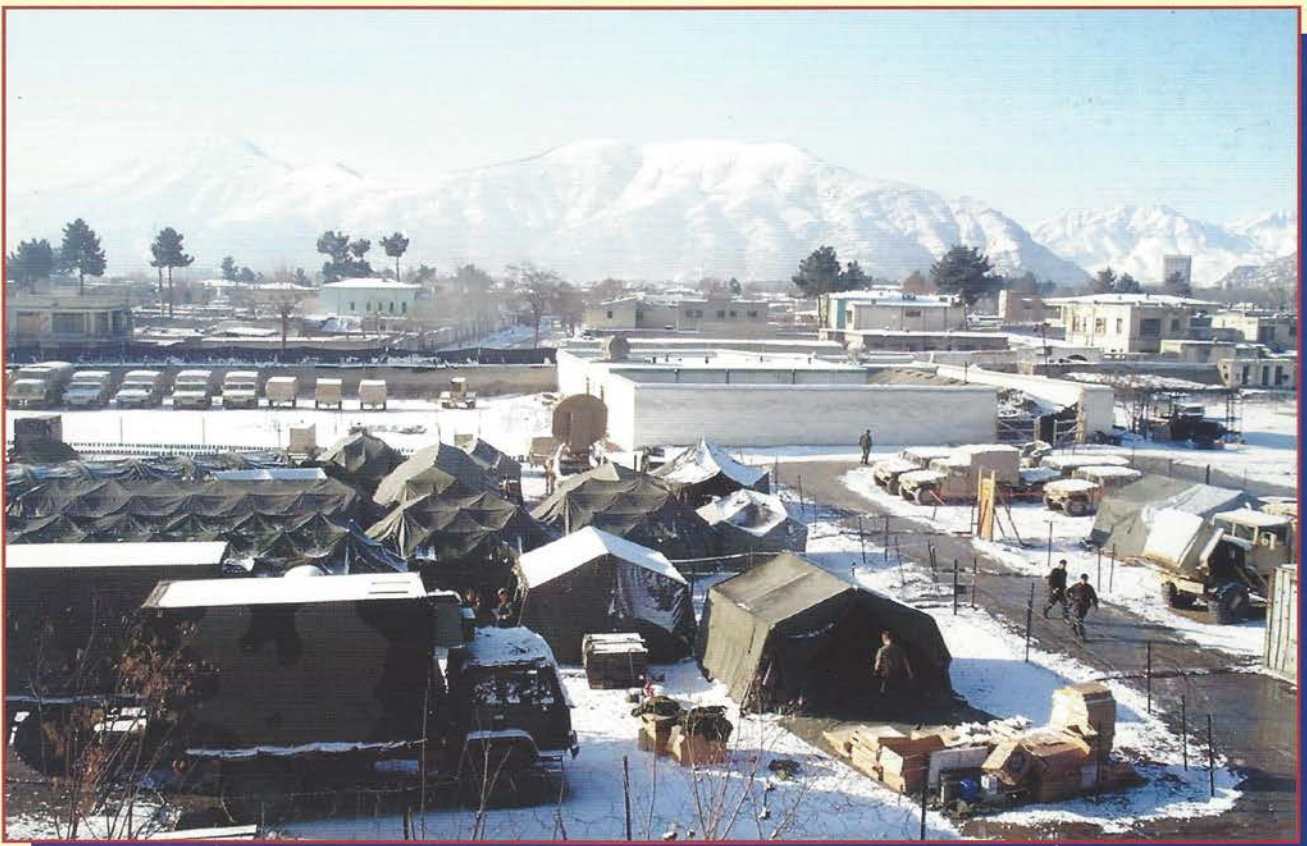


# THE RANGER

*Journal of the Defence Surveyors'*  
*Winter 2002*

Volume 2 Number 6



*Taciprint & Tacisys in Kabul with HQ ISAF*



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## This edition of Ranger...

unfortunately does not include the usual update from "Hydro" as recent major changes in senior RN HM staff, coupled with the immense effort needed to bring the new survey ships into service, has left no time for the production of the Ranger input. The next issue will include a comprehensive review of "Hydro" events for the entire period. However, this issue does feature first hand descriptions of this year's deployment into Afghanistan, an event that at the time surely had Kipling muttering in his grave but which thankfully was not the disaster predicted in some quarters. Yet again, as I put an issue of Ranger together we are in uncertain times. It is early November and there is much sabre rattling over Iraq and the possibility of Saddam having, or developing, 'weapons of mass destruction'. By the time you read this we may well know whether the sabre was drawn or the entire episode was just another crisis.

The "yesterday, today and tomorrow" format of Ranger does allow one to view events in the greater perspective of history. Incidents that to the individual involved, if not the nation as a whole, were at the time utterly absorbing and vital are quickly reduced to little more than one-line footnotes in history. Who but those involved remember Op Musketeer, better known as the Suez Crisis, itself a term no more familiar to many people than the 49th Parallel, EOKA or FLOSSY (answers on a postcard!). Even relatively recent headlining words such as UNPROFOR are fading rapidly from the public's mind as more urgent and immediate dramas unfold. Hopefully Al Qaeda will also soon be committed to the pages of history and be reduced to no more than a backdrop to soldier's "warry stories" in the Mess bar.

As with each of the recent issues of Ranger, I have been blessed with an abundance of articles making selection difficult. Any submission not included in this edition will feature in the next. This brings me to the matter of publication dates. The more observant of our readers will have noticed that this is the winter rather than autumn issue. It has been decided to move publication to summer and winter issues which will not only make collecting articles easier but also provide reading material for the summer and Christmas holidays.

This issue's articles should provide something for everyone. Picking a couple at random, James Prain's comprehensive discourse on geographic information in the 21st century will help many of our readers who are not involved daily in the defence 'geo' business to understand the way things have moved in recent years as well as gaining an insight into where they may go in the future. We also publish an excellent article by a Gunner Survey sergeant who adds a 'coalface' view to the ongoing debate into the future of RA Survey. Tom Phillips' wartime survey in Sudan reminds us that, as always, surveyors tend to be sent off in ones and twos to act on their own initiative and produce a solution irrespective of the problems involved.

Have a good read.

*Alan Gordon*

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

# DEFENCE SURVEYORS' ASSOCIATION

## Formerly the Field Survey Association

The Defence Surveyors' Association, or DSA, is a registered charity whose principal objectives are:

- To maintain a permanent liaison between serving officers, retired officers and civilians working in the Defence domain who have a professional interest in geospatial data.
- To keep abreast of current issues in the geomatics arena.
- To recognise the most significant contributions to geomatics by serving personnel through the award of annual prizes.

The Association publishes the Ranger journal on a periodic basis and organises various technical visits and social events for its members. These meetings provide an ideal opportunity to meet a wide range of people, all of whom have a connection with some aspect of the geomatics profession.

The Council of the Association is currently widening its membership and improving its services to members. *If you want to keep in touch with the survey profession and friends in the business please come and join us.*

Membership is open to personnel who are engaged, or have been engaged, in Defence related geomatic disciplines at a management level. In addition, a candidate for membership must also be known personally to at least two Members, who, as sponsors, must satisfy the Council that he or she is suitable for membership.

The cost of membership is a modest £10 per year payable by standing order on the 1st January. New members joining while still serving get free membership for the remainder of the year in which they join.

Those desirous of becoming Members should contact the Association at its registered address or telephone the Membership Secretary on 01730 823638 or e-mail: [membership@defencesurveyorsassociation.org](mailto:membership@defencesurveyorsassociation.org)

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## EDITOR'S THANKS AND APOLOGIES

My thanks to everyone, volunteers and volunteered alike, who produced an article for this edition of Ranger. Yet again, I have received sufficient high quality input to fill two issues and so, at the very last minute, I had to select those to be included in the Winter edition. Selection was firstly on the basis of the currency and timeliness of the content followed by the need to maintain a balance between the three component disciplines of the DSA and also the yesterday, today and tomorrow theme. My sincere apologies to those authors whose work has not been included...your efforts will appear in the Summer 2003 edition. Please do not let this current abundance of wealth stop anyone from writing something for the next issue....all articles are most welcome.

*Alan Gordon*

## BEREAVEMENTS

It is with regret that the association announces the deaths of Maurice R Mullins MBE and Frank Berncastle DSC and bar, whose obituary is published elsewhere in this issue.

Although not a DSA member the death of Jock Robertson, well known in Military Survey circles, will be sad news to many members.

## John Croft the New DSA Chairman



John Croft was commissioned into the Royal Engineers from RMA Sandhurst in 1958. After engineering courses at Chatham and a short time in 1st Field Squadron as a troop commander in BAOR he served with the Gurkha Engineers in Malaya, British North Borneo and Nepal as well as Brunei and Sarawak for the rebellion and subsequent confrontation with Indonesia.

On return to UK in 1964 he spent a year as training adjutant of the Junior Leaders' Regiment RE at Dover before joining RE Survey and attending No 36 Army Survey Course. A secondment to the Directorate of Overseas Survey followed with a year in Northern Nigeria altimeter heighting and second order traversing using towers on the edge of the Sahara. In contrast he returned to the jungles of Sarawak for his second year for more second order survey work and some cadastral surveying.

In 1969 he joined 13 Field Survey Squadron RE at Barton Stacey as second in command but a gravity survey in the Bahamas and astro work in the Orkneys with 19 Topographic Squadron made a break from administrative duties whilst he was in 42 Survey Engineer Regiment.

In 1971 he attended the Long Print Course at the London College of Printing prior to a staff appointment in the Directorate of Military Survey dealing with the development of map reproduction techniques and the procurement of equipment. Projects undertaken included the truck mounted Taciprint (for which he was awarded the Field Survey Association prize in 1974), a new mobile printing train and a replacement map supply truck.

He returned to 42 Survey Engineer Regiment in 1975 to command 22 Lithographic Squadron and subsequently 13 Map Production Squadron on re-organisation before joining HQ 1st British Corps in BAOR in 1977 as the Survey staff officer. Remaining in Germany he moved to HQ BAOR on promotion to lieutenant colonel in 1978 to become the Assistant Director of Survey.

He was the Commandant of the School of Military Survey from 1980 until 1984 then returned to Feltham to be the SO1 Tasking in the Production, Planning and Control Unit RE.

In 1986 he went back to Rheindahlen on promotion to Colonel as Chief Joint Geographic of the Joint NATO HQ of NORTHAG/TWOATAF until 1989. His remaining four years in the Service were spent at Feltham, first as Commander of the Technical Support Group of the Mapping and Charting Establishment RE and, when that was disbanded, he re-joined the staff of the Directorate to lead the implementation team for the new organisational structure of Military Survey. Finally he became the Market Testing Officer for the new Military Survey agency.

Since his retirement from the Army in 1993, after a brief period as a consultant, he has run his own small map making business, working from home.

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## CHAIRMAN'S COLUMN

Having taken over as Chairman in June this year I am very much aware of the interesting and encouraging progress that the Association has made in recent years. Clearly, it has seen many changes, both to the way in which our profession has been conducted and to its own structure from its beginning 75 years ago as the Field Survey Association, when it was created by those who were determined not to waste the lessons learned by hard practical experience in war, through to the present day. Probably the greatest changes have occurred during the last five years when the Association's range of interests in defence geographic matters have broadened considerably indicating its willingness to keep up to date with advances in modern technology and its integrated nature. I have no doubt that the successful evolution of the Association has occurred thanks to the commendable efforts of the last two Chairmen, hard working members of the Council and the wise guidance of our President. The loyal and active support of members too has been absolutely vital for its continued healthy state. A positive measure of its success has been the increase in new members with the variety of specialist knowledge they have brought with them. As the Membership Secretary for the past two years I have had the pleasure of contacting and welcoming aboard forty new members.

Whilst looking, quite rightly, to the future I believe it is important to remember the past not only for the valuable lessons we can learn from it and from our more senior members but because we afford the opportunity for old friends to enjoy each others company and to be in touch with those actively in practice at present. It is indeed a pleasant and fulfilling thing to do. I strongly believe that everyone who gets involved can gain by doing so in one way or another. As we all know, history has a habit of repeating itself time and again, and so those working in the business now might well find it useful to find out how those previously faced with similar challenges fulfilled their commitments even though the technology has moved on. Surely the interchange of knowledge and ideas between different parts of the defence geographic community can also provide mutual benefit to those willing to keep in touch. The Association now provides greater opportunities for this to happen, through direct contact at meetings and visits, through this excellent, well illustrated magazine, the Ranger, that in itself is creating a valuable record and reference of the defence geographic information business, past, present and future and through our colourful and informative website with its more immediate information and links to other related organisations. Here, on behalf of the DSA I wish to record particular thanks to Alan Gordon and Robert Dobbie for their work on the Ranger and DSA Website respectively. Their industry, expertise so enthusiastically applied and their knowledge in developing and maintaining such high standards have indeed enhanced the DSA to the benefit of many within the Association and outside.

Most of what I have written above is well known to many in the DSA but I have set it out here because I wish you to know that I see my role, as Chairman, as one that, together with the Council, helps to bring together the many parts of our Association for the mutual benefit of its members and the fulfilment of its stated objectives using the means described above. I hope that we can continue to build on the successes of the recent past and still derive benefit from the achievements of our illustrious predecessors. A word of grateful thanks here to Lieutenant Colonel Mike Stanbridge on behalf of the Association for all his good work whilst Chairman and from me personally for his valuable support during the hand over. Last years activities are well covered in his final report recorded in this edition of Ranger. Since then we have had an excellent guided visit to the Tower of London preceded by a very pleasant lunch on board a launch that took us from Tower Pier to the Houses of Parliament and back. Again we have Mike Stanbridge to thank for arranging this and looking after us so well and David Wallis for his support as Secretary. A party of us are due to look at the Royal Cartographic Collection in Windsor Castle in November kindly arranged by Dr Yolande Hodson. We are planning more visits for next year and we will let you know about them in good time to book your place.

In conclusion let me urge you to be actively involved with the Association by the various means I have mentioned above. The continued well being of it depends on all of us, the members. I look forward to being in touch in the future.

*John Croft*  
Chairman

## **CHAIRMAN'S REPORT 2002**

### **Presented to the Annual General Meeting at HQ RE Mess**

#### **Introduction**

This is my last Report to you after having served a total of four years in office viz. two-2 year tenures. As a consequence, I am going to make it fairly short, like all final chapters should be, in order that your new Chairman, Col John Croft can continue with the next volume covering the future.

#### **Membership**

Our Association has now been established for 75 years so we are well ahead of the Queen in her Jubilee year and, like Her Majesty, we have good reason to celebrate. With the tremendous changes that have taken place over those years in the way our profession operates within the Defence arena, the Association has not only survived but

also flourished and grown. We have achieved this by moving with the times and there is no doubt that we must continue to do this, not only to reflect the periodic changes in Defence geomatic organisations and their responsibilities but also the accompanying political, social, economic and technical environments. Only by doing this will we continue to attract a diverse range of applicants for membership.

During the past few months the Council has proven to be more open with our membership acceptances whilst keeping within the Articles of the Association and our membership continues to rise. On the subject of growth, there has been some concern expressed in Council recently about how many members we can sustain; when event management, secretarial and financial duties are

undertaken by volunteer committee members in their spare time. This is because more members inevitably result in more work and we therefore have to find more volunteers to do the work, cap our membership numbers or pay someone to do the additional work. Personally, I believe we should continue to grow as much as we can and find a workable solution, whatever that may be, to cope with the DSA's expansion.

#### **Website**

Our website is now kindly sponsored by my own Company, EDS Defence Ltd, the UK defence arm of the global IT/IS Services company Electronic Data Systems, and I hope this support will continue in future years. Whilst the website provides an excellent marketing and information dissemination tool, the key to any website's success is that it is regularly maintained and kept up to date. Because I review the site regularly, I know that it meets these criteria owing to the tremendous effort put in by Robert Dobbie, for which I thank him.

#### **The Ranger**

Alan Gordon, our Editor, continues to do an outstanding job by producing two excellent editions per year and I wish he had the time, and we had the money, to do more. It has been suggested that we should consider publishing additional, supplementary, newsletters but currently it remains another aspiration for the DSA Council to keep under review. Cost and effort, versus benefits and risks again, the old and well-used adage comes into play again. BAE Systems continues as the major sponsor for our magazine and for this I thank both the Company and, indeed, Kevin Porter for making the necessary arrangements.

#### **Events**

Since the last AGM, we have had two social events and visits, one to the RAF Museum at Hendon and the other to The Royal Armouries at Fort Nelson. Both were excellent visits, with the latter attracting more than sixty people, and my thanks go to David Wallis and Geoff Gathercole for carrying out the recce and making the necessary arrangements. David, in particular, continues to find the energy and the enthusiasm to carry out most of the Secretarial duties and I have not yet discovered, in my four years as Chairman, how he fits all the DSA

work into his other business and domestic activities. However, I know he is in desperate need of help on some occasions with 'folding, packing, licking and sticking' of circulars and if there is anyone out there willing to help I am sure they would be most welcome.

For today's AGM and after lunch tour to the RE Museum, John Croft has been kind enough to make all the preliminary arrangements with the details being finalised by David Wallis. With regards to future events, we are currently planning a Thames River trip and tour of the Tower of London for early September and we will keep you informed of developments and final arrangements.

#### **Summary**

On reflection, I have thoroughly enjoyed my four years as the DSA's Chairman even though I took it on with a certain amount of persuasion and, indeed, some trepidation because of my heavy business commitments. I could not have achieved what we have without the support and tremendous effort of other members of Council, particularly the ones I have mentioned. However, I cannot depart this Chair without saying a final thank you to our President, General Barton, for his direction and support when needed. In essence, he has given me the autonomy I required as a Chairman whilst providing back up on the rare occasions I called for it.

I would like to finish this report by wishing my successor, John Croft, the very best for the next two years (or perhaps more!) in the Chair. The Association is in good shape with a growing membership, healthy finances and good promotional tools with the Ranger and Website. I therefore hope he continues to take the DSA to new 'heights' and, in so doing, receives the same support as I have done from the Executive Committee and other Council Members.

May I also thank all of you, the Members, for your continued support and attendance at events such as this one at Chatham, because without your continued interest and attendance at such events, the Association would dissolve.

*Mike Stanbridge*  
Chairman DSA  
1st June 2002

#### **EXERCISE PATAGONIA APOGEE 2002**

The latest Apogee expedition will take place during November and December. The aim is for a party of soldiers from the Geographic Engineer Group to cross the Northern Patagonian Icecap from east to west whilst carrying out investigations into navigation techniques using handheld GPS, satellite imagery and PDA technology in a hostile environment. The trek will culminate in an ascent of San Valentin, the highest mountain in Patagonia, which the team will height by differential GPS methods. The next issue of Ranger will include a detailed write-up this latest in the long line of Apogee adventures. Good luck and a safe return.

developments for operational environmental support into reality. Temporarily seconded to the Northwood Headquarters, he proved to be a key player in the management of the novel environmental data fusion cell. In short, this enabled hydrographic survey data, gathered in the Area of Operations by HMS ROEBUCK, to be transferred via satellite link to Northwood where the data was used to update existing digital databases before retransmission to key amphibious units. This was achieved by the utilisation of a technology demonstrator containing an array of commercial off-the-shelf software rather than a fully tested operational system. There were therefore many technical obstacles to overcome in achieving a working capability. As the expert hydrographic surveyor in the Headquarters team, Lieutenant Commander Churcher's analytical methods, complemented by a firm understanding of the capabilities of IT, made him ideally suited to this task and ensured that the concept was eventually proven.

Lieutenant Commander Churcher has been on the leading edge of the initiative to ensure the timely delivery of geospatial data to operational commanders. He now takes this work forward on appointment to the new Fleet Headquarters. His resolute performance and initiative mark him out as a deserving winner of the DSA Annual Royal Navy Hydrographic Prize.



*Lieutenant Commander Jeremy Churcher, the Royal Navy prize winner*

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## NEW MEMBERS

The Association welcomes the following new members and hopes to see them at an event in the near future.

**Mr David Bunting MRICS FASI FGIS MISM** - joined the Royal Artillery in 1959 and served in 39 Regiment from 1959-1969 then 22 Locating Battery from 1970 - 1973. He was stationed at the RA Range in the Hebrides from 1973 - 1975 and then was with 94 Locating Regiment from 1975-1981. On retirement from the Army he joined Huntings Surveys Ltd., working on survey projects in Nigeria, Qatar, UAE, Yemen and UK from 1981-1984 and 1985-1987. He was with Iffland & Associates from 1984-1985 for survey projects in UK then he founded Capital Surveys Ltd in 1987 and continues to be its Director.

**Lt Col Mark Burrows MA BSc RE** - to date has served 22 years in the army, half of which has been with Military Survey. He commanded 13 Topo Squadron RE on operations in the Balkans in 1996. He attended the Royal Navy Staff College and served in MOD where he was responsible for the provision of equipment for the DGIA and other organisations. He has recently taken up the post of SO1 Geographic at HQ ARRC.

**Colonel Roger Clowes (late RE)** - attended 29 Army Survey Course in 1962 before being seconded to the Directorate of Overseas Surveys in Malawi and Zambia. On return to UK he was the Assistant Instructor Field Survey at SMS before completing a staff appointment at Feltham in the Directorate of Military Survey. He was then posted to the Ordnance Survey as OS Controller of East Midland Region. After that he returned to Feltham to become the Assistant Director of Survey 2. He then served in a NATO appointment as Chief Joint Geographic Officer HQ NORTHAG/2ATAF before returning to Feltham once again, this time to command the Production Planning and Control Unit. He retired in 1987.



**Sir Clive Martin OBE TD DL** - his military career began as a member of the Army Emergency Reserve Survey Pool from 1955-1956 before carrying out his National Service with RE Survey from 1956 to 1958. On returning to civilian life to continue in the printing industry he joined 135 Survey Engineer Regiment serving from 1959-1962. He then joined the Honourable Artillery Company (HAC) and served in G Battery which has a surveying and sound ranging role. He commanded the HAC in the late 1970s. He is the head of a large group of printing companies and has been closely involved with the City of London for many years eventually becoming Lord Mayor. He is still closely involved with the City and became Honorary Colonel of 135 Geographic Squadron RE (V) in 1999. His long association with both sapper and gunner surveying makes him doubly welcome to our Association.

**Mr Michael Paskin** - 24 years with Military Survey from September 1976 - May 2000. A field Survey Tech Class 1, with an HNC in Surveying, he served all over the world. Micheal continues globe-trotting as he is now a hydrographic surveyor working off-shore with FUGRO.

**Major (Retd) Peter Savage MA, MSc** - attended No 40 Army Survey Course from 1967-1968 before becoming a Troop Commander in 42 Survey Engineer Regiment from 1968-1971. He specialised as a Photogrammatist at UCL in 1972-1973 attaining his MSc (Photogram). From 1972-1973 he was the Regimental Technical Control Officer for 42 Survey Engineer Regiment. As OC Technical Services Squadron RE from 1973-1976 he served in JARIC and then was the Manager of Air Survey Branch in Ordnance Survey at Southampton from 1976-1979. He retired from the Army in 1979 and joined GEC Marconi for various appointments before retiring fully in 1999.

**Captain (Retd) SE Tress** - trained as a Valuation Surveyor up to RICS Inter Parts 1 & 2 from 1934-1939 then World War 2 intervened. From 1940-1943 he was a Surveyor RA Class 2 Gunner and JNCO in Artillery Survey involved mostly with Sound Ranging. He attended OCTU from 1943-1944 and completed the RA Long Survey Course. He was with a Sound ranging Battery from 1944-1945 operating mostly in Holland. He served in Persia and Iraq from 1945-1946 and was with 1st Observation Regiment at Bulford from 1946-1951. He became the adjutant of 94 Observation Regiment in 1948 and the Officer Commanding of the Sound Ranging Battery at Luneberg during the change to 94 Locating Regiment. He was involved in TA training at Larkhill from 1951-1952 before retiring and joined the Inland Revenue as an Inspector of Taxes for 28 years.

**Lieutenant Colonel (Retd) Tony Vickers** - completed his Army Survey Course in 1980 before his initial survey appointment with the Ordnance Survey. This was followed by a tour with the Royal Australian Survey Corps as the British Exchange Officer. On return to UK he became Officer Commanding 13 Squadron and then SO2 Svy 4 at the Directorate of Military Survey dealing with the procurement and development of equipment and survey and map production techniques. On promotion he became Chief Geographic Officer Hong Kong and retired in 1995. For five of these appointments he claims to have been the last officer in post. He is now at Kingston University taking a PhD "studying whether replacing 'Z' in a terrain model with 'V' (value) might be useful!

**Mr Graham Walker** - as an ex-Royal Artillery National Service Surveyor (1948-1950) he served at Larkhill and after at Luneburg with 94 Observation Regiment. He is a retired FRICS and Training Adviser to the RICS. He is also a member of the Chartered Institute of Agricultural Valuers. He continued carrying out large scale surveys whilst running his own practice in estate management. He has retired and is now the Mayor of Battle in Sussex.

**Mr Geoff Woodhead MBE C(Text)FTI, FRSA** - ex-RAF Meteorologist in World War 2. Spent the war with Meteorological Units attached to various Royal Artillery Units in UK and Burma. After the war he returned to the textile industry, mainly with Courtaulds. He travelled widely representing UK on several international committees dealing with textiles. Awarded MBE for services to industry in 1980. He retired in 1989 after several years as a consultant and continued his interests in the history of World War 2 particularly the role of RA Survey Units. Geoff has written several articles for Ranger on "RAF Support to the Gunners".

## 42 ENGINEER REGIMENT (GEOGRAPHIC) SUPPORT TO OPERATIONS UPDATE

By Lt Col John Kedar

Commanding Officer 42 Engineer Regiment (Geographic)

2002 has been an extremely busy one for 42 Engineer Regiment (Geographic), deploying personnel to many Op VERITAS related locations, including Afghanistan and Oman. The Regiment has also continued with the provision of support to Sierra Leone, the Falkland Islands and Northern Ireland. The Balkans theatre requirement for geographic support continues and will do so for the foreseeable future.

In addition to operations, the Regiment has carried out other live tasks. 13 Geographic Squadron carried out a post-marking task in Kenya for the Kenya Survey Department, accurately tying PR9 imagery with identifiable features on the ground. Regiment personnel deployed to Alaska to provide advice and final on-site quality control to enable US Army teams undertaking airfield surveys to meet Ron Brown Airfield Initiative (RBAI) technical specifications. Additionally, the Regiment's TA squadron, 135 Independent Geographic Squadron RE(V), for their annual camp, carried out the Group's annual requirement to conduct a boundary survey for the British Sovereign Territory in Cyprus, Op TRIG MED.

The Regiment has supported exercises in Germany, Canada, Norway, Spain and the Czech Republic whilst also deploying a squadron to Norway for a technical exercise working alongside the Norwegian Military Geographic Service. 14 Geographic Squadron supported NATO's ACE Rapid Reaction Corps in its major exercise of 2002. Much new equipment has been received, the major item being the Digital Geographic Support System (Light) which proved highly successful with 3 Commando Brigade in Afghanistan.

On the sporting front 42 Engineer Regiment (Geographic) has won three football competitions: the Army Minor Units Cup, the 4 Division Minor Units Cup and the 4 Division 1st Division league. The Regiment was also victorious in the 4 Division Minor Unit Cricket and the Army Minor Unit Rugby. Regimental Hockey continues apace with victories in the Sapper Cup, the 4 Division Major Unit Cup and the Sapper Indoor Cup. On the Athletics field Spr McMullen became Army Long Jump Champion. Soldiers have also participated in Adventure Training Expeditions and shortly the Regiment mounts the latest of the Apogee series of major expeditions, combining adventure training with survey work, this time to the largest Chilean ice cap. Members of 16 Geographic Support Squadron recently completed a run from London to Paris.

The articles on Norway and Kenya, included below, and on Operation JACANA published elsewhere in this issue, illustrate the variety of work undertaken within

the Regiment and its four squadrons. The focus for 2002 has been operations but much else has been achieved besides.

### EXERCISE TRIG NORGE 2002

Trying to convince 13 Geographic Squadron that deploying on an exercise for two weeks during the World Cup was a good idea, proved to be an excellent test of the "carrot and stick" principle of leadership. The carrot took two parts, the fact that the exercise was in Norway and that they would be able to watch all England's games. This settled, we set about the planning and preparation required to deploy the Squadron on Exercise TRIG NORGE 2002. In addition, reinforcements from 135 Independent Geographic Squadron RE(V) were employed alongside their regular military equivalents and fully integrated into all aspects of the exercise.

The exercise had a number of aims and objectives, the principal being to deploy a geographic squadron overseas and work alongside a NATO ally to test the interoperability of both nations. The exercise was held on the Honefoss Training Areas, 60kms north of Oslo and close to the Norwegian Geographic Cell based at the local Engineer Regiment. This proved an excellent location providing testing conditions for the initial infantry phase and subsequently a good harbour area in a wooded environment for the technical phase. The first major challenge faced was the movement of 35 vehicles and 85 soldiers to Norway which was achieved by a series of moves by sea/air and road. Fortunately only one vehicle broke down and we arrived safely in Honefoss some 60 hours after we had set off.

The first phase of the exercise was designed to test the basic military skills of the troops seeing them deployed into the dense woods for 48 hours. They were set a variety of military tasks, including patrols and ambushes, culminating in an attack on a well-defended bunker. Given the constant attention of mosquitoes and that there was only three hours of darkness each night, they had little opportunity to sleep. However they returned safely in time to watch a recording of England's draw with Nigeria.

The technical phase involved a move into another part of the woods and all vehicles were well concealed beneath camouflage nets. This was the first opportunity to test a number of new geographic systems and containers and to practice working alongside the Norwegian geographic container. The Norwegian geographic container was based on our TACISYS but has taken the design a stage further. It is based on a

container with expanding sides, providing room for six technicians to work comfortably. Equipped with the latest hardware and geographic software it is a powerful tool and the exercise proved that it is more than capable of working alongside us.

This phase was particularly successful and proved that a geographic squadron can operate effectively in the field without any loss of capability. The availability of over 1 tera byte of digital data proved a challenge in trying to transfer it onto our systems and store it. A wide range of tasks were completed, including a number of live tasks for the Norwegians. The Data Technicians completed a field survey task at the National Research Centre to position reflectors for the Shuttle to within 10mm. Detailed terrain analysis of the local area was possible and tested the less experienced members of the Squadron. The Production Technicians were kept busy printing copies of the 1:50,000 series covering Northern Norway and an image map of the Engineer Barracks. Again we were able to pause to allow everyone to watch the 3-0 win over Denmark.

The second week of the exercise included two visitor days, the first for a variety of visitors from the Norwegian Mapping Agency, DGIA and the Norwegian Chief Engineer. The second saw DGIC and his Norwegian equivalent, Maj Gen Hagen visit the Squadron. Both visits went well and showed off the capabilities of a geographic squadron operating in the field. This includes a large element of 16 Geographic Support Squadron RE who provide logistic support in the field. They have the ability to repair and maintain all the vehicles and equipment in the Squadron, including the IT systems, procure specialist stores and chefs to feed everyone.

The exercise finally drew to a close in time to allow everyone to watch the game against Brazil. Apart from the final score, this provided an excellent way to end the exercise on a high. The final day before we recovered to Hermitage was spent either in Honefoss or Oslo and allowed everyone a chance to see the local area. Unfortunately, at £6.00 a pint, a lot of time was spent walking the streets rather than discussing the English football tactics in a bar.

### **Welcome to Kenya....Exercise Dhowes Marker 2002**

It was the middle of winter - that time just after Christmas when its always dark, cold and never stops raining! So who wants to go to Kenya?

After seemingly weeks of planning, and decimation of our team to support the operations in Afghanistan, 26 of us finally set off on the weary journey along the M4 to Heathrow Airport. Thus started 13 Geographic Squadron's task of helping to produce 1:50,000 scale mapping of Kenya using aerial photographs, a vast array of GPS equipment, tripods, computers and no small amount of desert survival skills!

We left a cold, wet and dark Heathrow Airport bound for Nairobi courtesy of British Airways who never grumbled once, despite twice the expected cargo load and six boxes of personal weapons! Following an uneventful flight (no the video screen did not work



*Making Friends with the Locals*

properly) we arrived to 30 degrees of beautiful sunshine. All was going well; so we thought! No problems were encountered until we tried to clear customs with our six boxes of weapons. Once the Kenyan official had stopped laughing, and despite gallant work by the Defence Attaché and the Logistic Rep (who wants a permanent post in Nairobi; its alright for some!) they impounded the weapons for some two weeks! Welcome to Kenya; the struggle had just begun.

For those readers familiar with exercising in Kenya you will be aware of the vital logistic and medical support given by the Army Air Corps and the team at BATLSK. As we were working directly for the Kenyan Government we had no support from LAND and very little from BATLSK, so we went shopping! Four Land Rovers, two Bedfords (courtesy of much haggling), Air Ambulance Cover for 26 soldiers covering Kenya, Sudan and Uganda, six Shogun Jeeps, eight tonnes of bottled water, 960 24-hour ration packs and 2,000 rounds of ammunition later, we were ready to go! Well we would if we had our weapons and survey kit, which was still impounded by the Kenyan Authorities.

Some two weeks after setting out from the UK and after a lot of negotiations and deal striking, we finally set off on the 700 km trek north-west to the Turkana province of Kenya. Interestingly this area is archaeologically rich in finds, being most famous for the discovery of "Turkana Man", believed to be the oldest human remains anywhere in the world. We were to be based in a dusty outpost town called Lodwar located some 2 degrees north of the equator in the Kenyan desert- it felt like the last town before the end of the world. It was.

By the time of arrival we were working our way quickly through the 8 tonnes of water, consuming some 15 litres per man per day to stave off the oppressive 50 degrees heat. Bear in mind also that the Kenyan's idea of a main road may just about meet our requirements for a good farm track; the lower class roads literally were just dirt tracks; for 700 km's; hard going! With a little help from our Kenyan Army friends (our armed escorts for the exercise) we soon had the camp up and running in proper military fashion. Even the fridge worked (to the relief of the chef!) and the time was then spent preparing technical kit and vehicles for deployment into the bush.

The survey techniques we were following to meet the requirements of the Kenyan Government and British Army quality control was a form of ground control known as post-marking. This involved detailed analysis of aerial photography before deployment from the UK, the purpose being to identify ground features in the photos which we thought could be found on the ground. In addition, we laid out an imaginary grid over the existing 1:250,000 mapping of the area and marked the areas to be surveyed (to coincide with the aerial photographs). The field teams then deployed for five days at a time to the pre-allocated points, identified the features and set up the GPS survey equipment. Readings were then taken to an accuracy of +/- 1cm;

compare that to your hand-held Magellan and you get an idea of the accuracy of the survey methods. The total survey area extended to over 17,000 square kilometres centred on Lodwar, where our concreting skills were fully utilised building monument points to act as the survey control.

Once the field teams had deployed, the HQ element started the (somewhat lengthy) liaison with the local Tribal Elders and Muzungo (white) Missionaries to acquire all the items required for our extended stay in the desert. Apart from the fridge (for the food of course!) the most urgent requirement was for decent workshop facilities to repair the frequent punctures and occasional breakdowns. Once found, courtesy of a Dutch businessman, our REME support were kept fully occupied and, under the circumstances did a fantastic job creating all sorts of weird and wonderful devices to ease the pain of the breakages. To our great amusement, and despite the field teams regular off-road forays in the bush and along the very rocky wadis, the sorry looking Land Rovers and Bedfords from BATLSK proved almost unbreakable, but the Shoguns did suffer somewhat!

By the end of our six week exercise, looking decidedly thinner and more sun-tanned, we fought our way back towards Nairobi on some of the roughest roads ever encountered. We had completed the job, much to the delight (and surprise ) of many. The boys had not only brushed up on their survey skills but also learnt some valuable lessons in survival on the way. The war stories about ambushes on the Ugandan border, the ritual slaughter of camels and goats and the continual amusement of negotiating with the local tribesmen will be told for many months to come yet. We all came back alive, and are looking forward to the next leg in 2003!



*GPS work in the Kenyan Desert*

## DEPLOYMENT TO AFGHANISTAN

By Major John Adlington

I was involved in the 3(UK) Division Engineer Group exercise on the Salisbury Training Area when the events of September 11th unfolded. Kabul and Afghanistan in general were places I had read about but never considered to be top of the list of potential sites to visit, certainly not in the foreseeable future anyway.

The UK soon signed up to lead the force into Kabul with the aim of bringing stability and security in order that a gender sensitive, free government would be established. The Headquarters would be made up from staff from HQ 3(UK) Division supported by elements from the Permanent Joint Headquarters (PJHQ) and HQ LAND and the Brigade HQ would be provided by HQ 16 Air Assault Brigade. The UK would supply the bulk of the force with elements from a variety of European countries. The UK aim was to achieve the ISAF mission and then hand over as lead nation to another country.

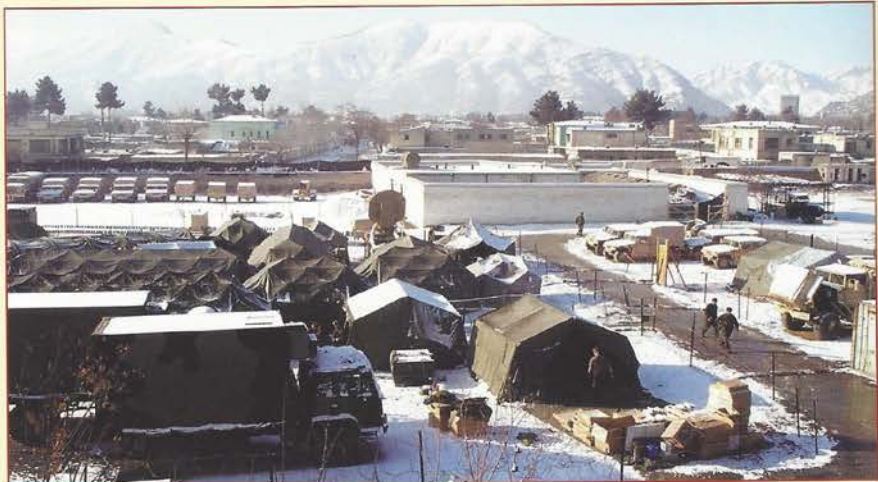
The Geographic component was to be made up from the organic Geographic elements within HQ 3(UK) Division augmented by a small section from 42 Engineer Regiment (Geographic). 16 Brigade were to take their own Geographic staff in the form of the Geographic Sergeant and Corporal.

The preparations for the deployment began in earnest in late November which meant an uncertain Christmas for all the nominated personnel. Christmas was spent compiling data and producing the first of many Force Protection Maps.

After several false alarms over the Christmas period the first members of the Section eventually moved from the UK in early January prepared for a cold arrival in Kabul. We arrived in Thumrait in the Oman at one of the Forward Mounting Bases, for what should have been a brief two to three hour stay. This turned into a short nine day stay whilst we waited for available airframes to take into theatre. During this time the remainder of the Geo Section from Hermitage joined us and we all travelled into Kabul to be greeted by temperatures of minus 19° C. Body armour and helmets had to be worn on the descent into Kabul as the security state was still cause for great concern. In retrospect, I often wondered if it would have been better to sit on the body armour as that was the most likely place that one might be hit!

The initial conditions in Kabul and the surrounding areas were clearly that of a country that had been

involved in many years of conflict. Most buildings had been reduced to rubble and the people did not appear to have any luxuries or even a basic infrastructure available to them. HQ ISAF was located in an old Officers Club complex which sounds very grandiose. However, it was a compound that had been used by the Taliban for things less than relaxation for its incumbents. The officers made use of the shell of the old hotel whilst the rest had to make do with tents. The first few days were very cold and it really felt like an operational tour. There was centralised boiling of "boil in the bags" and a mess tent was set up containing a warm heater around which



HQ ISAF

people sat and suffered together! The 'Puffing Billy' technology was used to provide hot water in the morning complete with the soot to add that extra charm. Deep Trench Latrine technology, as used when I first joined the Army, was put to good effect showing that basic is good! It was extremely cold and the stories of toothpaste freezing overnight are true. There is only so much one can get into ones sleeping bag!

There had been no rain in Kabul for some time and there were signs of the drought that had affected the area with dust everywhere. However, the Brits had arrived and so it snowed, melted and snowed again, turning the camp into a quagmire. It was on one such day, whilst looking at the swamp we found ourselves in, that I rather unwisely commented to the German Geographic Colonel that the area resembled the conditions of the Somme!

Patrols had started in the streets and ISAF troops had been welcomed across the city. 16 Brigade had established themselves in an old Wine Factory and many other nations had deployed troops. The German brigade had a 2-man section that were to prove invaluable later when we were attempting to withdraw from the theatre.

In the initial period we did not have all our heavy equipment as it had to wait in priority order but it did eventually turn up on an Antonov 124 contracted by the UK MoD. With TACISYS and TACIPRINT established in the HQ complex a variety of products were generated. The ability to print Force Protection Maps in theatre, even though restricted to small format, was extremely helpful. The Geo Section had to support the HQ in a number of CONPLANS together with assisting the Brigade in the supply of more specific imagery-based products. 16 Brigade Geographic staff arrived soon after and found themselves very busy supporting a multinational customer base. One of the major sources of complaint in the UK is the lack of available high resolution data to be used on training exercises. The data available for the Kabul area was excellent and brought about its own problems in that there was so much of it. Data management is a subject that has been paid lip service in the past but proved to be one of the major areas that needs to be addressed with the growing capability of the computer systems.



*Home Sweet Home - Kabul style*

Despite all the available data and excellent digital products distributed throughout the Force, paper maps were in high demand. The Map Store was soon established and proved to be fairly busy throughout the day. The peak of demand was when the Turks visited on a reece and realised that they could have a relatively unlimited supply of mapping. (Some diplomacy was required to convince them that ISAF could not supply the whole of the Turkish Army with maps).

There were many key events during the deployment of which I will mention only a few.

There were a number of shootings and rocket attacks but all were poorly executed and none caused direct threats to ISAF troops. Most shootings were tied to crime within the city and the level reduced as the presence of ISAF became more apparent. The major threat was one of mines and UXBs. It is regrettable that several ISAF lives were lost in one major accident during the attempted disarming of a rocket system.

In an effort to promote a positive image for the Force, a football match was held between ISAF and Kabul United. The match was held in the Olympic Stadium, once used for executions, and provided some much

needed entertainment for the locals. The Premier League sent over some representatives together with the Premier League trophy and some qualified officials. I was fortunate to go to the match where I witnessed the German and Afghan methods of crowd control! Sticks and rifle butts held back an enormous crowd who could not all fit into the stadium. The match itself was tense but there was relief all round when Kabul scored an excellent goal. The stadium erupted and the joy from the locals was thankfully unconfined. ISAF had not read the script and ended up winners by 3 goals to 1. Towards the end of the match the whole crowd moved to the edge of the pitch in a scene similar to that in the film "Escape to Victory".

There were a number of earthquakes during our stay, one of which caused minor damage in the city. I was stood with two Northern Alliance 'hoods' on a fort when the whole area started to move. We could see dust rising all over areas of the city but they did not seem worried at all and just pointed to the sky. There was considerable damage in the Hindu Kush some 450 kms to the north of Kabul. This first large earthquake resulted in a huge rock face sliding down into a valley and blocking the local river. The lake that was forming would clearly become a hazard very quickly and the water down stream was effectively cut off. A variety of solutions were put forward but in the event were solved by the locals who made a channel for the water to pass. The second quake caused a lot of damage and, whilst ISAF and the non-governmental organisations helped where they could, it was clear that external organisations could not solve all the problems of Afghanistan.

The Germans agreed to take over the Brigade HQ from 16 Air Assault Brigade which saw the departure of the HQ staff together with its Geo personnel. This resulted in a situation whereby the German Lieutenant Colonel worked to an SO2 in HQ ISAF.

As the HQ became more established and the new building was nearing completion, the date for full multinationalisation was reached. This saw the influx of members from nineteen different nations to form the new headquarters. Many members of the original deployed troops were replaced and returned to the UK but were no volunteers to take over the HQ ISAF Geographic function and so the Section remained until mid May. During this time the Section had a steady flow of work that resulted in the generation of a variety of different digital products. A 'mines' database was set up using data from the local UN Mines Action Centre and used to produce the force protection mines maps.

Conditions in the HQ complex became much better as the weather and infrastructure improved. The food in the cookhouse changed from "boil in the bag" to fresh and life became generally more comfortable. The multinational influence became more apparent with a good supply of French wine and Italian espresso making life somewhat more bearable!

As with any deployment, we had our fair share of visitors ranging from the Head of the United Nations to national politicians. One politician visited Kabul and on his return to the UK stated that he had had the opportunity to go on patrol with UK Troops in Kabul. As with most politicians he told no lies however he failed to mention that whilst he may have had the opportunity, he chose not to take it and went shopping instead! The most memorable visit was from US General Tommy Franks who was confronted by all the HQ staff officers lining the tent where he came in. He proceeded to shake hands with them all. The first officer said 'Good morning General' which was returned with 'It is and I am'!!

As with any deployment, there were a number of lessons to be learnt. One such lesson is that you must keep the 'big picture' in mind even though you are experiencing extreme frustration as when waiting for the vehicles to find a place on the aircraft coming into theatre. In this case, it turned out that this operation evolved into the biggest air move since the Berlin Airlift - a fact that put our problems into perspective. Another lesson, re-learnt on most operations, is that once again it has been shown that the most important geographic product is the paper map without which troops cannot conduct their business.

In mid-April we were fortunate to make our escape having been relieved by personnel from 42 Engineer Regiment (Geo) led by Captain Hamish McCarthy. They, in turn, had the pleasure of handing over the geographic responsibility to the Germans which allowed all the UK geographic personnel to be withdrawn from Afghanistan.

I will finish with a few points I have gleaned from this deployment. Kabul has changed for the better since the Taliban have departed and there is a noticeably positive difference in the city. ISAF have done a great deal of good work both in providing stability and security but one of the major benefits has been the influx of funding to the city. Many schools have been renovated, roads have been repaired and the people have been encouraged to help themselves. The people have welcomed ISAF and I firmly believe we have made a difference. ISAF has only touched the city of Kabul and there is still a whole country to bring together and it will be up to the Afghan government that ISAF helped establish to achieve this. But, we should remember that Afghanistan



*Just before the earthquake with Northern Alliance Members*

is a huge country with many different ethnic groups who may never live in total peace but hopefully will not resort to long periods of war as has been the case over the last 20 years.

Finally I must comment on the ability of the British Armed Forces to succeed in their mission, wherever and whatever that may be. I have witnessed the deployment of a force with somewhat basic equipment make a huge difference to a local population.....and remember, wherever you go bring back a little memento of your tour. I have several rock samples and two delightful rugs that I know have really been made in Afghanistan!

**John Adlington** joined the Army in 1973 and trained as a Field Survey Technician. He served with 19 Geodetic Squadron working on field survey tasks worldwide, in an instructional post and then with the Special Forces. As technical Warrant Officer with 512 STRE he was responsible for the introduction of GPS into service use, returning from the USA to Hermitage as RSM. After commissioning, John was posted to 13 Topographic Squadron, which included a tour in Bosnia, and then as Assistant Instructor Geodesy in the RSMS. During that time he served in Macedonia and Kosovo. Next to HQ 3(UK) Division and the deployment to Afghanistan after which he took up his current post as SO2 Geographic Imagery in HQ Northern Ireland.

## OPERATION JACANA: THE STORY

By Corporal C Puzey

D-Day, Thursday 21st March 2002. At least it was known to me on that particular day as D-Day, later on it merely just blended in as just another one of the all too frequent false alarms. With long awaited eagerness Deployment Day, now actually D+24 was eventually here, Sunday 14th April. A farewell to my good lady wife and Brize Norton bound we go, via South Cerney's armoury, which is where I had abandoned my rifle some two weeks earlier, on D+9, in one of the many failed attempts to deploy.

Upon arrival at Brize Norton I was greeted by the traditional "Tactical Military Delay" and the smiling faces of the "I'm just doing my job" RAF Police, who then proceeded to rummage through my baggage in an

that was to become all too familiar. The route bore scars of the Russian occupancy in the form of disabled armour, abandoned artillery, mines and trenches from former confrontation lines. All of which brought home the real reason why I had been sent here; this was to be no playground for the Task Force.

Upon arrival at Bagram Airbase the first situation I had to deal with was the huge language barrier, could I understand what these Royal Marines were on about. "Right perce, just drop your rig in the 501 and get yourself some oggin, you'll be living on ship with the Royals. I'm off to the heads, when I get back we'll find your grof then nip down to the galley for some goffers, OK". I decided the best course of action to take was to

stand still and adopt a "my brain hurts" type of expression, and wait for the possible translation into English to follow. Luckily it did in the form of a 'Jack Speak' Aide Memoire, which for the first week or so proved to be the most useful document available.

The first week was spent familiarising myself with the personalities and routines of the Brigade Headquarters, and the operational areas that were to become our "Hunting Ground". This was made slightly more challenging by the fact that what seemed like every other day either the Geo tent, Int tent, Sleeps tent or

Galley tent were to move location. After this comical tortoise phase had settled down and we had moved to our final location, the empire building exercise began. Now with both Geo and Int co-located, the J2 Empire was about to move into warp speed.

Sat 27th April. Only twelve days into my tour and the first letter has arrived, although it came in that suspicious brown official style envelope. It turned out to be very official, it was in fact my posting order, to arrive no later than 22nd March at 42 Engineer Regiment. It had by the looks of all the crossed out address labels on the front travelled most of the way around the world before it eventually found me. The other significant part of this day was H Hour for Operation Goffer, which was to take till the end of the tour to accomplish. Let me enlighten you to Op Goffer, it involves using the cover of darkness, two man raiding parties, command and lookout posts and the eventual improper possession of the Americans theatre supply of canned drinks.



*The Operations Room*

attempt to confiscate any essential items or Gucci gadgets that I had and they wanted. At last after boarding checks, hold baggage checks, contraband checks, hand baggage checks, security checks and pre-boarding checks, we boarded the aircraft. Well, I say aircraft - it was more like an oversized flying MT hanger, crewed by the vodka brothers. But that said, the seats were the most comfy in NATO, and the flight was smooth, at least as far as Baku in Azerbaijan, which is where it stopped. Luckily, it was just a quick five hour delay whilst the vodka brothers disappeared off with a man who fitted the stereotypical description of a "Russian Spy". The remainder of the flight went smoothly and we soon found ourselves safe and sound on Kabul runway.

After a little negotiating I soon acquired myself a Med Rover, Marine Commando Major and a Convoy that allegedly was going to Bagram. The journey from Kabul to Bagram was only 50 km, but due to the conditions lasted nearly two hours, and took in scenery



With the new empire now fully operational, which included a giant vertical version of the Division bird table, covered with mapping and by now several layers deep in heavily annotated sheets of talc. The planning Op now in full swing, with the Brigade Recce Force and 45 Commando Group RM about to deploy on the next mission and things were starting to warm up. For the next week all I saw was maps, talc, my laptop, more talc and occasionally the inside of my eyelids. That said, I did spend two very interesting days with the Brigade Recce Force, giving the Team Commanders Terrain Briefs and Geographic Advice for their missions. The planning was now all done and the Recce Force was in place, the gun line was in and had test fired and the 'infill' was about to take place with the helicopters deploying imminently.

Today was an especially exciting day, as it was one of the Marines birthday. We were not too excited about the fact he was going to be 23 today, more to the fact that GMTV's one and only Lara Logan had been booked to bring the birthday cake along to our party. This sight reduced everyone to a drooling mess almost instantly, and the lucky marine who's birthday it was nearly had a coronary when he got two kisses!

Meanwhile, there was now a sudden lull in the proceedings, all the planning was done, and the operation was under way. This did mean that we now had to provide 24-hour cover, so to the 'camel spider' shift I moved, technically not a camel, nor a spider, but they were still far too mysterious and scary for me. Providing 24-hour cover did mean that we had time to collect 'to death' intelligence and GIS of the new Area of Operations (AO). The next operation was to cover a huge area of vastly different terrain types, which made the planning all the more interesting. As it ended up we had another three AO's to plan, which put everyone under strain. The hard work helped the time fly by and it wasn't long before the 'exfill' was complete.

With everyone back in, the briefings and final planning for the next operation were now at the forefront of everyone's mind. At least, until the Australian Special Forces sent a contact report over the net. A quick switch fire took place; we now had only three hours before the Recce Force and the Commando Group were to commence their 'infill' into literally uncharted territory. This was a frantic time with some very rapid Intelligence and Terrain Analysis but we all made our deadlines and the 'infill' was a success. For the next nine days, whilst the extraction was taking place, we snatched time to re-supply and catch up on loose ends from the last operation. The extraction was a success and it was decided that we would role straight into the next operation with the remaining two companies going

out by road to meet with the extraction team in the new AO.

This new operation, less aggressive than the last three and more overt, would last over thirty days in total. We now had some 'slack' to play with and the Intelligence cycle began once again, this time coming up with some trump cards. It led to numerous arms cache finds in cave networks and compounds in some of the surrounding villages. The photo shows one of the cave networks being blown with all the weapons, which included 19,000 rounds of AAA ammunition, 4,000 rockets, 1,300 mortars rounds and 600 land mines and grenades, still in situ.

I must confess that the thirty days were not all-solid slavery, there was a lull in the battle that just happened to coincide with the England World Cup matches. That said, there were yet more contact reports thrown in to keep our senses heightened and adrenaline flowing. And the J2 'fluttering society' managed to win \$100 on the Grand National and \$100 on the World Cup Final, although the boss kept his winnings very quiet, we suspect to avoid getting the 'wets' in. '



*Destruction of an arms cache*

The operation is now drawing to its end, elements of the Commando Group are still out operating in the AO's, but work here in the Op Jacana Command Post has taken on a different light. Tents that took all day to put up in the sun now merely took 5 minutes to be stripped out, cleaned and packed away. It's been a different tour, nothing like I had expected, in which every day brought new experiences and it has proved to be an extremely challenging and rewarding tour. I can honestly say that I have gained some extremely useful working practices that I can take away and develop into squadron life. But don't get me wrong, I'm looking forward to getting on that plane and leaving all this dust, wind, blazing heat, camel spiders, arctic tents and long hours behind me. But I will miss the lads, practical jokes, spinning the dits, Lara Logan and most of all - Operation Goffer.

## TO PAKISTAN - TWICE

By Patrick Fagan

There was the fabled city of Kabul, away in the far distance more imagined than really seen. Mine was a generation brought up on heroic tales of the North West Frontier of the old India and the Afghan Wars, and here was I high on the Khyber Pass on a fine but very cold January day. It was 1962, and I had been brought here by Noel Odell, famed for being the last man to see Mallory and Irvine on Everest in 1924. In retirement he had taken a post in the University of Peshawar, and was showing me round at the end of an expedition into the Karakoram Mountains of Pakistani Kashmir.

Forty years ago I had been selected as the surveyor on a scientific expedition to the Biafo Glacier region, a little west of the Baltoro Glacier and K2, the second highest mountain in the world. The survey work was simple and will be quickly told, but Pakistan was then just finding its feet 14 years after partition from India, and going through interesting and difficult growing pains. Now again, it is much in the news, and perhaps some thoughts on the changes over these years might be of interest to *Ranger* readers - for I was back there again 35 years later, in 1996.

In August 1961 our expedition traveled out by sea through the Suez Canal, in an already elderly ship used primarily by those who had made their lives in India and were now left behind by history. They traveled to and fro, unsettled in either UK or the newly independent countries, forced to survive on meagre non-transferable funds at each end. It was still the world of the Raj Quartet, or *A Passage to India*. On arrival in Karachi, I was made transport officer, and arranged for a special wagon for our stores to be attached, carefully locked, on the 46-hour train journey that took us north to Rawalpindi.

In those days, Rawalpindi still seemed very much part of the Raj, and we were entertained in a local Officer's Mess, with very smart soldiers being drilled outside (still in English), cricket played enthusiastically nearby, and chilled cocktails served by brilliantly turned out military waiters. Some wives were present, glamorous in their shalwar khamiz. I felt very much at home.

Our Pakistani hosts followed English county cricket, and spoke of shopping back 'home'. They wondered when we British were going to return to run the country - we aren't doing very well ourselves, they would say. The better local hotels were fine, though the few expats tended still to use the clubs dating from the days of the Raj, and the bars were well stocked with alcohol, unlike today. Indeed, there was a brewery in Murree, not far

from Rawalpindi, and I went there to deliver a parcel of theirs that had got caught up with all our expedition goods. I had hoped for a little token of gratitude to our expedition from the brewery, but it was not to be!

In those days there were no roads into Baltistan, that part of Kashmir that we were headed for, and we flew in a twin-engined Bristol Freighter to Skardu, now quite a metropolis and well known to mountaineers and trekkers, but then without motor traffic at all. Here again, in Skardu, we were royally entertained by the



*Rafting across the Indus at Skardu - now there is a bridge*

local regiment, the Northern Scouts, in their tiny but very smart Mess. As the Bristol aircraft had a loaded ceiling of only 11,000 ft, our flight up the Indus gorge beside Nanga Parbat, more than twice as high as us, was stunningly spectacular. But we recalled the huge loss of life there had been on this mountain.

From Skardu it was a 12-day march into the mountains, with close to 200 porters, over the most hair-raising foot bridges and rafting, 4 at a time, across the very swollen and steep rivers. We came across small parties of military, or tribal police, all immaculately turned out in well ironed clothes, and highly polished chapli sandals. The halts were delightful, both at midday and at night, for the porters loved to sing and dance and had amazing energy after a day's carrying. The villages on the way looked well nurtured, though the people were obviously very poor.

My survey work was very simple. To insert stake markers across and along the Biafo Glacier, and to fix the position of these at regular intervals, and to provide plane table surveys for others then to use and plot their own data on. This went pretty well for the most part, but



*Singing and dancing at the midday halt*

as the autumn and colder weather arrived so strains developed within the expedition. The porters walked out, having not been paid, and it soon became apparent that we did not have the food, or perhaps the clothing/equipment/tentage to be able to cope meaningfully through the winter. Our base camp was at 11,000 ft and our work was to take us up to 17-18,000 ft. Our leader proved inadequate, and suddenly left without explanation. The rest of us then decided to cut our losses, and pull out also. It was late December, and the temperature on the glacier had dropped below -40°C. We had a huge amount of help within Pakistan, and caught the next ship going home - after my memorable visit to the Khyber Pass.

Thirty-five years later I was back in the same area, and found that much had changed, almost all for the worse. This 1996 visit was a 'holiday', joining with 2 others on a ski-mountaineering trip in that part of Kashmir. Our journey was to take us from Gilgit to Skardu over 2 of the largest glaciers outside Antarctica - the Hispar and the Biafo. The total distance on foot was

perhaps 100 miles, all over 10,000 ft and over the pass between them at about 18,000 ft. But the weather was appalling and 14 ft of new snow fell on us, so that we took a week longer than planned. The death of 8 on Everest during this same period made world news. Search parties were sent out to find us, fortunately for our wallets only on foot as the weather had prevented helicopters flying for many days.

The Karakoram is famous for being one of the most unstable geological regions anywhere, and we had more than a fair share of avalanches. From Askole, the last village up the valley to K2 and the other giants in the area, we had planned to take a jeep back to Skardu - there now being an unsurfaced track where before there was only a rough path. But there was no jeep, and we learned that the track had been cut by some 30 avalanches over the 50 miles. We would have to walk - in our ski boots. We engaged some porters, but no longer did they sing or dance at halts as before. The radios we heard were all given over to speech, and we never heard music; it was as if the strict Saudi attitude to music being sinful had taken root here.



*High on the Hispar Glacier*

We were anxious to contact our agent in Rawalpindi, to let him know we were safe, and to try and get him to reschedule our missed flight home. We called on the local army section but they were pitiful, clad in worn out gym shoes and expedition cast-offs, their morale clearly very poor, their tents repaired with polythene sheeting and their radios not working. No help there for us. Such a contrast to my previous visit, and this was not far from the disputed Kashmir border where war continues high in the mountains to this day. This unit might be untypical, but it made a marked contrast with what had been.

Skardu has grown enormously, and now had traffic jams and attendant noise where only animals had been 35 years before. Clearly commerce has grown, but women were now nearly invisible and certainly not to be met socially - or, for the most part, even spoken to. They had to be veiled, and I was told that girls no longer went to school except amongst the elite families in the major cities. Back again in Rawalpindi I found the same hotel that I had visited in 1962, but no longer did it - or any other place - serve alcohol. The

Catholic Church I had visited was now closed, too. It seemed that the iron grip of the mullahs had taken hold, and snuffed much of the fun out of their lives.

The poor PIA staff had a terrible time crediting us with the value of our missed flights and booking new ones, with their main computer crashing several times. The man who solved it for us over many hours was on his day off, but determined to show us another side of Pakistan. He was charm itself, and invited the 3 of us to stay with him and his family should there be any further problem with the flight. "We love to have visitors, and would like many more tourists to Pakistan", he said - and clearly meant it. But, though we are not all alcoholics, it is hard to see a flourishing tourist industry under prohibition, and, mountains apart, Pakistan got a raw deal in partition with almost all sites of tourist interest being in India.

I found my return visit quite depressing. Pakistan has many delightful people still, but they struggle under a system that seems set to go backwards while most of the rest of the world goes forward. I suspect that I shall not visit it again, and I'm sorry about that.

**Patrick Fagan** was commissioned into the Royal Engineers in 1955, and started his survey career in 1961. He was surveyor on expeditions to the Karakoram and to South Georgia, and from Aden he led the party that did the border survey between Oman and what was then the Trucial States. After tours in BAOR and Barton Stacey, he obtained MSc in photogrammetry at UCL before spending three very happy years with the OS in charge of air surveys. Successive tours at Feltham led to tours with NATO in the Netherlands and then Belgium before returning to Feltham for the last time in 1985. He retired as Director General Military Survey in 1990.

# MILITARY GEOGRAPHIC INFORMATION IN THE 21<sup>ST</sup> CENTURY

By Lieutenant Colonel JF Prain RE

## Introduction

Technologies, such as the aeroplane and the tank, which saw their birth in the early part of the last century, are still vital parts of today's military arsenal, though they have evolved considerably over the past 100 years. Military mapping too has developed over this period and it is worth reviewing how it is providing the Armed Forces of today with the vital geographic information they need.

The paper map has been the traditional medium for depicting information about topography ie: the natural and man-made features on the earth's surface. The Forces of the 21st Century now also seek such information in digital form for use within command and control systems, along with smart weapons and the platforms that carry them.

For most activities, the Armed Forces use topographic maps and equivalent digital products in the scale band from town plans to 1/250,000, and associated air charts at 1/500,000 and smaller.

## So why do the Armed Forces need military geographic information?

In common with many aspects of life over the past 100 years, military doctrine and technology are evolving in a continuous spiral. Military commanders today seek information superiority over their opponents. They need to know more than their adversaries; equally importantly they need the ability to extract the vital elements of information in order to be able to act quickly - so called decision superiority. At the same time commanders want to execute precision attack ensuring forces and weaponry are used to maximum effect. Carpet-bombing has been replaced by cruise missiles seeking specified windows and deployed ground forces can no longer be sacrificed; today's infantryman is highly valued, being equipped with a good rifle, a personal radio and a GPS receiver. Commanders also require their Forces to be able to move rapidly throughout the theatre of operations - so called operational manoeuvre. Thus the demand for geographic information that is accurate and provides the required level of detail is still paramount.

Effective use of terrain is still vital to most operations - classic examples include Harold's selection of Senlac Hill and Wellington's choice of Waterloo. A map, or in common parlance "terrain visualisation", provides prior knowledge of the ground as part of the military commander's overall planning and decision making process.

All those involved in the formulation and execution of a military plan need a comprehensive picture of the battlefield. This shows not only terrain information but

also superimposed military information. Included in this is the commander's battle plan with objectives and timelines linked to terrain features, details of the enemy's estimated disposition, the layout of minefields, and numerous other themes. Up to now, such information has been overlaid on the paper map by use of layers of clear plastic marked up with some grease pencil or felt pen. These composite layers of information are euphemistically known as the birdtable. Unfortunately it is not easily replicated nor disseminated. However in the digital era such fusion of information can be done more effectively on the computer screen with standard application software, generating a common view of the battlespace (see figure 1) linking the environmental components of land, air, sea and sub surface together with the operational components. Thus not only the commander but also all those engaged in an operation will know what is going on.

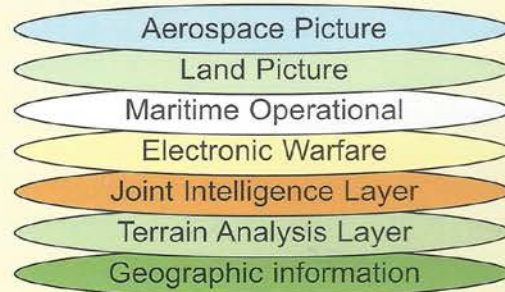


Fig. 1. Common operational picture

The science of processing all this information is known as Intelligence Preparation of the Battlespace (IPB) (or of the Environment (IPE)) which takes terrain information together with seasonal aspects - crops, foliage, soil and weather, to determine likely 'going'. This is assessed in conjunction with enemy tactics and intelligence relating to his likely intentions. This process highlights the commander's key decision points within the planning cycle.

However, no matter how good the geographic information is, commanders at all levels still need to physically see the ground for themselves, if the situation allows. The blur between a virtual world and reality can be dangerous. Neither the paper map nor its digital equivalent can be 100% accurate and commanders must bear the consequential operational risk.

That said, effective mission rehearsal can be achieved with accurate data. Air crews regularly train in simulators. For some scenarios, generic simulated data is appropriate. However the rehearsal of a real task, such as landing on a specific airfield or penetrating a

particular building during a commando raid, requires near truth. Today, soldiers supporting the police in Northern Ireland are spending less time on foot patrol and are being increasingly held in reserve on the UK Mainland. The downside of this is that they are losing 'the knowledge' - that intimate understanding of their local environment. This can now be partially rectified by modern computer modelling based on real images geometrically fused to create a faithful 3-dimensional model.

Geographic information is now critical to an increasing number of weapons systems and platforms. Cruise missile mission planning systems need a range of data sets including geographic information to select the optimum routes leading to their targets. The missiles themselves need a terrain model as part of their on-board navigation system. Air defence and radio network management systems too require terrain models.

Finally, having established the unrelenting requirement for geographic information, it is necessary to understand in what parts of the globe the UK will have interests. With the end of the Cold War, the concept of fighting World War 3 on the North German Plain has been replaced with a Defence Policy based on global reach. Whilst soldiers, bullets and rations can be used anywhere, maps of Germany are useless in the Middle East! The challenge for military geographic planners is to accurately anticipate where UK Forces might deploy and to expend effort preparing suitable mapping of areas where this is most likely, as well as being able to respond rapidly to the unforeseen.

**So how is the world of military geographic information changing?**

From a user perspective, there have been some major developments in the nature of the map, which continue today. Maps are now based on aerial imagery either as the source or as the map itself. The use of balloons and aircraft in World War 1 gave the military commander a new view of the ground both immediately below and most importantly over the horizon. One of the first applications of aerial information was for the production of trench maps. More fundamental was the use of pictures to update existing mapping. The aerial photograph or image provided a wealth of information which could be exploited back on the ground in the comfort of the office as opposed to the exposed position of the surveyor on his hill top. Overnight, plane tabling was replaced by the exploitation of aerial imagery, which covered the terrain more completely and more simply. As well as being a rich source of information for

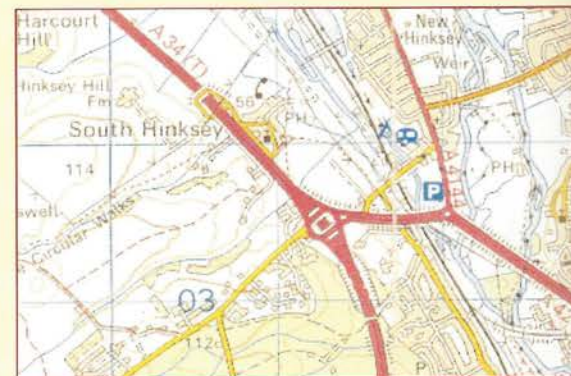


Fig. 2. Image and line maps - Crown Copyright reserved

the cartographer it is also a rich product for the end user. With geometric corrections applied, through a process known as ortho-rectification, such imagery can be turned into so-called image maps, which are preferable to standard line maps in certain circumstances (see figure 2). The pros and cons of these two map types are numerous and include the temporal advantage of the image map versus the interpretation advantage provided in a line map.

World War 1 also saw the development of a military grid reference system introduced in order to simplify the mathematics associated with correcting indirect artillery fire. (An early example of metrication was the use of a 1,000m grid on 1" to 1 mile scale maps!)

The grid reference system is based on Cartesian co-ordinates which are true for a flat world. Accordingly such systems can only be applied in localised areas. They must be re-orientated regularly in order to keep Grid North in sympathy, within several degrees, of True North - the line of the meridian or longitude. There is also the complication that the latitude and longitude system is itself based on a variety of local origins or datums. These inconsistencies can be of the order of



The Coronation Parade, Kasferit Airport, Egypt (1952) - including 42 Survey Engineer Regiment - do you recognise anyone?

several hundreds of metres - not a problem for the grand strategist using the Times Atlas; however the pilot seeking to get his cruise missile into the correct window needs a consistency of co-ordinates nearer to the 1 metre level.

The solution to a standardised global co-ordinate system has come from US military navigation satellite programmes including GPS. The underpinning positional geometry is based on the World Geodetic System (WGS). WGS and a universal grid reference system based on the Transverse Mercator projection (UTM) are the preferred military operational datum/grid systems; that said many map products, even in UK, do not match this. Under the UTM system, grid zone changes occur along predefined meridians. By chance these occur through the island of West Falkland and Kuwait City - two places where UK Forces have recently been deployed! This apart, today's Armed Forces now have a consistent co-ordinate reference system supporting mapping and navigation aids.

Apart from the wider use of aerial imagery and the development of a universal co-ordinate reference system, little has changed in terms of the look and feel of military mapping over the past 50 years. The size of the map as a piece of paper and the preferred scale have remained fairly constant. Operations today are still conducted on the 1/50,000 scale maps as a norm. What is missing in maps at this scale is data which impacts on cross country movement and low flying aircraft including helicopters. The airman seeks details of potential hazards, navigation and target aiming points. Terrain analysis is the science of predicting how one's own forces or those of the enemy will traverse the terrain - the goings, and is part of the IPB process mentioned earlier. This requires interpretation skills and, more importantly from a producer's perspective, the

requirement for additional data on features which hinder cross country movement such as tree spacing, tree diameters, river banks, edges/steps etc., to be captured. Certain countries acquire this information as part of their national mapping specification.

The advent of digital geographic information and suitable exploitation tools now enable users to visualise the terrain in near 3 dimensions (see figure 3). This new capability allows commanders to gain a far better understanding of the terrain than before - a move towards the virtual world. This is a step change in how users can understand the lie of the land compared with the complex task of interpreting the contours and drainage patterns depicted on a 2 dimensional map. In its simplest form, near 3-D terrain visualisation involves draping the line map or image map over the associated terrain model. The increasing sophistication of the application software enables the viewer to see the terrain from different angles and fly through the model.

As well as exploiting visualisation tools, the Forces are realising the power of geographic information system (GIS) applications, which can hold the time and space elements of information. Engineer intelligence and targeting dossiers are but two activities now becoming more effective through the use of a GIS.

Another benefit of digital data is that seamless layers of geographic information may at last herald the end of the Murphy's Law that all military campaigns take place on the corner of 4 map sheets!

#### **The changing military geographic information business.**

Whilst the Ordnance Survey (OS) was originally set up to map the Realm for military purposes, it now supports all UK governmental and commercial needs and is no

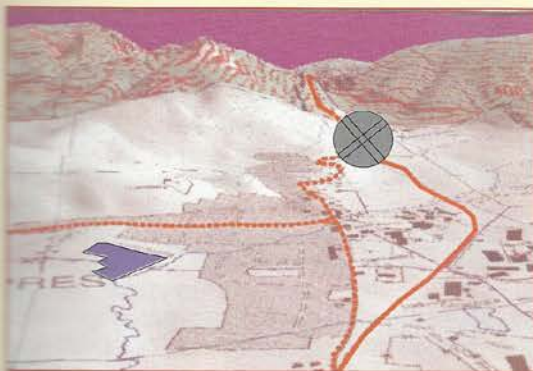
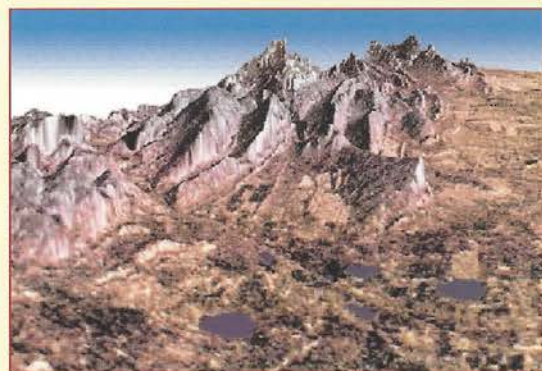


Fig 3. 3D visualisation



Photograph by Campbell Gilbert a former National Service Military Surveyor - and excused boots on the day!

longer owned by the MOD. Its counterpart organisation is the Defence Geographic and Imagery Intelligence Agency (DGIA) which has the remit to provide UK Defence with the geographic information it needs to plan, train, mount and conduct operations effectively worldwide. This is done by a combination of acquisition of suitable products from third party sources, including the OS, and of production.

Through a judicious programme of acquisition the DGIA maintains a global collection of geographic information sources including current mapping, aerial and satellite imagery together with text sources such as travel guides. Even the hire car map is useful as it contains street names and buildings information - information not obtainable from an aerial image. Acquisition of an existing product, providing it is of suitable quality, is the most cost effective solution to satisfy mapping needs of the Armed Forces. The major proportion of products used by UK Defence is acquired from other parties. Mapping of the UK is obtained from OS whilst mapping of Germany comes from the DGIA's equivalent organisation. The cost of acquisition is offset by the exchange of UK generated products or services.



Fig. 4. Unmanned and Tornado reconnaissance aircraft

Under burden sharing agreements nations contribute to both regional and global map series.

When existing mapping is not available or out of date then UK Defence needs the capability to generate suitable geographic information. The core process is based on extracting data from stereo overhead imagery. In addition to using opportunity pictures, the systematic use of stereo imagery, developed in the Inter-War years, has been the standard source of the map maker. The use of stereo photography continues today albeit that the images are taken by newer platforms and with data recorded digitally, in some cases being transmitted back in near real time. The move from optical-mechanical plotting instruments to computer systems has also meant that the 'near vertical' criteria for the capture of imagery is now less critical.

Currently most mapping products have been generated from optical or electro-optical sensors mounted in both aircraft and satellites (see figure 4). However the development of radar and multi-spectral band sensors

offer exciting possibilities for the map maker. Radar can penetrate cloud and darkness whilst multi-spectral data sets assist in surface material classification including the discrimination of crop type. It would be of tactical interest to know if in 6 months time a crop will turn out to be 12 cm high sugar beet or 2 m high sugar cane! As well as exploiting traditional sources of information, the Defence community is recognising the wider utility of its intelligence and surveillance sensors. Information gathered is now being shared more widely than occurred in the past. Thus geographic staff are gaining access to complementary sensors such as those carried by the Tornado fighter in reconnaissance mode. Data from these can be usefully used to update existing mapping.

In order to provide the geometric framework to which the 3-dimension model created from stereo imagery is fitted, a network of ground survey points is required. This is now obtained by using GPS receivers designed for geodetic work. This technology has revolutionised land survey operations and has almost completely replaced the electronic theodolite and electronic distance measurers such as the tellurometer. The amount of actual ground survey needed is dependent on the amount of data obtained about the position and the attitude of the sensor at the instant of exposure; this data is also obtained nowadays using GPS.

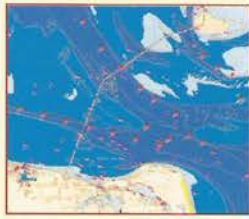
Over the past 30 years, production techniques have become increasingly digital. Digital cartography automated the actions of the cartographer extracting and storing data as points, lines and polygons. The structure of this data has gone through several stages of evolution in order to make it more smart based on vector format. The ultimate goal is the provision of a seamless database of geographic information which can support geographic queries. Amongst the numerous challenges associated with managing vector data is the time and effort needed for extraction and attribution of the data. One of the benefits of this format is that it is based on the centre line of linear features such as roads and is now of comparable accuracy to that of GPS and is certainly more accurate than its cartographic predecessors. Having been extracted and attributed, this data can then be depicted with suitable symbols.

Complementary to the vector format is raster and matrix. The benefit of the raster format is that digital mapping can be produced relatively quickly, meeting many of the requirements of today's Forces. The downside is that the size of the files means that extremely high bandwidths are needed if such data sets are to be effectively disseminated on-line. The third type of format relates to terrain data which comprises a regular matrix of posts which define a 3-D surface. Such a surface is generated from stereo imagery, both optical and radar. A recent NASA Space Shuttle mission has collected radar data covering a high proportion of the earth's surface from which a coherent world wide terrain data set will be generated.

Turning to outputs, in spite of being in the digital age, paper products remain the principal media for the Armed



Imagery Data



Hydrographic Data



Vector Data



Terrain Data

Fig. 5. New Geospatial Information Concept

Forces. Paper is robust and works with a bullet hole in it. Hence whilst much of the production process is digital, the end stage still involves printing. This is currently undertaken at static base production facilities or from mobile systems using lithographic printing technology. So far the printing industry has yet to develop robust technology based on that of the photocopier - but this will come. The time may come when the end user prints a highly localised map on demand on an A3 plotter located in the back of his vehicle. These can be done as frequently as necessary and saves soldiers and air crew having to cut up or excessively fold maps to suit their needs including being able to fit into a pocket!

The need of mapping agencies to be more responsive in the post Cold War era has forced a review of the costs of cartography. Consequently greater use is being made of imagery. Primary imagery needs to be reprocessed so that it has true geometry, a principal feature of a map, through a process known as ortho-rectification. Increasing amounts of geographic information are now produced on warning or just in time, rather than just in case. An evolving concept being adopted by UK Defence and allies is for likely areas of interest to be mapped at a scale suitable for operational planning (1/250,000 scale). The data sets (see figure 5) will comprise terrain model, rectified imagery and a vector layer. As the campaign develops the areas of tactical interest will then be densified becoming more consistent with the content of conventional 1/50,000 scale mapping. That said, existing mapping will still be both acquired and produced, and will complement these other newer data types.

Working with allies to reduce the cost of generating new information sets remains a major theme of the military geographic information business. This requires international co-operation to jointly sponsor certain product lines and to adopt agreed standards governing information exchange and mutual exploitation. Not

surprisingly, this whole business requires highly specialist military and civilian analysis and production staff.

To provide valued added services military geographic staff deploy in support of operational forces (see figure 7). Using more advanced GIS and visualisation application software as well as mobile printing systems, these specialists perform a series of important functions including updating geographic information databases with locally acquired information and producing theatre-specific map-based products.

### The challenges for Defence

Whilst the mapping community has the responsibility for developing digital geographic information sets, there are certain aspects of the business that require a Defence solution.

The distribution of paper mapping and digital data on hard media such as CD-ROM remains a logistics issue handled in the UK by geographic specialists, a process envied by many NATO allies. However there are challenges when it comes to embracing e-Business and the on-line dissemination of geographic information. Whilst the producer agency continues to exploit the digital revolution, Defence has yet to provide suitable bandwidth to support the dissemination of such information over both static and mobile communication networks. Whilst the telecommunications industry can provide the technology, the scale of investment for UK Defence is immense and must be balanced against other competing equipment programmes. When high bandwidth communications are established, the geographic specialist deployed in a theatre of operations will have access to a wider range of information sources and will have the ability to pass tasks back to the UK base for processing. This may reduce the need to deploy large teams of geographic specialists with their associated equipment.

The aspiration of the producer community is to support a geographic information Push and Pull environment. Users can pull information they need directly from a suitable warehouse in support of routine activities, knowing that in a crisis, they will be pushed data they need thus ensuring a common picture of the battlespace is maintained. However there are a number of dangers associated with working in the digital age. Ensuring the correct versions of the information sets is the first. Then there will be anarchy if end users have too much freedom to tailor their own products thereby undermining the principal of interoperability. Monitoring and advising on the use of digital geographic information to ensure the right data is being used in the most effective manner, a function known as Information Management, requires effort if it is to be effective.

### In summary

Across the spectrum of activities undertaken by the Armed Forces, there remains the paramount requirement for timely and accurate fusible information about the



geography of the theatre of operations to support decision superiority and to act swiftly, with surgical precision.

The Armed Forces are seeking increasing amounts of digital geographic information in increasingly sophisticated formats in addition to paper-based products. This reflects the relative robustness and simplicity of the map compared with its computer counterpart. Users are becoming increasingly aware of the benefits of a digital environment supporting the pull of information on an as required basis together with the ability to visualise the terrain and to fuse this with other information sets within a GIS.

Whilst in appearance maps may seem to have changed little over the past 50 years, there have been significant developments in military doctrine and in concepts for the exploitation of geographic information. There have also been developments in digital production methods and a greater standardisation of the co-ordinate reference system. What is about to change is that resources no longer permit the luxury of obtaining and producing geographic information to the required levels of accuracy and density in advance of operations that can be anywhere around the world. Provision on warning will focus effort on generating the framework of strategic information, which is subsequently fleshed out in areas linked to tactical operations.

The move from products to information still requires adherence to standards in terms of exchange, scale and depiction in order to ensure interoperability between participating units and allies, and to simplify training in interpretation skills.

High bandwidth communications are still the key element in ensuring all combatants have a common view of the battlespace based on the base layer of geographic information. This requires major investment by Defence.

However, even in the digital age, a paper map is still required though it may not be a large sheet printed at source; instead a more focussed product generated locally.

**James Prain** joined Military Survey in 1991 and is currently serving in the MOD as the SO1 Equipment Capability ISTAR. He follows his father Tony Prain and great uncle Sandy Prain in the military surveying business. James has previously served on the staff of the Headquarters of the Defence Geographic and Imagery Intelligence Agency, the Royal School of Military, at JHQ and with units in Germany and with the UN in the Balkans. He was the recipient of the 1993 Field Survey Association prize and is the official DGIA representative on the DSA Council.

## THE FUTURE OF ROYAL ARTILLERY SURVEY

The spring issue of *Ranger* made mention of the publication in May this year of a revised Royal Artillery Navigation Policy which would then be the subject of an 'official' article in this edition. However, the new Commander Force Development, Colonel David Challes (also the official Royal Artillery representative to the DSA) has decided to carry out a further review of the draft before proceeding with publication. It is hoped that a definitive answer to the provision of navigation, fixation and pointing for the Royal Artillery will be available for all to see in the next issue of the journal.

Meanwhile, as ever, surveyors of all 'breeds' have opinions on everything that impinges on their business. Hence we are, after all, able to publish an article on the future of RA Survey - only this one reflects the personal opinion of Sergeant Jason Cartwright, currently PSI Survey with 101(N) Regiment RA(V). It is a view of the problem as seen from the 'theodolite level' and is well worth the read. By way of a footnote to Sergeant Cartwright's article, we also publish some comments on the article from Major Phil Maye, until recently SO2 Doctrine and Plans at the Geographic Engineer Group and previously the Senior Instructor at the Royal School of Military Survey responsible for GPS training.



*How will the geo data be provided to the guns in the future?*

# THE FUTURE OF THE ROYAL ARTILLERY SURVEYOR: A personnel view

By Sergeant JT Cartwright RA

*"Surr'n't, why do we have to run around all over the place, carrying all this kit, when we've got two GPS in the wagon?"*

Gunner Kevin Mills - Kosovo - May 1999

## Introduction

What of Gunner Mills' thoughts in Kosovo, undoubtedly echoed by other RA Surveyors before and since, even though in 1999 'first generation' Global Positioning System (GPS) was not necessarily the perfect answer to military survey in terms of absolute accuracy and guaranteed dependability? Before the advent of the GPS and other technological wizardry, the value of those slow, excruciatingly time consuming, often very complicated survey tasks was often spurious and never did quite 'square' the time and efficiency circle.

Now, just three years later, the pace of technology has produced reliable, readily available, cost effective and easy-to-use GPS equipment of the required accuracy and consistency. Gunner Mills' question deserves a proper response even though Survey Party prayers for corporate release from endless 'schemes' of indeterminate value might be akin to turkeys voting for Christmas, however little they might realise it.

So, what is the future role of the RA Surveyor? Indeed, is there any further need for Surveyors, or even for Conventional Survey? Can't any Tom, Dick or Harry now operate an "off the shelf" GPS, available on the High Street, to bring in sub-metre fix and accurate orientation in the field anywhere in the world? What does the future hold for Gunner Mills and his fellow RA Surveyors?

## General

In order to discuss this, we must consider the enduring requirement for survey and the past and present role of the Surveyor. Essentially, this is (and always has been) to carry out the process of determining and recording the relative position of points on the surface of the Earth, thereby achieving the four aims of Survey $\hat{\circ}$ , as follows:

- To permit the effective engagement of targets by unobserved fire.
- To enable a number of Guns or formations to concentrate their fire onto a particular target.
- To reduce the number of adjusting rounds required for observed fire.
- To enable locating equipments to produce target data in the form of accurate locations of enemy weapons and/or to adjust our own Guns

onto selected targets.

Like many 'aims', these were carved in tablets of stone many years ago, in fact in another era before the so called Revolution in Military Affairs, and might well be worthy of revision and additions.

## Basic Principles

Nevertheless, regardless of past changes in techniques and equipments, the tried and tested basic principles of Survey, proven over the years, remain sound, relevant and immediately applicable to all levels of Survey. These are:

- The maintenance of control over all individual and interlinked Survey tasks.
- The achievement of optimum accuracy and consistency, so far as equipment will permit.
- Rigorous application of independent checks throughout all work.
- Revision.



*A half-section of Gunner Surveyors on the zone change in Hungary.*

## The Development of Survey

If we are to make sensible judgements and consider alternatives, then we should at least understand the current RA Survey system and its evolution. Generally speaking, it has gradually developed from a system using separate instruments, through Electronic Total Stations (ETS), to the Global Positioning System (GPS), which is increasingly in use today.

**Survey Instruments:** Until the early 1990s, theodolites were used to measure angles. Devices such as the MRA5 and metal tape measures, together with processes such as sub tense, were used to measure distances.

These instruments and routines were accurate but often time consuming. MRA5 was also at times unreliable. Steel tapes were adequate at the time and, for short distance measurements only, they can still be used today.

These instruments, and MRA5 in particular, came under increasing criticism when they proved patently unable to respond to the dynamic environment of the modern battlefield.

**Survey Processes:** The choice of available survey routines such as triangulation, trilateration, various traverses and sub tense have not been superseded nor radically altered despite the change to ETS although this equipment has considerably reduced the time required to complete these processes.

**Global Positioning System:** GPS was invented by the Americans and introduced into the British Army in the late 1980s. It proved extremely successful during the Gulf War, gaining immediate popularity both on account of its novelty and its ability to produce instant answers in the badly mapped, featureless, desert environment. But in those days, despite universal Command and Gunnery Staff ecstasy at its appearance, it was only a fairly accurate fix production and navigational aid and would only function properly under favourable conditions, being susceptible to atmospheric and, of course, non-availability of satellites.

Today 30 orbiting satellites give ample worldwide coverage to support GPS and it is now considered to be a quick, readily available, fairly reliable, system, accurate to nine metres Probable Error.

**Differential GPS (DGPS):** DGPS is the very latest satellite supported Survey equipment. It is being issued at the time of writing and training courses have only very recently begun. The DGPS system, known as 'Lightweight Artillery GPS Enhanced Receiver', enables the Surveyor to post-process GPS data and to compare it with a known datum to produce fixation to sub-metre accuracies. LAGER can also produce fix without comparing it to known datum, though this is more time consuming. This now makes the RA Surveyor far less dependant upon Royal Engineers Surveyors and enables the RA Survey Troop to densify an area in fairly short order.

**Current RA Survey Equipment:** Currently, at RA Survey level, the Leica T1100 and TC1100 theodolites are used to produce fixation and orientation. These instruments are Electronic Total Stations, ETS, which measure angles to an accuracy of 0.001 mil and distances to +/- three parts per million. This is a great step forward and Surveyors can close their schemes

with errors in fixation of only 1/100,000 - an almost impossible achievement 10 years ago.

This is partly due to reliable distance measuring devices. The TC1100 reliably measures distances up to 5km and the DI3000 Distomat produces accurate answers for distances in excess of 10 km. Such long distance measurements permit the Surveyor to work his way rapidly (and happily) across country, unlike his predecessors who, in days of yore, trilaterated their way slowly (and unhappily) across endless frustrating miles, more often than not discovering that events had overtaken them and that their results were too late.

**Ancillary Equipment:** Some items of equipment have stood the test of time. The beloved Beacon Banderole Set dates back to 1924 and is still used for observations over 20 km. The Lamp Signal Survey can be seen from some 50 km distance at night and a variety of flags, skirts and scales give sterling service and make life a little easier.

### The Conundrum



*Explaining differential GPS to a Staff Officer*

So what do we do now? Should we render Gunner Mills' trade as an RA Surveyor obsolete? Has technology overtaken the Surveyor to the extent that batteries and regiments can fend for themselves using their own GPS or LAGER systems? Can the Sappers be relied upon to back them up with timely 'theatre survey' when mapping is bad and datum points scarce and, if not, can we accept the loss in Survey accuracy? Or should we resist the constant tug on our purse strings, irrespective of the perceived logic of the argument, and insist that sufficient RA Survey cover must remain, in some form at least, especially since Leica and Distomat have cut response times considerably?

### Operational and Other Tasks

In fact, one might be surprised to learn just how much call there has been, and still is, on the services of the RA Surveyor, since 1990. Since the Gulf War, Gunner Mills and his colleagues have been very busy in Bosnia and Kosovo, providing accurate survey data for HALO and producing bearing pickets for gun artillery use. They additionally provided survey support in conjunction with plans for the possible withdrawal of 1 CHESHIRE from UNPROFOR in 1993. Other tasks, both current and historic, regular and ad hoc, include:

- The provision of Bearing Pickets for 105mm Light Gun in Kenya.
- The provision of Bearing Pickets for 155mm AS90 in Canada.
- The provision of Bearing Pickets for the AMF(L) in Norway.

- Survey support to Locating Batteries in Hungary and Germany.
- The provision of accurate Survey for MLRS firings in UK, particularly at Otterburn, Kirkcudbright, Eskmeals and Castlemartin Ranges.
- Assistance to RE Surveyors with various tasks.
- The production of calibrated ranges to facilitate the calibration of Challenger Tank Laser Range Finders.
- Assistance to BATUS in producing Safe Target Areas for Danger Close practises.
- The production of fixation points in some REME Workshop areas for equipment calibration purposes.

Admittedly some of the above tasks may not be repeated and some might have gone ahead with end-user GPS-originated Survey, but such a move would take away the guaranteed 'start point' accuracy which is so vital a baseline for much of our weaponry.

Yes, we have accurate GPS; Yes, both AS90 and MLRS have their own internal navigation system fixation systems; No, it might not matter if Danger Close Safety Arcs are a mil or two 'out'; and No, we are not obliged to answer RE and REME calls for help. But where do we now start to compromise? Is it really a case of "Gunner Mills - you're out!"?

### The Decline of the Survey Section

Well, we have already gone some way along that road! Surveying has always been considered a vital art and Regimental and Battery Surveyors proliferated within the Royal Regiment during the two World Wars. Terminology and titles have changed over the years and RA Survey capabilities have already undergone severe pruning to a point where the 'art' is now of questionable sustainability. At the start of the 1990s, Regimental Surveyors existed in the four Locating Batteries, (Q, 22,156, 57), and were found in three Regiments (5, 32 and 94). This strength has been reduced by slow degrees until only one troop of Regular Surveyors remains, in 5 Regiment RA in Catterick, with a Section of Volunteers in 101(N) Regiment RA(V) in Newcastle. That is a significant reduction of capability, even against the wider background of Defence Reviews and the disbanding of units.



*Students on a Basic Survey course.*

### Equipment Limitations

Even modern survey equipments have their limitations:

- Both DGPS and GPS systems are reliant upon low power radio waves, the frequencies of which can be found on the Internet or in your local library. The system can be locally jammed with unsophisticated, easily distributed radio transmitters, at a surprisingly low cost, (around £1.50 per jammer).
- If, for whatever reason, GPS is 'down', the RA Surveyor will have to produce fixation and orientation using conventional methods. This will be absolutely critical in theatres which lack an abundance of firm map detail.
- As we become more reliant on GPS, whatever the nature of the conflict in which we become involved, it is conceivable that the GPS 'user

segment' and the 'space segment' will become 'high pay off' targets. Even some gun fired artillery shells can now produce an electromagnetic pulse, capable of disabling either the 'user' or even the 'space segment'.

- It is the opinion of many that even in asymmetric warfare, a technically inferior enemy could seriously disrupt our use of GPS through the simple control of a transmitter

(i.e. radio station) set onto either the L1 or L2 frequency, thereby denying use of GPS in that battle space. The possible nature and deployment of such transmitters varies widely, from small devices dispensed from artillery rounds or missiles, to helicopter or aircraft mounted transmitters which could deploy rapidly and deny GPS to the user at the most critical moment.

Well, where does that leave us? Is it really "Gunner Mills - you're out!"?

### Possible Options

The consequences of dispensing with the services of Gunner Mills range from the militarily unmanageable and barely acceptable to the highly risky:

- We will become wholly reliant upon outside agencies, chiefly the Royal Engineers' Geographic Engineer Group, to provide the Royal Artillery with Datum Points. In so doing we must accept their frequent non-availability in this prioritised World.
- Our ability to produce independent, accurate, 'start-point' data in any theatre will be lost.

- Other Arms, even the Sappers, requiring ad hoc Survey will not be supported.
- The job of producing fixed Survey data in peacetime is contracted out to a commercial provider and we accept the cost, the accuracies and the reaction times of the civilian market. Production of Survey on operations remains civilianised but becomes more problematic and certainly more expensive.
- Accept the military risk of becoming GPS dependent and declare that we do not really require experts to provide us with Survey data. We place the fixation and orientation challenge fairly and squarely in the lap of the regiments concerned. Give them the best equipment available, allow them to task and train Surveyors within their own ORBAT as an SEQ.

### Conclusion

There has been much debate as to the future of the Royal Artillery Surveyor. The main reason for this is simply a funding issue. GPS is seen as the way forward but I believe that it is very dangerous to rely on a single system to produce our fixation and orientation. Where would we go when problems happen if our experts are gone? Complicated issues like transformation of coordinates and change of grid are beyond those untrained in specialist survey. Who do we go to in order to calibrate our equipments if there is no local BP data available? You cannot calibrate a Gun Laying Positioning System (GLPS), the north seeking gyro and range finder equipment, with another GLPS. The RA Surveyor has the depth of knowledge on these matters to find a solution to most problems. It is all well and good to say GPS is the definitive answer, but what happens when things go wrong?

It would be interesting to see a brigade, or even a battle group, on exercise in a difficult foreign environment with GPS switched off! Vehicle commanders might find using map and compass a challenging skill, with which they are now less than familiar. There would be a few people scratching their heads trying to work out

how to get accurate fix for their gun position now that the GPS is down. Would we try and find Gunner Mills or could we live with the outcome of firing from map data? The vogue may now be to say that survey doesn't really matter; that if GPS is 'down' we can fire the error out. That is true but in today's climate of peacekeeping can we afford to do so, and can we afford to do so on almost every mission? The ranges of locating equipments have increased and weapon systems will be able fire further distances, therefore using map data our first round may not be in the same area as the target. And what of our GPS dependent ISTAR systems? Is this the way forward all due to cost cutting of a small but expert trade?

Gunner Mills still has a vital contribution to make, and I will happily explain to him why he needs to carry his survey gear up the hillside!

1 Pam 12 Artillery Survey.

2 Bearing Pickets. Bearing Picket, BP, cards are the end product that the user normally sees and they show the fixation of a Survey Point to an accuracy of decimals of a point (usually 0.001 mil or metre). BP Cards are produced by RA Surveyors and used in precedence over GPS. BP Cards can be found on any artillery range in UK and also overseas, typically BATUS which holds 100+. The cards can be used to calibrate equipments such as GLIPS, directors and compasses. An instrument should not be used to calibrate a similar instrument; likewise, an instrument should always be calibrated or checked by (if not an expert) an independent checker and not by the user. A 'self-check' is often no check at all.

3 Transferring the Survey Role entirely to the TA is considered unsustainable due to the length and complexity of the Survey trade courses. It would effectively mean recruiting trained Surveyors who would immediately see the potential for providing their services at commercial rates as opposed to TA rates of pay.

**Sgt Jason Cartwright** was born in October 1971 and joined the Royal Artillery at Woolwich in August 1989. He was then posted to 94 Locating Regiment RA, where he trained as a Royal Artillery Surveyor. He has deployed on survey related operations in both Bosnia and Kosovo. From 1990 to date he has carried out survey in the UK, Canada, Germany, Italy, Norway, Hungary and Turkey. Currently employed as a Permanent Staff Instructor in a TA Regiment in Newcastle, he has trained TA soldiers as surveyors. He will shortly be moving back to 5 Regiment RA at Catterick as Troop Sergeant within the Div Survey Troop.

### FOOTNOTE FROM MAJOR PHIL MAYE OF THE DGIA

This is an articulate and well-written article that raises some very sound and relevant points. Looking to the possible options and conclusions, perhaps the most pertinent was missing. I would be happy to explain to Gunner Mills why he should not carry his survey gear up the hillside when Sapper Mills could do the task in safety and with greater speed, perhaps plucking the datum points from imagery.

But Gunner Mills should not despair - Sapper Mills is beckoning! The Royal Engineers are undeniably short of surveyors (now RE Geographic Data Technicians) across all ranks due to an ever-increasing number of posts being established to utilise his/her skills. These are exciting days embracing and using new technology and techniques. I wonder how Gunner Mills feels about changing cap badge to become a Data Tech. The RLC Printers managed the transformation quite painlessly a few years ago and now you can't tell the difference!

## GEO PEOPLE



**Commander Vaughan A Nail Royal Navy**

*Commanding Officer, HMS Enterprise*

Vaughan Nail is a member of the small cadre of hydrographic surveying specialists that the Royal Navy employs to acquire the key environmental data underpinning naval operations. His professional background has involved participation in bathymetric surveys, from oceanic regions to amphibious landing areas, as well as geophysical and oceanographic surveys.

After initial training and a first complement appointment to the Anti-Submarine frigate HMS Dido, he specialised as a surveyor in 1980 and took part in a variety of survey tasks, including a lengthy deployment to the South Atlantic in HMS Hecate, in which Joint Service operations assessed the feasibility of new airfields in the Falkland Islands and South Georgia. After surveys in home waters and further specialist training, Vaughan Nail took part in a Joint Service Expedition to the rain forest of Sulawesi, this time as a land surveyor and bug collector. Two rewarding years on the staff of the Naval College at Dartmouth allowed him to hone his own sailing skills, while being responsible for the professional development of new entry officers.

Returning to sea in 1988, he was involved in geophysical surveys in the equatorial South Atlantic and, as Executive Officer of HMS Roebuck, in hydrographic surveys off the Western Isles. In 1991, on exchange duties with the United States Navy, based at the US Naval Oceanographic Office, he took part in a number of survey operations, in the Persian Gulf and Caribbean, and also in the management of trials for two new survey vessels. On return, he assumed command of HMS Beagle, conducting surveys in the Dover Strait and Mediterranean. After Royal Navy Staff Course, he joined HMS Scott in build as Senior Naval Officer and served through to her first operational deployment in 1998.

On promotion to Commander, he assumed command of the RN Hydrographic School before being appointed to the Defence Procurement Agency as the Requirements Manager for two new survey vessels. This project was used as the naval pilot for Smart Procurement. In 2001, he took up the post of Chief Staff Officer to Captain(H) and managed the transition of that organization into a division of the newly-formed staff of Commodore Devonport Flotilla. He is soon to join HMS Enterprise as the first Commanding Officer.

Vaughan is married to Claire; they have twin teenage sons, Alexander and Lloyd, and live in Peter Tavy on the edge of Dartmoor. He enjoys sailing, cycling and gardening.



**Colonel Angus Cross**

*Commander, Geographic Engineer Group*

I was commissioned into the Royal Engineers in 1973. During the next six years my time was occupied by engineer troop commander tours with the UK Strategic Reserve and in BAOR, including two emergency tours in Northern Ireland, sandwiching a civil engineering degree course at RMCS. It was after a particularly difficult month of air survey practical work at Hermitage during the degree course that I swore Military Survey was not for me!

No surprise then that I joined 66 Army Survey Course and turned up at Hermitage prior to the course in time to help organise the Queen's visit to the School of Military Survey as it was then. Sixteen months of sums and black art such as Astro saw me through the ASC and dispatched off to Ratingen to serve a tour as 2ic 14 Independent Topographic Squadron RE. What a great tour, as with many I have subsequently had in survey units. I followed that with filling a new post in HQ UKLF as the Survey Advisor and SO3 Rest of the World, sadly no travel to the rest of the world involved! It was during this tour that I was promoted to Major and someone saw fit to nominate me to study for a MSc in Remote Sensing, the non academic version of photogrammetry.

My post after the MSc ensured I made no use of it what so ever in that, to my joy, I was appointed OC 14 Independent Topographic Squadron RE and, what a cracking good job it was. Other major's posts filled include a short R&D job and a couple of years as Chief of Staff 42 Survey Engineer Group. It was during this time the shortage of senior majors became apparent as they promoted me to Lieutenant Colonel.

The first SO1 post was Operations and Plans at Feltham with a tour in the Balkans for the United Nations thrown in. Following this I went off to a NATO HQ but only travelled as far as High Wycombe, Bucks until I again took a six month break in the Balkans. One of my least exciting but most satisfying roles came next when I was appointed Chief Instructor of the Royal School of Military Survey for a period that included great changes to all aspects of the training.

August 2001 saw me leave for Brussels and a tour with the European Union Military Staff, the embryo of the European Army. This was great fun and very rewarding but alas was to last for only eleven months as I was pulled back to Hermitage to fill my current post of Commander Geographic Engineer Group, an honour and opportunity for which I am very grateful.

Myra, my wife, is happy to be back as we see more of the three children, the youngest of which is currently partying her way through university. I can pick up on my golf and sailing and hopefully still afford to get a bit of skiing in during the winter.



**Michael (Mike) Stanbridge**

*Director Marketing & Business Coord, EDS Defence Ltd*

Mike joined EDS Defence in 1997 as the Business Development Manager for, firstly, the Geospatial, then ISTAR and subsequently the Secure Systems Group before taking up his current post earlier this year. This period of 5 years with a singular company beats all previous records of employment with commercial organisations. He attributes this to an unproven medical condition called 'itchy feet syndrome', contracted during his Service career, as a consequence of the normal 2-3 year posting cycle! Between leaving the Service in 1989 and joining EDS he was employed by, or consulted for, BAe (Military Aircraft) Ltd, BAe (Business Systems) Ltd, BAeSEMA, Logica, Aerosystems International and Sema (France) and Laser-Scan spending considerable periods of time overseas again in Saudi Arabia, Kuwait, France, Algeria and Abu Dhabi; all on geospatial data management related projects.

Prior to this second career, Mike's military and survey career started in 1964 and 1969 respectively when he was commissioned into the Corps of Royal Engineers and then, joined Military Survey as a student on 43 Army Survey Course. He made this decision, he says, because his tour of Hermitage during his 33YO course, 5 years earlier, had impressed him the most because there was always a useful product, the map, chart or unique position, at the end of the line. Unlike bridges and minefields that were regularly built and laid only to be dismantled again.

His first survey tour was as a Troop Commander in 13 Fd Svy Sqn in 'B' Camp, Barton Stacey, but he saw very little of that windy open place because most of his tour was spent on detachment, in either the Middle East or the Caribbean. The brief interludes in the UK were either spent flying the length and breadth of the Kingdom in a Beaver aircraft out of Netheravon for Low Flying Chart data acquisition purposes or determining the deviation of the vertical using B4's in the Orkney and Shetland Isles as part of the Polaris programme.

His subsequent Survey tours covered a good mix of command and staff appointments and included 2IC 14 Topo Sqn in Dusseldorf, SO3 Svy 1a in Feltham managing the careers of 450 Survey soldiers, OC 512 STRE in Washington DC, OC 19 Topo Sqn at Barton Stacey, SO2 Svy 2c (subsequently PPCU Supply) in Feltham, SI Field Survey at the SMS and finally SO1 Geo in Op Div, AFNORTH, Oslo. Without doubt, he says, his best tours were in 512 STRE, 19 Topo Sqn and AFNORTH. In 512 he travelled to some 25 different countries across the five continents carrying out forward recce and negotiating MOU's for Team entry. All this travelling and absence from Washington caused his wife, June, to ask a certain visiting DG whether the Stateside tour was, indeed, an accompanied posting! The 19 Topo Sqn and AFNORTH tours were also enjoyable for him because he was in uniform again amongst soldiers and multi national military staff. 19 Sqn gave him the opportunity to travel again, this time to Hong Kong, Nepal, Norway, Germany and Kenya on both survey exercises and real tasks. During his AFNORTH tour, he was also in the enviable position to engage in the three sports that he enjoyed passionately, Rugby, Skiing (both downhill and langlen) and offshore sailing. Not all in the same seasons of the year, he adds quickly, particularly at that latitude. His wife finally threw his Rugby boots out when he was 48 because, she says, he wasn't mending quick enough from one game to the next!

Towards the end of his AFNORTH tour in 1989, Mike received a posting order sending him back to the SMS, this time as Chief Instructor. This made him sit back and think twice about remaining in the Service as he had received provisional job offers from both Maganavox and BAe (Military Aircraft) Ltd together with a fill-in opportunity to be part of the Army's Whitbread Round the World Crew assessment team. What's more, he said, what would we be training for at the SMS, at the end of the Cold War era with no potential adversary? Little did he know at that time about the forthcoming Gulf War and subsequent UN policing operations? Hence, the decision was easily made and he left the Service to sail an 86' stretched maxi out of Antibes for a couple of months before taking up his appointment with BAe as Tornado Operations Support Manager. This appointment took him backwards and forwards to Saudi Arabia and he got caught up in the Gulf War as well as the environmental clean-up operation in Kuwait, immediately after it was liberated. For these efforts he was surprised, as a civilian, to receive the Gulf War medal albeit with his BAe staff number and the title 'Mr' replacing the normal service number and rank around the edge of the medal.

Mike and June now live in Winchester, and have seven grandchildren from their two daughters Michaela and Yvette. Current score for those tracking the competition is 3 - 4 respectively! Monitoring and managing this enlarged family is a very expensive and time consuming hobby which constrains Mike and June from doing much else with their lives except hosting client hospitality events supplemented by some gardening, offshore sailing and downhill skiing.

## FOVANT BADGES: UPDATE



The last issue of *Ranger* told the story of the unique chalk badges carved into the hillside above the quiet Wiltshire village of Fovant and how they were now in desperate need of repair if they were to survive. Readers will be pleased to hear that since the spring of this year things have moved on a pace with nearly 90% of the immediate capital funding required for the restoration



*Measuring the slope*

secured and work completed on the majority of the badges. Fundraising continues apace to raise not only the full amount necessary for the restoration work but to provide the £16,000 that will be required each year to maintain the badges.

As was explained in the previous article, it is only feasible to maintain eight of the remaining twelve badges. One of these, 'The Jimmy', will be looked after by the Royal Corps of Signals and the Fovant Badges Society is doing its best to preserve and maintain the other seven. The intention was to refurbish three of the badges during the summer of this year however, a very positive response to the appeal for funds together with the superb efforts of Dean and Dyball, the contractors, allowed two more badges to be added to this year's tally. The remaining two emblems will be completed next year.

Unless you visit the site and walk up the extremely steep slope of Fovant Down - and just how steep is detailed later in this article -it is hard to appreciate what a very difficult engineering task it is to repair these historic emblems. The severe slope meant that all the work had to be carried out by hand, the only machinery that it was possible to use were special motorised tracked barrows to take the old chalk away and to bring in the new, up to 75 tonnes for each badge. The contractor stored all the equipment in a secure metal cabin located well out of sight on the reverse slope from the A30 road. However, even in such a relatively remote and hidden spot, thieves managed to break in one night and steal the motorised barrows.

In mid-August, a 3-man survey team under Corporal Paul Hirst of 16 Geographic Support Squadron RE carried out a detailed survey of the badges to ascertain the precise area of each and the degree of slope on which they had been built. The Devonshire Regiment badge covers the smallest area, 708.99 metres squared but has the steepest slope at 28.82% - 1 in 3 in old money! - whilst the Australian Commonwealth Military Forces 'Rising Sun' is 32 metres tall and 51 metres wide (1,769m<sup>2</sup>), half the area of a soccer pitch.

The work of the Fovant Badges Society is never ending as even after the remaining two badges have been refurbished maintenance will be required on a Forth Bridge-basis as the chalk fades with time. The chalk Down itself is also subject to surface "creep" and the fight against weeds is a never-ending struggle.

If you would like to help the Society preserve and maintain these historic and somewhat unique memorials, please send your donation to:

Sir Donald Stringer CBE  
Treasurer Fovant Badges Society  
Beech Cottage, Barford-St-Martin, Salisbury SP3 4AS

For further information see the Society's website:  
[www.fovantbadges.com](http://www.fovantbadges.com).



## IS THERE LIFE AFTER MILITARY SURVEY?

By Mark Breach

*..... who left Military Survey in 1989 to become lecturer in Nottingham.*

The reasons why you leave Military Survey are as individual as the reasons you join.

As idle and disinterested a schoolboy as any at the school careers convention, I drifted into the army's presentation where they had a film show - big deal back in 1964! A handful of the army's leaflets found their way home and subsequently lay abandoned on the dining room table, where my parents found them ... and the rest is history.

I must be grateful for many things that the army in general, and Military Survey in particular, gave me. Education was second to none, from A levels at Welbeck to a "Master's" apiece at Cambridge and Oxford, as well as the Long Survey Course at Hermitage. I always thought of the army as my travel agent and with five years worth of postings to 512 STRE in USA and DOS in Kenya and North Yemen, all accompanied even though two year's worth were in a tent, what could have been better.

So then, as Senior Instructor Field Survey passing on my knowledge to the next generation, why the decision to leave? Certainly no complaints about the job - rather it seemed that all the best was by then in the past and it was time for a change. An advertisement for a Principal Lecturer in Engineering Surveying at the then Trent Polytechnic was the impetus.

They say that after death and divorce, the most traumatic things that can happen to you are moving house and changing job. Now add to that adoption times two and you get an idea of the upheaval that affected all the family. With hindsight, accepting a probable posting to Feltham would have been the soft option. However, no regrets, it was the right decision ... probably.

So here are some thoughts and recollections, in no particular order. Twelve years later I am still the PL in ES, but now at the renamed Nottingham Trent University. Some things I do miss about Military Survey and some things I don't. The academic life suits me, 'though it took a while to get used to the absence of a rigid "chain of command". Here, it is more a net of concurrence, and so things happen or do not, more by persuasion and agreement rather than by "you are to...". Leadership is with interpersonal skills and no backing from the Army Act. I have much greater freedom to

choose what I wish to get involved with. I have undertaken short lecture tours and field courses in Riga, Tallinn, Mikkeli, Oldenburg, Karlsruhe, County Clare and Tashkent and dabbled in consultancy in Nottingham, Cork and under the River Severn because I found them interesting and challenging. I have become involved in postgraduate research projects and taken on responsibilities for student admissions and marketing our capabilities through consultancy.

Twelve years in the same "posting" has allowed me to indulge a passion kindled and then denied by the army. I grew up in Falmouth and later sailed the Atlantic (with others) at Sandhurst. Now that I am settled I have my own yacht on the Humber - a wide open river with all the mud you can dream of - and the long university holidays in which to enjoy it.

The Mess is an institution much taken for granted, a social centre and a place where often, more business was conducted in half an hour over coffee than in the rest of the day. Sadly there is no equivalent here at university.

There is a wider spectrum of people in a university than in Military Survey. There are more filters that you pass through on the way to a commission than becoming a student. Consequently the level of commitment by many students can be frustrating, but when you find that commitment and ambition in one individual it can be a joy to nurture.

I thought that when I left Military Survey I would be going into a job with less security. Events seemed to have proved otherwise, but even so, we have just gone through a "reprofiling" exercise and after 25% redundancy we, the survivors, have come out on aggregate much younger and fitter.

Those who knew me from Military Survey days will recall that I dabbled in a little "ham dram". That continues, sometimes with all the family, and the occasional "professional" appearance in murder mysteries and also in pantomime - Oh yes it does!

Finally, my wife says she does not miss the packing and unpacking every two years - but the amount of junk in the loft will have to be faced one day, there is still a sword and Sam Browne up there somewhere...

## SURVEY WITH A DIFFERENCE: SUDAN 1940

By Tom Phillips

In mid-November 1940 514 Field Survey Company arrived in the Middle East after a long sea voyage. We were accompanied by the 1st Division of the Australian Army who gambled on top deck from morning until night throughout the voyage, playing some sort of toss the coin game whilst we British peeled the potatoes etc.! After about a fortnight in camp a south east of Cairo, in the vicinity of the Tura Caves, the Company made its way down the Nile to Wadi Halfa then across the Nubian Desert by train to Atbara followed by another boat journey to Khartoum arriving on Christmas Day. On Boxing Day a Christmas Dinner was served up by the officers in traditional style to much merriment and enjoyment.

The next two to three weeks were spent practising astronomical fixes and getting acclimatised until in mid-January the Company moved off for Kassala and Keren where surveying, I understand, proved not at all easy (for the story of that operation see John MacDonald's article in the autumn 2000 issue of Ranger).

When I write that the company moved off, I should explain that it did not apply to Sergeant Crozier and myself because we were detailed off to collect from the store, a tent, camp beds, mosquito nets and cooking equipment plus, a Tavistock theodolite and tripod, wireless set, sidereal chronometer, angle books, log books and star information, plane table and slide rule. With all the above stores we then went to Khartoum and purchased three months rations, which included 12 tins of Carnation Milk and 6 tins of Gold Flake cigarettes in sealed tins. To my disgust Sergeant Crozier, who was a chain smoker whilst I was a non-smoker, polished the whole lot off in no time at all.

Piling all our stores onto a lorry driven by a native driver, we travelled along the bank of the Blue Nile for mile after mile on a very dusty and sandy road with so many ups and downs one could easily have been sick. We eventually reached Roseires. I would mention that during the drive the lorry frequently petered to a standstill where upon the driver would administer water to the engine and hit it with a hammer and .... off we would go.

At Roseires we met the District Commissioner who I understood was a relation of Roald Amundsen, the

Explorer. The Commissioner, for our safety, arranged that twelve soldiers of the Sudanese Camel Corps be attached to us as well as three native cooks.

We were given a rag (cotton) map of the area where we were to operate, the co-ordinate of its south east corner was 36 degrees East 11 degrees North. It was essentially a sketch map with information supplied by Rosita Forbes the novelist who did a Safari in 1936 from Abyssinia to Khartoum, a rope and sound traverse by an Egyptian Army surveyor running north to south and a sketch route by JG White, Engineering Corporation of New York for a proposed road from Dangila to Roseires.

The Commissioner told us that our task was to construct a supply route to follow a band of Wingate-type men who were to try and attack Addis Ababa from the West. To do this he recruited about 150 natives for the work and gave us a box of 1,000 Maria Theresa Thalers to pay them. The box of coins, which had been newly minted in Australia to undermine the Italian currency, was so heavy it was difficult to lift off the ground. The coins were made of silver and were about 1½ inches in diameter and were copies of money used in Austria in the past.

The first sixty to eighty miles were as flat as a pancake, the surface was of black cotton soil with huge fissures several feet deep with a growth of elephant grass which had been burnt and covered us in black soot. It was not unusual to see a tall palm, which were dotted here and

there, burning at the top. At night time you could see hills in the distance glowing red with forest fires. As we went along the natives were filling in depressions in the line of track with stones and soil, also felling trees with their little axes and slashers. At this point our transport arrived in the form of camels from the Red Sea area but after riding one of these for a week or so I decided walking was quicker. The terrain was getting hilly causing problems for the camels and there is nothing to my mind to match the ludicrous sight

of a camel hurtling down a hillside head over heels after having tripped over a log. Another problem was that there was no vegetation for the camels to eat so we had dozens of dead camels on our hands which we tried to burn because of the smell and flies not to mention the maggots that marched away from the dead bodies in columns in the sand. Fortunately relief was at hand as vultures had got the scent of the camels and we left them to it.



*Practising sun observations in Khartoum*

The going was now slowing, as we had frequent dry wadis that had to be filled with boulders. Some of these wadis were very wide (up to 200 feet across) littered with huge boulders obviously washed down in the floods of the rainy season.

Our natives were on a diet of dura flour and onions and they started to suffer from scurvy, their legs and arms were raw and covered in flies, resulting in my having a sick parade waiting outside my tent so that I could paint their limbs with Gentian Violet.

A message was sent for a Sudanese Doctor who diagnosed the problem and sent for bags of lentils and beans, which soon cleared up the problem. I also required the doctor at this time as I was laid low with dysentery and he prescribed a glassful of castor oil to be downed in one go - I was of the opinion afterwards that the end of the world was nigh. A few days later I returned to terra firma and I decided that too much cold water from my charge (canvas water bottle) was the problem.

Our native labourers were now getting a bit apprehensive; they had come a long way from their villages and also they were afraid they would be set upon by warlike Abyssinians who customarily came down from the hills with hostile intent. This resulted in their departure for home and our having to recruit more labour from the Guba area.

We came across two sets of elephant tusks, obviously left behind by the preceding band, I suspect they shot them for meat. We ourselves shot an antelope for meat for the workers. Wild boar were plentiful as were flocks of guinea fowl but it was impossible to shoot either of these, the boars were too smart and firing into the guinea fowl only resulted in a flight of feathers.

The going was becoming very hilly and the vegetation more dense, the never ending thorn trees were getting very tall. These then gave way to bamboo, obviously we were getting near the western escarpment, which would be subject to heavy rain in the wet season. In this hilly region Sergeant Crozier and I had been supplied with a small Italian pony each, which were absolutely marvellous for the task. The ponies were extremely surefooted and at the same time, very nervous at any movement, such as reptiles, in the vegetation,.

In early April we received a message telling us that the war in Abyssinia had come to an end and that we were to return to Cairo as soon as possible. This we did by pony, by lorry over our track, by train, then boat, train again and finally a boat to Cairo. To say the least, it was quite



*Camels were not a successful form of transport*

a safari, a distance I estimate for the return journey of about 1,500 miles as the crow flies and a very rewarding experience indeed.

Our battery for the wireless had expired in a very short space of time, so we did not get around to doing any astro fixes which was a pity. However it was felt that progress on the road was more important, coupled with the problem of overseeing the natives, not to mention the oppressive heat. It must be said that most of the time we did not know where we were or even what

day it was, and you felt you were cut off from the outside world, and the direction we were going was entirely that of our native guide supplied by the District Commissioner.



*Building the road by hand was a slow business*

*Author - Tom Phillips*



## FRIENDS OF WAR MEMORIALS

By Maggie Goodall - FoWM Conservation Officer

Founded in 1995 to combat vandalism, theft and neglect of war memorials, Friends of War Memorials is unique in being the only charity solely devoted to war memorials of all date and types countrywide (as opposed to war graves or other types of public monument). FoWM now has a growing membership and enthusiastic team of 200 Regional Volunteers carrying out research, assisting local groups with projects and keeping a vigilant eye on war memorials "at risk" and on the skips and antique markets where so many displaced plaques and Rolls of Honour end up. For example, one FoWM volunteer rescued a wooden Roll of Honour from a bonfire and, after conservation work costing £500, it will be returned to a suitable new location in the community it originally came from.

Friends of War Memorials is a focal point for reports on the condition of war memorials and liaises with local people and ex-service groups to encourage secular or ecclesiastical authorities to take responsibility for remedial work and ongoing routine maintenance. FoWM also offers advice on conservation, sources of grant aid and practicalities, and so can act as a facilitator for a diverse range of related projects.

Friends of War Memorials is keen to involve members of the public and school groups in caring for memorials and aims to raise awareness of their historical, architectural and spiritual significance within our national heritage. Some are remarkable works of architecture or sculpture, others the work of (often anonymous) local masons or are purely practical (for example, war memorial footbridges or bus shelters). The UK National Inventory of War Memorials at the Imperial War Museum estimates that there are some 50 to 60,000 war memorials countrywide, but by virtue of the names and actions it records, each memorial is unique.

In recognition of special character of war memorials, English Heritage has established a grant scheme (administered by FoWM) to repair listed war memorials in Conservation Areas in England. However, there is still no central funding for all other types of war memorial and Friends of War Memorials is limited in the number it can help directly through its own Small Grants Scheme. If you would like further information about FoWM's work and how you can get involved, war memorial grants, or to report a memorial "at risk", please telephone 0207 259 0403 or e-mail [fowm@eidosnet.co.uk](mailto:fowm@eidosnet.co.uk).

New Members are warmly welcomed and all donations are gratefully received.



First World War memorial in Abergavenny. 3rd Bn Monmouthshire Regt by Gilbert Ledward



WW1/WW2 memorial in Hertford. Conserved in 2001 with a grant of £5,000 from English Heritage War Memorials grant scheme.

## AIRMAN WITH THE GUNNERS: PART 2

By Geoff Woodhead

The RAF Meteorological Unit joined the 2nd Survey Regiment RA at Cromer on 13th January 1943 where it was preparing for overseas service. The Regiment sailed from Liverpool on the MV Britannic on the 13th March and disembarked in Capetown on 12th April. After five weeks in a transit camp it re-embarked on the SS Orbita on 9th May and disembarked in Bombay on 10th June. After three weeks in the RA transit camp at Deolali the Regiment travelled across India by rail to Ranchi and joined XV Corps, command by General "Bill" Slim. The next six months were spent in intensive preparations for active service in Burma.



*Ready for the demonstration for General Slim*

At this time the Meteorological Unit consisted of five airmen: a Senior NCO, based at RHQ or BHQ, was in charge of the unit and was responsible for overall administration. The unit was structured to operate as two independent sections, each with one corporal and one LAC together with a 15 cwt Bedford truck and driver supplied by the Army. The RAF personnel were: Flt Sgt Ewen with Cpl Gerald Paradise and LAC WR (Bill) Hall attached to 'C' Troop and myself and LAC DI (Taffy) Evans attached to 'D' Troop.

At this time we were said to be the only unit in India or Burma capable of supplying gun meteors and that until our arrival the artillery did not have this facility. Whilst in the Ranchi area the unit participated in a number of exercises involving "gunshoots". The RA units appeared to be impressed with their improved accuracy which they attributed to the use of live gun meteors. We were instructed to put on a demonstration for General Slim when he visited the Survey Regiment. He seemed very interested although I, personally, was somewhat chastened when he remarked to me that it did not seem to be good practice to lay out rubber balloons in bright sunlight!

At the beginning of November 1943, 44 Battery of the Regiment, including 'D' Troop and its Meteorological Unit, travelled to Calcutta and boarded a boat for Chittagone. After several days in yet another transit camp, we travelled by road in our own transport to the

village of Ramu, inland from Cox's Bazaar. This was a distance of some 75 miles, on a road which had been constructed by the Royal Engineers. The road was built above the level of the surrounding paddy fields using roughly made bricks standing on end. The engineers had not only made the bricks but also the kilns for baking them. The road was very rough and the convoy was enveloped in a cloud of red dust which adhered to everything.

Although Ramu was some forty miles or so behind the front line, on arriving there the Meteorological Unit was instructed to start supplying gun meteors immediately with a frequency of three per day, at dawn, midday and late afternoon. These were relayed to 7th Division HQ for distribution to the forward artillery.

Because of the distance from the supply bases it had been realised that the replacement of consumables, in particular hydrogen for the balloons, would be difficult. The backroom boffins had solved this by designing equipment for units in the field to generate hydrogen as required. This involved mixing caustic soda flakes with iron-filing like pellets (potassium ferro-silicon I think) and a small quantity of water in a large cylinder. It was, however, not a job we enjoyed, and even after many such procedures we always watched, with not a little apprehension, the rapidly rising pressure gauge needle as it approached the red danger line.

On 1st January 1944 the Troop was instructed to move up to the front line with the 7th Indian Division. The journey was an experience in itself. The only access to the forward units on the inland, eastern side, of the Mayu range was through the Ngakyedauk Pass, usually referred to by the troops as the "Okeydoke Pass". Originally a jungle track only suitable for troops on foot or with mules it had been improved to take small vehicles, but this was inadequate for the intended Arakan offensive. The army engineers, with only a limited amount of mechanical equipment, had widened the track to make it into a one-way road, capable of taking heavy vehicles such as tanks and artillery. The road ran in a winding, snakelike manner over jungle-covered hills with a rise and fall of over 1,000 feet in less than three miles. The average gradient was 1 in 8, but parts were much steeper. The journey was a nerve-wracking experience with a succession of vicious hairpin bends and large warning signs such as "No rubber-necks beyond here". Vehicles were ordered to stay in bottom gear all the way. The road surface was compacted earth and needed continual repair.

Shortly after negotiating the pass we experienced our first taste of enemy action when the convoy was dive-bombed by Japanese planes; they failed, however, to inflict either damage or casualties. We were soon made

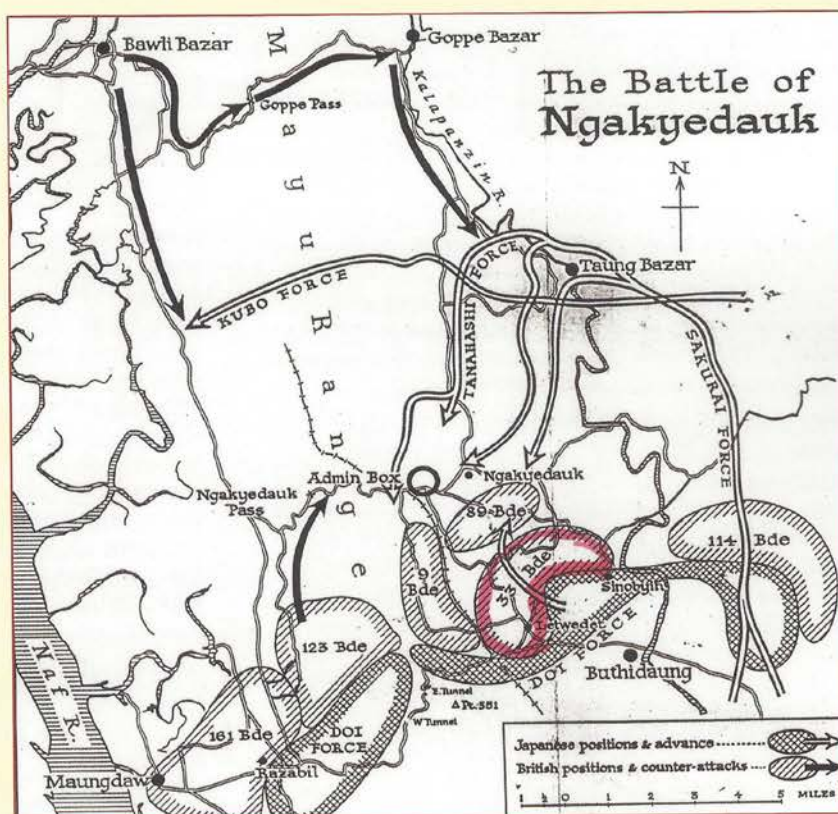
aware that the Japanese had observation posts in the 1,000-2,000 ft peaks of the Mayu range on our eastern flank to observe any movement of our troops. We eventually arrived at our destination, code named "Wet Valley", a narrow valley running east to west between jungle-covered hills.

We commenced supplying gun meteors the following day, during which we were subjected to some spasmodic shellfire. After several days with regular balloon observations, the area was the target for heavier shelling. As we were sited in the lee of a ridge most of this was over our heads. The brunt was borne by the 136th Field Regiment in a more exposed position on the opposite side of the paddy field, and their command post received a direct hit, killing Major Burton, the acting Commanding Officer. The Gunners alleged that the Japanese had probably pinpointed the area because of our balloons, released from the paddy field. As a result we were prohibited from releasing any more balloons from the vicinity but had instead to carry out balloon observations by driving a distance away to find a suitable site where there were no troops present. This was somewhat stressful, particularly for the early morning observation. To stand out in the open looking into a theodolite for twenty minutes or so with only the army driver standing guard and not knowing whether or not a Japanese patrol was watching from the bushes was not a welcome experience. Packing up and driving off was always done with amazing speed. To our relief the restrictions were not enforced when the Troop moved to other locations and we were allowed to make our observations from positions not far away from the troop site.

Several days later, probably 12th/13th January we moved to a different location less than a mile away, code named "Happy Valley". When the Troop first commenced sound-ranging activities we provided meteorological corrections by the established UK procedures, using the twelve standard Goodwin graphs, selecting the nearest one to the observed wind and temperature conditions. The Troop soon abandoned this system. For what reason was never explained to me, but possibly the wind graphs were more appropriate for European conditions. The alternative SR system afterwards used was called, I think, the Comparator Method. This involved matching enemy gun recordings with those from shell bursts from our own artillery. Throughout the remainder of the campaign we were

never asked to supply another SR meteor. Our future work was only concerned with gun meteors for the artillery, and there was continual demand for these.

The Arakan area was not covered in continuous jungle as in the rainforest. The terrain consisted of flat open paddy fields with a random distribution of frequent steep hills 100 to 500 feet or so high, covered in jungle and brush. The forward infantry of both sides established their positions on the summit of the hills and peaks, overlooking the adjacent paddy fields. The Japanese positions were usually very well fortified and difficult to penetrate. Our infantry attacks were usually preceded by dive-bombing by Vultee Vengeance aircraft, then low-level cannon attacks by Hurricanes and then a concentrated artillery bombardment from all the available artillery. General Slim in his book refers to one



such barrage on 11th March 1944 saying "Corps artillery put down 7,000 shells in ten minutes on a five hundred yard objective". The infantry, sometimes accompanied by Sherman or Grant tanks if the terrain permitted, advanced behind the barrage, but as close to it as was practical. Under these circumstances where the air temperature correction alone could make a difference of hundreds of yards, the artillery regarded regular meteors as vital.

Major attacks were often scheduled for dawn, and the Meteorological Unit was sometimes asked to provide a meteor in advance. This necessitated a night pilot

balloon observation, using a lighted candle in a Chinese lantern attached to the balloon. The theodolite had to be sited in an open space, away from the brush-covered hills. Between dusk and dawn, no other personnel were allowed outside the unit's defence perimeter and showing any light or smoking was prohibited. Two of us had to work out in the open, striking matches to light the candles, which invariably took several attempts. Once the balloon, with its lantern, was released it had to be picked up in the field of view of the theodolite with azimuth and elevation readings following at one-minute intervals for 15 to 20 minutes or so. The theodolite illuminator had to be switched on for this, whilst the other operator used a flash lamp to book down the readings. It was not a task we enjoyed. In a paper given at a Meteorological Office conference in 1988 it was stated that "night balloons were totally banned during the Burma campaign". I can only say that no one informed us of this!

At the end of January 1944 the troop moved forward to an area code-named "Gun Valley" and was sited to the rear of a hill feature named "Kettle". On the 3rd and 4th of February the Japanese launched HA-GO, a major offensive intended to lead to an invasion of India. The first objective was to cut off the supply lines to 5th and 7th Divisions by an encircling movement, as the same time infiltrating 7th Division positions and taking the Ngakyedauk Pass. In the anticipated ensuing chaos the Japanese planned to annihilate 7th Division as it tried to escape. The first part of the plan - to cut off and isolate 7th Division - was quickly accomplished.

The first intimation we had of this was on the night of 6th February. Following a night of grenade explosions, fusillades of small arms fire and shouting in the area, we were told that a Japanese patrol had over-run the cookhouse area of 136th Field Regiment, but had been dislodged by a counter-attack. Although this was at first regarded as a random attack, 'D' Troop prepared more extensive defensive positions. The following night our positions appeared to be the focus for an enemy attack, with heavy and sustained small arms fire using tracer bullets, and rifle grenades. Our defences were concentrated on the upper slopes of the hill, apart from a Bren-gun post guarding a gully track and a small detachment of four men guarding the Sound Ranging vehicles. Lt WR Stent and L/Bdr Bill McNish of the vehicle guard party were seriously injured, probably by grenades. Bill McNish died two days later in the Brigade ADS. Lt Bill Stent, a popular young officer from Cumbria, was flown out some days later in a light aircraft spotter plane, but died from his wound in a Comilla hospital on 30th March.

The following morning we were told that the Japanese had cut the "Okeydoke" Pass, and that 7th Division was now isolated and cut off. There was considerable apprehension amongst the ranks, as the view of the Japanese soldier as the super jungle fighter bogeyman was still prevalent.

All units, however small, were ordered to stand fast in allocated positions, until forces arrived to relieve them. The situation at the time appeared chaotic, until the defensive strategy became clearer. The Division organised itself not in one overall defensive "box" but in a number of smaller ones. 'D' Troop was part of 33 Brigade box, some two miles deep and three miles wide, incorporating the main front-line infantry, three RA units and Brigade HQ. Within the box each unit had its own defensive perimeter into which it withdrew at night, with the paddy fields within the box being by both our own and Japanese patrols.

'D' Troop was ordered to bury as much equipment as possible, and abandon the remainder and the vehicles, before moving to a new position named "The Pimples", on the perimeter of 33 Brigade Box. For the next three weeks the personnel, irrespective of rank or trade and including the Meteorological Unit, were used as infantry. In addition to guarding the perimeter of the box they participated in both listening and fighting patrols, and standing ambush patrols. In the last week of February the "Okeydoke" Pass was re-opened by relieving forces and the Battle of the 7th Division Box was over.

'D' Troop left "The Pimples" and returned to its original position on "Kettle". The Japanese had dug up our hastily concealed stores but there was surprisingly little damage to either equipment or vehicles. (After the war it was found out that the Japanese infiltration forces were under strict orders to preserve captured stores and vehicles in case they were needed to facilitate their intended advance into India). An inventory check showed that the only loss or damage to the Meteorological Section equipment was one slide rule missing. This was surprisingly returned to us by the nearby artillery unit several days later, although minus the cursor. It was reported that it had been recovered from the body of a lone Japanese shot whilst trying, in broad daylight, to drop a grenade down the barrel of a 25 pounder.

During March and April the Division re-grouped and resumed the attack on the main Japanese forces holding the Maungaw to Buthidaung road. 'D' Troop resumed normal activities, moving up with the forward artillery and changing positions several times. The Meteorological Section was required to produce regular gun meteors throughout this period, as concentrated and sustained artillery barrages were frequent. By the beginning of May, 7th Division had made significant progress and began to consolidate in preparation for the coming monsoon. 'D' Troop was withdrawn and commenced the journey back to Chittagong for a rest period after the arduous campaign. Events, however, prevented this. Before arriving in Chittagong the troop was diverted and flown into Imphal, where XIV Army forces were surrounded and under siege.

The "Battle of the 7th Division Box" has since been acclaimed as a turning point in the war with Japan. It was the first time a Japanese land force had been

decisively beaten. The published statistics for the Japanese HA-GO offensive in the Arakan are that of the 7,000 men deployed by Japan, 5,000 were killed, and a large proportion of the remainder could not be accounted for. Very few survived. The British and Indian battle casualties were 3,506. For the members of the 2nd Survey Regiment involved, it was an unforgettable experience and served to give an insight and consequent appreciation of the life and conditions endured by the infantry in the Burma campaigns.

**Geoff Woodhead** joined the RAFVR in 1941 as a meteorologist and then spent most of the War attached to a variety of Royal Artillery units in England and Burma. Demobilised in 1946, he resumed his career in the textile industry, mainly with Courtaulds, travelling extensively on behalf of the company and presenting papers at international conferences and representing UK on several international committees. Awarded the MBE "for services to industry" in 1980 he retired in 1989. Interested in local history and has published work on the subject.

## NOTES ON SURVEY FOR TRENCH MORTARS IN THE FIRST WORLD WAR: PART I

By Peter Chasseaud FRGS.

### Introduction

Alone of the belligerents, the Germans, learning the lessons of the Russo-Japanese War, made a considerable pre-1914 investment in close-support and trench warfare weapons and stores. They alone, also, realised that trench artillery was indeed artillery and, like the field, foot (heavy) and fortress artillery should be made fully effective through equipping it with dial sights and giving it an indirect fire capability. Trench mortars, like other artillery equipments, were fully integrated into the new battlefield geometry represented by the gridded 1:25,000 artillery map (*Planmaterial*) and artillery and plotting boards from 1904 onwards. By contrast, the British and French had no modern trench artillery, and when trench warfare set in on the Aisne (September 1914 onwards) they had to improvise. The Germans retained their lead throughout the war, integrating their trench mortars into every fireplan (culminating in the stupendous preliminary bombardments of 1918) and applying survey consistently, even setting up special Trench Mortar Survey Sections for creating local surveys in conjunction with the wider surveys made by divisional, corps and army survey units. These Sections produced trench mortar artillery boards, target location plotting boards, fire control plans, etc., and helped to fix the positions and line (azimuth) of individual mortars and mortar batteries.

### Germany

In 1914 the Germans were first in the field with trench mortars, having learnt from the Russo-Japanese war and had several models in production before the outbreak of the First World War. The first light smooth-bore *Minenwerfer* was developed about 1908; this was elevated with the aid of a clinometer, but had no sighting apparatus for obtaining line. It was not capable of

traverse on its platform, the whole affair having to be swung by hand and aligned 'direct' by eye. A 17cm rifled medium *Minenwerfer*, which was accepted for service early in 1914, had recoil apparatus and a steel bedplate on which the cradle and mounting traversed. This was followed during the war by a long-barrelled version.<sup>1</sup> Both were equipped with sophisticated optical sights. The Krupp Trench Howitzer, firing a 'toffee apple' bomb, dated from 1912, and was fitted with a sight bracket;<sup>2</sup> right from the start, the Germans envisaged applying artillery indirect-laying techniques to its mortars. During the war the Germans had many models of *Minenwerfer* in service: old and 1916 pattern heavy 25cm, heavy 24cm and medium 17cm '*Flügelminenwerfer*', old and 1916 pattern medium 17cm, old and new light 7.6cm, light 3.9cm '*Granat-Schnellwerfer*', and light '*Granatwerfer*.' The old patterns of *Minenwerfer* had a very short barrel and rectangular bedplate; the new (1916) patterns had a longer barrel and were mounted on a circular bedplate with all-round traverse.<sup>3</sup> In general, the German mortars seriously outranged the British and French models.

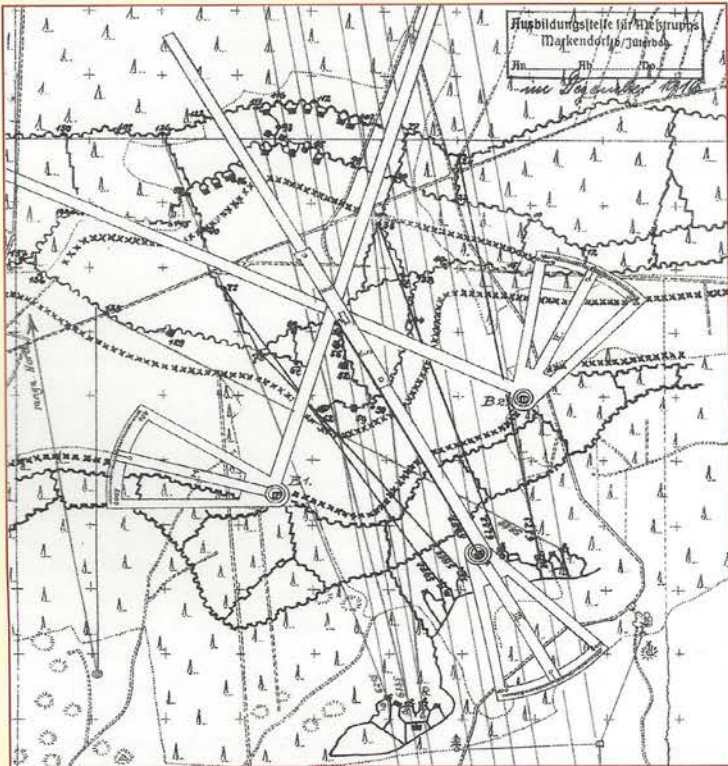
Trench Mortar Survey Sections (*Minenwerfer Messtrupps*) were trained at the Central *Minenwerfer* Survey School (*Ausbildungsstelle für Messtrupps*) at Markendorf bei Jüterbog. Artillery Boards (*Batteriepläne*) for trench mortar units were produced from air photos from 1915 onwards at large scales, usually 1:2,000 or 1:2,500, and Fire Control and Fire Distribution Plans at 1:5,000. At the short ranges at which mortars fired, it was often possible to cover the field of fire with one air photo. All that was then necessary was to re-photograph it to a specific enlarged scale, easily obtained through identifying control points on a measured line within the German position. One illustration dating from March 1916 showed a 1: 2,000



artillery board, with air photo/s superimposed on a large-scale plan, with a graduated circle to be superimposed on the trench mortar plan.<sup>4</sup>

'The heavy and medium *MW* were used as high-angle artillery firing with gun director and panoramic periscope. At first they were emplaced in the trenches, but as the infantry did not much like the enemy fire they attracted there, they moved out of the trenches to the rear, often into special dugouts. This demanded both a

being produced from a simple enlargement of the 1:25,000 map. [A photo of two gridded *MW* plans, one primarily utilising air photos, and the other a line map (1:2,500 *Karte 306 Borowno* (Bow)) finely drawn & printed by VA22) was shown]. The rectified air photo forms the basis for the *MW* plan, which through fitting onto the map extract projected at the scale of 1:2,500, and to as many control measurements as possible, and fitted to identical points, has been brought to the scale of 1:2,500.



German mortar plan

From the air-photo-map originated in this way a completely new map is produced through tracings of the road network and other positions, completely independent of the existing map-base, and onto this our own and the enemy's trenches are also transferred by tracing. Through photographic reduction of this Trench Mortar Plan to the scales of 1:10,000 and 1:25,000, I obtain a valuable control, on the one hand of the accuracy of the *MW* plan, and on the other of possible inconsistencies in the map. The 1:2,500 plan produced in this manner, which is capable of including all details of the hostile tactical organisation, is completed by entering the reference points, reconnaissance and observers' reports from the troops about the position of hostile observation posts, trench mortar and flame thrower positions, machine guns, etc.

[Further photos were shown - horizontal views across no man's land from higher ground, and a low view across no man's land through wire entanglements.] Also the *Vermessungsabteilung's* telephoto camera can be used to take terrestrial panorama photos, or binocular periscope panoramic photos (*Scherenfernrohrrundbilder*) of the Artillery Survey Sections, respectively, and extracts included from the same. Partial surveys of

greater range and a greater azimuth [horizontal angle/arc] of fire and led to the development of the *sMW16* [heavy] and the *mMW16* [medium], both launchers being equipped with longer tubes [barrels] and firing larger charges, which increased their ranges to 970m for the heavy and 1,160m for the medium model. A turntable underneath both weapons widened their azimuth to 360°.<sup>15</sup>

In December 1916 Captain Dreist, commander of *Vermessungsabteilung* 22 which was the survey formation of Army Group Linsingen (HQ Cholm) on the Eastern Front, prepared a lecture for the General Staff Officers Advanced Training Course of Army Group Bernhardt in Kowel on 10 January 1917. This was entitled 'Newest Developments of the Maps Organisation for Serving the Troops with Particular Reference to Trench Mortar Plans.'<sup>16</sup> The section dealing with trench mortar survey was as follows:

'The Trench Mortar Plan (*Minenwerferplan*) is produced at the very large scale of 1:2,500 from accurate survey foundations and is therefore in principle very good, not

important trench sectors are used to complete this map. [One of the previous photos] shows clearly the type of Russian barbed wire obstacle, because we can see the exact number of rows of posts of the 3 successive entanglements.

[A further photo] shows a 'well-developed, constructed above the ground position'. The inhabited shelters are clearly shown by the smoke rising from them. By means of phototheodolites or the still more modern trench camera (*Schutzengrabenkamera*), unfortunately still not available at the VA, we are able finally to fix points in and behind the enemy front line, which provide valuable control points for the [Artillery] Survey Sections and for the fitting of air photos. A 1:2,500 plan completed in this way is then, besides its application as a *MW* Plan, also a superb means of orientation for smaller support groups in planned attacks as well as for patrol activity.'

#### France

Like the British, but unlike the Germans, the French Army made no provision for the application of survey techniques to its trench mortars. Both British and French

began the war with no mortars in service, and rapidly had to improvise. The French initially used ancient pieces of Crimean vintage,<sup>7</sup> and makeshift 'crapouillots' manufactured out of old shell-cases. Purpose-built light, medium and heavy mortars were soon introduced, for which range-tables for elevation were created by test-firing on ranges behind the lines. Initial range was presumably measured from a large-scale trench maps. Initial horizontal angle-of-fire appears to have been estimated on the spot, rather than applied in the normal artillery way via aiming point or post and dial sight. The Schneider 75mm Mle 1915 was mounted to traverse on a circular bedplate, but the enlarged Schneider Mortier *Tranchée 15cm Mle 1916*, which had a range of 1,900 metres, had a rigid platform on which the piece was only capable of limited traverse. The later, more sophisticated, 15 cm 'Mortier Fabry' (*Matériel Mle 1917*) was mounted on a top carriage giving considerable traverse.<sup>8</sup>

French heavy mortars were from 24cm calibre upwards. The largest was the 340mm; below this were the 310mm (an enlarged 240mm), and the 240mm which had a range of 1,000 metres.<sup>9</sup> As this had all-round traverse on a circular bedplate, this was presumably graduated and capable of fine adjustment for firing according to compass or map bearing. With most medium and heavy mortars, surveying the centre or zero line of the bedplate would increase accuracy. All mortars were generally ranged by visual observation.

It is possible that a rectangular plotting board with an arc was used for certain French mortars; one illustration (of a *Canon de 58 No. 1 bis*) suggests this, but it is so simple as to leave other interpretations open.<sup>10</sup> It is probable that survey was applied to the heavy mortars, manned by the artillery. The French distinguished between the 'obusier' (howitzer) and the 'mortier' (mortar), but many of the latter were high-trajectory, short-range heavy rifled pieces rather than smooth-bore trench mortars - i.e. the *Mortier 220 Schneider*, the *Mortier de 270 (1913)* and old *Mortier de 270 Schneider-Canet*, and the *Mortier de 280*, the first and last of which were fitted with normal artillery dial sights graduated to 6,400 mils.<sup>11</sup>

Neither the French official '*Raport de Guerre*' prepared by the *Service Géographique*, nor the various artillery manuals, refer to artillery survey being extended to trench mortars. This does not, however, mean that it was not done, and indeed some form of survey must have been used.

### Britain

Like the French, but unlike the Germans, the British Army made no provision for the application of trig survey techniques to its trench mortars. Both British and French began the war with no mortars in service, and rapidly had to improvise. The French initially used ancient pieces of Crimean vintage, some of which formed the basis of the British mortar units,<sup>12</sup> and makeshift 'crapouillots' manufactured out of old shell-

cases. The British manufactured similar mortars out of gas-pipes. Purpose-built light, medium and heavy mortars were soon introduced, for which range-tables for elevation were created by test-firing on ranges behind the lines. The Vickers 40mm (1.57-in) mortar was a copy of the Krupp Trench Howitzer, which fired a spherical bomb on a stick ('toffee apple' or 'football'); this was equipped with a sight bracket.<sup>13</sup> On 1 June 1915, General Haig (First Army) arranged for Maj.-Gen. Mercer to have 'a detachment from the bomb school to explain and fire our three kinds of bomb mortars (1ft-inch, 2-inch and 4-inch)' to the Prime Minister, Asquith.<sup>14</sup> The first two of these types were 'toffee apples.' In August 1915, the revolutionary Stokes mortar - the prototype of all modern mortars - was introduced into the British service; this was also later used by the French. In the front line trenches, a periscope, and preferably a periscopic sight, was absolutely essential.

One of the largest French trench mortar was the 240mm; this was also used, after considerable modification, by the British, who classed it as 9.45-in and knew it as the 'flying pig'. It had a range of 1,000 metres,<sup>15</sup> or 1,100 yards to the British. This had all-round traverse on a graduated circular bedplate, capable of fine adjustment for firing according to dial sight, compass or map bearing.

Range for mortars was initially measured from a large-scale trench maps and air photographs. Initial horizontal angle-of-fire was sometimes estimated on the spot through a periscope, but was also applied in the normal artillery way via aiming point or post and dial sight. All mortars were generally ranged by visual observation. Registration was nearly always carried out, with observation from special stations, but even then could be rendered nugatory by changes in meteor; the wind was the most hazardous factor, often wafting bombs way off course, perhaps to fall among our own waiting infantry. Major R. T. Rees, describing preparations made by his mortars to blow away the German wire before a British trench raid, wrote: 'A great deal of preparation was necessary. Emplacements had to be prepared for twelve guns, with protection against enemy fire, great stacks of ammunition had to be provided and carried up, and of course the greatest care was necessary in timing the whole affair. We had also to register with care, in order to get something like the correct range without giving the whole show away beforehand'. However, Guy Chapman recorded an occasion when the 60-pr 'toffee-apple' mortars, again tasked to blow away the German wire before a raid, were stymied by a wind which was blowing across the front: 'The trench mortar fired; but the registration had been carried out when there was no wind. The breeze caught the bomb, carrying it down the line. It exploded a few yards from the attacking group', killing and wounding men of the raiding party and washing out the raid.<sup>16</sup>

*The author would be grateful for any further information regarding mortar survey in the First World War.*

## EXERCISE DHOWES LANDING

### 42 Engineer Regiment (Geographic) Battlefield Tour

*"To us is given the honour of striking a blow for freedom which will live in history; and in better days that lie ahead men will speak with pride of our doings."*

General Montgomery, C-in-C 21 Army Group.

Ex Dhowes Landing, 42 Engineer Regiment's battlefield tour of Normandy sought between the 22nd and 26th of April this year to look at the early stages of this blow for freedom.

On the Friday afternoon prior to Monday's departure for Le Havre, a number of Officers and SNCOs from the Regiment gave presentations to the exercising troops outlining the events leading up to D Day, the so-called "Longest Day", and the subsequent operations leading to the crushing defeat of the Germans at Falaise. Despite being a Friday afternoon when most peoples' minds are already half way home, it set the scene for those who had not studied this campaign before.

After a much more enjoyable trip than for those who crossed the Channel on the 6th June 1944, we arrived at Caen at the very hospitable Hotel Mercuré. After a first class meal and few drops of vin rouge, Mr Ron Takel, a Royal Engineer Survey veteran and DSA member, recounted some his experiences from his time as a Sapper in No.2 General Field Survey Section RE. As the years go by we are rapidly losing the opportunity to speak to those with first hand experience of the World Wars, and to have Ron with us brought the tour to life, truly giving us valuable insight into what it was really like. The Commanding Officer, Lieutenant Colonel John Kedar, pointed out that since the Second World War the world has not seen operations on such an immense scale.

A beautiful sunny morning greeted us on the first day of the tour as we looked at where the British Airborne landings were carried out on the night of the 5th/6th June 1944. Our first stop was the German gun battery at Merville, followed by a look at Pegasus Bridge and the excellent museum on the bank of the Orne Canal. It is obvious to see why the Parachute Regiment is so proud of its heritage (even if it was the Oxford and Bucks Light Infantry who took Pegasus Bridge!).

Wednesday morning showed how it is all too easy to listen to statistics and yet lose what they really mean. The Commonwealth War Graves Commission Cemetery

at Bayeux provided us with the first opportunity to visualise the sheer number who gave their lives in Normandy. Before lunch we had our first look at the remnants of the Mulberry Harbour at Arromanche, truly an Engineers' paradise. The excellent museum in the village and the unique 180-degree cinema filled in the gaps with some superb scale models and interpretations. The construction of the Mulberry Harbour was truly a magnificent feat, not only in terms of the technology and scale of its construction, but also the volume of supplies and equipment that were landed through it. It is fitting that the Royal Engineers Memorial is located on the cliff above Arromanche and it was here that we carried out an Act of Remembrance, laying wreaths from 42 Engineer Regiment (Geographic), The Royal Engineers Association and The Royal British Legion.

On Thursday we had a chance to view the much famed US landing sites on Utah and Omaha beaches. Pointe du



*DSA member and Normandy veteran Ron Takel and Lieutenant Colonel John Kedar, Commanding Officer 42 Engineer Regiment (Geographic) lay wreaths at the Royal Engineers Memorial at Arromanche.*

Hoc is an absolute must for anyone visiting Normandy, being the only site where craters from the allied bombing have not been filled in. However, we ended the day at Omaha beach and the awe inspiring US Cemetery featured at the start of Steven Spielberg's classic film "Saving Private Ryan".

Overall the trip was a huge success. People not only enjoyed themselves, but everyone could not fail to take home valuable lessons and experiences.

## PERHAPS NOT QUITE MY FAVOURITE MAP

By Ian Mumford

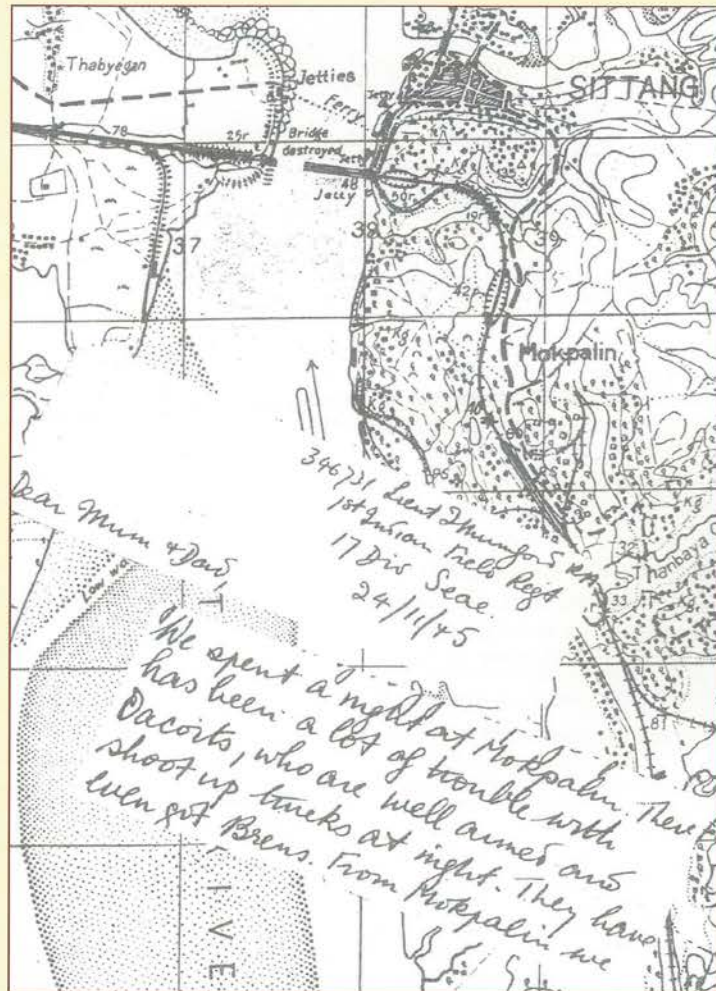
This is the time of year to think of holidays in exotic places, and late in the autumn of 1945 I thought I was on one! The war was over a few weeks before and, with the draft of Gunners I had been waiting to take out to the Far East to fight the Japs, we were now en route for a direct landing in liberated Rangoon. For a twenty-year old this was the nearest thing to a luxury cruise that one could imagine even though it was on a troopship, the large battle-scarred Union Castle liner, Durban Castle. There was butter on the table at every meal, and menu cards printed daily. De Lesseps waved us into the Suez Canal, along which we passed camps full of sun-blackened de-mob happy soldiers who raucously invited us to get our knees brown. The Red Sea claimed a typical victim when one of the sweating pursers caught pneumonia, apparently as a result of sleeping nude under a porthole to which he had fitted an air scoop. The ship stopped for a few minutes on the Horn of Africa to commit him to the deep off Cape Guardafui, where the water is several thousand feet deep, and the wits were wondering whether he would reach suspended inanimation before we reached Rangoon.

Across the Arabian Sea we were regaled with cocktails of plague, cholera and yellow fever, and began the endless daily diet of 'smarties' called mepacrine which were obviously designed to turn the skin into a lovely yellow to attract mosquitoes and ward off native women. As if the latter wasn't enough, the Senior Medical Officer gave a rousing account of letters home from a young virgin soldier which finished with the lamentation "and the MO says that I should have shot the Princess and slept with the tiger".

We came to anchor for the first time since leaving Liverpool in the great harbour of Colombo, where the vast US Fleet, including destroyers with bathing beauties painted on their funnels, surrounded the giant battleship Missouri on which the Japs had surrendered. That day we seemed a tiddler amongst sharks, but a few days later we were the largest ship to get up the mine-swept Rangoon River since before the war. After a few days sightseeing in Rangoon - the Shwedagon temple heavily encrusted in pure gold left untouched by the Japs - I left for Moulmein with the remains of my draft, on the day after the expected armed Revolution did not take place, on a slow train to Pegu. This was followed the next day by an even slower dawn ride to Waw packed into open trucks, across the fertile plains which had been the scene of fierce battles a few weeks before. Everywhere there

were thousands of Jap POWs labouring on the roads and railways, looking far too fit and healthy to have just lost a war.

The bridge over the Sittang River was the scene of yet



Extract from Burma 1:25,000 Series HIND-SEA/E/397: Sittang Bridge First Edition Survey HQ Twelfth Army April 1945 reprinted by 61 Repro Group August 1945. Courtesy of India Office Records.

another early disaster, following the fall of Singapore, when it was destroyed in the retreat before the invading Japs in 1942 - unfortunately before our fleeing army had arrived there with its guns and transport to make the crossing. So we crossed the wide river in small landing craft, and were taken on to Mokpalin, where there was a main army camp to stage in overnight. That was the night I lost any sense of peaceful innocence. All I said in my letter home was the dacoits (rebels, revolutionaries?) were in the habit of shooting up transport at night, and that they seemed to be well armed with Bren guns. In fact that night they were firing

directly at the camp, but without much effect since our bashas (bamboo huts) were in a bit of a hollow.

So this map reminds me of the night I lay under my flimsy mosquito net thinking that, having survived nearly six years of often very close encounters with high explosive, oil and thermite bombs and cannon and machine gun fire from the German airforce, as well as watching V1s come down, and feeling a V2 shake the Prince of Wales Theatre during a matinee, not to mention hands-on experience, while still a Sixth Former, of the Home Guard's primitive "sticky bombs" and PIAT mortars, and then the regular army interest in Mills 36 grenades and 808 plastic explosive to blow them up when they hadn't gone off, this Peace was apparently not going to be Peace at all, but rather war continuing with different labels.

And over forty years as a map researcher in Military Survey confirmed that fear, as Jeremiah put it, of people out there saying "Peace, peace; and when there is no peace".

**Ian Mumford** sometime Subaltern, and Mess Secretary, in the Maharajah Scindia of Gwalior's State Battery, First Indian Field Regiment, Royal Indian Artillery, 17 (Black Cat) Division, SEAC, at Moulmein, Burma, 1945-1946. Later, a Principal Map Research Officer with Military Survey and then consultant.

## THE SECOND ATTEMPT ON LORD KITCHENER'S LIFE

As a postscript to the article printed in a previous issue of *Ranger*, Mike Nolan has supplied the following article which was first published in 1929.

Supplement to the R.E. Journal - November 1929

The Editor and Proprietor of Northern News Service, 2 Queen Square, WCI, has kindly supplied the following account of an incident in the life of Lord Kitchener, written by a Member of the Council of Famagusta, Cyprus:

### **An unrecorded event in the life of Lord Kitchener:**

An attempt at Assassination in Cyprus

The unveiling of the commemorative plaque which was placed on the wall of the house in which General Kitchener lived when in Cyprus, reminds me of a strange incident, a serious danger, which he ran when solely a Lieutenant, engaged in surveying for mapping Cyprus. One morning he was taking some notes at Stronggylolaonno, a hill near Pissouri, without dismounting from his favourite white horse. On that hill two outlaws were hiding. They were Turks: Mustafa Merdjian, accused of the murder of Salih Kriticos, his co-villager, and Salih of Stavroconnou, accused of cattle stealing.

When these two criminals saw the English officer, whom they mistook for a Commandant of Police, Mustafa raised his rifle, took aim, and was about to fire. Salih tried to prevent him, assuring him that the supposed Commandant of Police had not seen them. Bloodthirsty Mustafa insisted, and, having raised his rifle a second time, took aim and fired. The bullet failed in its purpose and wounded slightly the horse in the breast. Kitchener, they say, spurred his horse, and

rushed towards the spot, but soon afterwards returned to Pissouri, as the murderers had hidden themselves.

At Pissouri, Kitchener reported the incident to the muchtar, or headman of the village, emphasizing that he saw so well the features of the criminals that he would identify them if they were brought before him. The muchtar and the villagers were willing to help in the discovery of the miscreants, but as there were no police stations at the time in any of those villages, it was impossible to chase them, though the villagers had serious reason to suspect who were the murderers, as they knew that the two outlaws were in their district. Kitchener was therefore obliged to go to Abdimou, where a mudir was stationed, performing police duties, and reported the attempt. In the meanwhile, the perpetrators left their haunt at Pissouri and fled to Crites, in Papho. Later, Mustafa's friends helped him, and he succeeded in escaping.

Some months later, in 1884, he returned to the island, and soon after his arrival was arrested and brought before the assizes, and accused of the murder of Salih. The police did not know at the time that the accused was the same person who attempted to murder Kitchener. Mustafa was lucky enough to be acquitted, as the principal witness, who was also an eye-witness of the crime, was compelled by threats to change his evidence before the Assizes. The court, in the absence of evidence, though sure of his guilt, had to release him. The President of the Assizes was at that time the famous Sir Elliot Bovill, Chief Justice, and the Greek judge was the late Demetrious Rossides, who, having expressed his regret at the unfortunate result of the case to the Chief Justice, received from him the answer, "That blackguard's countenance is such that he is sure to appear before us again."




*Kitchener and his surveying staff in Cyprus, 1883. Kitchener is seated in the centre*

In reality, after a few months, in August 1885, the same Mustafa killed a harmless man, brother of a certain Kiamill, whom he wanted to murder, having a grudge against him. Kiamill reported the matter to the police. Mustafa was arrested, and after the usual proceedings was brought before the court, in January 1886. Sir Elliot Bovill was again President of the Limassol Assizes. I shall never forget his characteristic smile as he turned towards the judge Demetrious Rossides, when the villain was produced in court handcuffed, as if trying to remind the Greek judge, with his glance and smile, of his prophecy. This time no one gave false evidence, Mustafa was sentenced to death, and was

executed in the yard of the ancient castle. Nobody knew then whom this bloodthirsty murderer sought to kill, paying at last with his life for his criminal intentions. I heard the incident later from Salih, the murderer's companion, who related to me the story after his discharge from prison. Thus the career of the famous General would have come to an end by the murderous bullet of Mustaf Merdjian, long before he met his death in the deep waters of the North Sea by the German submarine.

*Reproduced verbatim from an article first published in the Supplement to the RE Journal November 1929*



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## OBITUARY

### FRANK BERNCASTLE DSC and Bar



My name is Kenneth Scott. I was privileged to know Frank Berncastle for just on 60 years, four of which we served together in the Royal Navy from 1942 when he joined the staff at Combined Operations Headquarters under Admiral Lord Mountbatten.

Frank Measham Berncastle, DSC and Bar, Royal Navy, joined the Royal Navy from the Merchant Service and in 1938 went as a Lieutenant to join HMS Endeavour, surveying in New Zealand waters. On the outbreak of hostilities he came home to Sheerness where he was employed in minesweeping, principally in the Thames Estuary, work for which he was awarded the DSC. In 1941 after a spell in HMS Franklin on the east coast, Frank joined Combined

Operations in Whitehall. It was shortly after this that Frank and I met at HMS Tormentor, a Combined Operations training base for minor landing craft on the River Hamble at Warsash. I was an RNVR officer in command of one of these craft at the time, being trained in the art of beaching and landing army personnel. Frank explained that he was a Hydrographic Survey Officer, a part of the Navy I knew very little about. However, Frank taught me the essential basics of surveying and he told me his brief, namely to measure the gradients of beaches so as to build up information preparatory to an assault on an enemy shore. In order to achieve this, Frank said that my landing craft was to be converted and fitted with hydrographic gear. Working ultimately by night on a foreign hostile shore would present certain problems so we took part in two operations in the Mediterranean (at Sicily and Salerno) to gain experience and to check that Frank's ideas were sound.

It was due to the success of this venture that Frank came home to report and was ordered to arrange the conversion of six more craft and prepare at once to survey the Normandy coast in Baie de la Seine. Seven operations were mounted involving eight survey landing craft under the command of Lt Donald Hay DSC RNVR, between November 1943 and February 1944. As a result of these surveys a complete picture was built up of all the landing beaches for use prior to the invasion and subsequently.

On completion of the Normandy operations, the flotilla was disbanded. Frank was awarded a Bar to his DSC before joining HMS Franklin again for a short period of Clearance Surveys of North European ports.

Then followed a period in Australia serving in HMS Challenger. In 1945, Frank fell sick and was posted to the Headquarters of South East Asia Command in Ceylon where he assisted in the planning for the invasion of Malaya.

From April 1946, Frank served in several survey ships and in 1949 was given command of HMS Sharpshooter. He came ashore in 1951 and after service with the Hydrographic Equipment Department, he was lent to the Joint Intelligence Board. Before retirement in July 1957 he served with the Flood Warning Service on the east coast.

On retirement he became an Assistant Hydrographic Surveyor with the Port of Bristol Authority and in 1964 transferred to the Humber to become Conservator and Engineer to the Conservancy Board.

After his retirement Frank and I kept in close touch and attended reunions of the Survey Landing Craft Flotilla in London for many years. He spent many holidays with my wife and I particularly in Scotland where we lived until 1998. Frank always enjoyed his visits, but in latter years was dogged with ill health due in large measure to his skin cancer which affected his eyesight, restricting his reading. He lived at Shoreham-by-Sea with his wife Hilda who died in 1987 but continued to live on his own in his flat there. He was an excellent correspondent, keeping in touch with other officers of the Hydrographic Service and his Flotilla, following their activities including the Australian First Lieutenant of the Flotilla from Melbourne who used to visit Frank during visits to this country.

Frank was a dedicated naval officer insisting always on high standards of accuracy resulting from his training under Rear Admiral Wyatt, an Hydrographer of the Navy whose own knowledge and principles could be traced back through only a few distinguished surveying captains to Captain James Cook who first set the standard for British Hydrography. Frank needed to pass on these high standards of accuracy and integrity to the young RNVR officers to enable them to aspire to Captain Cook's work and provide surveys for the Normandy landings in particular and elsewhere.

Frank was a keen member of the Defence Surveyor's Association, formerly known as the Field Survey Association. He also attended meetings of the Master Mariners Association in which he was keenly interested.



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