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ARGENTINA'S TACTICAL AIRCRAFT EMPLOYMENT IN THE FALKLAND ISLANDS WAR

by

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The aerial forces of the Argentinean Air Force and Navy found themselves in a complex, unenviable position during the 1982 conflict with Great Britain for possession of the Falkland Islands / Islas Malvinas. Despite Argentinean numerical superiority, the modern weaponry and tactical proficiency of the United Kingdom's armed forces were a formidable threat. The Argentineans found themselves in a disadvantaged tactical situation due to a lack of preparation to include planning, intelligence, training, and resources necessary to counter a sophisticated military threat. To lessen their disadvantage, the Argentineans reorganized their Air Force; leveraged the tactical skill, innovation, and determination of their pilots; and employed their newly acquired air-launched Exocet anti-ship missile. This paper examines the context of the Argentinean political situation, explores the condition and reaction of the Air Force and Naval Air Arm to imminent conflict, details the aerial combat employment outcomes, and concludes with an evaluation of the results. Worldwide headlines declared either invasion or liberation on 2 April 1982. These words explained how both London and Buenos Aires felt after the Argentineans seized the Falkland Islands from the United Kingdom. Because of this action, the aerial forces of the Argentinean Air Force and Navy found themselves in a complex, unenviable position during the conflict with Great Britain for possession of the Falkland Islands. Despite Argentinean numerical superiority, the modern armed forces of the United v Kingdom were a formidable foe. The Argentineans were in a disadvantaged tactical situation due to a lack of preparation to include planning, intelligence, training, and resources necessary to counter a sophisticated military threat. To lessen their disadvantage, the Argentineans reorganized their Air Force; leveraged the tactical skill, innovation, and determination of their pilots; and employed their newly acquired air-launched Exocet anti-ship missile. This paper examines the context of the Argentinean political situation, explores the condition and reaction of the Argentinean Air Force and Naval Air Arm to imminent conflict, details the aerial combat employment outcomes, and concludes with an evaluation of the results.

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Preface

One of my childhood memories is watching news footage of Argentinean fighters attacking British ships in the Falklands. These events intrigued me and spurred me to learn more about what happened with tactical aviation in this war. In addition, I wanted to learn more about tactical aviation's role and methods used because of the admirable performance and dedication of Argentina's pilots. This was especially true since their performance exceeded some expectations based on western perceptions of NATO strength in the 1980s.

I discovered that material written from an Argentinean perspective is very difficult to find. Furthermore, my search yielded no source that focused exclusively on tactical aviation. This paper's focus on tactical aviation is only a start on this topic and is by no means complete. To accurately capture the entire picture, further study of this subject matter is needed using original Argentinean sources.

Abstract

The aerial forces of the Argentinean Air Force and Navy found themselves in a complex, unenviable position during the 1982 conflict with Great Britain for possession of the Falkland Islands / Islas Malvinas. Despite Argentinean numerical superiority, the modern weaponry and tactical proficiency of the United Kingdom's armed forces were a formidable threat. The Argentineans found themselves in a disadvantaged tactical situation due to a lack of preparation to include planning, intelligence, training, and resources necessary to counter a sophisticated military threat. To lessen their disadvantage, the Argentineans reorganized their Air Force; leveraged the tactical skill, innovation, and determination of their pilots; and employed their newly acquired air-launched Exocet anti-ship missile. This paper examines the context of the Argentinean political situation, explores the condition and reaction of the Air Force and Naval Air Arm to imminent conflict, details the aerial combat employment outcomes, and concludes with an evaluation of the results.

Worldwide headlines declared either invasion or liberation on 2 April 1982. These words explained how both London and Buenos Aires felt after the Argentineans seized the Falkland Islands from the United Kingdom. Because of this action, the aerial forces of the Argentinean Air Force and Navy found themselves in a complex, unenviable position during the conflict with Great Britain for possession of the Falkland Islands. Despite Argentinean numerical superiority, the modern armed forces of the United

Kingdom were a formidable foe. The Argentineans were in a disadvantaged tactical situation due to a lack of preparation to include planning, intelligence, training, and resources necessary to counter a sophisticated military threat. To lessen their disadvantage, the Argentineans reorganized their Air Force; leveraged the tactical skill, innovation, and determination of their pilots; and employed their newly acquired air-launched Exocet anti-ship missile. This paper examines the context of the Argentinean political situation, explores the condition and reaction of the Argentinean Air Force and Naval Air Arm to imminent conflict, details the aerial combat employment outcomes, and concludes with an evaluation of the results.

Political Situation

In the 1970s, Argentina had severe domestic problems under the Perón government. As a result, General Videlia led a military coup in 1976 and established a military junta to get the country back on track. Although most of the populace initially welcomed the government change, popular support had weakened. In 1981, just four months before the Falkland crisis, President Videlia was in ill health. The current army commander, General Leopoldo Galtieri, used this opportunity and succeeded him as president.

Sustained economic decline and tenuous internal strife had taken a toll on the country. In the midst of this turmoil, the public opinion of the military government was not good. Galtieri needed to rally the nation and refocus the Argentinean people on something besides their domestic troubles. In the words of Rutledge, he played the "nationalistic card" to unite the populace. [1] The object he chose was the Islas Malvinas, whose ownership was disputed with Great Britain. Also known as the Falkland Islands, it is a small group of islands about one-tenth the size of England located about 400 miles to the east of Argentina's southern coast.

The quest for the Falkland Islands was a calculated gamble in the arena of international politics for President Galtieri. Although ownership of the islands had been disputed since the 1830s, he and the junta bet the British would not risk armed conflict to settle his claim to the Falkland Islands. After all, they reasoned that the British population on the islands was small and the islands seemed to fit the exact mold of colonies previously released from the empire.[2] They assumed their occupation would

provide the British a timely opportunity to relinquish sovereignty of the islands.[3] They were wrong.

After the Argentinean invasion on 2 April 1982, the British public was outraged. Parliament held its first Saturday session in almost 30 years and the Margaret Thatcher led government swiftly demanded a full Argentinean withdrawal. When Argentina refused, Britain stated it would retake the islands by force. A Royal Navy convoy departed Southampton three days later for the 8,000 mile, month-long journey. The rapid military response by the United Kingdom surprised the Argentineans because they held fast to the idea that the UK would back down. In the junta's mind, the invasion had simply been a method to force the stalled negotiations. Continuous diplomatic talks had existed since 1965. A nonbinding U.N. resolution, number 2065, recognized the dispute and invited the two countries to seek a peaceful solution.[4] However, in spite of these diplomatic actions, dialogue produced nothing.[5]

A war had not been part of the plan.[6] As international diplomacy picked up pace and worked its course, both militaries feverishly engaged in crisis planning. The US Secretary of State, General Al Haig, visited both countries with the hope of reaching a peaceful agreement, but to no avail. Both sides were resolute. The United States president, Ronald Reagan, also appealed directly to President Galtieri with no success. On 3 April 1982, the United Nations passed Resolution 502 that directed Argentina to withdraw from the Falklands.[7] Six days later, the European Economic Commission placed an arms embargo upon Argentina. Despite a string of diplomatic failures, there was still hope for a peaceful solution. Peru sponsored a proposal that would cease hostilities, withdraw forces, and reengage dialogue.[8] President Galierti and the junta had

decided to sign the agreement but then news arrived that the British submarine, *HMS Conqueror,* had sunk the cruiser *General Belgrano.* Thus on 2 May 1982, a diplomatic solution became unpalatable for the Argentineans. At this point, Argentina found itself diplomatically isolated and domestically pressured to act. With further armed conflict inevitable, the Argentinean armed forces scrambled to prepare for the daunting threat posed by the men and modern weaponry of the British fleet.

Notes

[1] Bernard A. Cook, "Falklands War" Europe Since 1945: An Encyclopedia, (First edition. 2005), 1.

[2] Lawrence Freedman and Virginia Gamba-Stonehouse, *Signals of War: The Falklands Conflict of 1982,* (Princeton, N.J.,: Princeton University Press, 1991), 6.

[3] James S. Corum, "Argentine Airpower in the Falklands War: An Operational View," *Air & Space Power Journal*, Volume XVI, No. 3, (Fall 2002): 59-77.

[4] Freedman, 8.

[5] Ruben O. Moro, *The History of the South Atlantic Conflict: The War for the Malivnas,* New York: Praeger Publishers, 1989, 2.

[6] Cook, 1.

[7]United Kingdom Secretary of State for Defence, *The Falklands Campaign: The Lessons,* CMND 8758, London: Her Majesty's Stationary Office, December 1982, 13.

[8] Moro, 138.

Tactical Military Condition

At the beginning of hostilities, the physical condition and composition of Argentina's tactical airpower was the largest and best equipped in South America[9]. The Argentinean Air Force / Fuerza Aerea Argentina (FAA) had 19,500 men and the Naval Air Arm / Comando de Aviacion Naval Argentina (CANA) had 3,000. The numerical total of forces did not represent actual combat capability because the entire annual conscript class was still involved in training. Despite the fact the new conscript class was not combat ready, morale in the FAA was very high. A strong nationalist, General Lami Dozo, led the FAA and tapped into national pride and honor to inspire and motivate his airmen throughout the build up and execution of the war.

Prior to the war, operational readiness had been an emphasis item of the Air Force leadership.[10] As a result, the manpower and equipment of the tactical forces were not caught completely off guard. Maintenance practices were well established but supply problems were prevalent.[11] Adequate experience levels of maintenance personnel and the pilots' willingness to fly with less than optimum equipment helped partially overcome and mitigate some supply shortfalls.[12] With few exceptions, most of their hardware was much older than the British Harrier and ship-based missile defenses. The overall inventory of the Air Force and Navy consisted of over 250 aircraft with the exact composition varying slightly depending on the source.[13] However, the accepted mix of tactical aircraft included over 140 fighter, attack, and bomber aircraft. The fighter, attack, and bomber aircraft included the A-4, Mirage III, Dagger, Super Etendard, and Canberra. Furthermore, 14 reconnaissance aircraft, and 96 transport, helicopter, and

support aircraft complemented the inventory.[14] This was a significant numerical advantage over the 34 Royal Navy and Air Force Harriers.[15] A specific breakout of each type of Argentinean aircraft is listed in the following paragraphs.

The most numerous attack aircraft in both the Air Force and Navy was the McDonnell Douglas A-4 Skyhawk. The FAA had 48 and the CANA had 20. Acquired from the United States in 1966, this single engine jet had twin 20mm cannons and five weapons stations that could carry up to 5,000 pounds of bombs or missiles. Due to the extreme range to the target area, fuel constraints reduced the typical combat load down to three or four 500-pound bombs. The FAA's newest 25 A-4s were fitted with Ferranti ISIS D126R sights for more precise weapons delivery. They could also carry the first version of the heat seeking Aim-9B missile that was only able to guide on a target from the stern. Of particular note, this missile was vastly less capable than the all-aspect, modern Aim-9L employed by the Harrier that gave the Harrier pilots a significant tactical advantage. The twenty-plus-year-old A-4 suffered some maintenance supply problems due to the United States' 1978 parts embargo.[16] Although the A-4 had a limited combat range, an aerial refueling capability enabled it to fly extended ranges and reach the target area.

The French-built, delta winged Dassault Mirage III brought a supersonic air-to-air and air-to-ground capability. It had two 30mm cannons and five external stations for up to 2000 pounds of bombs or missiles. In an air-to-air configuration, the Mirage III could carry one Matra 530 air-to-air missile or two Aim-9B infrared missiles. The Matra 530 had two variations. The first was a semi-active radar homing missile and the second was an infrared missile. The Mirage III was the premier aerial interceptor of the Argentinean

Air Force and although capable of both air-to-air and air-to-ground operations, it operated exclusively in an air-to-air role in this war.[17]

Israeli Air Industries supplied a derivative of the Mirage III, similar to the Dassault Mirage V, known as the Dagger. It was essentially a Mirage III optimized for an air-to-ground role. In addition to an increased bomb load, it was able to carry Israeli made self-protection infrared missiles. With external fuel tanks, it had a range of about 750 miles.

The newest acquisition was the Dassault Super Etendard with two 30mm guns and five weapons pylons. It was equipped with radar to find enemy ships and an inertial navigation system that allowed it to self-navigate accurately. It had an air-to-air and air-to-ground capability. The weapons pylons could be fitted with the Matra Magic air-to-air heat-seeking missile. They could also be loaded with bombs or the AM-39 Exocet anti-ship missile. Employment of the Exocet missile was the Super Etendard's primary mission for the CANA. Although built for carrier operations, the Super Etendard flew exclusively from ground bases, and like the A-4, it was able to aerial refuel.

Of the fighter, attack, bomber inventory, the only true bomber aircraft was the British Aerospace Canberra. Argentina had up to 10 of these light bombers which were capable of carrying 5,000 pounds of bombs and either 20mm or 30mm machine guns.[18] It had a crew of two and a combat radius of 800 miles. This range provided a capability to strike British targets without the assistance of aerial refueling.

Argentina used three types of aircraft primarily for observation and close air support. They were the FMA IA 58 Pucara, Beechcraft T-34, and Aermacchi 339. The FAA operated approximately 71 indigenously produced Pucaras at the start of the war.[19] This twin-turbo prop had the capacity to carry four 7.62 mm machine guns, two 20mm

machine guns, and bombs. The CANA operated the T-34 and Aermacchi 339. The T-34 was a small turbo prop with four pylons for guns, bombs, or rockets. The Aermacchi 339 carried up to 400 pounds of ordnance. In the war, all three aircraft types flew from bases in the Falkland Islands.

For reconnaissance, the military used three aircraft. They were the Grumman S-2 Tracker, Lear 35A, and Boeing 707. The CANA had two S-2s in inventory. They were equipped with acoustic search equipment and purpose-built for an antisubmarine role. As traditional commercial jets, the Lear 35A and Boeing 707 provided long-range reconnaissance platforms.

The FAA used Lockheed KC-130s for aerial refueling. They only had two refueling aircraft in the inventory and they both provided drogue basket aerial refueling for both Air Force and Navy A-4s and Navy Super Etendards. The KC-130 proved to be a true force multiplier and maintained a high state of readiness and performance during the war.

In the air-to-surface arena, the FAA and CANA used two different types of weapons: non-precision bombs and precision air-to-surface missiles. The vast majority of weapons employed were non-precision “dumb” bombs. The Argentinean bomb inventory included 500 and 1000-pound general-purpose weapons. The FAA inventory was solely of the low drag configuration. Designed for medium and high altitude delivery, the bomb body on these freefall weapons had conical fins. In addition to low drag weapons, the CANA had the high drag 500-pound Mk-82 Snakeye designed for low altitude delivery. Instead of conical fins, it had fins that popped out when the pilot dropped the bomb. The deceleration produced by the fins allowed the aircraft to get away from the fragmentation pattern. As a result, it enabled delivery at lower altitudes than a low drag weapon. The

last type of bomb available to the FAA was napalm, a jellied gasoline mixture, employed by the Pucaras in a close air support role.

The only aerial precision weapons available to the Argentineans were five AM-39 Exocet missiles. Acquired from France with the purchase of the Super Etendards, these missiles are about 15 feet long and weigh 1447 pounds[20]. The missile gets a cue to the target location from the radar in the Super Etendard. After launch, it drops to very low altitude and maintains approximately eight feet of clearance from the water with the help of a radar altimeter. Approaching the cue, an internal radar activates and searches for the target, and when found, the missile guides to impact.

Simply having an inventory of over 200 aircraft, although impressive, does not convey the actual numbers that were combat ready. At any one time, the Air Force and Navy combined never had more than 110 aircraft available due to a lack of parts and spares.[21] General Lami Dozo, Argentinean Air Force Commander, validated this statistic in a post-war comment when he stated the FAA never had more than 82 operational aircraft available.[22] Nevertheless, the Air Force maintained a steady state of readiness that provided a strong foundation for the spin-up to combat.[23]

Notes

[9] Peter Way, *The Falklands War: The Day to Day Record from Invasion to Victory*, Part 6 "Battle in Bomb Alley", (London: Marshall Cavendish Limited, 1983), 108.

[10] Ibid, 68.

[11] Bryan Perrett, *Weapons of the Falklands Conflict*, (Dorset: Blandford Press, 1982), 77.

[12] Earl H. Tilford Jr, "Air Power Lessons," In *Military Lessons of the Falkland Islands War: Views from the United States*, Edited by Bruce W. Watson and Peter M. Dunn, (Boulder, Co.: Westview Press, 1984), 39.

[13] Perrett, 85.

[14] Jeffrey Ethell and Alfred Price, *Air Force South Atlantic*, (New York: MacMillan Publishing Company, 1983), 231.

[15] Wing Commander David K. Norriss, "A Most Unlikely War? High Technology and the Human Dimension in the Falklands War", (Maxwell AFB, Al.: Air War College, 1988), 11-12.

[16] Tilford, 39.

[17] Ethell, 255.

[18] Perrett, 78.

Notes

[19]Lt Col Csaba B. Hezsely, "The Air War in the Falklands 1982: An Argentinean Perspective," Air War College, (Maxwell AFB, Al., 1988), Appendix B.

[20] Robert Hewson, *Janes Air-Launched Weapons*, Issue 44, (Surrey, United Kingdom: Sentinel House, Sep 2004), 147.

[21] Christopher Chant, *Air War in the Falklands 1982*, (Oxford, England: Osprey Publishing, 2001), 37.

[22] Ethell, 26.

[23] Moro, 68.

Military Reaction

The Argentinean military rapidly commenced emergency planning when the political leadership forced a situation with no options other than imminent hostilities. This was Argentina's first armed conflict in over 100 years. Both the FAA and CANA neither anticipated nor practiced against the naval, high-tech threat employed by the British. There was no doctrine to support warfare versus an enemy like Great Britain.[24] Up to this point, Argentina's primary threat was Chile.[25] As a result, the FAA base locations focused primarily westward toward the mountains.[26] A ground threat was forefront in their training and tactics, and the FAA's pilots had never trained to fight an ocean threat.[27] Furthermore, the British naval threat was at the ragged edge of the Argentinean tactical range. The nearest Argentinean base to the Falklands, Rio Grande, was 440 miles away. To face this threat, their employment of airpower had to change. From a tactical airpower perspective, the actions of senior officers in the Air Force and Navy can be broken down into three distinct areas: military structure reorganization, force deployment, and tactics training.

The FAA created three new commands: Strategic Air Command, Air Transport Command, and Air Force South. The Strategic Air Command was responsible for operational mission planning. This included tracking the British fleet, reviewing British war preparations, and creating air-centric battle plans.[28] The Air Transport Command was created to organize and execute airlift operations.[29] Air Force South / Fuerza Aerea Sur (FAS) was a specific command subordinate to Strategic Air Command. FAS, commanded by Brigadier General Horacio Crespo, was created to be the means with

which the Air Force would fight the war.[30] As a result, Crespo received whatever manpower and equipment he wanted to assemble FAS.[31] Once he had the assets identified, they deployed to the southern part of the country.

While the tactical aviation assets in the Navy did not restructure, their location did change. After the cruiser *Belgrano* was sunk, the Navy sent its aircraft carrier and pride of the fleet, the *25 de Mayo,* back to port. It is speculated this action was caused by either mechanical problems, insufficient wind to launch a combat loaded A-4, or fear of the submarine threat. Regardless of the cause, the bottom line result was the Argentinean blue-water fleet remained out of the fight for the remainder of the war. Ground-based air power was to be the primary means to combat the British. As a result, the *25 de Mayo's* aircraft were flown ashore and dispersed to the south of the country in a manner similar to the FAA's aircraft.

The FAA and CANA did not change alone. The junta created a separate, direct reporting command under the command of Admiral Juan Lombardo. The South Atlantic Theater of Operations was created to control the Malvinas Military Garrison, the fleet, and submarines. This command is noteworthy because it independently controlled the tactical aircraft based on the Falkland Islands that included the Pucaras, T-34s, and 339s.

Once aircraft deployed to air bases closer to the Falklands, they still had to optimize their capability for long ranges. The FAA and CANA had four possible courses of action to solve the problem presented by extreme transit distances. They could utilize the two KC-130s to aerial refuel, attempt buddy refueling from A-4s, optimize flight profiles for fuel conservation, or simply accept limited time in the threat environment for target acquisition and threat reactions. Even though the tactical situation did not allow much

flexibility for fighters, these procedures provided the fuel required to get to the target area and return. With fuel conservation as a prevailing factor, the FAA and CANA had to determine the best way to hit targets.

The only force trained to attack ships was the small cadre of pilots in the CANA. The CANA hosted a hurried training program to teach the FAA pilots the ways of sea attack. According to Lieutenant Benito Rotolo, the FAA pilots not only had to learn how to fly very low, they had to change core habit patterns such as relearning new post release actions in a bomb delivery. Air Force pilots normally climb aggressively after releasing their bombs in order to guarantee avoidance of the bomb fragments. The problem faced by pilots attacking warships was this climb lengthened their exposure to enemy fire.[32] Therefore, pilots flew at low altitude on both the ingress and egress. In fact, the goal of Mirage and A-4 pilots was to strive to fly in the target area at the incredibly low altitude of ten feet.[33] This was much easier said than done. Lt Rotolo went on to say that sometimes Air Force pilots felt like they were low enough but they really weren't because they didn't survive. Moreover, it is widely documented that the cockpit visibility was often greatly impaired due to sea salt residue on the windscreen. As the CANA worked with the FAA, they were also busy readying a new weapons system.

The Super Etendard was the Argentinean's newest acquisition. Just four months prior to the embargo, the Super Etendard squadron stood up with five aircraft and five AM-39 Exocet anti-ship missiles. They were, however, far from mission ready. The pilots had received about 45 hours of basic flight training in France, which did not include any tactics.[34] In addition, the jets had not received the final combat configuration that would mate the aircraft's radar and computer to the missile. Since France was an

overtly strong NATO ally to Great Britain, they condemned the Argentinean invasion, voted for the UN resolution, and participated in an arms embargo. Under this premise, the British believed the air-launched Exocet was not operational and therefore did not feel threatened by it.[35] There is dispute on whether French technicians assisted the CANA in the maintenance with some sources stating that the French already had technicians in country and did not recall them.[36] As the Argentine mechanics worked around the clock on the project, some speculate the French technicians provided assistance while others insist the CANA did it alone.[37] Whether or not the CANA got outside help is irrelevant to the result – the Exocet was ready.

While maintenance worked on the modification, the pilots worked on employment options. This included practice of short-field takeoff and landings to determine if sustained operations from the 4100-foot runway at Port Stanley were feasible. They learned it would only be suitable for emergency landings. In addition, they honed their skills as they practiced air-to-air refueling, low flight practice and navigation, radar map mechanics, attack profiles, and weapon employment tactics. The CANA pilots flew training profiles against various types of ships and honed their skill through repetition.[38] This coordinated exercise enabled them to determine actual radar horizon, detection distances, reaction times, and radarscope interpretation for mapping and cueing the Exocet. In April, they deployed from Espora southward one thousand miles to Rio Grande and declared themselves combat mission ready on 19 April 1982. This was a mere two weeks before they launched the first Exocet.

The FAA performed an assessment of low-level training and tactics by executing realistic attack scenarios on their own navy's type-42 destroyer that had similar detection

abilities as the Royal Navy. This dress rehearsal proved very beneficial for pilot proficiency but somewhat somber due to the exercise's resultant survival rates. Although the air force pilots disagreed with the destroyer crew, results indicated a 25% survival rate for the attacking formations.[39] The true test would be with live weapons against real men and machines.

Notes

[24] Hezsely, 11.

[25] Colonel James Forsyth, "War, Peace, and Politics," lecture, Air Command and Staff College, Maxwell AFB, Al., 12 January 2005.

[26] Corum, 3.

[27] Ethell, 26.

[28] Hezsely, 8.

[29] Ibid.

[30] Moro, 88.

[31] Ibid.

[32] Ethell, 29.

[33] Paul Eddy; Magnus Linklater; and Peter Gillman, *War in the Falklands: The Full Story*, (New York: Harper & Row, 1982), 216.

[34] Ethell, 27.

[35] Eddy, 169.

[36] Ibid.

[37] Otero, 27 & Freedman, 133.

[38] Ethell, 28.

[39] Moro, 79.

Combat Employment Results

As Argentinean forces geared up to defend the islands, the overall strategy called for a target selection hierarchy. The primary target set was the two British aircraft carriers. The secondary target set was all other ships in the British armada.[40] Finally, if an amphibious landing took place on the islands, the tertiary target was fielded forces. To support this plan, dedicated escort and sweep aircraft were to eradicate the fleet's Harrier aircraft. They attempted to execute this plan on the first day of aerial combat, 1 May 1982. Over the course of the day, the FAA and CANA launched over one hundred attack aircraft sorties. Their perception of the attacks was positive and based on this view, their morale was very high. In hindsight, actual implementation did not meet the planned objectives.

True to von Moltke's prediction of war plans, this plan's actual execution did not survive first contact with the enemy. As changes in the tactical situation emerged, the Argentineans continually adapted to change and fought with unrelenting bravery. The British understood this and fully recognized the FAA and CANA to be well trained and aggressive. The outcomes of Argentinean tactical combat employment are divided into air-to-air engagements, air-to-surface attacks on shipping, and air-to-surface attacks on fielded forces.

The air-to-air scoreboard is ambiguous because the final numbers depend on the source. Most sources give a distinctly one-sided advantage to the British. Their Harriers downed 20 aircraft with the Aim-9L and four with the 30mm gun.[41] The Argentinean results are vague. *Armed Forces Journal International* reported four of the nine Harriers

the British lost might have been killed in air-to-air combat.[42] The Argentineans claim 17 confirmed Harrier kills.[43] The official British records for the Falklands Campaign lists nine Harrier losses with no cause specified.[44] Ethell and Price repeat the nine aircraft number and state all nine were lost to reasons other than air-to-air. The only quantifiable British loss acknowledged by both sides occurred when an FAA Pucara shot down a Royal Marine Scout helicopter.[45] While the truth may never be known, the methods employed by the FAA and CANA throughout the war can be deduced. The air-to-air engagement philosophy of the FAA changed as the war progressed and was divided into two phases: direct attack and avoidance.

The first phase was direct attack. The Argentineans were confident in their abilities and flew straight at the British. This phase started and ended on the first day of aerial combat on 1 May 1982 when four separate air-to-air fights took place. The first one was between two Mirage IIIEAs and two Harriers. Each side knew its weapons system well and judiciously stayed in its area of advantage.[46] For the delta winged Mirage, high altitude combined with high speed were its exclusive realm. The subsonic Harrier, on the other hand, was better suited for lower altitudes and lower speeds. Each set of aircraft stayed outside the others' weapons envelopes for several minutes until the Mirage flight ran low on fuel, disengaged, and returned to base. In the second engagement, two Mirage IIIEAs shot missiles for the first time. It is speculated the missiles were semi active Matra 530s. The shots were ineffective. Based on interview data from the targeted Harriers, the missiles were apparently shot without a radar lock because neither Harrier had missile warning indications.[47] In addition, the missiles were apparently shot at too great a range to be effective. This may have been a tactic by the Mirage pilots to attempt

a surprise kill because they had low confidence in their aged missiles compared to the British Aim-9L.[48] After the missed missile shot attack, the Mirages returned to base.[49] The third engagement resulted in the destruction of two Mirage IIIEAs by the Harrier's Aim-9L.[50] The fourth fighter engagement was between two Daggers and two Harriers, and resulted in a single missile shot by both sides. The Dagger's shot was a miss and the Harrier's shot downed a Dagger.[51] The tactical aircraft scoreboard after day one: Argentina – 0, Britain – 3.

The resultant events of day one caused the Argentinean headquarters to make a change in tactical air strategy. Another strong influence for this tactical shift occurred after the BLACKBUCK 1 mission whereby an RAF Vulcan bombed the Port Stanley airfield.[52] The British ability to bomb strategic targets from 8,000 miles away stunned the Argentinean general staff who now perceived the mainland to be threatened. As a result, the best air-to-air fighters in the inventory, the Mirage IIIEAs, were thereafter relegated primarily to coastal defense against possible bomber attacks.[53] With this decision, the Argentineans discarded the goal of air superiority over the Falkland Islands.[54] Daggers and A-4s did ground attack exclusively after the first day. The losses of day one to the Harrier were simply not sustainable and the FAA did not seek a war of attrition. Since the British had not started a land campaign yet, the FAA cut back the sortie rate in anticipation of surge operations when the ground war began.[55]

With the premier air-to-air fighter relegated to coastal defense, the second phase of air-to-air employment was avoidance. In this phase, the FAA and CANA did not intentionally engage in combat with the Harrier. The pilots fully recognized and respected the all aspect threat of the Aim-9L.[56] In addition, fuel was a precious

commodity for the fighters. Since the ranges were extreme, the Mirages and Daggers were unable to exploit their tactical advantage of speed. Another contributing factor to this avoidance phase was the overall battle tactic used by the FAA and CANA. In this phase, the goal was to overwhelm the British ship defenses with mass. If the pilots deviated to engage the Harrier combat air patrols, they may have forfeited the achievement of critical mass.[57] Because of combat experience, coastal defense priorities, tactics adjustments, and lack of fuel, the FAA and CANA shifted focus almost exclusively toward air-to-surface attack.

Tactical strikes were the primary method the Argentine general staff used to attack the British fleet because tactical aircraft were the only assets capable of inflicting damage on the British fleet. This was due to the geographic isolation of the islands from the mainland coupled with a lack of participation by the surface Navy. The results of air-to-surface attacks on ships, while more definite than the air-to-air results, still cause disagreement from each side. At the low end of the scale, the British acknowledge the loss of six ships.[58] Other sources refer to nine ships damaged or lost.[59] At the high end of the scale, 29 British ships are claimed to have been damaged in addition to nine destroyed.[60] Regardless of the exact number, tactical airpower proved to be Argentina's primary instrument of force application in this war. The execution of air-to-surface attacks against ships can be broken down into two categories: precision and non-precision.

As already stated, the only precision weapons available were five AM-39 Exocet missiles employed by the CANA's five Super Etendards. The squadron had prepared for months to hone methods of employing this weapon. Tactics created and practiced

involved a two-ship rendezvous and refuel with a KC-130, descent to low altitude at 130 miles, and receipt of updated ship position from the S-2 reconnaissance aircraft.[61] At approximately 50 miles from the target area, the formation would climb to approximately 2,000 feet and search with their radar. When the target was located, the pilot would cue the weapon and launch the missile at approximately 30 nautical miles. Once the pilots launched the missiles, they would turn back to base. The design of this attack profile kept the Super Etendards well clear of any missile threat from the fleet.

The Super Etendards employed all five Exocets over the course of three carefully planned missions. The desired targets for this weapon were the two aircraft carriers. On the first mission, they launched two Exocets. This attack resulted in the destruction of guided missile destroyer *HMS Sheffield.* The second mission used similar tactics and shot two Exocets. This attack hit and eventually sank the cargo ship *Atlantic Conveyor.* The final missile was launched in a combined attack package of two Super Etendards and four A-4s armed with two 500-pound bombs.[62] The mission planned for the missile-equipped Super Etendard to launch against an aircraft carrier. The A-4s then followed the missile's smoke trail and attacked what remained. The results of this attack are highly contentious. The Argentineans claim to have hit the aircraft carrier *HMS Invincible*. Most sources dispute this claim.[63] The final tally of precision weapon effectiveness is five missiles expended with two definite hits.

The vast majority of air-to-surface weapons employed against ships were non-precision bombs and bullets. The FAA and CANA flew hundreds of tactical attack sorties in this role. This large number was primarily because non-precision weapons were the most numerous. A big disadvantage of the Argentine's non-precision weapons

was the close range required to deliver the weapons. Whether employing bombs or bullets, the nature of the attack profiles exposed the pilots to British ships' gun and missile defenses. As a result, the pilots were constantly in a tedious balancing act of self-preservation and mission success. The tactical employment methods of Argentine pilots evolved over the course of the war. They started with combined medium and low altitude attacks, moved entirely to low altitude attacks, and finally used mass and multiple attack headings to overwhelm enemy defenses. Key defining points of tactical execution took place on the first day of aerial conflict, the build up prior to the British amphibious landings, and operations after ground landings.

In concert with the direct attack phase of air-to-air employment, the first phase of non-precision air-to-surface employment took place on 1 May 1982. The FAA and CANA launched 37 dedicated fighter attack sorties in addition to air-to-air escort, reconnaissance, and aerial refueling missions.[64] These missions took place in four packages that all used low and medium-altitude attacks. The plan for the first package included 12 bomb-loaded A-4s escorted by four Mirage IIIEAs and four Daggers. Due to an incorrect vector by the ground-controlled radar facility on the islands, this package never found the enemy.[65] The second package was three bomb-loaded Daggers that successfully attacked three British ships that were bombarding Argentine army positions near Port Stanley.[66] All six of the Dagger's bombs expended missed their intended targets and their machine gun fire only caused minor damage. While this attack did not achieve target destruction, it greatly boosted the morale of the pilots and the Argentinean soldiers who watched the attack from shore. The third package was much bigger than the second and was designed for 24 A-4s. Despite their large size, only one flight of four jets

actually found and attacked a ship in the target area. This ship turned out to be a friendly merchant vessel that had recently delivered cargo to the island. Two bombs found their mark but failed to explode.[67] The final air-to-surface package for the first day had two flights of three Canberras at medium altitude who failed to find a target. In addition, Harriers shot one down with an Aim-9L. The air-to-surface results of the first day were not impressive. Only three aircraft found British ships and their attack inflicted superficial damage.[68] Despite the fact of minimal damage to the enemy, Argentinean pilots, in the heat of battle, perceived greater success. This perception, combined with confidence of surviving the first day of combat, bolstered the pilots' morale. The junta press office and military public affairs attempted to foster this notion and only released exaggerated stories that emphasized success.[69] Despite good morale, the Argentinean losses suffered on the first day coupled with the realization the British had not landed ground troops caused the FAA and CANA to reduce their sortie rates and avoid a war of attrition.[70]

The second timeframe of Argentine air-to-surface non-precision operations took place prior to the British ground force landings. This reduced sortie rate period was different from the first day of attacks because tactical operations centered on force deployments, preparation, and few ship attacks. The CANA's A-4s deployed from the aircraft carrier, *25 de Mayo*, to the mainland bases in the south. No non-precision air-to-surface activity took place for a week after the first attacks. On 9 May 1982, eighteen A-4s launched to attack a frigate and a destroyer near Port Stanley. Due to inclement weather, three crashed and the remainder returned to base.[71] Three days later, eight A-4s attacked the *HMS Glasgow* with 500-pound bombs and hit it with one bomb that pierced

a hole all the way through the hull. Shipboard missiles shot three of the eight down and a fourth jet was lost due to fratricide caused by anti-aircraft fire near Goose Green. The loss of four A-4s yielded a tactical victory when the *HMS Glasgow* permanently withdrew from the combat area for repairs.

Headquarters staffs used this time and pored over the combat reports and details to glean any helpful information to refine tactics. One of the common trend items they failed to recognize quickly was that the bombs generally did not detonate.[72] Many have studied this problem and the common consensus is the bombs were either fused incorrectly or delivered at too low of an altitude to arm. The fuses in general purpose bombs are set on the ground and have two function settings. The first setting determines the time delay required for the weapon to arm. Ideally, the fuse arm time allows adequate time for the pilot to drop the bombs and escape the bomb blast. If the arm time is too short, the pilot and aircraft risk destruction by bomb blast fragments. If the delay is too long for the flown delivery profile, the bomb will dud upon impact. The second setting, the fuse delay, determines how long the bomb waits to explode once it hits a target. This is important to get desired weapons effects. If the bomb explodes immediately upon impact, the blast will occur outside of the ship. If the delay is too long, the bomb will simply pass through the ship and detonate. If the pilots failed to utilize both fuse functions, they would not be able to optimize weapons effects. Despite numerous unexploded bombs, tactics failed to adjust for this weakness in this phase.

The third defining point that changed non-precision air-to-surface tactics was the commencement of ground attacks once the British amphibious landings started on 26 May 1982. Tactical employment changed at this time for two reasons. The FAA and

CANA had to support the Argentinean ground troops and the predictability of amphibious operations made the British targets easier to find and hit. As a whole, the British fleet operated closer to the islands in order to support troop landings in the Falkland sound. The Argentinean air staff decided to focus attacks on shipping instead of troops. This was due to the assumption that conventional general-purpose bombs had a low probability of inflicting damage to British ground forces. The reason for this logic was the postulation that the majority of bomb blast force would be absorbed by the island's soft terrain. Another reason for a ship-centric strategy was the difficulty required to find and attack small targets.[73] Tactical forces executed this game plan when the amphibious assault started.

The first tactical aircraft to attack the British amphibious force was an island-based Aermacchi 339 that damaged the *HMS Argonaut*. The FAA attacked with four formations throughout the day that included Daggers, A-4s, and air-to-air Mirages. They exclusively used low-altitude ingress, target attack, and egress tactics. Their work resulted in the destruction of the frigate *HMS Ardent* as well as damage to three other frigates and a destroyer in the Falkland sound.[74] The CANA A-4s flew disciplined attack profiles at slightly higher low altitude elevations that allowed adequate bomb time of flight for weapons arming. While terminal attack profiles improved, one flight of A-4s compressed their time over target too tightly behind the lead formation and sustained battle damage.[75] Generally, follow-on attacks must deconflict from bomb explosion fragments by time or altitude. Since the game plan was to attack at low altitude, formations planned to allow at least 20 seconds spacing between attacks for timing deconfliction. The Argentine cost of the first day of amphibious attack was the loss of 12

tactical aircraft.[76] Two days later, some of the FAA's aircraft were equipped with 500-pound, parachute retarded bombs in an effort to make bombing more accurate.[77] 64 FAA aircraft attacked shipping in the Falkland sound and successfully sank the frigate *HMS Antelope*. High sortie rates continued and on 25 May 1982, A-4s executed a simultaneous, multi-axis attack on the destroyer *HMS Coventry* with 500-pound bombs.[78] This new tactic overloaded the capacity of the ship's defenses and resulted in a destroyed ship when the A-4's bombs exploded upon impact.

Tactics and force composition developed throughout the war and reached the highest complexity in this phase. Sometimes, attack aircraft used the more accurate navigation systems of Lear 35s or in one case, Super Etendards, to locate targets.[79] In addition, tactics matured and used Lear 35s and Mirage IIIs as decoys to divert Harrier combat air patrols from the actual attack aircraft.[80]

While not the deliberate focus of this last phase, the Argentineans did attack fielded forces. On 27 May 1982, two Canberras attacked British troops before sunrise and destroyed some equipment. The same day, eight A-4s inflicted numerous casualties and destroyed supplies.[81] Island-based Pucaras dropped napalm and Aermacchi 339s strafed troop positions.[82] Despite their dogmatic attacks, these close air support aircraft failed to produce substantial results and suffered high rates of attrition. In fact, the island-based Pucaras and 339s did not kill any British troops.[83]

As Argentinean forces planned to defend the islands, their chosen strategy of tactical aviation aimed to attack British aircraft carriers, ships, and fielded forces. The FAA and CANA sought this goal with hundreds of attack sorties combined with numerous dedicated aerial refueling, air-to-air escort, navigation, and reconnaissance support

sorties. The outcome of Argentina's dedicated tactical air-to-air sorties produced no confirmed kills. The only confirmed Argentinean air-to-air kill took place when a Pucara shot down a Scout helicopter on a close air support sortie. Tactical air-to-surface missions versus shipping proved significant and netted six destroyed and numerous damaged British ships. Tactical air-to-surface missions versus fielded forces were not instrumental and only netted minimal damage and casualties.

Notes

[40] Tilford 44.

[41] United Kingdom Secretary of State for Defence, 45.

[42] Anthony H. Cordesman, "The Falkland Crisis: Emerging Lessons for Power Projection and Force Planning," *Armed Forces Journal International*, September 1982, 32.

[43] Moro, 329.

[44] United Kingdom Secretary of State for Defence, Annex C.

[45] Ethell, 248-249.

[46] Chant, 44.

[47] Ibid.

[48] Ethell, 63.

[49] Chant, 45.

[50] Perrett, 87.

[51] Chant, 45.

[52] Eddy, 160.

[53] Chant, 49.

[54] Ethell, 73.

[55] Hezsely, 14.

[56] Colonel Marcus Carballo, Fuerza Aerea Argentina, interview, Air Command and Staff College, Maxwell AFB, Al., January 20, 2005.

[57] "The Falklands: The Air War and Missile Conflict," *Aviation Week and Space Technology*, September 8, 1982, 34.

[58] United Kingdom Secretary of State for Defence, Annex C.

[59] Ethell, 253.

[60] Moro, 331.

[61] Martin Middlebrook, *The Fight for the 'Malvinas': The Argentine Forces in the Falklands War*, (London: Viking, 1989), 123.

[62] Middlebrook, 202.

[63] Middlebrook, 202 & Falklands Campaign Lessons, 14.

[64] Ibid., 84.

[65] Ibid., 83.

[66] Ethell, 67.

[67] Middlebrook, 89.

Notes

[68] Chant, 42.
[69] Middlebrook, 94.
[70] Hezsely, 14.
[71] Middlebrook, 127.
[72] Ethell, 91.
[73] Moro, 220.
[74] Ethell, 253.
[75] Middlebrook, 160.
[76] Ethell, 238.
[77] Moro, 233.
[78] Middlebrook, 171.
[79] Ibid., 202.
[80] Chant, 74.
[81] Moro, 53.
[82] Middlebrook, 191.
[83] Ethell, 223.

Evaluation of Results

Simply put, Argentina lost the Falklands War. In spite of this fact, tactical aviation forced the British to pay a hefty price for victory. Argentina's tactical aviation was instrumental in the war and inflicted the most damage on the British fleet. Even though tactical aviation was never the sole solution to the junta's predicament, it could have accomplished more. An analysis of Argentina's tactical airpower yields two specific root causes and two contributing factors in both the air-to-air and air-to-surface mission areas. A root cause is the single item that would yield a different result if corrected. The two root causes for Argentina's less than optimum tactical effects in both air-to-air and air-to-surface employment are inadequate equipment and training. This determination was deduced from the premise that the true measures of tactical performance are weapons effects and force survival.

The air-to-air performance of the FAA and CANA is best summarized as ineffective. This was due primarily to inadequate equipment and training with contributing factors of extended ranges and strategic decisions. The Mirage IIIEAs and Daggers were respected aircraft despite their age but their equipment limitation was lack of modern air-to-air missiles. Their infrared missiles were only stern aspect and this greatly limited their tactical utility against the Harrier's all-aspect capability. A contributing factor to inadequate equipment was the fact the Mirages and Daggers were not aerial refueling capable. The geographic location of the fight from mainland Argentina caused severe fuel limitations for these aircraft. Another contributing factor to air-to-air ineffectiveness was the general staff's decision to relegate the Mirages to mainland coastal defense after

the Vulcan bomber attacks on the islands. The second root cause in air-to-air employment was inadequate training. Even though the combat seasoned Israelis trained the FAA's pilots, they were not ready for combat with the British.[84] On the first day, they realized their aircraft's optimum employment envelope but failed to properly launch missiles. Realistic training would have enforced proper employment habit patterns. In addition, training with live-fire exercises may have identified short falls in missile reliability and decreased malfunctions in combat.

Air-to-surface attacks also failed to attain their potential effectiveness. Like the air-to-air mission, this failure was primarily due to equipment and training inadequacies. Contributing factors were lack of intelligence and aerial refueling assets. As for equipment inadequacies, FAA and CANA aircraft were not properly equipped to combat a modern threat array. The Falkland Islands based tactical aircraft such as the T-34, Pucara, and Aermacchi 339 were effective for insurgency operations but not high-tech threats like shipboard defenses, Blowpipe missiles, or the Aim-9L. The mainland based tactical aircraft such as the A-4, Mirage, Dagger, and Canberra were disadvantaged because they lacked defensive electronic countermeasures. If they had the ability to electronically jam a hostile weapon's radar, they could have had much higher survival rates. In addition, many aircraft lacked the ability to dispense chaff and flares to defeat enemy radar or missiles. By the end of the war, several Daggers, A-4s, and Canberras were equipped with chaff and flares but none proved to decoy a missile.[85] Finally, Argentine aircraft did not have an all weather capability. One third of the aircraft launched in this war either returned to base or cancelled their mission due to weather.[86] The combination of systems limitations increased attrition, limited effectiveness, and

created a vulnerability that directly influenced the extremely low altitude tactics used in ship attacks. Of the weapons delivered from this tactic, only 50% of bombs fused.[87] There are many reasons for this problem. Equipment inadequacies contributed since many munitions were old and had decayed wiring.[88] In addition, few high-drag weapons were available since military planners failed to procure adequate numbers of them prior to the war. Finally, only five precision weapons existed. The EEC Embargo proved to be the causal factor for their failure to acquire additional Exocet missiles from France. Faced with less than optimum equipment, inadequate training emerged as the second root cause in air-to-surface employment.

As the war progressed, low-altitude tactics prevailed because they were the only method able to balance survivability concerns and weapons accuracy. Unfortunately for the FAA and CANA, up to 50% of weapons delivered from this tactic impacted in a safe configuration because they failed to achieve enough time of flight to fuse arm.[89] This high dud rate was due to lack of preparedness and training.[90] The pilots continuously flew too low to get the fuses to arm.[91] Few pilots were disciplined enough to climb prior to weapons release to ensure adequate arm time for the bombs. Except for a quick pre-war spin-up, the FAA's pilots never received specific training on ship attacks. As a result, low altitude employment training was not adequate to achieve weapons effects. If the FAA and CANA had practiced these attack scenarios before the war, tactics and training procedures for multiple delivery profiles could have been honed. Finally, realistic training did not adequately prepare pilots to use chaff and flare dispensers. Although some aircraft were equipped with these systems, pilots did not properly utilize them when they faced enemy threats. The final training inadequacy was a lack of night

proficiency. With the exception of Canberra pilots, none of the other tactical aircrews were trained in night operations.[92]

There were several contributing factors to air-to-surface employment. The first factor was scarce intelligence. Inaccurate, outdated intelligence was a trend through out the war.[93] In fact, many sorties never found targets and were wasted due to lack of accurate information.[94] As a result, pilots simply flew to the target area and bombed whichever ship they saw.[95] One method the Argentineans used to find aircraft carriers position was to dead reckon the fleet's position based on Harrier flight paths based on island-based radar data.[96] Another technique used to track British ships close to the islands was spotters on mountaintops.[97] Airborne reconnaissance by the S-2 was unreliable due to serious maintenance problems that grounded the aircraft.[98] These breakdowns were not exclusively the fault of intelligence officers and equipment because attack pilots often provided inaccurate battle damage assessments that contributed to the fog of war.

Lack of sufficient aerial refueling assets was the second contributing factor. Due to the distance required to fly to the islands, tactical aircraft rarely had enough fuel in target area. Two minutes was the average time attack aircraft had available in the target area.[99] The two KC-130s performed admirably but they needed more. The combination of not enough aerial refueling assets and geographic location of the fight caused minimum time in the target area and very predictable flight paths. These repeated flight paths made tactical aircraft more vulnerable to Harrier combat air patrols. Another issue planners had to deal with was how aircraft package flow bottlenecked at the tanker. Based on limited tanker availability, flights attacked in sequential formations instead of larger force

packages. This frustrated and sometimes mitigated planned tactical efforts to overwhelm enemy defenses with mass attacks.

Argentina's tactical aviation was very influential in this war and the pilots' performance was commendable. However, despite some combat success, the senior staff's lack of forethought into both probable and possible threats resulted in the tactical air forces being inadequately prepared for this war.[100] They had neither the equipment, nor tactics, nor training to optimize tactical employment. If the FAA and CANA had robust, realistic training and acquisitions programs, they would have been better prepared to address shortfalls in doctrine, tactics, and equipment. These failures directly hindered tactical airpower's ability to reach its potential in both the air-to-air and air-to-surface mission areas during the Falklands Islands War.

Despite these shortcomings, once combat was imminent, Argentina's flexibility and adaptability under pressure was admirable. In a very short time-span, they reorganized their air force, readied a new weapons system, and implemented new threat-specific training. They did not allow a lack of doctrine, weapons, or tactics to paralyze their campaign. Instead, they adapted to the threat and used tactical aviation to inflict a heavy cost on the British. Therefore, flexibility and adaptability under pressure greatly assisted and enabled the Argentine war effort and are worthy attributes that would benefit any nation, despite its readiness, engaged in conflict.

Notes

[84] Bruce W. Watson and Peter M. Dunn, *Military Lessons of the Falkland Islands War: Views from the United States,* (Boulder, Co.: Westview Press, 1984), 38.

[85] Ethell, 223.

[86] Corum, 7.

[87] "The Falklands: The Air War and Missile Conflict," *Aviation Week and Space Technology*, September 9, 1982, 36.

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[88] Eddy, 216.
[89] "The Falklands: The Air War and Missile Conflict," 36.
[90] Moro, 227.
[91] Watson, 45.
[92] Armitage, 206.
[93] Burden, 112.
[94] Cordesman, 29.
[95] Way, 187.
[96] Corum, 7.
[97] Middlebrook, 136.
[98] Corum, 7.
[99] Sabolo, 16.
[100] Kinney, 30.

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