S. Maps of Germany, Denmark and Central Europe, March 1944*" and "*Notes on Maps of The Balkans, July 1944*". No such guides were available for the Western Desert, North-West Africa or Burma Theatres of operations.

These guides followed a standard format. Part 1 consisted of a decryption of all the operational GSGS series of the theatre at 1:1,000,000 scale and larger including map samples and map series indexes. Part 2 generally contained notes on the mapping of the various countries, notes on road classifications, availability of air photo cover, notes on grids and grid junctions, notes on map distribution and the state of reproduction material distribution. Appendices include glossaries of the topographical terms used in various countries and gazetteers of geographical names appearing on medium scale series. Also often included are conventional signs cards and inserted large-format map series indexes.

These wartime guides are an invaluable description of, and finding aid for, the general mapping situation and map series in use in various theatres in World War 2. Armed with the information they contain the historian or researcher can, if required, seek appropriate series and sheets in the various archives and map libraries in which these maps may now be found such as The National Archives, The British Library, The Imperial War Museum, The Royal Geographical Society and University Libraries.

To this end, the Defence Surveyors' Association has included scanned versions of all four guides on the website to assist researchers who may not otherwise have access to these publications which, though becoming rare, may also be found in some libraries and archives. Due to their size, when scanned, the books have been divided into their major component parts on the website.

## **Survey on The Western Front**

The classic "*Report on Survey on the Western Front 1914-1918*", H.M.S.O., Oct 1920 compiled by Colonel EM Jack, Head of "*Maps GHQ, during the First World War*" has been on the website for some time as has Lt Col MN McLeod's "*History of the Fourth Field Survey Battalion R.E.*", which was submitted to Jack when he was compiling the official report. This document is a "Word" transcript of over 130 pages. To these key documents has now been added Lt Col Winterbotham's "*Survey on the Western Front Provisional*", which was also submitted to Jack at GHQ in December 1918. Winterbotham's report is a scanned document of over 50 pages.

The development of flash spotting and sound ranging in the Field Survey Companies/Battalions RE was crucial to the success of the un-registered artillery bombardments and counter-bombardments in the successful offensives on the Western Front and other theatres in the last year or so of the First World War. Many are familiar with the general principles of sound ranging but few realize the complexity of the sound-ranging instrument which could produce a record of hostile gun reports on 35mm film within a minute or so of the report. For anyone interested in the subject, the scanned version of the foolscap format handbook published by HMSO in 1921, "*Handbook of the Sound-Ranging Instrument*" should now provide all the answers.

## **Histories of the School of Military Survey**

Finally, two histories of the School of Military Survey, now located at Denison Barracks, Hermitage, near Newbury, have been added to the website.

# The Brunei Emergency 1962: Rapid Survey Response

By Mike Nolan

*"The Brunei emergency came as a surprise to 84 Svy Sqn RE".* So opens Annex F to 8437/2, the account of the Brunei Emergency in the 84 Survey Squadron Historical Summary for 1962. It probably also came as a surprise to most units in Singapore at the time! The squadron had left for the ranges at Bukit Timah at 0700hrs on Saturday the 8th of December 1962 to carry out its annual range classification. The OC returned to the unit at 0845 on a routine matter to be informed by OC 556 Field Survey Depot that men were required to help with emergency map supply, as there had been an armed revolt in Brunei in the early hours. The unit was immediately recalled from the ranges to assist the Depot and to prepare for emergency map production.

By 0830 556 Field Survey Depot had been reinforced by field surveyors who were not otherwise involved in the emergency and by 0945 the squadron was ready for production. From then till the 15th of December the unit was engaged in rapid map production working most hours of the day although it was only on the 12th of December was a shift system initiated. By New Years Eve 87,000 copies of some 70 map sheets were produced involving nearly 111,000 impressions. Direction of the tasks was mainly verbal by telephone from Survey Branch FARELF, with some liaison visits also, there being no time for written instructions.

The Air Survey Section of Carto Troop was initially employed on 1:10,000 scale uncontrolled photo-mosaics using rubber solution as an adhesive on white astrafoil. The Series T735 Sipitang sheet, 5/115/5, already well advanced by multiplex was completed and an uncontrolled sketch map of Bintulu was produced from oblique photography by the use of perspective grid and proportional compasses.

All aircraft of 81 (PR) Squadron RAF were involved in photo reconnaissance so the Air Survey Liaison Section was employed with the Air Survey Section.

The Topo Drawing Section gridded photo-mosaics in the normal way, with white ink being used directly on the photos. The section also completed three T735 sheets which were already well-advanced and produced red road and boundary overprints for the ¼-inch series. Topographical overprints were prepared for the 1:150,000 series.

The Litho Troop worked with a variety of reproduction materials ranging from multi-coloured copies, monochrome paper pulls, partially completed fair drawings, dyeline prints, compilations, transparencies and photo mosaics of varying quality. Almost all sheets involved a reduction either to complete coverage at a given scale or to reduce to within printing size of the machines. Reproduction from black pulls, transparencies and dyelines presented no problems other than some necessary retouching. Colour copies of T735 sheets included a blue-screened grid that was difficult to photograph but with sufficient trace of the grid to allow the lines to be cut in on the negative. For large sea areas only thick grid lines were cut in and the intermediates were duffed out. Some grid values also were cut in.

Lettering for the photomaps was either in black or white, positive stripping film being produced by photonymograph. Black names were applied to the mosaic prior to photography. Others were applied to the half tone negative. Because of the need for speed, hand lettering was used on sheets needing little other work. For sheets requiring other work such as grid construction, there was time to produce everything by photonymograph. Where paper pulls did not include a grid, data was computed and ticks drawn outside the border line on the copy prior to photography, the grid lines then being cut in on the negative.

In addition to standard materials the unit fortunately held stocks of both negative and positive Ozasol presensitised plates and chemicals. Experience in using these showed that they were always dependable, none having to be re-made, plates could be printed down in half the time needed for conventional plates and the image quality was superior to normal plates, fine detail being recorded which would have been lost even on a fine-grained conventional plate. Paper expenditure was not great since runs were small, varying from 200 to 2000, but other expendable stores were consumed at greater-than-normal rates, especially glass plates.

One problem experienced was in spare parts. Ordnance policy in FARELF was not to hold spare parts where only a few were normally required, such as spares for the one Survey unit, supply from UK by air being the norm for such items. Even had this been possible in 3-4 days, had they been required, this would have been a crucial delay in the immediate period of the operation from 8-15 December and the unit could not have met its role. However, fortunately there were no break-downs.

The emergency led to recommendations on the minimal amount of marginal information required on emergency products, this being; Series Title and Scale, Sheet Title, Identification Panels, Grid Note, North Point, Scale Bar, Publication Note and Print Note. Additionally it was recommended that an Emergency Edition note would be useful to both users and the producers.

As is often the case in these situations, print runs were problematic. It was concluded that printing in excess of immediate requirements, to obviate the need for later re-prints, was probably better, as a general policy, than printing short print runs to meet the immediate requirement. A minimum run of 1000 was recommended. Another problem was that of rapidly changing sheet priorities once sheets were in work.

It was concluded that while priority changes must be accepted, the overall effort was delayed and confusion could result. The use of pre-sensitised plates for rapid map printing was commended.

The squadron was shown to be well able to meet all calls placed upon it during the emergency, largely due to the training and experience gained in the previous two years in rapid map production. Unfortunately the copy of Annex F, the document from which these brief notes have been summarised, does not include its Appendix B which detailed the work carried out, nor Appendix C showing work in hand at 31 December 1962.

### Research Note

This short article has been drafted to draw attention to the fact that some material hitherto generally unavailable in what was the Map Research and Library Group MCE RE is now in TNA (The National Archives) at Kew. This includes the AD Survey FARELF Quarterly Reports for the period from January 1959 to December 1967 at pieces WO 402/228 & 229 and the 84 Survey Squadron annual Historical Summaries for the period from 1958 to 1964 at pieces WO 305/805, 806 and 1987. The fate of all the technical reports written by Troop officers on field survey and other tasks in Malaya and Borneo is not known. However, it is evident that there is now abundant material in the public domain from which a history of 84 Survey Squadron could be compiled while so many of those who served in the squadron are still around. Much has already been achieved on the REA Military Survey (Geo) Branch web site in recording anecdotal history and in collecting suitable photos and this effort has been very commendable. Could not more now be done using appropriate official source material as well as personal accounts?



*The entrance to 84 Survey Squadron at Dover Road in Singapore.*

# Book Review - The Tellurometer From Dr Wadley to the MRA7

*Compiled by JR Smith, B Sturman and AF Wright*

Published by Tellumat (Pty) Ltd, South Africa.

Hardback: 243 pages with 203 black and white photographs and diagrams.

ISBN 978-0-620-42303-8

Available from B Sturman, Tellumat (Pty) Ltd, PO Box 30451 Tokai 7966, South Africa or by e-mailing [BSturman@tellumat.com](mailto:BSturman@tellumat.com).

The compilers in their preface set out quite clearly that this book is not to be seen as a textbook but simply as a collection of material that is representational of the story of the Tellurometer. Although not intended as a textbook, there is comprehensive technical material in reviewing the various models from 1955 to 2005, together with appendices on the velocity of light and radio waves, units of measurement, refractive index and ground swing. But the compilers' aim has been achieved through a remarkable collection of material that includes papers on Dr Wadley the person, the development of the Tellurometer, its use across the globe and the reminiscences of those who involved with the equipment.

The book starts with a brief resume of Trevor Wadley and quickly brings out his brilliance as both a student and electronics engineer. The two chapters on Wadley – the Person and Wadley - the Man offers a fascinating insight into Wadley. The chapter on Wadley the Person is based on a paper by Raymond Vice and presents an image of Wadley as someone who constantly challenged everything not just in pursuit of ingenious solutions but in his dealings with bureaucracy in the form of the Post Office and planning authorities. Indeed he would take on a challenge as a bet and spend a great deal of time in argument and litigation.

The book then moves to more technical matters by reviewing RADAR and the Special Signals Service, the Ionosphere Recorder, Communications Underground, RACAL and various navigation systems. Then follows an overview of Wadley's involvement in the development of the Tellurometer through another paper that was presented to a conference in South Africa in 1997.

The Chapter on the development of the Tellurometer brings home the fundamental changes that this instrument brought about, whether working in vast areas of muskeg, desert or tropical rain forest. It is easy to see how 'those who laboured in measuring the Isiola base [*in Kenya, approximately 21Km*] in catenary were shattered to see a similar value obtained so much more quickly'. Just how much more quickly is demonstrated by the many examples given from across the globe. This is brought home in an example from Canada where 'a reconnaissance and triangulation of six points took one entire summer, whereas by tellurometer it took just two weeks'.

As with many technologies, novel and imaginative uses were developed for the tellurometer including the Hydrodist and Aerodist. This reviewer was certainly surprised to find that the Tellurometer in the form of the MRA 7 has found a niche market today in the mining industry for deep mine hoist monitoring.

The chapter on reminiscences brings the book to life. Arthur Allan points out that the introduction of the tellurometer did not just change the practical aspects of surveying but gave impetus to revamp the whole process of least squares estimation to put it on a more rigorous footing that could be exploited in the age of digital computing.

As Principal of the Royal School of Military Survey, I was impressed by Mike Cooper's note that when he was on the Army Survey Course in 1958, he used the original Tellurometer MRA 1 thereby exploiting new technology within a year of its introduction. Today we take voice communication for granted but Cooper reminisces on the luxury of voice communications at a time when all other forms of communication and essential services were lacking in Africa. Without Tellurometers he asserts that it would have been impossible for the department to have achieved what it did. Alistair MacDonald echoes this in his comment 'we could achieve levels of productivity previously unheard of.'

Several contributors describe the exploitation of the Tellurometer as fun. Norman Leppard concludes with 'it was tremendous fun doing it for the first time' and Alistair MacDonald thought it 'made it [the work of the field surveyor] more exciting and challenging'. The reviewer's own experience with the Hydrodist, was his first survey job on graduating from university, where he spent weeks in the hold of a smelly, oily former minesweeper driving the two Hydrodist antenna through joy sticks whilst trying to read tumbling neon numbers for transmission to the bridge. All this in the notorious Pentland Firth and normally following late nights on Highland Park! I am not sure that was quite the fun that Leppard and MacDonald talk about.

Of particular interest to readers of *The Ranger* will be the reminiscences of Ernie Wickens on using the MRA 2 and MRA 3 Tellurometers as a young volunteer in the early 1960's in 337 Topo Squadron, 135 Survey Engineer Regiment. I am sure many a surveyor can relate to two amusing incidents he describes.

One minor complaint is the mixing together of references and bibliography, and the 'selective' index. The book is a fascinating read for all those surveyors who worked with Tellurometers over the past 50 years. For the reviewer it brought back many memories and reflects the way in which field surveying has changed dramatically over those years. Throughout the book are excellent photographs, diagrams and cartoons together with many framed quotations that are used with great effect to make a point.

*John Knight*

## Book Review - Trevor Lloyd Wadley, Genius of the Tellurometer

*By Mary Wadley von Hirschberg*

Published by Mary Wadley von Hirschberg

Paperback: 112 pages with 33 black and white photographs.

ISBN 978-0-620-43829-2.

Available from Mary von Hirschberg, PO Box 1919, H100, Swaziland or by e-mailing [maryvh@iafrica.com](mailto:maryvh@iafrica.com).

Mary von Hirschberg tells the story of TL Wadley from a very personal perspective as one of his younger sisters in a family of ten. A gifted individual herself, Mary shows great pride in the achievements of her brother in this short biography. She sets the scene by recounting the family background and the environment in which Wadley grew up. Through her description of Wadley's parents it is easy to see where he acquired his own personality. His mother is described as formidable and his father as doing the work of four men, even in retirement. The author does not shy away from some very personal feelings such as her mother's aggressive attitude to Wadley, often accompanied with very hurtful words. The author goes on to describe how her mother had a profound effect on Wadley's life that included a lack of self-esteem that left him vulnerable both physically and psychologically in later life.

Referred to as a genius in the title, Wadley did however struggle at school and only just managed to pass his matriculation exams but it is clear that he thrived on those subjects he found exciting and where his imagination could be used. Later, when at University, he was considered to be 'one of the most brilliant students of the day'. He rarely took notes during lectures because, as his Professor observed, he had no need for them for he had a remarkable mind and could recall every item of every lecture.

Although by choice a lone worker, it is evident that Wadley was prepared to share and test his ideas with colleagues. When he did engage with people he absolutely loved to talk endlessly and provocatively but he also came across as kind and caring.

Following chapters on the Tellurometer, the Earth Measuring Instrument, and examples of the impact of the Tellurometer around the World, the book concludes by examining how the stresses

of developing and working, combined with extensive periods of travel drained Wadley's energies and impacted on his family life leading to divorce. In recounting his divorce and second marriage, the author returns to a familiar theme of 'liking to have his own way' and 'propensity to buck the system' even when related to his own health. She suggests that his own mother's attitude trained him to become a rebel and how his whole life seemed oriented to 'beating the system'.

Mary Wadley von Hirschberg provides an interesting insight into many aspects of Trevor Wadley's life. Through her discussion of the times in which he lived, his education, military service and time with the Council for Scientific and Industrial Research, the author brings together all those influences on his life that made the Genius of the Tellurometer. Although Wadley may have suffered from a lack of self-esteem, he achieved great things in his career and was much admired by those he worked with. Throughout his career Wadley was totally loyal to the organisations he worked for, and as a salaried man, never made a fortune from the measuring device that revolutionised surveying around the World.

In places some curious unrelated snippets are included, such as a reference to the first meeting of the International Atomic Energy Authority in 1957, but this reviewer found the book to be a fascinating insight into Trevor Wadley that compliments the insight provided in 'The Tellurometer - from Dr Wadley to the MRA7'. The text is accompanied by many photographs of the Wadley family and of Trevor Wadley demonstrating the Tellurometer, together with transcripts of his personal letters.

*John Knight*

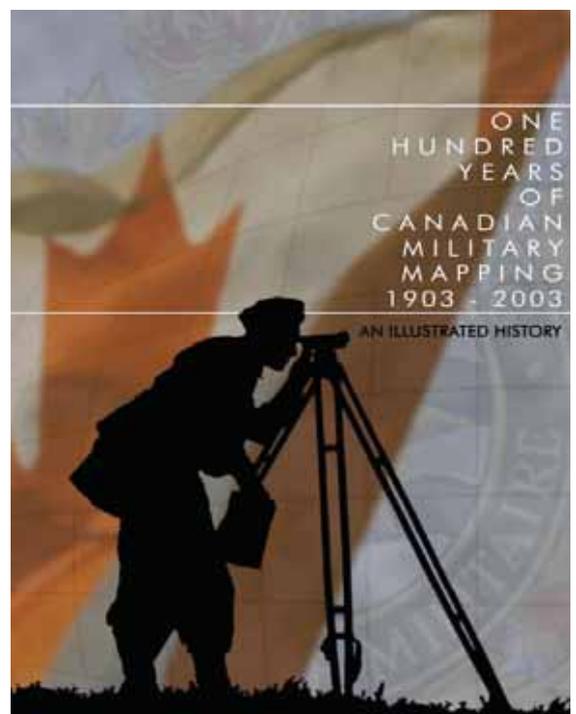
## A New Book - "One Hundred Years of Canadian Military Mapping 1903-2003: An Illustrated History"

Hot off the press in Canada as we put Ranger together is a new book telling the history of military mapping in Canada. The main "Coordinating Author" is John C Sinclair who worked with editor Bruce Hynes to put it together with much input from a great host of writers. The DSA is supporting a similar project here in the UK and so perhaps this book will show us the way forward. A review is planned for the next issue of Ranger.

A synopsis provided by the authors tells us that the book uses photos and personal stories to tell how these military mappers pushed, led, supported and assisted in the accurate mapping of Canada, a land 18 times the size of France. The role of early RE surveyors in forming Canadian Military Survey is covered as well as a complete list of RE Svy exchange personnel since 1950 and the RSMS Canadian students since the programme began. In the First World War Canadian surveyors were involved in the accurate location of artillery targets and in the Second World War used air photography for accurate and rapid mapping. In the Cold War they worked with allies to map the world and today the story tells of modern combat operations supporting military actions in the Balkans and in Afghanistan.

Back in 1903 these intrepid mappers slapped mosquitoes and black flies in the swamps of Petawawa while painstakingly drawing a map on a plane table. Now they sit in front of computers in the dust and danger of Afghanistan combining good maps with timely information about the enemy for use by commanders.

The ISBN number is 978-1-926596-31-0 and it is published by Baico Publishing Inc, 294 Albert Street, Suite 103, Ottawa K1P 6E6 and costs 29.95 Canadian dollars with postage to the UK at 16 Canadian Dollars. The book can be ordered from: Military Mapping Historical Committee, 246 Tompkins Avenue, Orleans, Ontario, Canada K1E 1H2.



# Obituaries



## Major Frank Hamer MC and Bar

On November 3 1942, at the battle of El Alamein, Hamer, then a lieutenant in 4th Durham Survey Regiment RA, personally supervised the survey of forward positions under heavy shell fire so that guns were able to bring down an intense bombardment on hostile batteries. Throughout a series of actions, he remained in close contact with the enemy and provided the information essential for accurate artillery operations. He was awarded his first MC.

After the invasion of Sicily, on July 27 1943, positions west of Agira had to be occupied by artillery after dark. The survey work had to be done in daylight in an exposed position, close to enemy infantry. Hamer, then a captain, and an assistant, succeeded in getting the requisite details whilst under continuous mortar and machine-gun fire.

On August 9, while under a sustained mortar barrage, Hamer and a pair of surveyors carried out observations allowing fire to be trained on enemy strongpoints near Mount Etna. The citation for the Bar to his MC paid tribute to his coolness and courage in the face of enemy fire.

Frank Hamer, the only son of a clerk at a cotton mill, was born at Bolton, Lancashire, on June 25 1919. He showed early promise by winning a place at Bolton School, where he went on to be head boy and excelled at cricket, football and athletics. It was a matter of great pride to him that his record for “throwing the cricket ball” remained unbroken.

While at school, his first encounter with Hitler’s Germany came when his German master asked him to organise a school camp for a group of Hitler Youth. Subsequently, a return visit was arranged at which the youngsters were subjected to a considerable amount of instruction in the marvels of the new Germany. They suspected that they had not been given the full picture when, at one point, they heard the sound of machine-gun fire in the nearby woods.

In 1938 Hamer went up to St Catharine’s College, Cambridge, to read Geography. He gained a Freshman Blue in athletics and, on the outbreak of war, joined the 4th Durham Survey Regiment RA. He arrived at Suez in December 1940 and saw action in Abyssinia and Eritrea.

In August 1942, when orders arrived to prepare for the artillery defence of Cairo and Alexandria, the siting of guns immediately west of Cairo was his responsibility. His athletics training proved useful when he had to run up and down the Cheops pyramid, the largest trig point in the area, three times in one morning.

On D-Day, June 6 1944, Hamer was perched on the top of a Sherman tank in a landing craft, approaching Gold beach, near Arromanches. He was feeling queasy and was talking to the tank commander over the deafening noise of the guns when shells suddenly burst all around them.

The tank commander turned to Hamer, grinned and said “Ta Ta!”, and closed his hatch. Hamer scrambled behind the turret for cover. When they arrived at the beach and the ramp was lowered, he dropped into five feet of water and found himself among drowned men, swamped vehicles and mines that had broken loose.

Ashore and under constant fire, he was taking equipment off the tank when a shell burst a few feet above him and he was hit in the arm by shrapnel. He put up a beacon on the beach as a rallying point before dressing the wound.

Hamer took part in the invasion of Sicily, Operation Market Garden and the Battle of the Ardennes before finishing the war on the Baltic. He was demobilised in June 1946 in the rank of major and returned to complete his studies at Cambridge. After graduating and winning a Blue for soccer, he moved to Birmingham, where he joined Cadbury, the chocolate manufacturers.

In 1966 he became personnel manager and the next year joined the main board as director of personnel. When Cadbury merged with Schweppes in 1969 he became group personnel director.

He took early retirement in 1980 to support his wife, Margaret, who had suffered a severe stroke. They settled at Llandudno, but after his wife’s death he moved to Bournemouth and then Hertford, to be closer to his children. Frank Hamer died on the 2nd of April 2009. He is survived by his son and two daughters.

*First published in the Daily Telegraph on May 26 2009*



### **Thomas Reuben (Ben) Burrows 1924 - 2009**

Ben died suddenly from a brain haemorrhage on the 12th of April this year. He had enjoyed (in the proper meaning of the word) a long and successful career in the Royal Engineers, more specifically, in the Survey Service. He served across the world and in the course of his travels made enduring friendships with people of many nationalities and many walks of life. Although after his retirement he did not travel to any great extent his visitors from his past were many and frequent.

He was born in Lancaster in 1924 and joined the Royal Engineers in 1942 when he was sent on a six-month general engineering course at Queen's University at Belfast prior to officer training at a Royal Engineers OCTU. After receiving his commission he was posted to the 8th Army in Italy where he joined 56 Divisional Engineers whose main tasks were bridge building and mine clearance. Progress was slow but his 21st birthday was marked by a most spectacular artillery barrage in preparation for the crossing of the rivers Reno and Senio north of Ravenna. Events then moved swiftly and the war in Europe was soon over. After a brief spell of home leave Ben was sent to India and then on to Hong Kong where he became Adjutant to CRE Kowloon. Following a Regular Commission Board in India he was posted to HQ Malaya District as SO3 RE (Ops) on the Chief Engineer's staff.

On completion of his overseas tour he was posted to Chatham as a student on a Post-War Supplementary Course which was designed to give post-war regular officers an overview of the wide range of the duties of the Corps. Theory was tested by examinations in project style. While at Chatham he sailed whenever possible with the RE Yacht Club and qualified as a helmsman. Ocean races in Torch or Avalanche were high events. The course made a four-week visit to the School of Military Survey and following this Ben was offered a place on the next course. He greatly enjoyed the Long Survey Course and I wonder how many people remember the Talbot Tourer he bought from Henley Dowson at this time. He had immense pleasure from this, his first car.

Next came an attachment to the Directorate of Colonial Surveys and during a two-year tour in Nyasaland, Northern Rhodesia and Tanganyika he had hands on experience of major control surveys in undeveloped areas. Each surveyor worked to a team programme but on his own with a party of porters for his equipment. Considerable distances had to be moved on foot and the logistic problems were acute. Mail took days to weeks in transit and communication between surveyors was mainly by Morse code using lamps by night and heliographs by day.

He returned from Africa to be a Senior Instructor at the SMS before going to Kuala Lumpur in 1957 to command 84 Field Survey Squadron whose tasks included surveys on the Malay-Thai border and in central Malaya and Johore. On return to England he became the Western Region Officer of the Ordnance Survey and in 1965 after this posting he was selected for the Long Photogrammetry Course at UCL for, as he put it, his mid-life update.

After a short period in the Middle East in 1966 he was then sent back to the Far East on promotion to Lieutenant Colonel as Assistant Director Survey FARELF where the Indonesian confrontation had generated a heavy demand for mapping and geospatial data. In addition he organised the geodetic survey linking the Thai network with that of the Malay Peninsula.

Ben returned to the UK to take command of 42 Survey Engineer Regiment at Barton Stacey. The tasks were all in the new fields of survey; including gravity surveys in support of the Polaris programme, and setting up and manning a satellite tracking station, a forerunner of GPS. His next post was that of Assistant Director Survey BAOR. Much of the work was concerned with large scale surveys of military installations and some relating to Eastern Germany and the boundaries of West Berlin.

In the mid 1970s he returned to the UK to a Special List appointment concerned with setting up RE Survey employment training and its supporting training publications. He then took an RO appointment at SMS as OIC of the Training Development Team and finally, in 1982, he became the Survey Author with responsibility for the overhaul and maintenance of all military survey publications.

One of his first tasks was to write a historical report of the Military Survey aspects of the Falkland operation. It was during this time that he became a member of the RE Historical Society and assisted in the production of the Occasional Papers of the Society. He was also a member of the RE Museum Executive Committee. It was not until he finally retired in 1989 that Ben was able to devote his time to preparing the Military Survey input for Volume XI, 1960-80, of the History of the Corps of Royal Engineers which was published in 1993.

During the many years during which I knew Ben I never saw him lose his temper although he could express his displeasure most effectively. He had patience and his arguments were suited perfectly to the importance of the subject and the strength of opinion he was contesting. If he was in the wrong he admitted it for truth was important to him. He was a good and considerate man who looked for the good in others and had great respect for their sincere opinions and beliefs.

Ben married Joanna Hamilton in 1957 and quickly became a dependable and loved son-in-law to Archie and Joan Hamilton. He and Joanna made happy homes around the world with their growing family. He was a devoted father and grandfather- I quote his daughter Jeanne here – “he was a really proper grandpa with a great capacity for fun in the old-fashioned sense. He never fussed over the children letting them find their own level with him. He taught them patience, to plan ahead thoroughly and when things didn’t go according to plan – well have another go. He was a good storyteller, the jungle, the bush country, climbing mountains and the broken bed tales being favourites. He taught by example to be kind to animals even including moles and spiders and other pests – these latter much to the chagrin of Joanna.”

Lunch with Ben was always a rewarding experience, as he loved experimenting with variations in the presentation of a curry. He grew his own chillies and those in the windows of his dining room made a fine backdrop to an appetising meal which was always enlivened by free ranging conversation. I shall miss those events. In later years he bore his travails cheerfully and without complaint taking care not to inflict them upon others and I know that his family, Joanna, Mark, Jeanne, Claire and his grandchildren gave him great comfort and support. His faith too helped him during the bad times. All who knew Ben will miss him but it is to his family that we must express our deepest sympathy in their sad loss.

*EXH*



### **Ronald ‘Ron’ Edward Takel MSc, FRICS, FCIT, FILT**

Ron was a man who had seen and achieved a great deal during his long life. Starting from a relatively humble background he went on to win international recognition in his field of port planning.

Ron was born in Abersychan on the 8th of October 1922 and was educated locally at Abersychan Grammar School. Although academically able to go on to university or become a chartered surveyor his parents were unable to financially support these ambitions, as was necessary at that time, and so he worked for a short while for Monmouthshire County Council before discovering that the Great Western Railway had a large estate department and did not demand a premium from its trainees. However, soon after joining the GWR Ron was called up and reported to the Survey Training Centre. After training he joined 2 General Survey Section based in Addlestone in Surrey and it was here, through the lens of a stereoscope, that Ron had his first view of the Normandy countryside that he was to come to know very well at first hand for the Section, along with every other survey unit in the country, was engaged on the highly secret task of producing the mapping for D Day.

In 1943 the Section began training for its operational role of providing field survey control for the Royal Artillery and Ron became a ‘booker’ and observer. May 1944 saw the Section move to Amptill and prepare for the channel crossing and landing. They sailed for France from London on the 8th of June aboard a Liberty ship and then transferred to an LST for the actual landing on Gold Beach at Le Hamel on D + 5. Ron then spent the entire Normandy Campaign carrying out field surveys, often under fire and in very difficult conditions. At the end of August, with the breakout from Normandy, the Section was attached to 3 Field Survey Depot and tasked with map supply, a role that continued as the Depot moved into Belgium and thence into Germany. When the war in Europe ended Ron was warned for transfer to the Far East but, after embarkation leave and a stay in a bleak Reinforcement Holding Unit near Ostend, the welcome news came on the 15th of August that Japan had surrendered and the war was finally over. However, Ron was still destined to serve overseas and was posted instead to 512 Field Survey Company in Egypt where, despite the tented accommodation, Sapper Ron Takel found life to be a fairly comfortable and was pleased that time was made available for troops to explore the historic sites and also to study for life after uniform which for Ron came in October 1946 when at last ‘his number’ came up.

Ron returned to his old job with the GWR and after qualifying spent the next five years in the planning the new town of Cwmbran. In 1955 he joined the British Transport Commission (Docks Executive) as estate surveyor to the South Wales Ports, a post he held until his retirement in 1987. During his tenure he became recognised as an authority on port planning, presenting papers, writing articles and authoring one of the standard reference books on the subject. He also lectured and wrote for the United Nations Commission for Trade and Development, contributing to their conferences in Sweden, Kenya and Singapore. After retirement he became a consultant to Grosvenor Square Properties and lectured on Maritime Studies at Cardiff University until he was in his late seventies. During retirement his other interests included archaeological digs, gardening, painting, writing poetry and model making. He was a long time member of the DSA and provided very useful assistance to the project to record the story of Military Survey. Ron died on the 10th of August 2009, sadly missed by his wife Betty, their six children and thirteen grandchildren.

**DEFENCE SURVEYORS' ASSOCIATION**  
(formerly the Field Survey Association)

**MEMBERSHIP APPLICATION FORM**

**To:** Honorary Membership Secretary  
Outrigger, 50C Huntenhull Lane,  
Chapmanslade, BATH, BA13 4AS

**E-mail:** [applications@defencesurveyors.org.uk](mailto:applications@defencesurveyors.org.uk)

**Personal Details:**

<b>Family Name</b>		<b>First Name</b>	
<b>Title/Rank</b>		<b>Decorations and Qualifications</b>	
<b>Date of Birth</b>		<b>Service and Rank (if applicable)</b>	
<b>Postal Address for Communication</b>			
<b>Home Telephone Number</b>		<b>Work Telephone Number</b>	
<b>Home Fax Number</b>		<b>Work Fax Number</b>	
<b>Home E-mail</b>		<b>Work E-mail</b>	
<b>A brief summary of relevant experience or interests in defence or civil surveying together with any background details of working experience in the defence, commercial or academic fields</b>			
<b>Name and Contact details of Sponsor</b>			

**Sponsorship.** Normally, sponsorship is by an existing member of the DSA. Applicants without sponsors may contact the Honorary Membership Secretary for details of likely sponsors in their locality. A sponsor's signature is not required on the application form.

**Submission of Applications.** Applications may be submitted either by e-mail or post using the addresses given above. When an application is approved applicants will be sent confirmation and an Introductory Pack.

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This form can be downloaded from the DSA website at [www.defencesurveyors.org.uk](http://www.defencesurveyors.org.uk). If you would prefer to reply in hard copy but do not wish to remove this page from the magazine please photocopy this application form. Replies in either hard or soft copy are welcomed by the Membership Secretary at the addresses given above.

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|    | <b>Stuart Haynes</b> , Director, Defence Geographic Centre, Intelligence Collection Group, <b>UK MoD</b>   |    |
|   | <b>Col. Jean-Armel Hubault</b> , Chief of Joint Geographic Department, Joint Senior Staff, <b>MoD France</b>   |   |
|  | <b>Neil Ackroyd</b> , Director Of Data Collection & Management, <b>Ordnance Survey, UK</b>   |  |
|  | <b>Brian Routledge</b> , Head of Operations Support, <b>EU Satellite Centre</b>  |  |
|  | <b>Lt. Col. Charalampos Paraschou (Babis)</b> Chief Geospatial Officer, NATO Deployment Core, <b>Greece</b>  |  |
|  | <b>Richard Smith</b> , Force Information Manager, <b>British Transport Police</b>  |  |
|  | <b>Patrick Brooijmans</b> , GIS Consultant, <b>Netherlands MoD</b>   |  |
|  | <b>Marlene Meyer</b> , Head of Defence Geospatial Organisation, <b>Denmark</b>   |  |
|  | <b>Michael W. Powers</b> , Technical Director, Geospatial Research and Engineering, <b>US ARMY</b>   |  |
|  | <b>Col. John D. Kedar</b> , Comd JAGO, <b>UK MoD</b>   |  |
|  | <b>Maj.Gen. Antonio De Vita</b> , Commander, <b>Italian Military Geographic Institute</b>  |  |
|  | <b>Tim Buckley</b> , GIS Consultant, <b>British Embassy, Kabul</b>   |  |
|  | <b>Wing Commander Charles Howard-Vyse</b> , Officer Commanding, No.1 Aeronautical Information Documents Unit, <b>RAF, UK MoD</b>                         |  |
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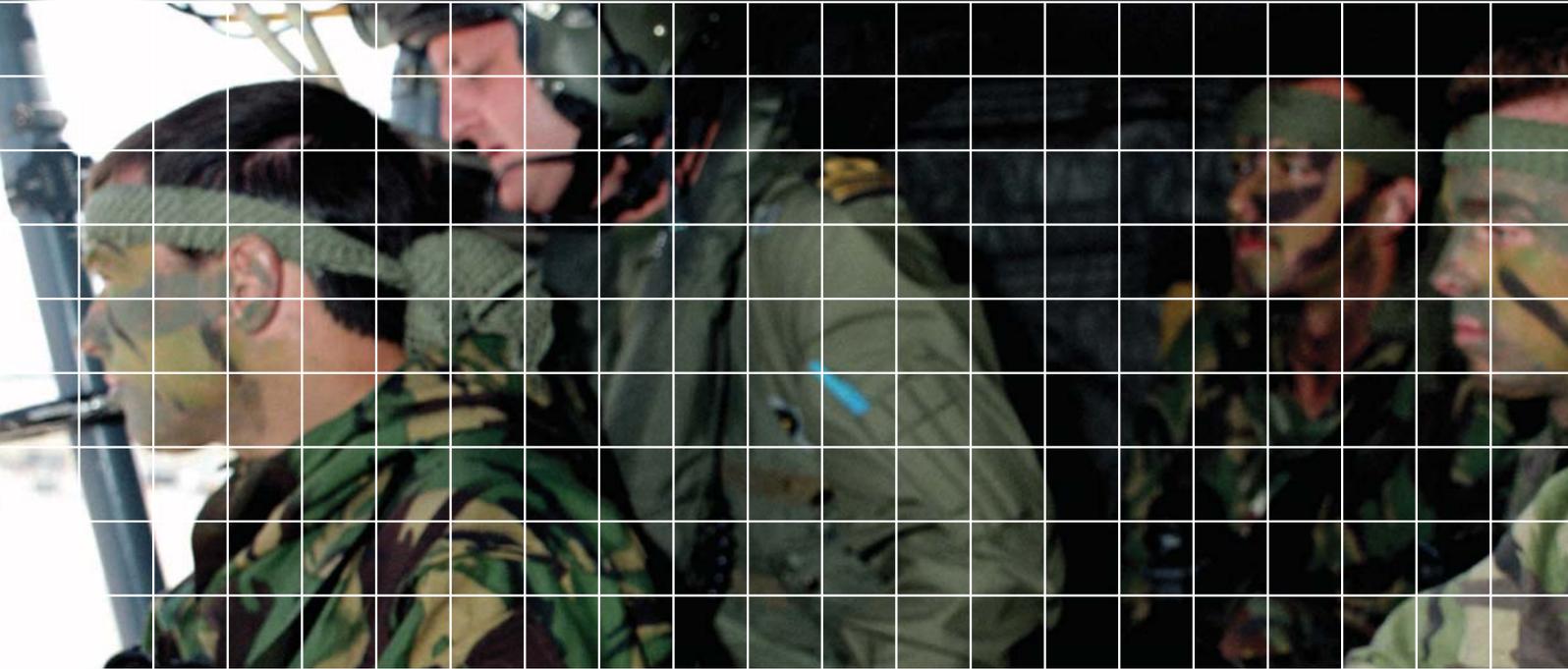


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