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14. ABSTRACT
The air operation in the South Atlantic War is a valuable case study in modern amphibious operations and provides insights that are applicable to a potential U.S. – China conflict in the South China Sea. The similarities to the Falkland Islands War and a potential China-U.S. conflict in the South China Sea are uncanny. Long lines of communication, Anti-Access/Area Denial capabilities, disproportionate air forces, and amphibious operations would all play a large role in a U.S. response to the seizure of an island in the South China Sea. Concepts such as exploiting exclusive use time, stretching the air defense, balancing pressure and reserve forces, and preparing the air environment for the execution of, or defense of, the amphibious assault permeated the air operations of the South Atlantic War. These lessons can reasonably be applied to both the U.S. and China in the South China Sea. The U.S. pivot to the Pacific has placed greater emphasis on the region and demands military professionals reevaluate historical case studies in the context of the region. The air war over the Falklands provides several compelling lessons that remain relevant today – particularly in a potential China-U.S. conflict in the South China Sea.

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From the South Atlantic War of 1982 to the South China Sea in the 21st Century:
An Assessment of the Past and Future in Amphibious Air Operations

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Executive Summary

Title: From the South Atlantic War of 1982 to the South China Sea in the 21st Century: An Assessment of the Past and Future in Amphibious Air Operations

Author: Major Michael Cicchi, United States Marine Corps

Thesis: The air operations in the South Atlantic War is a valuable case study in modern amphibious operations and provides insights that are applicable to a potential U.S. – China conflict in the South China Sea.

Discussion: The South Atlantic War began in April 1982 after Argentina seized the Falkland Islands – a group of islands over 400 miles east of the Argentine mainland – and Britain launched a naval task force over 8,000 miles to retake the islands by force. At the time, Argentina boasted a large and modern air force comprised of contemporary western-model jet fighters as well as an inventory of Exocet missiles – the premier air-launched anti-ship weapon of the day – and the British task force had less than 30 Sea Harriers

The combination of long logistic lines of communication, enemy Anti-Access/Area Denial capabilities, inferior numbers, and an opposed amphibious operation made this a very challenging endeavor for the British. Yet, despite these conditions, British pilots succeeded in dominating the skies over the Falklands and set the stage for a successful amphibious assault. The result was an overwhelming British victory that took less than three months.

The similarities to the Falkland Islands War and a potential China-U.S. conflict in the South China Sea are uncanny. Long lines of communication, Anti-Access/Area Denial capabilities, disproportionate air forces, and amphibious operations would all play a large role in a U.S. response to the seizure of an island in the South China Sea.

Concepts such as exploiting exclusive use time, stretching the air defense, balancing pressure and reserve forces, and preparing the air environment for the execution of, or defense of, the amphibious assault permeated the air operations of the South Atlantic War. These lessons can reasonably be applied to both the U.S. and China in the South China Sea.

Conclusion: The U.S. pivot to the Pacific has placed greater emphasis on the region and demands military professionals reevaluate historical case studies in the context of the region. The air war over the Falklands provides several compelling lessons that remain relevant today – particularly in a potential China-U.S. conflict in the South China Sea.

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Preface

The South Atlantic War is a fascinating anomaly of the late 20th century. It is the most recent example of an amphibious operation in the face of a modern and technologically relevant resistance; this brings forth a pertinent question: is this conflict relevant in the 21st century? My approach to this question is to examine the operational aspects of the British and Argentine air forces in an attempt to determine key decisions and/or acts that led to success and failure on the battlefield throughout the air operation. Much has been written on the tactics of the war and I will not add to this collection; rather, I shall draw on it to aid in the analysis of the operational picture as a whole.

Considering the U.S. strategic pivot to the Pacific, I will apply these key points to the context of the region – specifically, a potential China-U.S. conflict in the South China Sea. Given the geographic location and amphibious nature of this scenario, it is likely the U.S. Navy and Marine Corps would spearhead any U.S. response to Chinese aggression in the South China Sea. This aspect requires I restrict my aperture to the Maritime services and forego analysis regarding the Army and Air Force. Most importantly, I will look into the potential Chinese response to the Falkland Island War to identify those lessons that are most beneficial to counter U.S. amphibious operations in Southeast Asia. The scope of this paper is limited to the military; as such, the reasons and causes of such a conflict will not be covered; however, it is nearly impossible to extract politics from the military. Given this intertwined nature, political interventions and influences on the operational picture must be addressed where logical.

The sources I used in my research were all unclassified and the texts concerning China's current and potential future military capabilities were written within the last ten years. I used

current U.S. military doctrine and capstone documents to assess current and predicted U.S. military capabilities. As such, my analysis is unclassified and current as of the Spring 2015.

Finally, I would like to thank my wife for all of her patience and support throughout this process and my children for constantly reminding me that I shouldn't spend all of my time reading history books.

Introduction

On the night of 30 April 1982, eleven British Victor tankers and a British Vulcan bomber, loaded with twenty-one 1000-pound bombs, departed Wideawake Airfield on Ascension Island in the middle of the Atlantic Ocean. The target, Port Stanley Airfield on East Falkland, lay 3800 nautical miles to the south. Throughout the course of the next eight hours, the Vulcan bomber refueled from the Victor tankers five times in the black of night over the middle of the South Atlantic. Three hundred miles north of the Falkland Islands, the Vulcan bomber descended to 300 feet above the water to avoid radar detection as it commenced the final portion of its attack. Then, on 01 May at 0445 local time, nine hours after it had taken off, the Vulcan released its payload of bombs and turned back to the north towards Ascension Island. At the time, Operation "Black Buck One" was the longest-range bombing mission in history and it signaled the beginning of air operations in the South Atlantic War.[1]

The U.S. pivot to the Pacific serves to focus military planning and preparation. It also provides valuable context to the study of military history. This renewed emphasis compels military planners to review historical case studies in an attempt to evaluate the validity of lessons learned in the context of U.S. commitments to the Pacific region. Before plunging into complex analysis of historical conflicts, it is prudent to first acknowledge the other dominant stakeholders in the region. This allows for greater fidelity in assessing the validity of potential analyses. In the Pacific, China is the most prominent geopolitical force capable of challenging U.S. national interests in the region. More specifically, possible Chinese aggression in the South China Sea represents a very tricky situation that requires continuous attention from both military planners and

diplomats. With this enhanced understanding of the current situation, identifying a relevant case study becomes clearer. The similarities between the South Atlantic War of 1982 and a potential U.S. – China military conflict in the South China Sea are uncanny. In this instance a continental power with a modern and primarily land-based air force and a robust A2/AD threat seized an island near its mainland, which in turn required a response by an amphibious task force at great distance from its home base with long logistical lines of communication (LOCs). In the second, a similar scenario could emerge in the future.

The various aspects of an amphibious operation are complex and detailed analyses of all aspects are extensive. As such, the focus here will be the air operations. The ability of the British Task Force, without the aide of a large-deck carrier and its accompanying air wing, to challenge a numerically superior land-based air force is fascinating. More importantly, it begs the question: how did the Argentines lose? What can be gleaned from an assessment of this war that would aid China in its theoretical endeavors? The air operation in the South Atlantic War is a valuable case study in modern amphibious operations and provides insights that are applicable to a potential U.S. – China conflict in the South China Sea.

Analysis of Air Operations in the South Atlantic War, 1982

British Operational Successes

British air operations in the South Atlantic began with "Black Buck One" on 01 May 1982. The result of the actual attack on the airfield itself is not the topic of discussion at this time. What is important is the strategic implication of this long-range bombing mission. Initially conceived to destroy the runway at Port Stanley in order to

prevent further logistical support to the Argentine forces on the island, British planners soon realized the strategic merits of a long-range bombing mission. Tactically, the better option would have been to use Sea Harriers from the Amphibious Task Force. As a general rule, the more sorties assigned to a target, the greater the probability of success. Using multiple waves of Sea Harriers to attack the airfield would have been more likely to produce the desired results as opposed to a single Vulcan bomber. Many British planners argued for this course of action, and in the end, the British employed both tactics – a Harrier attack on Port Stanley followed the Vulcan raid. However, the advantage of "Black Buck One" laid not in the tactical outcome, but rather the strategic result. Britain demonstrated the ability to attack an airfield over 4000 miles away from Ascension Island, which meant it could, in theory, also attack targets on the Argentine mainland. British officials believed this show-of-force would convince the Argentines to maintain aircraft in defense of the mainland, thus reducing the number of aircraft available for combat in the Falklands – and they were correct.[2]

The Argentine response to the British attack on 01 May relied entirely on aircraft, primarily launched from the mainland. The air assault was the pre-planned response to an impending British landing in the Falklands – although the British Task Force had no intention of conducting the landing on 01 May.[3] This Argentine misstep was not lost on the British, as Admiral Sandy Woodward, the Task Force commander, could reasonably conclude the enemy's intentions in the future during the actual amphibious assault.[4] More significant became the British defense against this attack. The Argentine assault consisted of nearly 60 sorties with only 35 reaching the target area. The Sea Harriers shot down seven Argentine aircraft, two of which were Mirage IIIs, the most capable

interceptor in the Argentine inventory.[5] The British suffered no aircraft losses and negligible damage to their naval fleet. The success of the British air defense, specifically the Sea Harrier, on the first day of air operations had a lasting impact on the Argentine air forces for the remainder of the conflict. Subsequent Argentine attacks relied on attack aircraft avoiding the British Combat Air Patrols (CAPs) by flying "blockade running" profiles at low altitude without fighter escort aircraft. In the event Sea Harriers did locate and attempt to intercept the incoming Argentines, it became common practice for the Argentine aircraft to jettison their ordnance into the ocean and immediately withdraw back to the mainland.[6] By the end of the war, the Sea Harriers accounted for ninety percent of all Argentine aircraft losses.[7] The initial British dominance in the skies over the Falklands caused the Argentines to flinch first and essentially cede control of the airspace to the British Task Force – thus confirming two key requirements for a successful amphibious operation: control of both the air and sea.

While the Sea Harrier asserted its control over the Falkland Islands, other British aircraft were pursuing the Argentine naval fleet. Nimrod Maritime Patrol aircraft, operating out of Ascension Island, covered vast swaths of the South Atlantic in search of the Argentine Navy while Sea King helicopters fanned out from their ships in search of Argentine submarines.[8] After the sinking of the Argentine cruiser *General Belgrano* by the British submarine *Conqueror*, the Argentine Navy, including its aircraft carrier *Ventecinco de Mayo*, retreated into the territorial waters of the mainland, where they would remain – Britain did not attack Argentine forces inside the mainland territorial waters. Despite this fact, the British remained dedicated to an aggressive area denial

posture. This mindset proved useful, as the Argentine Navy never really challenged the British Task Force.

In the days leading up to the British amphibious landing on East Falkland Island, planners wrestled with choosing a landing site.[9] Given the Argentine response to the Task Force on 01 May, Admiral Woodward was convinced the landing would be strongly opposed by the enemy's air force. The fleet (and thus the whole operation) would be most vulnerable during the offload of the landing force – a critical vulnerability. The key was to get the landing force ashore as quickly as possible. In order for this to happen, the British needed to take the Argentines by surprise.[10] Thus they used a pair of deceptive operations to disguise the actual landing site. Before sunrise on 21 May, British warships attacked Port Stanley and Goose Green while the landing force turned toward San Carlos Water (the actual landing site) at the last possible moment.

This tactic, albeit effective, may seem to have little bearing on air operations. However, due to distance from the mainland airbases, Argentine pilots had minimal time in the target area (often less than five minutes) before they had to return to base. Through the deception, the British forced the bulk of Argentine Air Force to wait for definitive word on the landing site – effectively conducting air defense without firing a shot. Those aircraft that did launch with insufficient intelligence ended up attacking the first ship they could find, which was the outer picket of warships and not the high-value amphibious ships offloading the landing force.[11] Within the first few hours, word of the landing site got back to the Argentine Air Force, but their air assault remained ineffective as the combination of ship-based anti-aircraft missile systems, shore-based Rapier and Stinger surface-to-air missiles, and the Sea Harrier CAPs wreaked havoc on the fuel-limited

attack aircraft. By 23 May, the landing force was firmly ashore and the Argentine air campaign was essentially lost.[12] During the landing (21-25 May), Argentina lost 21 additional fixed-wing aircraft to just two downed British fixed-wing aircraft (one Sea Harrier and one Royal Air Force [RAF] GR-3).[13] The deception plan coupled with the symbiotic integration of multiple air defense platforms created an effective barrier against the only real threat to the British amphibious landing force.

British Operational Failures

The operational success of "Black Buck One" did not equate to tactical success. The mission was to destroy the airfield at Port Stanley and thus prevent further logistical support to the Argentine ground forces on the island.[14] Of the 21 bombs dropped on the airfield, only one hit the runway and this did prevent Argentine fighters from using the airfield.[15] However, transport aircraft could still operate out of the airfield and these brought much-needed supplies to the island. In order to truly enforce the Exclusion Zone, Port Stanley airfield needed to be neutralized.[16] Throughout the course of the conflict, British Sea Harriers and GR-3s conducted multiple attacks on the airfield in an attempt to render the runway unusable to transport aircraft. In the month of May alone, Britain conducted no less than seven attacks on the runway and all failed to achieve the desired effects.[17] Additional "Black Buck" missions launched out of Ascension Island also proved unsuccessful. In the end, Argentine transport aircraft operated out of Port Stanley airfield until the British ground force seized the site on 13 June. The failure to shut down the airfield on East Falkland allowed Argentine ground forces to hold out for as long as they did and even allowed for the positioning of a land-based Exocet missile

system that successfully damaged the British warship *Glamorgan* resulting in the death of 14 sailors aboard.[18]

Much has been said about the successful British air blockade of the Falkland Islands. The glaring error is the fact that despite the dominance of the Sea Harrier, the Argentines were successful in getting more than half of their attack aircraft through the blockade and into the target area.[19] The Argentines accomplished this by flying a "High-Low-High" profile. On departure from the mainland airbases, aircraft would climb to a high cruising altitude in order to conserve as much fuel as possible. As aircraft approached the islands, each would descend to approximately 50 feet above the ocean surface and ingress into the objective area. Once the attack was complete, the aircraft would again climb back up to high altitude and cruise home.[20] The extremely low altitude ingress exploited a weakness in the British ship-based surveillance radars. The ships' radar could not differentiate the aircraft from the ground, essentially allowing the attacking aircraft to approach the British ships undetected.

A potential solution to this problem would have been the integration of an Airborne Early Warning (AEW) platform into the Task Force's air defense system. However, this it did not possess. The lack of AEW thus had serious implications in British air operations.[21] First and foremost, it meant the Task Force would not get indications of impending Argentine attacks until the enemy aircraft elevated from their ingress altitudes to conduct their bombing runs (approximately 60-90 seconds prior to weapons release). This is evident in the fact that the vast majority of Sea Harrier intercepts of Argentine aircraft occurred after the Argentines had already executed an attack and were egressing the objective area.[22] Second, the British had to dedicate more

aircraft sorties to air defense missions in order to mitigate the problem of short notice.[23] If a capable AEW platform had operated in conjunction with the Task Force, there would have been reduced need for continuous CAP coverage as aircraft could have been diverted from strike missions or launched from the carriers with sufficient time to intercept the threat. Since the British entered the conflict with scarce fixed-wing resources, their lack of an AEW capability forced nearly all Sea Harrier sorties into the air defense role at the expense of operating in direct support of the ground forces.

This lack of fixed-wing resources plagued the British Task Force throughout the war. Britain began hostilities with 20 Sea Harriers aboard two carriers. Additional RAF GR-3s entered the fray near the end of May, but the total fixed-wing aircraft to man at least three CAPs continuously as well as conduct strike missions, close air support, and screen for Argentine naval vessels west of the islands remained less than 40. Due to the Argentine air threat, British carriers remained well east of the Falklands, resulting in no more than 30 minutes of on-station time for the Harriers. This meant that during daylight hours, each British carrier was launching a section (two) of Sea Harriers every 20 minutes. By the end of the war, each Sea Harrier had averaged six sorties (approximately nine flight hours) per day.[24] In order to accomplish this, maintenance crews worked tirelessly to achieve aircraft readiness rates in excess of 95%.[25] Aircrew and maintenance crews were working to near exhaustion.

British war planners wanted the high sortie rates to make up for their inferior numbers, which necessitated high readiness rates. In this, they either lacked understanding of or disregarded the effects of fatigue in aviation. Of the six Sea Harriers lost in the campaign, only two were due to enemy action. The other four aircraft losses

were due to accidents, which can likely be, at least partially, attributed to fatigue of aircrew and/or maintenance personnel.[26] If more aircraft and maintenance personnel had been available, the necessary sorties would have been available to air planners without pushing pilots and maintainers to operate at unsustainable rates. However, Britain made due with what it had on hand at the outset of the war. If the Argentines had been able to prolong the conduct of hostilities and the British operational tempo had remained the same, it is likely that more mishaps would have occurred.

The final British misstep to address was their long LOCs. The geography of the operational theater dictated the expanse of the logistics footprint. The "air bridge" (and accompanying sea LOCs) from the U.K. to Ascension Island and, from there, on to the Falkland Islands was crucial to the overall success of Operation Corporate. However, the British left the link between Ascension Island and the Falklands (the most vulnerable to Argentine exploitation) virtually undefended throughout the course of the war. The Argentines failed to capitalize on this oversight, or one could argue the British left the LOCs undefended because the Argentines did not pose a credible threat. The *Atlantic Conveyor* (a merchant ship transporting additional helicopter and fighter aircraft to the Falklands) made the trek from the U.K. to the Falklands with an armed Harrier sitting on the Vertical Take-off and Landing pad ready to launch against potential threats belies the latter argument.[27] This act implies the British acknowledged that some amount of defense was prudent, but as it was a singular event it could just have easily been an act of opportunity (the ship was carrying Harriers, it was easy to provide its own defense). In reality, the Argentines did not pose a credible threat to the LOCs due to their limited resources and the distances involved; but it is difficult to say whether or not the British

believed that or merely were lucky. Regardless, it is prudent in the analysis of this case study to point out the apparent disregard by the British of a basic tenant of warfare: protect the logistics train. This would have increased demands on already scant aviation and naval resources; however, the LOCs were the lifeline for the entire British Task Force and vital to overall mission success.[28]

Argentine Operational Successes

Given the lopsided outcome of the air war in the South Atlantic, it is easy to focus solely on the failures of the Argentine air forces – this would be an error. However, the seemingly insignificant successes in defeat can prove equally insightful. The Argentines launched nearly 450 fixed-wing attack sorties throughout the course of the war and nearly 300 made it to the target area despite a dominant and persistent British CAP.[29] Following the overwhelming defeat at the hands of the Sea Harrier and the AIM-9Ls on 01 May, the Argentines assessed that meeting the British CAPs head-on would result in rapid attrition of their aircraft. In a great display of flexibility, the Argentines stripped their attack aircraft of their fighter escorts and proceeded to approach the islands at low altitude and high speed. This allowed the attacking aircraft to reach the target area undetected, thus degrading the effects of the superior British air defenses. The Argentine Super Etendards executed this exact technique in successful Exocet attacks on the British ships *Sheffield* and *Atlantic Conveyor*.[30] The Argentine air forces also employed another more effective technique on several occasions (although not extensively) which involved the use of fighter escorts at high altitude while the attack aircraft executed a low-altitude ingress. The British Sea Harriers would maneuver to intercept the fighter escorts (at which time

the Argentine fighters would disengage and proceed back to the mainland) allowing the attack aircraft access to their targets.[31]

The ability of the Argentines to penetrate British air defenses, in the face of superior CAP aircraft, presented a viable threat to the British Task Force. As long as the Argentines maintained pressure on the British Fleet, Admiral Woodward had to honor the threat and keep his carriers well East of the Falklands. This reduced the time on station over the islands for his Harriers and prevented extensive use of fixed-wing aircraft in support of the land operations.[32]

Despite the British desire to keep the bulk of its task force barely within the reaches of the Argentine Air Force, the amphibious landing would require moving closer to the threat. The Argentines knew the landing would occur at some point and that the British would do all they could to keep the details of the time and location hidden until the last possible moment. In order to respond with substantial force, Argentina maintained air forces in reserve and ready to attack the amphibious force. They recognized that the British would be most vulnerable during the landing.[33] On 21 May, in response to the British amphibious assault, Argentina launched a massive air attack against the British forces. The attack resulted in six ships hit. The HMS *Antrim* and *Argonaut* both sustained major damage – which removed them from operations – and two sailors died. The Argentines sunk the HMS *Ardent* and 22 sailors perished in the attack. The other three ships suffered minor damages.[34] Obstacles beyond British air defenses, such as shaky intelligence and limited fuel, compounded to prevent the Argentines from dealing a more lethal blow. Still, the Argentines were able to mass their forces at the time and place when the enemy was most vulnerable and were able to do so due to prior

planning and operational foresight. The balance between maintaining pressure on the British naval fleet and maintaining the capability to launch a major offensive against the amphibious force was delicate, but well executed nonetheless.

As the British Task Force initially sailed south from Ascension Island in April, Boeing 707 aircraft shadowed the fleet at such a distance so as not to provoke hostilities. The aircraft, by all accounts, looked like civilian airliners but were acting suspiciously. British Sea Harriers began intercepting these aircraft to escort them clear of the fleet. The British (correctly) concluded these aircraft were providing intelligence to the Argentines and proceeded to take a more aggressive stance toward them. Unknown to the British at the time, the aircraft carried a Signals Intelligence (SIGINT) payload.[35] The use of unconventional intelligence aircraft, such as civilian airliners, by Argentina presented a very challenging problem to the British. Civilian air traffic is usually easily identified on a ship's radar for many reasons, but due, in large part, to their very predictable (and non-threatening) flight characteristics: high altitude, relatively slow speed, and constant heading. Normally, radar operators quickly identify these contacts and brush them off as neutral aircraft.

However, once the British recognized the Argentines were using airliners for surveillance, all aircraft in the vicinity of the Task Force became suspect. This tactic served several purposes. First, it slowed the British fleet down. No longer could the Task Force steam directly for the Falklands, for it had to take time to investigate suspect aircraft and vary its course as needed to disguise its location. Second, it complicated the air targeting picture. Once Argentina had demonstrated the will and ability to use civilian aircraft for military purposes, all aircraft on the radar scope became potential threats to

the fleet and the British had to honor those threats for the duration of the conflict. Third, and most significantly, it created the potential for an international incident. If the British wrongly identified a neutral airliner as an Argentine airliner acting in a military capacity and shot down that aircraft, the political consequences could be immense. This exact situation nearly played out when British forces almost shot down a Brazilian airliner.[36] Even if the British shot down an airliner that was, in fact, conducting military intelligence, the Argentines could claim it was purely civilian and the U.K. would still suffer some political fallout with the international community. If this had occurred, a tactical incident would have had strategic consequences.

The last successful piece of Argentine air operations was their air defense assets on the Falkland Islands. The primary air defense assets (ADAs) on the Falklands consisted of the Blowpipe man-portable surface-to-air missile (MANPAD), the Roland surface-to-air missile (SAM), the Short Tigercat SAM, and 35mm anti-aircraft artillery (AAA). Any one of these systems alone would be easily overcome by British attack aircraft. The four systems working together created a daunting defense. This produced a serious tactical problem for close air support aircraft. The engagement envelopes of the four ADAs overlap and the strengths of one compensate for the weakness of another.[37] Additionally, all these systems are mobile, which enabled the Argentines to move them around the islands and thus complicated the targeting efforts by British forces. Arguably more important than the SAMs and AAA was the ground-based early warning radar based in Port Stanley. Argentine defending forces were very dependent on the Falkland-based radar system in order to maintain awareness to the British CAPs as their mainland-based radars were of little use in the middle of the South Atlantic.[38] This system, too,

was mobile, a fact both the Argentines and the British knew. British aircraft searched for, and unsuccessfully attempted to destroy, the Falkland radar site throughout the war. However, the Argentines often repositioned it around Port Stanley specifically to avoid such targeting by the British. Ultimately, the radar site was never destroyed and it operated, without interruption, for the duration of the conflict.[39]

The integration of all of these assets constituted a formidable defensive capability and proved to be quite effective. The air defenses on the Falklands shot down three GR-3s, two Sea Harriers, and two Gazelle helicopters (Argentine aircraft, by contrast, only shot down one Lynx helicopter).[40] This may not seem significant – except in comparison to the Argentine air forces – but further analysis provides a more in-depth assessment. The GR-3s operated in support of British ground forces during the land operations. Only ten of these aircraft operated in the South Atlantic, which means Argentine ADA on the Falklands shot down 30% of the GR-3 force. Contrast that with the two Sea Harriers shot down by the same ADAs, representing less than 10% of the force. Notably, the Sea Harriers operated almost exclusively on CAPs in an anti-air defense role – out of reach of the Falkland air defenses. The two Gazelle helicopters were shot down while escorting a cargo helicopter ashore in the initial amphibious assault and the British subsequently ceased using light attack helicopters in that role to prevent further losses.[41] Thus, the air defenses on the Falkland Islands were, in fact, quite effective against the aircraft that operated in support of the land operations on the islands.

Argentine Operational Failures

The most significant impediment to Argentine success in the air operations was the 400 miles of Atlantic Ocean between the mainland and the Falkland Islands. The

attack aircraft of the Argentine air forces operated at the edge of their effective combat radii and thus had minimal time in the target area.[42] The consequences of this situation have been addressed in previous sections; the conspicuous issue is the fact Argentina did little to alleviate this problem. The Argentine aircraft carrier *Vientecinco de Mayo* spent the bulk of the war in port or within the territorial waters of the mainland and had disembarked its aircraft early on in the conflict. Argentina likely made this decision due to the British submarine threat, as demonstrated in the sinking of the *Belgrano*.[43]

Aside from carrier aviation, Argentina had other options available. The Argentines seized Port Stanley on 02 April and the British Task Force arrived in the Exclusion Zone on 29 April.[44] They had nearly a month of exclusive use time – time in the objective area with complete freedom of action – but made no noticeable improvements to the airfield. If the runway had been expanded, even just enough to allow mainland-based aircraft to use it as an emergency divert, the possible improvement to aircraft time on station could have allowed Argentina to contest for control of the air more effectively. The Argentines wasted their precious time by failing to enhance the conditions of the operational theater in their favor. The time lost not preparing the defense could not be regained. Ultimately, Argentina could not recover once the British Task Force arrived in the region.

The other alternative would have been to expand Air-to-Air Refueling (AAR) capability, but this would have required procurement of additional tanker aircraft prior to the war. Ultimately, the Argentines made the best of the limited tanker assets available as demonstrated in the successful Exocet attacks on the *Sheffield* and the *Atlantic Conveyor*. Both strikes incorporated tankers in order to get the Super Etendards in range

of their targets.[45] In the end, it is hard to divest this analysis from the political situation: the Argentines did not plan for nor anticipate a British military response and the result was disastrous. At the strategic level, the Argentines made a wrong assumption that resulted in significant operational and tactical consequences.

The 21st Century: Implications in the South China Sea

Potential Scenario

The complex geopolitical condition in the southwest Pacific, specifically, the South China Sea, does not easily lend itself to forecasting the actions of any of the involved states let alone the preconditions leading to Chinese military action. Many scholars have written extensively on the politics of the territorial disputes in the South China Sea and, as such, the diplomatic circumstances that would precede a Chinese assault are outside the scope of this study. However, a key diplomatic assumption in this scenario is the desire by both parties to keep the scale of potential hostilities to a minimum (i.e. limited war) and focused on the objectives in the South China Sea.

The Spratly Islands lie in the middle of the South China Sea approximately 700 nautical miles south of the Chinese mainland and approximately 400 nautical miles southwest of Manilla in the Philippines. In the northwest quadrant of this island group is Thitu Island, the archipelago's second largest island; Thitu is currently occupied by the Philippines but also claimed by China. A 4300ft airstrip is on the island along with several municipal buildings and approximately 200 Filipino civilians. A small Filipino military contingent of about 50 soldiers garrisons the island as well.[46] The island's

location (at the edge of mainland-based aircraft ranges) and airstrip make it a logical choice for potential Chinese action as China seeks to strengthen its claim to the region.

In comparison to the Falkland Islands, Thitu Island lies at the extreme edge of Chinese continental air forces operating from Hainan and Guangdong (southernmost Chinese provinces).[47] However, aside from the runway that juts out into the water, the island itself encompasses less than a quarter square mile; this is much smaller than the Falkland Islands. There is no formal port facility and approaches to the island are shallow and ringed with coral reefs. The runway is a dirt strip capable of handling aircraft up to the size of a C-130; however, the Philippines currently have plans to pave the airstrip in order to allow for a greater range of aircraft to use it.[48] Additionally, China has a fighter base on Woody Island in the Paracel Islands (approximately 350 nautical miles northwest of Thitu Island) and is currently expanding Fiery Cross Reef (approximately 130 nautical miles southwest of Thitu) to accommodate an airstrip capable of hosting fighter aircraft.[49]

China's current amphibious fleet, one of the largest in the world, is more than capable of seizing a small and poorly defended island – and has done so on several occasions.[50] China continues to strengthen its amphibious capability through development and acquisition of advanced amphibious shipping, connectors, and support aircraft (primarily helicopters).[51] Chinese advances in its aircraft carrier program will only serve to bolster its military advantage in the region. Current estimates on the Chinese carrier program vary; however, it is prudent in this instance to assume at least one aircraft carrier will be fully operational and integrated into amphibious operations prior to possible Chinese aggressive action in the South China Sea bringing with it

roughly 24 fighter aircraft.[52] Chinese air forces operating from the mainland will still need to support any military operations in the South China Sea, as naval aviation alone will be insufficient to defend her fleet while conducting offensive operations.[53]

China possesses over 1000 fighter aircraft ranging from aging J-7 and J-8 third generation fighters to modern J-11 and J-16 fourth generation fighters. The People's Liberation Army Air Force (PLAAF) is currently updating its organizational structure and is transitioning from massive air regiments consisting of 70-120 older aircraft to more flexible brigades consisting of approximately 36 more modern fighters. This makes unclassified force estimates challenging. Eleven air regiments are stationed in the Guangzhou Military Region, which is based in Guangdong Province. This equates to roughly 500 fighter aircraft, of which approximately 175 are in the southern-most bases on Hainan Island and Woody Island.[54] China could possibly surge more fighter aircraft to the air bases on Hainan; however, Woody Island is not likely to be able to accommodate additional aircraft due to its small size and limited infrastructure. This means the bulk of Chinese aircraft operating in the South China Sea would be stationed on Hainan Island – placing Thitu Island at the extreme edge of their combat radius.

The U.S. response to potential Chinese military action in the South China Sea will likely be guided by the U.S. Marine Corps' capstone *Expeditionary Force 21*. The U.S. would composite a Marine Expeditionary Brigade (MEB), composed of elements from the deployed west coast Marine Expeditionary Unit (MEU) and the Japan-based 31st MEU.[55] The total strength of the MEB's Air Combat Element (ACE) would be roughly 30 fighter aircraft comprised of AV-8Bs, F-35s, and F/A-18s.[56] Additional support from naval aircraft in the form of maritime patrol aircraft, such as the E-3 and P-8, would be

likely in order to fill the gap in organic MEB Electronic Warfare (EW) and AEW capabilities. The addition of an aircraft carrier to the task force is a possibility, which would bring 48 additional fighter aircraft, organic AEW and EW platforms as well as multiple warships associated with the carrier battle group. The diplomatic ramifications of placing such an overtly offensive asset in the midst of an already tense situation must be weighed carefully against the benefits of the additional combat power in order to keep hostilities confined to the South China Sea. As such, this analysis focuses on the MEB's aviation operations; however, the lessons would apply equally to the implementation of a carrier air wing.

Chinese Application of South Atlantic War

Chinese military and national defense thinkers have long emphasized the importance of getting the strategy right. Central to China's views on the South Atlantic War is the belief that Argentina failed miserably in assessing British capabilities and intentions as well as over-estimated its own military capabilities. China sees Argentina's failure to prepare for and anticipate the British military response and continued dedication of military assets to the defense of the mainland throughout the conflict as the crucial strategic error.[57]

It is with Argentina's failure in mind that the Chinese would be prepared for a U.S. military response. China would seek a strategy that embraces a protracted conflict while making a U.S. victory appear to be very costly in blood and treasure. Time is on China's side in such a conflict. A short war negates a major Chinese advantage: superior numbers. If the U.S. could quickly assemble and conduct an amphibious assault, China's superior number of aircraft would not be not afforded sufficient time to attrite U.S.

forces. Conversely, a protracted conflict would undoubtedly lead to high casualty levels – a condition that the PLA has historically accepted and, current writings suggest, continues to plan for.[58] However, Chinese military culture has also long stressed Sun Tzu's principle of winning the war without fighting. If the U.S. were to feel that the cost of victory would be too great for a small and insignificant coral island in the South China Sea, it might acquiesce to the Chinese before a shot is fired.

Instrumental to this strategy is the appearance of strength on and near the objective area. In preparation for offensive operations, China might reinforce Fiery Cross Reef and Woody Island with additional aircraft (if able) and ADA. Following the amphibious assault, China would likely exploit its "exclusive use" time efficiently, i.e., rapidly build up combat power and establish a formidable air defense on the islands. China currently boasts one of the most advanced and robust air defense networks in the world.[59] Given the effectiveness of the Argentine ADA in the South Atlantic, it is logical to assume China would make every effort to expand its air defense deep into the Spratly Islands. In conjunction with improved air defense, anticipate that China would improve the airstrip on Thitu Island (if required) to allow for fighter operations. Additionally, in order to maximize the amount of exclusive use time, the Chinese would endeavor to delay the arrival of the U.S. task force through any means available. The Argentines failed to capitalize on their exclusive time; the Chinese won't make the same mistake and thus would strive to make every effort to prepare the operational theater to their advantage.

The Argentines posed little threat to the British LOCs in 1982; the Chinese would certainly contest U.S. LOCs in the 21st century. The Chinese assessed British LOCs in

the South Atlantic to be the "soft underbelly" of the Task Force.[60] China is unable to project significant force beyond the first island chain – even with an operational aircraft carrier – so it is unlikely they would move to completely sever U.S. LOCs running across the Pacific. However, opportune strikes against U.S. logistical assets would serve nearly the same purpose. Such a credible threat would force the U.S. to alter its LOCs to longer and less efficient routes in order to maximize force protection, to include dedicating some of its aircraft to the defense of logistical shipping and thus reduce the number of aircraft available to defend the Task Force. Additionally, attacking the logistical networks would be less risky than attacking the U.S. Task Force directly as air defense capabilities cannot be consolidated upon every logistical convoy. Current U.S. Navy doctrine focuses extensively on the defense of the carrier and the British exhibited similar tendencies in the South Atlantic. Instead of challenging the robust defenses of the carrier, China can be anticipated to focus on lower risk targets such as logistical and support shipping – assets that are vital to sustained combat operations.[61] This would help China preserve its assets in order to mass their forces at the chosen time and place, while degrading U.S. combat power in the region.

The time and place for the Chinese to mass air power is against the amphibious force during the assault onto the contested island. Argentina correctly identified this fact in 1982 and it remains true: the amphibious force is most vulnerable during the assault onto the beach.[62] The lessons of the South Atlantic War can serve China in this regard in several ways.

First, the U.S., like the British, must make an amphibious assault onto the island in order to achieve its objective. China, like Argentina, occupies an island and the U.S.

must take the island by force. Unique to these two scenarios is the fact that all parties involved knew, or would know, the location of the amphibious assault. It is true that the size of the Falklands provided the British with several options for landing sites; however, the islands in the Spratlys are very small and provide no such advantage. This is unlike other major historical amphibious campaigns, such as the Allied assaults into France and Italy in WWII. Even the island hopping campaign in the Pacific in WWII had a level of uncertainty as to where and when the Allies would conduct amphibious assaults. The defenders in these situations had large expanses of territory to cover. The only variable with which the Chinese must contend is when the attack would occur. As the Argentines did, the Chinese would maintain a portion of its air force in reserve, ready to mass against the U.S. amphibious assault.

Second, the Chinese would endeavor to succeed where the Argentines failed during the amphibious assault: they would target the high value amphibious ships. As discussed earlier, Argentina succeeded in massing its forces against the amphibious assault but failed to repel the attack. This was due to Argentina's failure to destroy the amphibious ships that carried the assault force and its supplies. In order to get its attack aircraft in a position to target the amphibious shipping, China might utilize fighter/bomber tactics similar to those employed successfully (although sparingly) by Argentina; the PLAAF could also do so on a much larger scale. The PLAAF would use massive fighter formations to saturate the U.S. air defenses, particularly its CAP aircraft. After the fighters have forced U.S. CAP aircraft to engage, Chinese attack aircraft would be able to maneuver into position to target the amphibious ships. Given the ranges at which Chinese aircraft would be forced to operate, it is likely the attack aircraft would

originate from the airfields in the Spratlys. Aircraft departing from Thitu Island itself could ingress at low altitudes and high speeds and enjoy the coverage of the island's air defenses for portions of their mission. With aircraft operating out of airfields on Fiery Cross Reef, Woody Island, and an aircraft carrier, China would be able to create a multi-axis-of-approach problem for U.S. air defenses, further complicating the situation. Departing from the island airfields would also provide Chinese attack aircraft additional time in the target area. This increases the time available for the Chinese pilots to positively identify the high payoff amphibious ships – a luxury Argentine pilots did not have.

Third, leading up to the assault, China would maintain constant pressure on the U.S. task force, just like Argentina did to the British Task Force. Argentine pressure forced the British to maintain a high operational tempo that had detrimental effects in the form of aircrew fatigue. A key take away from this concept is the fact that Chinese forces would not necessarily have to engage U.S. forces to achieve this objective. To this end, China might use a combination of feints and attacks to present a persistent and credible threat to U.S. forces, to which the Americans will have to plan and adjust. Additionally, the Chinese might use civilian aircraft to further complicate the American air defense targeting process. The relatively tight confines of the South China Sea lend itself to this tactic in particular as the boundaries of multiple different sovereign airspaces – with plenty of civilian air traffic – converge in the region. Argentina employed civilian aircraft to fill a military void (reconnaissance), China, however, would use civilian aircraft primarily to saturate the airspace, with any added military value secondary. The result of these efforts would be a very complex and dynamic targeting situation for U.S.

air defense assets, forcing prolonged periods of acute alertness and leading to increased combat stress and fatigue in aircrew and air defense personnel. Furthermore, U.S. forces would have to honor this threat and, similar to the British, maintain significant standoff from the objective prior to the actual assault. The effect is twofold: greater distance from the target area reduces the threat to the Chinese mainland, and any U.S. movement towards the objective provides China with an added indication of the impending amphibious assault.

Fourth, China would use an aircraft carrier to support combat operations in the South China Sea. Chinese military strategists have already written on the advantages of carrier aviation in South Atlantic War and China would not make the same mistake as the Argentines did in 1982.[63] The addition of an aircraft carrier provides more aircraft but, more importantly, an added attack axis that the U.S. would have to defend against. In the South Atlantic, Britain only had to defend against the single Argentine attack axis from the east. This allowed British defenses to focus on that single avenue of approach.[64] The mobile threat of a Chinese aircraft carrier would stretch the U.S. air defenses and add a layer of complexity, one with which the British did not truly have to contend.

Finally, China has gone to great efforts to dramatically increase its lethality against maritime targets. The inability of the Argentine pilots to damage or destroy more British ships despite their success in penetrating British air defenses left an indelible mark on Chinese military thought.[65] In recent years, China has expanded its air-launched anti-ship cruise missile capability.[66] The result is a very potent and flexible airborne anti-ship threat. This capability, combined with the previous key elements, woul lead to a

greater probability of success of Chinese attacks on U.S. amphibious shipping during the critical stages of the amphibious assault.

U.S. Application of the South Atlantic War

The U.S. response in the South China Sea must encompass a similar A2/AD mindset that the Chinese will likely employ, only it must focus on the amphibious task force. The most significant difference between the two strategies (those of the U.S. and the Chinese) lies in the desired end state. While the Chinese could conceivably succeed by simply making the conflict appear to be too costly to the U.S., the United States would need to retake the contested island by force.

Given the formidable threat the PLAAF poses, the U.S. would need to seek to dominate the skies from the outset of hostilities. This begins with the task organization of the MEB. The British task force had to sail with the forces it had readily available and then reinforce its air component with GR-3s later in the conflict. The U.S. has an advantage in this regard as it maintains a significant presence in the Pacific, and it would need to make every effort to weight the fighter component of the ACE considerably in order to counter the Chinese anti-air warfare threat.

Once within range of Chinese fighters, MEB aircraft would need to aggressively defend the skies through a continuous CAP. Early dominance of the air over the Falklands by the British task force resulted in altered Argentine air operations. Following British supremacy during the initial air assault on 01 May, Argentine pilots went out of their way to avoid the British Harriers, essentially ceding control of the skies.[67] The U.S. would have to strive to achieve similar results.

A key component to this end is the integration of AEW to the MEB's air defense system. The British lack of AEW had a profoundly negative impact on the effectiveness of the CAP aircraft.[68] The inability of Argentine pilots to successfully engage British ships played a large role in the success of British air defenses. Given China's advances in anti-ship missile technology, it would be unlikely to suffer the same pitfall. AEW would provide increased command and control of U.S. aircraft and fill gaps in ship-based radar coverage. The goal is to intercept Chinese fighters before they are able to attack the U.S. task force – a mission the British failed to accomplish. The biggest drawback to this capability would be the requirement for the ACE to defend the AEW platform. This particular mission must be carefully considered and planned for, as Chinese forces would undoubtedly target any high value airborne assets (HVAAs).

Aside from the actual conduct of the air defense, the U.S. should make every attempt to stretch the Chinese air defense. Similar to the British "Black Buck" missions, a credible U.S. threat to the Chinese mainland would force the PLAAF to expend assets in the defense of its vast coastline. Admittedly, the political situation for any conflict against China would be tenuous; but U.S. forces stationed in Japan would have to posture and operate in a manner that would, at least, demonstrate the ability and willingness to strike targets on the Chinese mainland. Such an effort would force China to use aviation assets in defense of the homeland, thus reducing available aircraft for attacking the U.S. task force. Argentina used only a fraction of its military forces in the South Atlantic War and the threat to the mainland played a key role in that decision.[69]

Specific to China's defensive capabilities in the Spratlys, the U.S. would have to respond rapidly to Chinese aggressions in the region. If China is likely to exploit its

exclusive use time efficiently, the U.S. must minimize this time. Once in the region, U.S. forces would need to disrupt Chinese efforts at supplying and strengthening military positions in the Spratlys. The runways on Thitu Island and Fiery Cross Reef are logical targets to reach this end; however, runways can be challenging targets – just as the British discovered with the airfield at Port Stanley – even with today's precision munitions. Smaller point targets such as radar facilities and ADA are often easier to prosecute and still achieve similar effects – degraded defense capability. The small size of the islands in the region should allow U.S. forces to locate and target these types of assets more effectively than the British did in Port Stanley. Even if the runways remain operational, the degradation of the islands' air defenses would allow U.S. forces to target aircraft (particularly transport aircraft) operating out of these airfields more effectively, thus disrupting Chinese efforts to fortify its positions and supply its forces in the region.

Due to the small size of the islands in the South China Sea (Thitu Island is less than a quarter square mile), the location of the amphibious landing would not be a surprise to either party. Notably, the timing of the landing would be the only variable the U.S. has at its disposal. To that end, the U.S. would need to disguise its intentions through a combination of feints and deception. The British Amphibious Task Force used this technique well and was able to delay the Argentine air force response, which served the landing force well in those crucial initial moments of the assault.[70] Any Chinese delay or hesitation in response to the amphibious assault would benefit the landing force.

The final concept the U.S. needs to comprehend from the South Atlantic War case study is the potential cost associated with conflict in the South China Sea. Recent Chinese military modernization efforts have led to a highly capable A2/AD threat in the

region. Losses of U.S. aircraft and shipping would be inevitable, as witnessed by the British over thirty years ago near the Falklands. Despite U.S. air defenses, some Chinese aircraft would get through and hit and damage or even sink U.S. warships. Operational requirements will clash with force protection requirements in a potential military conflict in the South China Sea, just as they did when Admiral Woodward wrestled with the dilemma off the coast of East Falkland in the spring of 1982. Admiral Woodward chose to err on the side of caution, which may not necessarily be the answer in the 21st century, but must be weighed carefully by U.S. military leaders.[71]

Conclusion

The U.S. pivot to the Pacific requires the reevaluation of historical conflicts in order to assess the validity of lessons learned in the context of the Pacific region. The South Atlantic War is the first modern conflict in which an amphibious task force had to account for an enemy capable of implementing a robust Anti-Access/Area Denial threat. At the time the British Task Force sailed from the U.K., Argentina possessed over 200 tactical jet aircraft (most of which were modern, capable fighters) and the Exocet missile – the premier air-launched anti-ship weapon at the time. The British arrived in the Falklands with just 28 Sea Harriers. In hindsight, Argentina's actual performance was much less effective than initially expected. However, the case study still provides unique insights into the characteristics of combating a highly capable and determined enemy at great distances from home. Air operations over the Falkland Islands demonstrated the ability of an amphibious task force to overcome a numerically superior land-based air force. It would be easy to focus on those things the British did well or those aspects that the Argentines could have done better; however, as the U.S. redirects its focus to the

Pacific, greater value comes from viewing this conflict through the eyes of the most dangerous threat to U.S. interests in the region – China.

The territorial disputes in the South China Sea create a breeding ground for potential military conflict, and China possesses the military capabilities to present a very challenging problem in the area. Chinese seizure and subsequent defense of an island in the South China Sea presents a very challenging problem for U.S. planners. Although the South Atlantic War certainly does not provide all the answers, it does give military planners an insight into the means through which China could achieve its objectives in the face of U.S. opposition. The similarities between the South Atlantic War and a potential conflict with China in the South China Sea are hard to overlook: an amphibious task force operating with long logistical lines of communication against a numerically superior land-based air force with a credible A2/AD threat. The key is understanding not only what can be learned from the conflict over the Falklands, but also, more importantly, how the Chinese will apply those lessons. It is in this light that the South Atlantic War is still relevant today.

APPENDIX A

Timeline of Significant Events: South Atlantic War, 1982

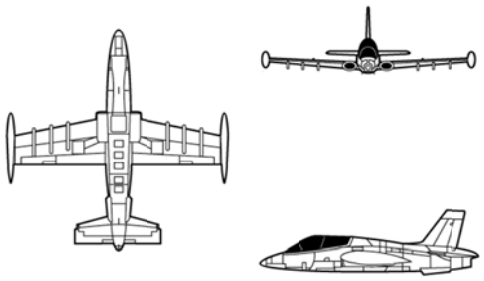
Date (1982)	**Event**
02 April	Argentina Seizes Port Stanley, East Falkland.
05 April	Carrier Task Force sails from England.
25 April	British forces recapture South Georgia Islands.
29 April	Carrier Task Force arrives at exclusion zone. Vulcan bombers arrive at Ascension Island.
30 April	Total exclusion zone goes into effect.
01 May	First Vulcan air attack on Falkland Islands (Black Buck One). First Argentine aircraft shot down.
02 May	*General Belgrano* sunk by British submarine *Conqueror*.
04 May	*Sheffield* sunk by Exocet missile. First Sea Harrier shot down.
07 May	Total exclusion zone extended up to Argentine territorial waters. Amphibious Task Force sails from Ascension Island.
10 May	Final plans completed for amphibious assault.
18 May	Amphibious Task Force links with Carrier Task Force.
21 May	Amphibious assault onto East Falkland begins. First RAF Harrier shot down.
25 May	British landing force ashore on Falkland Islands. *Atlantic Conveyor* sunk by Exocet missile.
28 May	Battle of Goose Green.
02 June	British Forward Operating Base (FOB) with expeditionary airfield at San Carlos open to Harriers and helicopter aircraft.
11 June	Battle of Port Stanley begins.
12 June	Battle for Tumbledown and Wireless Ridge. *Glamorgan* hit by Exocet missile.
14 June	Argentine surrender at Port Stanley.

Source: Hastings, *Battle for the Falklands*.

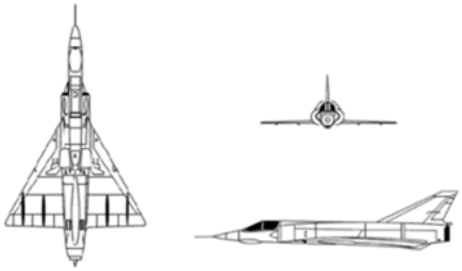
Appendix B

Characteristics of Argentine Fixed-Wing Aircraft, 1982

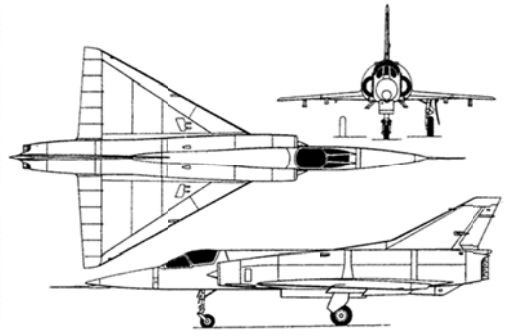
Aermacchi MB-339A
Role: Light attack trainer
Speed: 550 mph
Combat Radius: 500 nm
Armament: 30mm cannon, bombs, or rockets



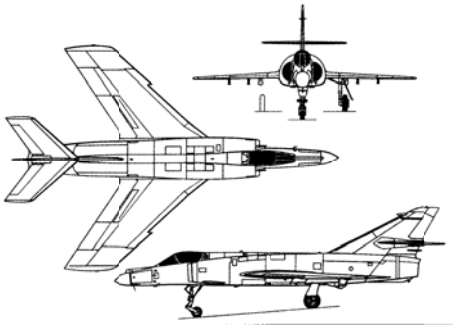
Dassault Mirage III
Role: Interceptor/Ground attack
Speed: >1000 mph
Combat Radius: 500 nm (750nm with external fuel tanks)
Armament: 30mm cannon, air-to-air missiles, bombs, rockets, or air-to-ground missiles



IAI Nesher (Argentine Dagger)
Role: Fighter
Speed: 1300 mph
Combat Radius: 650 nm
Armament: 30mm cannon, air-to-air missiles, bombs, rockets, or air-to-ground missiles



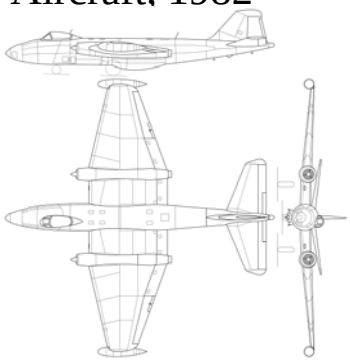
Dassault-Breguet Super Etendard
Role: Carrier-based attack aircraft
Speed: >800 mph
Combat Radius: 600 nm
Armament: 30mm cannon, air-to-air missiles, bombs, rockets, or 1 x AM-39 Exocet Anti-ship missile



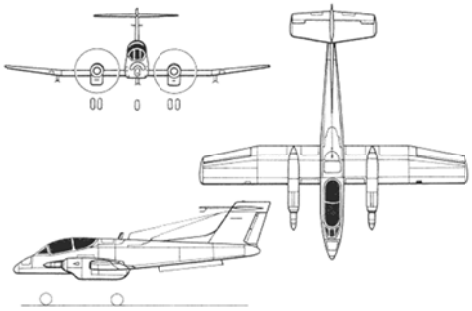
Appendix B

Characteristics of Argentine Fixed-Wing Aircraft, 1982

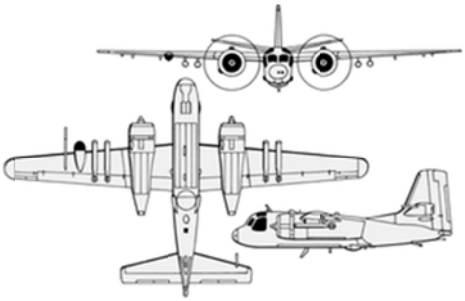
English Electric Canberra
Role: Light bomber
Speed: 550 mph
Combat Radius: 400 nm
Armament: 30mm cannon, up to 5 x 1000lb bombs



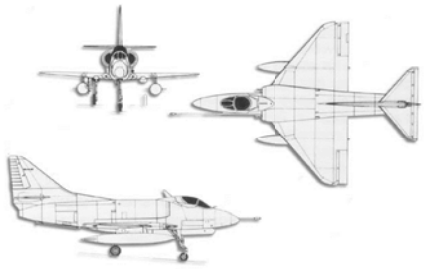
FMA IA-58 Pucara
Role: Light attack
Speed: 350 mph
Combat Radius: 250 nm
Armament: 20mm cannon, bombs, air-to-ground missiles



Grumman S-2 Tracker
Role: Anti-submarine warfare
Speed: 250 mph
Combat Radius: 650 nm
Armament: Torpedoes, rockets, bombs



Douglas A-4 Skyhawk
Role: Light attack
Speed: 680 mph
Combat Radius: 850 nm
Armament: 30mm cannon, bombs, air-to-ground missiles, air-to-air missiles

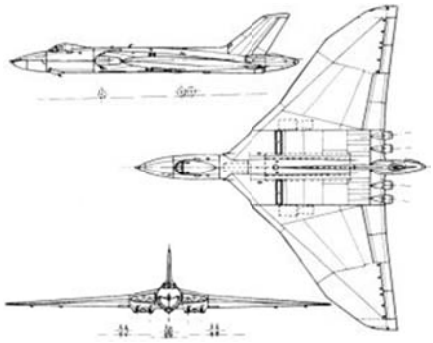


Source: Perrett, *Weapons of the Falklands Conflict*

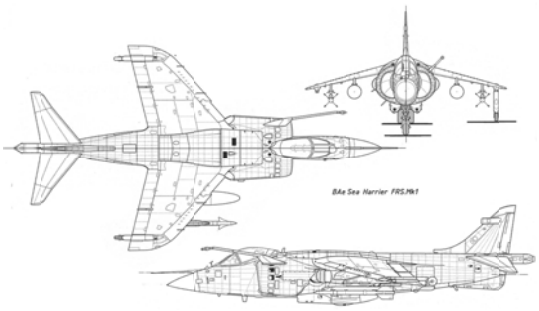
APPENDIX C

Characteristics of British Fixed-Wing Aircraft, 1982

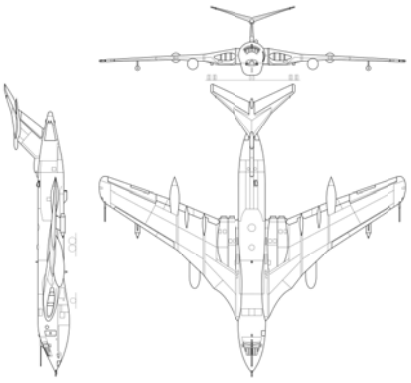
AVRO Vulcan
Role: Long-range medium bomber
Speed: 645 mph
Combat Radius: 2300 nm (without in-flight refueling)
Armament: Nuclear bombs, or 21 x 1,000lb bombs



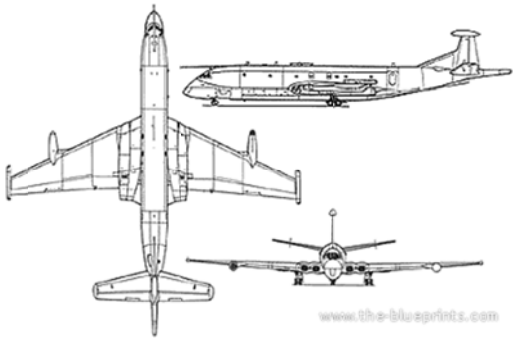
British Aerospace GR-3 and Sea Harrier
Role: Light attack
Speed: 600 mph
Combat Radius: 800 nm
Armament: 30mm cannon, air-to-air missiles, bombs, or rockets



Handley Page Victor K2
Role: Tanker
Speed: 640 mph
Combat Radius: 2300 nm
Armament: None



Hawker Siddeley Nimrod
Role: Anti-submarine and Electronic Support
Speed: 550 mph
Combat Radius: 2800 nm
Armament: Torpedoes, depth charges, anti-ship mines



Source: Perrett, *Weapons of the Falklands Conflict*

APPENDIX D

Table of Fixed-Wing Aircraft Losses: South Atlantic War, 1982

Date	Country	Aircraft Type	Location	Cause
01 May	Argentina	Pucara	Goose Green	Cluster bomb (hit while on ground)
01 May	Argentina	Mirage	North of Falklands	AIM-9L (Sea Harrier)
01 May	Argentina	Mirage	Falklands	AIM-9L (Sea Harrier)
01 May	Argentina	Dagger	West of Falklands	AIM-9L (Sea Harrier)
01 May	Argentina	Canberra	NW of Falklands	AIM-9L (Sea Harrier)
03 May	Argentina	Aermacchi 339	Port Stanley	Crashed while trying to land in bad weather
04 May	Britain	Sea Harrier	Goose Green	35mm Oerlikon (AAA)
06 May	Britain	Sea Harrier (x2)	East of Falklands	Crashed while on patrol, likely due to poor weather
09 May	Argentina	Skyhawks (x2)	Falklands	Crashed while conducting low-altitude attack against ships
12 May	Argentina	Skyhawks (x3)	East of Falklands	Sea Wolf SAM (HMS *Brilliant*)
12 May	Argentina	Skyhawk	Goose Green	Friendly Fire from Argentine AAA
15 May	Argentina	Pucaras (x6)	West Falkland	Destroyed on the ground by British ground forces
15 May	Argentina	Turbo Mentors (x6)	West Falkland	Destroyed on the ground by British ground forces
21 May	Britain	GR-3	East Falkland	20mm (AAA)
21 May	Argentina	Pucara	East Falkland	Stinger Missile (MANPAD)
21 May	Argentina	Dagger	Falklands	Sea Cat SAM (HMS *Argonaut*)
21 May	Argentina	Pucara	Falklands	30mm Gun (Sea Harrier)
21 May	Argentina	Skyhawks (x3)	Falklands	AIM-9L (Sea Harrier)
21 May	Argentina	Daggers (x4)	Falklands	AIM-9L (Sea Harrier)
21 May	Argentina	Skyhawks (x2)	Falklands	30mm Gun (Sea Harrier)
23 May	Argentina	Skyhawk	Falklands	Engaged by multiple weapons including Sea Wolf, Sea Cat, AAA, and MANPADs
23 May	Argentina	Dagger	West Falkland	AIM-9L (Sea Harrier)
24 May	Britain	Sea Harrier	East of Falklands	Crashed shortly after take off from HMS *Hermes*

APPENDIX D

Table of Fixed-Wing Aircraft Losses: South Atlantic War, 1982

Date	Country	Aircraft Type	Location	Cause
24 May	Argentina	Dagger (x3)	West Falkland	AIM-9L (Sea Harrier)
24 May	Argentina	Skyhawk	West Falkland	Engaged by multiple weapons including Sea Cat, AAA, and MANPADs
25 May	Argentina	Skyhawk (x2)	East Falkland	Engaged by multiple weapons including Sea Cat and MANPADs
25 May	Argentina	Skyhawk	Goose Green	Friendly Fire from Argentine AAA
27 May	Argentina	Skyhawk	Falklands	AAA (HMS *Intrepid*)
27 May	Britain	GR-3	Goose Green	35mm Oerlikon (AAA)
28 May	Argentina	Aermacchi 339	Goose Green	Blowpipe (MANPAD)
28 May	Argentina	Pucara (x2)	Goose Green	Blowpipe (MANPAD)
28 May	Argentina	Pucara	East Falkland	Crashed in bad weather
29 May	Argentina	Dagger	East Falkland	Rapier (MANPAD)
29 May	Britain	Sea Harrier	East of Falklands	Crashed off the deck of HMS *Invincible* due to poor weather
30 May	Argentina	Skyhawks (x2)	East of Falklands	Sea Dart (HMS *Exeter*)
30 May	Britain	GR-3	Port Stanley	Argentine small-arms fire
01 June	Argentina	C-130	North of Falklands	AIM-9L (Sea Harrier)
01 June	Britain	Sea Harrier	Port Stanely	Roland (SAM)
07 June	Argentina	Learjet	West Falkland	Sea Dart (HMS *Exeter*)
08 June	Argentina	Skyhawks (x3)	Falklands	AIM-9L (Sea Harrier)
08 June	British	GR-3	San Carlos	Crashed due to mechanical failure
13 June	Argentina	Canberra	North of Falklands	Sea Dart (HMS *Exeter*)

	Losses due to Air-to-Air	Losses due to SAMs	Losses due to AAA	Destroyed on Ground	Losses due to Operational Accidents	Total
Argentina	22	17	3	13	4	59
Britain	0	1	4	0	5	10

Source: Ethell, *Air War South Atlantic*

APPENDIX E

Table of Ship Losses: South Atlantic War, 1982

Date	Country	Name	Type	Cause	Result
25 April	Argentina	Santa Fe	Submarine	Depth charges/ anti-ship missile	Damaged and run aground
01 May	Britain	HMS Arrow	Frigate	Aerial attack	Minor damage
01 May	Britain	HMS Glamorgan	Destroyer	Aerial attack	Minor damage
02 May	Argentina	General Belgrano	Cruiser	Submarine torpedo	Sunk
03 May	Argentina	Alferez Sobral	Patrol Boat	Anti-ship missile	Serious damage
03 May	Argentina	Comodoro Somellera	Patrol Boat	Anti-ship missile	Sunk
04 May	Britain	HMS Sheffield	Destroyer	Exocet missile	Sunk
09 May	Argentina	Narwal	Trawler	Aerial attack	Sunk
12 May	Britain	HMS Glasgow	Destroyer	Aerial attack	Moderate damage
16 May	Argentina	Bahia Buen Suceso	Freighter	Aerial attack	Run aground
21 May	Britain	HMS Argonaut	Frigate	Aerial attack	Serious damage
21 May	Britain	HMS Antrim	Destroyer	Aerial attack	Serious damage
21 May	Britain	HMS Broadsword	Frigate	Aerial attack	Minor damage
21 May	Britain	HMS Ardent	Frigate	Aerial attack	Sunk
21 May	Britain	HMS Brilliant	Frigate	Aerial attack	Minor damage
22 May	Argentina	Rio Iguazu	Patrol Boat	Aerial attack	Run aground
23 May	Britain	HMS Antelope	Frigate	Aerial attack	Sunk
24 May	Britain	RFA Sir Galahad	Amphibious LSL	Aerial attack	Moderate damage
24 May	Britain	RFA Sir Lancelot	Amphibious	Aerial attack	Moderate damage
24 May	Britain	RFA Sir Bedivere	Amphibious	Aerial attack	Minor damage
25 May	Britain	HMS Broadsword	Frigate	Aerial attack	Moderate damage
25 May	Britain	HMS Coventry	Destroyer	Aerial attack	Sunk
25 May	Britain	Atlantic Conveyor	Container	Exocet attack	Sunk
08 June	Britain	HMS Plymouth	Frigate	Aerial attack	Serious damage

APPENDIX E

Table of Ship Losses: South Atlantic War, 1982

Date	Country	Name	Type	Cause	Result
08 June	Britain	RFA Sir Galahad	Amphibious	Aerial attack	Scuttled
08 June	Britain	RFA Sir Tristram	Amphibious	Aerial attack	Serious damage
12 June	Britain	HMS Glamorgan	Destroyer	Land-Based Exocet attack	Serious damage

Total Ships Lost or Seriously Damaged by Type		
Type	**Argentina**	**Britain**
Patrol/Trawler	4	0
Frigate	0	4
Destroyer	0	4
Cruiser	1	0
Amphibious	0	2
Container	1	1
Submarine	1	0
Total	**7**	**11**

Source: Ethell, *Air War South Atlantic*

Endnotes

[1] Jeffrey Ethell, and Alfred Price, *Air War South Atlantic* (New York: Macmillan Publishing Company, 1983), 22-29. The attack was executed in textbook fashion as the string of 21 bombs crossed the runway at an angle of approximately 20 degrees. Despite the well-executed attack, only one bomb hit the runway, one bomb hit the ramp area, the remaining bombs landed outside the airfield area. The runway remained operational and the airfield sustained little damage from this attack.
[2] Lawerance Freedman, *The Official history of the Falklands Campaign*, vol. 2 (New York: Taylor and Francis Inc., 2005), 275-281. Also discussed in Ethell, *Air War South Atlantic*, 48. Following the successful Vulcan Raid, Argentina moved a squadron of Mirage IIIs from Grupo 8 in the south to airbases in the north in order to defend the mainland from potential British attacks. This effectively ensured the conflict would remain limited – at all three levels of war.
[3] Rodney Burden, et al, *Falklands: The Air War* (London: Arms and Armour Press Ltd., 1986), 21.
[4] Freedman, *Official History*, 281-283.
[5] Burden, *The Air War*, 26-27.
[6] Max Hastings and Simon Jenkins, *Battle for the Falklands* (New York: Norton and Company, 1983), 217.
[7] Philip Grove, "Falklands Conflict 1982 – The Air War: A New Appraisal," in *The Falklands Conflict Twenty Years On: Lessons for the Future*, ed. Stephen Badsey, Rob Havers, and Mark Grove (New York: Frank Cass, 2005), 266. Horacio Mir Gonzales, "An Argentine Airman in the South Atlantic," in *The Falklands Conflict Twenty Years On: Lessons for the Future*, ed. Stephen Badsey, Rob Havers, and Mark Grove (New York: Frank Cass, 2005), 80.
[8] Christopher Chant, *Air War in the Falklands 1982* (Oxford: Osprey Publishing, 2001), 61.
[9] Freedman, *Official History*, 443-444.
[10] Freedman, *Official History*, 458.
[11] Gonzales, "An Argentine Airman," 78.
[12] Burden, *The Air War*, 24.
[13] Burden, *The Air War*, 26-27, 188.
[14] Freedman, *Official History*, 276.
[15] Ethell, *Air War South Atlantic*, 48.
[16] Freedman, *Official History*, 257.
[17] Freedman, *Official History*, 422-423, 485-486.
[18] Chant, *Falklands 1982*, 71-76. Of the seven Black Buck missions launched during the course of the war, only four made it all the way to their target in the Falklands (including the initial Black Buck One) and none had significant weapons effects on the runway; the others aborted due to weather or mechanical problems.
[19] Burden, *The Air War*, 25.
[20] Chant, *Falklands 1982*, 53.
[21] Grove, "A New Appraisal," 266.
[22] Hastings, *Battle for the Falklands*, 208.
[23] Grove, "A New Appraisal," 272.

[24] Hastings, *Battle for the Falklands*, 206. Argentine fighters only operated during the day. Night operations were restricted to transport aircraft running the blockade into Port Stanley. Given the on-coming winter, this meant British fighters only had to provide extensive air cover for less than 11 hours each day. Despite this, each Harrier still flew nearly nine hours each day in order to man three CAPs and conduct ground attack missions.
[25] Alastair Finlan, "War Culture: The Royal Navy and the Falklands Conflict," in *The Falklands Conflict Twenty Years On: Lessons for the Future*, ed. Stephen Badsey, Rob Havers, and Mark Grove (New York: Frank Cass, 2005), 203.
[26] Finlan, "War Culture," 203-204.
[27] Burden, *The Air War*, 224-226. Argentina subsequently sunk the *Atlantic Conveyor* with an Exocet missile, however, it no longer had its Harrier aircraft aboard and was with the Carrier Task Force at the time.
[28] Ethell, *Air War South Atlantic*, 70.
[29] Burden, *The Air War*, 25.
[30] Ethell, *Air War South Atlantic*, 44, 54,116.
[31] Chant, *Falklands 1982*, 74.
[32] Hastings, *Battle for the Falklands*, 216.
[33] Freedman, *Official History*, 465-467.
[34] Freedman, *Official History*, 778-779.
[35] Freedman, *Official History*, 216.
[36] Freedman, *Official History*, 218-219.
[37] Bryan Perrett, *Weapons of the Falklands Conflict* (Dorset: Blandford Press, 1982), 106, 130-132.
[38] Burden, *The Air War*, 22.
[39] Freedman, *Official History*, 435.
[40] Burden, *The Air War*, 188, 230-235, 382-385.
[41] Hastings, *Battle for the Falklands*, 203.
[42] Perrett, *Weapons*, 85.
[43] Ethell, *Air War South Atlantic*, 52.
[44] Hastings, *Battle for the Falklands*, 341.
[45] Ethell, *Air War South Atlantic*, 54, 116.
[46] Carl Thayer, "What If China Did Invade Pag-asa Island?" *The Diplomat*, last modified January 16, 2014, http://thediplomat.com/2014/01/what-if-china-did-invade-pag-asa-island/.
[47] Jane's IHS, *Jane's Sentinel Security Assessment – China and Northeast Asia*, Section Air Force, Chapter China, accessed February 15, 2015, https://janes-ihs-com.lomc.idm.oclc.org/CustomPages/Janes/DisplayPage.aspx?DocType=Reference&ItemId=+++1303145&Pubabbrev=CNA. Current Chinese fighter aircraft J-10 and J-11 have a combat radius of approximately 400nm and 800nm respectively. Chinese fighter aircraft in development, the J-16 and J-15 (carrier variant), have combat radii of approximately 800nm. China also possesses several Russian SU-27s and SU-30s which both have similar combat radii of approximately 800nm. All of these combat distances assume no in-flight refueling and minimal external ordnance. (note: nm = nautical mile)
[48] Thayer, "Pag-asa Island."

[49] Jane's, *Sentinel Security Assessment*. James Hardy and Sean O'Connor, "China building airstrip-capable island on Fiery Cross Reef," *Jane's Defense Weekly*, last modified November 20, 2014, http://www.janes.com/article/46083/china-building-airstrip-capable-island-on-fiery-cross-reef.
[50] Daniel Kostecka, "From the Sea: PLA Doctrine and the Employment of Sea-Based Airpower," *Naval War College Review* 64, no. 3 (Summer 2011): 18-19. China has seized islands in the South China Sea claimed by other nations on several occasions. Most recently in 1995, China occupied Mischief Reef, which had been claimed by the Philippines. Earlier instances include clashes with Vietnam in 1988 over Johnson Reef in the Spratlys and the Chinese seizure of the Paracel Islands in 1974.
[51] Lyle Goldstein, "China's Falkland Lessons," *Survival* 50, no. 3 (June-July 2008): 74-76. Kostecka, "From the Sea," 18-21.
[52] Jane's, *Sentinel Security Assessment*. Nan Li and Christopher Weuve, "Chinese Aircraft Carrier Development," in *Chinese Aerospace Power: Evolving Maritime Roles*, ed. Andrew Erickson and Lyle Goldstein (Annapolis, MD: Naval Institute Press, 2011), 214-216.
[53] Kostecka, "From the Sea," 14-18.
[54] Jane's, *Sentinel Security Assessment*.
[55] Department of the Navy, Headquarters United States Marine Corps, *Expeditionary Force 21. Forward and Ready: Now and in the Future* (Wasington, D.C: Department of the Navy, Headquarters United States Marine Corps, 4 March 2014), 23-24, http://www.mccdc.marines.mil/Portals/172/Docs/MCCDC/EF21/EF21_USMC_Capstone_Concept.pdf.
[56] Author's first hand experience. Current USMC TACAIR force laydown assumes six fighters deployed with a MEU, 8-12 fighters assigned to the 31st MEU based in Okinawa, Japan, and 14 fighters permanently stationed in Japan assigned to the 1st Marine Aircraft Wing. The USMC is currently replacing all of its legacy fighter aircraft (AV-8Bs and F/A-18s) with the F-35B (Joint Strike Fighter Short Takeoff/Vertical Landing variant) and the F-35C (Joint Strike Fighter Carrier variant). The actual composition of the ACE in this scenario will depend on the status of this transition at the time of hostilities. Current projections indicate the transition to a total F-35 force will be complete by 2030. The F-35B is far superior to both USMC legacy fighter platforms in all respects; however, individual fighter performance is not necessarily a significant factor in this analysis.
[57] Christopher Yung, "Sinica Rules the Waves? The People's Liberation Army Navy's Power Projection and Anti-Access/Area Denial Lessons from the Falklands/Malvinas Conflict," in *Chinese Lessons from Other Peoples' Wars*, ed. Andrew Scobell, David Lai, and Roy Kamphausen (Carlisle Barracks, PA: Strategic Studies Institute, 2011), 81-82.
[58] Wayne Ulman, "China's Military Aviation Forces," in *Chinese Aerospace Power: Evolving Maritime Roles*, ed. Andrew Erickson and Lyle Goldstein (Annapolis, MD: Naval Institute Press, 2011), 48.
[59] Ulman, "China's Military Aviation Forces," 48.
[60] Yung, "Sinica Rules," 89-90.

[61] James Holmes, "Integrated Chinese Saturation Attacks," in *Chinese Aerospace Power: Evolving Maritime Roles*, ed. Andrew Erickson and Lyle Goldstein (Annapolis, MD: Naval Institute Press, 2011), 417-418.
[62] For an in-depth discussion on the theory and principles of defending against an amphibious assault, see Theodore Gatchel, *At the Water's Edge: Defending Against the Modern Amphibious Assault* (Annapolis, MD: Naval Institute Press, 1996). The text specifically addresses the South Atlantic War as a case study.
[63] Goldstein, "China's Falkland Lessons," 70.
[64] Burden, *The Air War*, 23.
[65] Goldstein, "China's Falkland Lessons," 69.
[66] Andrew Erickson and Jingdong Yuan, "Antiaccess and China's Air-Launched Cruise Missiles," in *Chinese Aerospace Power: Evolving Maritime Roles*, ed. Andrew Erickson and Lyle Goldstein (Annapolis, MD: Naval Institute Press, 2011), 278-281.
[67] Gonzales, "An Argentine Airman," 80.
[68] Grove, "A New Appraisal," 266.
[69] Peter Gray, "Air Power: Strategic Lessons from an Idiosyncratic Operation," in *The Falklands Conflict Twenty Years On: Lessons for the Future*, ed. Stephen Badsey, Rob Havers, and Mark Grove (New York: Frank Cass, 2005), 258-261.
[70] Michael Clapp and Ewen Southby-Tailyour, *Amphibious Assault Falklands: The Battle of San Carlos Water* (Barnsley: Pen and Sword, 2007), 133-140.
[71] Hastings, *Battle for the Falklands*, 216.

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Badsey, Stephen, Rob Havers, Mark Grove, eds. *The Falklands Conflict Twenty Years On: Lessons for the Future*. New York: Frank Cass, 2005.

A compilation of essays written following a conference held at the Royal Military Academy, Sandhurst. The focus of the conference was to re-examine the South Atlantic War and the lessons learned in a contemporary context. It hosted British and Argentine veterans of the war as well as political figures. The essays provide insight derived by those that were involved in the war as well as analysis by professional political and military historians.

Burden, Rodney, Michael Draper, Douglas Rough, Colin Smith, and David Wilton. *Falklands: The Air War*. London: Arms and Armour Press Ltd., 1986.

This is a detailed account of every aircraft that fought in the Falklands War. Every specific tail number that can be traced to the South Atlantic is addressed, including both British and Argentine aircraft.

Chant, Christopher. *Air War in the Falklands 1982*. Oxford: Osprey Publishing, 2001.

This book chronicles the exploits of the British air forces in the Falklands. Specifically, it discusses how the less-capable British Harriers competed with their more-capable Argentine counterparts using superior weaponry. Chant also nicely assesses the Argentine use of the Exocet anti-ship missile.

Clapp, Michael, and Ewen Southby-Tailyour. *Amphibious Assault Falklands: The Battle of San Carlos Water*. Barnsley: Pen & Sword Military, 2007.

Written by the commander of the British Amphibious Task Force, this book covers the leadership and planning challenges associated with executing the amphibious assault onto the Falkland Islands. The statements made in this text corroborate statements made in other texts.

Department of the Navy, Headquarters United States Marine Corps. *Expeditionary Force 21. Forward and Ready: Now and in the Future.* Wasington, D.C: Department of the Navy, Headquarters United States Marine Corps, 4 March 2014 http://www.mccdc.marines.mil/Portals/172/Docs/MCCDC/EF21/EF21_USMC_Capstone_Concept.pdf

The U.S. Marine Corps' capstone document concerning amphibious combat operations in the future. The document addresses current capabilities and identifies the role of future capabilities.

Erickson, Andrew, and Lyle Goldstein, eds. *Chinese Aerospace Power: Evolving Maritime Roles*. Annapolis, MD: Naval Institute Press, 2011.

A collection of essays chronicling China's advance in air and space power. The essays cover China's aircraft and missile development as well as the evolution of the PLAAF's role in the Chinese military.

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This is the British government's official history of the South Atlantic War. The two-volume set comprehensively covers the politics leading up and through the war as well as the military decision-making associated with combat operations.

Gatchel, Theodore. *At the Water's Edge: Defending Against the Modern Amphibious Assault*. Annapolis, MD: Naval Institute Press, 1996.

The author leverages decades of personal USMC experience with historical analysis to examine amphibious operations from Gallipoli to the Falkland Islands to determine why the defenders were unable either to prevent the attackers from landing or to throw them back into the sea after they had fought their way ashore.

Goldstein, Lyle. "China's Falkland Lessons." *Survival* 50, no. 3 (June-July 2008): 62-82.

The author is with the Director of the China Maritime Studies Institute at the Naval War College. The article focuses on applying lessons from the Falklands War to a China-Taiwan scenario. The similarities between the Taiwan scenario and a South China Sea scenario make many of the author's assessments relevant to both situations.

Hardy, James and Sean O'Connor. "China building airstrip-capable island on Fiery Cross Reef." *Jane's Defense Weekly*. last modified November 20, 2014. http://www.janes.com/article/46083/china-building-airstrip-capable-island-on-fiery-cross-reef

This is a contemporary (2014) news article concerning China's efforts to expand its aviation reach into the South China Sea, specifically the Spratly Islands.

Hastings, Max, and Simon Jenkins. *Battle for the Falklands*. New York: Norton and Company, 1983.

This is one of the pre-eminent works on the South Atlantic War. Max Hastings was a journalist embedded with the British military throughout the conflict. He witnessed the war from the beginning of hostilities through the surrender of Argentina at Port Stanley.

Jane's IHS. *Jane's Sentinel Security Assessment – China and Northeast Asia*. Section Air Force, Chapter China. Accessed February 15, 2015. https://janes-ihs-com.lomc.idm.oclc.org/CustomPages/Janes/DisplayPage.aspx?DocType=Reference&ItemId=+++1303145&Pubabbrev=CNA.

The Jane's database is the primary open-source reference for current military dispositions and capabilities.

Kostecka, Daniel. "From the Sea: PLA Doctrine and the Employment of Sea-Based Airpower." *Naval War College Review* 64. No. 3 (Summer 2011): 11-30.

This article discusses the evolution of China's naval air doctrine. The author specifically addresses China's burgeoning aircraft carrier and amphibious shipping capability.

Perrett, Bryan. *Weapons of the Falklands Conflict*. Dorset: Blandford Press, 1982.

This is a technical account of the aircraft, and air defense assets employed by both the British and the Argentines in the war.

Thayer, Carl. "What If China Did Invade Pag-asa Island?" *The Diplomat*. last modified January 16, 2014. http://thediplomat.com/2014/01/what-if-china-did-invade-pag-asa-island/

A contemporary (2014) news article concerning potential hotspots in the Spratly Islands. The article hypothesizes reasons for China to seize Thitu Island.

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This text covers four separate case studies on naval operations, one of which is the Falkland Island War. This is excellent in covering the leadership challenges and planning of British amphibious operations. The data brought forth in this text corroborates that in other sources.

Wood, Peter. "How China Plans to Use the Su-35." *China Brief* 13, no. 18 (September 2013): 10-14.

This article covers the development of the Su-35 in the Chinese military. While doing so, the author outlines the problems associated with the current PLAAF with respect to the South China Sea. Specifically, the challenge of covering such a vast expanse with minimal range capabilities from mainland China.

Yee, Chan Kai. “Chinese troops to seize Zhongye Island back from the Philippines.” *China Daily Mail*. last modified January 11, 2014. http://chinadailymail.com/2014/01/11/chinese-troops-to-seize-zhongye-island-back-from-the-philippines-in-2014/; and Yee, Chan Kai. “China and Philippines: The reasons why a battle for Zhongye (Pag-asa) Island seems unavoidable.” *China Daily Mail*. last modified January 13, 2014. http://chinadailymail.com/2014/01/13/the-reasons-why-a-battle-for-zhongye-pag-asa-island-seems-unavoidable/

> Both Yee articles are Chinese news stories from 2014 concerning the contention for Thitu Island by both China and the Philippines.

Yung, Christopher. “Sinica Rules the Waves? The People’s Liberation Army Navy’s Power Projection and Anti-Access/Area Denial Lessons from the Falkland/Malvinas Conflict.” In *Chinese Lessons from other Peoples’ Wars*, edited by Andrew Scobell, David Lai, and Roy Kamphausen. Carlisle Barracks, PA: Strategic Studies Institute, 2011.

> This article attempts to uncover the lessons China learned by studying the South Atlantic War. The author uses Chinese military writings to outline those concepts Chinese military scholars have identified as key take-aways from the conflict.