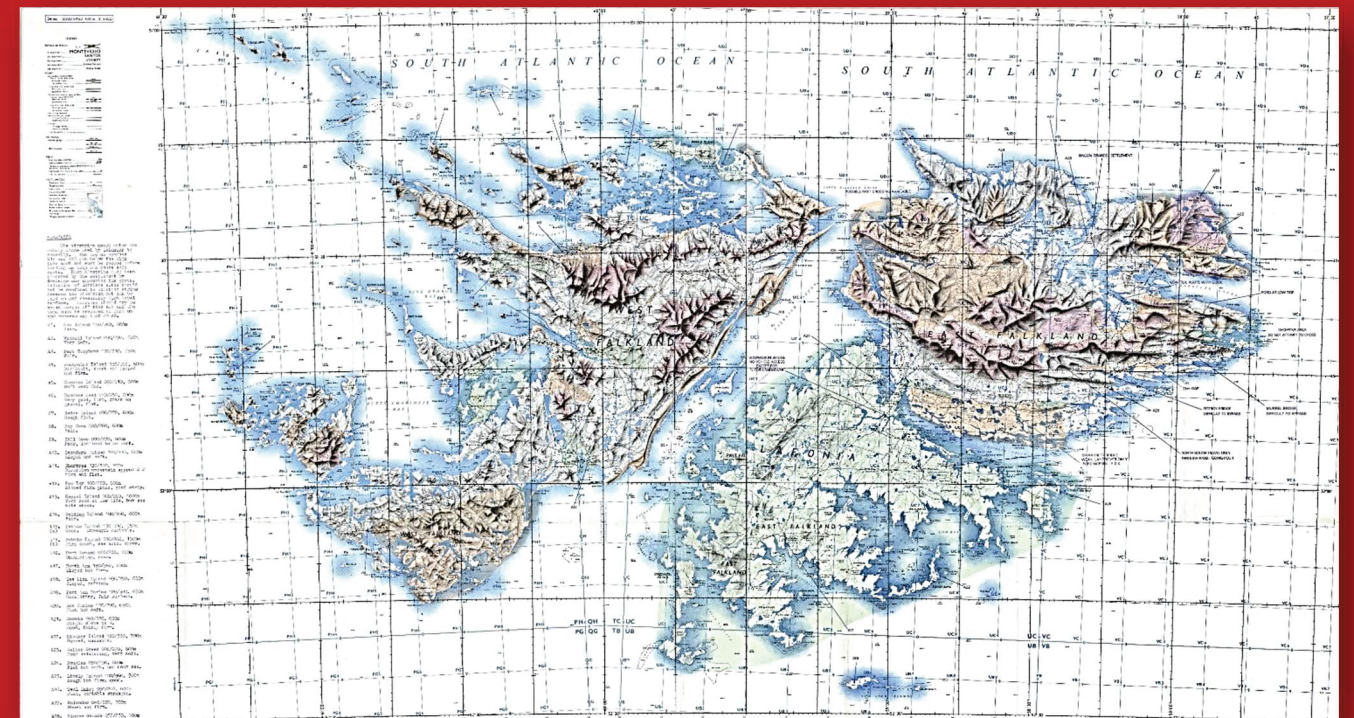


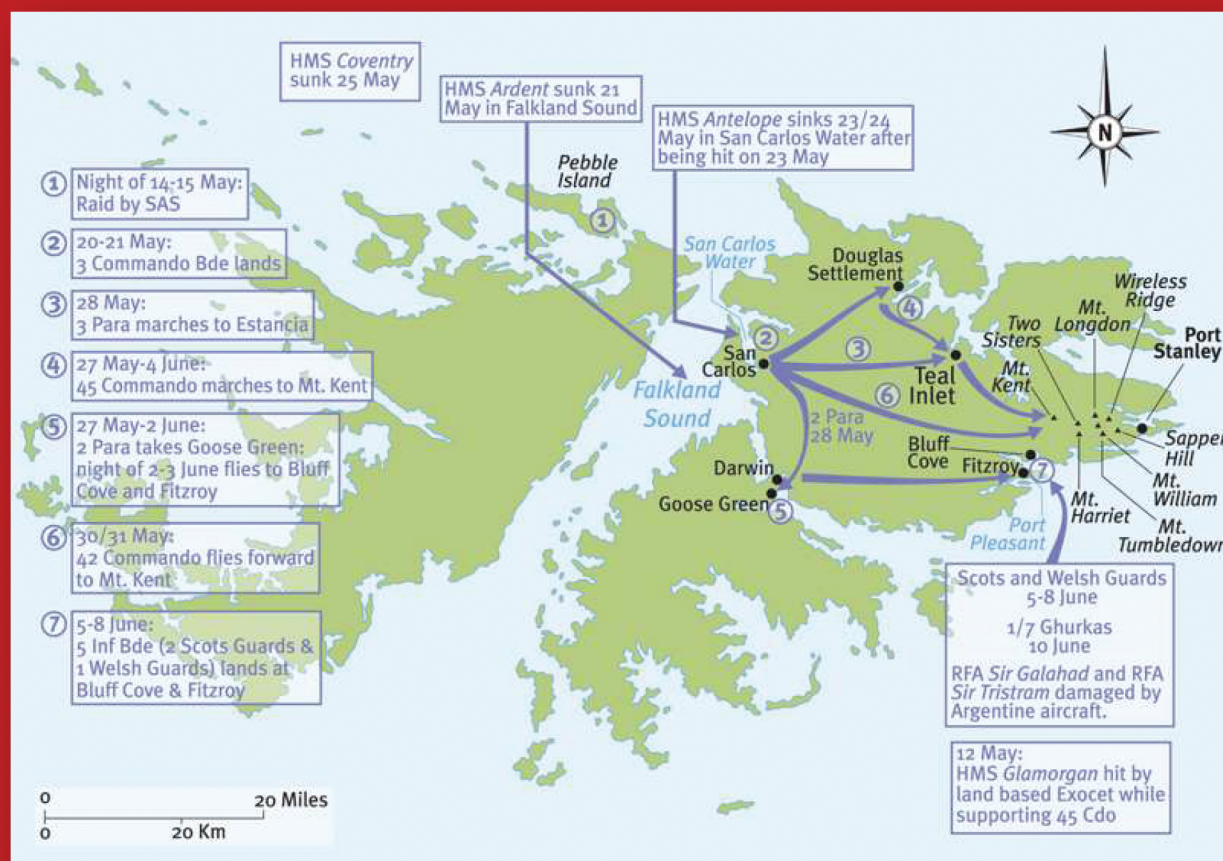
THE RANGER



40th Anniversary of the Falkland Conflict Military Survey Support

Journal of The Defence Surveyors' Association
2022 (Spring 2023)

Registered Charity No. 221816



Map Source: Military History Matters (MHM)



Defence Surveyors Association

In 1927, a group of officers who had contributed to the tremendous success of the Artillery in 1917-1918 by the provision of counter-bombardment data from 'Sound Ranging & Flash Spotting' formed the Field Survey Association as an old comrade's association and a known pool of expertise if called upon for another war. The Nobel Prize winners Sir Lawrence Bragg and Harold Hemming led the endeavour.

The association was in abeyance during the Second World War, but many members again saw active service.

The Association resumed activities in 1945 and, in 1997, was renamed the Defence Surveyors' Association to more fittingly reflect the multi-disciplined changing nature of Geographic Intelligence support to the three Services.

The DSA aims to promote an understanding and appreciation of defence surveying, mapping, charting, and geospatial intelligence in historical, current, and future contexts and keep past and present members of that community in touch with one another. Members are from the defence, industry, academia, and private sectors.

The Ranger 2022

The Falkland Conflict - Maps



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Introduction to Ranger 2022

The year 2022 was the 40th Anniversary of the Falklands invasion by Argentina and its successful re-capture by Great Britain. At the annual seminar of the Defence Surveyors' Association (DSA) on 17th June 2022, the Military Survey support to the campaign was illustrated through a display of A1-size posters. A DSA working group researched and assembled the collection with the active help of the Defence Geographic Centre, the successor organisation to the Mapping and Charting Establishment RE. Each of the score of posters showed maps or graphics produced supporting the campaign, along with an explanation of the context.

In 2022 following the COVID lockdowns, many were reluctant to travel and engage in closed environments such as a theatre. The DSA Seminar was one such event; consequently, only a few people saw the posters. Given the amount of research, compilation and editing of the posters and their importance as a historical record, the DSA decided that Ranger 2022 would focus on the material with Military Survey support to Op Corporate being the central theme.

To convey the content of the A1 posters to the reader, various formats were considered. A coffee table A3 size publication was developed. Sizes between A3 and A4 were considered, and examples were created. However, the final decision was that the A4 Ranger format should prevail.

In 2022 the Ranger Editor, through health and other commitments, resigned. Noel Grimmett has been a sterling supporter of the DSA and will continue to support the Military Survey world by producing the REA Geographic Branch Newsletter. The challenge of the format, the loss of the Editor and some production matters delayed the production of Ranger 2022.

The conflict and the recovery of the Falkland Islands have been examined and presented many times during 2022. The Ranger does not cover any of the operations.

While focusing primarily on the maps, this edition does look wider regarding the background of the Falkland Conflict and the Op Corporate mapping. It is over 40 years since the conflict. Those serving have retired, many who joined soon after 1982 have also

retired, and for the younger elements of the Military Geographic world, 1982 is history. Simply providing detail of the maps would not have given the context of the demand for geographic support.

"Background to the Falkland Island Conflict" looks at the events leading to the conflict. Within the article are a couple of telling sentences. In 1981 the British and the Argentinians began to dust off and update contingency plans for the Islands' defence. The new Argentine Junta began updating their contingency plans to invade the Islands similarly. In both instances, maps were not included in updating the contingency plans. Following the Falklands War, there was a significant restructuring within Military Survey such that when Iraq invaded Kuwait in August 1990 Military Survey was well organised and able to deliver the most extensive mapping programme since World War II.

"The Falklands Conflict – Operation Corporate. Military Survey and Meeting the Demand for Mapping". Revisits previous Ranger articles and gives a narrative to the maps and related Military Survey Support.

In 1982 automated cartography (Auto-Carto in Military Survey parlance) was beginning to emerge to replace the long-established map compilation and production techniques. Computer graphics were in their infancy. The Map Library held paper copies and reproduction material. The demands for maps and products were met for the existing and some new material with new products being compiled and updated.

Three short articles highlight earlier mapping of the Falkland Islands. "The First Military Maps of the Falkland Islands" includes a map by Robert Fitzroy of the *Beagle* fame. "14 Field Survey Company – A Veteran Remembers" outlines the tasks, survey, and mapping undertaken in 1942. The third article, "The DOS Triangulation and 1:50,000 Scale Series of Maps", explains the work undertaken between 1958 and 1961.

The second part of this Journal deals with the maps and related geographic products derived and produced for Op Corporate. The material is based on the A1 Poster collection. The posters from the 2022 DSA Seminar can be viewed on the DSA website and scaled to A1 format.

The concluding article summarises the work undertaken by the Military Survey organisation.

Background to the Falkland Islands Conflict: 1982

War is the last of all things to go according to schedule - Thucydides

The Falkland Conflict was forty years past in 1982.

Throughout the conflict, British Military professionalism surfaced and prevailed time and again, even when the politico-military situation became murky, and Clausewitz's fog of war overtook the principles of war.¹

The Falkland Conflict - the last British Colonial War?

At the same time as the Falkland Conflict, the Cold War was at its height. The British Military's primary focus was Europe and NATO, with a heavy commitment to Northern Ireland.

In April 1982, after Argentina invaded the British-administered Falkland Islands and its quick rout in the following short war, the British public revelled in an unbridled demonstration of nationalism.² Still debated is whether the British politicians and press successfully popularised the war effort by appealing to old imperial nationalisms that had previously united the nation.

Ultimately, the political discourses and representations of the Falklands War illustrate how ideal Britishness was conveniently found abroad in the former empire during the alleged British decline. Indeed, well into the so-called "post-colonial" period of the 1980s, settler communities had a significant bearing on domestic British politics and identity.



Margaret Thatcher

In discussing the Falklands War, the context is part of Britain's imperial history and identity. The Falkland War reasserted imperial nationalism that had

¹ Train II, Harry D., 'An Analysis of the Falkland/Malvinas Islands Campaign', *Naval War College Review*, 41.1 (1988), 33-50 <<https://www.jstor.org/stable/44636703>>

² Rogers, Lindsey, "The Myths of War: The Impact of the Falklands War on British Politics, Decolonization, and National Identity" (2021). Undergraduate Honors Theses. William & Mary. Paper 1694. <https://scholarworks.wm.edu/honorstheses/1694/>

long unified the diverse British nation into a cohesive whole, namely the symbiotic relationship of "otherness" and "sameness". Imperial issues dominated Margaret Thatcher's tenure in Downing Street-the resolution of the Rhodesia crisis, hunger strikes in Northern Ireland, patriations of the Canadian, Australian and New Zealand constitutions, the Falklands War, Grenada, negotiations over Hong Kong, and her controversial Apartheid policy. British understandings of national identity during this period often hinged on the imagination of an idealised settler identity.³ Politically, the Falkland War ensured the survival of Margaret Thatcher and secured her re-election.

The conflict involved the first use of modern cruise missiles against warships of a powerful navy, and it was the first time since World War II that sustained air attacks made against naval forces at sea. It also included the first use of nuclear-powered attack submarines and the first known use of vertical/short take-off and landing aircraft (VSTOL) in combat.

The action in the Falklands demonstrated that war's outcome is determined on the ground. The Royal Marines and the British Army won on the battlefield. The nature of the conflict was that the Royal Navy could have lost the Falkland Islands conflict at sea but could not have won the war.

The diplomatic prelude to the Falkland Islands Conflict spans 150 years. In the immediate years leading up to the encounter, the primary players were: the United Nations, the Falkland Islands Company, Foreign Minister Lord Chalfont, the Falkland Islands Emergency Committee, Foreign Minister Lord Carrington, the new junta in Argentina, the Royal Navy, BBC Television and Constantino Davidoff, an Argentine scrap metal dealer.

In 1960 The United Nations passed U.N. Resolution 1514, urging all colonial powers to divest themselves of their colonies and submit a list of those colonies to the United Nations. The British listed the Falkland Islands as a British colony. Argentina responded by claiming the Malvinas Islands were no one's colony. The United Nations subsequently created a committee to negotiate the conflicting British and Argentine claims.

³ Herbert, Joel, 'A Post-Imperial Frontier? Britishness, the Falklands War, and the Memory of Settler Colonialism' (North Carolina, 2013) <<https://cdr.lib.unc.edu/concern/dissertations/dv13zt91w>>

Many residents of the Falkland Islands derived their livelihood from the Falkland Islands Company, a profitable operation involving the sale of wool produced in the Falklands. In following secret negotiations between Argentina and Britain and rumours of an imminent settlement of the Falkland Islands sovereignty issue, Lord Chalfont visited the Islands. This high-level visit so alarmed the Falkland Islands Company that the structure continued.

In 1971 Great Britain and Argentina signed, under U.N. auspices, a communication agreement. Under this agreement, Argentina assumed from Great Britain the burden of communication support of the Islands and instituted air service between the Falklands and the mainland.



Lord Carrington

In the years following, talks primarily focused on the sovereignty issue and were subject to periodic breakdowns. 1981 was a turning point in the conflict because it marked a return of Argentinean aggressiveness following the failure of the sovereignty negotiations. Then, in 1981, Lord Carrington was about to embrace a Hong Kong-type lease-back agreement with Argentina. The Falkland Islands Emergency Committee, with their emotions running high, embarked upon a blitz of Parliament and succeeded in obtaining a decision to discontinue all discussions of sovereignty in the talks with Argentina. Violent reactions in Argentina to this diplomatic setback prompted the British to dust off and update contingency plans for the Islands' defence. The new Argentine Junta began updating their contingency plans to invade the Islands similarly. In both instances, maps were not included in updating the contingency plans.



Galtieri

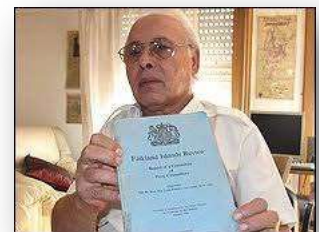
In 1981 Argentinean newspapers began to call for the end of military rule. Thus, it started considering external conflict to bolster its domestic support and offset criticisms.⁴

⁴ Jervis, R., Lebow, R. N., & Stein, J. G. (1989). *Psychology and deterrence*. JHU Press. p. 98

It appears that once the Galtieri Junta took over in late 1981, they set an invasion timetable for the Falkland Islands between June and October of 1982; however, due to the Davidoff expedition on South Georgia Island, the timetable had to be sped up. The reason for setting the invasion between June and October was the onset of winter in the South Atlantic. Any British reaction to using force against the Falkland Islands was more difficult, if not impossible. Also, Argentinean weapons procurement and refit would only be complete in October 1982.⁵

The 1981 riots in England's coal mines and the Labour Party's exploitation of the Conservative Government's distress created pressures within the United Kingdom to seek a unifying cause. Also, the Royal Navy received yet another setback when John Nott, Secretary of State for Defence, announced that one-quarter of the surface combatants in the Royal Navy would be deactivated. The Navy needed an argument to modify the reduction.

At the end of March 1982, merchants landed on the distant and inhospitable South Georgia island - 900km (600 miles) east of the Falkland Islands. The background is that a scrap metal dealer, Constantino Davidoff, had purchased three abandoned whaling factories in the South Georgia Islands; he planned to bring "white card" workers to the Islands to dismantle the factories and ship the scrap to Argentina. There were misunderstandings between Davidoff and British Government officials regarding the correct procedures to be followed in performing his mission. When Davidoff refused to follow the proper port of call procedures, the *HMS Endurance*, with twenty-one Royal Marines onboard, was sent to remove the salvagers from the island. The Argentinean government told the British embassy that an Argentine ship was leaving to remove Davidoff and his crew. *The HMS Endurance* held off from removing the salvagers, and it was met by three Argentine warships, forcing it to leave without removing the Argentineans.⁶



Davidoff

The considerable diplomatic and consular ineptitude of Governor General Rex Hunt at Port Stanley resulted in an electrifying report from the British Antarctic Survey team in the

⁵ Malin, M. (1995). [Review of *Asymmetric Conflicts: War Initiation by Weaker Powers*, by T. V. Paul]. *Journal of International Affairs*, 48(2), 653–658. <http://www.jstor.org/stable/24357609>

⁶ Psychology and deterrence. P.99

South Georgia Islands stating that the "Argentines have landed." The BBC announced that two British nuclear submarines had sailed for the Falkland Islands. That was not the case. The events and misunderstandings led to war.

Deterrence

Conventional deterrence failed to prevent open warfare between Britain and Argentina over the Falkland Islands sovereignty issue. Previous Argentine governments may have considered using military force to regain sovereignty over the Falkland Islands (Malvinas Islands). However, such actions were deterred by their perceptions of Great Britain's that capability to defend its interests.

Argentina faced a dilemma before the Argentine military force committed to occupy Port Stanley on 2 April 1982. The Argentine contingency plan was supposed to be part of an academic exercise. Nevertheless, several high-ranking generals and admirals considered the options in a secure location. The Galtieri-Anaya-Lamidoze junta did not believe the British would respond with military force. Broadly the reasons related to the continued decline in British Military capability included;

- the loss of Suez in 1956 and the associated loss of overflight rights and use of bases created obstacles to sustaining British deployments east of Suez; the loss was a massive blow to British perceived prestige
- the 1957 British defence review resulted in cutbacks of Royal Navy and British Army forces stationed outside of the United Kingdom;
- the 1966 Labour government economic review resulting in a significant reduction of British forces stationed east of Suez;
- the late 1960s mission reduction of the Royal Navy; and plans to deactivate all Royal Navy aircraft carriers, transferring the tactical air mission to the Royal Air Force—all cast doubt on the ability of the Royal Navy to support the vital interests of the United Kingdom;
- failure of the Conservative Party to alter this trend during their 1970-1974 stewardship gave a sense of permanence to these setbacks;

- the 1975 Labour government defence review sealed the doom of the aircraft carrier retired amphibious ships, projected reductions in the size of the Navy and ordered further withdrawals from British overseas bases;
- the 1981 Conservative government announcement of deactivating one-quarter of the Royal Navy's surface combatants and simultaneous negotiations to sell one-third of their newly constructed class of miniature VSTOL carriers to Australia painted a picture of doom for the Royal Navy.

The Junta did not believe that the British had the capability, capacity and political will to oppose a military occupation of the Falkland Islands.

Following the false report on the deployment of the submarines, Argentina concluded that the opportunity for a successful invasion would disappear when the submarines arrived on the calculated date of 12 April. D-Day was set for 2 April.

The attack by Argentina should not have come as a shock or surprise to Britain since it cracked the Argentinean diplomatic code in 1979. The Foreign and Commonwealth Office Intelligence Committee (JIC) should have ascertained an updated threat assessment regarding Argentina's intentions.⁷ Yet, this was not done effectively. Britain's political and military planning, combined with severe psychological limitations, decreased its regional credibility and reputation, severely undercutting its ability to affect Argentina's risk analysis and conventional deterrence failed in the Falkland Islands conflict.

Taking back the Falkland Islands

The Argentina landing was well executed. Seven hundred marines and one hundred commandos undertook an amphibious assault on Port Stanley. Their rules of engagement were to shed no British blood and avoid damage to British property. The marines and commandos were back-loaded the same day and replaced with a comparable number of army occupation troops. From this point, until the sinking of the *General Belgrano*, on 2 May, the Argentinian leadership thought they were in a crisis management situation, while the British, on the other hand, believed they were at war. The Argentine leaders considered the invasion a mere military nudge to diplomacy and continued to seek a diplomatic

⁷ Psychology and deterrence. P. 91

solution for gaining sovereignty over the Malvinas Islands. Meanwhile, the British sailed their fleet, including ships taken up from trade, loaded out with paratroops and commandos, toward the war zone.

The First Ten Days

The Argentine plan was to occupy the islands with a small force and negotiate from strength of possession. They did not plan to support this force with a substantial logistics effort since the Argentine leaders did not believe they would have to fight. By similar reasoning, the Argentines saw no reason to lengthen the Port Stanley Airport to permit A-4s, Super Entendards and Mirages to operate from the Islands.

Argentina probably lost the war between the 2 April invasion and the 12 April arrival of the British submarines. That is not to say the British won the war then, as they did not win it until early June, but the Argentines lost it early on.

Britain goes to War



Admiral Leach

On 31 March, the First Lord, Admiral Sir Henry Leach, joined a sad discussion in Prime Minister Margaret Thatcher's office in Parliament.⁸ That afternoon, a report had reached White Hall that an Argentinean invasion force would reach Stanley, the capital of the Falkland Islands, early on 2 April. He astonished the gathering by arguing that a task force should be assembled and sent to the South Atlantic as soon as possible. The surprise to those present lay in Leach's conviction that it was possible to send a force so quickly and capable of landing marines on the islands while looking after itself if subjected to air and sea attack. The reason: 'because we do not, or if we

pussyfoot in our actions and do not achieve complete success, in another few months we shall be living in a different country whose word counts for little.'⁹

⁸ Freedman, Lawrence, 'The War of the Falkland Islands 1982', *Foreign Affairs*, 61.1 (1982), 196–210 <<https://doi.org/doi.org/10.2307/20041358>>

⁹ Leach, Henry, *Endure No Makeshifts* (Pen and Sword, 1993). P. 209-211

Leach received the authority to make preparations for a task force. When Leach returned, he informed then Acting Chief of Defence Staff, Air Chief Marshal Sir Michael Beetham, about the emergency meeting and its decision.

The advice was only to set sail a task force that could - if need be - retake the Falkland Islands. At each stage from 5 April, the task force steamed on or returned home - there was no holding position. Had

Prime Minister Margaret Thatcher been unable to send a task force, the probability was of international humiliation and her possible resignation.



Britain goes to war

In reporting that a task force was mobilising and ready to sail, the Prime Minister provided a rallying point for Parliament. She held on to the political initiative at home, avoiding a potentially fierce and possibly demoralising debate. She also recovered some of the lost diplomatic ground lost the previous day.

The size of the British force, which sailed from the United Kingdom, surprised the Argentine leadership and led them to make hodgepodge decisions on troop reinforcement. They fed in additional regiments by air until their troop numbers reached 10,000. Yet, they took no measures to augment their initial decision to provide limited logistical support when merchant ships could have safely transited the waters between the mainland and the with heavy artillery and mobility assets such as large helicopters.



General Mario Menéndez

The commander of the Argentine garrison in Stanley, General Mario Menéndez, surrendered to Major General Jeremy Moore at 2100 hours on 14 June 1982,



Major General Jeremy Moore



Operation Corporate

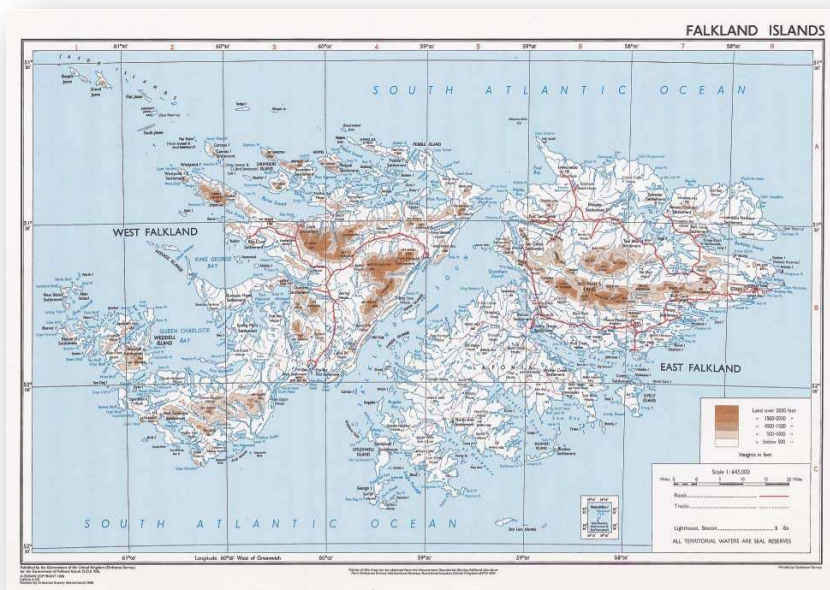
Military Survey and Meeting the Demand for Mapping

In 1982 Military Survey worked to priorities given by its operational taskmasters, the three Vice Chiefs of Staff and their subordinate operational staff, tempered by CINCFLEET, UKLF and Strike Command input. The Falkland Islands and its Dependencies were in the lowest priority area.

The headquarters (Directorate General of Military Survey) was based at Feltham, alongside the production capability, the Mapping and Charting Establishment - MCE RE. The Map Library, a worldwide collection of maps and charts, was 11 miles away at Tolworth, while 8 Map and Chart Depot RE at Guildford stored bulk stocks of mapping. The uniformed element of Military Survey, 42 Survey Engineer Regiment (which included the War Reserve

Map Depot), was based at Barton Stacey and provided additional production and printing resources and survey and map supply detachments.ⁱ

When Argentina invaded South Georgia and The Falkland Islands, no contingency plans stated the coverage and scales of



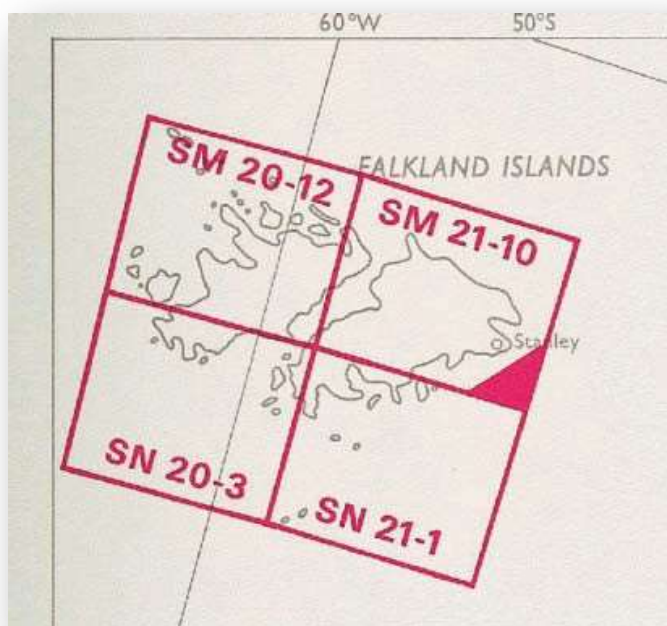
DOS 906 – the most useful general map at the start of the operation

maps required for the area, no maps in the War Reserve Depot, and no medium or large-scale military maps. Even the Map Library, usually considered MOD's insurance policy for mapping, had a limited collection of maps of South America and the Falkland Islands. The

Library was considering relocating them to an off-site store to utilise the space for mapping of the more potentially active areas.

However, available as a map for the Falkland Islands was the Operational Navigation Chart at a scale of 1:1 million produced by the Americans in 1965. The Islands covered less than 2% of the sheet at this scale and showed little detail. Military Survey had produced a 1:250,000 Joint Operations Graphic at the planning scale as part of a joint production programme with America. The Directorate of Overseas Surveys (DOS) created a larger scale product at 1:643 000, DOS 906, in 1966, which was a more manageable size and showed more detail.

The Falklands, despite their small size, were at the junction of 4 sheets and, to complicate matters further - 2 grid zones! The islands fell across longitude 60W, the intersection of two zones of the Universal Transverse Mercator (UTM) grid referencing system. The



significance of the grid junction is that a single location could have two different grid references depending on the grid zone used.

There were two series of civil maps at larger scales. The DOS had produced the 1:50,000 DOS 453 maps as part of their responsibility to the Ministry of Overseas Development. This series was in 29 sheets and created in 1961-2, based on 1956 aerial photography.

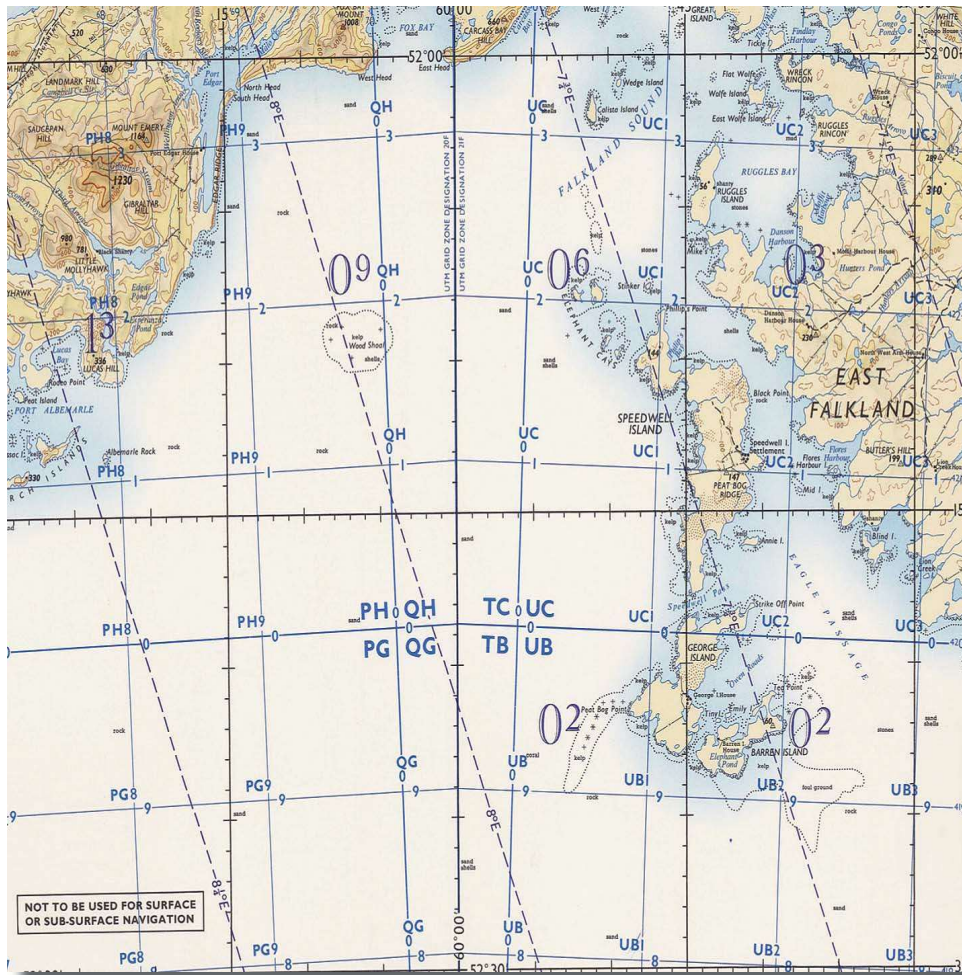
Most sheets were $\frac{1}{4}$ degree by $\frac{1}{2}$ degree in size though seven were larger and would not fit onto NATO-size printing presses. The series had been constructed on the Transverse Mercator projection and only had grid ticks in the neatlines of the map. DOS had extended the grid zone across the islands to avoid the grid junction's inconvenience. The outcome was a nightmare scenario of using two map series - 1:50,000 and JOGs - across the same area with different grid zones and grid references.

The other large-scale series consisted of two sheets at 1:2,500 over Stanley, also produced

by DOS in 1966. It lacked contours and only covered a small area.

However, the grid junction mentioned earlier along longitude 60W was a problem with the 1:50,000 series. The grid lines on both axes were not parallel across the zone boundary.

The bulk of the Falklands falls to the east of 60W (in Zone 21), but about one-third falls to



The grid zone junction shown on the JOG series

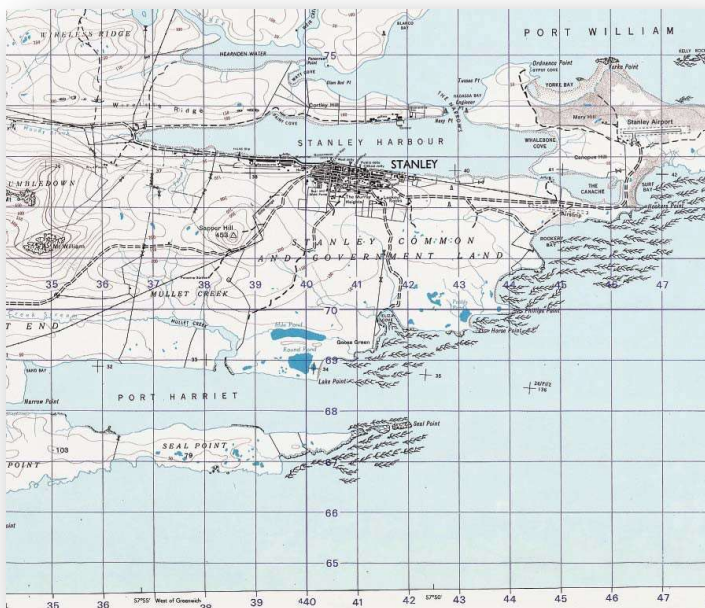
the west (Zone 20)). To overcome the inconvenience of the grid junction, DOS had constructed all 29 sheets of the series with Zone 21 grid ticks, which provided incorrect references on the ten western sheets (for example, on sheet 23, Malacara Valley was located at grid ref TC 5327 on Zone 21 but PH 6431 on Zone 20). The solution showed both grids on the western sheets using different colours. A prominent warning note directed users to give references using the red numbers for Zone 20 and the purple for Zone 21. Unfortunately, the two grids seriously impaired the western sheets' legibility. Later reports indicated that the forces did not use the dual-gridded sheets because they were too cluttered.

This series was the most used in combat, and reports indicate that the "yomp" from San Carlos to Stanley was marked by the piles of maps discarded as the advance progressed

successfully. Given the strong winds that sweep the island, this may be apocryphal.

On 7 April, DOS notified Military Survey of an error on sheet 25. Some of the islands in the northwest were misplaced by 6mm (about 300m on the ground). DOS had corrected their reproduction material, but the Military Survey held set had not been changed. Reprinting the 1:50,000 sheets perpetuated the error. Work was necessary to correct the position on this sheet and the 1:250,000 scale mapping derived from it. Luckily, Bird Island did not

feature in the operations. Four years after the conflict, the island was discovered to be 700 metres from where it was supposed to be!



DOS 1:50,000 series reproduced by Military Survey as series H791

Since it was clear that Stanley would become the focus of attention, Military Survey overprinted the DOS 1:2,500 sheets with more recent information and a UTM grid to create a series GSGS 5451. Since it was clear that maps of Stanley

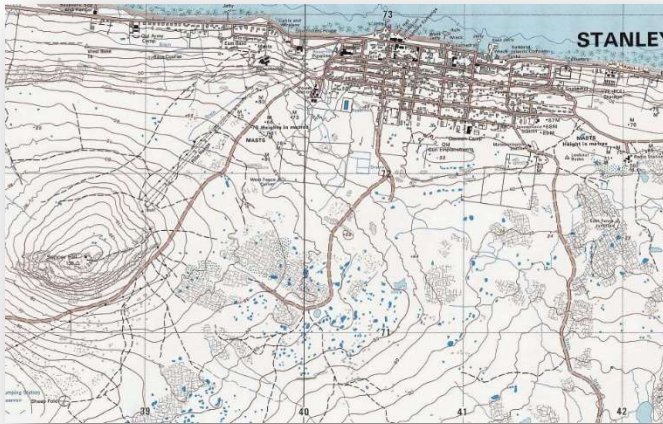
airport would be required, various

plans, engineering drawings and diagrams came from the Civil Aviation Authority. By 6 April, four sheets had been printed at 1:500 to 1:50,000 to supplement the meagre information held previously.

Towards the end of April, it became necessary to rationalise the variety of products over Stanley and to ensure that a suitable map for planning the final assault was available. Initially, two sheets over Stanley were produced, and four more sheets further west were completed in May. The Hydrographic plots did not cover the required area, and some of the 1:50,000 series were enlarged to fill the gap. This product reached units in time for the final assault and proved invaluable for subsequent explosive clearing work.

Trying to operate off four JOG sheets was difficult, so the sheets were joined to produce a single sheet over the area (GSGS 5455). The map served as the base for creating an

updated topographic map on which roads, tracks, bridges, and installations identified from HMS Endurance helicopter photography could be printed in magenta. A new survey was impossible, so the 1:50,000 mapping was enlarged and reproduced on new sheet lines over the required areas and overprinted with updated information. CINCFLEET also liked the product and, on 27 April, requested sheets over Fox Bay, Port Howard, Port San Carlos, and Darwin/Goose Green - two days later, Pebble Island was ordered. A first edition was



GSGS 5456 1:12,500 compiled by DOS to a standard specification using plots provided by the Hydrographic Office and air photography by HMS Endurance.

produced by enlarging the 1:50,000; then, it was overprinted to include new information to create edition 2. It is not standard cartographic practice to enlarge 1:50,000 to 1:25,000, but in this case, the original had been produced at the larger scale.

A requirement for a 1:100,000 scale product was also identified. The JOG was enlarged to make a five-sheet

1:100,000 series, GSGS 5460, omitting the hill shading to save time, adding a warning note to alert users to the possible lack of accuracy and overprinting it with updated information. The resulting product was not pretty but met the requirement exactly.

For the first time in an operation, computer graphics assisted topographic assessments. Digital Terrain Elevation Data was created based on the 1:250,000 contours and used in the Vulcan cockpit during Operation BLACK BUCK, the bombing of Stanley airfield. In addition, the terrain model around Stanley was later refined using the new contours from the 1:12,500 maps. Computer Terrain Views were also produced, showing the ground shape from any selected viewpoint.

A rendezvous point was required to regroup and replenish the Task Force's first wave. A senior Warrant Officer was despatched to Ascension to manage the withdrawal of superseded maps from stock and replace them with the latest editions.

On 7 April, the decision was to include artillery units in the Task Force. Therefore trig lists

for Falklands and South Georgia were produced. At the time of the Argentine invasion, a gazetteer of almost 3,000 place names compiled from DOS 453 maps and published by the British Antarctic Survey in 1972 was used, and during the week following the invasion Military Survey speedily produced an updated gazetteer (GSGS 5442) with over 3,000 entries for the Falklands (including variants) and 830 for South Georgia and the South Sandwich Islands. Sources used were the 453 series maps (including second editions of sheets 14 and 15 from 1979), Admiralty hydrographic charts, manuscript additions on the Series 453 sheets made in the 60s and 70s by administrators in the Islands and Argentine 1:500,000 sheets from 1968 and 1974. Unnecessary duplications were removed, and coverage of the Dependencies expanded to over 1,000 entries.



The RE Briefing Map - one of the most useful and sought-after products.

The gazetteer contained variant names (primarily those found in Argentine sources) cross-referenced to the main entries. The action was crucial because the Argentines had different names for over 200 major geographical features of the Islands. Frequently, these were not simple translations of the English name that could be easily deduced. For example, when the Argentines reported on 1 May that a Mirage had hit a destroyer near Puerta Enriqueta, the gazetteer told you that this was the Argentine version of Port Harriet. During the conflict, the Argentines employed five names for Stanley, settling on Puerto Argentina only on 21 April.

DOS maps of the Falklands were on public sale and carried a note "Agents for the sale of this

map are Edward Stanford 12/14 Longacre London". Argentina spent £2,000 buying up stocks of these maps from Stanfords before the invasion, without anyone in Britain attaching any significance to the fact. They also captured DOS maps during the invasion and reprinted them in Argentina. On his surrender, the Argentine commander General Menendez had a DOS 1:50,000 map with him – ungridded. The Argentineans did not use a ruler and a pencil to join the grid ticks - precisely what the Commandos under Thompson did in the early days before the gridded versions reached them. Not only was mapping inferior on the Argentine side it was also scarce. One conscript afterwards lamented: "I hadn't the slightest idea...where I was...As soon as they landed, they had an idea of where they were; they knew which hill was which. I, on the other hand, had no idea. We didn't even have basic geography. You want to see a map, at least to find out where you are".

The article is based on the following publications.

John Himbury, 'Operation Corporate: The Military Survey Involvement', *Re Journal*, 1982

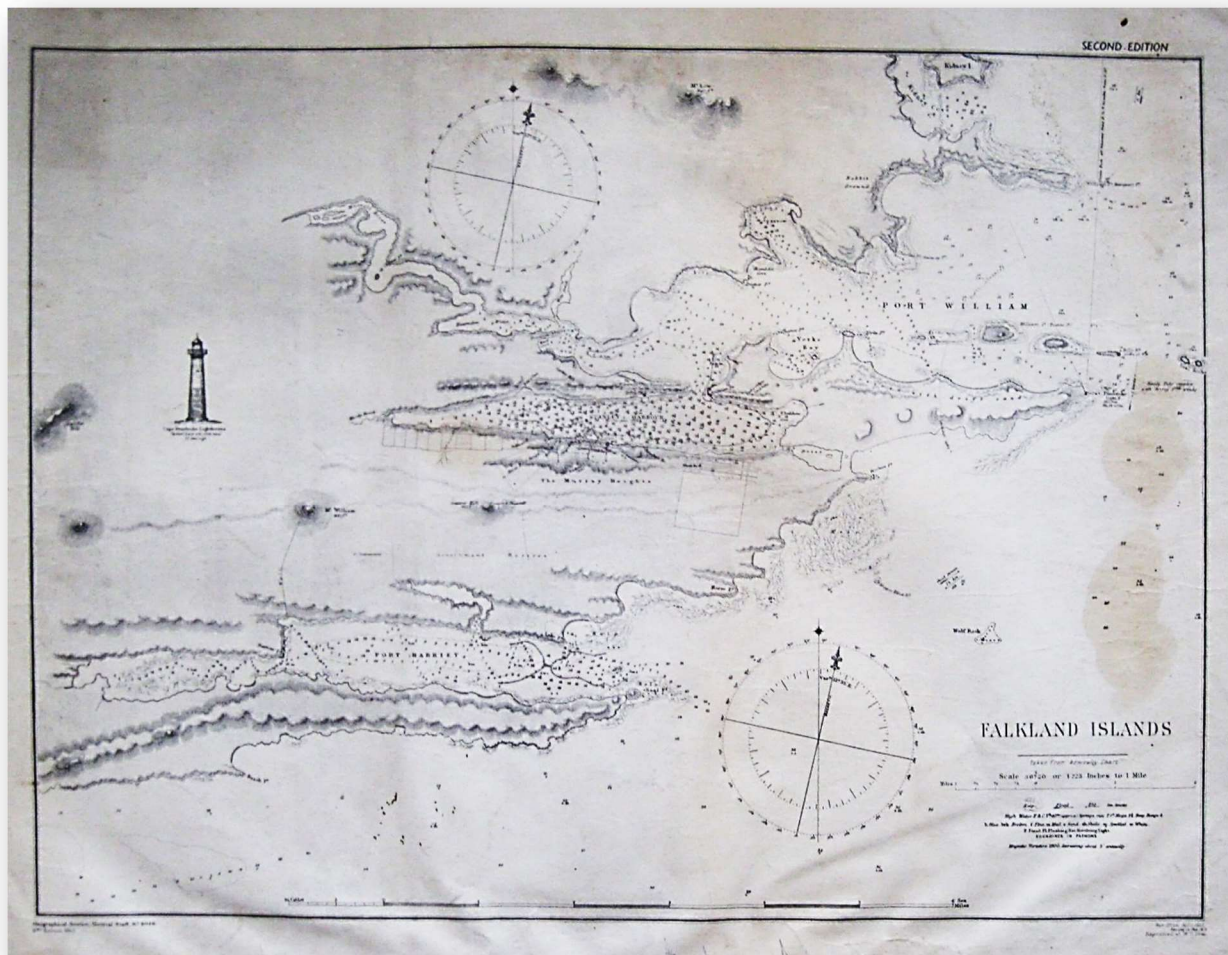
John Himbury, '25th Anniversary: Operation Corporate: The Military Survey Involvement', *The Ranger* 2007

Liz Manterfield, and John Peaty, '25th Anniversary: Operation Corporate, The Military Survey Involvement Mapping for the Falklands', *The Ranger*, 2007

ⁱ Although not strictly correct, unless it is important to distinguish which part of the organisation had a key role, for the sake of simplicity this article refers to all the elements as 'Military Survey'

The First Military Maps of the Falkland Islands

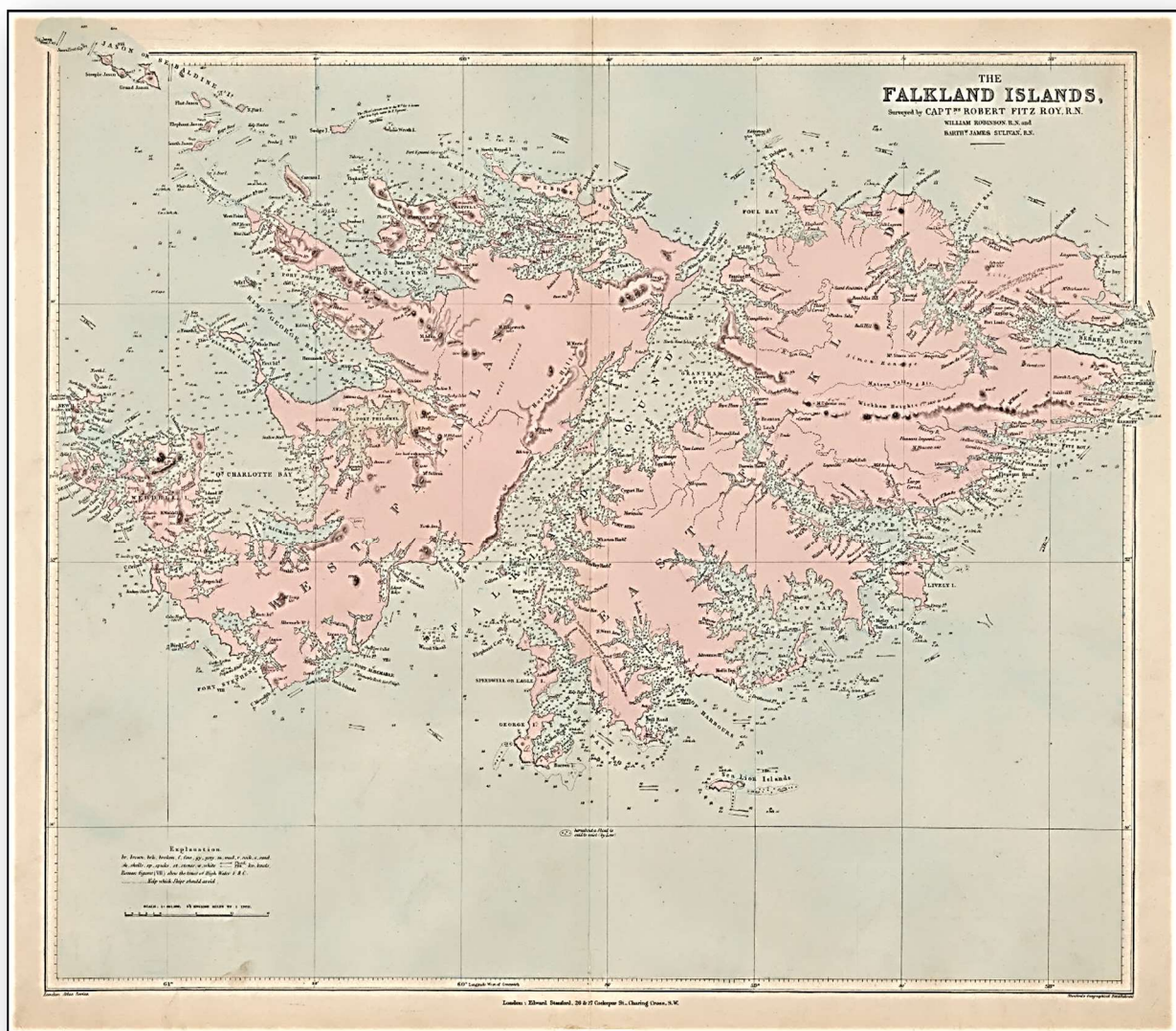
In the nineteenth century, Admiralty charts had sufficed for all purposes relating to the need for maps of the Falkland Islands.



The map was revised in February 1913 and printed in 1914 with the designation G.S.G.S. 2029. In 1933 it was reprinted to illustrate the defence scheme of 1933. A second edition was printed in 1941. Finally, the American Army Map Service published a version

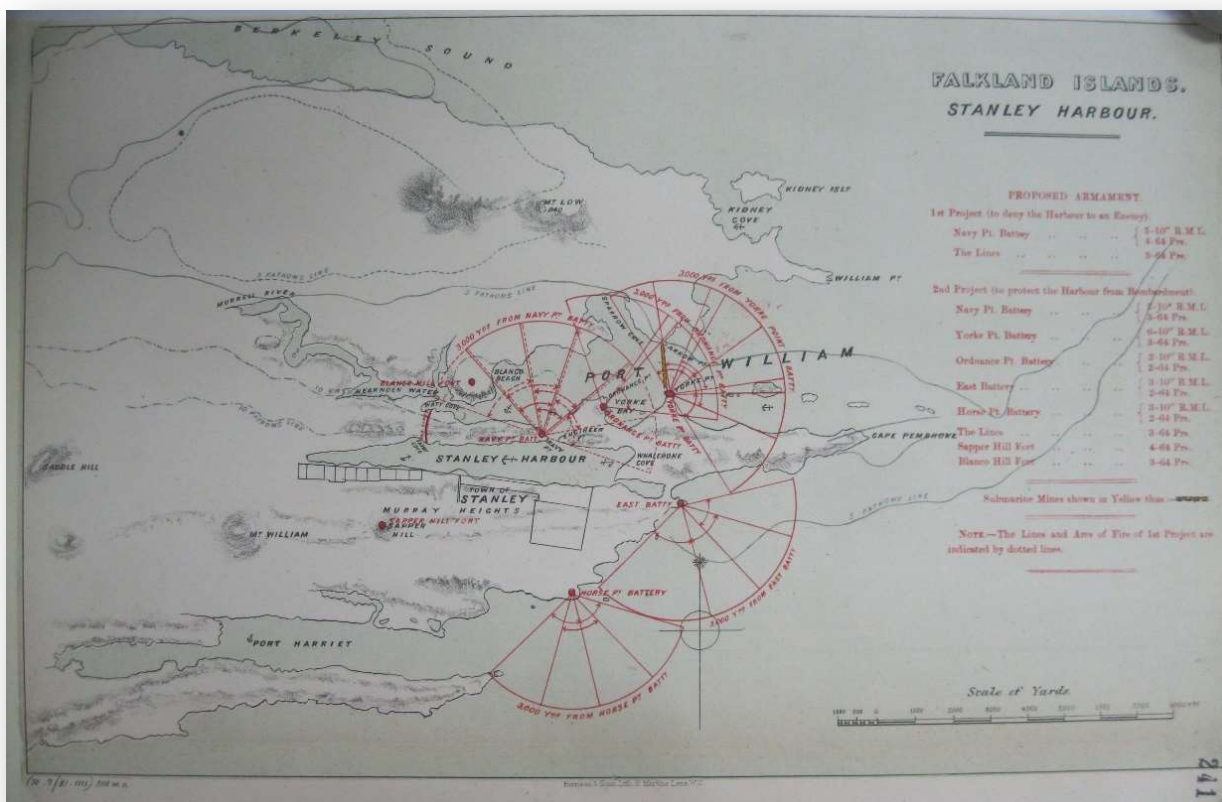
A Royal Commission Appointed to Enquire into the Defence of British Possessions and Commerce Abroad was appointed on 8 September 1879 under the chairmanship of Lord Carnarvon. The Commission produced "the first comprehensive study of Imperial defence".

The three Reports of the Commission were submitted on 3 September 1881, 23 March 1882 and 22 July 1882. The third report of the Royal Commission on the Defence of British Commerce and possessions anticipated a decrease in shipping and trade around the horn once the Panama Canal opened and less need for the defence of the Falkland Islands. The Commission concluded that considerable expense was not justified but worth considering if achieved at a small cost. Due to their sensitive subject matter, none of these Reports was published. Following an incident over the Chilean ship "Maipo" in 1891, the governor drew attention to Stanley's helplessness in hostilities. A volunteer defence force was raised and supplied with 100 martini henry rifles and two nine-pounder field guns.



The Falkland Islands, Surveyed by Captn. Robert Fitz Roy, R.N., William Robinson, R.N. and Barthw. James Sulivan, R.N. Published in 1894 by E Stanford

The armaments were proposed first to deny the harbour to an enemy and second to protect the harbour from bombardment. The planned arcs of fire are shown for the proposed mix of 64-pounder guns and 10-inch rifled muzzle-loading guns.



Proposed armament for Stanley. The war office plan indicates the Imperial coastal defences envisaged and is typical of the plans produced by the Committee for Imperial Defence.

World War II - 14 Field Survey Company - A Veteran Remembers

In 1942 Force 122, comprising the 11th West Yorkshire Battalion, 100 Royal Engineers, some Royal Army Service Corps and Royal Electrical and Mechanical Engineers personnel,



embarked on the SS *Esperance Bay*, an ex-armed merchant cruiser bound for the Falkland Islands, arriving there in September after fourteen weeks at sea. On landing at Stanley, the infantry assisted the field engineers in building the Force camp. The infantry carried out the construction.



Some artillery was included in the Force, with two 3.7-inch guns and two Bofors guns emplaced with a predictor.

On landing and for a period after, the Force had no maps of the Falklands and had to rely on

Fitzroy's Admiralty charts of the 1830s. The Engineers produced an initial sketch map to remedy this deficiency.

Later, 2 TOPO Section of 14 Field Survey Company RE arrived to make a map of the environs of Port Stanley. The eighteen-strong detachment comprised wartime personnel except for L/Sgt Lockwood and Sgt Holland. Lt Calder, a Lancaster Fusilier from the Garrison. Harry Calder was attached to the Topo Section for the task's duration.

14 Field Survey Section
 Middle Row L-R
 Cpl. John Bunn, L/Sgt. Walter
 Lockwood,
 Lt. Harry Calder, Lt. T. Lesley
 Thomas,
 Sgt. Gilbert Holland, Cpl. Suddaby



The Section was commanded by Lt T.L. (Tommy) Thomas, Welshman who had worked at the General Electric Company in Stafford. Harry Calder describes Thomas as "a brilliant mathematician" and was awarded an MBE.

Field Survey. The section was equipped with three Tavistock theodolites for observing a triangulation, mostly of braced quadrilaterals but with some intersections. Sapper Hill was heighted by levelling from the datum, but after that, all heighting was by theodolite vertical angles. Plane tables surveyed the detail.

The Section was equipped with two steel tapes: one used as standard, the other as the field instrument. The base was measured on Stanley Racecourse by surface taping following Winterbotham's manual, and ten bays were measured ten times in one direction. The base was then re-levelled and measured again from the other direction. The maximum error was 1/10 inch.

The Drawing Office. The section accommodation was two Nissen huts, one for eating and sleeping and one for a computing and drawing office. The first task was to draw the grids for the



sheets, which were to be on the US Polyconic Projection but with a metric grid. A baseline was selected on the race course, at the west end of which astronomical observations were observed for latitude and longitude by position lines.

Tasks. The Section's first task was to address the projection. The tables supplied were for the US World Polyconic Projection Band 5 Zone South. These used the yard as their unit of measure. Because the British army measured in metric units, the projection tables needed converting. Calder had the job; he used the Benoit

Cheney conversion, which had succeeded the Clarke conversion.

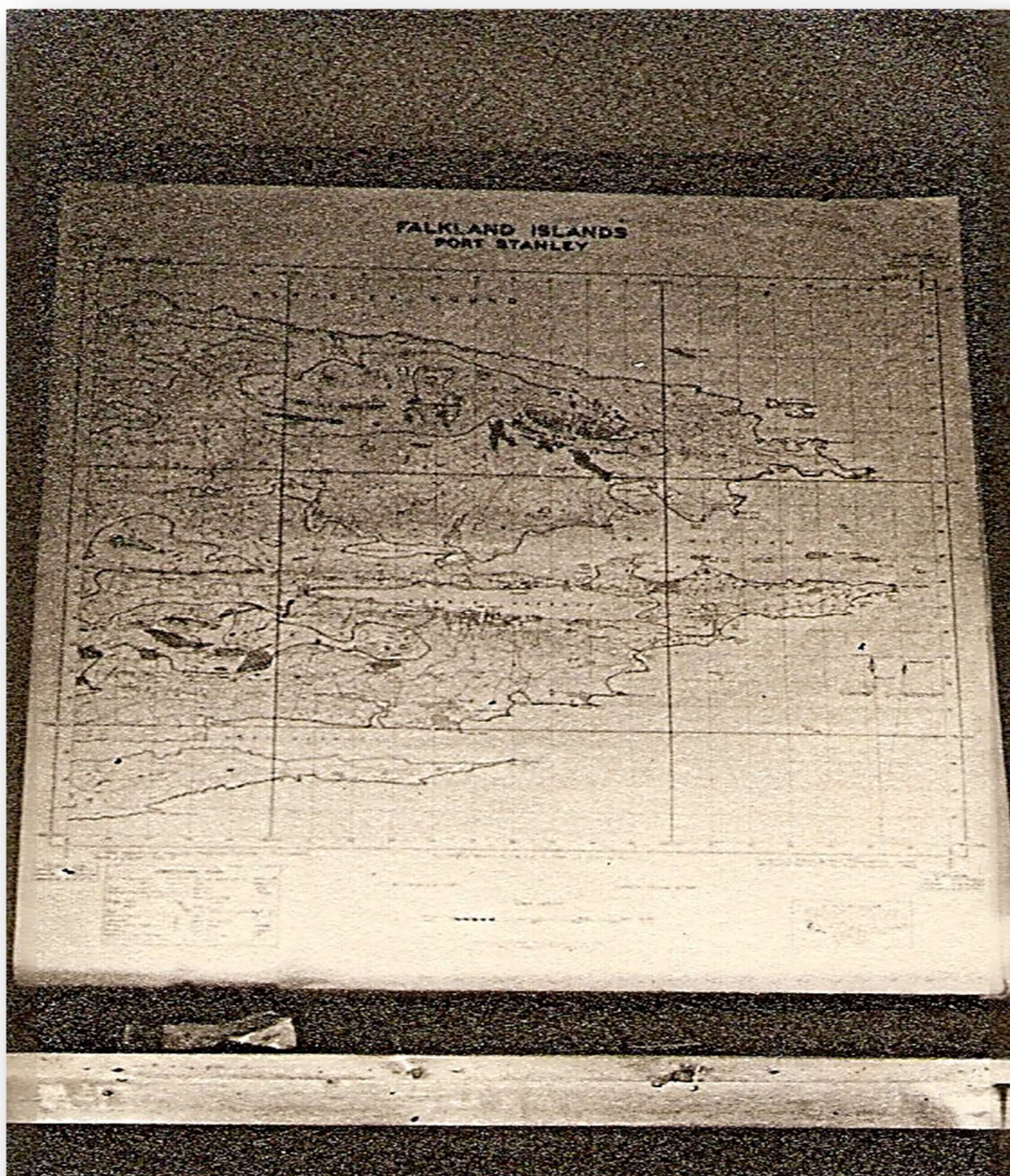


The next task for the Section was a reconnaissance of the ground. The datum was fixed at the west end of the base, and latitude and longitude were derived from position line observations to appropriate southern stars.

For the triangulation, the Section was equipped with three Tavistock theodolites. The triangulation was based as far as possible on braced quadrilaterals with some points fixed by intersection and resection. The base extension was to three points on the north side of Stanley Harbour. The trig point on Twelve O'Clock Hill was concreted on the spot with an iron bolt as a fine point—an OS. Beacon erected above it. The Hill was so named because it was due north of Government House.

Heighting was by trig heighting methods. Initially, a height was transferred from the datum to Sapper Hill and back by levelling. The detail was surveyed by plane tabling. Large-scale plans, such as the Falkland Camp, were surveyed by chain survey. The draughtsmen

produced only one copy of each field sheet. The sheets were assembled to create a single map. The map was sent to the UK; copies were only printed later.



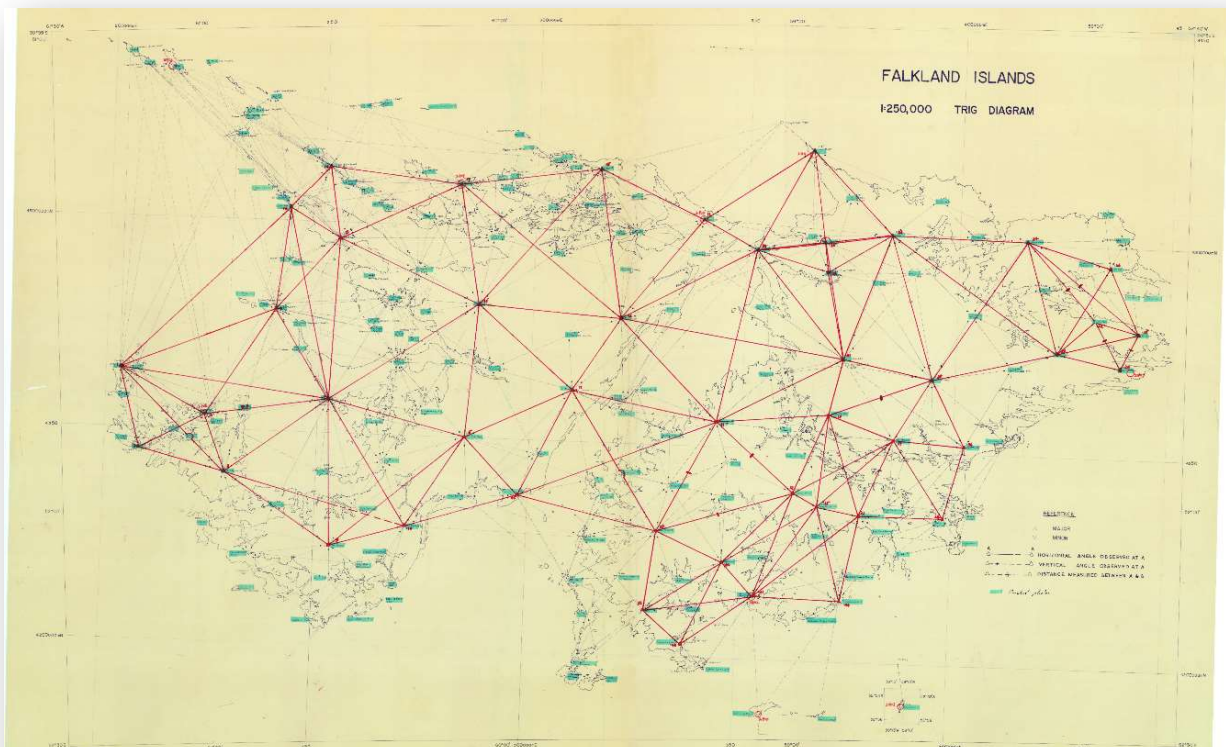
The completed map on the drawing office table

The Survey Section of 14 Company departed in 1943.

This article is based on a previous article written as a result of telephone conversations between Col. M. A. Nolan and Harry Calder in 2007, from Barry Calder's interviews with Harry (his father) in October and November 2007 and a few documents now in possession of Barry Calder

The DOS Triangulation and 1:50,000 Scale Series of Maps

Between 1958 and 1961, the Directorate of Overseas Surveys (DOS) conducted a conventional triangulation of the Falkland Islands.



The final diagram of the main triangulation of the Falkland Islands after adjustment by the Geodetic Office

In 1960 a team from the Falkland Islands Dependencies Survey (FIDS) participated in this survey, bringing an MRA 1 Tellurometers, which enabled distances between trig points to be measured and the scheme to be scaled accurately.

Using aerial photography taken in a Catalina aircraft, DOS, based in Tolworth, then undertook the mapping of the islands producing a complete cover in 29 sheets printed by the Directorate of Military Survey (DMilSvy) in 1961.

To meet possible but undefined military requirements, the civilian style 1:50,000 maps were given the Standard Series Designation H791 and adopted for military use.

Small stocks, rarely exceeding a hundred copies, were held by 8 Map and Air Chart Depot RE (8 Depot) primarily for an issue to the small detachment of Royal Marines stationed on the islands.

The sheets were constructed on the Transverse Mercator projection, and Universal Transverse Mercator grid values for Zone 21 were shown against ticks around the neat line of the 18 sheets east of the 60 degrees West meridian.

DOS 453(Series H791), comprising 29 Sheets, was a very clear map showing the islands' topography very well due to the lack of vegetation and cultural detail away from Stanley.

Sheet 14 extends from 58-00 to 58-30W & 51-30 to 51-45S and shows the area of the western approaches to Stanley, including some of the rugged hill features. The sheet shows the 1,000-metre UTM Zone 21 grid ticks around the neat line but not the 1,000-metre grid lines on the face.

It also shows the geological feature known as the "stone runs", making cross-country movement in some areas difficult on foot and on wheels.

The first edition was produced in February 1961 from Huntings Surveys aerial photographs dated 1956.

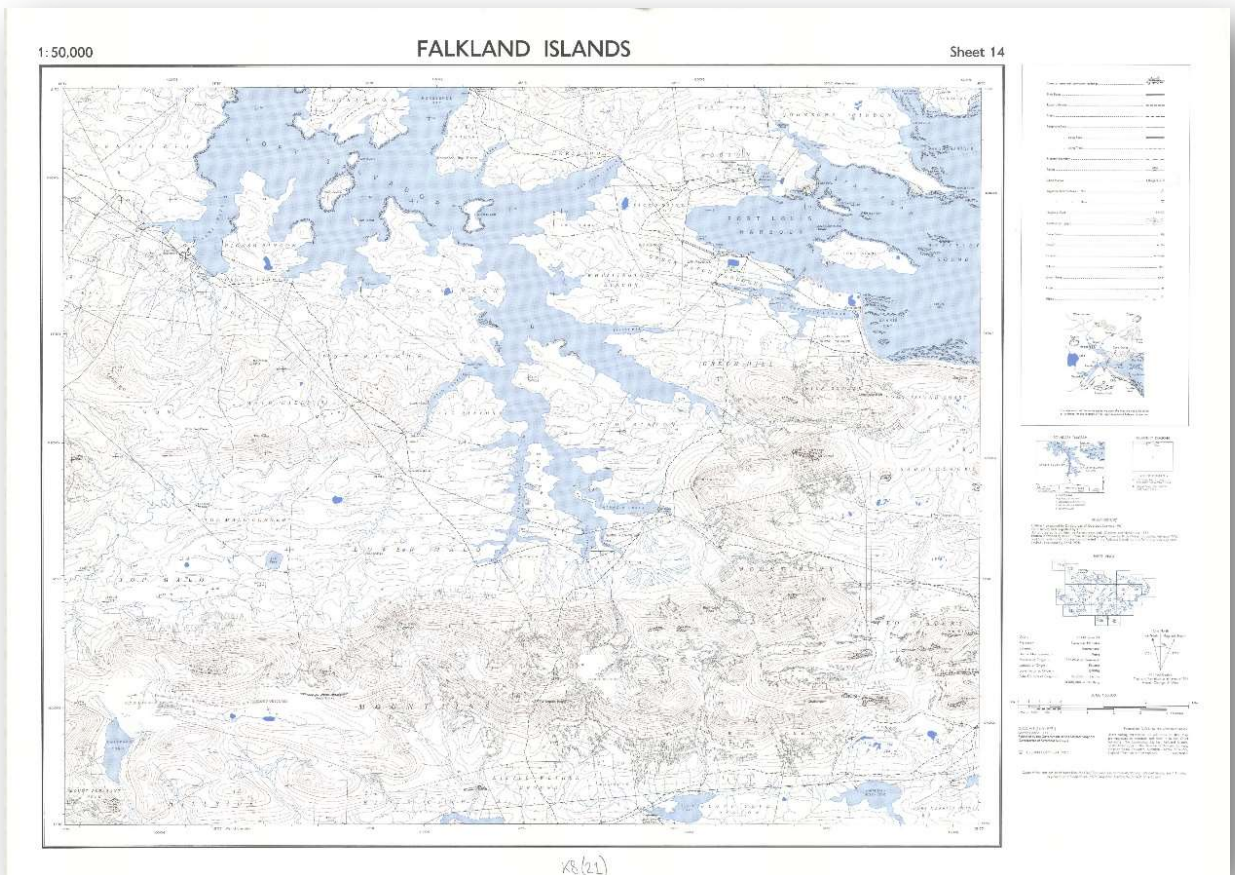
This second edition sheet was revised from Royal Navy helicopter aerial photography dated February 1976 and printed in November 1979.



Packing camp to the summit of Mount Moody
9 May 1959.



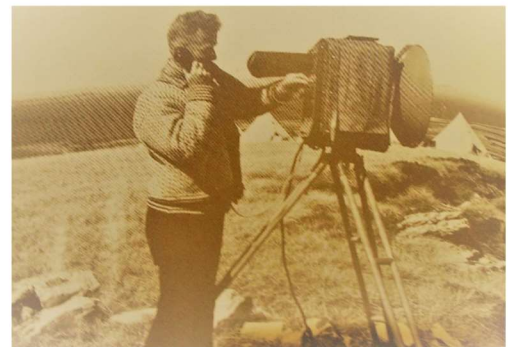
Building a stone observation wall on
Mt Moody 9 May 1959



D.O.S. 453(Series H791), comprising 29 Sheets, was a very clear map which shows the topography of the islands very well due to the lack of vegetation and cultural detail away from Stanley. Sheet 14 extends from 58-00 to 58-30W & 51-30 to 51-45S and show



Above. D.O.S. surveyor John Evans and Geodetic Tavistock theodolite on "Smoko" Mountain 9 Oct 1958

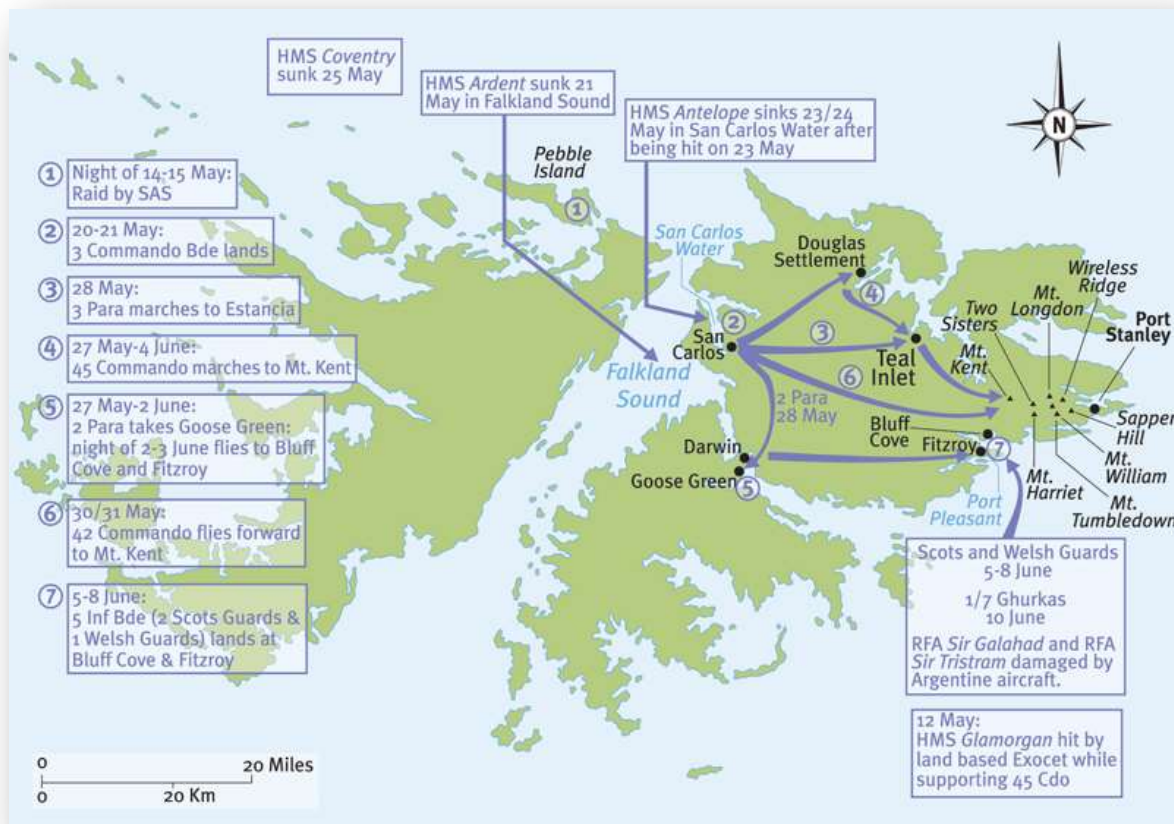


Top Right. John Evans measuring a distance between two trig points with an electronic distance measuring equipment, the MRA1 Tellurometer



Right. Survey beacon on First Mountain, Pebble Island, 10 Jan 1958

Op Corporate - The Falklands



The Campaign*

2 April	Argentinian Forces invaded and occupied the Falkland Islands.
3 April	Argentine Forces occupied South Georgia.
5 April	The UK despatched a Naval Task Force to reclaim the Falklands and S. Georgia.
21 May	The British Forces landed at Port San Carlos.
14 June	General Menendez surrenders the Argentinian Forces to Major General Jeremy Moore.

The General Outline - Military Survey

The Military Survey Response

When the crisis broke, the stocks of operational maps were limited.

By the end of Op Corporate 410 different products had been made available and 750,000 maps had been printed.

Military Survey Units Involved

Mapping & Charting Establishment RE

42 Survey Engineer Regiment RE

135 Field Survey Squadron RE

School of Military Survey

8 Map & Air Chart Depot

Geographic Branch HQ BAOR

Other Supporting Agencies

The United Kingdom Hydrographic Office

The RN Survey Fleet

The Directorate of Overseas Surveys

The Ordnance Survey of Great Britain

Falkland Conflict - Op Corporate

Time Line and Military Survey

The Operational Timeline		
Date	Op Corporate Events	Military Survey Events
Mar 19	Argentinian party lands South Georgia.	
26		CINCFLEET staff ask MOD Map Library for map of the Falklands.
27	Junta closes negotiations.	
29	Covert deployment of subs to South Atlantic.	
Apr 1	Argentina rejects US request for restraint.	NAIC Pinner seek maps.
2	Argentinian forces land on Falkland Islands.	UKLF queries lack of grid on H791.
3		Special Forces seek mapping.
6		Acquisition & Printing of Stanley Airport Graphics.
7	UK Imposes of a 200-mile Total Exclusion Zone.	
8		Urgent printing of 1:50,000 and 1:250,000 maps complete. Stanley runway profiles produced.
9	3 Cdo Bde & 3 Para sail in Canberra.	
12	South Georgia Task Group departs Ascension.	US supplies ONC 1:1M air charts.
16	Task Force Advance Group departs Ascension.	GSGS 5453 RE Briefing Map produced.
18	Carrier Battle Group departs Ascension.	
19		Falklands Gazetteer produced. Ascension Trig List to 79 Bty. Ascension Trig List to 79 Bty.
23		GSGS 5455 Moving Map Display Edn1 produced for RAF Harriers.
25	South Georgia taken.	
26	2 Para sails for the Falklands.	Port Stanley GSGS 5457 1:25,000
28		GSGS 5457 Port San Carlos, Port Howard, Darwin/Goose Green. Fox Bay. Stocks to HMS Fearless.

May	1	Op Black Buck: First Vulcan raid on Stanley Airport.	GSGS 5456 of Port Stanley 1:12,500.
		Carrier Battle Group reaches Total Exclusion Zone.	
	2	Belgrano sunk.	
	4	Maj Gen Moore appointed Comd Land Forces FI.	
		HMS Sheffield sunk.	
		Op Black Buck 2.	
	12	QE2 sails with 5 Inf Bde.	G892 Ascension Island revised.
	13		Computer Terrain Views for CINCFLEET.
	15	SAS Raid on Pebble Is.	
	21	Landings at Port San Carlos.	
	22	HMS Ardent sunk.	
	23	HMS Antelope sunk.	
	25	HMS Coventry & Atlantic Conveyor sunk.	
	26	2 Para take Camilla Creek.	
	27		Coverage of 1:25,000 cover San Carlos to Port Stanley complete.
	28	2 Para take Goose Green.	
	29	45 Cdo and 3 Para take Douglas Settlement & Teal Inlet.	
Jun	1	Mt Kent taken.	
	8	RFAs Sir Tristram and Sir Galahad attacked.	
	12	3 Para take Mt Longdon. 45 Cdo take Two Sisters. 42 Cdo take Mt Harriet.	
	13	2 SG take Mt Tumbledown. 2 Para take Wireless Ridge.	
	14	3 Cdo Bde and 5 Inf Bde on outskirts of Port Stanley. Argentinian Forces seek ceasefire. Argentinian Forces. surrender at midnight.	
	20	Argentinian Forces at South Thule surrender.	

Series ONC - Operational Navigation Chart 1:1,000,000

The Joint Products

The 1:1,000,000 scale series was called the Operational Navigation Chart (ONC).

The 1:500,000 scale series was called the Tactical Pilotage Chart (TPC). It had not been produced over the Falklands before the crisis broke, and therefore does not feature in this poster series.

For the 1:250,000 scale series 1501 Joint Operations Graphic,

Operational Navigation Chart - ONC

ONC sheet T-18 depicts the Falkland Islands fully but much of the depiction of the South American mainland is incomplete. Sheet T-18, falls within the US area of production responsibility but the UK stocked only small quantities. Operational stocks of sheet T-18 ordered from the US arrived on Ascension in the second week of April.

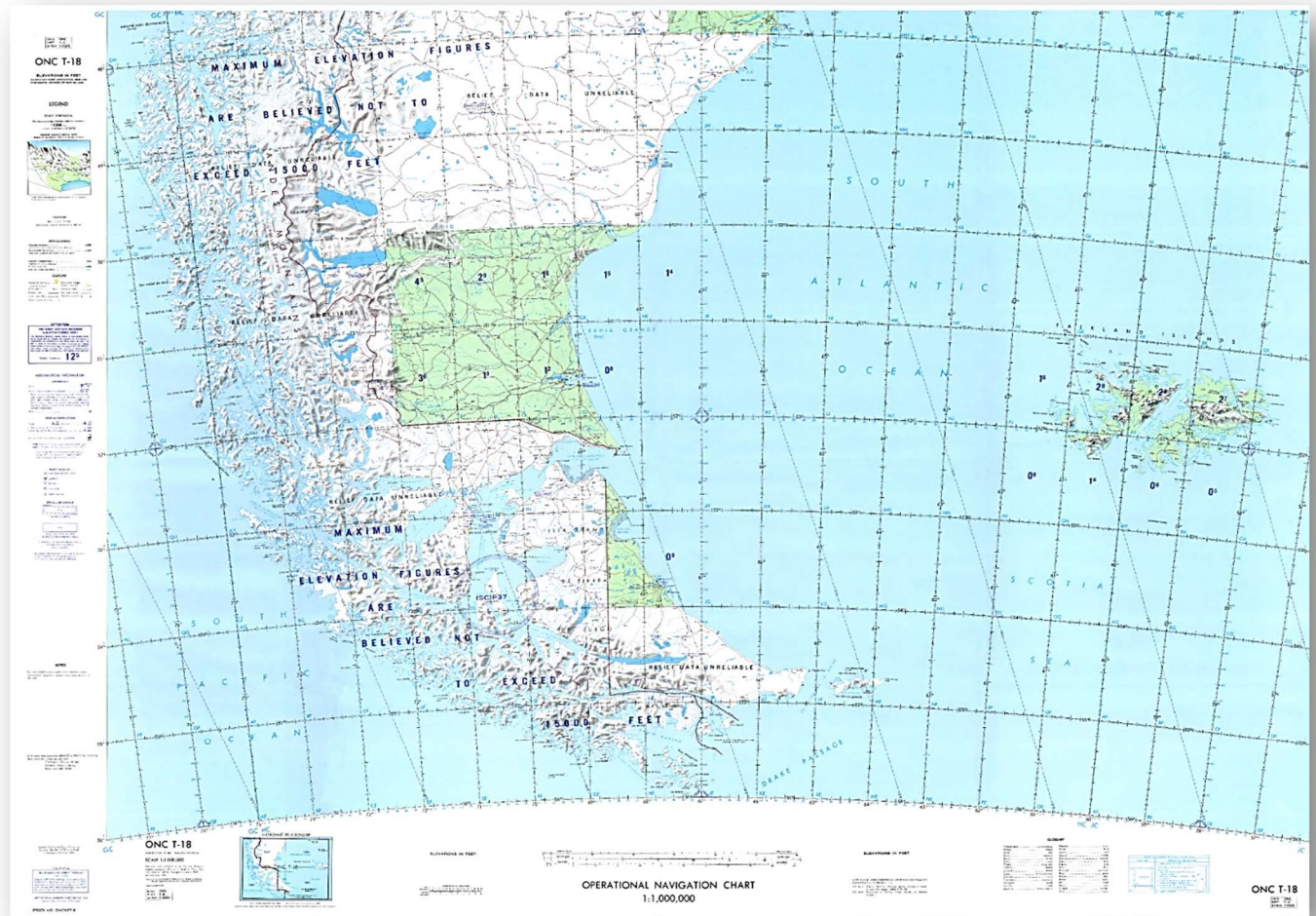
The Falkland Islands

The map extract on the right shows the Falkland Islands at 1:1,000,000 scale.

The map extract shows the 1-degree graticule with 1, 5 and 10-minute grid ticks around each 1-degree quadrangle as required by navigators. Across the face are pecked lines or Isogonals, showing lines of equal magnetic variation.

The large, bold “electric blue” figures in the centre of each one-degree quadrangle are Maximum Elevation Figures which show aircrew the lowest safe flying altitude in that quadrangle. For instance, 2⁸ being 2,800 feet above mean sea level.

The relief is shown by contours, spot heights and hill shading. Cultural detail is simplified for air use.



ONC Sheet T-18, shown at reduced scale



The map extract shows the Falkland Islands on the 1:1,000,000 scale

Maps When the Crisis Broke

Series DOS 653 Falklands 1:250,000 & DOS 1185A Falklands and Geological 1:250,000

On the evening of Friday, 26 March, the MOD Map Library took a call from Fleet HQ. The caller urgently sought a “map of the Falklands”, but the purpose was not disclosed. The two DOS 653 second edition sheets were immediately issued from his description of his needs and concerns about the Argentinian invasion.

Directorate of Overseas Surveys (DOS) Series 653

DOS 653 was compiled in 1964 from the twenty-nine sheets of Series DOS 453 (H791) at 1:50,000 scale (Poster 6).

DOS 653 has layer-shaded relief, which gives a good picture of the rugged terrain. Cultural detail, such as settlements, roads, tracks, and vegetation, is sparse, and the result is a clear, easy-to-read topographical map showing property boundaries and names. The Argentinian forces had copied and re-published this map with the title Islas Malvinas (Poster 16).

Series DOS 1185A Geological Map of the Falklands

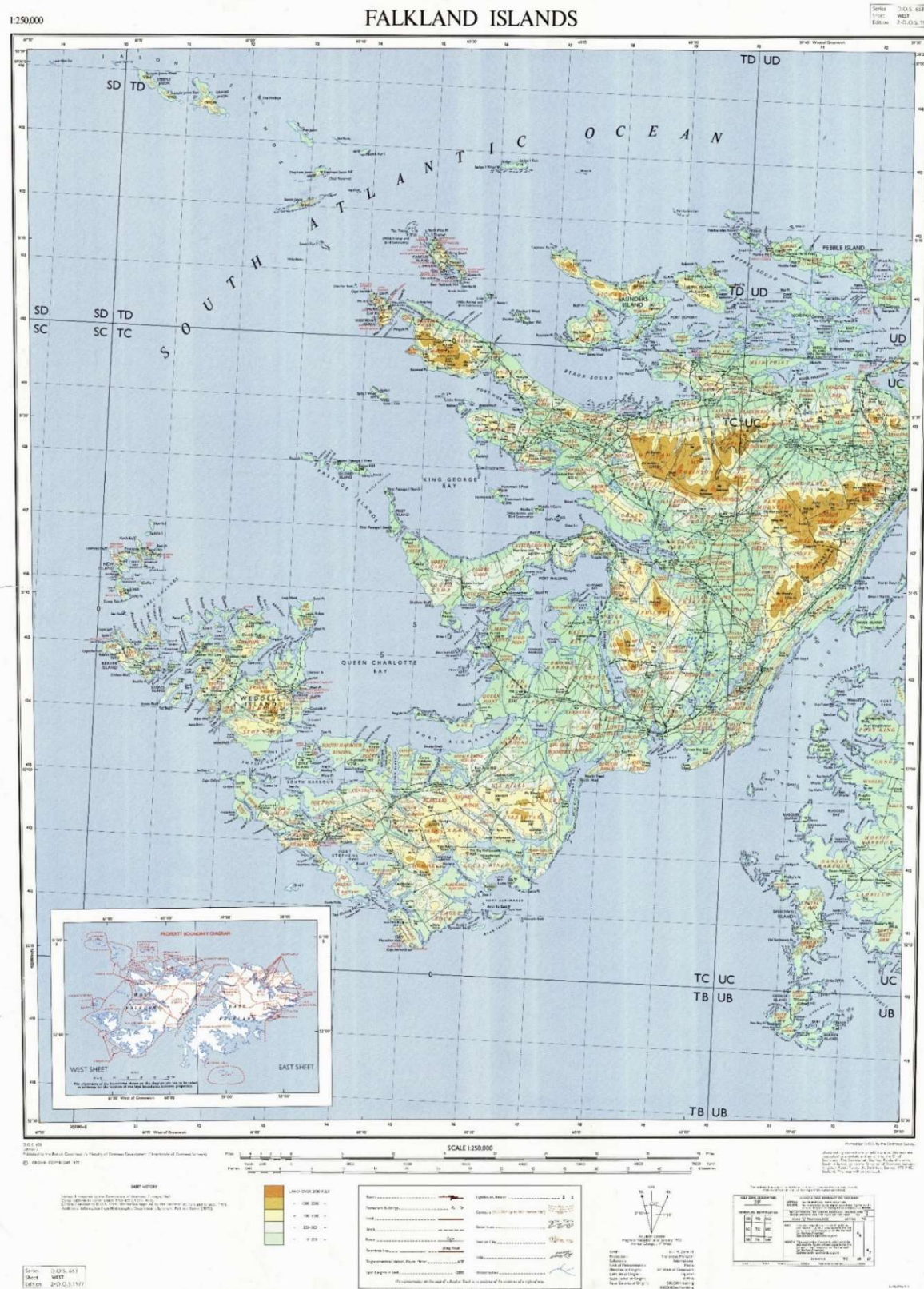
The islands had also been geologically surveyed and mapped in 1972.

This information on the geology and surface features, including “stone-runs” soils and drainage, was invaluable for Royal Engineer terrain and cross-country movement analysis.

MOD Map Stock Policy

The MOD Map Library held Reference copies of DOS 653 and DOS 1185A. Still, there was no Joint Theatre Plan for the Falklands and no operational requirement for maps other than limited quantities for use by the Royal Marines of Naval Party 8901. MOD held limited stocks of Series 1501 and DOS 453 (H791) for use by the Royal Marines based on East Falkland. (Posters 4 and 6).

The First Maps Issued as the Crisis Broke



DOS 653 West



38



Series 1501/1501 Air - Joint Operations Graphic 1:250,000

The Joint World Series

Series 1501 and 1501 Air, the Joint Operations Graphics (JOGs), were the largest scale of the Joint World Series of maps and aeronautical charts. The design ensured compatibility between ground and air users in joint operations.

Series Specification and Design

Sheets are constructed on geographical sheet lines, commonly covering 1.5 degrees of longitude by 1 degree of latitude. At higher latitudes, sheets are on 2-degree by 1-degree sheet lines. For easy and instant geographical referencing to the nearest minute, the framework of JOGs is a graticule of black 15-minute geographical quadrangles whose sides have 1 and 5-minute ticks. For the air user, sheets include a nautical mile scale, statute miles, and a GEOREF quadrangle diagram. In blue, JOG sheets also show the 6-degree wide Universal Transverse Mercator grid zones. Each 10-kilometre grid square includes its 100km square identifier, e.g. PJ9. As shown on this sheet at 600W, the grids converge at grid zone junctions, and the grid squares become truncated.

Air and Ground Versions

The Air and Ground versions exhibit fundamental differences in specification. Whilst the topographic base is common to both variants, the Ground version depicts settlements and roads in great detail and carries many place and feature names. In contrast, the Air version minimises these elements with a detailed overlay of air information in its place. Altimeters are calibrated in feet, and the Air version shows contours, heights and air information in feet, whereas the JOG for ground forces (as in this poster) shows the height in metres.

Stocks and Issues

The four sheets covering the Falkland Islands, SM 20-12, SM 21-10, SN 20-3, and SN 21-1 were produced in 1971 and stocked in 8 Map and Air Chart Depot. Reprinted stocks were immediately issued to the Task Force units before sailing.

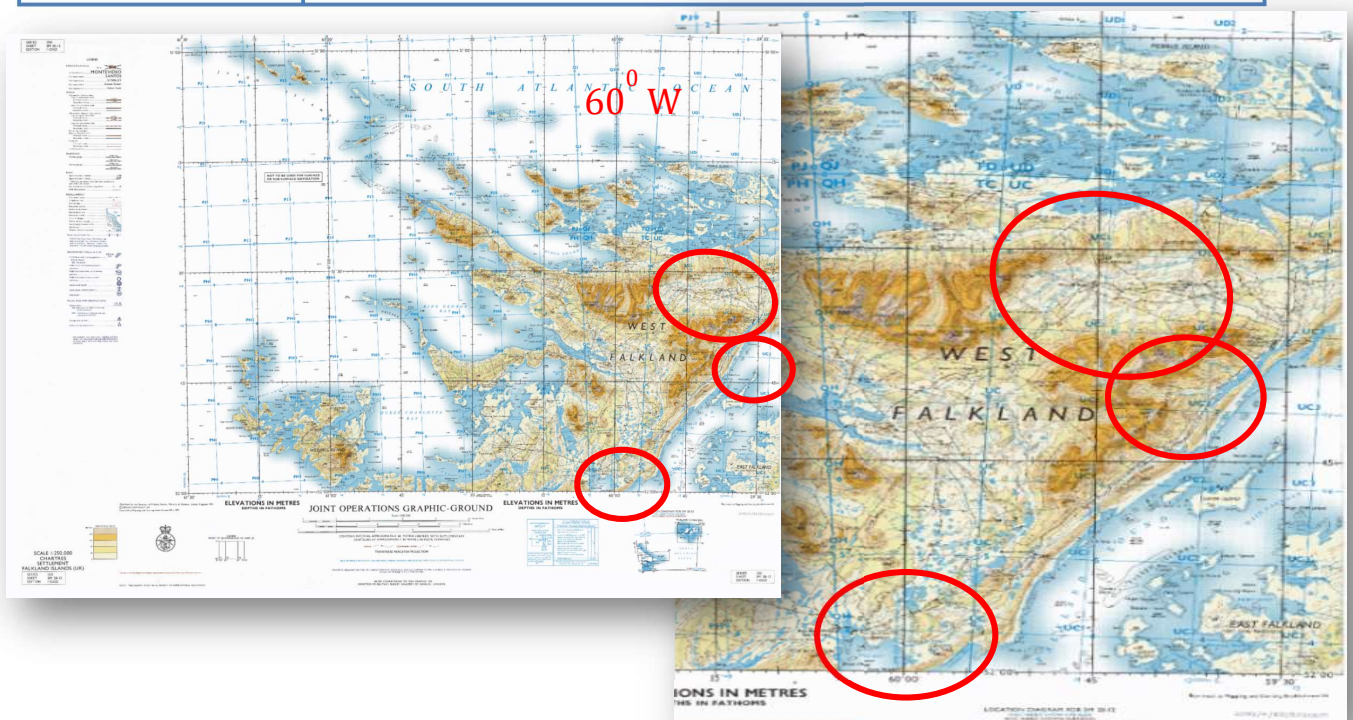
A second edition, including a magenta component showing revised roads and tracks, airstrips, bridges and other information, was printed on 8 April and despatched to Ascension for issue when the Task Force arrived.

The Argentinian garrison locations of Pebble Island, Port Howard and Fox Bay are shown on this sheet. Pebble Island was the scene of the successful Special Forces raid and naval bombardment of the Argentinian airfield on 12 May

Derived Maps

The four sheets covering the Falkland Islands were combined into one composite sheet and used as the basis for several derived maps: -

<i>Series GSGS 5453</i>	The Royal Engineers Briefing Map 1:250,000 (Poster 5).
<i>Series GSGS 5455</i>	Terrain Information Overprint 1:250,000.
<i>Series GSGS 5460</i>	An enlargement to 1:100,000 scale in five sheets for the Defence Intelligence Staff.
<i>Series GSGS 5465A</i>	The commemorative Manoeuvre Map at 1:100,000 scale shows the campaign's final unit moves (Poster 17).
<i>Series GSGS 5382</i>	Moving Map Display filmstrips for RAF Harrier aircraft.



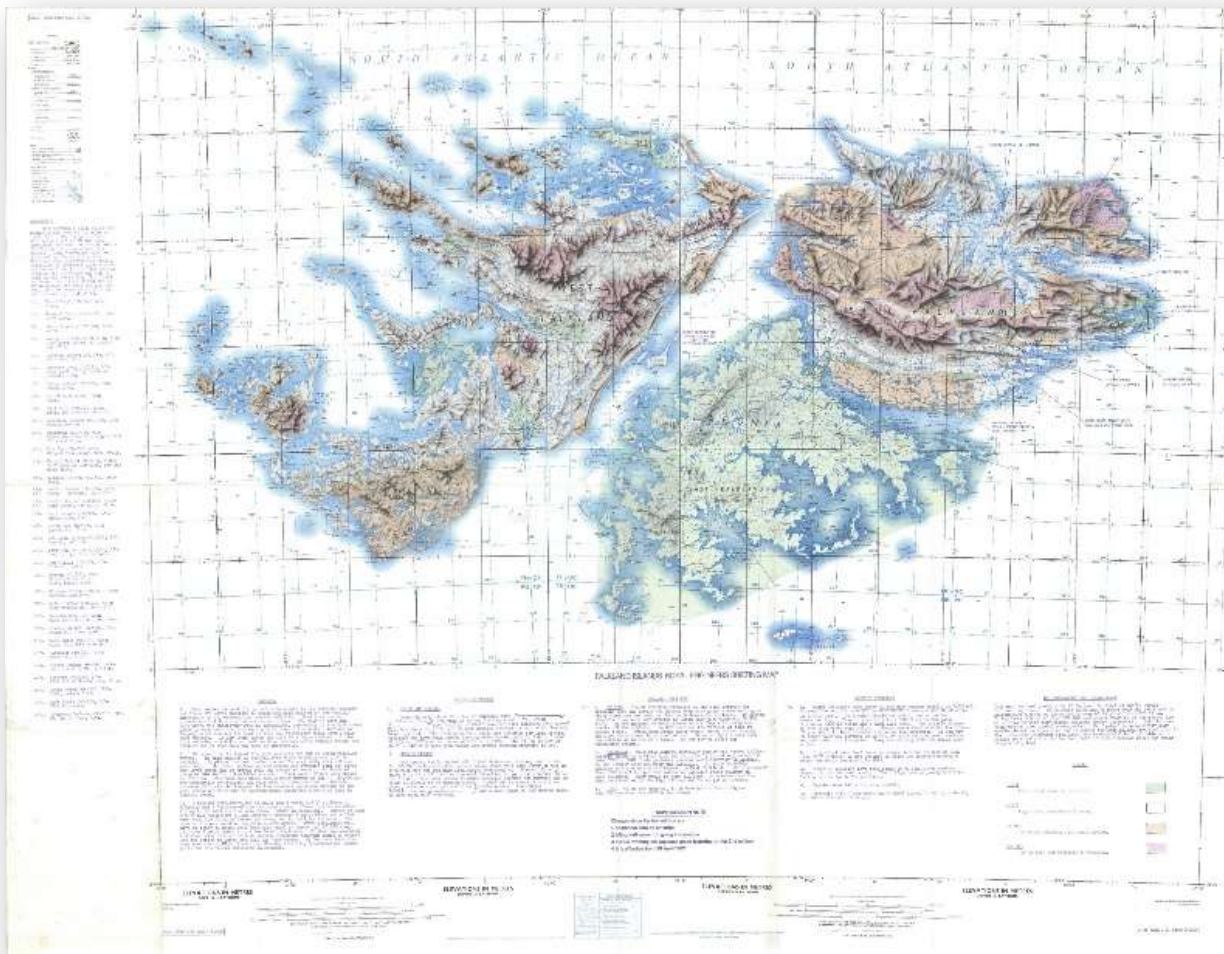
GSGS 5453

Royal Engineers Briefing Map

1:250,000

Production of the RE Briefing Map

In the MOD, information on cross-country mobility, the “going”, was initially sparse. HQ Engineer-in-Chief initiated the collection of soils and going information from various sources, including the de-briefing of Falkland Islanders and Royal Marines who recently returned from the islands. An RE Major and an agronomist collated available geological and other information, including DOS geological maps.



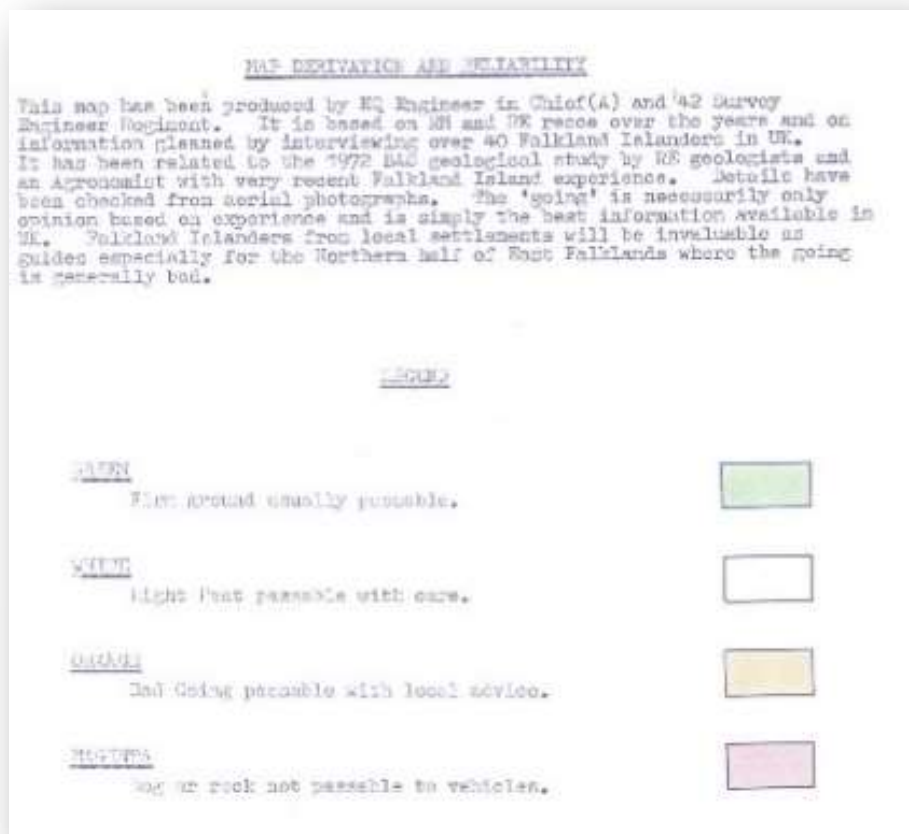
A draft of the first edition was completed in 36 hours, and three NCOs from the 42 Survey Engineer Regiment were attached to HQ EinC to present these data. By 16 April, 42 Regiment had printed the first edition of a single composite sheet, compiled from the four sheets of Series 1501, including tabulated data on roads and airstrips and showing going information by coloured tints. A second, more detailed edition was printed on 26 April, and a third, improved edition was printed and immediately issued on 4 May.

The Royal Engineers Briefing Map was subject to heavy demands, and 3,000 copies were printed in December 1982.

Road & Cross-Country Movement

The map colour-coded legend shows: -

Green	Firm ground, passable.
White	Light peat, passable with care.
Orang	Bad going, passable with local advice.
Magenta	Bog or Rock, not passable by vehicles.



The typescript Legend at the bottom of the sheet gives general information and specific information on Roads and Tracks, Tracked and Wheeled Vehicle “going”, and the derivation and reliability of the map.

In describing roads and tracks, the legend states:

There are only about 20 miles of surfaced road [-----] in Falkland Islands and this is in the Stanley area. The track [- - - - -] from Stanley to Bluff Cove has been improved with gravel fill but there is still a 2km soft section (marked on map) which has not been improved. The bridges on this route are designed for Land Rovers/tractors and have thin wooden decking which would probably take a loaded BV 202 but NOT a 4-ton cargo vehicle or a CVRT. The all-up weight of CVRT is almost 8 tons even though its ground-bearing pressure is low.

Airstrips

The legend describes numerous airstrips through the following introduction: -

The airstrips noted below are mainly those used recently by Islander aircraft. The two on beaches A13 and A15 are below the high tide mark and must be recced before landing as kelp can cause soft spots. Most airstrips have been improved by the settlement by drainage and improving the grass. Selection of Harrier sites should not be confined to existing strips because the aluminium mat can be laid on any reasonably firm level surface. Harriers should try to avoid moving off this mat and the team must be prepared to jack up and recover any that do so.

Descriptions for those airstrips shown ringed on the extract opposite are: -

*A19. Port San Carlos 120/300, 650m
Undulating, fair surface.*

*A20. San Carlos 110/290, 650m
Flat but soft.*

*A21. Darwin 140/320, 600m
Slight slope to W. Good, fairly firm.*

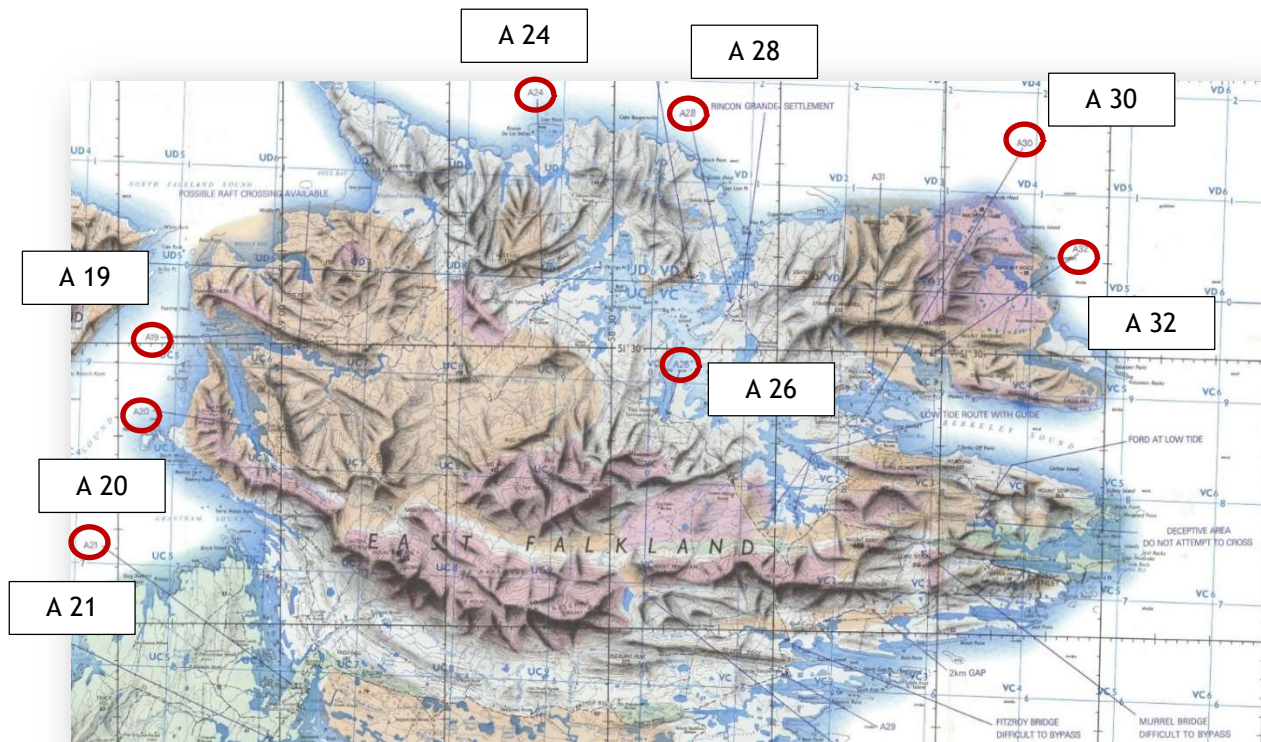
*A24. Douglas 050/230, 600m
Flat but soft, not near sea.*

*A28. Rincon Grande 050/230, 600m
Down slope to NW, softish.*

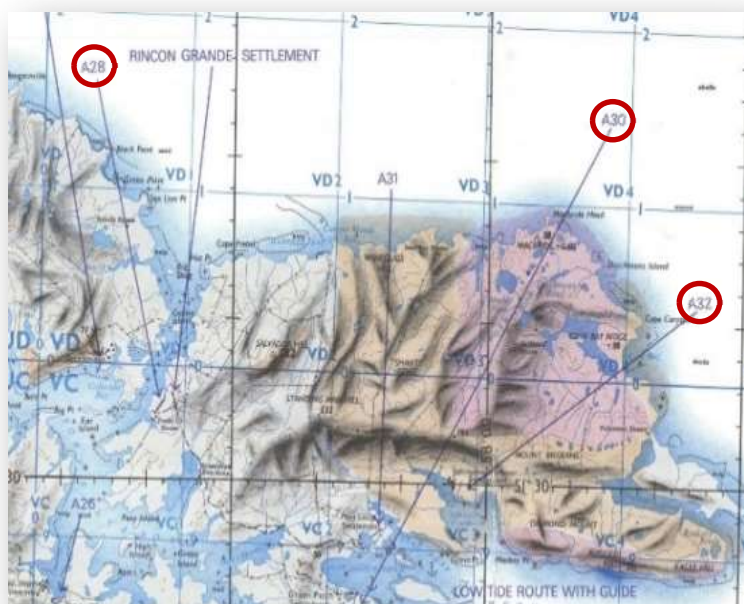
*A29. Fitzroy 050/230, 600m
Flat but soft when wet, fair.*

*A30. Green Patch 080/260, 700m
Good, mainly firm.*

*A32. Johnson's Harbour. 030/210
Dip In surface. Soft.*



GSGS 5453 Royal
Engineers Briefing Map
1:250,000
Air Strips



Series DOS 453 (H791) Falkland Islands 1:50,000

Series History

Until 1958, the only military triangulation in the Falkland Islands was a small scheme covering the Stanley area carried out by 14 Field Survey Company RE in 1943. In October 1956, Hunting Aerosurveys was contracted to provide full aerial photographic coverage of the islands using two Canadian CANSO (Catalina) amphibious aircraft.

In 1958, DOS commenced a triangulation of the Falklands, including measuring some lines with a new Tellurometer Electronic Distance Measurement equipment to strengthen the scheme's scale.

The first editions of sheets in Series DOS 453 (H791) were produced in February 1961. Military Survey printed stocks for both DOS and military use, the latter primarily for use by Royal Marines of Naval Party 8901. Some sheets were revised using aerial photos taken by Endurance's Wasp helicopter in 1976 and printed in 1979.

Series Design

The series is constructed on the Universal Transverse Mercator (UTM) Projection. UTM Grid Zones 20 and 21 adjoin the 60 degrees West meridian, which bisects West Falkland. Being primarily for civilian use, DOS did not show the Zone 20 and 21 grids on the face. Instead, the UTM Zone 21 grid ticks and values around the neat lines of all sheets.

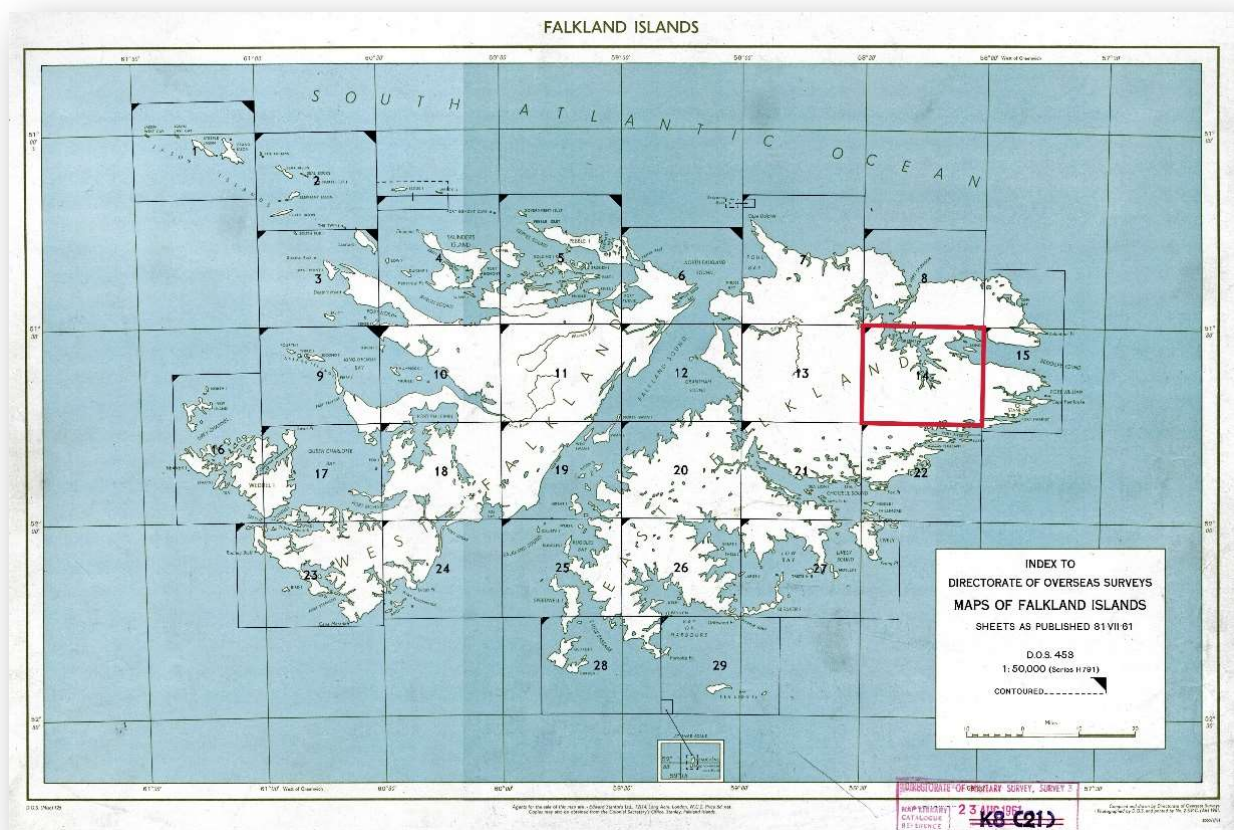
To minimise the number of sheets required to cover the Falklands, DOS designed standard sheets to cover 30 minutes of Longitude by 15 minutes of Latitude.

Sheet 14 on the facing page, a standard sheet measuring 68 x 55 cm, shows the western approaches to Stanley, including some of the rugged hill features. Contours at 50 feet intervals clearly show the topography. Also pictured, ringed in red, are two "stone runs", a geological feature of the Falklands which make cross-country movement in many areas impossible approaches to Stanley, including some of the rugged hill features.

Contours at 50 feet intervals clearly show the topography. Also pictured, ringed in red, are two "stone runs", a geological feature of the Falklands, which make cross-country movement in many areas impossible by vehicles and difficult on foot.

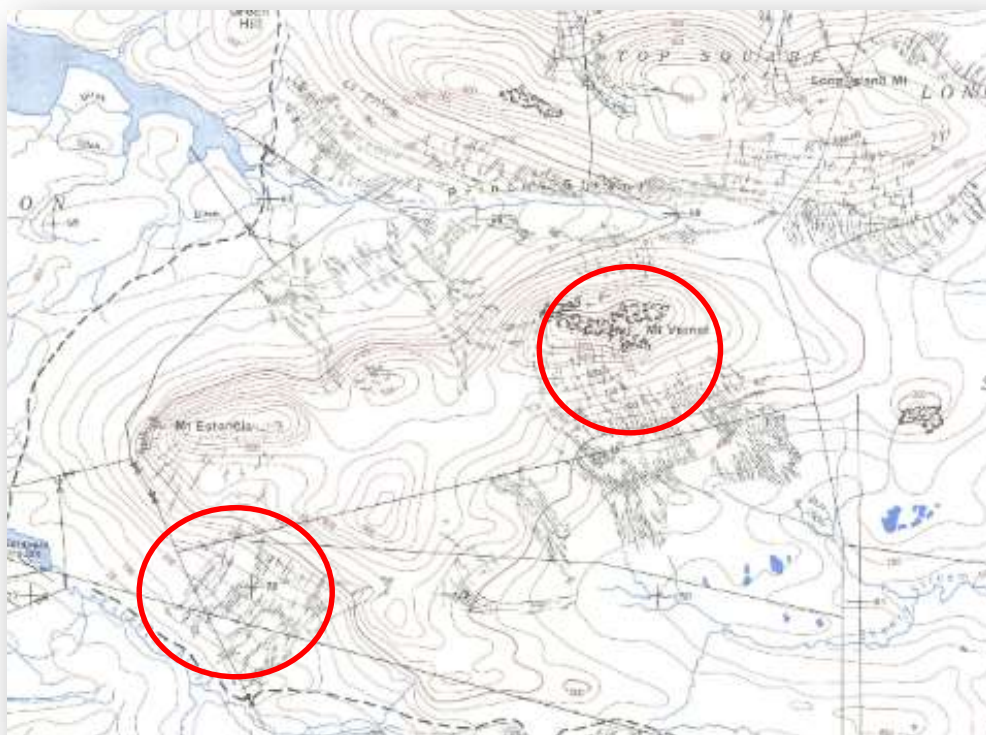
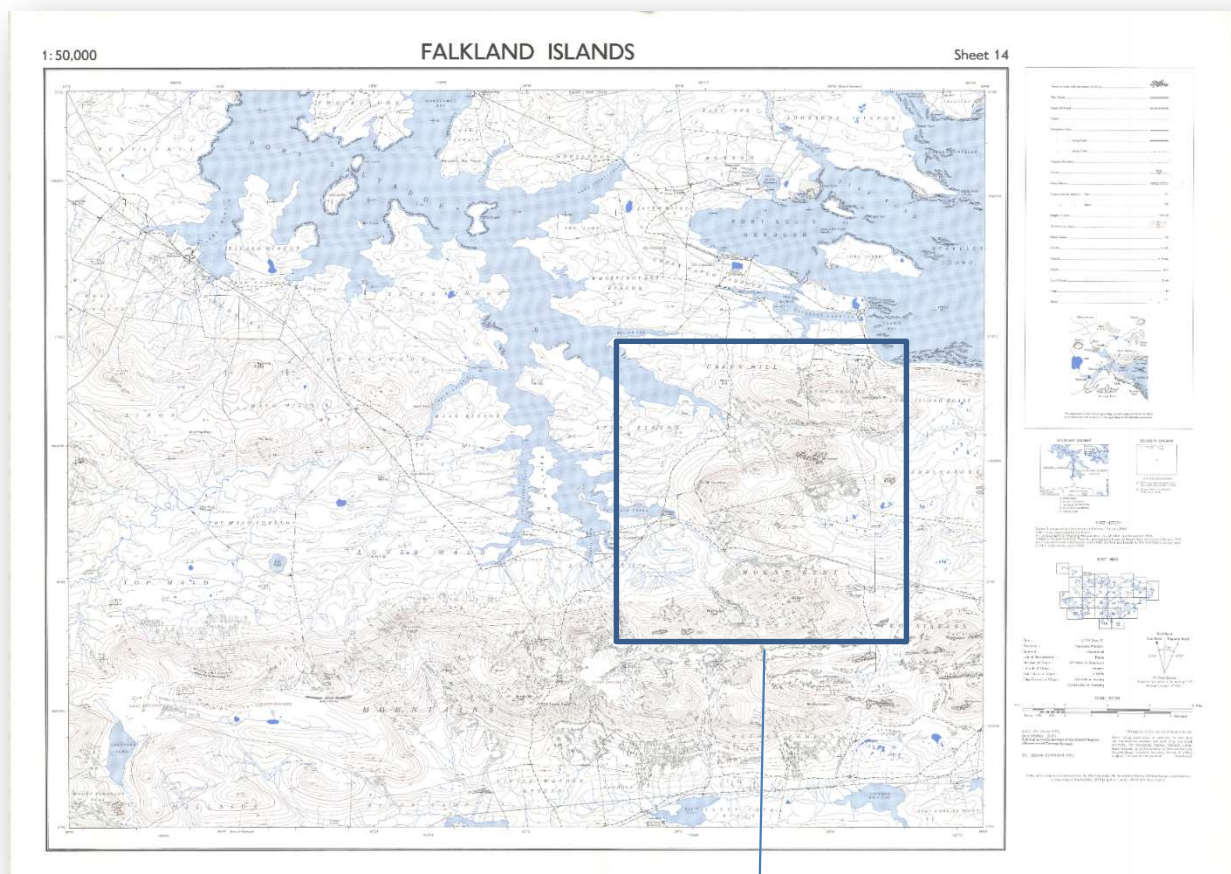
Issue of Un-gridded sheets for Task Force Use

When the Argentinians invaded the Falklands, it became necessary to make the 1:50,000 scale Series DOS 453 (H791) series compatible with the four 1:250,000 scale Series 1501 sheets, which showed the UTM grid correctly. This urgent remedial action was not possible before the first units of the Task Force sailed for Ascension Island. As a preliminary measure, 42 Regt and Mapping & Charting Establishment RE (MCE) printed stocks of the un-gridded sheets for the issue to task force units when they sailed, to be replaced by correctly gridded sheets on arrival in Ascension Island.



DOS Map Catalogue Index

The Index dated 1961, shows the 29 sheets of Series DOS 453(H791). Sheet 14 is outlined in red



Sheet 14, 2nd Edition DOS, 1979 showing two stone runs circled in red

Background to the 2022 Seminar Poster Display and Acknowledgements

(The poster below was produced at A1 size and has been scaled to fit the A4 format)



Military Survey Support to Op Corporate - The Falklands Conflict 1982

Defence
Geographic
Centre

ACKNOWLEDGEMENTS

The Defence Surveyors' Association (DSA)

In 1927, those who had served as Sound Rangers and Flash Spotters or Field Surveyors in the Great War formed the Field Survey Association. In 1997, the FSA was renamed the DSA to reflect its wider membership, from the Defence, Industry, and Academic communities. The common thread is the application of science and art to geographic interpretation for defence purposes.

Aims of the DSA

The aims of the DSA are to promote an understanding and appreciation of the full range of its interests in historical, current and future contexts, and to keep past and current members, and others who may be interested, in touch with one another. The DSA website, which includes back issues of the DSA's annual journal, The Ranger, may be found at www.defencesurveyors.org.uk.

Contributing Organisations and Individuals

The Council of the Defence Surveyors' Association gratefully acknowledges the contributions of the following entities in the production of this display

Defence Geographic Centre

The DGC mission is to deliver geographical information, geographical intelligence, services and liaison to support the achievement of Defence objectives.

Its primary role is to provide land maps, aeronautical charts, positional information, geo-referenced imagery and digital data in raster, matrix, and vector formats for UK defence planning, operations and training

Ian Spencer, Director DGC

Amanda Warrington-Brown, AD Collection Division

Christopher Dawe, AD Distribution Division

Information and Digital Replication Branch Staff

United Kingdom Hydrographic Office

The UKHO provides hydrographic information in the form of marine navigational products and services and related safety information to the MOD, other Government departments, the hydrographic offices of other nations, and merchant shipping companies.

It also provides bespoke maritime operational products and services to Defence.

The UKHO also provides hydrographic products and services for waters of UK national responsibility

Dr. Adrian Webb, Chief Archivist

John Williams, Assistant Archivist

The Project Working Group

Brig (Retd) Phillip Wildman OBE RE

Col (Retd) Mike Nolan RE

Brian Garvan, former Head MOD Map Library

Colin Wright, Head MOD Map Library, DGC

Special mention must be made of the late Lt Col J. Shimbury RE, above, who was AD Survey 2, Directorate of Military Survey in 1982, responsible for map production and author of the official "Report on the Geographic Support by Military Survey during Op Corporate, October 1982."

The National Archives, Kew, DEFE 70/1003.



Lt Col Himbury RE c2011 © Mike Nolan

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Series H791 Falkland Islands

1:50,000

Planning for a Gridded Series H791

The need for fully gridded 1:50,000 maps was urgent.

For speed, the new editions, designated H791, were to be printed without change of content from the DOS 453 (H791) editions, but with a 1-kilometre grid included, magnetic information updated.

Because of the incorrect use of Zone 21 ticks and values over the whole series, it was necessary to decide how the eleven sheets west of the grid zone junction, including Sheet 18 opposite, should be gridded.

Consultation with HQ Commando Forces

On 5 April, after consultation with HQ Commando Forces, the decision was to show the Zone 20 grid in red and the Zone 21 grid in purple with bold warning notes on the face and in the margin.

The red Zone 20 grid was to make the eleven sheets west of the Grid Zone Junction, including Sheet 18 above, compatible with the JOGs (Poster 4). The sheets east of the grid zone junction had the single Zone 21 grid in purple.

Production of Gridded Editions

As the Task Force sailed for Ascension with stocks of the un-gridded DOS 453(H791) maps, 42 Regt and MCE commenced production of the gridded Series H791.

On 8 April, 3,000 - 5,000 copies of all sheets of Series H791 were sent to Ascension by air for the issue to Task Force units.

Post-Campaign Assessment

The Military Survey post-campaign report acknowledged that the dual-gridded sheets “..... may well have posed problems to users had any operations, other than Pebble Island.....” happened on West Falkland.

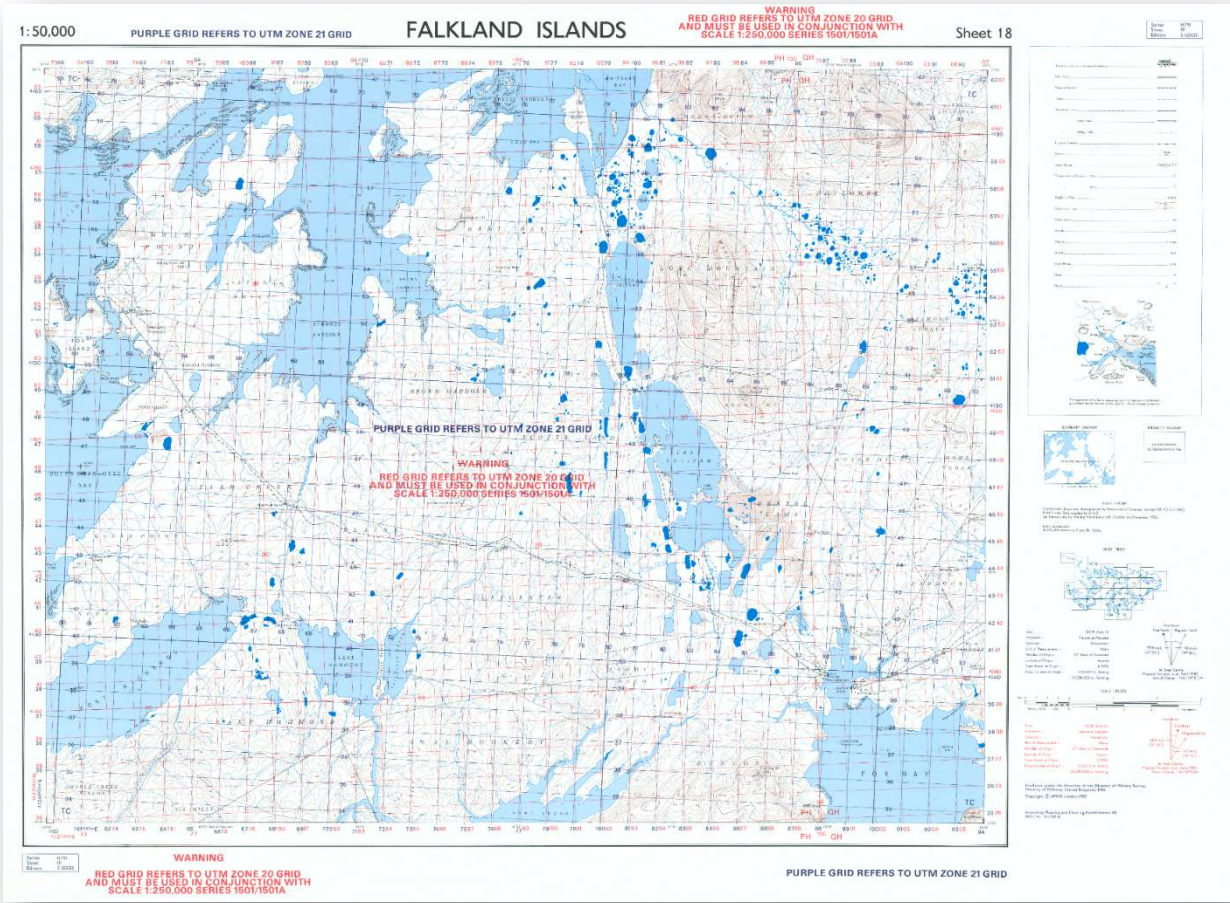
WARNING

RED GRID REFERS TO UTM ZONE 20 GRID

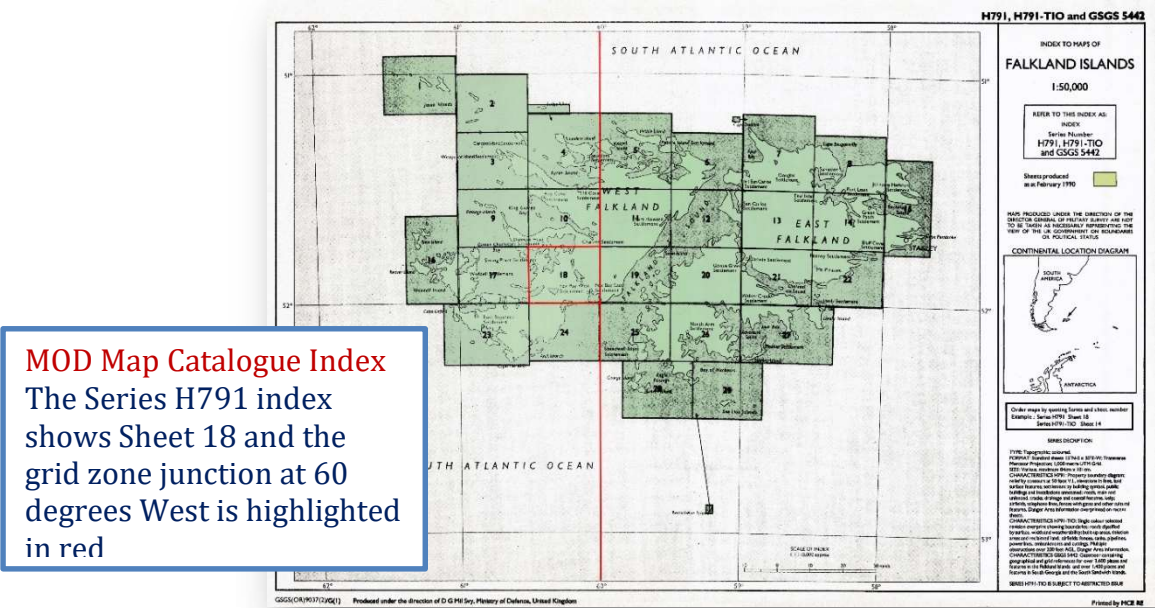
AND MUST BE USED IN CONJUNCTION WITH

SCALE 1:250,000 SERIES 1501/1501A

Sheet 18



Series H791 Sheet 18, Edition 2-GSGS, printed April 1982



MOD Map Catalogue Index
The Series H791 index shows Sheet 18 and the grid zone junction at 60 degrees West is highlighted in red

G892 Ascension Island 1:25,000

Task Force Rendezvous

Contingency planning for a Task Force anticipated the need for a staging post at which personnel, stores and equipment could be trans-shipped, unpacked and reallocated to the various ships and units in the Force before it resumed its journey south to the Falkland Islands. Ascension Island was the obvious location with its good anchorage, airfield, and excellent communications facilities.

Map of Ascension Island

DOS published a map of the island in 1964 - DOS 327. The printed Military stocks had the designation - G892. For the planning of administrative operations on the Island, additional stocks of the 1967 2nd Edition G892 sheet were obtained and subsequently updated. An edition partially revised by 42 Regiment in May 1982 is shown on the facing page. It incorporates a magenta Topographical Information Overprint (TIO) showing realigned roads and other changes.

Task Force Map Supply

Those elements of the task force which departed early were supplied with whatever stocks of land maps of the Falkland Islands and S Georgia were available as the crisis broke. By 8 April, maps at the vital operational scales had been updated, replenished, and sent by air transport to the island. An RE Warrant Officer was sent from the UK to act as Survey Adviser on Ascension, tasked with arranging the necessary replacement of superseded editions with which the Task Force had sailed, as and when updated stocks arrived from the UK, and stocks of the Operational Navigation Chart arrived from the USA. He departed Ascension Island on 22 April.

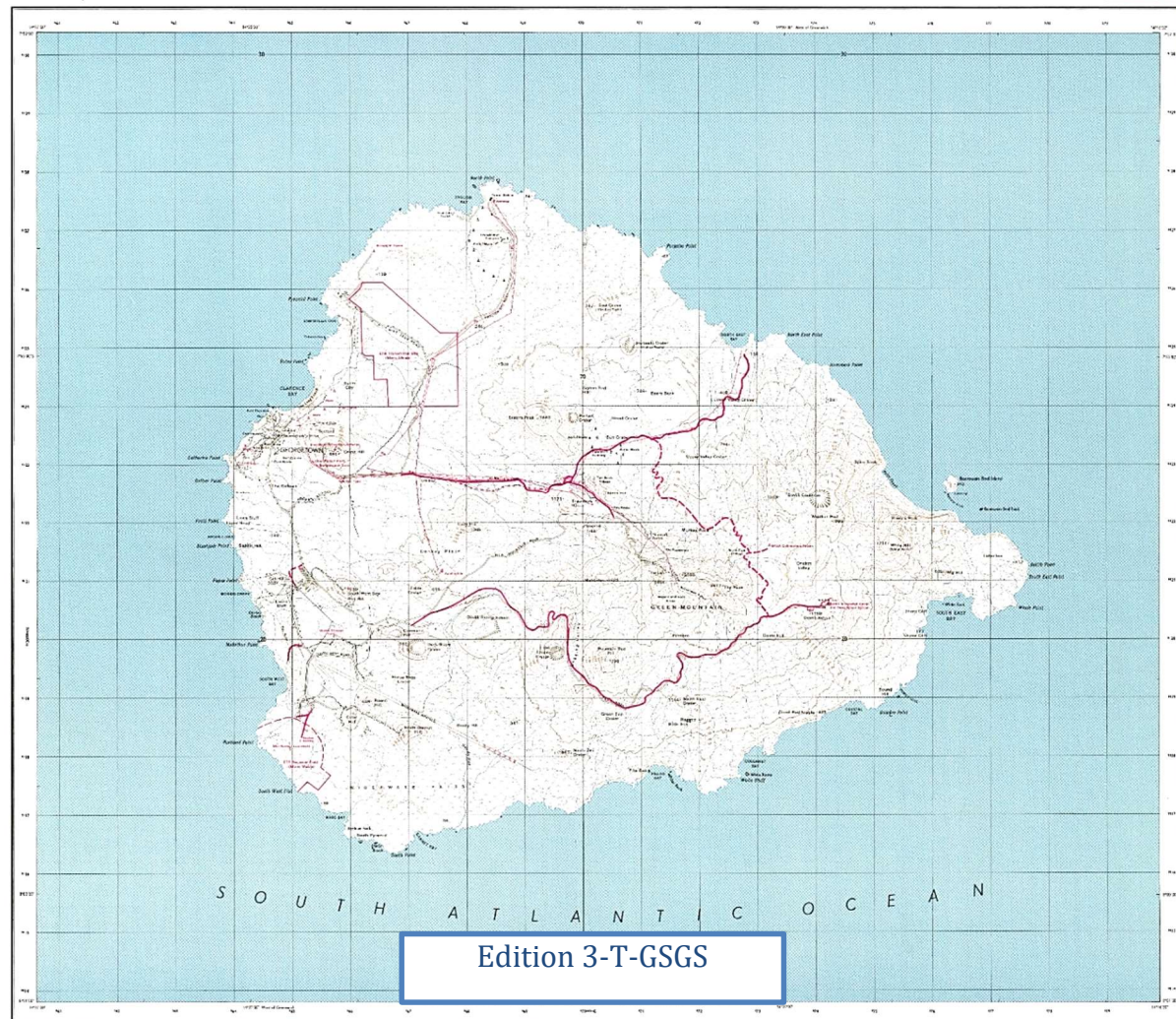
Artillery Support

The Survey Adviser relaid a request for trigonometric information from 79 Battery RA. An extract of recoverable trigonometric control in the SW corner of the island went by signal, and three copies of the complete list by air.

SCALE 1:25,000

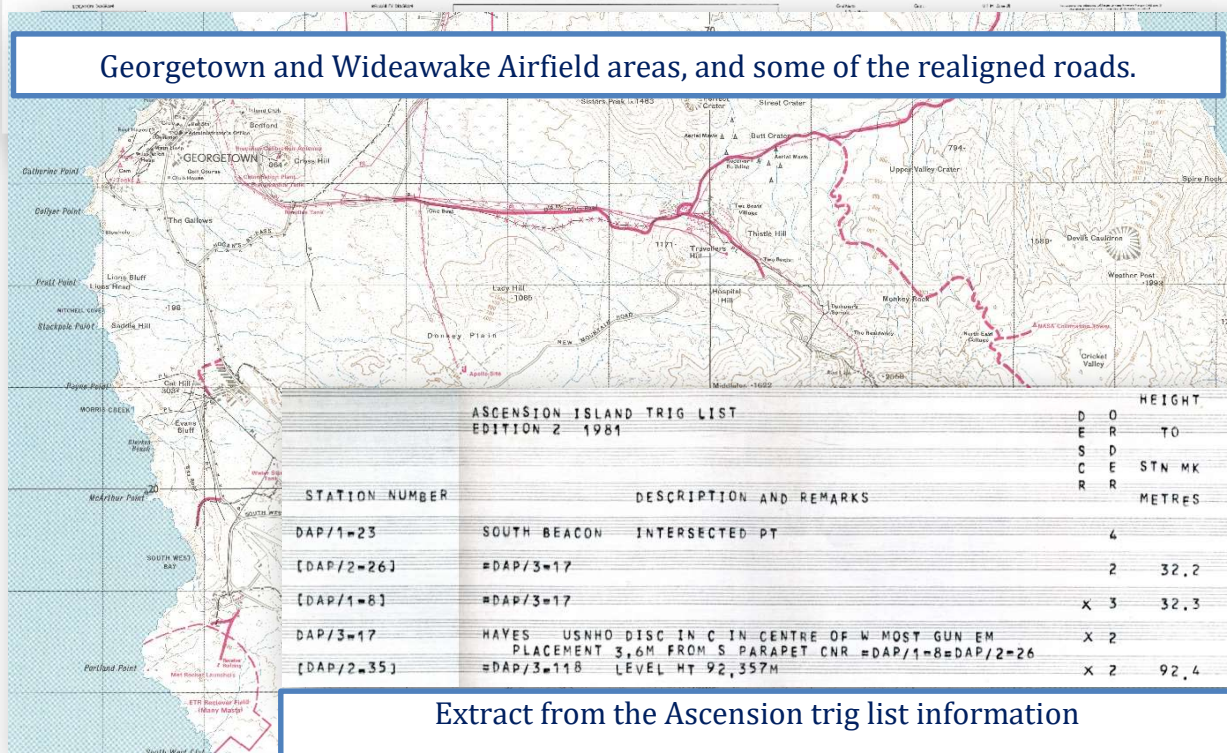
ASCENSION ISLAND

Scale 1:25,000
From ASCENSION ISLAND
EDITION 3-T-GSGS



Edition 3-T-GSGS

Georgetown and Wideawake Airfield areas, and some of the realigned roads.



ASCENSION ISLAND TRIG LIST EDITION 2 1981

STATION NUMBER

DESCRIPTION AND REMARKS

HEIGHT
D O
E R TO
S D
E STN MK
R R
METRES

DAP/1=23	SOUTH BEACON INTERSECTED PT	4	
[DAP/2=26]	#DAP/3=17	2	32.2
[DAP/1=6]	#DAP/3=17	X 3	32.3
DAP/3=17	HAYES USNHO DISC IN C IN CENTRE OF W MOST GUN EM PLACEMENT 3.6M FROM S PARAPET CNR #DAP/1=8=DAP/2=26	X 2	
[DAP/2=35]	#DAP/3=118 LEVEL HT 92.357M	X 2	92.4

Extract from the Ascension trig list information

Series GSGS 5436 - South Georgia

1:100,000

South Georgia Operational Timeline

24 Mar: Argentinian contractors and soldiers land at Leith (1) and raise the Argentinian flag.

03 Apr: Invasion of South Georgia by Argentinian forces.

12 Apr: Operation Paraquet task group sails from Ascension.

21 Apr: One Wessex 3 and two Wessex 5 helicopters from HMS Antrim land Sixteen SAS on Fortuna Glacier. (2)

22 Apr: SAS evacuated by Wessex 3 helicopter after overnight hurricane. The two Wessex 5 helicopters crash in the attempt.

25 Apr: Argentinian sub Santa Fe disabled off entrance to Cumberland Bay. SAS and Royal Marines land at Grytviken (3) supported by bombardment by HMS Antrim and Plymouth.

25 Apr: Argentine forces at Grytviken surrender at 1700 hrs.

26 Apr: Argentine forces at Leith surrender.

See the map on page 55 for the numbers.

Available Maps

In the absence of any stated operational requirement, only Series 1501 at 1:250,000 scale was stocked by Military Survey.

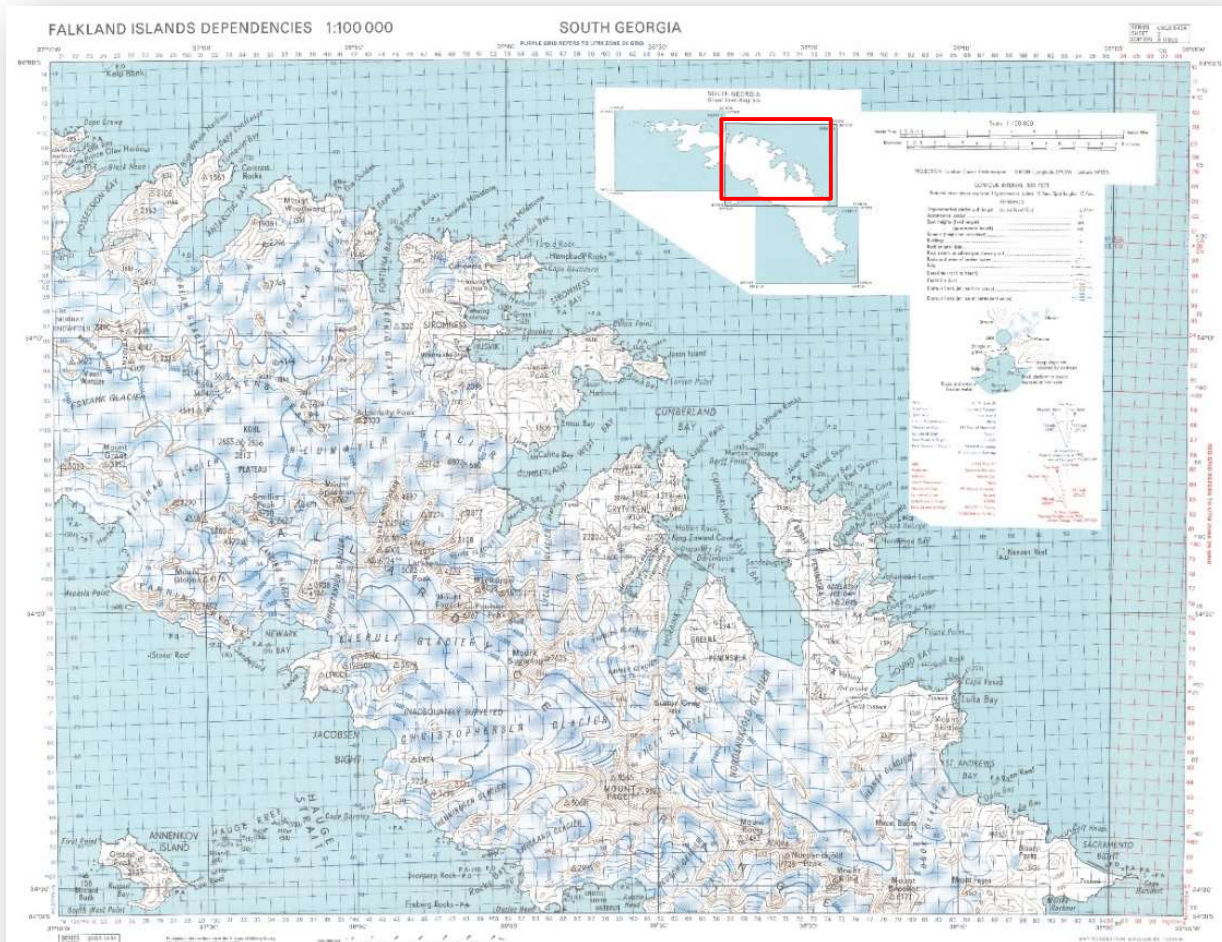
However, DOS had published a map series at 1:100,000 scale in three sheets in 1957 and, in 1958, a single sheet published at 1:200,000. It was compiled at 1:100,000 scale and was more reliable than the earlier 1:100,000 series.

Copies were held in the MOD Map Library.

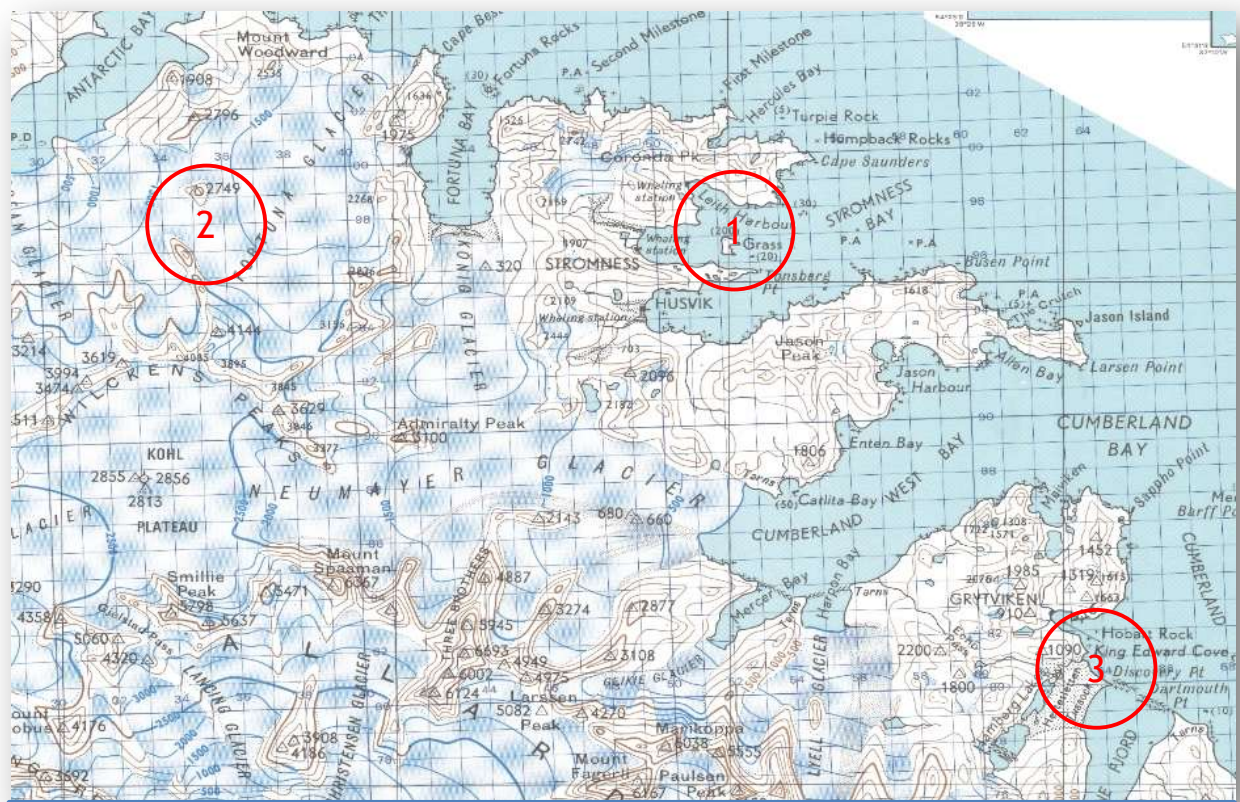
Operational Map Production

MCE initially reprinted the three DOS 1:100,000 scale sheets between 2 and 4 April with the designation GSGS 5436.

Using the more reliable DOS 1:200,000 scale sheet as a base, MCE subsequently produced third editions of the 1:100,000 series GSGS 5436 completing them on 30 April.



Sheet 2 Edition 3-GSGS In the Index to Sheets, Sheet 2 is highlighted in red.



Extract from Sheet 2 Edition 3-GSGS with op timeline and highlighted locations

Series GSGS 5457 - Falkland Islands

1:25,000

On 27 April, MCE was tasked to produce 1:25,000 scale maps of four key areas, Port San Carlos, Darwin & Goose Green, Fox Bay and Port Howard, and issue 2,000 copies by 1800hrs the next day.

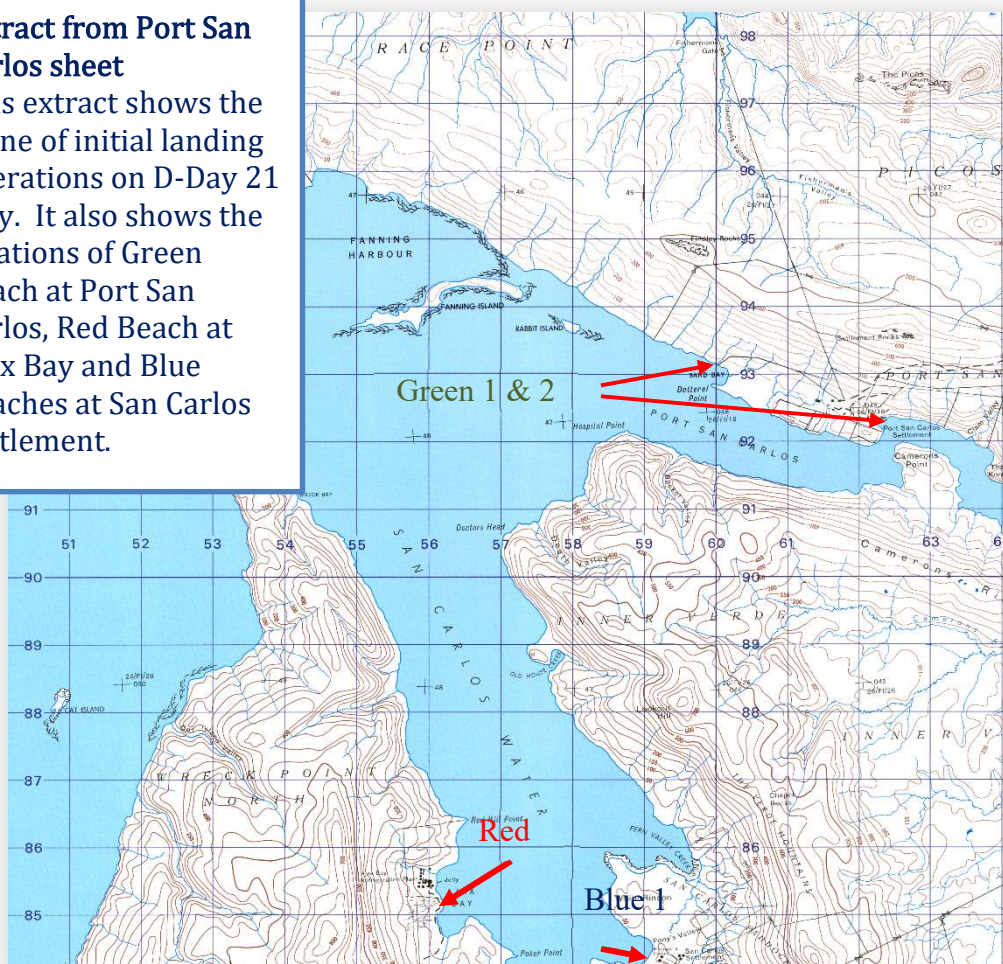
The 1:50,000 Series DOS 453 (H791) had been compiled at 1:25,000 scale and was thus of 1:25,000 scale accuracy. The GSGS 5457 sheets were enlarged to the original compilation scale to give users more legibility and space to annotate dispositions and movements under operational conditions than if using Series H791.

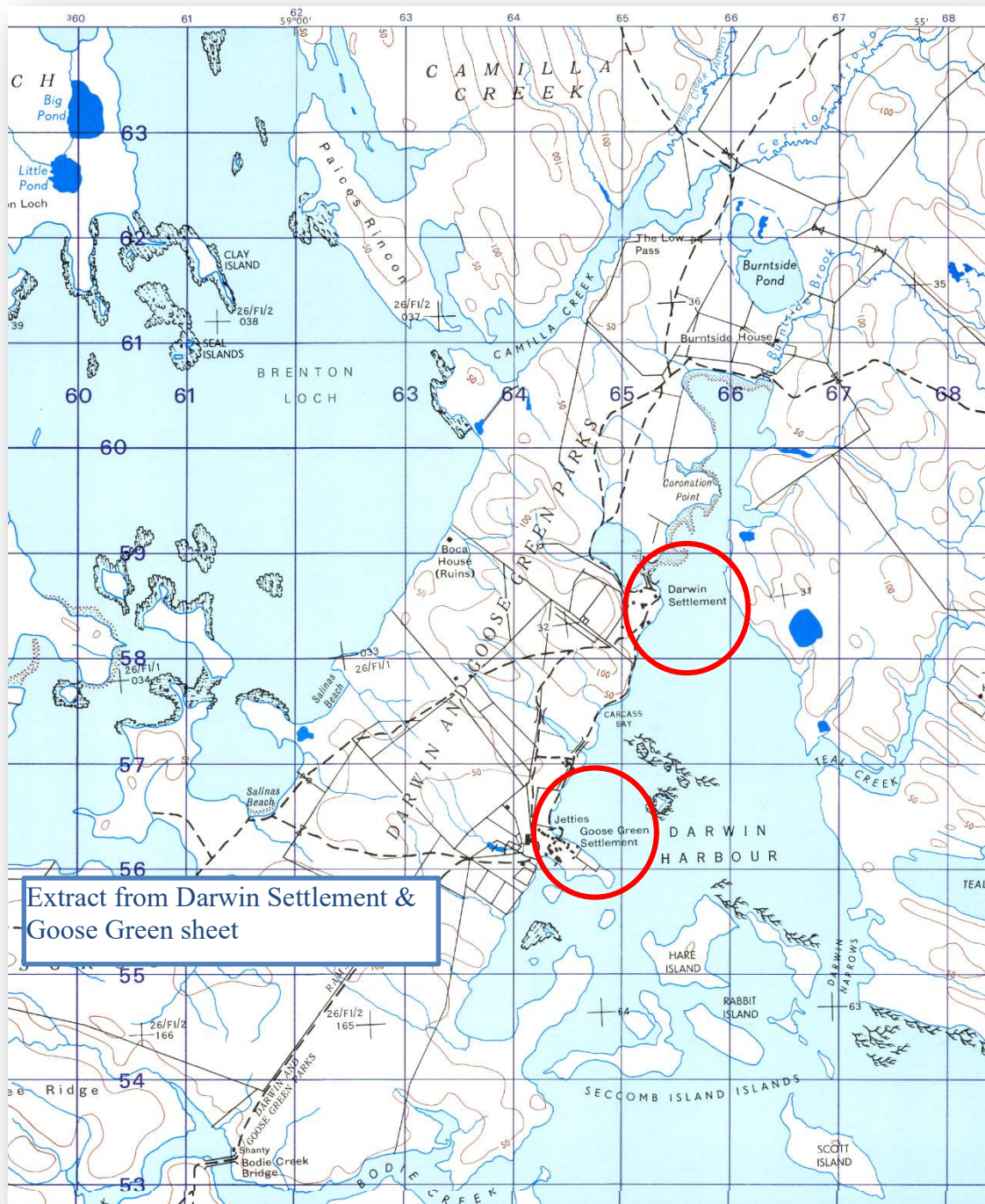
On 29 April, C-in-C Fleet demanded a similar map of Pebble Island, and 42 Regiment immediately produced 2,000 copies of the first edition with a Topographic Information Overprint (TIO) added to the Pebble sheet in a second edition. Still, an airstrip identified from air photos was a peat cutting. A corrected fourth edition was released on 6 May.

Up to 5,000 copies of all sheets were reprinted by 11 May for the issue to the 5 Infantry Brigade and supporting arms and services about to embark on the *RMS Queen Elizabeth 2*.

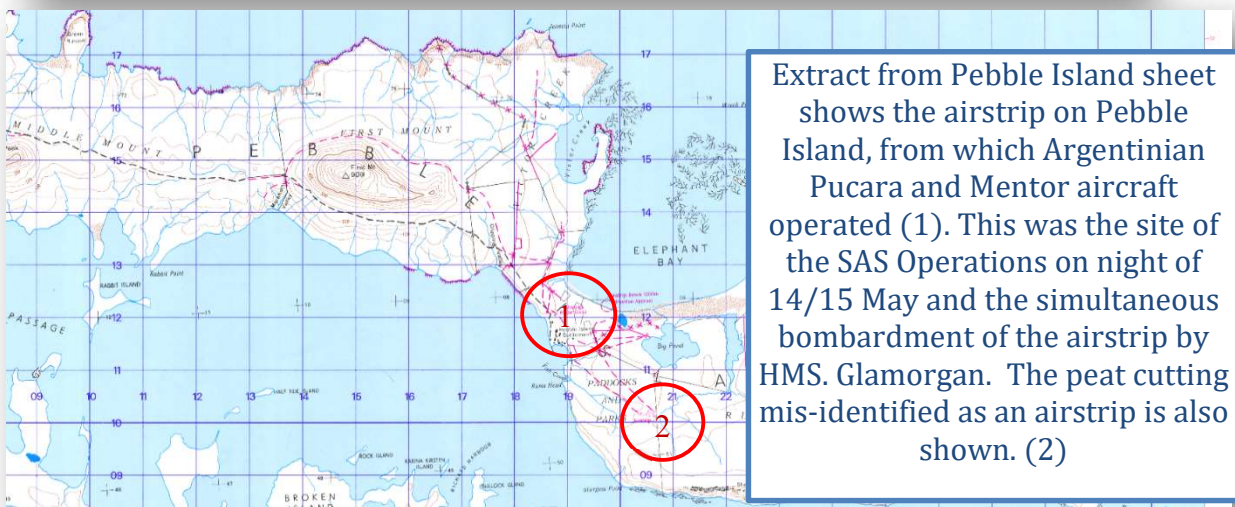
Extract from Port San Carlos sheet

This extract shows the scene of initial landing operations on D-Day 21 May. It also shows the locations of Green Beach at Port San Carlos, Red Beach at Ajax Bay and Blue Beaches at San Carlos Settlement.





Extract from Darwin Settlement & Goose Green sheet



Extract from Pebble Island sheet shows the airstrip on Pebble Island, from which Argentinian Pucara and Mentor aircraft operated (1). This was the site of the SAS Operations on night of 14/15 May and the simultaneous bombardment of the airstrip by HMS. Glamorgan. The peat cutting mis-identified as an airstrip is also shown. (2)

Use of Pre-Conflict Royal Navy Air Photography



Above are three prints covering the Stanley Airport area taken on Sortie Endurance
01/82 dated 18 January 1982



Left prints of the Stanley Airport area, approximately mosaiced, from sortie Endurance 22/76 dated 14 March 1976 from which the photogrammetric plot below was made.
This was invaluable source material for Series GSGS 5456



To assist the hydrographic charting programme in the Falkland Islands, the RN had developed a camera mount for the Wasp helicopter carried by HMS Endurance. This enabled near-vertical survey quality photography to be taken using the F49 Mk II camera which took 9 inch x 9 inch photos. The image above shows the camera, a sight and the intervalometer fixed on the bulkhead.



Series GSGS 5456 - Falklands

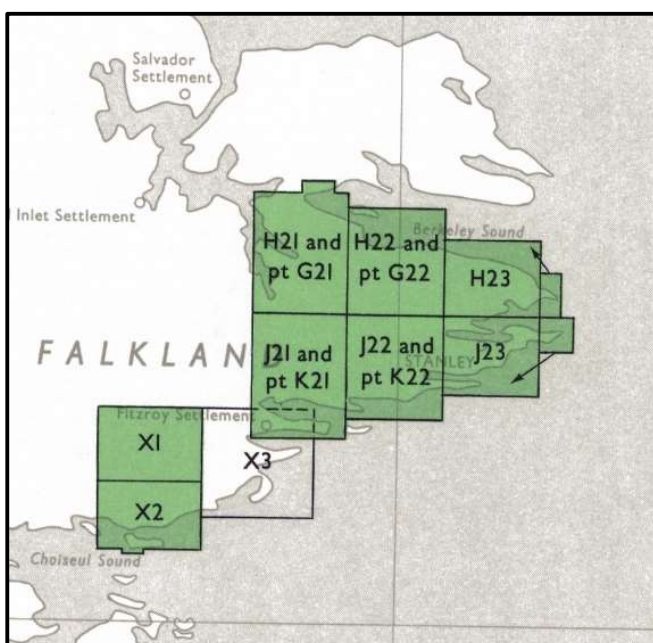
1:12,500

In late April, DOS was tasked to compile a series of maps of the Stanley area at 1:12,500 scale from original DOS photographs, later aerial photos taken by HMS Endurance's Wasp helicopter, and photogrammetric plots already made by UKHO.

The topography is shown in great detail with contours at 5-metre intervals up to 150 metres and 10m metre intervals above that. Two sheets covering Stanley were completed on 1 May.

On 24 May, HQ C-in-C Fleet demanded more comprehensive cover. One SNCO and eight Air Survey Technicians from 42 Regt assisted DOS for one week in this task, and the second editions of the first two sheets and first editions of four new sheets were printed by 31 May.

Units received these maps just in time for the final battles. They were invaluable for later high-priority tasks of clearing the minefields, booby traps, and munitions covering the battlefield. Two Sisters, Mt Harriet and Mt Longdon, where Sgt Ian McKay earned a posthumous VC, Mt Tumbledown and Mt William, are shown on the Port Harriet extract on the right. Wireless ridge and Sapper Hill are on the Stanley extract.



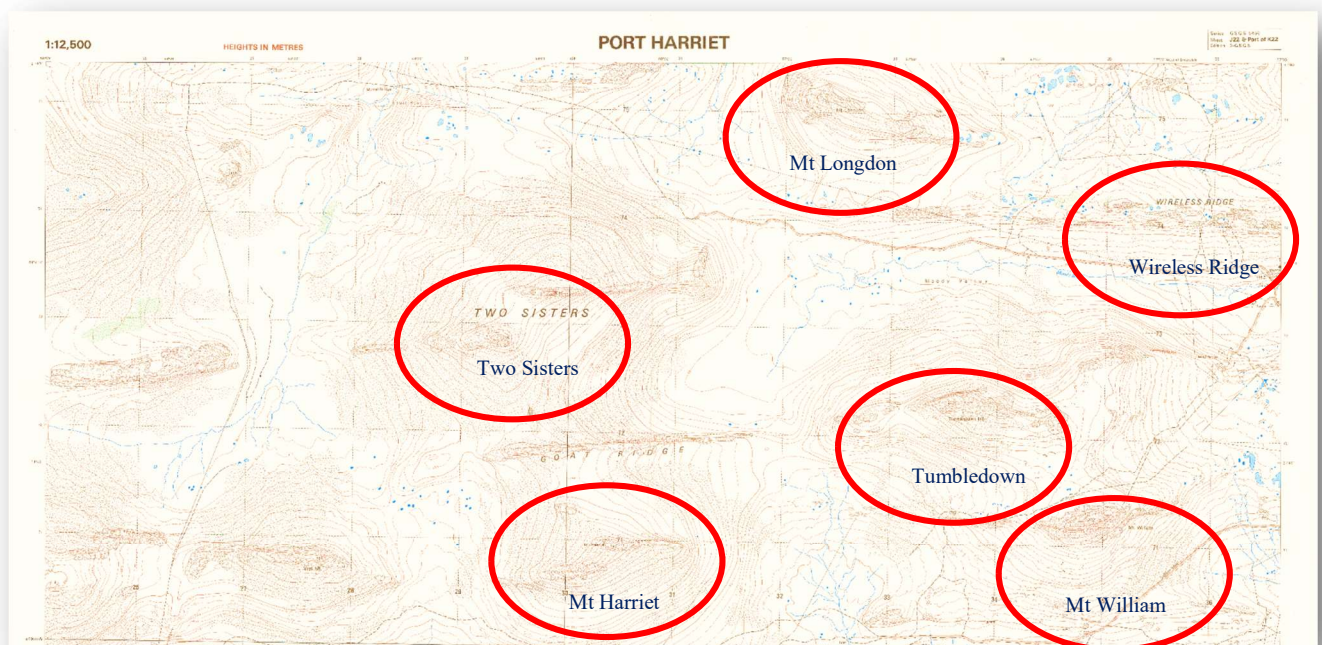
The MOD Map Catalogue index extract on the right, dated August 1982, shows the final extent of the series

Main Battle Areas

Main battle locations are shown in red.

11/12 June	Mount Longdon	3 Para
11/12 June	Two Sisters	45 Cdo
11/12 June	Mount Harriet	42 Cdo
13/14 June	Tumbledown	2 SG
13/14 June	Mount William	1/7 GR
13/14 June	Wireless Ridge	2 Para
14 June	Sapper Hill	1 WG

Extract from GSGS 5456 Sheet
J22 & Part of K22 Port Harriet
Edition 2-GSGS



Stanley Airport Graphics

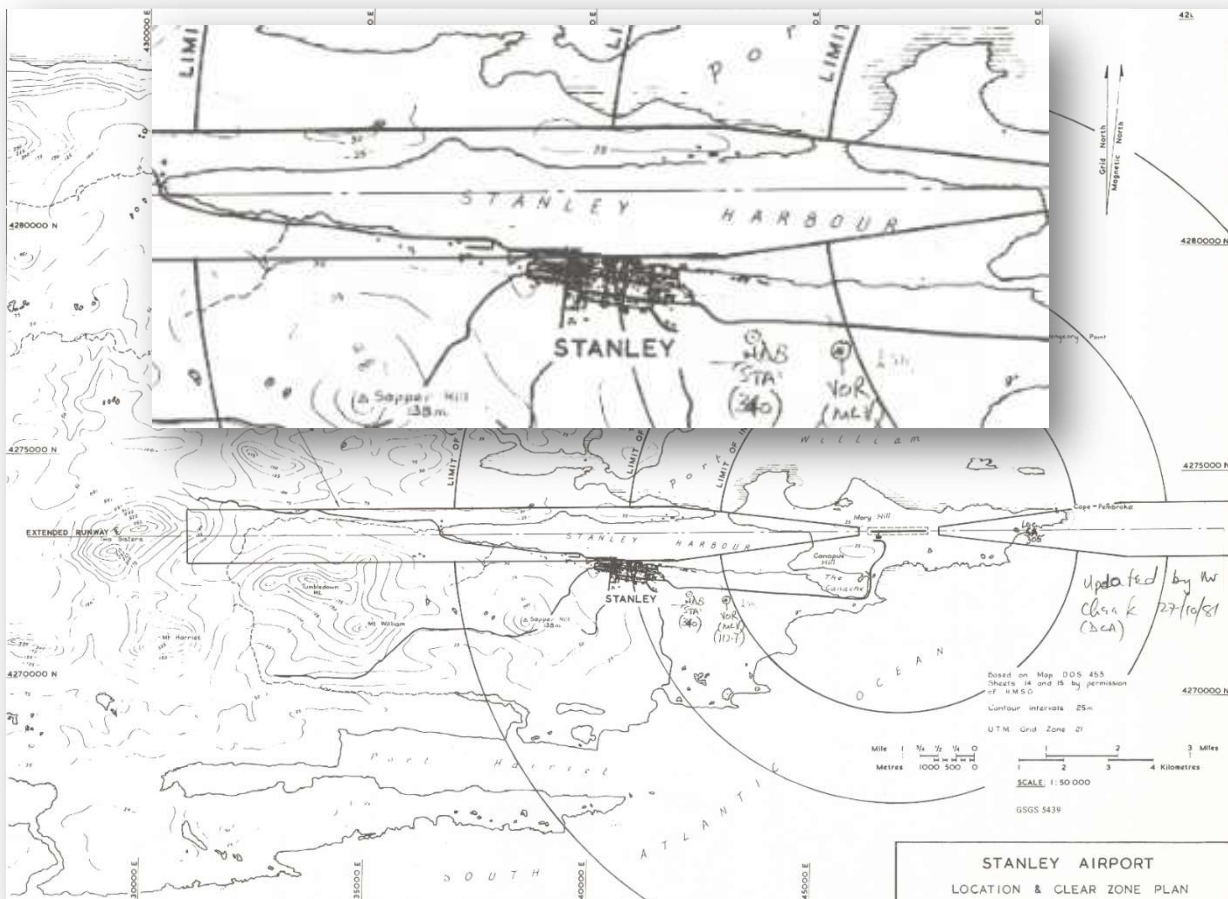
Preparation for Operations

One of the early requirements was for details of Stanley Airport.

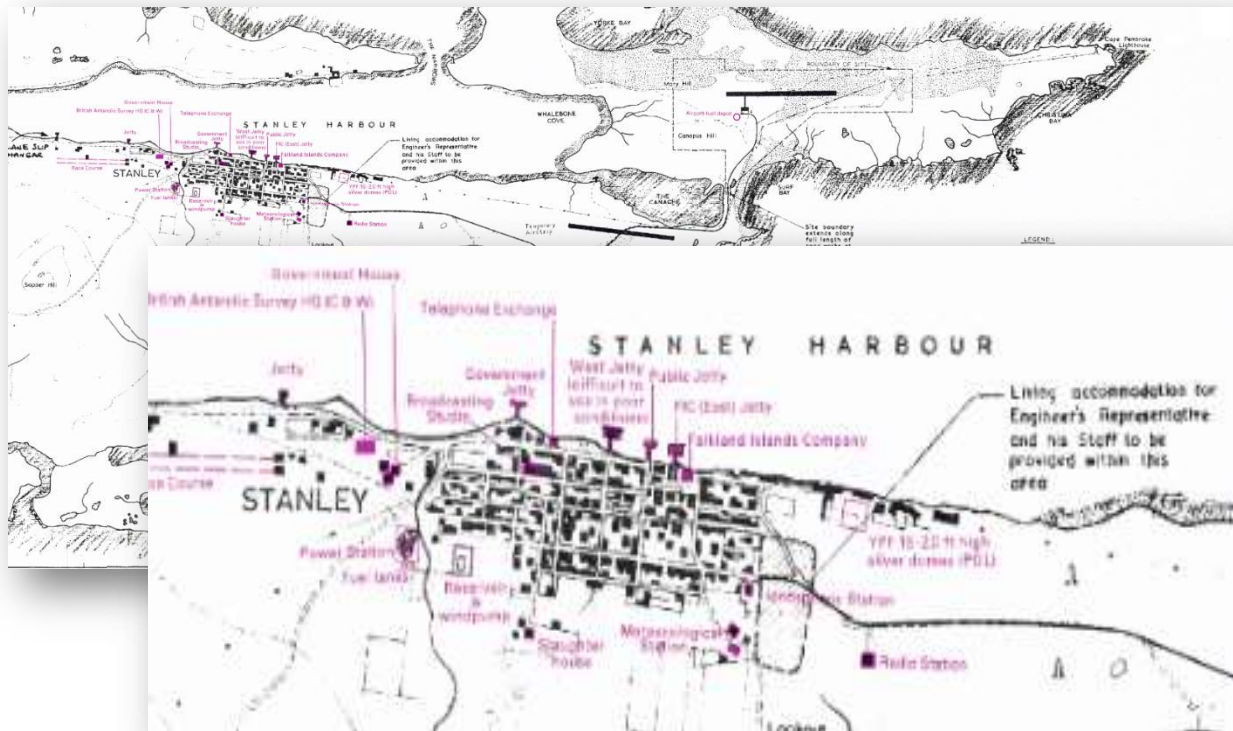
The information was required for RAF planning for Operation Black Buck, the bombing raids on Stanley Airport runway beginning 1 May, and for Special Forces contingency planning for a possible assault on the terminal.

Maps, plans, engineering drawings and diagrams at varying scales ranging from 1:500 to 1:50,000 from a variety of civilian sources were held in the MOD Map library.

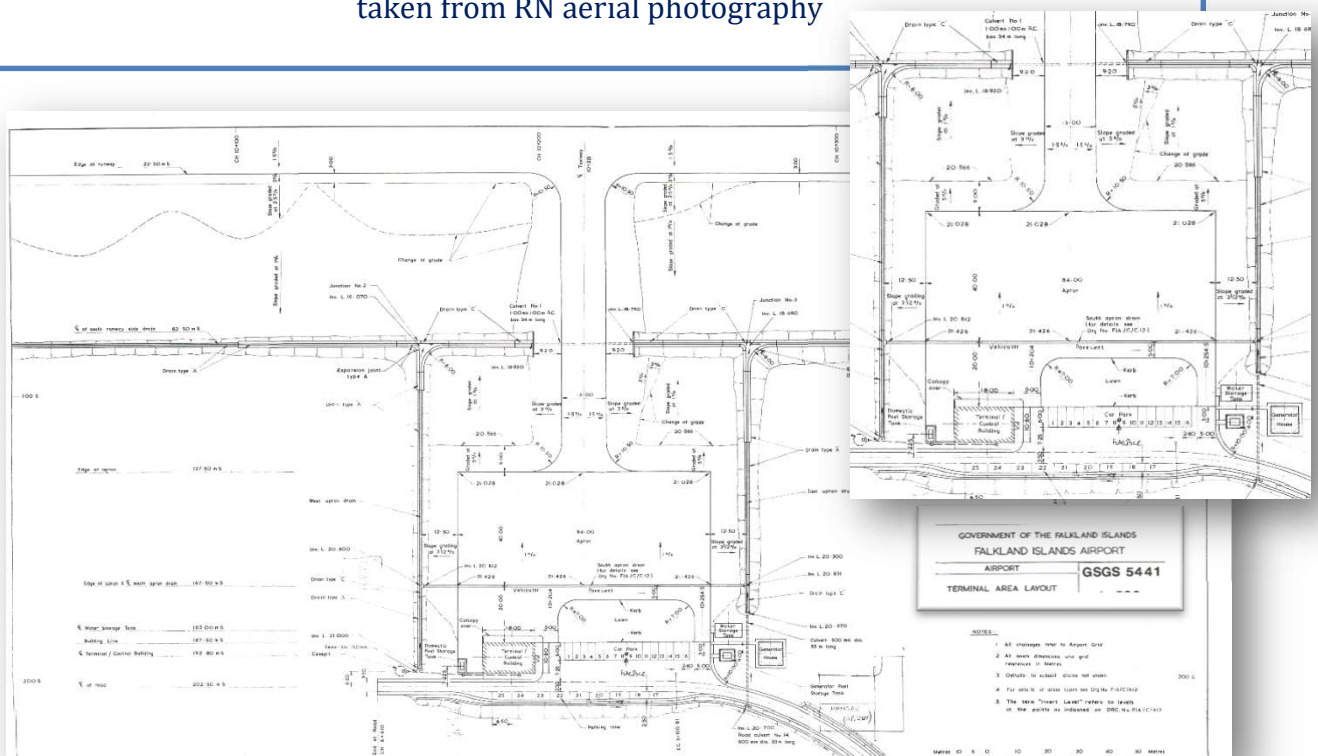
Small quantities of the three miscellaneous graphics shown here at reduced scale were printed by MCE by the 6 April.



Stanley Airport Location & Clear Zone Plan
The map extract is from the Stanley Airport Location & Clear Zone Plan 1:50,000.



Airport Location Plan. The map extract shown above is from the FI Government's Stanley Airport Location Plan 1:20,000. It includes a TIO in magenta, showing new information taken from RN aerial photography



Terminal Area Layout. The plan extract shown to the right is from the Stanley Airport Terminal Area Layout, 1:500, at reduced scale

In addition, runway profiles of Stanley Airport were plotted from aerial photography provided by UKHO by 42 Regt on the 7th of April (Poster 11).

Series GSGS 5442 - Falkland Islands & Dependencies Gazetteer

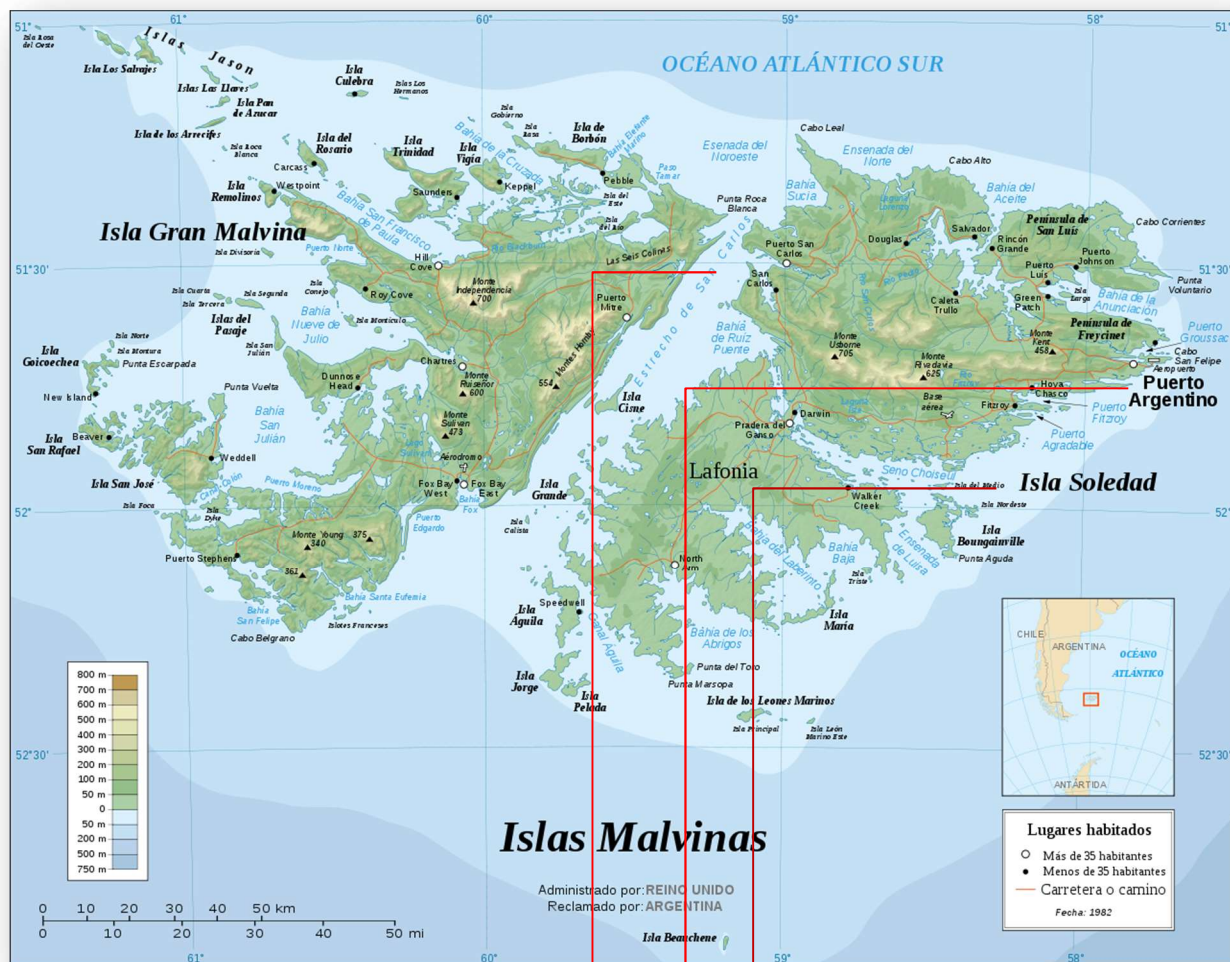
Background and Requirement

In addition to maps, Military Survey produces gazetteers listing named features shown on maps with their category, their grid co-ordinates, their latitude and longitude, and, in the case of the Falkland Islands, the number of the 1:50,000 scale map sheet on which the feature is shown. In recent years, gazetteers have been produced for campaigns in the Balkans, Iraq and Afghanistan.

As the Falklands conflict opened, a requirement arose for gazetteers of Argentina, and of the Falkland Islands and its Dependencies, including South Georgia.

In their radio communications, Argentinian forces referred to locations on the Islands by Spanish names, which had to be equated to the British names on British military maps.





R E S T R I C T E D				PAGE 4	
PLACE NAME	DESG	CO-ORDS	LATITUDE	LONGITUDE	SHEET NO
DOLPHIN, CAPE LEAL, CABO	HDLD	6222	51.14S	58.58W	07
EAGLE PASSAGE AGUILA, CANAL	CHNM	2599	52.19S	59.34W	28
EAGLE POINT AGUILA, PUNTA	PT	4789	51.32S	57.45W	15X
EAST FALKLAND SOLEDAD, ISLA	ISL	XXXX	51.50S	59.00W	XX

FALKLAND SOUND SAN CARLOS, ESTRECHO DE	SND	0427	52.03S	59.50W	25
FALKLAND SOUND SAN CARLOS, ESTRECHO DE	SND	0427	52.05S	59.50W	25

R E S T R I C T E D				PAGE 10	
PLACE NAME	DESG	CO-ORDS	LATITUDE	LONGITUDE	SHEET NO
STANLEY PUERTO ARGENTINO (FROM C 22/4/82)	PPL	3972	51.41S	57.51W	15
STANLEY PUERTO RIVERO (UP TO C 21/4/82)	PPL	3972	51.41S	57.51W	15

Extracts from pages showing Argentinian equivalents of the alphabetically listed English names, their co-ordinates, latitude, longitude and Series H791 sheet number. Featured on the Argentinian map and in the Gazetteer are Stanley/Puerto Argentino, East Falkland/Isla Soledad and Falkland Sound/ Estrecho de San Carlos.

Digital Terrain Models and Computer Terrain Views

A requirement for Digital Terrain Models

For the first time, in support of actual operations, computer graphics were produced to aid the assessment of topography in the context of radar siting for air defence systems.

The requirement arose from an RAF enquiry about the availability of digital terrain data over the Falklands, of which there was none and a subsequent tasking for data.

Over selected areas of Europe, a product by the name Digital Terrain Elevation Data (DTED) had been developed collaboratively by NATO nations. The Falkland Islands task required data for radar siting.

Data Production

Production began on the 23rd of April using the 1:250,000 scale JOG series as a contour source. Data tapes of NE

Falkland were completed by the 7th of May and

despatched to Royal Signals and Radar Establishment

and the Army

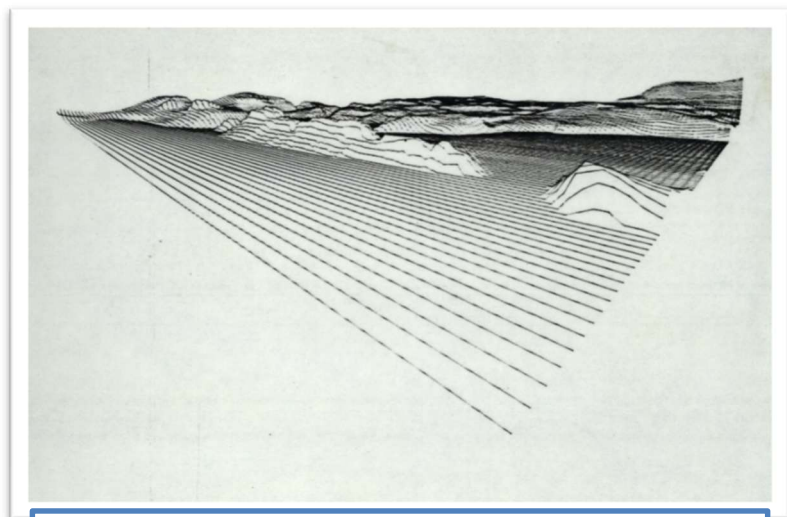
Electromagnetic

Compatibility Agency.

Having met the immediate requirement, the NE

Falkland data tapes for the

Stanley area were augmented and refined using the 1:50,000 scale maps and later the 1:12,500 scale maps. However, since this augmentation process was largely experimental, it had to take priority below existing operational requirements.



Early perspective view.

Further development work resulted in the production of perspective projections which were then annotated by hand and further enhanced by the addition of cultural features, colouring and hill-shading.

These items did not reach units of the task force before the



Rapier Surface to Air
Missile Position © IWM

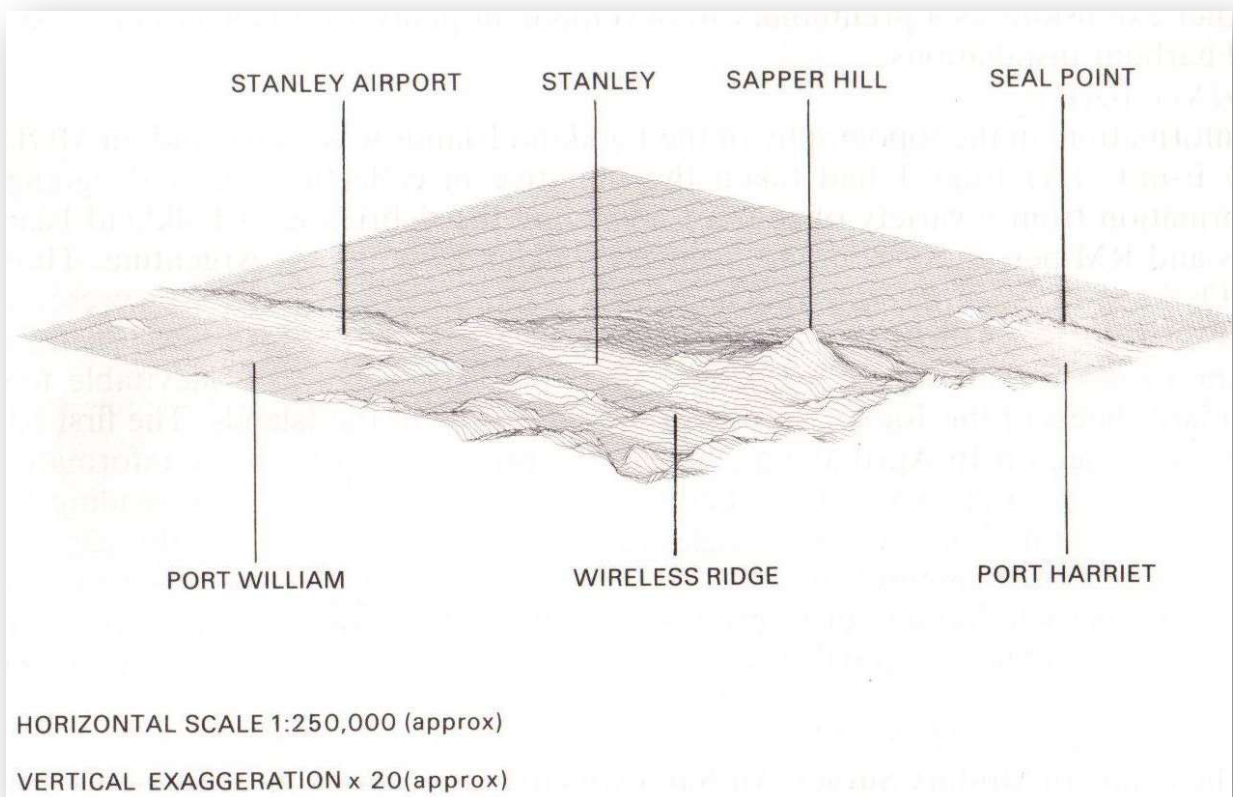
Computer Terrain Views (CTV)

Following discussions with the staff of CinC Fleet and MOD branches, a firm requirement for these items was established.

MCE produced fifteen digital terrain models in 1-degree longitude cells to be prepared to generate CTVs covering areas of 6 minutes of latitude by 12 minutes of longitude. Once digitised, the terrain can be depicted from any specified direction in the horizontal plane and from any angle in the vertical plane from sea level (0

degrees) to overhead (90 degrees).

The digital terrain data were processed on a plotter to produce what became known as CTVs, the early “views” being isometric, as distinct from perspective projections.



Isometric CTV of Stanley area

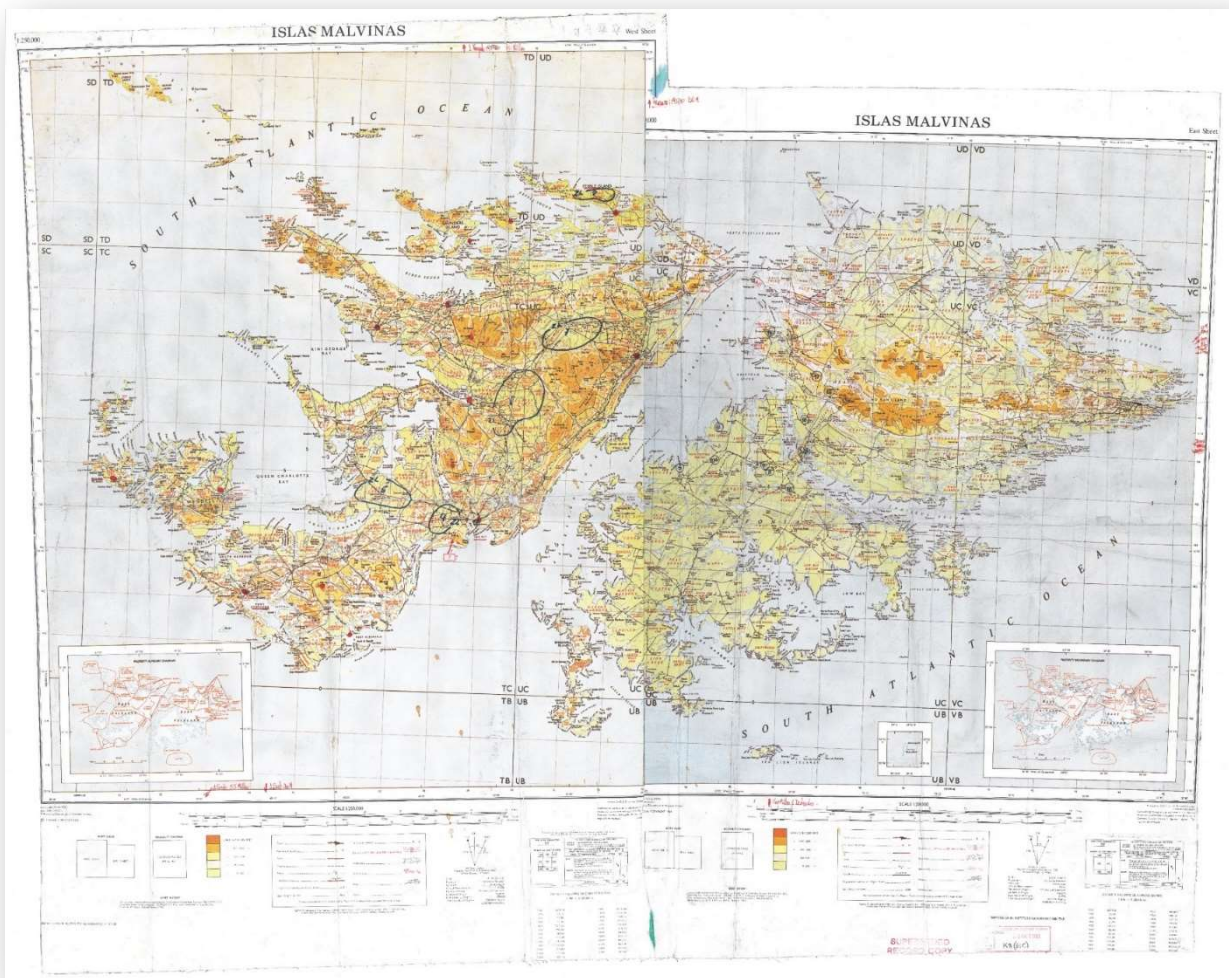
Captured Argentinian Maps



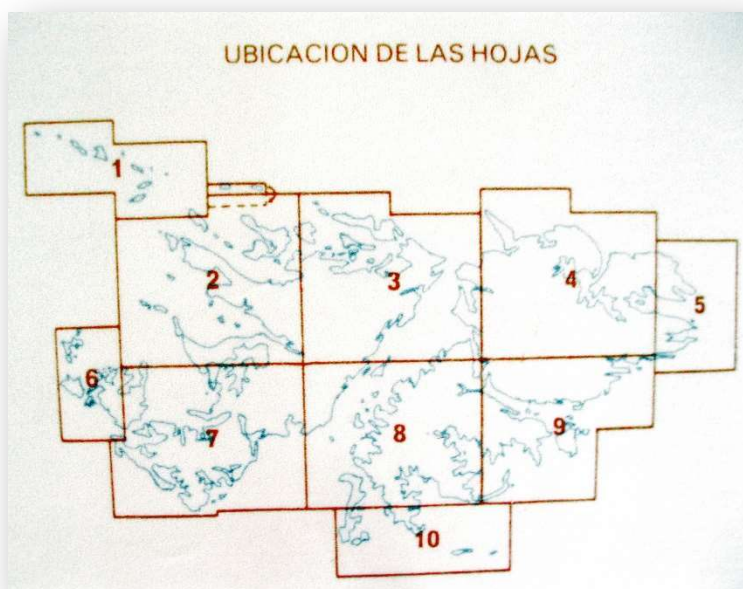
A captured Argentinian 1:100,000 scale map of the Stanley area. The originals were ungridded DOS first editions probably bought from Stanford's in London.



The Argentinians reduced the un-gridded DOS 1:50,000 scale maps to 1:100,000 scale and combined blocks of four of these reductions to make one standard 1:100,000 scale sheet of the same size, but many sheets are non-standard format.



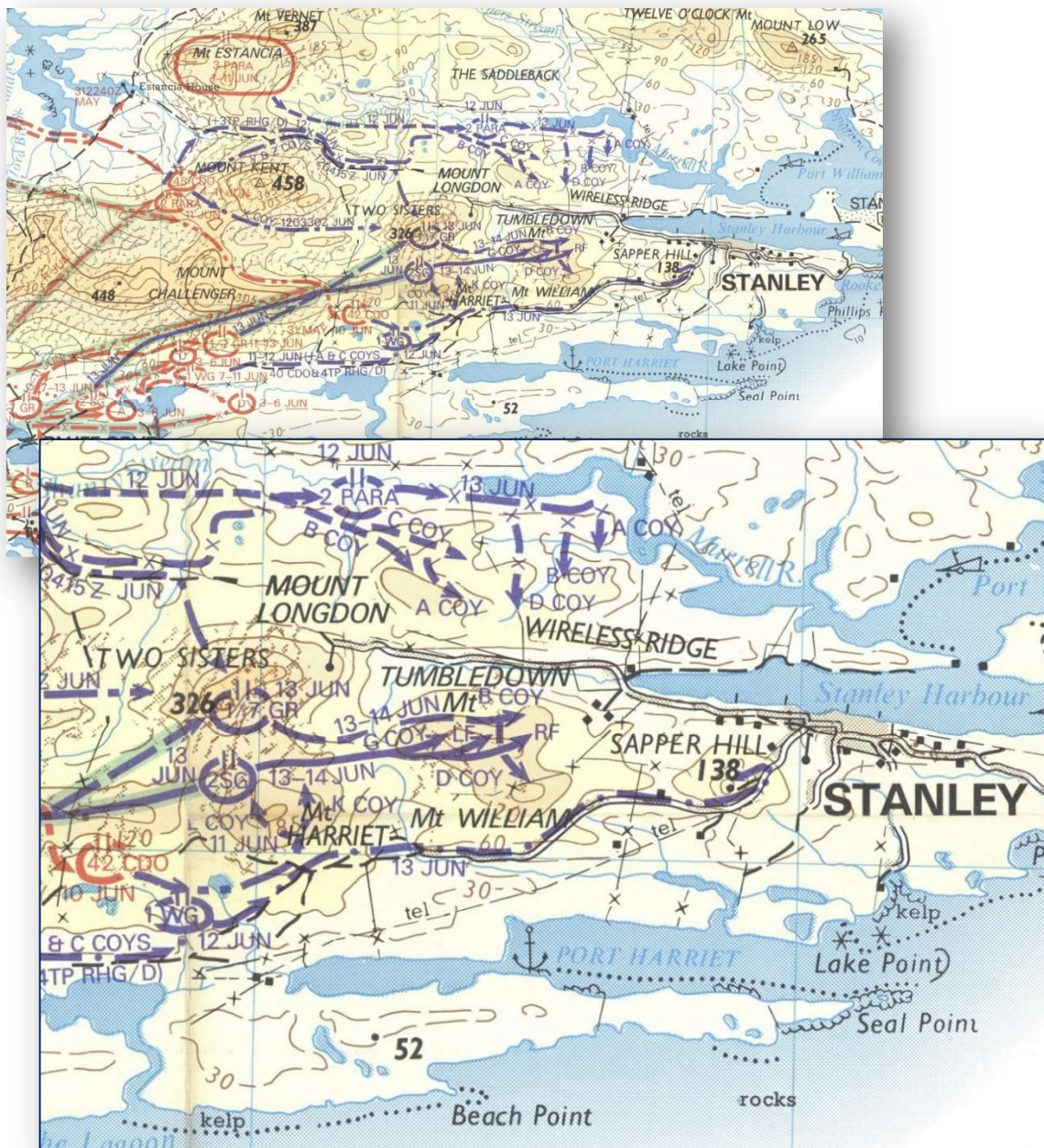
An Argentinian copy of the DOS 653 sheets, printed by the Instituto Geografico Militar showing Argentinian dispositions on West Falkland and some spot numbers on East Falkland.



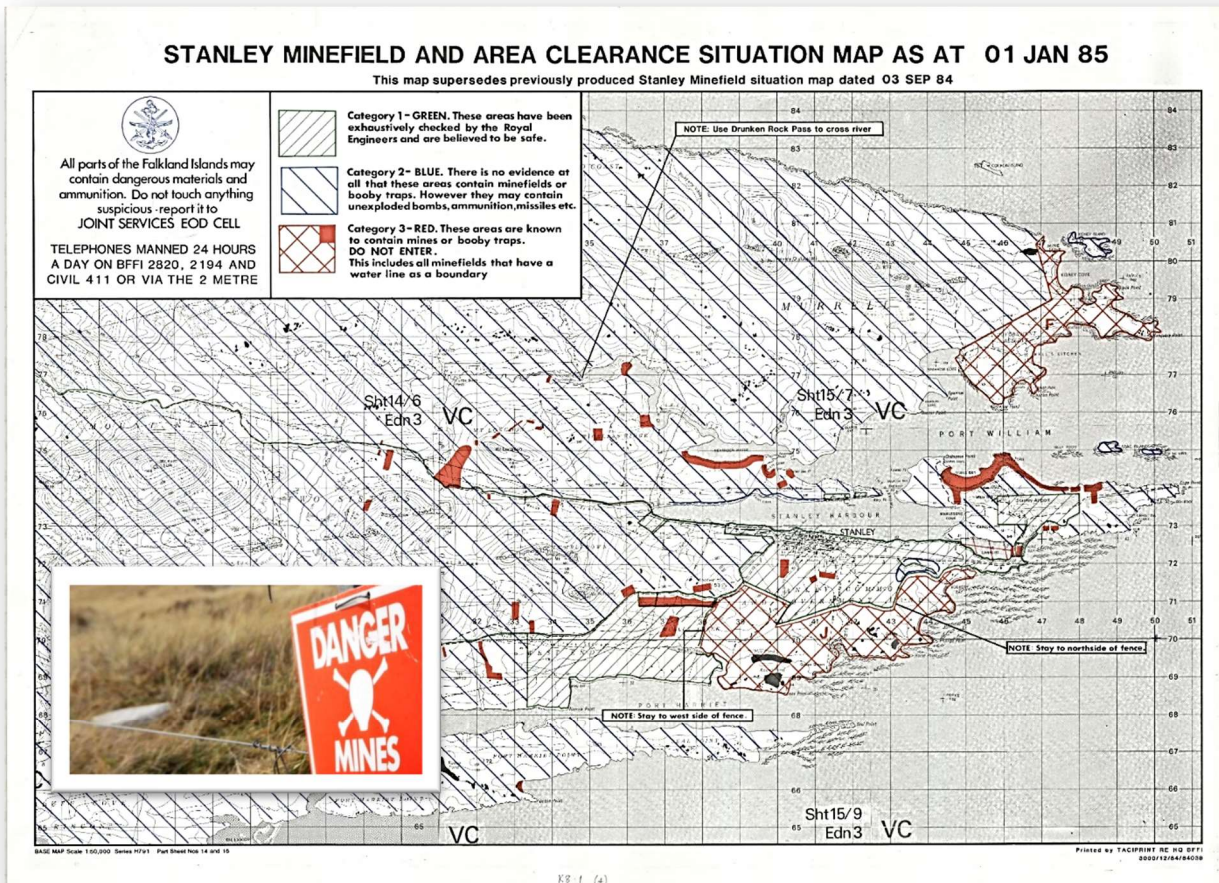
Index to 1:100000 Scale
Each sheet included an index to adjoining sheets showing the layout of the ten sheets in the 1:100,000 scale series.

GSGS 5465A - Op Corporate Manoeuvre Map 1:100,000

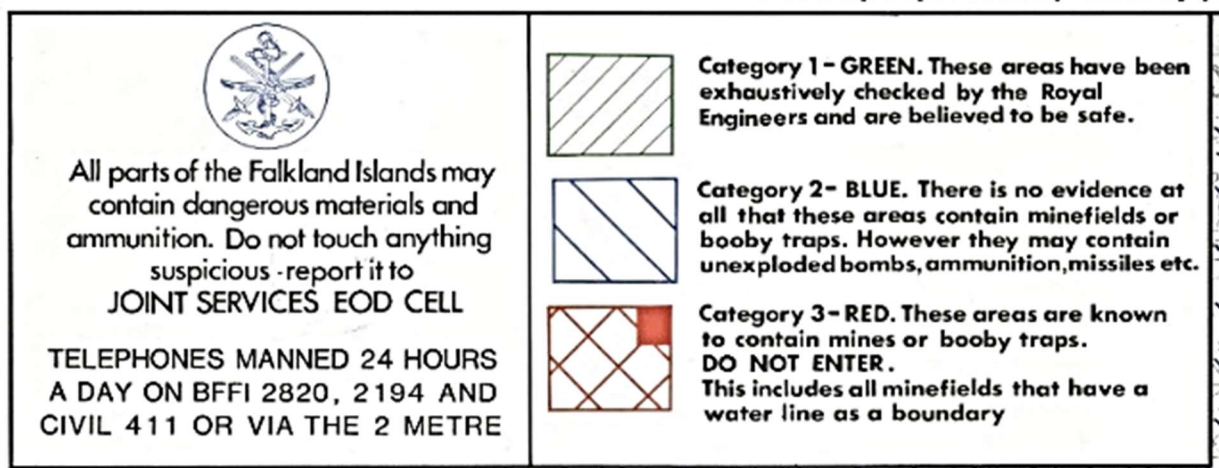
In November 1982, a commemorative map designated Series GSGS 5465A, was produced. It showed the movements of major units of 3 Commando Brigade and 5 Infantry Brigade from Port San Carlos and Goose Green to Stanley by foot, by air and by sea. It includes a coloured Key listing the units involved and their movements. The map is simply re-formatted enlargement of Series 1501 but with the hill-shading deleted. Edition 2 was printed in March 1985, followed by Edition 3 in January 1985. The three print runs totalled 27,000 copies.



Minefield Clearance Situation Maps 1:50,000

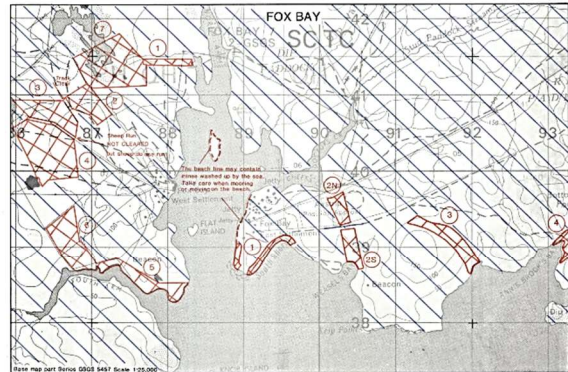
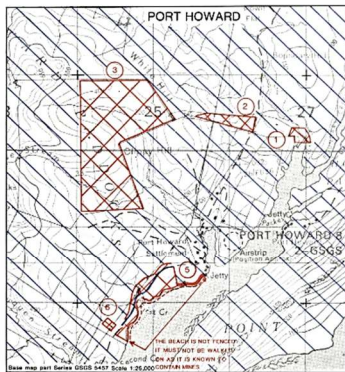
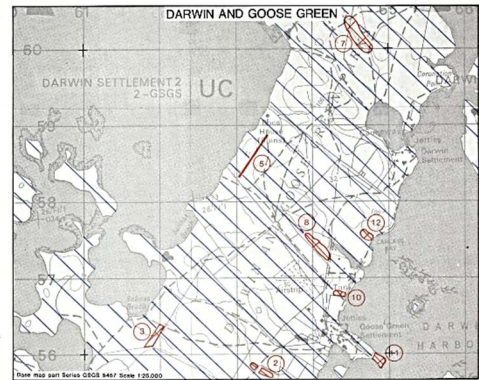
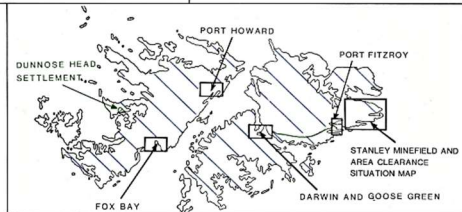
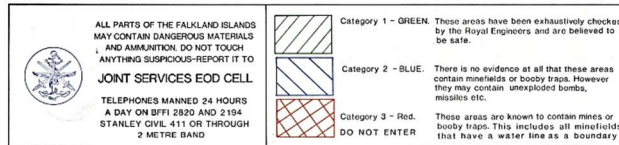


A UK-funded programme began to de-mine the islands in 2009 and has been completed three years ahead of schedule in 2017. The Falklands will be officially declared landmine free on 14 November 2017.



CAMP MINEFIELD SITUATION MAP AS AT : 03 SEPT 84

This map supercedes previously produced Camp Minefield Situation Map dated 21 MAY 84



KS (92)

Camp Minefield Situation Map showing minefields at Darwin & Goose Green, Port Howard, Port Fitzroy and Fox Bay.

Military surveyors were not involved in operations on the islands. After the Argentinian surrender two surveyors were sent to the islands to assist in the mapping of the vital minefield clearance task with a vehicle container housing a Rotaprint RA2S offset-litho printing press and ancillary equipment.

Periodically, they produced A2 format minefield clearance situation maps, showing the state of clearance as it was carried out by the Royal Engineers.

These maps were monochrome extracts from the Series H791 1:50,000 scale sheets with red, green and blue overprints.

Thousands of mines were laid during the 1982 Falklands War between British troops and the occupying Argentinian forces

Op Corporate - Military Survey

Supporting Operation Corporate

Introduction

The following is based on the Report of Geographic Support to operation Corporate by Lieutenant Colonel John Himbury RE, Assistant Director of Survey 2, Directorate General of Military Survey (DG Mil Svy). In twelve weeks, 410 line items were produced, totalling more than 750,000 maps, aeronautical charts and associated products.

Directing the Operation

Within the Directorate General of Military Survey, the geographic operations were managed essentially by the DG Mil Svy staff branches. Survey 2 in close consultation with Survey 3 and Survey 6. Survey 1 managed staff duties, communications and local administration, and Survey 4 managed the procurement of equipment and materiel for which there were urgent requirements to meet the Operation Corporate commitments. Authority was then delegated within the defined limits and subject to stated conditions to sponsor branches, in this case, Survey 4.

Map Production and Support

42 Survey Engineer Regiment

At 42 Regt, 24-hour manning began and sustained to meet the volume and variety of tasks which arose. The unit provided the Senior Warrant Officer Adviser for Ascension Island, the detachment of Cartographic Technicians to the Headquarters Engineer in Chief and the detachment of Air Survey Technicians to the Directorate of Overseas Surveys for the survey at 1:12,500 scale of North-East Falkland. By 15 May, the pattern of tasking had become sufficiently clear to allow the Regiment, less a 22-man production team, to depart on military training exercises. Still, it was necessary to recall certain personnel.

The Mapping And Charting Establishment RE

The MCE RE had no formal mobilization plan for reacting to emergencies, and as the situation developed, responses were matched to escalating requirements. Without any unit transport, arrangements had to be made with 491 Troop RCT to move material between the headquarters and the Map Research and Library Group and also for the delivery of products. The separation of The Map Research and Library Group (MRLG) from Feltham resulted in much movement of personnel and material. It was not until secure telephone communications were established that the situation eased. Much overtime working by civilian staff was necessary to meet very tight deadlines,

8 Map & Air Chart Depot RE

8 Depot took Operation Corporate in its stride, although it was required to attach another officer to the Depot for ten days in April when activity was at its highest. After two months of continuous duty, the Officer Commanding was relieved for a few days by the Training Adjutant of the SMS. After the mapping up of 5 Infantry Brigade before its departure on Queen Elizabeth 2, the workload on the Depot gradually returned to more normal levels.

Royal Navy Helicopter Photography

The Officer Commanding 1 Air Survey Liaison Section RE was attached to the Depot during April. He had no direct involvement in the operation. Still, he had earlier been responsible for assessing the air photography taken by the Westland Wasp helicopter of HMS Endurance during the antipodean summer of 1981-2. This photography produced GSGS 5456 at 1:12,500 scale undertaken by the DOS assisted by 42 Survey Engineer Regiment RE.

The School Of Military Survey

The training of students at the SMS was not interrupted by Operation Corporate. The School's resources were called upon several times and at short notice to relieve the loads, which sometimes placed severe stress on the capacities of other units. The School used its process cameras for colour separation work, its large presses for various overprints and both a small press and a large press for the production of the Falkland Islands and Dependencies Gazetteers. Specific spares and small items of equipment were issued on loan.

The Ordnance Survey

The tasking of the Ordnance Survey under the standing agency arrangements continued as usual with the addition of only two low-priority tasks; one was the reprint of four British Antarctic Survey sheets, and the other required the enlargement of several microfilm originals.

HQ BAOR & British Defence Liaison Staff.

The activities of the Chief Geographic Branch, Headquarters British Army of the Rhine, in acquiring material from European sources significantly contributed to providing topographic information to task force units. In BDLS Washington, the UK Assistant Director of Survey provided maps, information, and technical support to the British Embassy Staff and the US Mapping and Intelligence community.

A Diary Date

Defence Surveyors' Association Annual Seminar



22 June 2023

Arlington Arts Centre - Newbury

The Programme

10.00 hrs	Assemble for tea, coffee and biscuits.
10.30 hrs	Welcome and Opening Remarks - Chairman DSA.
10.45 hrs	Session 1. Defence Geographic Centre Update - Ian Spencer.
11.30 hrs	Session 2. Uncrewed Underwater Vehicles (UUVs) - Cdr Joe Tretton RN.
12.15 hrs	Session 3. DSA Awards and Introduction to displays by Vision Engineering.
12.30 hrs	Lunch. (Including Vegetarian Option and Bar).
14.00 hrs	Session 4. Dieppe Raid - Mike Nolan
14.45 hrs	Session 5. D-Day Preparations - Chris Barrington-Brown
15.30 hrs	Tea.
16.00 hrs	Session 6. Map Supply during Op Telic - Drew Craig)
16.45 hrs	Closing Remarks - Maj Gen (Ret'd) Roy Wood, President DSA.
17.00 hrs	Departure.

Cost £30:00 per person

For further details, see the DSA Web Site: <https://www.defencesurveyors.org.uk/>