

AU/ACSC/210/2000-04

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

BATTLE OF MIDWAY

USS *HORNET* (CV-8) AIR GROUP

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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April 2000

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Preface

As the son of an U.S. Naval Officer, I was intensely intrigued by the Navy and its World War II history. My father had taken me on numerous occasions to the USS *North Carolina* memorial that further increased my interest of the events during the war, especially those in the Pacific. Prior to the academic year at Air University, Air Command and Staff College I was able to read Samuel Eliot Morison's *A Two-Ocean War* and other books and novels about World War Two. Also, during this time the August 1999 issue of U.S. Naval Institute Proceedings that contained "The Lost Letter of Midway" was published. While reading the article, I asked myself numerous questions as to some of the operational decisions made during the Air Groups attack. Of note, were the serious lack of command and control during the operation, lack of tactical intelligence, communications, and why was the air group so far off in finding the Japanese. These reasons, plus the guidance from Dr. Muller, are why I chose to research the battle and the action of the *Hornet* Air Group. At the beginning of my research, I felt that the letter written by CDR Stanhope Ring was an attempt to deflect the blame early historians have placed on him for the failure of the air group—but found that not to be the case.

I would like to thank Dr. Richard Muller for his inspiration and guidance in my research. I would also like to acknowledge John Lundstrom from the Milwaukee Public Museum and author of *The First Team* for providing me with valuable, hard to obtain historical naval documents. Most importantly, I would like to thank my wife, Diana, for her patience and support throughout the academic year at Air Command and Staff College and throughout my career.

Abstract

This research paper first summarizes the preliminaries to the Battle of Midway taken by the Japanese and American navies and provide an overview of the battle with an emphasize on the actions of the *Hornet* Air Group. The analysis reconstructs the air group's events and flight paths on the morning of 4 June. This includes the spotting of aircraft on the carrier through rendezvous to the attack by VT-8 and the failure and losses incurred by the rest of the air group. The analysis provides a detailed factual explanation of the events and actions by the air group based on CDR Rings letter and naval documents.

The central problems researched in the paper are the time it took to get the air group airborne, formed-up, and departed toward the enemy. And with the new information provided by CDR Ring, what was the most viable path taken by the air group. In "The Lost Letter of Midway," CDR Ring states that it took the air group an hour and a half-hour to depart after launching. This seems a little excessive, especially when it took the Japanese 15 minutes to accomplish the same. Additionally, in the letter, CDR Ring also provides more insight into the flight path that was not provided to previous historians. The paper will provide a viable path taken by the air group.

Primary and secondary research methods using U.S. Navy documents and action reports, and scholarly and literary works from historians for compiling the background to the battle and the events of the battle. For the analysis and conclusion, I used primary research consisting of naval documents and doctrine in order to follow the leadership thought process during the battle.

Findings include the means and method the Commanding Officer of USS *Hornet*, RADM Marc Mitscher, used to determine spotting of aircraft for launch, why it took CDR Ring one and one-half hours to depart towards the enemy after launching and the flight paths of the air group.

In concluding the paper, I conclude by using then-current doctrine for who was or who was not culpable for the failures and losses incurred during the mission.

The Battle of Midway: USS *Hornet* (CV-8) Air Group

Over 50 years ago, a sea-air battle between American and Japanese naval forces occurred north of the Midway Islands and marked the turning point of the war in the Pacific. As the second battle in history between ships over the horizon, the Battle of Midway enticed many historians to write of the events and of the Sailors, Marines, and Airmen involved in the battle. Most notable are the mysterious events surrounding the failure of the *Hornet* Air Group to engage the enemy in the first attack launched by the carrier. Many historians have proposed as many theories to the events, but until recently these have only been conjecture. Historians lack of access to an interview with, or failure to interview, Commander Stanhope Ring, Commander, *Hornet* Air Group was the main cause for the numerous theories and conjecture.

In a letter written by CDR Ring, dated 28 March 1946 (four years after the battle) and just recently discovered by his family, CDR Ring provides the historian with some insight into the events leading to the loss of two squadrons, Torpedo Eight (VT-8) and Fighting Eight (VF-8).¹ VT-8, commanded by Lieutenant Commander John C. Waldron was decimated with all aircraft lost and only one survivor in the initial attack on the Japanese carrier fleet intent on capturing Midway. VF-8, commanded by Lieutenant Commander Samuel G. Mitchell, lost all of its aircraft to fuel expenditure and forced water landings in the open Pacific Ocean. All but two pilots of VF-8 were eventually recovered. With a formidable force consisting of 59 aircraft, the

Hornet Air Group's first attack group was only able to release one weapon toward the enemy, and lost 28 aircraft, 28 pilots, and 18 radiomen/gunners for the remainder of the battle.

The purpose of this research paper is to re-cap the preliminaries to the battle and the events of 4 June 1942. Most significantly, by utilizing the new information, other reference material covering the Battle of Midway, and my own experiences and knowledge as a naval officer and Surface Warfare Officer, the paper will provide an analysis of the launch and rendezvous-departure operations and propose a viable layout of the flight paths of the *Hornet* Air Group.

Prelude to battle

The primary objective of the Japanese plan to attack and capture Midway Island, codenamed Operation MI, was not necessarily to gain possession of the island, but to draw the American carrier fleet out after capture of the island and into a "Mahanian style" decisive battle against a superior force. In his estimate of the American situation and to strengthen his forces' will after the losses incurred by Japan in the Battle of the Coral Sea, Admiral Yamamoto believed the following as the basis for his plan:

- a. Although the enemy lacks the will to fight, it is likely that he will counter attack if our occupation operations progress satisfactorily.
- b. The enemy conducts air reconnaissance mainly to the West and to the South but does not maintain a strict vigil to the Northwest or to the North.
- c. The enemy's patrol radius is about 500 miles.
- d. The enemy is not aware of our plans...
- e. It is not believed that the enemy has any powerful unit, with carriers as its nucleus, in the vicinity.
- f. After attacking Midway by air and destroying the enemy's shore based air strength to facilitate our landing operations, we should be able to destroy any enemy task force which may choose to counter attack.
- g. The enemy's attempt to counter attack with use of shore based aircraft could be neutralized by our cover fighters and AA fire.²

Admiral Yamamoto originally intended to draw out the tattered remains of the Pacific Fleet into a decisive battle to gain an indisputable position over the United States in the Pacific, and

then force them to sue for peace. The threat to seize the islands would force the U.S. Navy to fight because the loss of Midway would place unbearable pressure on Pearl Harbor, little more than a thousand miles to the southeast.

Yamamoto's operational plan divided the fleet into five major forces. The Main Force with Admiral Yamamoto commanding combined with the First Carrier Striking Force (carriers *Soryu*, *Hiryu*, *Akagi*, and *Kaga*) with Vice Admiral Nagumo commanding, the Midway Occupation Forces with Vice Admiral Kondo commanding, and the Aleutian Strike Force and Second Carrier Striking Force with Rear Admiral Kakuta commanding.³ During the planning phase for the invasion of Midway, the Battle of the Coral Sea occurred, resulting in the sinking of the light carrier *Shoho*, and operational losses for Operation MI of the Japanese carriers *Zuikaku* and *Shokaku*. The *Zuikaku* and *Shokaku* losses constituted approximately one-third of the planned Midway Main Force. In spite of the reduced force available, Admiral Yamamoto did not see it as detrimental to the overall operation because both of the American carriers, the *Lexington* and *Yorktown*, involved in the battle were reported sunk. Admiral Yamamoto, from the Coral Sea battle reports, thus believed that the Americans definitely had two carriers in the Pacific, the *Hornet* and the *Enterprise*, and possibly a third, the *Wasp*, still giving Japan a superior carrier force. On the day of the battle, five large carriers were either in or near the Pacific Ocean. If the operation was delayed one week Admiral Yamamoto would have confronted a force of four large carriers. On 26 May, the first of the Japanese Naval forces left Japan with another force departing each day until the final forces departed on 29 May, heading towards Midway and Aleutian Islands in execution of "Operation MI."⁴

Through prior extensive cryptological and intelligence work (MAGIC) to break the Japanese Naval code, the Americans were well aware of the composition of the Japanese forces and their

intentions to attack, invade and capture Midway Island.⁵ Admiral Nimitz, Commander in Chief, U.S. Pacific Fleet and Pacific Ocean Areas, assigned Task Forces 16 (TF-16) and 17 (TF-17), comprised of the carriers *Hornet*, *Enterprise*, and *Yorktown* under the operational control of Rear Admiral Jack F. Fletcher to execute CinCPac Operation Plan 29-42. TF-16, under the tactical control of Rear Admiral Raymond A. Spruance, would depart Pearl Harbor on 28 May and TF-17 would depart Pearl Harbor a day later in order to complete emergency repairs on *Yorktown*. Under the tactical control of Rear Admiral Fletcher, TF-17 would chase after TF-16 rendezvousing northeast of Midway. RADM Fletcher would then take operational control of both task forces for the operation.⁶

Admiral Nimitz fully realized that the Pacific Fleet was in “tattered” condition after the losses from the Pearl Harbor attack and the Battle of the Coral Sea. Strategically, Admiral Nimitz believed it was more important to the nation to not lose the carriers during the battle than to not lose Midway Island unless the carrier loss came with significant Japanese losses.⁷ Operation Plan 29-42 instructed “Fletcher and Spruance to lie in wait northeast of Midway, stationing them on the left flank of the Japanese carriers attacking Midway from the north west.”⁸ Upon locating the Japanese carrier force, Fletcher and Spruance were to inflict maximum damage upon the enemy by attrition. But, wrote Nimitz, “you will be governed by the principle of calculated risk which you shall interpret to mean the avoidance of exposure of your force without good prospect of inflicting, as a result of such exposure, greater damage to the enemy.”⁹ Verbally, Nimitz instructed the Admirals that “conserving the precious American carriers was more important than saving Midway.”¹⁰ On 28 May the *Hornet* and *Enterprise* with RADM Spruance embarked, with escorting destroyers and cruisers, departed Pearl Harbor. And,

on 29 May the *Yorktown* with RADM Fletcher embarked, with destroyers and cruisers accompanying the carrier, departed in execution of Operation 29-42.¹¹

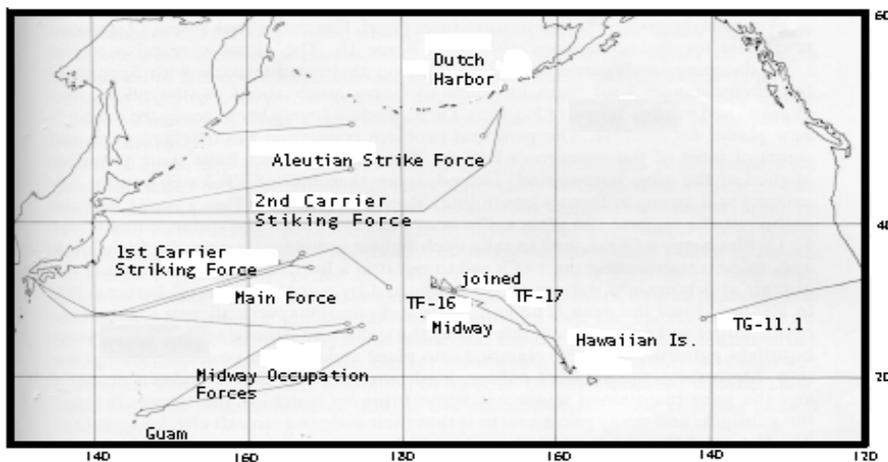


Figure 1 The Midway campaign, movements to 0000, 4 June¹²

Battle of Midway: June 4, 1942

In the morning hours of 4 June 1942, hostilities in the Battle of Midway began with the Japanese 1st Carrier Striking Force launching 108 planes from the four carriers for an attack on the islands of Midway. The Japanese fleet was located 240 nautical miles northeast of Midway. The wind was light and from the southeast requiring the carriers to continue on a track towards Midway at approximately 17kts while launching aircraft. The attack force was comprised of 36 Type-97 level bombers from *Soryu* and *Hiryu*, 36 Type-99 dive-bombers from *Akagi* and *Kaga* and fighter escort of 36 Zeroes (9 from each carrier). The entire attack force completed launch operations within 15 minutes of the order to launch the strike. By 0445 the strike formed up, climbed to altitude and was enroute to Midway. Immediately after the launch of the first wave, seven scout planes were launched from the screening destroyers and cruisers to search for possible enemy carriers in the area. The seven scout planes when compared to previous search procedures amounted to only a token effort. This was in large part due to Admiral Yamamoto

believing that the Americans were not aware of the Japanese plans, were unprepared, and that a powerful unit centered around a carrier was not in the area. All scouts were launched on time with the exception of one from the cruiser *Tone* that was 30 minutes late launching. It launched at 0500 and proved to be the search plane that would eventually detect the American Task Force. If launched without delay, the American task forces would have been detected earlier, and this could possibly have resulted in a much different outcome of the battle, but those were the events that morning. While the Midway attack was proceeding and the search planes were out, another strike force was brought up to the flight decks of the four carriers in order to be prepared for an attack on an enemy fleet if one was detected.¹³

“At 0545, a most important contact was made by a [Midway based] PBY search plane, which reported many planes headed for Midway from the northwest, 150 miles distant, and seven minutes later another PBY reported two enemy carriers and many other ships on the same bearing [320°], 180 miles away [from Midway], coming in [closing Midway] on course 135° at 25 knots.”¹⁴ This report alerted the Midway defenses. A total of twenty-six fighters, mostly Brewster Buffalo fighters and some F4F-4 Wildcats were airborne immediately to intercept the attacking force. Additionally, anti-air positions on Midway were armed, ready and anxious for the arrival of the Japanese force. At 0610 the Midway Island based aircraft intercepted the Japanese force 47nm from Midway with little damage to the attack group.¹⁵ The Japanese attack force caused extensive superficial damage to the bases, but from the air, due to the burning fuel storage tanks, the destruction appeared more severe. The one major objective of the attack was to eliminate the shore-based aircraft stationed on Midway to ensure success of the amphibious operation by the Japanese Occupation Forces. The Midway aircraft, however, were not at Midway during the attack.

Two forces from Midway consisting of Army Air Forces B-17 and B-26 bombers, Navy TBF torpedo-bombers, Marine SB2U-3 and SBD-2 dive-bombers, and fighter aircraft were directed to attack the 1st Carrier Striking Force. From 0705 to 0715 a force consisting of the B-26 bombers and TBF torpedo-bombers (VT-8 detachment) attacked the Japanese carriers. Again from 0755 to 0830 the Japanese forces were attacked by a large force consisting of Marine SB2Us, SBD-2s, and B-17 bombers. “The determined American torpedo assaults were shot to pieces one by one without any damage to the Japanese, while Nagumo and his people simply ignored the B-17s, reasoning correctly that it was impossible to bomb fast-moving and nimbly maneuvering warships from twenty thousand feet.”¹⁶ The two attacks on the Japanese forces did no damage to the carriers, but, as will become important later, did delay the launching of a surface attack force and dispersed the surface combatants and carriers.

Onboard the American carriers, Fletcher had also received the 0545 “many planes” report at 0553 and the “two enemy carriers” location report at 0603 from the Midway search planes through *Yorktown*’s communication center, but hesitated to launch an attack. According to Naval Intelligence estimates, there were likely to be more than two Japanese carriers, possibly five, in the attack force, and *Yorktown*’s own search aircraft were airborne searching for the force.¹⁷ Additionally, the distance between the carrier groups was beyond the combat radius of the TBD-1 Devastators. Fletcher, in order to gain a better tactical picture of the situation, wanted to locate the additional carriers and recover his search planes before launching an attack. At 0607, Fletcher sent orders by signal light to Spruance for TF-16 to proceed in a southwesterly course to close the Japanese force and to attack when definitely located.¹⁸ Spruance, following Fletcher’s orders, altered TF-16’s course to the southwest (240°T) in order to close the Japanese fleet and launch an attack. At 0700, Spruance ordered the first strike to launch from the carriers

Hornet and *Enterprise* based on the position report received at 0603 (320°T, 180nm, course: 135°T, speed: 25kts).¹⁹

Onboard the *Hornet*, all aircraft of the first attack group, with the exception of nine TBD-1 Devastators which were below in the hangar, were spotted on the flight deck and loaded for the attack mission. The aircraft were spotted on the deck with eight CAP aircraft launched first, ten escort fighters (VF-8) second, followed by the fifteen SBD Dauntless scout planes and CDR Ring, then nineteen SBD Dauntless dive bombers (VB-8), then six TBD-1s of VT-8. The remaining nine TBD-1s were brought from below one at a time after the flight deck was cleared and launched last.²⁰ While VT-8 was launching, VF, VS and VB-8, under the command of CDR Stanhope Ring, Commander, Hornet Air Group (CHAG) climbed to a preparatory departure altitude of 5,000 feet. “All airplanes maintained moderate altitude (below 5,000 ft) until after rendezvous of the Group was effected.”²¹ The launch sequencing commenced at 0700 and completed at 0806,²² but according to CDR Ring, the group did not depart the area until one and one-half hours after his launching.²³

Prior to launching of the *Hornet* Air Group, RADM Marc A. Mitscher, Commanding Officer *USS Hornet*, conducted a quick meeting on the bridge with CDR Ring and his squadron commanders. Because there is no recorded transcript of this meeting, it is difficult to ascertain the context of what was said. Likely topics include the estimated position of the Japanese forces and the course to fly in order to intercept them, in light of LCDR Waldron’s disagreement with Ring on the course to intercept. Another possibility is that Mitscher wanted to ensure the commanders had the information required by doctrine, because the group would maintain radio silence during the attack and this was to be the groups first combat action. One topic that was discussed was Waldron’s concern for his torpedo-bombers and the intentional lack of fighter

coverage for his squadron during the attack. The TBD-1 Devastators would not have any fighters escorting them because the fighter that has the altitude advantage over the other possessed a greater tactical advantage and the Wildcat fighter needed every bit of advantage it could muster when pitted against the Japanese Zero. Waldron lobbied for at least one fighter for coverage; he got none.

While returning to the carriers, the first Japanese Midway strike force radioed ahead at 0700 stating the necessity for a second attack on Midway because the land based aircraft were not present during the attack and needed to be eliminated prior to landing forces. Based upon this recommendation, Admiral Nagumo ordered the second attack wave of 108 aircraft rearmed for land attack, as they were readied for an attack on surface ships, but none were known to be operating in the area. At 0715, the second attack wave was struck below into the hangar deck for re-arming. The remaining Zeros were launched to replace the CAP at 0800. At 0837, Nagumo ordered the recovery of the first strike force, and recovered the entire force and the first CAP by 0918.²⁴ During these sequences of events, at 0728, the *Tone* search aircraft that launched late reported a force of 10 enemy ships, with amplifying information at 0809 that the force consisted of 5 destroyers and 5 cruisers. Again at 0820 the plane reported more ships with the uncertain words, “what appears to be aircraft carrier bringing up the rear.” At 0830 the same search plane reported two more surface ships, which lead Nagumo to firmly believe that a force that large had to contain at least one carrier, but could not understand why, when only 200nm away, it did not participate in the attack on the Japanese force.²⁵

Another issue facing Nagumo was the dispersion of his carriers and surface ships. After the two attacks from the Midway land-based aircraft and course changes for launching and recovering of aircraft, the carriers and surface combatants had become widely separated. Thus,

at 0855, Nagumo ordered his force to re-group and after completion of recovery operations to proceed north (030°T/30kts) in order to open the distance from Midway to avoid any more attacks from the land based aircraft. On all four carriers, deck crews worked feverishly to re-fuel and re-arm the 90 aircraft for a launch at 1030 to attack the American carriers. Suddenly, at 0920 came the first reliable indications that enemy carriers were within strike range when reports from screening ships reported carrier-based torpedo bombers approaching.²⁶ These were the 15 TBD-1's from the fateful VT-8 squadron launched from USS *Hornet*.

The Japanese CAP consisting of nearly 50 Zeroes descended from altitude and shot down all 15 aircraft of VT-8 with only one attacker able to get into position to release his torpedo. Having become separated from the remainder of the *Hornet* Air Group, the squadron was alone and unprotected in the attack. ENS George Gay was the only *Hornet* Air Group aviator able to release a weapon against the Japanese and the only VT-8 survivor of the attack. VF-8, VB-8 and VS-8, led by CDR Ring (CHAG), continued on a southwesterly course to intercept the predicted track the Japanese carriers would follow based on their last known position, course and speed (0603 report: 320°T/180nm from Midway, course 135°/speed 25kts) to close Midway. Having not found the Japanese carriers at the anticipated interception point, CDR Ring decided to turn southeast toward Midway Island on the "assumption that the enemy was closing Midway"²⁷ and were closer to the islands. The "*Hornet* Group [VB, VS, VF] proceeded southeast until smoke from Midway was sighted. At that time, it was apparent immediate return to the carrier was necessary if landings aboard were to be effected since fuel supply was running low."²⁸ At this point, the group headed in a northerly direction in an attempt to establish connectivity with *Hornet*'s homing beacon (YE-ZB beacon) but could only receive what CDR Ring interpreted as *Enterprise*'s beacon. CDR Ring eventually disregarded the signal and changed course in an

attempt to intercept the *Hornet* using dead reckoning procedures.²⁹ Fourteen aircraft from VB-8 and the ten aircraft of VF-8 apparently continued to follow the YE-ZB beacon signal CDR Ring believed as *Enterprise*'s beacon. Eventually the 14 VB aircraft reversed course towards Midway in an attempt to land safely before their fuel expended and they were forced to execute water landings. The 10 VF aircraft accompanying the 14 VB aircraft continued on the same northeasterly course as directed by the erroneous YE-ZB signal. Of the fourteen VB aircraft heading towards Midway, using the smoke from burning fuel storage tanks as guidance, eleven safely landed and three landing in the water, two of which landed in or near the lagoon.³⁰ At approximately 1112, CDR Ring and the remaining 19 SBD's (16 VS, 3 VB) eventually located the *Hornet*, and after 4.5 hours of flight and critically low on fuel, safely landed.³¹ The entire VF-8 squadron landed in the water because they ran out of fuel, resulting in the loss of the 10 F4F-4 Wildcats and the death of two pilots.³²

After recovery of the search aircraft at 0630, Admiral Fletcher, aboard the *Yorktown*, ordered the carrier to launch an attack on the Japanese carriers. "From 1030 [0830 local] to 1050 [0850 local] [the *Yorktown* launched] an attack group composed of seventeen [SBD-3s] VSB [from] VB3, twelve VT [TBD-1s] from VT3, and six [F4F-4s] VF from VF3."³³ The *Yorktown*'s after action report continued, "orders were to attack the two enemy carriers previously reported."³⁴ The *Yorktown* Air Group flew directly towards the Japanese fleet because of current positioning data, and was able to execute a well orchestrated attack on the fleet.

The positive aspect of the fateful attack on the Japanese carriers by the unprotected Devastators of VT-8 was that they drew the entire Japanese CAP down to an altitude of 1000ft. Soon after VT-8's attack, VT-6 of the *Enterprise* Air Group followed in towards the fleet targeting the *Akagi*. Two consecutive torpedo squadron attacks on the Japanese fleet kept the

Zeroes low and expended their ammunition. With the Zeroes in this tactically disadvantageous position the *Enterprise* and *Yorktown* dive-bombers were able to execute a completely unimpeded attack, with the exception of inaccurate shipboard anti-air guns, on three of the Japanese carriers,³⁵ the *Kaga*, *Soryu*, and *Akagi*.³⁶ All three carriers, as a result of the attacks, were burning uncontrollably, leaving the *Hiryu* as the only operational carrier. Onboard the *Hiryu*, the Japanese force had only 40 operational aircraft available for attacks on the American fleet, 18 dive-bombers, 12 Zeros, and 10 torpedo-bombers.

Rear Admiral Tamon Yamaguchi, Commander Carrier Division 8, aboard *Hiryu*, assumed tactical command of the remaining ships after Admiral Nagumo shifted from the damaged and sinking *Akagi* to the light cruiser *Nagara*. RADM Yamaguchi ordered a strike against the American carriers consisting of the 18 dive-bombers and 6 Zeroes as fighter escort. At 1054, the first Japanese attack force took off from the only remaining operational carrier. While enroute to the American carriers, two Zeroes veered off to attack returning American aircraft thus reducing the Japanese attack force coverage to four Zeroes during the strike. The first Japanese attack, by following the returning American aircraft, located the carrier *Yorktown* and at 1200 commenced attacking the carrier.³⁷ The carrier's CAP and screening destroyers and cruisers met the Japanese attacking aircraft. So good were the Zeroes capabilities and pilots that the American fighter pilots reported the attack force contained 18 Zeroes, when in actuality there were only four. Resulting losses to the Japanese force included one Zero fighter and eleven bombers. Seven bombers leaked through the CAP and screening ships to attack the *Yorktown*. These seven bombers claimed three hits on the *Yorktown* causing severe damage to the carrier, but all damage was repaired or contained and the carrier was able to make 20 knots or better by 1437.

While the first attack group was proceeding to attack the American carriers, RADM Yamaguchi ordered the remaining aircraft, 10 torpedo-bombers and six Zeroes, to launch for a second attack on the American carriers. The second Japanese attack launched from *Hiryu* at 1320. At approximately 1440, the second Japanese attack force of torpedo-bombers came in for an attack on the *Yorktown*. Because of the damage control efforts of the *Yorktown* crew, the Japanese attackers believed they were attacking a different, undamaged carrier. The CAP also intercepted these attackers and three Japanese torpedo-bombers were shot down. Of the remaining seven torpedo-bombers, two were able to strike the *Yorktown* with their torpedoes on the port side. These two hits were catastrophic blows to the carrier. Unable to contain the resultant damage and correct a 26° list, the Commanding Officer ordered abandon ship at 1455.³⁸ The carrier, now unmanned, out of action, and dead in the water, remained afloat listing severely to port.

With the *Yorktown* out of action for the Americans and the *Hiryu* as the only remaining carrier of four for the Japanese, the Americans gained a decidedly superior advantage. With the *Hiryu* located, Spruance ordered the launch of an attack force to attack the lone carrier. At 1530 the *Enterprise* launched an attack force consisting of 24 VB aircraft, 11 armed with one 1000lb bomb and 13 armed with one 500lb bomb. The force was directed to attack the Japanese force consisting of one CV (*Hiryu*), 2 battleships, 3 cruisers, and 4 destroyers. At 1705 the attack force attacked the Japanese leaving the *Hiryu* and one battleship severely damaged and burning.³⁹ Onboard the *Hornet*, a force of 16 VB aircraft armed with a 500 or 1000lb bomb were launched at 1603 to attack the same group of ships that the *Enterprise* aircraft attacked. At 1730 the *Hornet* aircraft found the carrier *Hiryu* burning along its entire length and determined the carrier was no longer a viable target; thus, the group attacked a battleship and a heavy cruiser.⁴⁰

The Japanese were completely caught by surprise in that the Americans were actually in the area, and that three carriers were involved. Along with poor intelligence, inaccurate reporting also plagued the Japanese. Admiral Yamaguchi received the report that two carriers had been struck, and that the Americans were also down to one carrier. With this information, Yamaguchi, before the fateful attack on the *Hiryu*, planned a dusk attack on the remaining American carrier.⁴¹ The attack was not to happen, as before dusk the carrier *Hiryu* was a burning hulk drifting with the other Japanese carriers.

4 June 1942: Analysis

Aircraft

The American carrier-based aircraft utilized in the Battle of Midway were for the most part, inferior to their Japanese counterparts, the “Kate,” “Val,” and the well-known “Zero.” The *Hornet* Air Group employed the Douglas TBD-1 Devastator torpedo bomber, the Northrop/Douglas SBD-3 Dauntless dive-bomber, and the Grumman F4F-4 Wildcat fighter in the air war on 4 June. The aircraft were specifically designed for carrier operations, but were also substantially utilized by shore-based units, mainly Marine Corps aviation squadrons, during the Pacific War. With the different aircraft launched from the *Hornet* the morning of 4 June came different specifications that, when analyzed and logically applied to the launch sequencing, would have changed the launching of the aircraft and, therefore, may have affected the results for the Air Group.

Aircraft	TBD-1 ⁴²	SBD-3 ⁴³	F4F-4 ⁴⁴
Top Speed	180 kts	217 kts	278 kts
Cruise Speed	110 kts	135 kts	130 kts
Rate of Climb	720 ft/min	1,190 ft/min	1,950 ft/min
Combat Range	380nm	1,175nm	795nm
Max Range		1,380nm	1,090nm
Ceiling	19,500 ft	27,100 ft	34,000 ft

Table 1 Aircraft Performance Specifications

TBD-1 Devastator

The Devastator was the first all metal, low-winged, three-man aircraft specifically designed for service aboard carriers.⁴⁵ Of special note, the Devastator was the first naval carrier-based aircraft with power folding wings, which made storage and spotting aboard space-constrained carriers easier. The aircraft had the capability to carry a payload of either a 21in Mk-VII torpedo or 1000lb bomb in the bomber role. Additional armament for self-defense included the 0.50in machine-gun forward mounted on the right side and the aft mounted rear firing 0.30in machine-guns. The U.S. Navy ordered the first Devastator (XTBD-1) on 30 June 1934, with its first flight on 15 April 1935. Production of the Devastator began on 3 February 1936 with the final TBD-1 of 129 total aircraft delivered to the Navy in November 1939. The initial design held a crew of three, the pilot, a navigator/torpedo officer in the middle, and a radio-operator/gunner in the rear. Eventually the navigator/torpedo officer's duties were assigned to the pilot, thus reducing the crew requirement to two.⁴⁶ "The TBD-1 was a big improvement over what had gone before in the way of torpedo planes,"⁴⁷ but still lacked range, speed, and altitude performance.

Referring to table (1), the Devastator's performance specifications are, when compared to the other aircraft of the group, the slowest, shortest and lowest. The maximum range of a Devastator equipped with a Mk-VII torpedo conducting combat operations was 380 nautical miles, which gave the aircraft a maximum combat radius of 190nm. Maximum speed of the

aircraft was 180 knots and a cruise speed, loaded with the Mk-VII torpedo, of 110kts. The ceiling of 19,500 ft is of insignificant importance, because the primary mission of the aircraft required an altitude of 80ft, thus, the aircraft cruised at about 1,800ft. In addition, with a climb rate of 720 ft/min, the aircraft would expend valuable time gaining altitude and by staying low, the Devastator gained a small amount of protection from the much nimbler Japanese Zero. The aircraft's performance specifications were not the only faults with the "weapon system" as a whole. The Mk-VII torpedo was a poor performing weapon. There were many instances, far more than were acceptable, where the torpedo would malfunction due to numerous reasons and not inflict the desired damage to the target. In 1939 the aircraft was a big improvement over previous torpedo-bombers, but by 1942 advancements in other aircraft designs rendered the aircraft obsolete and ineffective, thus making Midway the final major engagement in which the TBD-1 Devastator would participate on a large scale.

SBD-3 Dauntless

The Dauntless dual mission dive-bomber/scout was another all-metal low-winged aircraft initially designed by Northrop Corp. and after a contractual change, built by Douglas. The first Dauntless, the XBT-2, was completed and test flown in April 1938 and the first operational Dauntless, the SBD-1, was delivered to the U.S. Navy in September 1940. Improvements over previous Dauntless versions included self-sealing gas tanks and armor protection for the pilot. The aircraft carried a single centerline bomb (500lb or 1000lb) and had one pod under each wing capable of carrying a 100lb bomb. Self-defense armament included two forward firing 0.50in machine-guns in the engine cowling and one rearward firing 0.30in machine gun. Unlike the Devastator, the aircraft was not specifically designed for carrier operations, but was the most destructive aircraft launched from carriers in the Navy's inventory. The crew of two consisted of

a pilot and a radio-operator/gunner. The U.S. Marine Corps also utilized the aircraft from forward bases in the Pacific and the Army Air Forces utilized the SBD, designated the A-24, in the European theater of operations.⁴⁸

The Dauntless' performance specifications were, for the period, remarkable. The maximum range of the aircraft was 1,380nm and a combat range of 1,175nm (combat radius: 585nm) giving the SBD-3 the longest legs of the air group. Maximum speed of the aircraft was 217kts and a cruising speed of 135kts giving the aircraft a respectable speed, but still slower than the Zero. Because of its steep dive angle from an altitude of 15,000ft, the Dauntless gained the defensive advantage over the Zero's offensive capabilities, improving its survivability. The maximum altitude of the Dauntless was 27,100ft with a climb rate of 1,190 ft/min. The dive-bomber normally cruised at an altitude from 18-20,000 ft, but with a low rate of climb, it required precious time to get to altitude. Overall, the Dauntless was a mainstay of the U.S. Navy and Marine Corps during the war in the Pacific. The aircraft, modified as the war progressed, participated in every major engagement until Japan surrendered in 1945.

F4F-4 Wildcat

The first Wildcat was initially designed and developed by Grumman in March 1936 as a biplane and designated the XF4F-1. The follow-on, the XF4F-2, a monoplane, was first flown in September 1937 and sequentially became the XF4F-3 after crashing and being rebuilt. The XF4F-4, through a contractual change first flew in February 1938 and the first operational deployment of the aircraft was aboard the HMS *Ark Royal* in November 1938. The major design change to the F4F-4 Wildcat from previous versions was the hydraulic controlled foldable wings which reduced the aircraft's wingspan 50% when stored onboard the carriers. Additionally, 58 gallon drop tanks could be fitted to the aircraft with one underneath each wing next to the

fuselage allowing a longer combat range to cover the long-range dive-bombers. Armament on the aircraft included three 0.50in machine-guns built into each wing. Compared, one on one to the Japanese Zero, the Wildcat was a less capable, but more durable aircraft. The Zero held the speed, climb rate and maximum ceiling advantage over the Wildcat. Equipped with armor protection for the pilot and self-sealing fuel tanks, the Wildcat could withstand a more significant amount of damage than the Zero before being forced down. Not until the introduction of the “Thach Weave” tactic developed by LCDR John S. “Jimmy” Thach did the F4F-4 begin to outgun the Zero.

The Wildcat’s performance specifications (Table (1)) readily illustrate that the aircraft, in order to provide the coverage to the Dauntless, needed improvement. The Achilles heel of the aircraft was its combat range of 795nm (395nm combat radius) as compared to the dive-bomber it was designed to protect. The maximum speed of the aircraft (278kts) was less than the Japanese Zero, but with improved tactics was able to defeat the fighter and provide defense for the Dauntless.

Hornet Air Group’s first attack group consisted of 10 F4F-4 Wildcats, 34 SBD-3 Dauntlesses (16 scouts, 18 dive-bombers) and 15 TBD-1 Devastators. The combat air patrol (CAP) of ten F4F-4s was the first group of aircraft launched, followed by the 10 F4F-4s as attack group fighter protection. Next came VS squadron of 15 aircraft followed by CDR Ring, then the 18 SBD-3 dive-bombers. The Devastators were spotted on the aft end of the flight deck with only six aircraft on deck and the nine others in the hangar waiting to be brought up once the elevator was clear and room on the flight deck was available. Thus, VT-8 was the last squadron launched off the carrier. Given the various performance specifications of the aircraft in the

group, was the launch sequence of VF, VS, VB then VT following current doctrine or based on previous experience?

Launching

Pre-war and the current naval aviation doctrine on the issue of launching aircraft from a carrier stated that:

“Commanding Officers are responsible for prescribing the condition that will be assumed by his flight deck and his vessel as a whole, and the order of spot of airplanes that will best insure compliance with orders and the needs of the tactical situation.”⁴⁹

Naval aviation doctrine, by giving the responsibility to the Commanding Officer, allowed for flexibility in the decision making process and employment of aircraft by the on-scene commander as he saw fit. Thus, by evaluating the tactical situation and through experience, the Commanding Officer, with recommendations from the Air Group Commander and Air Officer, determined the launch sequencing.

The Battle of Midway was the first combat operation, other than launching the Army Air Force B-25 raid on Tokyo, for the USS *Hornet* and the attached air group. For the Navy as a force, the amount of carrier-to-carrier combat experience was limited to the Battle of the Coral Sea with the *Lexington* and *Yorktown* as the only American carriers involved in the battle. The task force, also commanded by RADM Fletcher, executed four total group launches between the two carriers for attacks on the Japanese fleet. *Lexington* Air Group launch sequence was first the SBDs, followed by the F4F-4s, then last off the carrier were the TBDs. *Yorktown* Air Group launching was slightly different, as the TBDs were launched second and immediately departed towards the target, then the F4F-4s launched.⁵⁰ Few, if any, of the aircraft ditched during the

battle of the Coral Sea could be attributed to fuel exhaustion directly related to the launch sequencing of the aircraft from the carriers.

The *Hornet* launch sequence did not follow either of these previous experiences or the intent of aviation doctrine to spot the aircraft in order to best support the needs of the tactical situation. Prior to arriving in the Midway area, RADM Mitscher, CAPT Mason (RADM Mitscher's relief), CDR Apollo Soucek (*Hornet* Air Officer), CDR Ring and the four air group squadron commanders met on May 31. In the meeting the officers discussed the concept of operations for the battle that would take place including "the launch sequencing and procedure for flying to the target."⁵¹ The tactical thought process focused on how to get as many aircraft into the air as quickly as possible. The F4F-4s were spotted first and took off first because their lighter weight required less flight deck length for launching. The SBD-3s were the next heaviest and the next launched. The first Dauntlesses were armed with a single 500lb bomb with the rear Dauntlesses armed with a 1000lb bomb because they would have the additional flight deck length for launch. Last came the TBDs armed with the 1,936lb torpedo requiring the most flight deck length for launch. Additionally, for the pilots of VT-8, this would be their first ever take-off, from either a carrier or an airfield, while carrying a torpedo. Spotting the aircraft in this manner permitted the maximum number of aircraft to be brought up on the flight deck given the length of flight deck required for launching. The guiding factor in the launching of aircraft from *Hornet* was not the tactical situation as dictated by doctrine, or experience gained in the Battle of the Coral Sea, but the length of flight deck needed for the launching of aircraft to get as many aircraft in the air as quickly as possible.

Timing

Launching of the air group took an hour to accomplish, but according to naval aviation doctrine “flight operations included 20 minutes for launching...a full group (74 planes).”⁵² Launching 74 aircraft in twenty minutes averages one aircraft every 16 seconds. As stated earlier the order of launching was CAP, VF, VS, VB, then VT. The exact amount of time between launch of each aircraft follows closely with then-current naval aviation doctrine until it came time to launch the nine TBD-1s still in the hangar. ENS George Gay was the first VT pilot launched from the *Hornet*, and states that he launched at 0915 (0715 local--his watch was still set to Hawaiian time).⁵³ A total of 44 aircraft launched prior to ENS Gay’s launch at 0715. This averages one aircraft every 20 seconds. From 0715 to 0806 a total of 14 aircraft launched, equating to one aircraft every 3 minutes 38 seconds. Recall that nine aircraft of VT squadron were still below in the hangar waiting to be brought up to the flight deck, prepared for launch (unfolding wings), spotted and launched. Assuming that it only took 20 seconds to launch each of the five VT-8 aircraft that were spotted on the flight deck, then it took approximately 5 minutes 25 seconds for the remaining aircraft to be brought from below and launched. This delay accounts for the hour taken to launch the entire group, but the group did not depart from rendezvousing until an hour and a half after CDR Ring launched.

Rendezvous and Departure

According to naval aviation doctrine one of three procedures was to be followed for departure towards an objective after take-off and the decision of which to use was to be based on the mission. Normal departure prescribed scouts to depart by sections, then the remainder of the group would rendezvous as squadrons before proceeding toward the objective. Normal departure was employed when fighter aircraft opposition to the attack was not anticipated and the

objective was far enough away to allow for rendezvous enroute. Urgent departure called for all aircraft to depart toward the objective by sections with the squadrons effecting rendezvous enroute. This method was used when the objective was within close striking range and the enemy's position was known. Deferred departure required all squadrons to rendezvous prior to departure toward the objective resulting in a coordinated attack. Deferred departure was utilized when determined fighter aircraft opposition was expected.⁵⁴ CDR Ring, as the Air Group Commander, decided to use the deferred departure method, thereby requiring the Wildcats and Dauntlesses to remain, according to naval aviation doctrine, at 5000ft until the final Devastator launched at 0806.

Using the previously calculated 20 seconds per aircraft launched, it can thus be inferred CDR Ring launched at approximately 0713, and from his letter, the group departed an hour and a half after launch, at 0843.⁵⁵ After the final Devastator launched at 0806, CDR Ring then commenced the steady, slow, time consuming climb to an altitude of 18,000ft for the dive-bombers and 20,000ft for the fighters. Recalling the performance data for the dive-bombers, the maximum climb rate is 1,190ft/min. It would, at a minimum, take the SBD-3 eleven minutes to get to the cruise altitude. For the F4F-4 with a maximum climb rate of 1,950ft/min would take 8 minutes to get to altitude. Those times are calculated using maximum climb rates, which will also consume precious fuel at an alarming rate, especially for the Dauntlesses armed with a 1000lb bomb. But, according to naval doctrine, the climb rate while proceeding to altitude should not exceed 500ft/min.⁵⁶ Thus, using the doctrine maximum climb rate, it would take the Dauntlesses approximately 26 minutes to reach an altitude of 18,000ft and the Wildcat 30 minutes to reach the 20,000ft altitude. This explains why it took the group approximately an hour and a half to depart towards the objective after CDR Ring launched.

The Flight

Referring to figure (2), “Flight path of *Hornet* Air Group,” the driving facts in reconstructing the flight paths are the time that VT-8 attacked (0930) and cruise speed towards the enemy (110kts); the time the remains of the air group returned to *Hornet* (1112) and the cruise speed for the group (135kts). In analyzing the flight path as displayed in figure (2), I will break it down into two sections, VF/VS/VB (main group) and VT.

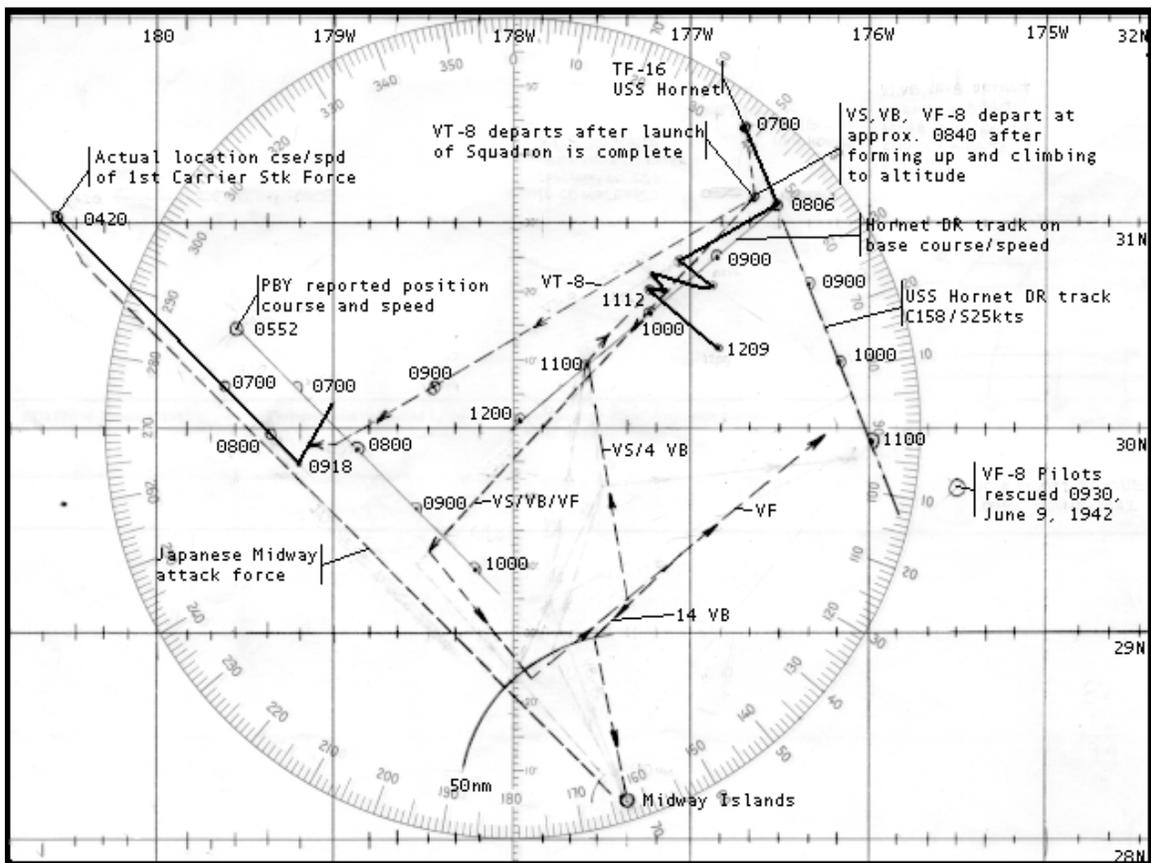


Figure 2 Flight Paths of *Hornet* Groups

According to CDR Ring, in the *Lost Letter of Midway*, the main group departed on a pre-estimated course to intercept the Japanese force along its dead reckoning (DR) track. The DR was based on the erroneous 0552 PBYP search airplane position report, thus taking the main group far enough to the east to not visually detect the Japanese fleet. CDR Ring, prior to

departure from *Hornet*, estimated he would intercept the Japanese carriers at approximately 0900, but possibly on the account of the delay in departure, altered course to intercept at 0930. This alteration of course from 0900 to 0930 is of little significance since the course difference between the two is five degrees and would still be far enough away from the Japanese fleet so as not to detect them.

CDR Ring, in order to stay in contact with the slower Devastators, regulated the main body's speed on the southwest leg. This tactic was highly inefficient, wasting precious fuel, but was required in order to execute a coordinated attack on the enemy. The Wildcats regulated speed by executing slow, lazy "S" turns along the track slowing the forward progress enough to maintain position above the lower, slower aircraft. Thus, on the first leg of approximately 140nm and by regulating their speed to match the 110kt Devastators, it would take 1 hour, 16 minutes to reach the anticipated interception point. Given that the main body departed at 0843, they would then reach the point at approximately 0959. For the Wildcats, the total distance traveled, because of the need to regulate speed, was not 140nm, but 165nm. Additionally, by this point, the Wildcats had been airborne for approximately 2 hours 51 minutes.

At this point, CDR Ring, without finding the Japanese fleet, decided to turn the main body southeast towards Midway on the assumption that the ships were closer to the island than estimated. The main group continued on this course, closing Midway, until smoke from the burning fuel tanks on the islands was seen. Reports from other aviators state that the smoke could be viewed 50nm from the island, thus it can be inferred that the main group from *Hornet* altered course once they were approximately 50nm from Midway. Assuming the main group realized that VT-8 was no longer below them, they ceased regulating their speed to make 135kts

good along the track, this would make it approximately 1020 at the turn towards the northeast onto a YE-ZB beacon signal.

Realizing the need to return to the carrier in order to effect safe landings onboard the carriers, CDR Ring then turned the group on a course as directed by the signal received from the YE-ZB beacon. In the *Lost Letter of Midway*, CDR Ring did receive a beacon signal, but the signal received did not match the signal chart provided by *Hornet* prior to launch. CDR Ring believed the received signal was from the *Enterprise*, thus he eventually disregarded the signal. Before continuing, an understanding of the operation of the beacon and navigation requirements is necessary.

The YE-ZB beacon is conceptually similar in operation to what is known today as the TACAN. The YE portion of the system is a transmitter on the carrier with an antenna mounted high on the mast to maximize reception range. The ZB portion of the system is a receiver mounted in the aircraft. The system works by dividing 360° into 30° increments and is synchronized to true north through inputs from the ship's gyrocompass. In each 30° segment, a different letter is transmitted in Morse code. Comparing the letter received to the chart determines the course to steer to return to the carrier. As the pilot passes from one 30° segment into another, the letter signal changes alerting the pilot to alter course more towards the transmitter.⁵⁷ The key to accurate operation of the entire system is that the beacon needs to be synchronized to true north; if not, the pilot will fly on inaccurate courses thus requiring an alternate means of returning to the ship.

CDR Ring believed he was receiving *Enterprise*'s beacon and was not heading towards the *Hornet*. The YE portion of the beacon was not synchronized to true north, but instead transmitted 30° left of north causing returning pilots to fly 30° to the right. Transmitting this

directional error caused the main group to fly a course of 050°. Referring to figure (2), the reciprocal course of the outbound course, departure from the carrier, was 043°. Comparing the two courses, the beacon course is to the right of the outbound reciprocal course, meaning the course that the main group was following was not closing the carriers. Each aircraft, according to Current Tactical Orders and Doctrine (USF-74), was required to carry the Mark III and Mark IV Plotting Boards for navigating. Using the internal instruments and magnetic compass tables (Deviation Tables) each pilot is responsible for ensuring proper navigation of his aircraft.⁵⁸ CDR Ring most likely deduced the error by plotting the course of 050° on his plotting board and comparing it with the outbound course and the base course of the carrier. Thus, later explaining the error as originating from *Enterprise's* beacon, CDR Ring altered course to the north to intercept the *Hornet* using the Point Option method.

According to doctrine, “whenever aircraft may be expected to operate outside of sight contact with the carrier, the “Point Option” system of navigation shall be used.”⁵⁹ Point Option is “a point moving on a specified course and speed such that at any instant it represents the predicted position of the carrier, with an allowable error of less than half the radius of visibility.”⁶⁰ This is essentially the dead reckoning of the carrier’s position based on the base course and speed. Base course and speed is the desired movement of the ship or formation of ships as determined by the senior officer afloat. For Task Force 16, base course and speed was 240° true, speed 25 knots.⁶¹ But if the base course and speed changed or other circumstances required a change to the location of point option, this change should have been transmitted to the air group as “Point Option Two.” Should additional corrections to point option be required, subsequent changes to point option would have been transmitted as Point Option Three, Four, and so on.⁶² Unfortunately, for the air group’s ability to discover the corrected point option,

RADM Spruance ordered radio silence for the carriers and aircraft prior to launching of the attack, thus preventing *Hornet* from updating the air group of the point option changes. After realizing the erroneous beacon signal, CDR Ring altered course to the northwest towards Point Option, the 1100 DR position of the carrier. The exact position where the main group turns to the northwest is not known. The position depicted on figure (2) is based upon the time CDR Ring returned to *Hornet* (1112), the cruise speed of the aircraft (135kts), and the estimated time the group turned onto the YE-ZB beacon. Additionally, the group broke up into two groups. The first group consisted of CDR Ring with the SBDs from VS-8 and four from VB-8. The second group contained the remaining 14 SBDs from VB-8 and all F4F-4s from VF-8.

Seeing the main group dividing into two groups, CDR Ring attempted to chase down the second group without success and they continued, apparently on the erroneous YE-ZB signal. Eventually the 14 SBDs reversed course to effect landings at Midway. Eleven of the 14 were able to land safely on Midway, where they were rearmed and refueled in order to return to *Hornet*. The 10 fighters of VF-4 continued on the beacon course not realizing the error or able to navigate using the point option method. The fighter pilots relied heavily on the bombers and scouts to maintain an accurate navigation picture, because they were too busy scanning the airspace for enemy fighters and, especially when in a dogfight, navigation was often impossible. Without the task force's base course and speed, the fighters could not determine the location of point option, thus it is possible that the pilots believed the last course (158° True) and speed (25kts) would be the point option course and speed. This corresponds closely with the course which the beacon directed the fighters. Finding nothing but open ocean, the 10 fighters eventually ditched after running out of fuel and 5 days later eight of the ten pilots were rescued.

CDR Ring and the four aircraft of VB-8 and fourteen of VS-8 attempted to locate the *Hornet* by using the point option method. Arriving at the 1100 position, the pilots did not find the carrier. Due to course and speed changes to launch and recover CAP fighters, the *Hornet* was approximately 40nm away from the point option, beyond the visual range of the pilots. CDR Ring thus altered course to the reciprocal of the formation's base course. Soon thereafter, the pilots located the carrier and safely landed, all still with their bomb underneath the airplane.

Torpedo Squadron Eight

As stated earlier, two facts which helped to reconstruct the flight of VT-8 are the time the squadron attacked the Japanese fleet and their cruise speed. The cruise speed of the Devastator was 110kts and the time the group attacked was 0930. The distance traveled for the squadron was approximately 147nm. According to ENS George Gay, the only VT-8 survivor of the attack and navigator for the squadron, the "course was a constant 240 degrees and the speed 110kts."⁶³ To fly 147nm at a speed of 110kts would take approximately one hour twenty minutes. Take the time away from the attack time (0930), the squadron would have to have departed from the formation immediately after launching and forming up at 0810. All aircraft were shot down by the Japanese Zeroes, thus negating the need for a return flight. ENS Gay was rescued the next day.

Conclusion

Historians agree the battle marked the turning point of the war in the Pacific against the determined, war hardened Japanese fleet. For the men of the *Hornet* Air Group, the Battle of Midway was, for a majority of them, their baptism into World War II. CDR Ring, the commander of the air group and senior pilot for the task force, also experienced his first combat

action during the battle. Prior to the battle, the air group did not execute coordinated training with the four squadrons. Each squadron conducted individual training, either practical or classroom. Coordinated training and evaluation between the squadrons prior to the battle, including launch sequencing with synchronized attacks on a target and navigation would have highlighted the differences between the aircraft allowing the commanders to determine the most tactically efficient sequence of launching. The launch sequences and departure methods employed by the *Enterprise* and *Yorktown* during the battle took into account not only the limitations of the various aircraft but also the tactical situation. The *Hornet's* launch sequencing, however, was determined by the flight deck length required for the loaded aircraft to become airborne. The sequence of events that resulted in the mission failure and loss of aircraft did not start after launching--the events began well before then.

After launching, the time to rendezvous, form-up the group and depart was excessive for two reasons. The first reason was a function of two restrictions from then-current aviation doctrine; remaining below 5,000ft after launching and climbing rate of 500ft/min to altitude. The second was caused by the decision on 31 May to utilize the deferred departure method. Even though the decision was doctrinally correct, it expended precious time and fuel. These two reasons for the excessive expenditure of time from launch to departure were also exacerbated by CDR Ring's leadership style. CDR Ring was known by the pilots of the air group as a strict disciplinarian and a stickler for proper military procedures. His leadership style forced the pilots to not question his orders or authority and follow doctrine to the letter. This in turn caused the pilots to obtain the precise position according to aviation doctrine when forming up into parade formation prior to departure. As a direct result of CDR Ring's leadership style and the decisions of 31 May, the group expended precious time and fuel, indirectly contributing to the failure to

engage the enemy and the subsequent loss of aircraft and pilots. But that is as far as CDR Ring can be held culpable for the failure and losses.

To successfully attack a target, the location of the target must be known, at least with an error within visual range. The reported position of the Japanese fleet, which CDR Ring led the *Hornet* Air Group on, was in error by approximately 38nm. But once reaching the expected interception point, and not finding the Japanese, CDR Ring chose to turn southeast towards Midway expecting the carriers to have increased speed in order to close the island for the planned invasion. CDR Ring has been criticized for not executing an expanding square search even though doctrine does not address this method for search of a surface vessel. But this begs the question: which direction should he have started the expanding square search, to the southeast or northwest? Either direction, and his group would soon have been critically low on fuel, possibly resulting in more unnecessary losses due to fuel exhaustion. Thus, by not finding the Japanese and returning to the carriers without attacking and not mounting a credible protracted search, CDR Ring ensured that those aircraft and pilots would be available for subsequent attacks.

Until the discovery of the *Lost Letter of Midway*, CDR Ring was shrouded in mystery and speculation. By not seeking an interview or through simple neglect, historians could only speculate as to the flight path of the *Hornet* air group. But the letter still does not provide all the answers to questions such as: how could VF-8 fly off in the direction away from the U.S. carriers until they expended their fuel? Even after disclosure of the letter, CDR Ring is still held responsible for the fate of the ten aircraft of Fighting Eight and the failure of the squadron to execute an attack. According to doctrine,

Each plane is at all times responsible for its own navigation and will continually fix its own position as accurately as its facilities permit. Even when flying in

formation, each plane must, to the best of its ability, record its successive positions in order that it may be able at any time to operate independently. If any pilot believes that his formation commander is flying on an incorrect course, he may fly alongside the leader and indicate what he considers to be the correct course, but he shall then rejoin the formation and continue to follow his commander.⁶⁴

At no time did any other commander or pilot question the actions of CDR Ring during the flight. From the inaction by any other pilot it appears that CDR Ring was the only pilot maintaining an accurate navigation picture. When CDR Ring disregarded the erroneous YE-ZB beacon signal, the fighters and bombers continued on the same course leading to an open ocean.

For the *Hornet* Air Group, the first attempted attack resulted in an unfortunate conclusion. The responsibility for the failure and the losses cannot be applied to one person--it was caused by everyone from the Commanding Officer to each individual pilot as well as the then-current aviation doctrine.

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- ⁴⁸ Francillon, *McDonnell Douglas Aircraft since 1920: Volume 1*, p. 254-265.
- ⁴⁹ U.S. Navy, *Current Tactical Orders and Doctrine, U.S. Fleet Aircraft, Volume One; Carrier Aircraft (USF-74)* (1941), 168.
- ⁵⁰ Wildenberg, *Destined for Glory*, p. 177-186.
- ⁵¹ Lundstrom, *The First Team: Pacific Naval Air Combat from Pearl Harbor to Midway*, p. 325.

Notes

⁵² U.S. Navy, *Current Tactical Orders, Aircraft Carriers, U.S. Fleet; USF-77 (Revised)* (1942), p. 16.

⁵³ Gay, *Sole Survivor*, p. 114.

⁵⁴ U.S. Navy, *Current Tactical Orders and Doctrine, U.S. Fleet Aircraft, Volume One; Carrier Aircraft (USF-74)*, p. 118-119.

⁵⁵ Linder, "The Lost Letter of Midway," p. 31.

⁵⁶ U.S. Navy, *Current Tactical Orders and Doctrine, U.S. Fleet Aircraft (Vol 1) Carrier Aircraft (USF-74B)* (November 1944), 1-27. Even though this document is post-Battle of Midway it can be assumed with some accuracy that the procedure of not exceeding 500ft/min climb rate was followed because doctrine evolves from practices in use in the fleet.

⁵⁷ Wildenberg, *Destined for Glory*, p. 174-175.

⁵⁸ U.S. Navy, *Current Tactical Orders and Doctrine, U.S. Fleet Aircraft, Volume One; Carrier Aircraft (USF-74)*, p. 181.

⁵⁹ *Ibid.*, p. 182.

⁶⁰ *Ibid.*, p. 181.

⁶¹ USS *Hornet* Deck Log, 0800-1200 Watch, 4 June 1942.

⁶² U.S. Navy, *Current Tactical Orders and Doctrine, U.S. Fleet Aircraft, Volume One; Carrier Aircraft, (USF-74)*, p. 182-183.

⁶³ Gay, *Sole Survivor*, p. 115.

⁶⁴ U.S. Navy, *Current Tactical Orders and Doctrine, U.S. Fleet Aircraft, Volume One; Carrier Aircraft (USF-74)*, p. 26.

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