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WITHDRAWAL SHEET

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Collection: NORTH, OLIVER: Files

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File Folder: Falkland Islands (Malvinas) [1 of 2] Box 97 103

Date: May 16, 1997

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
1. map	re Falklands (1 pp.) <i>D, 5/9/00 F96-003-1, #5</i> <i>D 11/23/05 M1426 #1</i>	n.d.	P1
2. memo	Bob Helm to Clark thru Richard Boverie re DOD Interim Report of US Lessons Learned in the Falklands (2 pp.) <i>R 11/23/05 M1426 #2</i>	3/9/83	P1
3. memo	Weinberger to AP, NSA re-attached interim report (1 pp.) <i>R, 5/8/00 F96-003, #7</i>	3/3/83	P1
4. report	Preliminary Observations and Findings South Atlantic Conflict Lessons Learned Study (pp. 6 - 7, pp. 10 - 11; pp. 14 - 39, pp. B-2 - B12, pp. C-3 - C-16, pp. D-2 - D-12, p. D-13, pp. D-15 - D-21, all) <i>P, 5/8/00, F96-003 #8</i> <i>P 11/23/05 M1426 #3</i>	1/21/83	P1

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P-1 National security classified information [(a)(1) of the PRA].
- P-2 Relating to appointment to Federal office [(a)(2) of the PRA].
- P-3 Release would violate a Federal statute [(a)(3) of the PRA].
- P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA].
- P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA].
- P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA].

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- F-1 National security classified information [(b)(1) of the FOIA].
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- F-9 Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA].

PENDING REVIEW IN ACCORDANCE WITH E.O. 13233

Ronald Reagan Library

Collection Name NORTH, OLIVER: FILES

Withdrawer

SMF 3/29/2007

File Folder FALKLAND ISLANDS (MALVINAS) (1 OF 2)

FOIA

M1426

Box Number 103

ID	Doc Type	Document Description	No of Pages	Doc Date
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2	MEMO	HELM TO CLARK THRU BOVERIE RE DOD INTERIM REPORT (M1426 #2)	2	3/9/1983
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CAS 5/15/97

DECLASSIFIED IN PART

NLS E96-003-1, #8
By dlb, NARA, Date 5/8/02

PRELIMINARY OBSERVATIONS AND FINDINGS
SOUTH ATLANTIC CONFLICT LESSONS LEARNED STUDY (U)
(INTERIM REPORT)

DoD/IDA Task Force

21 JANUARY 1983

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CAS 5/15/97

PRELIMINARY OBSERVATIONS AND FINDINGS
SOUTH ATLANTIC CONFLICT LESSONS LEARNED STUDY(U)
(INTERIM REPORT)

DoD/IDA TASK FORCE

21 JANUARY 1983

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**SOUTH ATLANTIC CONFLICT LESSONS LEARNED STUDY
TASK FORCE ORGANIZATION**

- The Secretary of Defense has established a DOD-wide effort to identify and study military lessons that can be learned from the South Atlantic Conflict. A subcommittee was formed, headed by Mr. Andy Marshall, Director, OSD/Net Assessment, and charged with the responsibility for the overall South Atlantic Conflict lessons learned effort.
- A joint DOD/IDA task force was established to conduct the South Atlantic Conflict assessment for Mr. Marshall and the subcommittee. The task force was established by and operates from Task Order T-2-134 under Contract MDA903 79 C 0018, issued by the DOD-IDA Management Office (DIMO).
- The DOD/IDA task force is under the direction of LtGen Philip Shutler, USMC (Ret). The Deputy Director is Mr. Edward Kerlin, Assistant Director of Program Analysis Division, IDA. The team members include the part-time participation of ten to twelve IDA staff members whose total effort averages approximately 6 man-months per month and full-time participation of six military service personnel.

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**SOUTH ATLANTIC CONFLICT LESSONS LEARNED STUDY
(DOD/IDA TASK FORCE)**

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MISS MARY SHOVER

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**SOUTH ATLANTIC CONFLICT LESSONS LEARNED
OBJECTIVE, SCOPE AND PURPOSE**

- The objective of this study is to assess the nature and effectiveness of the weapons, tactics, doctrine, organizations, forces and procedures used by the combatants in the South Atlantic Conflict.
- The scope of the study will include a review and analysis of the weapons and personnel performance; operations and tactics; force management, communications, and intelligence; mobilization, readiness, training, logistics; and the impact of arms transfers and other national and international obligations and interactions.
- In addition to each of the areas indicated above, special attention will be focused on a number of issues that cut across many of the areas noted. These issues include:
 - the use of electronic warfare in all its forms
 - the utilization and impact of special operations
 - the equipment, methods, procedures, and effectiveness of tactical and strategic C³I
 - the role of innovation and the environment which permits it
 - activities of third world countries during the conflict.
- Results from the analysis of each of these issues will be made a part of and integrated into the study's findings from which lessons learned will be identified that are applicable to the United States.

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SOUTH ATLANTIC CONFLICT LESSONS LEARNED

OBJECTIVE

TO ASSESS THE NATURE AND EFFECTIVENESS OF THE WEAPONS, TACTICS, DOCTRINE, C³I, ORGANIZATIONS, FORCES AND PROCEDURES USED BY THE COMBATANTS IN THE SOUTH ATLANTIC CONFLICT

SCOPE

TO REVIEW AND ANALYZE, WHERE APPROPRIATE

- WEAPONS AND PERSONNEL PERFORMANCE**
- OPERATIONS AND TACTICS**
- FORCE MANAGEMENT, COMMUNICATIONS, INTELLIGENCE**
- MOBILIZATION, READINESS, TRAINING, AND LOGISTICS**
- NATIONAL AND INTERNATIONAL OBLIGATIONS & INTERACTIONS**

PURPOSE

FROM THIS STUDY, LESSONS LEARNED WILL BE IDENTIFIED THAT ARE APPLICABLE TO THE UNITED STATES

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**SOUTH ATLANTIC CONFLICT LESSONS LEARNED
ADDITIONAL GUIDANCE**

- Other studies are presently ongoing which relate to the events and lessons to be gained from analysis of the South Atlantic Conflict. Studies are currently being conducted by the following groups:
 - The Defense Intelligence Agency is conducting a study of the events and intelligence systems used in the conflict. Specific studies of logistics and readiness for both UK and Argentina are also being done by DIA.
 - The Director of Operations, Joint Staff, is conducting a study of special operations activities that were conducted during the South Atlantic Conflict.
 - The U.S. Navy Department is conducting a study to identify lessons learned that can be used to validate and/or improve Navy, Marine, maritime and industrial capabilities and readiness. This study will focus on combat operations, hardware capabilities, and manpower/training.
- The DOD/IDA task force will review the on-going studies and examine the lessons learned. Valid findings and lessons will be retained and integrated into the overall DOD study.
- The DOD/IDA task force will maintain a central repository for questions, data, reports and other documentation concerning the events, facts, systems, and operations of the South Atlantic Conflict.
- As a result of the review of other studies, and the detailed analysis of the events of the conflict, the study will:
 - Relate the results of the conflict in the South Atlantic to assessments of systems, operations, and tactics, and
 - Derive implications for U.S. systems and operations in the European, Korean, RDF, and other contexts as appropriate.

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SOUTH ATLANTIC CONFLICT LESSONS LEARNED

ADDITIONAL GUIDANCE

- **MAINTAIN A CENTRAL REPOSITORY FOR QUESTIONS, DATA, REPORTS, EQUIPMENT, AND OTHER RELEVANT DOCUMENTATION CONCERNING EVENTS, FACTS, SYSTEMS AND OPERATIONS OF S.A.C.**
- **RELATE RESULTS OF CONFLICT IN THE SOUTH ATLANTIC TO ASSESSMENTS OF SYSTEMS, OPERATIONS, AND TACTICS**
- **DERIVE IMPLICATIONS FOR U.S. SYSTEMS AND OPERATIONS IN THE EUROPEAN, KOREAN, RDF AND OTHER CONTEXTS AS APPROPRIATE**
- **DERIVE GENERAL IMPLICATIONS (MILITARY, POLITICAL, ECONOMIC, ETC.) FOR NATIONAL SECURITY**

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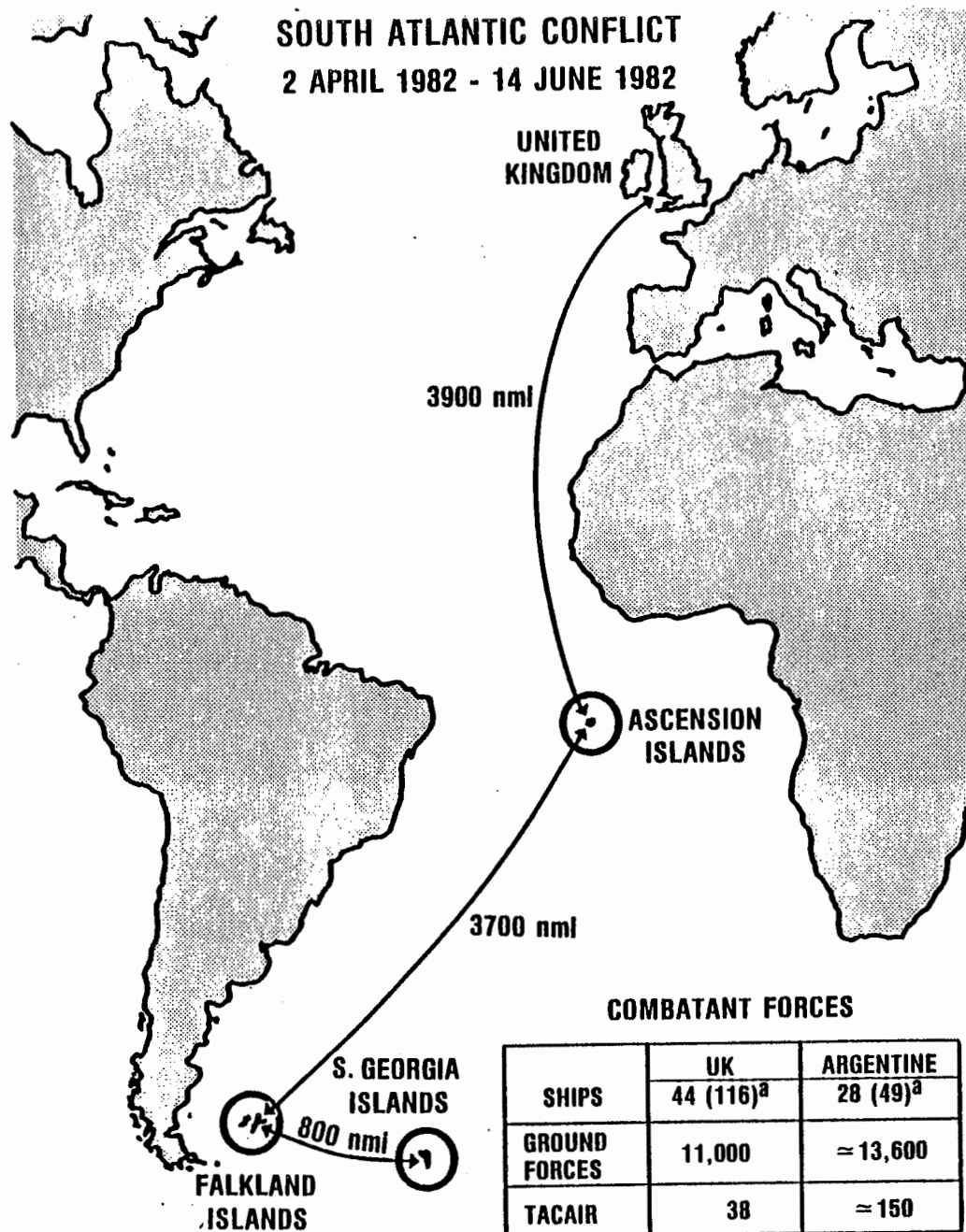
**PRELIMINARY OBSERVATIONS AND FINDINGS
SOUTH ATLANTIC CONFLICT LESSONS LEARNED STUDY**

The following discussion of our observations and findings contains what we have learned thus far in our study of the South Atlantic Conflict. We should emphasize that we are midway in our study, and these are preliminary observations and findings. We have compressed our remarks in the interest of time but, of course, will expand on them or answer questions as you wish. This slide gives a picture of the scope of the conflict. You might say it was 100 miles wide and 8,000 miles long.

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SOUTH ATLANTIC CONFLICT 2 APRIL 1982 - 14 JUNE 1982



COMBATANT FORCES

	UK	ARGENTINE
SHIPS	44 (116) ^a	28 (49) ^a
GROUND FORCES	11,000	≈ 13,600
TACAIR	38	≈ 150

^aTotal ships supporting in ().

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INTRODUCTION

- It was a small campaign but it takes on added interest as the first naval campaign in nearly forty years and as a demonstration of a rapid deployment force employed in Joint Operations at a great distance. To put it on a more familiar geographic scale, the Falklands are about the same distance from London as is Hong Kong or Honolulu. Most, in fact practically all, the "lessons" are old ones relearned but they are valuable nonetheless in that many more people will now understand more of the implications of new technology applied to modern warfare. Technical lessons, like the short reaction time to defend against a sea skimming missile, previously known by only a few, are now known by many.
- The war started from miscalculations. The British misread the mood of the Argentine Junta. The Argentines misperceived the British political will and their ability to respond to military action. They also miscalculated world opinion.
- The major obstacle to be overcome for the British was, of course, time--time to convert a North Atlantic anti-submarine force into a South Atlantic amphibious force and to get it to the Falklands before winter. The Argentines on the other hand had to overcome a reluctance to participate in joint operations and inexperience in projection. And they certainly entered with tenuous political-military cohesion.
- The British deployment took a sizable portion of NATO-assigned forces. In the long run the war may have a positive effect since the equipment damaged or lost is currently planned to be replaced; in addition, the planned defense budget and some forces previously planned for layup will be kept active.
- The three distinguishing aspects of the war are Argentine Air vs the British Fleet, Argentine Air vs the Combined British Air Defenses and, of course, Ground vs Ground.



- And last, but probably most important of our introductory remarks, the focus of the study is on implications for U.S. forces in probable U.S. applications. We have looked at some specific applications of U.S. weapons but we have not spent much effort on how the U.S. would have fought a war against Argentina.

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INTRODUCTION

- **SMALL ISLAND CAMPAIGN REQUIRING JOINT OPERATIONS IN A REMOTE AREA, OF DIFFERENT DEGREES OF RELEVANCE TO POTENTIAL SCENARIOS INVOLVING U.S. FORCES**
 - **MISCALCULATION ON BOTH SIDES: BRITISH -- POLITICAL; ARGENTINE -- MILITARY**
 - **MAJOR OBSTACLES FOR BRITISH -- TIME AND DISTANCE; FOR ARGENTINES -- NATIONAL INEXPERIENCE IN WAR AND LACK OF POLITICAL-MILITARY COHESION**
 - **LARGE AMOUNT OF BRITISH RESOURCES, INCLUDING NATO-ASSIGNED FORCES, REQUIRED TO MOUNT SMALL OPERATION**
 - **THREE MAIN ASPECTS OF BATTLE: ARGENTINE AIRCRAFT VS BRITISH FLEET; AIRCRAFT VS AIR DEFENSE SYSTEMS; GROUND TROOPS VS GROUND TROOPS**
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- **FOCUS OF STUDY IS ON IMPLICATIONS FOR U.S.**

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OUTLINE

We have grouped our comments in these categories. For the most part, they are observations of the conflict but in the findings we start to transition to applications for U.S. forces.

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OUTLINE

OVERVIEW

AIR WARFARE

SEA WARFARE

LAND WARFARE

PRELIMINARY FINDINGS

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OVERVIEW

- In preparing for the war, we note that Argentina made little preparation, assuming Britain would not fight. The British, with some highly ready troops and ships but overall poorly prepared, used NATO plans as guidelines, requisitioned and chartered ships, selectively mobilized their industrial base, achieved internal and external political cohesion and developed Ascension Island as a staging base--all in very short order. In short, we observe once again the "Pearl Harbor Effect:" galvanization of a nation in response to military attack.
- Argentina's strategy was to occupy the islands and then to retain them through diplomatic efforts. The British were determined to show resolve by sailing the fleet hoping that vigorous diplomatic efforts would solve the problem but, nonetheless, they were mentally prepared to carry the attack to the enemy at sea and ashore if forced to do so.
- The British Force management was accomplished by a Joint Command in the UK. CINCFLEET headquarters at Northwood was modified by adding a land and air deputy and it was from Northwood that the war effort was directed, not from RADM Woodward's Flag Ship on scene. The short clear chain of command in London (War Cabinet to Chief of Defense Staff to CINCFLEET) made quick reaction possible. Careful use of Rules of Engagement (ROE) changes allowed the forces in the field to exercise tactical flexibility consistent with the policy being formulated in response to external diplomatic events.

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OVERVIEW
(Concluded)

- We were told there were only two "orders" issued from London: "Head South" to Woodward as he exited the Mediterranean and "Repossess the Falklands" when diplomatic efforts failed. But RADM Woodward reported that he had an hour "chat" with CINCFLEET each evening via secure voice satellite and that these conversations kept him from "running amuck."
- 

- The British MOD had difficulties with the press, who were incensed over censorship and lack of facilities. On the MOD side, there are more than a few servicemen who think the press added to the problems by publishing the unexploded bomb story and forecasting the actions at Goose Green and Fitzroy. We think that the British did not do too badly. Most essential secrets were kept and the public was reasonably informed.
- The last and most important point to be made in our overview is that people were the dominant factor: Firm political leadership in the UK, innovative support from industry, and well trained adaptable soldiers, sailors and airmen with good leadership in the field and at sea. We should also mention the courage and tenacity of the Argentine pilots in the face of considerable losses. They made it a very close thing indeed.

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OVERVIEW

- **PREPARATION FOR WAR**

- **ARGENTINA:** LITTLE PREPARATION BASED ON ASSUMPTION THAT BRITISH WOULD NOT FIGHT
- **BRITAIN:** USED NATO PLANS AS GUIDELINES FOR S. ATLANTIC PLANNING: REQUISITIONED AND CHARTERED MERCHANT SHIPS TO MAKE UP SHORTFALL IN AUXILIARY SHIPS, SPECIALIST AMPHIBIOUS SHIPS; SELECTIVELY MOBILIZED INDUSTRIAL BASE FOR SHIP, AIRCRAFT MODIFICATIONS; DEVELOPED ASCENSION ISLAND AS FORWARD STAGING/LOGISTIC BASE

- **STRATEGIES**

- **ARGENTINA:** MILITARY OCCUPATION FOLLOWED BY DIPLOMATIC RATIFICATION
- **BRITAIN:** 1) QUICKLY DEPLOY TASK FORCE TO DEMONSTRATE RESOLVE
2) PURSUE DIPLOMATIC RESOLUTION
3) LAND FORCES TO REPOSSESS ISLANDS

- **BRITISH STRATEGIC MANAGEMENT/COMMAND AND CONTROL**

- **JOINT COMMAND EXERCISED IN UK; NO ON-SCENE OVERALL COMMANDER WITH OVERALL AUTHORITY**
- **SHORT, CLEAR CHAIN OF COMMAND AT NATIONAL LEVEL MADE QUICK REACTION POSSIBLE**
- **RULES OF ENGAGEMENT USED TO PROVIDE TACTICAL FLEXIBILITY CONSISTENT WITH NATIONAL POLICY**

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OVERVIEW

(CONCLUDED)

- SATELLITE (SECURE VOICE) COMMUNICATIONS VITALLY IMPORTANT FOR FORCE MANAGEMENT
- BRITISH PROBLEMS WITH PRESS
 - IN SPITE OF CENSORSHIP, SOME OPERATIONALLY SENSITIVE INFORMATION LEAKED OUT
- PEOPLE WERE THE DOMINANT FACTOR
 - FIRM POLITICAL LEADERSHIP IN UK
 - PROFESSIONAL BRITISH FORCES AND COMPETENT, INNOVATIVE SUPPORT PERSONNEL
 - COURAGEOUS ARGENTINE PILOTS

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ARGENTINE AIR WARFARE

- AIR FORCE HAD ABOUT 25 LIGHT-ATTACK AIRCRAFT BASED IN FALKLANDS -- MOST WERE EVENTUALLY DESTROYED
- 146 MAINLAND-BASED FIGHTER-BOMBERS FLEW ABOUT 300 SORTIES; ALL ATTACKS IN DAYLIGHT, CLEAR WEATHER; FLOWN MOSTLY IN 5 DAYS DURING LANDINGS. (61 TACTICAL AIRCRAFT CONFIRMED KILLED, 11 PROBABLE)
- NO FIGHTER ESCORT; NO AIR DEFENSE SUPPRESSION; NO ECM EQUIPMENT -- LOW LEVEL FLIGHT WAS ONLY COUNTERMEASURE AGAINST BRITISH DETECTION; 3-4 MINUTES ON-STATION TIME DUE TO FUEL LIMITS
- ALMOST ALL ORDNANCE WAS UNGUIDED BOMBS; THESE BECAME "MANUAL PRECISION-GUIDED WEAPONS" RELEASED AT POINT-BLANK RANGE IN HIGH-SPEED LOW-LEVEL ATTACKS AGAINST BRITISH SHIPS; ARGENTINE AIRCRAFT WERE NOT A SIGNIFICANT FACTOR AGAINST BRITISH GROUND FORCES
- EXOCET: 5 AIR LAUNCHES, 3 MISSILES HIT, 2 SHIPS DESTROYED
2 GROUND LAUNCHES, 1 MISSILE HIT, 1 SHIP DAMAGED
 - POINT DEFENSE NEEDED: ESM, ECM (CHAFF)
 - MUTUAL SUPPORT DIFFICULT

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ARGENTINE AIR WARFARE

- As the conflict started, the Argentines had about 25 light attack aircraft (Pucara) based on the islands. Most of these were eventually destroyed. They made no attempt to use the airfield at Stanley as a tactical airbase. This and Argentine air defenses around Stanley probably accounted for the lack of vigor on the part of the British to put the runway totally out of commission.
- Our statistics on the Argentines are not as firm as on British forces, but we believe the Argentines had about 146 mainland-based fighter-bombers (Mirage, Dagger, A-4, Super Etendard and Canberras) with ranges to reach the Falklands. They flew about 300 sorties, all in daylight, clear weather.
- With the exception of a small encounter on 1 May, the fighter-bombers were used as bombers with no fighter escort, no air defense suppression and no ECM equipment. High speed, low level flight was the only countermeasure, and it may be added a very effective one, against British anti-air warfare screens. The result was arrival within the target area with very little excess fuel for defensive maneuvers and limited capability to select targets. By far the greater proportion of these flights was flown during the two landings--21-26 May (San Carlos) and 8 June (Fitzroy).
- Most of the weapons used were old fashioned bombs which, in the event, became "Manual Precision Guided Weapons" because they were released at point blank ranges.
- Most of the publicity, however, went to the Exocet, a sea skimming missile sold to the Argentines by the French. Five airborne Exocets were fired, resulting in three hits and two British ships sunk. There were also two Exocets fired from land, resulting in one hit.

[REDACTED] But we should keep in mind that time from release to impact is very short, and the low flight profile and small size make detection difficult; thus there is a high premium on alertness and point defense countermeasures. Mutual support between ships is very limited except, of course, in the mode of stopping the aircraft before it releases the missile.

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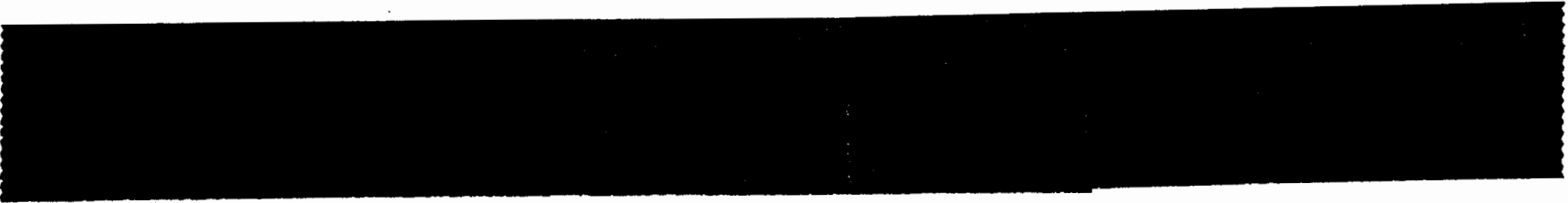
BRITISH AIR WARFARE

- Turning now to the British side of air warfare, we note that 28 of the 38 Harriers deployed were Sea Harriers configured for air defense. They flew all of the 1100 air defense combat air patrol sorties and some of the 215 ground attack sorties. The remainder of the ground attack sorties were flown by the RAF GR3 Harriers. Very little close air support was attempted (14 sorties).
 - The short take off-vertical landing (STOVL) characteristics of the Sea Harrier allowed the aircraft to operate effectively from the small ski-jump carriers and an 850 foot expeditionary field at San Carlos once it was operational on 5 June. In addition, they landed on the LPD's occasionally for fuel when San Carlos airfield was temporarily out of service. With this flexible basing, the short legged but reliable (85 percent) Harrier was able to achieve 30 to 45 minutes on CAP stations.
 - The 20 to 0 success rate of the Harriers in air-to-air combat is most impressive, but we should keep in mind that the air-to-air engagements were almost all against fighter-bombers on bomber missions in daylight and clear weather. Most Argentine aircraft would have had minimum fuel for air combat maneuvering and, in the event, did not do much.
 - The lack of airborne early warning which caused late detection and the small numbers of Harriers on combat air patrol at one time limited the number of preemptive engagements.
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BRITISH AIR WARFARE

- 28 OF 38 BRITISH HARRIERS WERE CONFIGURED FOR AIR DEFENSE MISSION; FLEW 1100 AIR DEFENSE (COMBAT AIR PATROL) SORTIES AND 215 GROUND ATTACK SORTIES AGAINST PRE-PLANNED TARGETS; LITTLE CLOSE AIR SUPPORT WAS ATTEMPTED
 - SHORT-LEGGED BUT RELIABLE (85%) HARRIERS OPERATED EFFECTIVELY FROM THE TWO SMALL CARRIERS WITH SKI-JUMP RAMPS, AN EXPEDITIONARY AIRBASE ASHORE, AND SHIPS WITH SMALL DECKS
 - AIR-TO-AIR ENGAGEMENTS, ALL IN DAYLIGHT AND CLEAR WEATHER, INVOLVED NO ARGENTINE MANEUVERING TO COMBAT BRITISH HARRIERS
 - LATE THREAT DETECTION AND LIMITED NUMBER OF HARRIERS ON COMBAT AIR PATROL LIMITED THE NUMBER OF PREEMPTIVE ENGAGEMENTS
- 

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SEA WARFARE

- **SUBMARINE OPERATIONS:**

- SSNs FIRST BRITISH FORCES ON-SCENE; AFTER BELGRANO, ARGENTINE SURFACE FLEET REMAINED IN PORT
- ARGENTINE SSs WERE A CONCERN TO THE BRITISH: [REDACTED]
[REDACTED]

- **BRITISH SURFACE FLEET TACTICS**

- INITIALLY: DRAW OUT, ATTRIT ARGENTINE AIRCRAFT BEFORE LANDING—ARGENTINES DID NOT TAKE BAIT
- SURFACE COMBATANT SCREEN FOR LANDING EFFECTIVE BUT COSTLY IN SHIP DAMAGE

- **LOW DENSITY ARGENTINE AIRCRAFT PENETRATED BRITISH SHIP DEFENSES**

- NO AEW (WARNING *PLUS* TRACKING) VS. LOW ALTITUDE ATTACKERS LED TO LATE DETECTION, SHORT REACTION TIMES
- FAILURE TO COORDINATE LAYERED DEFENSES RESULTED IN NUMEROUS ARGENTINE LEAKERS
- FAILURE TO IMPLEMENT EFFECTIVE COUNTERMEASURES TO EXOCET, A WEAPON IN THE UK INVENTORY

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SEA WARFARE

- The British probably got more than they counted on when the Argentine fleet bottled itself up inside the twelve-mile limit after the sinking of the BELGRANO by the SSN HMS CONQUEROR on 2 May. That incident had a lot of publicity, [REDACTED]

[REDACTED] Ultimately the British effectively discontinued ASW to allow use of the helos and escort ships to support the landings.

- The British frigates and destroyers took the bulk of the pounding from the Argentine Air Force and the reason, of course, is in the tactics used. First the frigates and destroyers were used as bait; then they were used to screen the troop transports physically.
- The relatively low density Argentine air attacks were able to penetrate British ship defense because:
 - Lack of Airborne Early Warning led to late detection and short reaction times before the enemy aircraft could be engaged.
 - Poor coordination between air defense layers allowed leakers.
 - Failure to implement effective countermeasures to Exocet in specific instances allowed the missile to approach the ships without appropriate defensive reactions.

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SEA WARFARE
(Concluded)

- The short reaction times forces the SAM missiles to use back-up visual guidance modes where possible. One of the noteworthy examples of high tech ingenuity was the reprogramming of some missile computers to shoot at crossing targets. 115 missiles fired resulted in 21 confirmed and two probable kills. Anti-aircraft guns accounted for four confirmed and one probable.
- The supporting and harassment fire provided by the British fleet to the ground forces was considered to be extremely valuable. Argentine anti-ship fire from guns ashore was not effective but, on the other hand, ground-launched Exocet was effective within the small sample size (one hit for two shots). Knowing that Exocet or similar land-to-surface missiles can appear in third world countries in large numbers should give us ample reason to double our alertness when approaching a hostile coast for any reason.

The following numbers summarize British ship damage:

6 destroyed: 2 Exocets, 4 bombs

11 damaged: 8 by bombs, 2 by guns and rockets, 1 by Exocet.

Some ships were hit more than once. Thirteen bombs that hit ships failed to explode.

- Fire and toxic smoke were the major problems. These in turn knocked out internal fire fighting systems and damage control communications. Aluminum superstructures, despite publicity to the contrary, were not a critical factor. Many of the damaged ships were repaired at sea by tenders and returned to the action.

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SEA WARFARE

(Cont'd)

- **BRITISH AUTOMATED SAM SYSTEMS COULD NOT HANDLE SHORT REACTION TIMES IMPOSED BY LOW FLYERS**
 - BACKUP VISUAL DESIGNATION/GUIDANCE MODES PROVED INVALUABLE
 - 21 MISSILE KILLS, 2 MISSILE PROBABLES, 115 MISSILES FIRED, 4 GUN KILLS, 1 GUN PROBABLE
- **NAVAL GUNFIRE SUPPORT**
 - HARRASSMENT AND SUPPORT FIRE CONSIDERED EXTREMELY VALUABLE BY BRITISH
 - COUNTERBATTERY GUNFIRE INEFFECTIVE AGAINST SHIPS BUT LAND-LAUNCHED EXOCET HIT ONE OF TWO SHIPS FIRED UPON
- **SHIP DESIGN AND VULNERABILITY**
 - SIX BRITISH SHIPS LOST, ELEVEN DAMAGED; BOMBS GREATEST FACTOR IN SHIP LOSSES/DAMAGE; (4 OF 6 LOSSES, 8 OF 11 DAMAGED); (13 DUDS)
 - FIRES AND TOXIC SMOKE MAJOR PROBLEMS
 - ALUMINUM SUPERSTRUCTURES NOT A CRITICAL FACTOR
 - SHIPS REPAIRED AT SEA

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LAND WARFARE

- 
- The British ground forces committed to the action were characterized as the cream of the British Land Force. They were well led, in superb physical condition, a very high percentage had served in Northern Ireland and all units had been stabilized for quite some time. While the Argentine forces that assaulted and seized the Islands in early April were given high marks, the garrison force that followed them and later were to confront the British did not compare in military professionalism.
 - All British ground forces undergo extensive night training, and they used night vision devices effectively. Four Sea King helicopters whose crews were equipped with passive night vision devices were used primarily for covert insertion and extraction of special forces at night. Other helicopters operating both with and without night vision devices provided logistic support and troop transport at night.
 - Ground patrols, many from SAS/SBS Special Forces,  were primary sources of tactical intelligence. Air recce was restricted by the threat of Argentine air defenses. The British had no RPVs available. General Moore highlighted some means to get tactical intelligence without using piloted aircraft as #1 on his "Wish I'd Had That" list.
 - We noted that the SBS switched from the 5.56 mm to 7.62 mm rifle to provide greater stopping power. This is still being looked into.

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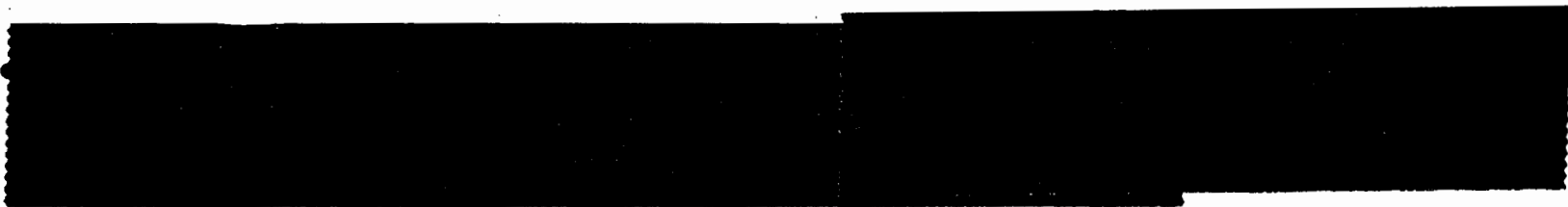
LAND WARFARE
(Concluded)

- Use of Ships Taken Up From Trade (STUFT) for the amphibious landing significantly slowed landing operations. The amphib ships could offload 90 tons/hour while the STUFT ships could only manage 20 tons/hour, a significant difference when STUFT ships must be used in the assault role as they were at San Carlos.
- 
- The British discovered the indispensability of transport and utility helos while crossing the boggy terrain of the Falklands. In particular, the one CH47 that got ashore did yeoman service and more. The helos were used only sparingly in attack or assault roles, however, largely because of concern for the air defense threat forward of the FEBA.
- Ground air defenses were seriously hampered by lack of early warning for alerting and cueing. This forced them to work against targets that were not detected until well inside the engagement envelope, hence, for the most part, were not engaged until after ordnance release.
- Despite those difficulties the Rapier performance was particularly noteworthy. They achieved a credible kill ratio of 49 percent (see Annex D, page 8), all in the optical mode. They showed excellent strategic and tactical deployability. The basic Rapier fire unit, to include the Blindfire radar tracker and one ton truck, was moved by five Wessex helicopters. The fire unit was generally brought into action in less than 30 minutes.

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LAND WARFARE

- 
- EXPERIENCED LEADERSHIP, HIGH STATE OF TRAINING, EXCELLENT PHYSICAL CONDITIONING, UNIT COHESIVENESS, WERE BASIC INGREDIENTS IN BRITISH SUCCESS: INGREDIENTS NOT MATCHED BY THEIR OPPONENTS
 - TO OVERCOME ARGENTINE DAYLIGHT ADVANTAGE (SUPERIOR NUMBERS, OBSERVATION AND FIELDS OF FIRE) BRITISH FORCES ELECTED TO EXPLOIT THEIR EXTENSIVE NIGHT TRAINING AND AVAILABILITY OF NIGHT VISION DEVICES TO FIGHT AND RE-SUPPLY AT NIGHT
 - GROUND PATROLS (SBS/SAS)  WERE PRIMARY SOURCE OF TACTICAL INTELLIGENCE: AIR RECONNAISSANCE RESTRICTED BY ARGENTINE AIR DEFENSE; NO RPVs AVAILABLE
 - THE SBS SWITCHED FROM 5.56 MM TO 7.62 MM RIFLES DURING CAMPAIGN TO PROVIDE GREATER STOPPING POWER. INVESTIGATION IS CONTINUING

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LAND WARFARE

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(Cont'd)

- USE OF SHIPS TAKEN UP FROM TRADE (STUFT) SIGNIFICANTLY SLOWED LANDING OPERATIONS (AMPHIBS - 90 TONS/HR; STUFT - 20 TONS/HR)



- TRANSPORT-UTILITY (NOT ATTACK) HELICOPTERS AS INVALUABLE TO UK IN FALKLANDS AS THEY WERE FOR U.S. IN VIETNAM: THEIR USE RESTRICTED BY ARGENTINE AIR DEFENSE THREAT
- LACK OF EARLY WARNING (ALERTING AND CUEING) SIGNIFICANTLY REDUCED EFFECTIVENESS OF UK AIR DEFENSES: TARGETS DETECTED WELL INSIDE WEAPON ENGAGEMENT ENVELOPE; ATTACKED AFTER ORDNANCE RELEASE
- RAPIER PERFORMANCE DURING THE CAMPAIGN NOTEWORTHY: ACHIEVED A CREDIBLE KILL RATE, EXCELLENT STRATEGIC AND TACTICAL DEPLOYABILITY, GENERALLY BROUGHT INTO ACTION WITHIN 30 MINUTES OF EMPLACEMENT. (14 KILLS CONFIRMED, 6 PROBABLE, 61 MISSILES FIRED)

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AIR DEFENSE SUMMARY

At this point it is useful to summarize the air defense activity from various viewpoints. The numbers below include only confirmed kills.

Air-based systems (Sea Harriers) achieved 16 kills for 26 AIM-9L missiles fired and 4 more with 30 mm guns.

Sea-based systems achieved 21 kills for 115 missiles fired and 4 more with guns.

Land systems achieved 24 kills for 161 missiles fired and 3 more with AAA and small arms.

The Argentine Air Force started the war with approximately 146 tactical aircraft (A-4, Mirage, Super Etendard, Dagger, Canberra). Over 40 percent were shot down.

All of the above demonstrates an exceptional performance on the part of the British air defense forces. But--despite that--more than 60 percent of the estimated 300 ingressing Argentine sorties got through to the weapon release point. The bottom line--a large number of Argentine aircraft put the amphibious task force at very high risk.

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	ACTIVITY	RESULTS
AIR BASED SYSTEM MISSILES GUNS	26 EXPENDED —	16 4
SEA BASED SYSTEM MISSILES GUNS	115 EXPENDED —	21 4
LAND BASED SYSTEM MISSILES GUNS	161 EXPENDED —	24 3 <u>72^a</u>

^aTHIS IS THE TOTAL OF ALL CONFIRMED ARGENTINE AIRCRAFT SHOT DOWN. 61 WERE TACTICAL AIRCRAFT. THIS REPRESENTED MORE THAN 40% OF THE TOTAL TACTICAL AIRCRAFT FORCE OF ABOUT 146 A-4s, MIRAGE, DAGGER, SUPER ETENDARD AND CANBERRAS.

ARGENTINE TOTAL SORTIES THAT REACHED THE AREA OF THE FALKLAND ISLANDS WERE REPORTED TO BE ABOUT 300. BEST ESTIMATE IS THAT ABOUT 60% PENETRATED TO RELEASE WEAPONS.

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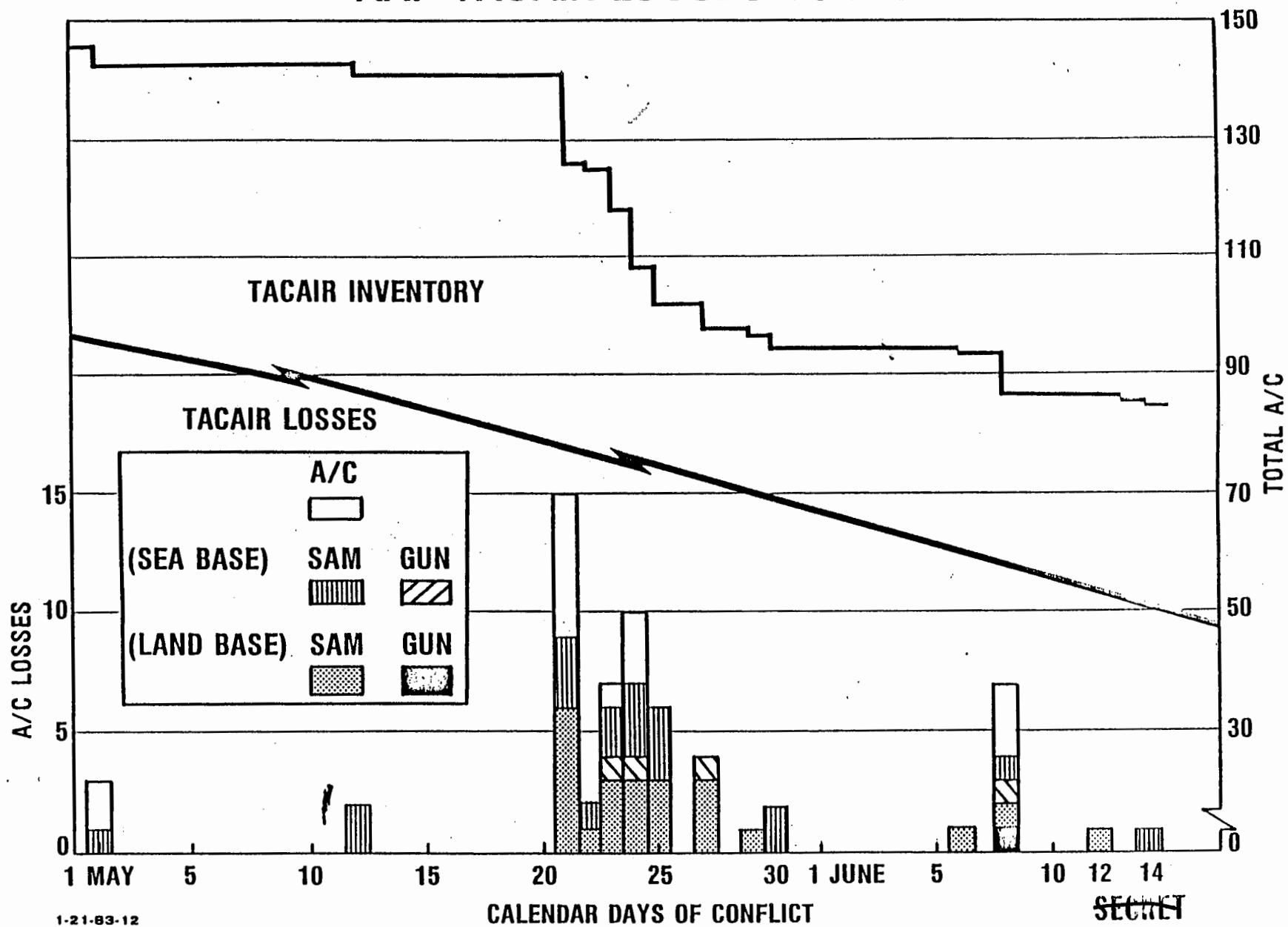
ARGENTINE AIR FORCE TACAIR LOSSES
(AAF LOSSES TO AAW)

- It was reported earlier that the Argentine Air Force flew approximately 300 attack sorties against the British forces in and around the islands. The actual distribution of these attack sorties, by day, during the conflict is currently unavailable. However, there are data on the confirmed number of Argentine tactical aircraft killed by the British forces during the period 1 May to 14 June as shown on the adjacent chart.
- It is obvious the aircraft losses are not evenly distributed during the 45 day period. They are instead grouped into a period of 5-6 days when the Argentine Air Force was attempting to disrupt the British amphibious landings: 21-25 May during the San Carlos landing and then on 8 June during the Fitzroy landing.
- Shown at the top of the chart is a running inventory of Argentine aircraft. By the end of the San Carlos landing (i.e., by 27 May) the Argentines had lost over a third of their fighter-bomber aircraft. By 14 June they had lost over 40 percent of their initial inventory of tactical aircraft.

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AAF TACAIR LOSSES TO AAW



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PRELIMINARY FINDINGS

Let me turn now to our preliminary findings.

- First and Foremost--Quality people count.
- But flexible and reliable weapons systems and logistics count too. These are some of the major material factors which contributed to British success:

Small carriers and VSTOL Harriers
Nuclear Submarines (SSNs)
Secure Communications via Satellite
AIM-9L Sidewinder missile
Rapier air defense system
Transport and Utility Helo
Night Vision Devices

and last on this list but certainly not least The Ascension Island base.

- The Harrier was given top billing by the British for its versatility operating from ski-jump carriers and expeditionary airfields. We, too, [REDACTED] note that the ski-jump take off which permits a full load operation with a very short deck roll significantly extends the radius of action or time on CAP over that achieved with a vertical take off.
- Despite the good individual performance of the various air defense systems, the lack of airborne early warning and control aircraft and adequate fighters prevented the British from achieving any significant barrier effect to keep the Argentine aircraft away from the fleet.

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PRELIMINARY FINDINGS

- QUALITY OF PEOPLE WAS DOMINANT FACTOR: DECISIVE BRITISH POLITICAL LEADERSHIP, PROFESSIONALISM OF BRITISH FORCES, COURAGE OF ARGENTINE PILOTS
- MAJOR MATERIEL CONTRIBUTORS TO BRITISH SUCCESS: SMALL CV-VSTOL (HARRIER) COMBINATION, SSNs, COMMUNICATIONS SATELLITE, AIM-9L, RAPIER, TRANSPORT-UTILITY HELOS, NIGHT VISION DEVICES, ASCENSION ISLAND BASE
- HARRIER OPERATIONS ENHANCED BY SKI-JUMP RAMP, SHIP ROLL-STABILIZATION, AND FORWARD AIRFIELD
- EARLY WARNING, CONTINUOUS THREAT TRACKING, AND INTEGRATED AIR DEFENSE SYSTEMS, PROVIDING CAPABILITY FOR MULTIPLE ENGAGEMENTS, ARE NECESSARY FOR SHIP- OR LAND-BASED AIR DEFENSE

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PRELIMINARY FINDINGS
(Concluded)

- It is this observation that leads us to the finding that the performance of the ski-jump carriers does not affect the essence of the ongoing U.S. discussion of large vs small carriers. Airborne early warning and a sizable force of fighters are clearly needed to create a reasonable barrier to ingressing enemy aircraft. Whether composed of large or small carriers, the U.S. carrier battle group must be capable of that function. The ski-jump carriers did not make enough contribution to barrier type air operations to warrant considering substituting ships of that type for either the large or small carriers being considered by the U.S.
- The British did not consider battlefield reconnaissance by manned aircraft viable in view of the air defense threat. This difficulty was also observed in the Arab Israeli War in 1973. Some other means, such as an RPV, is needed to provide responsive tactical intelligence where both the ground threat and the air defense threats are high.
- The performance of the Rapier, coupled with the ease of movement and quick set up time, warrant consideration for light infantry forces such as RDF designated and Fleet Marine Forces.
- Mobile, precision-guided ground-to-surface weapons like Exocet have put a sting back into the coastlines, particularly in third world countries. We must be careful when operating mine sweepers, naval gunfire ships or amphibians or, for that matter, any ships near a hostile coast where the enemy has the capability to fire ground-to-surface guided weapons.

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PRELIMINARY FINDINGS

(Cont'd)

- EFFECTIVE BRITISH EMPLOYMENT OF VSTOL HARRIER AND SMALL CARRIER DOES NOT BEAR ON ISSUE OF SMALL VS LARGE CARRIERS FOR U.S. NAVY
- BATTLEFIELD RECCE BY MANNED AIRCRAFT FOUND NOT VIABLE; OTHER MEANS (e.g., RPVs) NEEDED FOR TIMELY TACTICAL INTELLIGENCE
- RAPIER PERFORMANCE AND DEPLOYABILITY IN FALKLANDS MERIT ITS CONSIDERATION FOR USE BY U.S. FORCES
- PRECISION-GUIDED GROUND TO SURFACE WEAPONS ARE A CONCERN WHEN NAVAL FORCES ARE USED NEAR HOSTILE COASTS OF THIRD WORLD COUNTRIES

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FUTURE ANALYSIS

- This last major paragraph shows typical areas where we believe continued investigation or analysis is warranted. This list should not be considered conclusive.

- 
- The reasons why close air support was so little used are not clear at this time. In view of the importance of CAS to U.S., we believe it is necessary to explore the subject in greater detail.
 - The enhanced capability gained by the small carriers through addition of the ski-jump ramp and roll stabilization warrant estimating the costs and benefits of putting those systems in similar U.S. amphibious ships.
 - Additional analysis is needed to determine the applicability of the British ship damage control and point defense experience to U.S. ship design and operating techniques.

In closing, the following observation is provided. When asked what he thought the most important lesson was, RADM Woodward replied to the effect that flexibility in the use of equipment is most important since we probably will find the first few months of a war strictly come-as-you-are and hardly anything is used exactly as it was designed to be used. He put a very high value on flexibility of performance of equipment and on the adaptability and resourcefulness of people and organizations.

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FUTURE ANALYSIS

- INVESTIGATION AND/OR ANALYSIS IS NEEDED TO:

[REDACTED]

- B. DETERMINE WHY LITTLE CLOSE AIR SUPPORT WAS PERFORMED
- C. ESTIMATE THE COST-BENEFITS OF INCORPORATING SKI-RAMP AND ROLL STABILIZATION ON U.S. SHIPS FROM WHICH MARINE HARRIERS WILL OPERATE
- D. DETERMINE THE APPLICABILITY TO THE U.S. NAVY OF LESSONS LEARNED BY THE ROYAL NAVY ABOUT SPECIFIC ASPECTS OF SHIP VULNERABILITY

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The following four Appendices contain summary information on the air, sea, and land forces involved in the South Atlantic Conflict. The data depict, for the UK and Argentine forces, inventories of equipments, number deployed for the conflict, and combat losses (either destroyed or damaged). These values reflect a 21 January 1983 understanding of the conflict. As new information becomes available these individual tables will be updated accordingly.

- A. Chronology
- B. Statistical Information
- C. Task Force Organization and Summary Notes
- D. Additional Material

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**APPENDIX A
CHRONOLOGY**

Map of Atlantic with Chronology	A-3
Map of South Atlantic with Chronology	A-4
Map of Falkland Island with Chronology.	A-5

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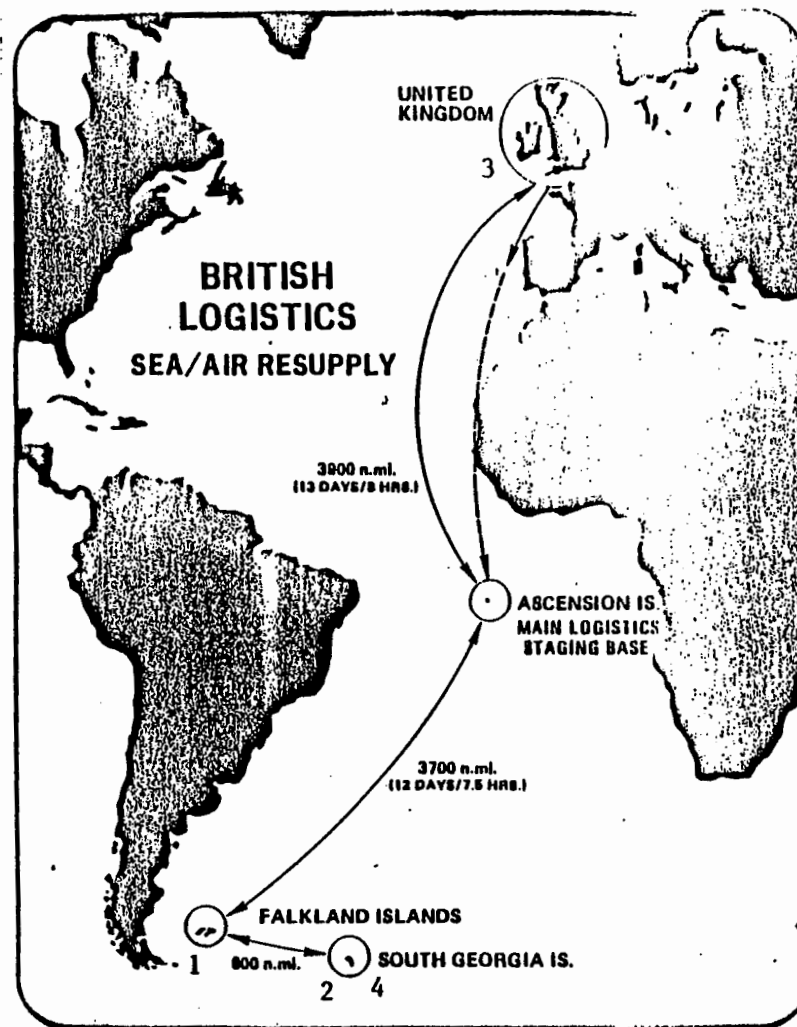
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CHRONOLOGY

1. 2 April--Argentina invades the Falkland Islands.
 2. 3 April--Argentina invades South Georgia; UN passes Security Council Resolution 502; first RAF transport aircraft deploy to Ascension Island.
 3. 5 April--First task force ships sail from the United Kingdom.
- 12 April--200 mile maritime exclusion zone comes into effect.
- 23 April--The British warn Argentina that any approach by Argentine warships or military aircraft which could amount to a threat to the task force would be dealt with appropriately.
4. 25 April--British Forces recapture South Georgia; submarine SANTA FE attacked and disabled.



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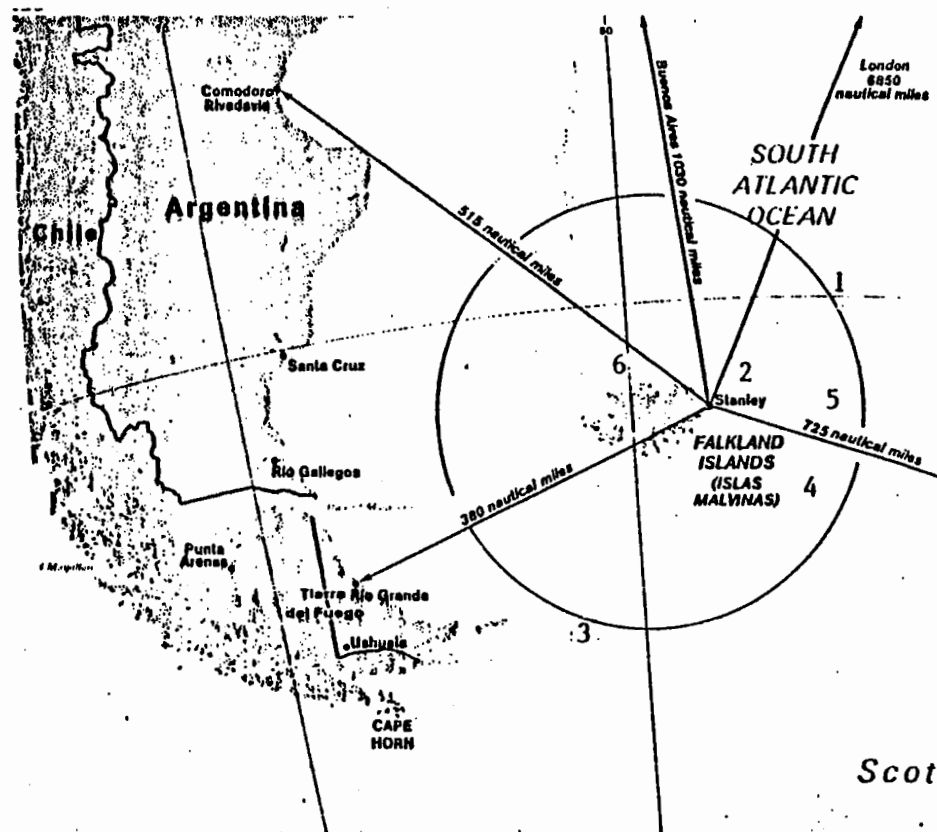
CHRONOLOGY

1. 30 April--Total exclusion zone into effect.
2. 1 May--First attack on Falklands by Vulcan, Sea Harriers and warships; first Argentine aircraft shot down.

1 May--First special forces ashore.
3. 2 May--GENERAL BELGRANO sunk by HMS CONQUEROR.
4. 4 May--HMS SHEFFIELD hit by Exocet missile; later sinks.

7 May--The British warn Argentina that any Argentine warships and military aircraft over 12 miles from the Argentine coast would be regarded as hostile and liable to be dealt with accordingly.
5. 9 May--Two Sea Harriers sink trawler NARWAL, which had been shadowing task force.

11 May--HMS ALACRITY sinks store ship CABO DE LOS ESTADOS in Falkland Sound.
6. 14/15 May--Special Forces night raid on Pebble Island; 11 Argentine aircraft destroyed on the ground.



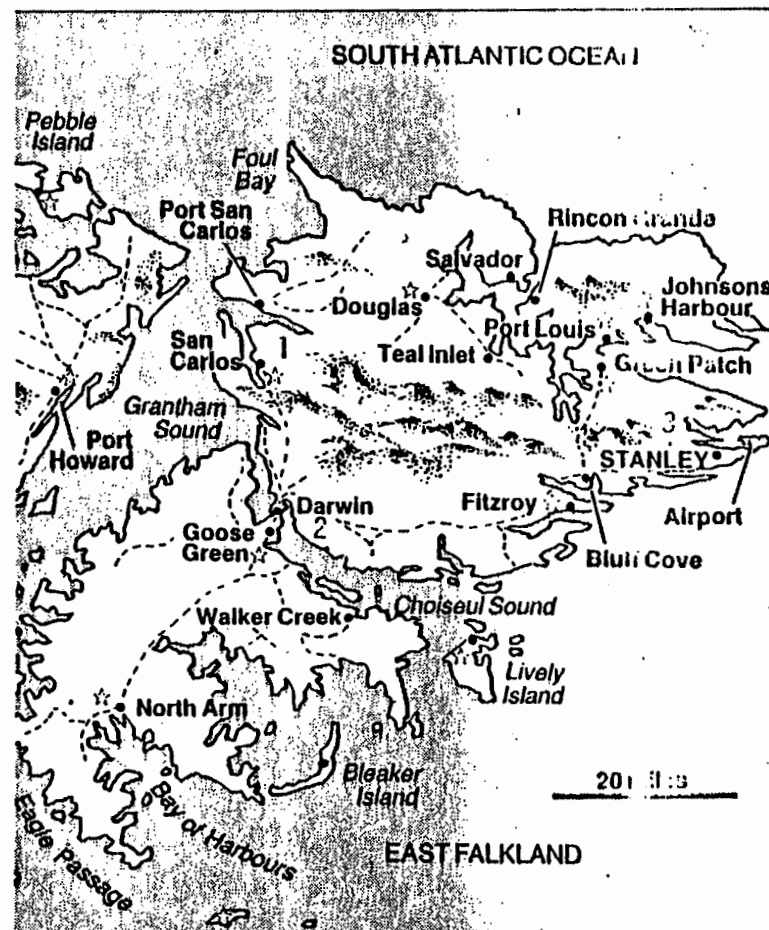
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CHRONOLOGY

1. 21 May--3 Cdo Bde establish beachhead at San Carlos; HMS ARDENT lost; 4 other ships damaged; some 15 Argentine aircraft destroyed.
23 May--HMS ANTELOPE crippled (sinks on 24 May); 10 Argentine aircraft lost.
24 May--18 Argentine aircraft destroyed; damage to 2 ships.
25 May--HMS COVENTRY lost and ATLANTIC CONVEYOR hit by 2 Exocets (sinks with critical supplies 28 May); 1 other ship damaged; 8 Argentine aircraft destroyed.
2. 28 May--2 PARA recapture Darwin and Goose Green.
30 May--45 Cdo secure Douglas settlement; 3 PARA recapture Teal Inlet; 42 Cdo advance on Mount Kent and Mount Challenger.
30 May--Established forward operating base at San Carlos. (Used by Harriers on 5 June)
1 June--5 Bde land at San Carlos.
8 June--RFAs SIR GALAHAD and SIR TRISTRAM hit at Fitzroy; 1 other ship damaged in Falkland Sound; 10 Argentine aircraft destroyed.
11/12 June--Mount Harriet, Two Sisters and Mount Longdon secured; HMS GLAMORGAN hit by shore-based Exocet--damaged but seaworthy.
3. 13/14 June--Tumbledown Mountain, Wireless Ridge and Mount William secured; General Menendez surrenders.

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APPENDIX B
STATISTICAL INFORMATION

British Aircraft.	B-2
British Aircraft Losses	B-3
Argentine Aircraft.	B-4
Argentine Aircraft Losses	B-5
British Ships	B-6
British Ship Losses	B-7
Argentine Ships	B-8
Argentine Ship Losses	B-9
British and Argentine Ground Forces	B-10
British and Argentine Ground Forces Equipment	B-11
Summary of British and Argentine Losses	B-12

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BRITISH AIRCRAFT

<u>Type of Aircraft</u>	<u>Inventory</u>	<u>Deployed</u>	<u>Destroyed</u>
<u>Fixed Wing</u>	(201)	(57)	(10)
Sea Harriers	34	28	6
GR-3 Harriers	75	14	4
Vulcan	63	2	-
Nimrod	34	3	-
Victor	19	15-17	-
C-130	53	varied	-
<u>Helicopters</u>	(344)	(150)	(24)
Sea King	68	46	5
Gazelle	144	15	3
Lynx	34	20	3
Chinook	21	4	3
Wessex	53	48	9
Scout	78	12	1
WASP	<u>unk</u>	<u>5</u>	<u>-</u>
Total	545	207	34

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BRITISH AIRCRAFT LOSSES

<u>Cause of Loss</u>	<u>No. A/C Lost</u>
<u>Air-to-Air Combat</u>	1 ^a (1)
<u>Surface-to-Air Missiles</u>	(2)
Roland	1
Blowpipe	1
<u>Lost When Ship Sunk or Damaged</u>	(13)
ATLANTIC CONVEYOR Sunk (Exocet) ^b	10
HMS ARDENT (bomb)	1
HMS GLAMORGAN (Exocet)	1
HMS COVENTRY (bomb)	1
<u>Other</u>	(18)
Small Arms Fire	7
Inclement Weather	4
Mechanical Problems	3
Bird Strike	1
Unknown	3
<u>Total</u>	<u>34^c</u>

^a Scout helicopter shot down by Pucara.

^b Aircraft were 3 Chinooks, 6 Wessex and 1 Lynx.

^c Ten Harriers, 24 helicopters.

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ARGENTINE AIRCRAFT

Type Aircraft	Inventory				Deployed ^a	Aircraft Losses		
	Air Force	Navy	Army	Total		Confirmed	Probable	Total
<u>Bombers</u>								
BAC Canberra	11	-	-	11		2	1	3
<u>Fighter-Bombers</u>								
Mirage III	21	-	-	21		24	3	27
Super Etendard	-	5	-	5		-	-	-
F86 Phantom	15	-	-	15		-	-	-
<u>Strike</u>								
IAI Dagger	26	-	-	26		-	-	-
A-4 Skyhawk	68	15	-	83		35	10	45
<u>Counter Insurgency</u>								
Pucara	45	-	-	45		21	-	21
MS.760 Paris	37	-	-	37		-	-	-
<u>Trainers and Others</u>								
T-34 Mentor	35	15	-	50		4	-	4
Aermacchi	-	17	-	17		3	-	3
.C-130/KC-130	9	-	-	9		1	-	1
Skyvan	-	5	-	5		2	-	2
Lear Jet	5	-	-	5		1	-	1
<u>Helicopters</u>								
SA-330 (Puma)	-	3	12	15		6	-	6
Bell UH-1	-	5	20	25		2	-	2
CH-47 (Chinook)	3	-	2	5		2	-	2
WG.13 (Lynx)	-	10	-	10		-	-	-
Totals	275	75	34	384		103	14	117

^a Number actually deployed is currently unavailable.~~SECRET~~

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ARGENTINE AIRCRAFT LOSSES

	<u>Confirmed</u>	<u>Probable</u>	<u>Total</u>
Air-to-Air Combat	(20)	(3)	(23)
AIM-9 missile	16	1	17
30 mm guns	4	2	6
Destroyed on the Ground	(22)	-	(22)
Found Destroyed	(9)	-	(9)
Surface-to-Air Missiles	(45)	(10)	(55)
Rapier	14	6	20
Sea Dart	8	-	8
Sea Cat	8	2	10
Sea Wolf	5	-	5
Hand-held Missiles	10	2	12
Other (including small arms)	<u>(7)</u>	<u>(1)</u>	<u>(8)</u>
Total	103	14	117

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BRITISH SHIPS

<u>Type of Ship</u>	<u>Inventory</u>	<u>Deployed</u>	<u>Lost</u>	<u>Damaged</u>
<u>Royal Navy:</u>	(106)	(44)		
ASW Carrier	1	1		
ASW/Commando Carrier	1	1		
Destroyers	13	8	2	3
Frigates	38	15	2	5
Submarines (nuclear)	12	4		
Submarines (diesel)	16	1		
Assault Ships	2	2		
Survey Ships	4	3		
Patrol Ships	9	3		
Minesweepers	9	5		
Hospital Ships	1	1		
<u>Royal Fleet Auxiliary</u>	(23)	(20)		
Logistic Landing Ships	6	6	1	2
Tankers	10	8		
Replenishment Ships	4	4		
Support Ships	3	2		
Subtotal	129	64	5	10
<u>Ships Taken Up From Trade</u>	(200) ^a	(52) ^b		
Tankers		24		1
Containerships		4	1	
Ro-Ro Ferries		8		
Freighters		3		
Refrigerated Cargo		2		
Oilfield Support		4		
Salvage Tugs		3		
Cruise Liner		2		
Passenger Cargo		1		
Cable Ship		1		
Subtotal	200	52	1	1
Total	329	116	6	11

^aThe actual number of non-Royal Navy ships available for use is estimated to be about 3-4 times what was actually used.

^bIn addition, five Royal Navy minesweepers and one hospital ship were in the STUFT category.

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BRITISH SHIP LOSSES

<u>Date</u>	<u>Ships Lost</u>	<u>Caused By</u>
May 4	HMS SHEFFIELD (type 42 destroyer)	Air-launched Exocet
May 21	HMS ARDENT (type 21 frigate)	Bomb(s) and rockets
May 23	HMS ANTELOPE (type 21 frigate)	1000 lb bomb (detonated during defusing)
May 25	ATLANTIC CONVEYOR (commercial)	2 Air-launched Exocets
May 25	HMS COVENTRY (type 42 destroyer)	1000 lb bombs
June 8	SIR GALAHAD (LSL, RFA)	Bomb(s)
June 8	LCU F-4 (from FEARLESS)	Cannon and rocket fire

<u>Date</u>	<u>Ships Damaged</u>	<u>Caused By</u>
May 2	HMS ARROW (type 21 frigate)	Bomb, slight damage
May 12	HMS GLASGOW (type 42 destroyer)	1000 lb bomb passed through ship
May 21	HMS ANTRIM (C-class destroyer)	One 1000 lb bomb failed to detonate
May 21	HMS BROADSWORD (type 22 frigate)	Unexploded bomb passed through ship
May 21	HMS BRILLIANT (type 22 frigate)	Aircraft cannon fire
May 21	HMS ARGONAUT (L-class frigate)	Two bombs hit, failed to explode, cannon fire
May 24	SIR LANCELOT (LSL, RFA)	Bomb(s) and cannon fire
May 29	BRITISH WYE (tanker)	One bomb rolled from back of C-130
June 8	SIR TRISTRAM (LSL, RFA)	Two bombs hit ship, failed to explode
June 8	HMS PLYMOUTH (R-class frigate)	Four 1000 lb bombs, all failed to detonate
June 12	HMS GLAMORGAN (C-class destroyer)	Land-launched Exocet

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ARGENTINE SHIPS

<u>Type of Ship</u>	<u>Inventory</u>	<u>Deployed^a</u>	<u>Lost</u>	<u>Damaged</u>
Aircraft Carrier	1	1	-	-
Cruiser	1	1	1	-
Destroyers	9	6	-	1
Frigates	3	3	-	1
Landing Ships	3	1	-	-
Submarines	4	3	-	1
Patrol Boats	37	13	2	2
Fleet Auxiliary	18	9	1	1
Merchant Vessels	<u>12 (+)</u>	<u>12</u>	<u>2</u>	<u>1</u>
Total	88 (+)	49	6	7

^aThe number of ships shown as deployed is a very rough estimate.
Actual number deployed will be updated when more information becomes available.

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ARGENTINE SHIP LOSSES

<u>Date</u>	<u>Ships Sunk</u>	<u>Caused By</u>
May 2	ARA GENERAL BELGRANO (cruiser)	2 MK-8 torpedoes
May 3	ARA COMODORO SOMELLERA (patrol craft)	Lynx helicopter with Sea Skua missile
May 9	NARWAL (trawler)	Harrier cannon fire
May 11	ISLAS DE LOS ESTADOS (transport)	Naval gunfire from ALACRITY
May 16	RIO CARCARANIA (transport)	Harrier attack (cannon fire)
May 16	WPB RIO IGUAZU (patrol craft)	Harrier attack (cannon fire)

	<u>Ships Damaged</u>	<u>Caused By</u>
April 3	FF GUERRICO (type A-69 frigate)	Anti-tank rocket fire
April 25	ARA SANTE FE (submarine)	Wessex helo with MK-11 depth charge and AS-11 wire guided missiles and Lynx helo with MK-46 torpedo
May 2	DD BOUCHARD (destroyer)	Possible torpedo hit
May 3	ARA ALFEREZ SOBRAL (patrol craft)	Lynx helicopter with Sea Skua missile
May 16	ARA BAHIA BUEN SUCESO (transport)	Harrier attack (cannon fire)
May 22	MONSUNEN (inter-island transport)	Harrier attack (cannon fire)
June 13	ISLAS MALVINAS (patrol craft)	Harrier attack (cannon fire)

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BRITISH GROUND FORCES

<u>Combat Units</u>	<u>Deployed Personnel</u>
3 Commando Brigade	7,400
40, 42, 45 Cdo Bn	
2, 3 Para Bn	
Combat Support and Combat Service Support ^a	
5 Infantry Brigade	3,500
1st Bn Welsh Guards	
2nd Bn Scots Guards	
1st Bn 7th Gurkha Rifles	
Combat Support	
Special Forces	185
Special Air Service	
Special Boat Squadron	
	<u>11,085</u>

ARGENTINE GROUND FORCES^b

<u>Combat Units</u>	
Army Brigades	11,000
Marine Bn	800
Other	<u>1,800</u>
	13,600

^a Combat Service Support for 5 Brigade provided by 3 Commando Brigade.

^b Ground force numbers are still under examination and provide only a rough order of magnitude.

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MAJOR BRITISH GROUND FORCES EQUIPMENT

<u>Type</u>	<u>Deployed</u>
<u>Royal Armored Corps</u>	
Scorpion	4
Scimitar	4
Samson	1
<u>Artillery</u>	
105 mm Light Gun	30
Rapier (launcher)	24
Blowpipe	48
<u>Infantry</u>	
81 mm Mortar	40
Wombat	8
Milan (launcher)	30

MAJOR ARGENTINE GROUND FORCES EQUIPMENT

<u>Armor</u>	
Panhard H90 Armored Car	12
<u>Artillery</u>	
105 mm Pack Howitzer	33
155 mm Gun	3
Roland SAM (launcher)	1

Land forces equipments are still under investigation and provide only a rough order of magnitude.

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SUMMARY OF BRITISH AND ARGENTINE LOSSES

<u>Air Losses</u>	<u>Argentina</u>		<u>UK</u>
	<u>Confirmed</u>	<u>Probable</u>	<u>Total</u>
Fixed Wing	93	14	107
Rotary Wing	<u>10</u>	<u>0</u>	<u>10</u>
TOTAL	103	14	117
 <u>Sea Losses*</u>			
Combatants	8		12
Other Ships	<u>5</u>		<u>5</u>
TOTAL	13		17
 <u>Personnel</u>			
Killed	765		255
Wounded	<u>1025</u>		<u>777</u>
TOTAL	1790		1032

*Includes ships sunk and damaged.

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APPENDIX C
TASK FORCE ORGANIZATION AND SUMMARY NOTES

South Atlantic Conflict Lessons Learned Observations

Force Management.	C-3
British Organizational Chart (HMG/MODUK/CINCFLEET).	C-4
British Organizational Chart (CINCFLEET 21 April)	C-5
British Organizational Chart (CINCFLEET 20 May)	C-6
British Organizational Chart (CINCFLEET 14 June).	C-7
Naval Operations.	C-8
Air Operations.	C-11
Land Operations	C-12
Support Operations.	C-15
International Activities.	C-16

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FORCE MANAGEMENT

- Short, clear chain of command at national level made possible quick reaction to events and force needs.
- There was no on-scene CDR with overall authority; joint command was exercised from the UK.
- Command structure of UK forces was altered during conflict to reflect changes in forces and their missions (see four following figures).
- Rules of Engagement were used by the UK Government to implement policy decisions; however, there were definition and application problems.
- The vital importance was shown of satellite communication (especially secure voice) in operations conducted at great distances.
- The volume of record communications traffic exceeded capabilities of staffs to handle despite attempts to reduce it.



- British ground forces pleased with operation of Clansman family of radios (HF, VHF, and UHF).
- British used approximately 850 assignments in HF spectrum without regard to international agreement.

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HMG

MODUK

CTF 317 (CINCFLEET)/CTF 324

CTG 317.0
COMAW

CTG 317.1
CLF
LATER
CLFFI

CTG 317.2
ASCENSION
ISLAND

CTG 317.8
FOF 1
CVBG

CTG 317.9
SOUTH
GEORGIA
GROUP

CTG 324.3
FOSM

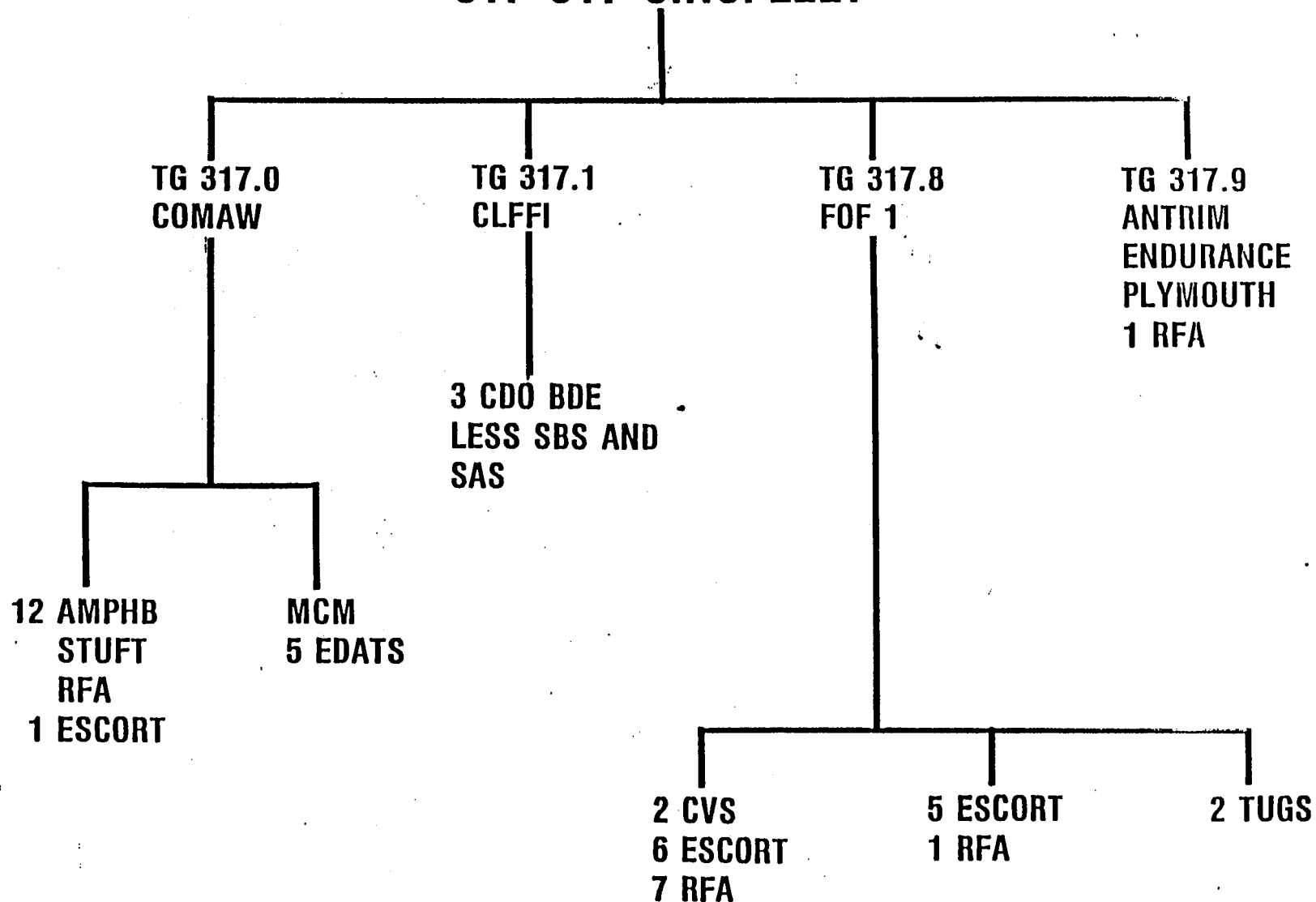
1-14-83-5

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CTF 317 CINCFLEET

21 APRIL



1-14-83-4

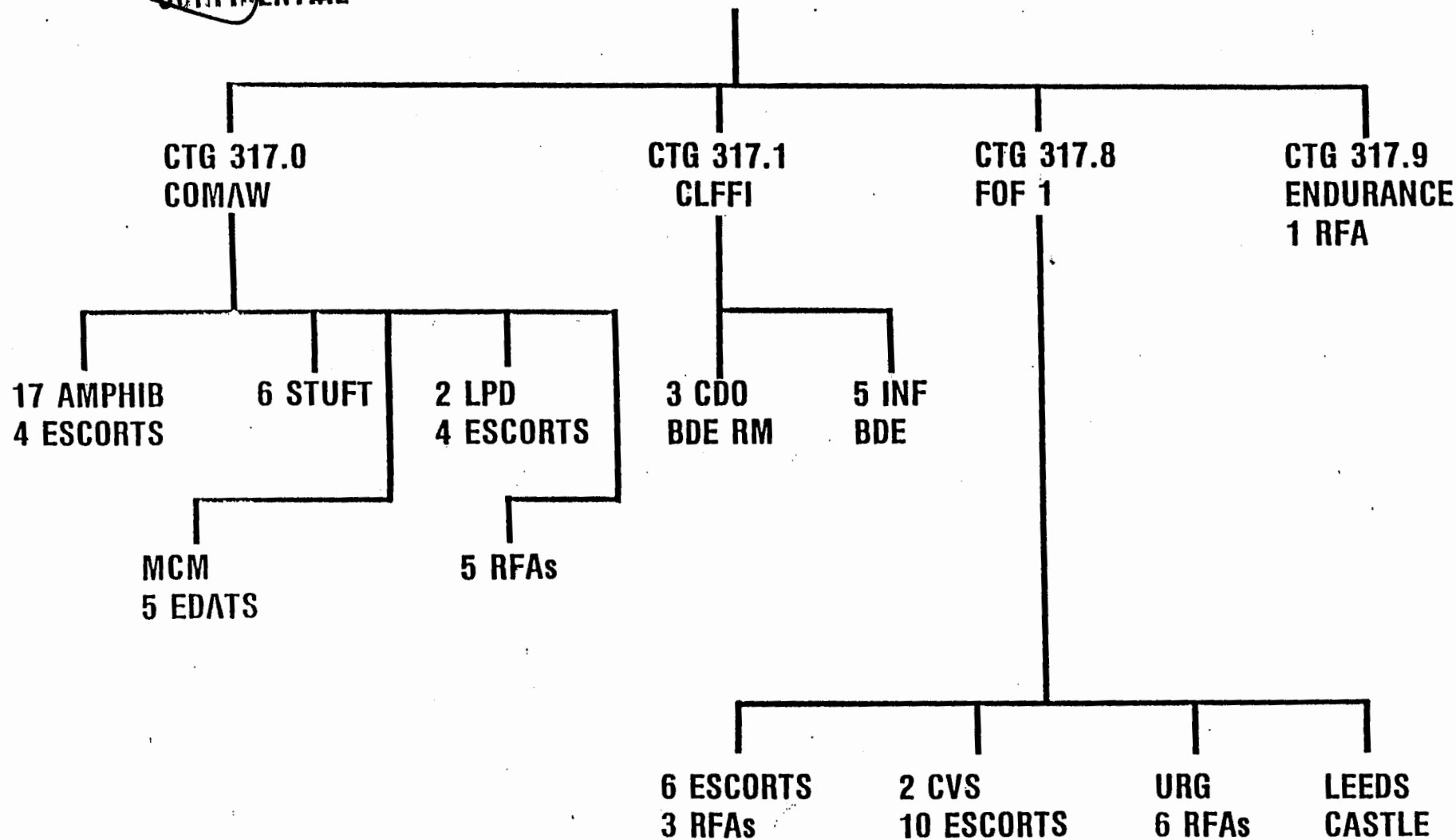
C-5

CONFIDENTIAL

20 MAY

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CTF 317 CINCFLEET

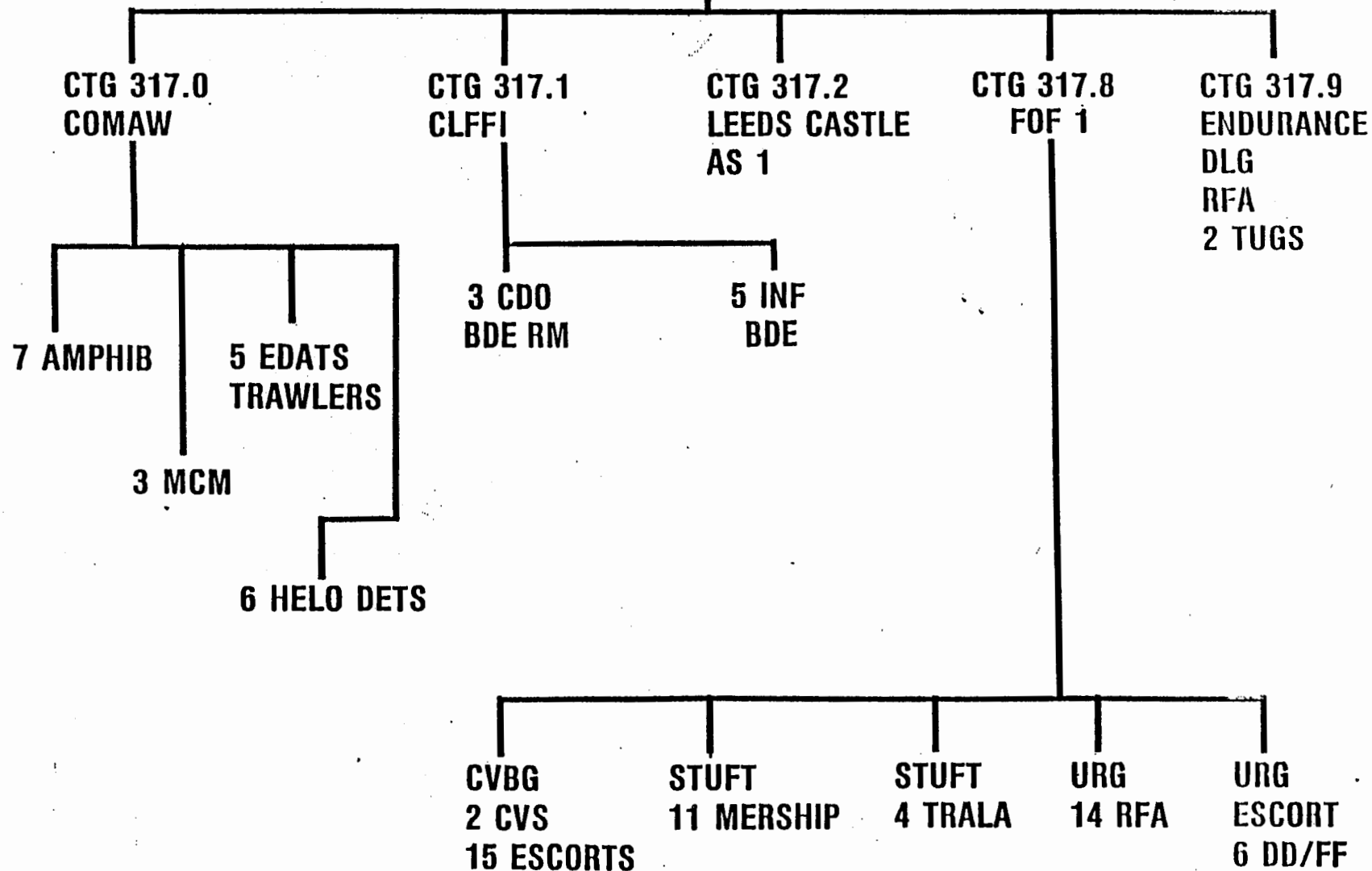


CONFIDENTIAL

CTF 317 CINCFLEET

14 JUNE

~~CONFIDENTIAL~~



1-14-83-2

C-7

CONFIDENTIAL

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NAVAL OPERATIONS

- British SSNs were first on the scene to enforce the maritime exclusion zone, force the Argentine surface threat back to port, and effectively monitor aircraft departing from Argentine mainland bases.
- British forces performed 235 ASW operations although only a very small number were likely to have been caused by the single Argentine submarine active in the Falklands area. No damage was inflicted on the British Fleet. It is uncertain whether the Argentine submarine was ever engaged.
- Helicopters were used extensively for anti-submarine and anti-surface operations
 - The helicopter-launched SEA SKUA missile performed effectively (8 hits in 8 firings).
- The value of standoff weapons, even with ranges as short as the Exocet (20-30 mi), is emphasized by the survivability of the Etendard (none engaged). It also emphasizes the need for Airborne Early Warning.
- No Exocet was successfully engaged by SAM or gun defenses. The U.K. fleet depended on chaff for protection, with uncertain success.
- Outer zone air defense was poor against ingressing low altitude aircraft
 - No airborne early warning and control capability
 - Poor air intercept radar lookdown performance
 - CAP-detected low altitude enemy aircraft visually.
- U.K. ship SAMs and guns inflicted large losses but could not deny completely the bomber attacks. Low density attacks penetrated British ship defenses.
- Argentina did not use ECM but did take advantage of horizon and terrain masking.

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NAVAL OPERATIONS (Continued)

- Defense in depth is needed against both direct air attacks and standoff attacks with sea-skimming missiles. No single layer is adequate. Defense should include:
 - Air surveillance and air cover
 - Mutually supporting missile systems and self-defense weapons, with short reaction times. These must permit multiple target engagements.
 - Active and passive countermeasures.
- British damage control experiences indicate:
 - Smoke and fire were greater hazards than expected
 - Redundancy needed in damage control stations, electrical distributions, telephones, and firemain
 - Adequate breathing equipment is necessary
 - Anti-flash gear greatly reduces burn casualties
 - Aluminum was not a critical factor in ship losses
 - Portable damage control facilities should be provided for commercial vessels sent into combat zones.
- British escorts made important contributions to fleet air defense and naval gunfire support of land operations.
- Landing decks on merchant ships increased the number of helicopters British could transport and employ.
- Merchant fleet proved invaluable in making up short falls in numbers of amphibious and auxiliary ships.
- Rapid mountout necessitated non-combat loading. Availability of Ascension allowed some corrective action.
- Utility of specialist amphibious ships, landing craft and helicopters was demonstrated.

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NAVAL OPERATIONS (Concluded)

- Inadequate numbers of landing craft and helicopters and the use of commercial ships to supplement amphibious lift compelled slow build-up ashore, thus increasing the exposure of ships to air attack.
- Argentine air threat compelled major off-loading subsequent to D-day to be conducted at night and forced British to forego plans for afloat logistics support.
- Precision guided ground-to-surface weapons (Exocet) were a threat to naval forces operating near shore.

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AIR OPERATIONS

- Harrier aircraft demonstrated flexibility in role (CAP, attack, reconnaissance).
- Harrier aircraft effectiveness included 20 aerial kills, 11 aircraft destroyed on the ground with only 5 Harrier combat losses. No Harrier losses in aerial combat.
- A total of 215 Harrier sorties were flown against ground targets. Of these, only 14 were CAS sorties
 - Strike sorties were often flown against low value targets
 - Ordnance delivery tactics employed by British aircraft often resulted in extensive small arms/AAA battle damage
 - Lack of guided standoff weapon reduced effectiveness and efficiency of attacks versus high value targets.
- Effectiveness of aerial reconnaissance was limited by Argentine air defense threat which forced recce aircraft to high altitudes.
- Argentine air defenses and air control facilities in Port Stanley remained intact throughout conflict reducing effectiveness of British air attacks.
- Harrier aircraft versatility resulted in non-stop ferry flights from the UK to Ascension to the carrier force, operation from the carrier, the San Carlos forward base and diverts to HMS FEARLESS and INTREPID.
 - The establishment of the forward operating base ashore afforded the carrier group increased flexibility.
- Harrier aircraft operations were significantly enhanced by the ski-jump takeoff ramp and shipboard roll stabilization.
- Harrier aircraft reliability resulted in 85 percent availability and completion of 99 percent of planned sorties.
- Importance of having a capability to make timely aircraft modifications was demonstrated.

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LAND OPERATIONS

- Strong leadership, realistic training and strenuous physical conditioning proved their value. The key word was professionalism.
- British forces, in contrast with Argentine ground forces, displayed a better ability to adapt rapidly to changing tactical situations and limitations posed by weather and terrain.
- Argentine operations were largely characterized by:
 - Weak leadership
 - Poor concept of tactical employment
 - Poor management of resources
 - Inadequate training and a general lack of aggressiveness.
- Special forces units were used extensively for reconnaissance, deception, and raids on South Georgia and throughout the Falklands.
 - Examples of particularly useful operations:
 - Tactical reconnaissance including data on beaches and enemy positions
 - Deceptive attacks associated with landing at San Carlos
 - Raid on Pebble Island in which 11 aircraft were destroyed
 - Units were inserted at night primarily by helicopters and in some cases by submarines
 - Special forces operations controlled from London through liaison cell at Amphibious Task Force Headquarters. Some dissatisfaction with these arrangements voiced by commanders.
- Effectiveness of air defense missiles was reduced by such factors as:
 - Aborts for safety, fire for deterrent effect, multiple engagement of single target, and fire out of envelope.
- Tactical surprise was achieved in the amphibious landing at San Carlos through deception. Strategic surprise was impossible.

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- Fire support for British forces was provided primarily by light 105 mm artillery and 4.5 inch naval guns.
 - UK forces expended some 17,500 artillery rounds, most in the final 6 days. Supplies totaled 90,000 rounds
 - About 7,900 Naval gun fire rounds were expended for fire support. Sixty-three separate bombardments were conducted.
- Harassment and interdiction fires provided mainly by naval gun fire and Harriers proved significant in sapping Argentine morale.
- Effectiveness of close air support was limited by:
 - Argentine air defenses
 - No CAS training/doctrine for Sea Harriers
 - Ground-air-ground communication
 - General lack of suitable targets
 - Weather.
- Because illumination rounds alerted Argentines to their presence, artillery spotters preferred passive night vision devices for adjustment of fires at night.
- Requirement for VT fuzes for artillery much higher than planned due to soft ground and open terrain.
- Helicopters proved indispensable in moving artillery.
- British made extensive use of helicopters. They logged over 21,000 flying hours in 10,000 sorties. The most prominent roles were:
 - Mobility and resupply of ground forces
 - Anti-ship and ASW
 - Casualty evacuation
 - Special forces insertion and extraction.
- A total of 24 UK helicopters were lost, 13 of them on damaged ships, only 4 to air defenses.

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LAND OPERATIONS (Concluded)

- Threat of Argentine aircraft and air defenses restricted UK helicopter operations to within own air defense envelope during daylight.
- Loss of 9 troop lift helicopters on Atlantic Conveyor compelled British to move approximately one third of their ground forces across East Falkland by foot.
- Although British deployed no armed helicopters, they conducted some air-to-ground attacks (17 AS-11 missiles fired).
- British achieved high helicopter operational availability (about 90 percent).
- British conducted extensive helicopter night operations both with and without night vision devices.
- 
- Light tracked vehicles proved surprisingly adaptable in several roles. Wheeled vehicle utility was very limited due to lack of roads and boggy terrain.
- Night attacks were dominant in UK ground operations.
- Tactical intelligence was gained primarily through ground reconnaissance (patrols and special forces operations) and communications intercepts.
- British found a need for two 7.62 mm general purpose machine guns per rifle squad to provide additional firepower in the assault. The open terrain also called for a heavier gun capable of sustained fire.
- Both sides used .50 caliber machine guns effectively in ground and air defense roles.
- Used antitank weapons against fortified position.

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SUPPORT OPERATIONS

- Industry's capability to improve conversions was seen in:
 - Flight decks/helo pads on ships
 - Troop accommodations aboard ships
 - Communication/crypto equipment aboard ships
 - Aircraft missile launching equipment and chaff dispensers.
- British operation in South Atlantic was aided by availability of:
 - Merchant ships and crews through requisition and charter
 - Tankers
 - Passenger ships
 - Fleet auxiliaries for at-sea replenishment operations.
- Important aspects of supply distribution systems were:
 - Forward staging base at Ascension for restowing ships and receiving airlift deliveries
 - Fuel management system
 - Forward supply points on East Falkland to support land forces.
- Peacetime readiness of personnel appeared to be high
 - Predeployment and enroute training tailored to Falklands campaign.
- Aircraft availability and utilization remained high throughout conflict.
- Ship maintenance and battle damage repair performed at sea: no ships taken out of action due to equipment malfunction.

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INTERNATIONAL ACTIVITIES

- Argentina miscalculated based on past U.K. defense budget and overseas deployment decisions
 - U.K. failed to respond at critical time even with limited force available which might have deterred invasion--but judgment can only be made with hindsight
 - U.K. found itself facing its own and other western weapons with the requirement for countermeasures
 - The U.K. experience of facing western weapons has not affected the arms transfer policies of major arms producers. In particular, France began deliveries of arms to Argentina immediately after the fighting
 - U.S. provided extensive logistics and equipment support to the U.K. with timely response by bureaucracy and highest levels of DoD
- 

- NATO readiness was affected by the war
 - In the short term it was degraded
 - Combat assets deployed 8,000 miles away
 - Combat losses and expenditure of munitions
 - In the long term it may be enhanced
 - Cancellation or delay of phase-out actions
 - U.K. personnel gained combat experience
 - Increased defense funding
 - Improved industrial base.

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By dlb, NARA, Date 5/9/00

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APPENDIX D
ADDITIONAL MATERIAL

Argentine Aircraft Losses by System/Date/Platform	D-2
British Antiair Warfare Kills by System	D-7
Stinger Engagements	D-9
Exocet Attacks.	D-10
British Ship Firepower Index.	D-12
Argentine Ship Firepower Index.	D-13
Weapon Characteristics.	D-15
British Ships by Type and Name.	D-16
Argentine Ships by Type and Name.	D-19

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ARGENTINE AIRCRAFT LOSSES TO BRITISH AIR DEFENSE SYSTEMS

	<u>Date</u>	<u>A/C Type</u>	
1a. Sea Harrier w/AIM-9L	1 May	Mirage	HERMES
	1 May	Canberra	INVINCIBLE
	1 May	Canberra	INVINCIBLE (P)
Kills (confirmed & probable) 16/1	1 May	Mirage	INVINCIBLE
Missiles Launched: 26	21 May	Mirage	INVINCIBLE
	21 May	Mirage	INVINCIBLE
	21 May	A4	HERMES
	21 May	A4	HERMES
	21 May	A4	HERMES
	21 May	A4	HERMES
	23 May	Mirage	HERMES
	24 May	Mirage	HERMES
	24 May	Mirage	HERMES
	24 May	Mirage	HERMES
	8 June	Mirage	HERMES
	8 June	Mirage	HERMES
	8 June	Mirage	HERMES
1b. Sea Harrier w/30 mm	21 May	A4	HERMES (P)
	21 May	Pucara	INVINCIBLE
Kills (confirmed & probable) 4/2	23 May	Puma	HERMES
	23 May	Bell UH1	HERMES
	1 June	Herc C130	INVINCIBLE
Rounds Expended: 5,761	8 June	Mirage	HERMES (P)

NOTE: On 1 June the C130 was hit by both Aden cannon and AIM-9L; the kill was confirmed and attributed to the Aden cannon.

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ARGENTINE AIRCRAFT LOSSES TO BRITISH AIR DEFENSE SYSTEMS (CONTINUED)

2.	Sea Wolf	12 May	A4	BRILLIANT
	5 kills confirmed	12 May	A4	BRILLIANT
		21 May	A4	BRILLIANT
	Missiles Launched: 8	21 May	A4	BROADSWORD
		23 May	Mirage	BROADSWORD
3.	Sea Dart	9 May	Puma	COVENTRY
	8 kills confirmed	25 May	A4	COVENTRY
		25 May	A4	COVENTRY
	Missiles Launched: 31	25 May	Aermacchi	COVENTRY
		30 May	A4	EXETER
		30 May	A4	EXETER
		8 June	Lear Jet	EXETER
		14 June	Canberra	EXETER
4.	Sea Cat	21 May	Mirage	PLYMOUTH
	Kills	23 May	A4	ANTELOPE
	(confirmed & probable)	24 May	A4	FEARLESS
	8/2	24 May	A4	UNIDENT
		24 May	Mirage	ARGONAUT
	Missiles Launched: 76	25 May	A4	YARMOUTH (P)
		25 May	A4	YARMOUTH
		27 May	A4	ARGONAUT
		8 June	Mirage	PLYMOUTH (P)
		8 June	A4	PLYMOUTH
5.	4.5 Gun	30 May	A4	AVENGER (P)
	1 kill probable			

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ARGENTINE AIRCRAFT LOSSES TO BRITISH AIR DEFENSE SYSTEMS (CONTINUED)

6.	Small Cal	3 April	Puma	South Georgia
	20 mm, 40/60 mm	23 May	A4	BROADSWORD, 40/60
	Bofors, Rarden cannon &	24 May	Mirage	ARGONAUT, 40/60
	small arms	27 May	A4	FEARLESS, 40/60
		28 May	Pucara	Land forces, sm arms
	7 kills confirmed	8 June	Mirage	PLYMOUTH
		8 June	A4	Rarden Cannon(Scimitar)
7.	Stinger	21 May	Pucara	
	1 kill confirmed			
	Missile Launched: 6			
8.	Rapier	23 May	Mirage	
		23 May	A4	
	Kills	23 May	A4	
	(confirmed & probable)	24 May	A4	
	14/6	24 May	A4	
		24 May	A4	(P)
	Missiles Launched: 61	24 May	A4	(P)
		24 May	A4	(P)
		24 May	A4	(P)
		24 May	A4	(P)
		24 May	A4	(P)
		24 May	Mirage	
		25 May	A4	
		25 May	A4	
		25 May	A4	
		27 May	A4	
		27 May	A4	
		29 May	Mirage	
		29 May	A4	(P)
		8 June	A4	
		12 June	A4	

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ARGENTINE AIRCRAFT LOSSES TO BRITISH AIR DEFENSE SYSTEMS (CONTINUED)

9.	Blowpipe	21-27 May	Mirage	RM, Ajax Bay
		21-27 May	Mirage	RM, Ajax Bay (P)
	Kills	21-27 May	Mirage	SIR GALAHAD, San Carlos
	(confirmed & probable)	21-27 May	Mirage	SIR LANCELOT, San Carlos
	9/2	21-27 May	A4	SIR PERCIVAL, San Carlos
		21-27 May	A4	SIR TRISTRAM, San Carlos
	Missiles Launched: 94	21-27 May	A4	2 Para, San Carlos
		21-27 May	Mirage	3 Para, San Carlos
		21-27 May	A4	3 Para, San Carlos (P)
		28 May	Pucara	RM, Goose Green
		6 June	Mirage	2 Para, Fitzroy
10.	Destroyed on Gd	1 May	Skyvan	Sea Harrier
		4 May	Pucara	Sea Harrier
		4 May	Pucara	Sea Harrier
		15 May	Pucara	SABOTAGE
		15 May	Pucara	SABOTAGE
		15 May	Pucara	SABOTAGE
		15 May	Pucara	SABOTAGE
		15 May	Pucara	SABOTAGE
		15 May	Pucara	SABOTAGE
		15 May	Skyvan	SABOTAGE
		15 May	Mentor	SABOTAGE
		15 May	Mentor	SABOTAGE
		15 May	Mentor	SABOTAGE
		15 May	Mentor	SABOTAGE
		21 May	Puma	GR3
		21 May	CH47	GR3
		23 May	Puma	Sea Harrier
		26 May	Puma	GR3
		31 May	Pucara	GR3
		31 May	Pucara	GR3
		31 May	Pucara	GR3
		11 June	Pucara	Sea Harrier

[Pebble Island
raid by
special
forces]

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ARGENTINE AIRCRAFT LOSSES TO BRITISH AIR DEFENSE SYSTEMS (CONTINUED)

11. Found destroyed on ground: 5 Pucara
2 Aermacchi
1 Bell UH-1
1 CH-47

12. Argentine Aircraft Losses

Type	Confirmed	Probable	Total	
A4	35	10	45	Fixed Wing
Mirage	24	3	27	
Pucara	21	0	21	
Aermacchi	3	0	3	
Mentor	4	0	4	
Canberra	2	1	3	
Skyvan	2	0	2	
C130	1	0	1	
Learjet	1	0	1	Helicopters
	93	14	107	
Puma	6	0	6	
Bell UH-1	2	0	2	
CH-47	2	0	2	
	10	0	10	
	103	14	117	

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ANTIAIR WARFARE

	<u>Confirmed</u>	<u>Probable</u>	<u>Total</u>
Harrier	(20)	(3)	(23)
Missiles	16	1	17
Guns	4	2	6
Sea Systems	(25)	(3)	(28)
Missiles	21	2	23
Guns	4	1	5
Land Systems	(27)	(8)	(35)
Missiles	24	8	32
Guns	3	0	3
Argentine Air Force Losses	(103)	(14)	(117)
Air Losses ^a	72	14	86
Destroyed on Ground	22	0	22
Found Destroyed on Ground	9	0	9

^aAir Loss Attrition Rate = AR

$$\frac{72}{300} < \text{AR} < \frac{86}{300}$$

24% 29%

But over the course of the 9 days of intense Argentine air activity, about 60% of the reported 300 sorties of fighter-bombers penetrated the British air defenses to deliver their ordnance.

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RAPIER PERFORMANCE

Total missiles expended		61
Missiles discounted:		10
- Engagements terminated for safety reasons		6
- Double engagements		6
- Operation of IFF		4
- Missiles deliberately fired to deter from defective launcher		4
Adjusted missiles fired		41
Target kills ^a		
- Confirmed kills (targets seen hit and going out of control within 15 sec)	14	20
- Probable kills (targets seen hit and smoking before being lost to view)	6	
Unsuccessful engagements ^b		21
- Ground equipment failures (16.4% of missiles fired)		10
- Missile failures (6.5% of missiles fired)		4
- Other failures		7
Adjusted kill rate (20 + 41) ^c		49%

^a Kills and probable kills had to be confirmed by three observers, one of which was outside the Rapier battery.

^b Of the 61 missiles fired, 47 were successfully gathered.

^c Confirmed plus probable kills total 36.4% of all missiles fired.

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STINGER ENGAGEMENTS

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	1st	2nd	3rd	4th	5th	6th
1. Type of aircraft	Pucarra	Pucarra	Pucarra	Pucarra	Pucarra	Pucarra
2. Range of target	1 km	6 km	1 km	6 km	1500 m	100 m
3. Height of target	500 ft	1000 ft	100 ft	500 ft	800 ft	50 ft
4. Speed aircraft	100 kts	100 kts	100 kts	100 kts	100 kts	100 kts
5. Direction of a/c relative to launch	crossing R to L	crossing R to L	crossing R to L	crossing R to L	crossing R to L receding	receding
6. Point of impact (on target)	port engine	missile into gd at 800 m	missile into gd at 500 m	missile into gd at 100 m	missile into gd at 60 m	missile into gd at 1500 m
7. Degree of immediate damage	destroyed 1 engine, flew 1 min, pilot bailed out	nil	nil	nil	nil	nil
8. Weather conditions	cold 34°, clear dawn, no sun, no wind	clear & cold, no wind, sun half right from operator at launch	cold, clear, no wind, bright hazy sun at half left from operator at launch	clear, cold, bright, hazy sun	clear & cold	clear & cold
9. Time to acquire target & track	10 sec	10 sec	15 sec	15 sec	not known	10 sec
10. Evasive target action	nil	flying across sun	low flying, banked sharply round hill as missile launched	nil	nil	low flying
11. Comment	nil	sun, excessive range	nil	flew across rising sun	operator error, correct tracking sequence not followed	failed to super elevate
12. Other information	nil	nil	nil	nil	check trembler left in place	second Pucarra close behind

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SELECTED DETAILS OF EXOCET ATTACKS

● HMS SHEFFIELD, 4 May

- SHEFFIELD, as radar picket, had search radars on. SCOT transmissions blanked out ESM.
- Super Etendards detected by GLASGOW ESM at 1358, correctly classified and reported. AAW coordinator on INVINCIBLE did not declare warning red until 1409, reclassified contacts as Mirages, did not call for countermeasures (misclassification perhaps based on similarity of Mirage/Super Etendard radars, previous experiences with Mirages, low chaff inventories).
- GLASGOW fired chaff on own account
- SHEFFIELD made radar contact at 1410, classified as Mirages, did not fire chaff
- 1 AM-39 launched at 1411, hit SHEFFIELD. Another may have been launched about twenty minutes later.

● ATLANTIC CONVEYOR, 25 May

- STUFT ship operating with task force
- ESM, radar contact with Super Etendard, countermeasures called for, chaff launched (ATLANTIC CONVEYOR had none).
- 2 AM-39s launched, appeared headed toward AMBUSCADE, veered to left toward ATLANTIC CONVEYOR, one passing through chaff cloud.
- Both missiles probably hit ATLANTIC CONVEYOR.

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EXOCET ATTACKS (Continued)

- HMS AVENGER, 28 May
 - AVENGER conducting NGFS
 - Illuminated by Argentine radar
 - One land-launched MM-38 passed over flight deck, seeker not yet activated.
- Task Force, 30 May
 - ESM detection of Super Etendards, countermeasures called for, chaff launched, maneuvers performed
 - AM-39 dropped into water
- HMS GLAMORGAN, 12 June
 - GLAMORGAN withdrawing from NGFS operations passed through known MM-38 danger area
 - Detected fast radar contact, misclassified as howitzer shell
 - Fired SEACAT unsuccessfully, no chaff launched
 - One MM-38 hit hangar, considerable damage caused

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BRITISH FIREPOWER INDEX (MAJOR COMBATANTS)

SECRET												
Ship	Aircraft	Sea Slug	Sea Dart	Sea Cat	Sea Wolf	Torp Tubes	Ikara	LIMBO ASM Mortar	Exocet	4.5" Guns	40mm Guns	20mm Guns
Hermes	12 S.Har 9 S.King			2 Quad								
Invincible	8 S.Har 11 S.King		1 Twin									
Fearless	4-5 Wessex			4 Quad							2	
Intrepid	4-5 Wessex			4 Quad							2	
Bristol			1 Twin				1	1		1		2
Antrim	1 Wessex	1 Twin		2 Quad					4	Twin		
Glamorgan	1 Wessex	1 Twin		2 Quad					4	Twin		
Sheffield	1 Lynx		1 Twin							1		2
Coventry	1 Lynx		1 Twin			2 Triple				1		2
Cardiff	1 Lynx		1 Twin			2 Triple				1		2
Glasgow	1 Lynx		1 Twin			2 Triple				1		2
Exeter	1 Lynx		1 Twin			2 Triple				1		2
Broadsword	2 Lynx				2 6- bbl	2 Triple			4		2	
Brilliant	2 Lynx				2 6- bbl	2 Triple			4		2	
Active	1 Lynx			1 Quad		2 Triple			4	1		2
Antelope	1 Lynx			1 Quad		2 Triple			4	1		2
Ambuscade	1 Lynx			1 Quad		2 Triple			4	1		2
Arrow	1 Lynx			1 Quad		2 Triple			4	1		2
Alacrity	1 Lynx			1 Quad		2 Triple			4	1		2
Ardent	1 Lynx			1 Quad		2 Triple			4	1		2
Avenger	1 Lynx			1 Quad		2 Triple			4	1		2
Argonaut	1 Lynx			3 Quad		2 Triple			4		2	
Minerva	1 Lynx			3 Quad		2 Triple			4		2	
Penelope	1 Lynx			3 Quad		2 Triple			4		2	
Andromeda	1 Lynx				1 6- bbl	2 Triple			4		2	
Yarmouth	1 Wasp			1 Quad				1		Twin		
Plymouth	1 Wasp			1 Quad				1		Twin		

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SECRET**ARGENTINE FIREPOWER INDEX (MAJOR COMBATANTS)**

SECRET														
Ship	Aircraft	Sea Dart	Sea Cat	Torp Tubes	Hedgehog ASW Mortar	Depth Charge Rack	Exocet	6" Guns	5" Guns	4.5" Guns	3.9" Guns	3" Guns	40mm Guns	20mm Guns
25 de Mayo	5 A-4Q Skyhawk 5 S-2A Tracker 4 SH-3D Helo		2 Quad										9	
Gen. Belgrano	1 Alouette		2 Quad					15	8				20	10
Hercules	1 Lynx	1 Twin		2 Triple			4			1				2
Santissima Trinidad	1 Lynx	1 Twin		2 Triple			4			1				2
Comodoro Py	1 Alouette			2 Triple	2	1			6					
Bouchard	1 Alouette			2 Triple	2	1	4		6					
Piedrabuena	1 Alouette			2 Triple	2	1	4		6					
Segui				2 Triple	2	1	4		6			4		
Drummond				2 Triple			4				1		1	2
Guerrico				2 Triple			4				1		1	2
Granville				2 Triple			4				1		1	2

Source: Reference [34].**SECRET**

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WEAPONS CHARACTERISTICS

<u>SYSTEM</u>	<u>IOC</u>	<u>MAXIMUM RANGE (KM)</u>	<u>MAXIMUM SPEED (MACH)</u>	<u>WARHEAD KG/TYPE FUZE</u>	<u>GUIDANCE</u>
SEA CAT	1962	6	M.7	18.1 HE/IR PROX + CONTACT	RADIO COMMAND
SEA DART	1967	65	M2.8 @ 18 km M2.3 @ Sea Level	RADAR OR IR PROX 27 HE CONT ROD	HOMING SEMI-ACTIVE
SEA WOLF	1978	4.6	M2.0	UNK	RADIO COMMAND
SEA SLUG	1961	MK1 = 32 MK2 = 37	M2.0	105 HE/PASSIVE IR	BEAM RIDER
BLOWPIPE	1975	6.5	M1.5	2.2 HE/CONTROL	OPTICAL RADIO COMMAND
RAPIER	1971	6.0	M2.0+	2.7 HE/CONTACT	OPTICAL RADIO COMMAND
SEA SKUA	1980	24	M.9	30 HE/CONTACT	SEMI-ACTIVE RADAR HOMING
EXOCET	1980	60	M.93	165 HE/CONTACT	INERTIAL & TERMINAL ACTIVE HOMING

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Combatants

ASW Carrier
INVINCIBLE

ASW/Commando Carrier
HERMES

LPD (Assault Ships)
FEARLESS
INTREPID

Type 82 Destroyer
BRISTOL

County Class Destroyer
ANTRIM (damaged)
GLAMORGAN (damaged)

Type 42 Destroyers
SHEFFIELD (lost)
COVENTRY (lost)
CARDIFF
GLASGOW (damaged)
EXETER

Type 21 Frigates
ACTIVE
ANTELOPE (lost)
AMBUSCADE
ARROW (damaged)
ALACRITY
ARDENT (lost)
AVENGER

Type 22 Frigates
BROADSWORD (damaged)
BRILLIANT (damaged)

BRITISH SHIPS

Royal Fleet Auxiliary

Logistic Landing Ships
SIR LANCELOT (damaged)
SIR GERAINT
SIR GALAHAD (lost)
SIR TRISTRAM (damaged)
SIR BEDIVERE
SIR PERCIVALE

Helicopter-Support Ships
ENGADINE

Large Fleet Tankers

OLNA
OLMEDA
TIDEPPOOL
TIDESPRING

Small Fleet Tanker
BLUE ROVER

Support Tankers

APPLELEAF
PLUMLEAF
PEARLEAF
BAYLEAF
BRAMBLELEAF

Fleet Replenishment Ships

FORT AUSTIN
FORT GRANGE
REGENT
RESOURCE

Stores Support Ships

STROMNESS

Other STUFT

Tankers

ALVEGA
ANCO CHARGER
BALDER LONDON
BRITISH AVON
BRITISH DART
BRITISH ESK
BRITISH FERN***
BRITISH IVY***
BRITISH TAMAR
BRITISH TAY
BRITISH TEST
BRITISH TRENT
BRITISH WYE (damaged)
CORONA***
CORTINA***
SHELL EBURNA
ESSO FAWLEY***
FINNANGER***
G. A. WALKER***
LUMINETTA***
ORIONMAN***
FORT TORONTO
SCOTTISH EAGLE
VINGA POLARIS***

Ro-Ro Containerships

ATLANTIC CONVEYOR (lost)
ATLANTIC CAUSEWAY
CONTENDER BEZANT

Container Ship

ASTRONOMER

Cruise Liner

SS CANBERRA
RMS QUEEN ELIZABETH II

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D-16

***Returned between 16-20 May

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BRITISH SHIPS (continued)

Combatants
Leander Class Frigates
ARGONAUT (damaged)
MINERVA
PENELOPE

Broad-beamed Leander Class Frigate
ANDROMEDA

Modified Type 12 Frigates
PLYMOUTH (damaged)
YARMOUTH

Survey Ships
HYDRA
HECLA
HERALD

Ice Patrol Ship
ENDURANCE

Offshore Patrol Vessel
LEEDS CASTLE
DUMBARTON CASTLE

Minesweepers (STUFT*)
CORDELLA
NORTHELLA
FARNELLA
JUNELLA
PICT

Hospital Ship (STUFT**)
SS UGANDA

Submarines
SPLENDID
SPARTAN
CONQUEROR
COURAGEOUS

RFA
Ocean Tug
TYPOON

Mooring/Salvage Vessel
GOOSANDER

Other STUFT
Ro-Ro Ferries
BALTIC FERRY
ELK
EUROPIC FERRY
NORDIC FERRY
TOR CALENDONIA

Freighters
AVELONA STAR
LAERTES
LYCAON

Refrigerated Cargo
GEESTPORT
SAXONIA
STRATHERE

Cable Ship
IRIS

Oilfield Support Vessels
BRITISH ENTERPRISE III
STENA INSPECTOR
STENA SEASPREAD
WIMPEY SEAHORSE

Salvage Tugs
IRISHMAN
SALVAGEMAN
YORKSHIREMAN

Passenger/General Cargo
NORLAND
RANGATIRA
SAINT EDMUND
RMS SAINT HELENA

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SS

ONYX

* Under Navy Control

** Under Army Control

TOTALS:

39 Surface Ships (33 RN, 6 STUFT)

4 Lost

8 Damaged

6 Submarines

24 RFA

1 Lost

2 Damaged

53 Other STUFT

1 Lost

1 Damaged

Overall Totals:

122 Ships and Submarines

6 Lost

11 Damaged

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ARGENTINE SHIPS (PARTICIPATING)

Combatants

Aircraft Carriers (100% of Total
in Class)
25 DE MAYO

U.S. Brooklyn-Class Cruiser (100%)
GENERAL BELGRANO (lost)

UK Type 42 Destroyer (100%)
HERCULES
SANTISSIMA TRINIDAD

U.S. Gearing FRAM II (100%)
COMODORO PY

U.S. Sumner FRAM II Destroyer
(100%)
BOUCHARD (damaged)
PIEDRABUENA

U.S. Sumner Class Destroyer
(100%)
SEGUI

U.S. Guppy Class Submarine (50%)
SANTA FE (damaged)

German Type 209 Submarine (50%)
SAN LUIS

Support Ships

Antarctic Support Ships
ALMIRANTE IRIZAR
(used as transport and
hospital ship)

Survey and Oceanographic Ships
PUERTO DESEADO (used as
supply transport)

Cargo Ship
ISLAS DE LOS ESTADOS (lost)
(employed as mineplanter)

Fleet Support Tanker
PUNTA MENDANOS

Polar Transport
BAHIA PARAISO

Transports
CANAL BEAGLE
CABO DE HORNAS
BAHIA BUEN SUCESCO (damaged)

Tugs
CHRIGUANA

Merchant Ships

General Cargo
CEIBO
FORMOSA
MAR DEL NORTE
RIO CARCARANA (lost)
RIO CINCEL
RIO DE LA PLATA
RIO GRANDE

Trawler
NARWAL (lost)

Others
3 Commercial Tankers
(names unknown)
1 Captured Freighter
(MONSUNEN) (damaged)

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ARGENTINE SHIPS (PARTICIPATING)
(CONTINUED)

Combatants

Fr A-69 Class Frigates (100%)
DRUMMOND
GUERRICO (damaged)
GRANVILLE

Patrol Ships (Various--69%)
COMANDANTE GENERAL IRIGOYEN
FRANCISCO DE CHURRUCA
YAMANA
ALFEREZ SOBRAL (damaged)
COMODARO SOMELLERA (lost)
BARADERO
BARRANQUERAS
CLORINDA
CONCEPCION DEL URUGUAY

Mine Warfare Ships (100%)
NEUCUEN
RIO NEGRO
CHUBUT
CHACO
FORMOSA

LST (100%)
CABO SAN ANTONIA

Support Ships

Merchant Ships

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**ARGENTINE SHIPS (PARTICIPATING)
(CONTINUED)**

<u>Combatants</u>	<u>Support Ships</u>	<u>Merchant Ships</u>
Coastal Patrol Craft ^a		
MAR DEL PLATA		
MARTIN GARCIA		
RIO LUJAN		
RIO URUGUAY		
RIO PARAGUAY		
RIO PARANA		
PIO DE LA PLATA		
LA PLATA		
BUENOS AIRES		
CABO CARRIENTAS		
RIO QUEGUEN		
BAHIA BLANCA		
INGENIERO WHITE		
GOLFO SAN MATIAS		
MADRYN		
RIO DESEADO		
CANAL DE BEAGLE		
ISLAS MALVINAS (damaged)		
RIO IGUAZU (lost)		
LYNCH		
EREXCANA		
	<u>TOTALS</u>	
50 Surface Combatant Ships	9 Support	12 Commercial

^aperfectura Naval Argentina.

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