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# The Battle of Midway

## Why the Japanese Lost

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Dallas Woodbury Isom

**T**HE BATTLE OF MIDWAY CONTINUES TO GRIP the imaginations of those interested in World War II. This is true not just because it was the pivotal engagement of the Pacific theater but also because it was a battle the Americans should have lost—but instead won by one of the most lopsided margins in naval history. The Japanese entered the battle with an overwhelming advantage in ship-sinking firepower, but in the end they were soundly trounced. All four of their aircraft carriers were sunk, as against just one of the Americans'. Most dramatically, three of the Japanese carriers were destroyed in a span of just two minutes, and only minutes before those carriers were to have launched their own attack against the American carrier fleet. On 4 June 1942, Japan's offensive naval air power was virtually destroyed in a single battle, and what little chance it ever had of winning the war in the Pacific went up in the smoke of its burning carriers. The titles of two popular books about the battle—*Incredible Victory* and *Miracle at Midway*—capture the momentousness of the event.

The principal protagonists in this battle for naval supremacy in the Pacific have become legendary. On the strategic level, Admiral Chester Nimitz, commander in chief of the U.S. Pacific Fleet, matched wits against Admiral Isoroku Yamamoto,\* commander in chief of the Japanese Combined Fleet; on the tactical level, Rear Admiral Raymond Spruance (under Rear Admiral Frank Fletcher) was pitted against Vice Admiral Chuichi Nagumo, commander of the Japanese carrier force.

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\* Japanese names are given in Western order, given name first.

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The genesis for the Midway operation was the failure of the attack on Pearl Harbor to catch and destroy the American carriers that Yamamoto had expected to be there with the rest of the Pacific Fleet. The Doolittle raid on Japan in April 1942, in which sixteen B-25 bombers were launched from the carrier *Hornet* (CV 8), had crystallized support in the Japanese high command for an operation to eliminate the American carrier force in the Pacific. Yamamoto's objective was to entice—by attacking and occupying the two small Midway Islands, where a U.S. naval base had been established—Nimitz's carriers into a decisive battle in which they could be destroyed. The Midway atoll, about 1,100 miles northwest of Hawaii, was regarded by the Japanese as the "sentry for Hawaii," too valuable an asset for the Americans to lose without a fight.

Yamamoto's plan—which included an attack in the Aleutians—was unprecedented in its complexity and scale, involving almost every combatant ship in the Japanese navy, almost 140 in all, along with dozens of support ships. The "teeth," however, were the four fleet carriers in Nagumo's Mobile Force—*Akagi*, *Kaga*, *Hiryu*, and *Soryu*.<sup>1</sup> Between them, these ships embarked around 270 planes, of which about 230 were operational (twenty-one land-based Zeros were being ferried for use on Midway after its capture.)<sup>2</sup> It was these four carriers, with their supporting ships, of the Mobile Force that were involved in what is popularly called the battle of Midway.

On the American side, Nimitz's code breakers had deduced the general outline and approximate date of Yamamoto's Midway operation. Nimitz, at Pacific Fleet headquarters at Pearl Harbor, planned to ambush Nagumo's carrier force. For this he had three carriers available—*Enterprise* (CV 6) and *Hornet* in Task Force 16, under the command of Spruance, and *Yorktown* (CV 5) in Task Force 17, under Rear Admiral Frank Jack Fletcher. (*Yorktown*, damaged three weeks earlier in the battle of the Coral Sea, had been hastily repaired.) The three ships collectively carried 234 planes, of which 221 were operational.<sup>3</sup> In addition, there were about eighty land-based combat planes and thirty-two PBY flying boats for reconnaissance on Midway itself. Thus Nimitz actually had more planes at his disposal in the immediate arena of the battle, but Nagumo's planes could deliver far more effective firepower, and his pilots were much more experienced. If the Americans were to have a reasonable chance of winning, their planes had to strike Nagumo's carriers before they

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could launch their own attack against the American carriers. That, of course, is exactly what happened—but just barely.

Had the Japanese gotten their attack launched, they stood a very good chance of winning the battle. They possessed a deadly ship-sinking weapon—an aerial torpedo that was very accurate and reliable, and so fast it was difficult to evade. The American aerial torpedo at that time in the war was unreliable and slow—it essentially did not work. Nor did the American navy have armor-piercing, delayed-fuse bombs that could penetrate into the bowels of a ship before exploding, as the Japanese had.<sup>4</sup> The bombs carried by the American carrier dive-bombers were short-fuse, high-explosive bombs that could destroy a large aircraft carrier only if it was caught in its most extreme condition of vulnerability—with decks crammed with planes fully fueled and laden with bombs or torpedoes. But that was how the three Japanese carriers were caught. They were destroyed more by fire from their own gasoline and secondary explosions from their own ordnance than by any fatal structural damage inflicted directly by the American bombs.

What, mercifully for the Americans, went wrong for the Japanese at Midway? The American carrier attack, which Nimitz intended to be an ambush, a surprise attack, was in fact no ambush. The American naval presence in the Midway area had been discovered by a Japanese search plane—the infamous “*Tone 4*”—on the morning of 4 June, at 0728, almost three hours before the fatal bombing at 1025 by American dive-bombers from the carriers *Enterprise* and *Yorktown*.

Why could the Japanese not get an attack launched before 1025? This has been one of the most perplexing mysteries of World War II. In the more than half-century since then, no satisfactory account has

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been published of those three hours on the Japanese side of the battle; on close examination, it appears that most of what is generally believed to have happened in fact never did. Admiral Nagumo and his staff were not the fools they have been made out to be, and the *Tone 4* search-plane pilot who discovered the American fleet was not the myopic, absent-minded incompetent that he has been portrayed as being. Mistakes were certainly made by the Japanese—there are plain reasons why the battle was lost—but they were not idiotic mistakes, as is commonly implied.

**The Standard Scenario.** Most of what is now popularly “known” about the Japanese side of the battle, as evidenced in books, films, and television documentaries, comes from a series of books published soon after the war.<sup>5</sup> These early books fixed in the popular mind a “standard scenario” of what happened on the Japanese side of the battle, which more recent movies and novels have presented vividly: a befuddled Nagumo refuses to accept the reality of the situation, “dithers,” and then in a series of blunders throws away any chance he had of countering the American carrier threat.<sup>6</sup>

### Fact and Fiction

Why could no attack be launched before 1025? The problem that prevented an immediate response to the discovery of the American carrier fleet is well known: at 0715, less than fifteen minutes before the American fleet was discovered, Nagumo had ordered the rearming of his torpedo planes and dive-bombers for a second strike on Midway. (The first strike had been launched at 0430 with 108 planes, thirty-six each of the torpedo, dive-bomber, and Zero types. A second wave, of equal numbers but intended—and armed—to attack ships, had been brought up to the flight decks of the four carriers.) The planes were struck below to the hangar decks: the torpedo planes (on *Akagi* and *Kaga*) were to be reloaded with eight-hundred-kilogram land-type bombs in place of torpedoes, and the dive-bombers (on *Hiryu* and *Soryu*) with 242-kilogram high-explosive fragmentation bombs instead of 250-kilogram, armor-piercing antiship bombs.

The rearming of the torpedo planes with land-attack bombs contravened a standing order by Yamamoto that half of the torpedo

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planes in Nagumo's Mobile Force were always to be fitted with torpedoes, on standby in the event an American carrier fleet showed up at Midway.<sup>7</sup> Nagumo justified his decision on grounds that the first-wave commander had notified him by radio at 0700 that Midway had not yet been neutralized and that a second strike was needed. As the Mobile Force was then under attack by torpedo bombers from Midway, this recommendation was given heightened force. Also, the fact that no American ships had been discovered after two and a half hours of search tended to confirm Nagumo's belief that there was no enemy carrier threat in the area.

Moments after this fateful decision, the crew of a float plane launched by the cruiser *Tone*—designated *Tone 4*—discovered elements of the American fleet. The sighting report was transmitted in telegraphic code at 0728: "Sight what appears to be 10 enemy surface ships, in position bearing 10 degrees distance 240 miles from Midway. Course 150 degrees, speed over 20 knots."<sup>8</sup> No mention was made of carriers. The earliest commentators on the battle assumed that this report was received directly by the radio room of Nagumo's flagship, *Akagi*, and thus by Nagumo, at around 0730.<sup>9</sup> Later authorities, however, accept that it was relayed to *Akagi* several minutes later by the plane's mother ship;<sup>10</sup> they suggest that the admiral received the sighting report around 0740.<sup>11</sup> In any case, it was presumably necessary to attack the U.S. ships as rapidly as possible—but the only aircraft available to attack them were being rearmed with specialized land-attack weapons. According to the standard scenario, Nagumo, after regaining his composure, responded with an order at 0745 that the rearming operation be "suspended."<sup>12</sup> In this view, at 0745 the rearming crews were about halfway through their task, with about half the torpedo planes still armed with torpedoes.<sup>13</sup>

The official Japanese government history of World War II (known as *Senshi Soshō*), in its volume on Midway, published in 1971, agrees that *Tone 4*'s sighting report was received by Nagumo indirectly, through the cruiser, shortly before 0745, but it takes a different position as to the nature of his countermanding of the 0715 rearming order. It contends that at 0745 the rearming operation was reversed—not merely suspended.<sup>14</sup> (The only recorded text of that order is ambiguous: "Prepare to carry out attacks on enemy fleet units. Leave torpedoes on those attack planes which have not as yet been changed to bombs.")<sup>15</sup>

At 0800, fifteen minutes after Nagumo supposedly issued his countermand order, the Mobile Force came under attack by sixteen Dauntless dive-bombers from Midway, quickly followed at around 0815 with an attack by fourteen B-17s. No hits were scored, but the radical, high-speed maneuvering by the carriers to evade the bombs

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*[N]o satisfactory account has been published of those three hours on the Japanese side of the battle; on close examination, it appears that most of what is generally believed to have happened in fact never did.*

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made further rearming of the torpedo planes practically impossible. At 0820 the crew of *Tone 4* finally identified a carrier in the American task force; this report was received by Nagumo at 0830. In the meantime, the Midway strike force had returned; many of its planes were shot up and in distress, and it requested an immediate landing.

At 0830, Nagumo was faced with a second fateful decision: whether to launch immediately an attack against the American carrier force with the aircraft then ready or to postpone his attack until after the Midway strike force had been landed and his second-wave torpedo planes had been rearmed with torpedoes. He chose to postpone. Under the standard scenario the attack was, soon after this time, scheduled for launch at 1030—a postponement of two hours.<sup>16</sup>

This decision has been roundly criticized. According to the standard scenario—in which the rearming operation was “suspended” by Nagumo at 0745—roughly half the torpedo planes were in the hangar decks and still had torpedoes attached at 0830; most of the other half were on the flight decks, rearmed with eight-hundred-kilogram high-explosive bombs. All thirty-six of the second-wave dive-bombers were properly armed for attacking ships and on the flight decks of *Hiryu* and *Soryu*.<sup>17</sup> It is said that a reasonably adequate attack could have been made at 0830 with those resources. Also, it is pointed out, the absence of those planes, loaded with fuel and ordnance, from the flight decks of the carriers at 1025 would have greatly reduced the damage inflicted on them by the American dive-bombers from *Enterprise* and *Yorktown*.

Nagumo’s decision to forgo a limited attack at 0830 in favor of a later “grand scale” attack (as he called it) more worthy of the Imperial Japanese Navy is largely attributed, by the standard scenario, to

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hubris, arrogance, and contempt for the capabilities of American naval pilots—attitudes constituting what has been called “victory disease,” resulting from the previous string of successes by the Japanese navy.<sup>18</sup> However, all commentators agree that there were no Zeros available at 0830 to escort the attack planes. Those originally assigned to the second wave had been diverted to the combat air patrol to fend off the series of attacks from Midway, and their fuel and ammunition were mostly depleted by 0830.

Given the standard scenario’s depiction of the armament status of the planes, its explanation for the postponement was troubling. A brief postponement might have been justified until some Zeros could have been landed, rearmed, and refueled, but a two-hour postponement does not make sense. Nagumo was aware that his Mobile Force had been discovered by American search planes three hours earlier;<sup>19</sup> by 0830 an attack from carriers should have seemed imminent.

As for any contempt he might have had for the abilities of American naval pilots—said to have been based on the pathetic performance he had just witnessed in the attacks from Midway—Nagumo and his staff should have been aware that American carrier pilots were substantially better than American land-based pilots at that time in the war. Just a month earlier, at the battle of the Coral Sea, American carrier pilots had managed to sink a Japanese light carrier and severely damage the “super-carrier” *Shokaku*. Even if Nagumo’s judgment was in fact impaired by “victory disease,” there is no evidence that Commander Minoru Genda, his staff air officer, whose advice on such matters was practically dispositive, was similarly afflicted.

What really casts doubt on the standard scenario’s account is a more fundamental mystery: why was an attack not launched before 1025, when the first bombs hit Nagumo’s carriers? If the rearming operation on the torpedo planes was halted at 0745—just a half-hour after it had been ordered—and even if restoring the torpedoes to the half of the planes from which they had been removed did not begin until 0830, surely the torpedo squadrons on *Akagi* and *Kaga* could have been made ready for launch well before 1025. If the rearming operation was actually reversed at 0745, as *Senshi Sosho* has it, this dilatoriness is even more incredible.



This, then, is the nub of the problem: why could not what had been done in thirty minutes be undone in less than two hours? A timely reloading of the torpedoes should have been possible, even though for much of the two hours after 0830 the Mobile Force was recovering the Midway strike force and fending off attacks by carrier-based torpedo bombers. Under the standard scenario's account of their armament status (and as will be seen below), there simply was not much left to do.

The problems with the official Japanese version of the scenario are still worse: according to it, the rearming operation was not just merely suspended at 0745 but reversed. If so, then more than half of the torpedo planes on *Akagi* and *Kaga* should have had torpedoes attached at 0830, and some of them, it would seem, would have been brought up to the flight decks to replace aircraft rearmed with bombs. (It would also seem that those few still in the hangar decks could have been raised to the flight decks and launched without causing inordinate delay in landing the Midway strike force.)<sup>20</sup> In either view, all the dive-bombers on *Hiryu* and *Soryu* were armed to attack ships and on the flight decks ready to launch; with that much antiship armament available, the decision to postpone the attack should have been excruciatingly difficult. Yet a staff officer is reported in *Senshi Soshō* as recalling that it was "easily made."<sup>21</sup>

It is yet more incomprehensible under *Senshi Soshō*'s scenario that the torpedo planes were not ready to launch well before 1025. There would have been even less work remaining than in the American version of the story. It is true that the recovery of the Midway strike force was not completed until about 0920 on *Akagi*, and again, during much of the time between 0930 and 1000 the Mobile Force was maneuvering to evade two waves of American torpedo bomber attacks. But if the rearming operation was reversed at 0745, there would have been time to get the second-wave strike force spotted on the flight decks before 1000—when, as will be seen, there was a fifteen-minute window during which a launch could have been made without any harassment from the Americans.

***Toward a More Plausible Scenario.*** It would seem, then, that Nagumo must have been facing problems more serious than have heretofore been realized. To find out what really happened on the Japanese side of the battle on that fateful morning of 4 June it is necessary to

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examine the primary sources, the principal ones being Nagumo's official report and the action reports from the air groups of the four carriers in the Mobile Force.<sup>22</sup> The surviving records, however, are fragmentary (most of the ship's log books and battle diaries were lost in the war), ambiguous, and even contradictory. There are also secondary materials derived from them but supplemented by testimony from Japanese veterans of the battle.<sup>23</sup> More illuminating are the untranslated Japanese literature—principally the *Senshi Soshō* volume on Midway.

The indispensable sources, however, are the carrier air group veterans of the battle. Of the few who survived the war, many of them had been aircraft and weapons mechanics—the men who did the “heavy lifting” on the hangar decks—and most have never before been interviewed about what went on during the battle. These veterans give insights into Japanese carrier operations that point to reasons why Nagumo could not get an attack into the air in time.<sup>24</sup>

### What Really Went Wrong?

The key to unlocking the mystery has been at hand for over fifty years but has generally been ignored. As noted, it is commonly assumed that the 0728 sighting report from *Tone 4* was received by Nagumo before 0745 and that pursuant to it Nagumo suspended or reversed the rearming of his torpedo planes and dive-bombers at 0745. But Nagumo states very clearly, twice, in his official report that he did not receive that sighting report until about 0800.\* His report complains that the delay in its delivery “greatly affected our subsequent attack preparations.”<sup>25</sup> However, this claim has been almost universally rejected by historians—all American ones and most Japanese—because it is inconsistent with two entries in the composite message log of that same report.<sup>26</sup>

The first entry is Nagumo's order, logged at 0745, countermanding the 0715 rearming order. The second is a command, logged at 0747, by Nagumo to *Tone 4* to “ascertain ship types.”<sup>27</sup> These orders, of course, make no sense unless Nagumo had already received the sighting report. Morison, indeed, declares that Nagumo's claim that it was not delivered until 0800 was “belied” by his 0745

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\* All times in the official report, which are in Tokyo time, have been converted to Midway time, which is three hours later and on the previous day.

countermand order;<sup>28</sup> Morison's immense prestige early established a pre-0745 receipt time as fact, and from it the standard scenario of the rearming operation has proceeded.

But what if Nagumo did *not* receive the sighting report until 0800 as he claimed? The strongest evidence against that claim remains the

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*It does not diminish the pride Americans can rightfully take in their victory to accept that Yamamoto, Nagumo, and the crew of Tone 4 were crafty and worthy adversaries.*

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two entries in the "composite log," but what if their times were erroneously logged? It is likely that they were and that those two orders from Nagumo were in fact issued later.

Evidence that they were issued later can be found in the composite log itself. Let us first examine Nagumo's order to *Tone 4*, logged at 0747, for identification of ship types. It is almost identical to an order logged at 0800 to "advise ship types." The standard scenario assumes that this was a repeated order; it portrays Nagumo as extremely irritated by the lack of response from *Tone 4* and considers this entry as evidence of lackadaisical performance by the aircraft's crew.<sup>29</sup> *Tone 4* did not respond to Nagumo's request for details until 0809, when it reported back that the "10 surface ships" consisted of five cruisers and five destroyers. Twenty-two minutes—from 0747 to 0809—is an inordinate length of time to take to respond to an Admiral's request and by itself casts doubt whether the request for details was sent as early as 0747. However, a nine-minute turnaround time for radio messages (from 0800 to 0809) would be more reasonable.

Could it be that the two orders to *Tone 4* to identify ship types were one and the same and that the order was actually sent at 0800? If so, this would indicate that Nagumo did not receive the sighting report until around 0800.

In the composite log are numerous examples of messages logged more than once, and in which the earliest of two or more entries is not the correct one. Among them: Nagumo's message to his Mobile Force advising them to "Proceed northward after taking on your planes. We plan to contact and destroy the enemy task force." This is logged as having been sent at 0855 and again at 0905. However, in

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the narrative portion of the report Nagumo states that he sent the message at 0905.<sup>30</sup>

Likewise, the report by *Tone 4* sighting two additional cruisers in the American task force is stated in the narrative as having been received at 0840 but is logged in the composite log at 0830, 0845, and 0850. Thus there are substantial grounds for believing that the 0747 time for Nagumo's request for *Tone 4* to "ascertain ship types" is erroneous and that 0800—which is consistent with Nagumo's statement in the narrative that he received the sighting report at about 0800—is actually the correct time the request was sent.

But what about the countermand order, which is logged only once and at 0745? There are also several examples in the composite log of events being logged at the wrong time, where the correct time can be established independently by American records of undisputed reliability. For instance, a Japanese search plane on a southeast course that took it near Midway radioed a report to the Mobile Force—logged at 0555—that "15 enemy planes are heading towards you."<sup>31</sup> Those planes were almost certainly a squadron of sixteen Dauntless dive-bombers from Midway. But they did not take off from Midway until after 0600 and did not form up into a group until around 0615.<sup>32</sup> Nor did any other group of planes—Vindicator dive-bombers, torpedo bombers, or fighters—take off before 0600 in response to the air raid warning at 0555. The only American planes from Midway that were in the air as a group at 0555 were a squadron of B-17s, which was over two hundred miles west of Midway. No group of planes could have been seen by that search plane until at least fifteen minutes after 0555.

Therefore, the time of Nagumo's order countermanding the rearming operation could also have been erroneously logged as occurring at 0745. It is more likely that it was issued after 0800.

The composite log was assembled from radio and other logs of the several ships in the Mobile Force; the *Akagi's* flag-bridge log had been lost. Its compiler noted that the entries were fragmentary and inconsistent and cautioned against placing too much credence on their accuracy.<sup>33</sup> Unfortunately, the early American scholarship on Midway—upon which the "standard scenario" is based—lacked the benefit of the caveat about the composite log's reliability and assumed that the times it gave for certain key events, such as the countermand order, were accurate. (The compiler's caveat appeared in

*Senshi Soshō*, which was not published until 1971—and then only in Japanese.) The narrative portion of Nagumo's official report, in contrast, is tightly written and internally consistent. The times it gives for key events deserve much more credence than they have been given—even allowing that Nagumo's account was likely to be somewhat self-serving.

In any case, Nagumo's claim is not the only direct evidence for an 0800 receipt time for the *Tone 4* sighting report. That time has been supported by Ryunosuke Kusaka, Nagumo's chief of staff, and

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*Mistakes were certainly made by the Japanese—there are plain reasons why the battle was lost—but they were not idiotic mistakes, as is commonly implied.*

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Minoru Genda, his staff air officer.<sup>34</sup> They were on the bridge with Nagumo and, in view of the report's shocking nature, are likely to have made particular note of when they heard it. After the war neither of them wavered from their recollections that the sighting report was not received in Nagumo's headquarters until about 0800—even after it became widely accepted that the report was received before 0745.<sup>35</sup> Even if Nagumo's credibility can be questioned, that of Kusaka and Genda has not been challenged. After the war, Genda served a long tenure as head of Japan's Air Defense Force. He earned a reputation among American as well as Japanese officials and historians for candor, objectivity, and probity. His insistence, along with Kusaka's, on a receipt time of 0800 is entitled to be given a great deal of weight.<sup>36</sup>

We may postulate, therefore, that Nagumo did not learn of the presence of American ships in the Midway area until about 0800 and that the operation to rearm the torpedo planes with land-type bombs continued until that time. This factor, as Nagumo claimed in his official report, did indeed have a profound effect on his ability to launch an attack against the American carrier force. It provides the key to cracking the two central mysteries of Midway: why no attack was launched at 0830—after the presence of an American carrier had been confirmed and before the Midway strike force was landed—and, more importantly, why the torpedo planes were not ready before the Japanese carriers were bombed at 1025.

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As has been seen, under the standard scenario, the decision at 0830 whether to launch an attack or postpone would have been a close call. If, on the other hand, Nagumo did not receive the *Tone 4* sighting report until 0800, the armament status of his torpedo planes would have been radically different: by then, all the torpedoes would have been removed. Moreover, they could not have been immediately reattached—because at 0800, as noted, the dive-bombers from Midway began their attack, followed by the B-17s, and until the attacks were over at 0830 the carriers were forced to maneuver radically; sharp turns and a heeling deck made the lifting involved impracticable. There were probably a few torpedo planes armed with eight-hundred-kilogram land-type bombs, but as the Kate torpedo plane could not dive-bomb, these were of little use against ships at sea. Add to all this the fact that there were no Zeros available to escort an attack group, and it is easier to understand why Nagumo found it unpalatable to delay the recovery of the Midway strike force while sending off the dive-bombers alone. More importantly, the very different armament status of the torpedo planes at 0830 makes it easier to understand why no launch took place before 1025.

***The Rearming Operation.*** The torpedo planes could not have been re-armed in time for a pre-1025 full-strength launch if Nagumo did not receive the *Tone 4* sighting report until 0800; conversely, however, they could have been had he received it before 0745, as generally claimed. To see why, let us examine the procedure of rearming the torpedo planes.

First, changing torpedo planes from torpedoes to eight-hundred-kilogram land-type bombs took much longer than commonly assumed. It has been stated by most American commentators that it took about one hour; that, however, was the time it usually took to arm a squadron of *empty* torpedo planes with torpedoes or bombs. This was the usual situation. Rearming from torpedoes to land-attack bombs, however, was highly unusual for the Japanese; in fact, they had done it only once before Midway, in an experiment conducted on *Hiryu*. It had been found to take one and one-half hours to change a squadron of torpedo planes from torpedoes to eight-hundred-kilogram land bombs (providing the bombs were already in the hangar deck) and two hours to change back from land bombs to torpedoes.<sup>37</sup>

When the order to rearm the second wave for a repeat strike on Midway was issued by Nagumo at 0715, the torpedo planes had first to be lowered to the hangar deck. As the carriers were still under attack by torpedo bombers from Midway, the striking below probably did not begin until about 0720.<sup>38</sup> It took about seven minutes for the first plane to be rolled to the elevator, positioned, lowered, and man-handled to its arming station in the hangar deck. Thereafter, as two elevators were used, planes arrived at their stations at about one-minute intervals. Accordingly, it took about twenty-five minutes to lower and position at their arming stations a squadron of eighteen torpedo planes. However, the weapons mechanics did not wait until all the planes were in the hangar deck; as each plane arrived at its station, the work began.<sup>39</sup>

The rearming procedures were performed neither on all eighteen planes simultaneously nor one at a time, as has respectively been stated by some commentators. Rather, the torpedo planes were re-armed in shifts—by *chutai* (divisions) of probably six on *Akagi*, possibly nine on *Kaga*. There were only enough ordnance mechanics and, especially, enough heavy-weapon “carrier cars” (wheeled ordnance-carrying carts, equipped with jacks) in a squadron to rearm a division of aircraft simultaneously.<sup>40</sup> (*Kaga*, with its larger squadron of twenty-seven torpedo planes, had more weapons mechanics and carrier cars than *Akagi*.) As each plane in a *chutai* reached its arming station, its torpedo was disarmed, disengaged from its release mechanism, and lowered on the jacks of the carrier car. This took about five minutes—until the twelfth minute into the overall operation for the first aircraft, the seventeenth for the last aircraft in *Akagi*’s first division. Thus it can be seen that almost nothing had been done to disarm the torpedo planes by 0728, when *Tone 4* sent its sighting report, especially if the operation did not begin until the American torpedo bomber attack was over at 0720. Had Nagumo learned of that report by 0730, as claimed by the earliest accounts, his 0715 rearming decision would have been quickly and entirely reversible.

But to continue: after the torpedo had been disengaged and lowered, it was rolled on the carrier car to a heavy-weapons rack, where it was deposited; this took about another five minutes. Before a bomb could be attached to the plane, it was necessary to replace the “launcher,” the ribbed rack on the belly of the plane to which external ordnance was attached. (Japanese torpedoes were long and

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slender, but the eight-hundred-kilogram land-type bombs were short and stubby.) The torpedo launcher had to be unbolted and replaced with a bomb launcher, a procedure that took surprisingly long—about twenty minutes. While this was being done, the carrier cars used for the first division of the squadron were available to remove the torpedoes from the planes in the second.

It has become accepted, however, that Nagumo did not receive the sighting report at 0730, in fact not before 0740—twenty (or twenty-five) minutes into the rearming operation. When the rearm-

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*This, then, is the nub of the problem: why could not what had been done in thirty minutes be undone in less than two hours?*

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ing operation was (supposedly) countermanded at 0745, what was the armament status of the torpedo planes?

The procedures described, continued up to 0745, would have resulted (on *Akagi*) in the removal of torpedoes from all six planes of the first division and from some in the second division. Specifically: the torpedo from the sixth plane would have been removed, as calculated above, at about 0737, at which time the torpedo from the first plane would have been deposited on the weapons rack; that car would have been available to remove the torpedo from the first plane of the second division. Assuming one minute to roll it to the plane and that additional cars were released from the first division at one-minute intervals, the torpedo from the first plane of the second *chutai* would have been removed at around 0743, and from the third around 0745. Thus, at 0745 nine torpedoes—give or take one or two—would have been removed from *Akagi*'s torpedo plane squadron.

On *Kaga*, the rearming schedule is less certain. It had twenty-seven torpedo planes, but it appears that perhaps only eighteen in the original second-wave formation had been armed with torpedoes, with the remaining nine—with less experienced crews—held in reserve in the hangar deck, unarmed. (All twenty-seven were later committed to the attack scheduled for 1030.)<sup>41</sup> If only eighteen were stricken below pursuant to the 0715 rearming order and they were rearmed nine at a time, then somewhat more than nine *Kaga* torpedo planes could have had their torpedoes removed by 0745. In any event, it is fair to assume that about half the torpedo planes on both carriers



still had their torpedoes at 0745, as claimed under the standard scenario. However, this does not mean that the rearming operation was half completed, as claimed; it was less than a third completed—there just had only been time to remove half the torpedoes. Also, no land bombs had been attached to the torpedo planes by that time (as claimed by some commentators, who apparently assume a one-at-a-time rearming procedure.)<sup>42</sup> None could have been: at 0745, the launchers were still being changed on the torpedo planes of each carrier's first division.

It should thus be apparent that if the rearming operation was reversed at this point—at 0745—it would not have taken much time to restore the torpedoes on the half of the planes from which they had been removed and respot all the planes on the flight decks of the two carriers, perhaps only about thirty minutes. But as we have seen, according to the standard scenario Nagumo did not reverse it; he only suspended it. The reason for this, it is said, is that he did not suspect that carriers were among the “10 surface ships” reported by *Tone 4* and wanted more information regarding the precise composition of the American force.<sup>43</sup> However, it is almost certain that Nagumo did suspect the presence of carriers. One member of his staff is reported as having doubted it, but Kusaka (Nagumo's chief of staff) and probably Nagumo himself realized that there would be no good reason for so many American ships to be at Midway unless they were a carrier task force.<sup>44</sup>

If the rearming operation could have been easily reversed at 0745, by 0800 (when, as we have concluded, *Tone 4*'s sighting report was actually received) the prospects had become much grimmer. It would have taken a few minutes for Nagumo to make the decision and get it to the rearming crews in the hangar decks of *Akagi* and *Kaga*. *Senshi Soshō* (which assumes a pre-0745 receipt time) reports a deliberation by Nagumo as to whether the rearming should proceed to completion and an attack against the American fleet be made by bomb-laden torpedo planes, or whether it should be reversed, restoring the torpedoes. It was decided that torpedoes should be restored—as level bombing by torpedo planes against moving ships had been proved to be very ineffective in comparison with torpedo attacks.<sup>45</sup>

Such a deliberation would seem needless at 0740, when the rearming operation could have been quickly reversed. However, by

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0800—when restoration of the torpedoes may have taken longer than completing the change to land bombs—Nagumo's options would have been more complex. Adding to the complications were the beginning of the dive-bomber attack from Midway and the return of first elements of the Midway strike. In the end, the decision was made to reverse the rearming operation, but given how busy things were just then, it may have taken a while to reach. There may, how-

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*The key to unlocking the mystery has been at hand for over fifty years but has generally been ignored.*

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ever, have been a fairly quick interim decision to suspend the rearming operation, but it seems likely that no order was issued to the rearming crews until at least five minutes after receipt of the *Tone 4* sighting report.

What was the likely armament status of the torpedo planes at 0805? To continue the rearming sequence from 0745: the torpedo on the last plane of the second division on *Akagi* would have been removed and deposited on the heavy-weapons rack by about 0753—the twelfth of the eighteen planes to be stripped of their torpedoes. By that time, the bomb launcher would have been installed on the first plane of the first division, and the carrier cars would have been available to begin installing land bombs on the planes of that division. Actually, however, it would have been more efficient at that point to use the carrier cars to remove the torpedoes from the third, and last, division of planes; time being of the essence, that was probably done. In such a case, the carrier car used to remove the torpedo from the first plane of the second division could have been positioned under the first plane of the third division around 0749, and the torpedo removed five minutes later. The torpedo from the last torpedo plane on *Akagi* would have been removed by around 0759 and deposited on the rack about five minutes later. In the meantime, the carrier car used to remove the torpedo from the first plane of the third division would have become available to transport a land bomb to the first plane of the first division around 0800.

Thus at 0805, none of the torpedo planes on *Akagi* had torpedoes attached; launchers had been changed for land bombs on about two-thirds of them (and torpedo launchers removed from most of the remainder); and land bombs were being trundled to about

one-third of them. On *Kaga*, if only eighteen torpedo planes were being rearmed, nine at a time, things would have been even more advanced: not only would all the torpedoes have been removed, but a few of the planes would have had land bombs installed. The restoration of torpedoes on those planes would have taken even longer than on *Akagi*.

These exact-seeming times are in fact only estimates, but the foregoing description is the likely armament status when Nagumo received the sighting report at 0800. Twenty minutes may not seem a long time, but given the nature of the rearming procedures and the timing of the American attacks, the admiral faced a far more complicated situation at 0800 than he would have at 0740.

If an order was issued by Nagumo to the ordnance crews at 0805, it is almost a moot point whether it was to reverse or merely suspend the rearming operation: the Mobile Force was under attack, and battle-speed evasive maneuvers made it almost impossible to move the 1,872-pound torpedoes, let alone reattach them.<sup>46</sup> (In any case, this could not be done until the launchers had been changed back.) About the only thing that could have been done between then and 0830, when Nagumo had to make his decision whether to attack or postpone, would have been to reinstall the torpedo launchers.

**Events after the Decision to Postpone.** The recovery of the Midway strike force began at 0837.<sup>47</sup> It had been delayed a few minutes by an attack by eleven more dive-bombers from Midway—the third attack since 0800. The *Akagi* dive-bombers were landed by 0859, and the Zeros, both from the Midway strike force and from the combat air patrol, were landed by 0918.<sup>48</sup> At 0917 the Mobile Force began turning to the northeast to close on the American carrier force. Thus, at about 0920 operations to respot the second-wave strike force on the flight decks could have begun, had the torpedo planes been rearmed with torpedoes. Had the countermand order been given at 0745, as the standard scenario holds, the torpedoes almost certainly would have been restored by 0920.

But the torpedo planes on *Akagi* and *Kaga* were not ready at 0920. All their torpedoes had been removed before the countermand order had been given after 0800. Also, although it had been over forty minutes since the air attacks on the Mobile Force had ceased, rearming could not have proceeded at full pace during that time: the Midway

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strike force dive-bombers had to be stricken below into the same hangar decks as were occupied by the torpedo planes undergoing rearming. (The flight decks—which, of course, were not “angled,” as flight decks are today—had to be cleared of dive-bombers so the Zeros could land and others take off for combat air patrol.) This evo-

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*Why, then, could not the aircrew see a carrier? . . . It is . . . likely that the Tone 4 crew actually saw everything that was visible and that there were no carriers with those ten ships.*

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lution did not prevent rearming operations on the torpedo planes, but as planes had to be jostled around to make room for the new arrivals in the cramped quarters, it slowed the process considerably. It can be roughly estimated that only about twenty minutes' worth of normal rearming work got done on the torpedo planes between 0837 and 0920. That would have been enough to get torpedoes back on half the planes, but at least another twenty minutes was needed for the remaining half. (It took longer to put torpedoes on a plane than to take them off.) On *Kaga*, with its twenty-seven planes, even more additional time was needed.

Thus, at 0920 on *Akagi* and *Kaga* there began for Nagumo what must have seemed one of the most frustrating races against time in naval history. For after just ten minutes of unimpeded rearming time, the first wave of American carrier-based torpedo bombers attacked at 0930—fifteen from *Hornet*, led by Lieutenant Commander John Waldron. The rearming operation again came to a halt as the carriers undertook desperate maneuvers to evade the torpedoes. This attack was quickly followed by a second wave of fourteen torpedo bombers from *Enterprise*. When it was over at 1000, about ten minutes of work still remained to rearm the last division of *Akagi*'s torpedo planes, and even more time was needed for *Kaga*'s. The torpedo planes that had been rearmed had been brought up to the flight decks, beginning around 0920, but at least a third remained in the hangar decks at 1000. By 1015, the rearming had probably been completed on *Akagi*, and the last torpedo planes were being brought up and spotted on its flight deck.<sup>49</sup> Had the whole strike force been ready to go at 1000, it, along with Zero escorts, could have been launched during this fifteen-minute window between attacks on the Mobile Force. But it was not, and at 1015 the window closed with the

arrival of a third wave of torpedo bombers. These were twelve planes from *Yorktown*.

Though these planes—like the previous two waves—scored no torpedo hits, the *Yorktown* torpedo bombers lured down to sea level the high-altitude combat air patrol. The Zeros previously on low-level patrol had run out of cannon ammunition while fending off the prior two waves of torpedo bombers. When Commander Clarence W. McClusky's two squadrons of dive-bombers from *Enterprise*, along with Lieutenant Commander Maxwell F. Leslie's squadron from *Yorktown*, showed up and began their dives shortly after 1020, there were no Zeros to oppose them. Nagumo had run out of time.

**What about Nagumo's Dive-Bombers?** Up to now almost no mention has been made of the second-wave dive-bombers on *Hiryu* and *Soryu*. The reason is that—in contrast to the torpedo planes, which obviously could not use torpedoes against land targets but also, as noted, could not hit moving ships with bombs—their armament status was not a problem in this drama. In fact, Nagumo's official report makes almost no mention of them in connection with the rearming operation. This led early commentators to believe that they were not included in the 0715 rearming order and thus remained armed with armor-piercing antiship bombs throughout the morning.<sup>50</sup> It is now clear, however, that in fact they were rearmed, along with the torpedo planes, for a second strike on Midway.<sup>51</sup>

It would have been irrational not to have rearmed them, first of all because dive-bombers would seem particularly effective for attacking airplanes on the ground—one of the main purposes of the second strike. There is a reason, however, why the dive-bombers did not affect Nagumo's ability to launch an attack against the American carrier force, either at 0830 or later: dive-bombers were more easily and quickly rearmed than torpedo planes. They carried bombs that were less than a third the weight of the torpedoes or eight-hundred-kilogram bombs carried by the torpedo planes. Thus, their bombs were more easily handled, and their manipulation was less impeded by the sharp swerving of the carriers maneuvering to avoid air attacks. Their launchers did not have to be changed to switch from antiship to land-type bombs. There were plenty of the smaller bomb dollies available, so the entire squadron could be rearmed simultaneously. Also, they could be rearmed on the flight deck as well as in the

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hangar deck. (It appears that only half of each squadron was lowered to the hangar deck after the 0715 rearming order, thus saving elevator time.)<sup>52</sup>

Lastly, only two-thirds of each dive-bomber squadron had to be rearmed. This is because when Japanese dive-bombers were armed to attack ships, ordinarily about two-thirds of the aircraft carried armor-piercing bombs and one-third fragmentation bombs—which in this case they had already.<sup>53</sup> The instant-detonation, high-explosive fragmentation bombs (that is, land bombs) were used to knock out anti-aircraft gun batteries and blow holes in flight decks. Because of all this, it took less than half as long to rearm the dive-bombers as it did for the torpedo planes.

The two-thirds of the dive-bombers on *Hiryu* and *Soryu* that had to be rearmed pursuant to the 0715 rearming order were most likely rearmed with land bombs before 0800. Most, if not all, of those had probably been changed back to armor-piercing bombs by very soon after 0830;<sup>54</sup> at least half of each squadron on *Hiryu* and *Soryu* was already on the flight decks at 0830. Moreover, even if less than the optimum number of dive-bombers had armor-piercing bombs attached, high-explosive fragmentation bombs were about as effective against carriers as armor-piercing ones. (The American dive-bombers destroyed the Japanese carriers with short-fused high-explosive bombs; the U.S. Navy lacked armor-piercing bombs at that time in the war.)

***Why the Delay in Forwarding the Sighting Report?*** We have seen that the key to why Nagumo could not launch an attack before 1025 is that he did not receive the *Tone* 4 sighting report until about 0800. The obvious question, however, is why it took a half-hour to get that report to him. This does seem incredible. One of the reasons for the common assumption that Nagumo received the report around 0740 is that examination of the composite log shows that on average there was only about a ten-minute difference between the time a radio message was sent and the time it was received in Nagumo's command center. The average, however, includes many cases where messages were expected by the communications staff of the Mobile Force and thereby got expedited handling.

Initial sighting reports from search planes, however, are often not expected, and that was certainly the case with *Tone* 4's. But how could this one have taken thirty minutes? In this case, no detailed

reconstruction of the procedures is available to explain the delay fully, but the following factors account for most of it. First, the radio message was not received directly by *Akagi's* radio room, which was not guarding the search plane's reporting frequency, but by the *Tone*. Second, *Tone 4's* report was sent not in plain language but rather in encrypted Morse code;<sup>55</sup> it would appear that the radioman was caught not fully prepared to decipher it. After it was taken to the bridge on *Tone*, it was relayed to *Akagi* by blinker (after catching the attention of a signalman who, apparently, was not expecting an urgent message). It was then transcribed and taken to Nagumo's flag bridge. Altogether, this added up to about thirty minutes.<sup>56</sup>

Subsequent messages from *Tone 4* took much less time to reach Nagumo's command center. They were expected, so communications crews were standing by to speed their passage. Some were in plain language, and even those sent in code were more quickly decoded; all were sent without delay, by flashing light, from *Tone* to *Akagi's* now-alerted signalmen. Thus, the time it took for those messages to get to Nagumo is in no way indicative of the time it took the initial sighting report to reach him.

Are there other initial sighting reports from that time in the war that can be used for comparison? There was one, the same day. It was sent in code by a search plane at 0530, but no report (and that, a retransmittal) was received until 0603 by the admiral for whom it was meant—Frank Jack Fletcher. Thirty-three minutes had elapsed—and the American commanders, unlike Nagumo, were *expecting* to find enemy carriers in the area.<sup>57</sup> In this light, the thirty-minute delay in relaying the *Tone 4* sighting report is not as anomalous as it first appears.

### The Decision to Postpone

At 0830, when Nagumo had to make a decision whether to launch an attack on the American force or postpone it, we have seen that he had ready no torpedo planes and no Zeros for escort. But he did have dive-bombers on *Hiryu* and *Soryu* available. They could have been launched fairly quickly and probably would not have delayed the landing of the Midway strike force long enough to cause serious plane losses from ditching (for lack of fuel). Indeed, Rear Admiral Tamon Yamaguchi, commander of the Second Carrier Division (containing

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*Hiryu* and *Soryu*), urged Nagumo to do just that.<sup>58</sup> He was fearful of an American carrier attack if the launch was postponed and believed that a limited attack was better than the possibility of none at all.

Nagumo chose to postpone. He did so not because he contemptuously disregarded any threat of an American carrier bomber attack—as portrayed by the standard scenario—but because he did not think that an effective attack could be made with the dive-bombers alone and thought he had time to organize a coordinated strike. Unescorted dive-bombers would be easy prey to American fighters over the target, especially without torpedo planes coming in at low level to split the American defenses. This would result, Nagumo believed, in unacceptable pilot losses with little chance of inflicting serious damage on the American carriers. Moreover, the torpedo planes, when he was able to send them, would be without those dive-bombers to divert American fighters and anti-aircraft gunfire. The slow and low-flying torpedo planes would be even more vulnerable to undivided defenses than the dive-bombers, and their pilot losses correspondingly even worse.

Carrier pilot losses were much more costly for the Japanese than for the Americans. They had fewer carrier pilots, and it took longer to train replacements. Japan had begun the war with only about four hundred experienced, first-line carrier pilots.<sup>59</sup> If Japan was to have any chance of knocking the American carrier fleet out of the Pacific, it had to do it in the first year of the war—and largely with those carrier pilots already on hand. Thus, conservation of carrier pilots was a serious concern for Nagumo; it was another factor that persuaded him that the better option was to postpone his attack until a coordinated attack with Zero escorts could be organized. The problem with this, of course, was time.

***What Made Nagumo Think He Had the Time?*** At 0830, Nagumo knew that his Mobile Force had been discovered by the Americans and that there was at least one American carrier in the area—probably two or three. One would think that an attack from them should have seemed imminent. What made him think he had the time to land the Midway strike force and then organize a coordinated attack? We know that his attack was scheduled for 1030, two hours after the decision to postpone. Did he really think he had two hours?



First, it is now clear that he did not schedule the 1030 launch at the time he made the decision to postpone at 0830. His official report indicates that at 0830 Nagumo thought that a coordinated attack could be launched very soon after the Midway strike force was landed.<sup>60</sup> The report also shows that it was around the time those landings were completed—about 0920—that Nagumo was informed by his carrier air group commanders that the torpedo planes on *Akagi* and *Kaga* would not be ready for launch until 1030.

But, even so, Nagumo at 0830 had been assuming that he could get an attack in the air by soon after 0930. The question still remains: what made him think he had even *one* hour? Perhaps surprisingly, there actually was reason to believe he had that much time. The 0728 *Tone 4* sighting report had given the location of the American ships as “10 degrees distance 240 miles from Midway.” This was quickly calculated by Nagumo’s staff to be a little over two hundred miles from the position of the Mobile Force at that time (see the search and course chart). This was judged too far away for a bomber attack to be escorted by the short-legged Wildcat fighters.<sup>61</sup> Nagumo’s staff knew that the Mobile Force was well within the range of the Dauntless dive-bombers, but it apparently believed the Wildcat’s combat radius was only about 175 miles.<sup>62</sup> Nagumo and his staff thus believed that the Americans had only two options at 0728, both of them favorable to the Mobile Force: wait until their carriers had steamed at least twenty-five miles closer to the Mobile Force, which would take about an hour, or attack without fighter escorts.

Under the first option, the Americans would not begin their launch until after 0830; it would take time to launch and form up the squadrons and then about an hour and a half for them to reach the Mobile Force. Nagumo appears to have concluded that he would have until after 1000 to get his own attack launched. Under the second option, it was thought that an American bomber attack without fighter escorts would be easy meat for the Zeros on combat air patrol and that the Mobile Force would not, therefore, sustain serious damage. (Nagumo had just declined to send his own dive-bombers off alone for this very reason.) It is likely, then, that Nagumo counted on his American counterpart delaying a launch until an escorted attack could be made—until after 0830. Nagumo took a calculated risk in postponing his attack, but the odds looked fairly good.

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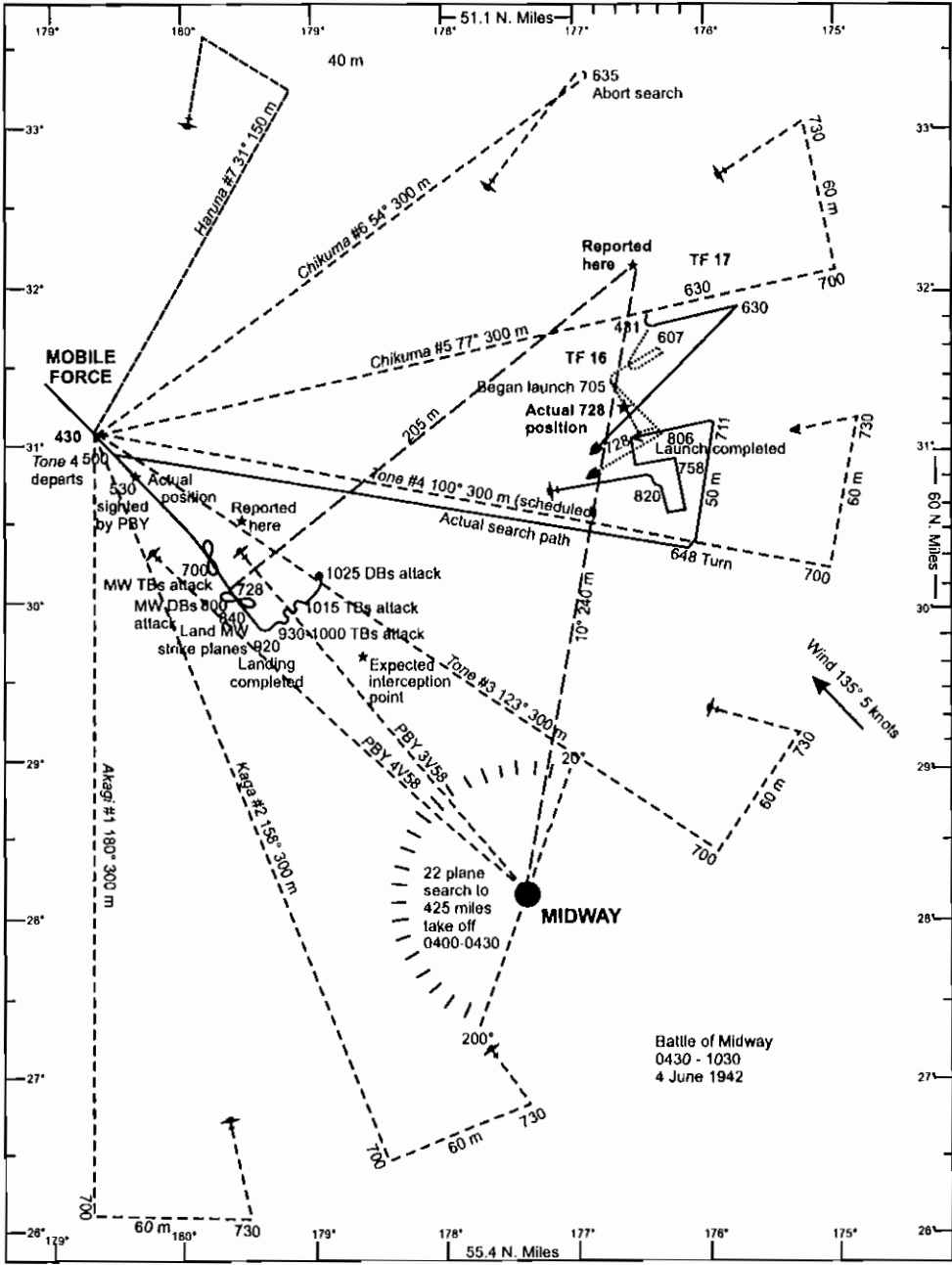
There was one horrendous problem with Nagumo's calculation: *Tone 4*'s navigator had mislocated the position of the American task force. It actually was about fifty-five miles farther south than reported and thirty miles closer to the Mobile Force—only about 175 miles away at 0728.<sup>63</sup>

It is not known why *Tone 4*'s crew thought the American ships were fifty-five miles farther north, relative to Midway, than they actually were. It has been suggested that *Tone 4*'s navigational charts were erroneous, or that because the float plane was brand-new perhaps its navigational instruments had not been properly calibrated.<sup>64</sup> (Another possibility, not mentioned in the Japanese literature, is simple error in plotting distance on the chart the aircrew was using—not adjusting distances for distortion due to the projection as positions advanced to the north. It is known that the crew was inexperienced at reconnaissance.)<sup>65</sup> In any event, the American ships were only 185 miles north of Midway—not the 240 reported—and Nagumo made a crucial decision to postpone based, in part, on his calculation that this put them thirty miles farther away than they actually were.

The aircrewmembers of *Tone 4* made a navigational error, but it is not clear that it was their fault, and in any case, they were not alone to blame for its consequences. The error should have been noticed in the cruiser *Tone*, to which they were reporting; the report placed the American task force over a hundred miles north and sixty miles west of where *Tone 4* should have been at that time. A request to *Tone 4* for a direction-finding radio transmission would have revealed its approximate distance north of Midway. In fact, someone on Nagumo's flag bridge must have later noticed that something was wrong with *Tone 4*'s location report, because at 0854 such a transmission was requested by Nagumo.<sup>66</sup> But by that time his decision had already been made, and the Mobile Force was halfway through recovering the Midway strike force.

It would be a mistake, however, to assume that Nagumo based his decision to postpone solely on *Tone 4*'s sighting report. As we have seen, there were other reasons—primarily the armament status of his planes—that made an 0830 launch unappealing. His calculation of the distance of the American fleet from the Mobile Force was just one factor in the decision. But it explains why Nagumo thought he had time to organize a “grand scale” attack, and it is one of the

### Search and Course Chart



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reasons why, according to a staff officer's recollection, the decision to postpone was "easily made."

## Ironies

Nagumo believed that the American carrier force was too far away at 0728 to be able to launch an escorted attack against him at that time because he reckoned that the Wildcat's combat radius was less than two hundred miles. From this he concluded that the Americans would either have to send bombers without fighter escorts, making them easy to defend against, or delay their attack until they got closer to the Mobile Force. The assumptions Nagumo made from the erroneous *Tone 4* sighting report are laden with irony.

The problem for Spruance at Midway was not so much the range of the Wildcat but that of the Devastator torpedo bomber. Although the Wildcat's combat radius was less than two hundred miles, that of the Devastator was even shorter—under 175 miles.<sup>67</sup> Spruance had indeed delayed his launch until he thought he was close enough to the Mobile Force to give his torpedo bombers a decent chance of returning to their carriers. He had wanted to launch an attack very soon after he received the sighting report at 0603 locating the Mobile Force, but he waited until 0705 to begin his launch.<sup>68</sup>

However, Spruance was also misled by an erroneous sighting report. At 0705, he had judged his distance from the Mobile Force to be 155 miles, based on its position and course given in the 0603 sighting report.<sup>69</sup> The Mobile Force was actually forty miles farther to the northwest, which put it about 182 miles—not 155—from Spruance's carriers. This twenty-seven-mile difference (which is about the magnitude of *Tone 4*'s thirty-mile error) would have required another hour of steaming to make up.

The great irony here is that if the American sighting report had been accurate, Spruance probably would have further delayed his launch in order to get closer to the Mobile Force—just as Nagumo had hoped. He may not have delayed another full hour, as he was eager to hit the Japanese carriers before they could launch an attack against him. But he very well may have delayed for another fifteen to twenty minutes to get to within 175 miles so his torpedo bombers would have at least a chance of returning from their mission. In such a case, McClusky's dive-bombers probably would have arrived over

the Mobile Force later—perhaps at around 1040 instead of 1022—giving Nagumo time to have gotten most of his “grand scale” attack launched.

The second irony is Nagumo’s assumption that if the Americans attacked before he was able to get his own attack launched, the American attack would be by unescorted bombers and thus be easy to fend off with his combat air patrol. Though not intended by Spruance, it did indeed turn out that none of the three squadrons of dive-bombers that arrived over the Mobile Force at 1022 had any fighter escorts. The escorts sent had either gotten lost or had been misdirected because of communications failures. But Nagumo’s assumption that unescorted dive-bombers would be easily disposed of by his combat air patrol did not take into account that none of the Zeros he relied on would be there to meet them. By the time the American dive-bombers arrived, the only Zeros left at high-altitude patrol after the first two waves of Spruance’s torpedo bombers had attacked had been drawn down to defend against the torpedo bombers from *Yorktown*.

### Myths and Misconceptions

It is widely assumed that Nagumo’s rearming dilemma could have been avoided had his search operation been better. According to the standard scenario, with a more extensive and diligent search effort the American fleet would have been discovered before 0715 and, thus, Nagumo would not have given the fatal order at 0715 to rearm his torpedo planes for a second strike on Midway. Three charges have been leveled. First, had the search plan involved more aircraft and thus more density of observation, a search plane probably would have discovered the American ships on its outbound search path—before 0700.<sup>70</sup> Second, even with the same search plan, had the *Tone 4* plane been launched on time, at 0430 instead of 0500, it would have discovered the American ships a half-hour earlier—at around 0700 instead of 0728.<sup>71</sup> Third, even with the 0728 discovery, had *Tone 4*’s crew been more observant it would have seen an aircraft carrier and reported it in the initial sighting report rather than not identifying it until 0820. This, it is said, would have given more urgency earlier on to Nagumo’s measures to counter the American carrier threat.<sup>72</sup>

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These are all myths. The reality contains even more ironies, and a paradox.

**The Search Plan.** It is true that the density of Nagumo's search plan was skimpy, especially compared with that employed by the Americans at Midway. He used only seven planes to cover an arc of 160 degrees, where the Americans used twenty-two planes to cover an arc of 180 degrees (see the chart). It should be realized, however, that the Americans were expecting the Mobile Force to be in the area—thus, their purpose was to locate it as early as possible. Nagumo, on the other hand, was not expecting American carriers to be in the area. In fact, he was convinced, on the basis of information he had, that they could not be near Midway on the morning of 4 June. Accordingly, his search effort was merely precautionary—by which standard the plan was adequate.

But Nagumo's search plan made absolutely no difference in the outcome of the battle, in any case. The low search-line density did not cause the failure to discover the American fleet earlier. In point of fact, one of the Japanese search planes—*Chikuma 5*—flew almost right over an American carrier task force at 0630 (see the chart); it saw nothing, because of heavy low-level clouds.<sup>73</sup> (Weather on the search line to the north was even worse—another *Chikuma* search plane had to abandon the search at 0635 and turn back because of a storm in the area.)<sup>74</sup> Therefore, whether there had been fourteen search lines or even twenty-two, because of the cloud cover it is very unlikely that the American ships would have been seen much before 0728. As Nagumo lamented in his official report, "The weather of the day certainly was not a friend of our search planes."<sup>75</sup>

**The Late Launch of Tone 4.** *Tone 4*'s launch, scheduled for 0430, did not happen until 0500, because of engine trouble or problems with the catapult (it is not clear which). However, the result was not a delay in its discovery of the American ships. What we have here is a striking paradox: had *Tone 4* been launched on time, a half-hour earlier than it was, it most likely would not have arrived at the point where it found the American fleet until over half an hour later than it actually did—not until after 0800 instead of 0728.

How can this be so? It is now clear that the reason *Tone 4* was able to arrive in the vicinity of the American fleet at 0728 is that it had

shortened its route. It was supposed to fly three hundred miles easterly before turning on its sixty-mile dogleg to the north; instead, *Tone 4* made that turn about sixty-five miles short (see the chart).<sup>76</sup> It ran onto the American ships very soon after it made its final turn at the end of the dogleg to head back to the Mobile Force. The shortcut took over 130 miles off its prescribed run—which, given its 120-knot cruising speed, reduced the time it took to reach that point by over an hour.<sup>77</sup>

It is not known why the pilot of *Tone 4* shortened his course. He was not instructed to do so by anyone on the cruiser *Tone*, and neither he nor anyone else in his crew survived the war to explain. The best guess, however, is that he did so in an effort to make up the lost time caused by the late launch. Thus the late launch of *Tone 4*, instead of delaying the discovery of the American carrier force, appears to have resulted in those ships being discovered over half an hour earlier than they otherwise would have been. Actually, it was the only piece of luck Nagumo had that morning.

***The Delay in Identifying a Carrier.*** When *Tone 4* spotted elements of the American fleet at 0728, it reported only that it had seen “10 surface ships.” To a request by Nagumo to identify ship types, *Tone 4* replied at 0809 that the ships consisted of five cruisers and five destroyers. No carrier was identified until 0820—fifty-two minutes after the initial sighting report. It is widely assumed that had a carrier been reported to begin with, Nagumo’s attack preparations would have been accelerated substantially. We now know that Nagumo had made no order at 0745 countermanding the rearming operation; nothing, then, could have been done before 0800 to counter an American carrier threat even if the initial *Tone 4* report had mentioned a carrier. Still, it is not unreasonable to assume that had the initial report identified a carrier, the communications personnel might have got it to Nagumo a few minutes sooner—and considering how close he came to launching his attack before being bombed at 1025, every minute saved could have made a significant difference in the outcome of the battle.

As it is, there has been an almost universal assumption that *Tone 4*’s crew was not up to par—some say hapless and incompetent—and that its apparent inability to distinguish an aircraft carrier from a cruiser was largely to blame for the subsequent debacle of the Mobile

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Force.<sup>78</sup> But would a more keenly observant search plane crew have seen a carrier at 0728, or at least well before 0820? Probably not.

It is generally assumed by American commentators that *Tone 4* made its initial sighting from a great distance, perhaps thirty miles, at which it was difficult to identify ship types.<sup>79</sup> Instead, it appears that *Tone 4* was very close to the American ships.<sup>80</sup> They probably were seen through a break in the clouds, and their composition would have been easily discernable. This conclusion—supported by *Senshi Soshō*—is based on two factors. First, the ships could not have been seen at all from a great distance; the area was too cloudy at 0728.<sup>81</sup> Second, the *Tone 4* report was precise about the course of the American ships—150 degrees. From thirty miles away, or even twenty, only a general direction could have been made out, such as “southeasterly.”

Why, then, could not the aircrew see a carrier? *Senshi Soshō* is at a loss to explain, and it shares the view that the *Tone 4* crewmen were sloppy observers.<sup>82</sup> It is more likely that the *Tone 4* crew actually saw everything that was visible and that there *were* no carriers with those ten ships. *Tone 4* probably sighted elements of Spruance’s Task Force 16. It appears that *Enterprise* and *Hornet*, along with a cruiser (probably the anti-aircraft light cruiser *Atlanta*, CL 51) and four destroyers, had begun soon after 0705, during the launch of their planes, to diverge from the rest of the task force—five heavy cruisers and five destroyers.<sup>83</sup> Also, there was fairly heavy cloud cover over the entire area of the task force;<sup>84</sup> it was only around 0730 that the clouds began to break up over the carriers. The ten TF 16 units, separated from and under less overcast conditions at 0728 than the carriers, were the ships *Tone 4* saw.<sup>85</sup> (The aircrew apparently felt that because it saw no carriers and was in a great hurry to encode and transmit its initial sighting, distinguishing between cruisers and destroyers was not important.)

The main evidence that the carriers had become separated is *Tone 4*’s 0820 report as given in the narrative of Nagumo’s official report: that the ships previously mentioned were “accompanied by what appears to be a carrier in a position to the rear of the others.”<sup>86</sup> This indicates that a carrier not with the group originally seen—probably *Hornet*, which completed its launch first—was now rejoining its main escorts. Another report from *Tone 4* lends support. At 0758 the search plane radioed that the American ships had changed course to



080 degrees (from the original 150). This would make no sense for a carrier; planes were still being launched, and it is almost certain that Spruance's two carriers steered a course into the wind—around 135 degrees—until the launch was completed at 0806.<sup>87</sup> If, however, the ten cruisers and destroyers seen by *Tone 4* had been diverging from the carriers by even fifteen degrees, by 0800 they would have been several miles to the west. They would naturally change course to the east near the end of flight operations to regain their prior positions with respect to the carriers.

It is probable, then, that *Tone 4* accurately reported what it saw at 0728 and 0809, and that no carrier was visible to it until 0820 (by when the aircraft had retreated about thirty miles, at which range Task Force 16 detected it on radar).<sup>88</sup> Had *Tone 4* not been found and pursued into clouds by fighters from *Enterprise* just after 0820, *Enterprise* would probably also have been seen. Even so, *Tone 4*'s work was not over; at 0830 it reported that two more cruisers (probably in *Yorktown*'s task force) had been spotted and at 0855 that ten torpedo bombers (probably *Yorktown*'s twelve) were heading toward the Mobile Force.

***Verdict on the Performance of the Tone 4 Crew.*** Far from being the sloppy, myopic incompetents portrayed by the standard scenario, the crewmen of *Tone 4* appear to have been very observant and even resourceful aviators. Although their navigation was faulty, without their shortcut some sixty-five miles before the end of their prescribed search path, the American ships would not have been discovered as early as they were. This fortuitous turn to the north cannot be attributed to mere navigational error; it was almost certainly intentional. Although the position the *Tone 4* crew gave for the American ships was too far north by fifty-five miles, that position was almost exactly correct on the east-west axis (ten degrees from Midway), meaning that they appear to have known how far east they were. When they found the American ships, they not only reported what was visible but stayed in the area monitoring their discovery for almost one and a half hours—at considerable risk to their safety. They also sent back seven reports during that time. Compared with most other naval reconnaissance of that time in the war, this was an extremely diligent performance. All in all, rather than being condemned, they deserved to be commended.

### The Real Mistakes That Cost the Japanese the Battle

As we have seen, many of the blunders that have been attributed to the Japanese at the battle of Midway are either mythical or the kinds of snafus one should expect in battle. Indeed, most of the operational blunders made by the two sides canceled each other out. The Japanese, however, made two high command-level mistakes that were egregious by any standard and, taken together, were to blame for the Japanese disaster. The first was a massive failure of communication; the second was rearming the torpedo planes. The communications failure was Yamamoto's fault, and it deprived Nagumo of vital information that might have precluded his own fatal blunder.

***The Communications Failure.*** When Nagumo departed from Japan on 27 May, he and most of the Japanese naval high command believed that the Americans were completely unaware of the Midway operation. The Naval General Staff in Tokyo thought an American carrier task force was in the South Pacific. Back on 16 May, *Enterprise* and *Hornet* had been spotted by a Japanese search plane east of the Solomon Islands, where Nimitz had ordered their commander, Vice Admiral William F. Halsey, to allow them to be seen.<sup>89</sup> While they rushed back to Pearl Harbor the next day, Nimitz perpetrated a clever disinformation scheme involving phony radio traffic to convince the Japanese that the task force remained in the area.<sup>90</sup> As late as 1 June the staff was radioing to Yamamoto its "considered judgment" that an American carrier force was still in the South Pacific.<sup>91</sup>

On 20 May, Yamamoto had advised his subordinate commanders, including Nagumo, of his own estimate that the Americans had two or three carriers in the Hawaii area;<sup>92</sup> he appears to have believed that the two carriers in the South Pacific would have returned to home waters by the time of the projected operation.<sup>93</sup> This, then, is the information Nagumo had when his Mobile Force sortied: the Americans were unaware of the Midway operation, and their carriers would probably be at Hawaii.<sup>94</sup>

The problem is that no further information reached Nagumo. He never learned that *Yamato* intercepted on 29 May a transmission from an American submarine in the vicinity of the Japanese transport group; nor that radio traffic from Hawaii (much of it marked "urgent," and also monitored by *Yamato*) had sharply increased; nor

that "Operation K," a scheduled long-range air reconnaissance of Pearl Harbor, had been canceled. Nor did he learn that Yamamoto had begun to suspect, especially from the increased radio traffic from Hawaii, that an American naval response to his Midway operation was under way.<sup>95</sup>

Yamamoto had not passed any of this vital information on to Nagumo, because he had decided on a policy of strict radio silence; he assumed that *Akagi* had picked up the same transmissions he had been receiving on *Yamato*.<sup>96</sup>

However, *Akagi*—because of its relatively small superstructure—lacked radio antennae large enough to receive the lower-frequency signals required for long-distance transmissions. Although the two fast battleships in the Mobile Force probably could have monitored long-range radio traffic, no arrangements had been made for them to do so and relay important intelligence to Nagumo. Kusaka, Nagumo's chief of staff, had worried about this very problem; before the departure from Japan he had urged that *Yamato* relay all important radio intelligence to *Akagi*, but he had been turned down, because of radio silence.<sup>97</sup> Thus, Nagumo had been left to assume that as of 31 May the Midway operation was still unknown to the Americans and also that Operation K had been carried out, and he had seen nothing to alter that assumption.

By 2 June (1 June in Hawaii) even the Naval General Staff in Tokyo, in an about-face, had come to the conclusion that the Americans had discovered the Midway operation and might be sending carriers to ambush Nagumo's Mobile Force. It sent that intelligence in an urgent radio message addressed to both Yamamoto and Nagumo. Yamamoto received this warning, but Nagumo did not. Yamamoto was inclined to relay it to Nagumo but, incredibly, was talked out of it by his senior staff officer—Kameto Kuroshima—on grounds that Nagumo had probably received it and radio silence should be maintained.<sup>98</sup> Thus, three days before the attack on Midway it seems that almost everyone in the Japanese naval high command suspected that American carriers might be at Midway—everyone except Nagumo.

Yamamoto's failure to provide for adequate communications resulted in Nagumo's being totally deprived of the information he needed to assess properly the American carrier threat on the morning of the battle. Just hours before the launch of his Midway strike force, Nagumo informed his staff, "The enemy is not aware of our

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plans. . . . It is not believed that the enemy has any powerful unit, with carriers as its nucleus, in the vicinity.”<sup>99</sup> Had he realized that American carriers might be in the area, it is most unlikely that he would have rearmed his torpedo planes for a second strike on Midway. The communications personnel of the Mobile Force would probably have been more alert in receiving and relaying search plane reports to him, increasing the chances of a timely strike against the American carriers.

***Rearming of the Torpedo Planes.*** Nagumo’s total lack of current intelligence regarding a possible American carrier threat, however, does not excuse his foolhardy blunder in deciding to rearm his second-wave torpedo planes at 0715. This not only contravened Yamamoto’s standing order but was unnecessary. A second strike on Midway was probably reasonable under the circumstances, as the first strike had failed to neutralize the air power there. However, it was not necessary to rearm the *torpedo planes*; an adequate second strike could have been made with just dive-bombers and Zeros. This is because the main purpose of the second strike was to destroy the aircraft that had escaped before the first strike, a task for which dive-bombers and Zeros were especially well suited. Even the other purpose, knocking out antiaircraft gun batteries, could have been achieved almost as well by dive-bombers as by torpedo planes. That extra margin of firepower provided by the torpedo planes was not essential, and its price was far too high: it made the Japanese carriers incapable of an effective strike against any American carrier force that might show up—however remote Nagumo judged that possibility to be.

Nagumo made, then, a “reverse lottery” gamble: instead of risking a little for the chance of gaining a lot, he risked a great deal in order to gain very little. Why did he do it? The main reason appears to be Nagumo’s devotion to the doctrine of coordinated attack, using all three types of planes. This doctrine had served the Mobile Force very well, and it probably even justified his decision to postpone his attack against the American carrier force later that morning. But in this instance—the second strike on Midway—he should have deviated from it.

\* \* \*

The “standard scenario” of the battle of Midway is not credible: most of the blunders supposedly committed by Nagumo and *Tone 4* are dubious, if not absurd. It is understandable that the Japanese were portrayed as capable of them immediately after the war; it has been commonplace to belittle the intellectual capabilities of one’s enemies, especially those of a different ethnic group. It is also understandable why this view was aided and abetted by the Japanese themselves; it is natural for a defeated people to indulge in a certain amount of introspective self-deprecation and scapegoating.

But now, over a half-century after the war, more objectivity is in order. Too little of the record survives to know for certain, but the new scenario proposed here is surely much closer to what actually happened than has heretofore been portrayed. It does not diminish the pride Americans can rightfully take in their victory to accept that Yamamoto, Nagumo, and the crew of *Tone 4* were crafty and worthy adversaries.

American pride, however, should also be tempered by the realization that sheer luck had much to do with the outcome. Without some incredibly good fortune for the Americans, and some equally bad luck for the Japanese—most notably, the cloud cover that obscured Task Force 17 when *Chikuma 5* flew almost right over it at 0630—Nagumo would have gotten his strike force off his carriers. The American carrier force most likely would have been destroyed. The remarkable decoding work that had uncovered the Midway operation and set the stage for an ambush would have been seen, instead, as having led the American carriers into a trap. Had that happened, the course of the war in the Pacific would have been unimaginably different. Such are the fortunes of war.

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### Notes

1. Nagumo’s carrier force of four fleet carriers and supporting ships has been variously called the Mobile Force, Striking Force, First Air Fleet or, in Japanese, Kido Butai.

2. Ikuhiko Hata and Yasuho Izawa, *Japanese Naval Aces and Fighter Units in World War II* (Annapolis, Md.: Naval Institute Press, 1989), p. 148.

3. John B. Lundstrom, *The First Team* (Annapolis, Md.: Naval Institute Press, 1984), p. 330.

4. Commander in Chief, U.S. Pacific Fleet, “Battle Report,” 28 June 1942, ser. 01849, part 1, p. 27.

5. Samuel Eliot Morison, *History of United States Naval Operations in World War II*, vol. 4, *Coral Sea, Midway and Submarine Actions, May 1942–August 1942* (Boston: Little, Brown,

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1988). Morison based his work largely on Nagumo's official report, "Mobile Force's Detailed Battle Report #6," translated and published in 1947 by the Office of Naval Intelligence under the title *The Japanese Story of the Battle of Midway*, OPNAV P32-1002. There are two versions of this report, with different pagination; the first, which Morison cites, appeared in the May 1947 issue of the *ONI Review*. The version I cite (as more available in libraries) was a booklet published by the Office of Naval Intelligence in June 1947 [hereafter Official Report]. The first popular account from Japan was Mitsuo Fuchida and Masatake Okumiya, *Midway: The Battle That Doomed Japan*, ed. Clarke C. Kawakami and Roger Pineau (Annapolis, Md.: Naval Institute Press, 1955). Later American popular works were Walter Lord, *Incredible Victory* (New York: Harper & Row, 1967), and Gordon W. Prange, *Miracle at Midway*, ed. Donald M. Goldstein and Katherine V. Dillon (New York: McGraw-Hill, 1982).

6. Especially the 1976 movie *Midway* and Herman Wouk's widely read novel (later a television miniseries) *War and Remembrance* (Boston: Little, Brown, 1978), pp. 398–403, 424. The image of a "dithering" Nagumo has been durable; see John Keegan, *The Price of Admiralty* (New York: Viking Penguin, 1989), p. 199. A recent scholarly treatment is Lundstrom; another excellent recent account of the American side of the battle is Robert J. Cressman and Steve Ewing, "A Glorious Page in Our History": *The Battle of Midway, 4–6 June 1942* (Missoula, Mont.: Pictorial Histories, 1990).

7. This order was not included in the Mobile Force's Midway operation order but was given to Nagumo orally before the fleets sortied from Japan. Yamamoto's staff officers Kameto Kuroshima and Yasuji Watanabe regretted after the battle that the order had not been put in writing. Prange, p. 214.

8. Official Report, p. 15.

9. Richard W. Bates, "The Battle of Midway, including the Aleutian Phase, June 3–11, 1942: Strategical and Tactical Analysis," unpublished manuscript, Naval War College, Newport, R.I., 1948, p. 90; Morison, *Coral Sea, Midway and Submarine Actions*, p. 107; and Lord, p. 118.

10. Fuchida and Okumiya, p. 165; and Prange, p. 218.

11. Fuchida and Okumiya, p. 165; and Prange, p. 218. In accord on time of receipt is John Toland, *But Not in Shame* (New York: Random House, 1961), p. 382.

12. Fuchida and Okumiya, p. 167; Lundstrom, p. 337; and Thaddeus V. Tuleja, *Climax at Midway* (New York: W. W. Norton, 1960), p. 109.

13. Prange, pp. 214, 218. See also Fuchida and Okumiya, p. 167; Lord, p. 119; Morison, *Coral Sea, Midway and Submarine Actions*, p. 107; and Tuleja, p. 109.

14. *Senshi Soshō* [War history series], vol. 43, *Middowe Kaisen* [Midway sea battle] (Tokyo Asagumo Shimbunsha, 1971), p. 313. (Under the American Library Classification system, the Midway volume is number 34.)

15. Official Report, p. 15.

16. Lundstrom, p. 339; and Prange, p. 234. Other authorities have the launch time scheduled after the Midway strike force was landed at 0918.

17. Fuchida and Okumiya, p. 169; and Prange, p. 218.

18. Fuchida and Okumiya, p. 245; and Prange, p. 370.

19. The Mobile Force was discovered around 0530 by an American PBY search plane, which was spotted by the Japanese at 0542. Official Report, p. 13.

20. *Senshi Soshō* (p. 289) gives as one of the reasons for deciding against launching an attack that even if all the torpedo planes had been rearmed with torpedoes, it would have taken forty minutes to raise them to the flight deck for a launch. If the rearming operation was reversed at 0745, however, why were all those planes still in the hangar decks at 0830?

21. Chuichi Yoshioka, quoted in *Senshi Soshō*, p. 291.

22. The action reports of the four carriers, translations by the Washington Document Center, are contained in unpublished document WDC 160985B, U.S. Naval Historical Center, Operational Archives Branch, Washington, D.C.

23. The most valuable in English is Bates; Morison—who had an office at the Naval War College, where Bates had worked, while writing his own volume—later acknowledged his heavy reliance upon that source. A small number of copies (some of poor reproduction quality) were disseminated, however, and it is available at most military libraries and some of the larger public libraries.

24. About two dozen such men were found and agreed to be interviewed. These interviews were made possible by Minehiro Miwa, a history professor specializing in the events leading to World War II in the Pacific and who had connections with Japanese navy veterans' organizations. He located veterans of the Midway operation, arranged for the interviews, and handled the translation and interpretation duties. Especially valuable were the interviews he arranged with Chuichi Yoshioka, who compiled Nagumo's official report, and with Hitoshi Tsunoda, who wrote the *Senshi Soshō* volume on Midway. He also introduced me to the Japanese literature on the subject and, finally, served as a sounding board. He was indispensable to this project.

25. Official Report, p. 42.

26. The "composite log," a section of the official report, is entitled "Outline of Events" but is actually a compilation of entries from the radio and other message logs of several ships in the Mobile Force.

27. Official Report. Both orders are at p. 15.

28. Morison, *Coral Sea, Midway and Submarine Actions*, p. 107.

29. Fuchida and Okumiya, p. 168; Lord, p. 124; and Prange, p. 223.

30. Official Report, p. 7.

31. *Ibid.*, p. 13. The message is reported in the log as having come from *Tone* 4 (which flew nowhere near Midway.) However, *Senshi Soshō* points out that it was actually the *Tone* plane on the #3 search path (also designated *Tone* 1)—that did fly near Midway. *Senshi Soshō*, p. 307.

32. Lord, p. 98; Prange, p. 219; and Robert D. Heinl, Jr., "Marines at Midway," Marine Corps Monographs, 1948, p. 27.

33. The compiler was Chuichi Yoshioka, a staff officer on *Akagi*; his caveats appear in *Senshi Soshō*, p. 284.

34. Prange, p. 217. Prange cites Ryunosuke Kusaka, *Rengo Kantai* [Combined fleet] (Tokyo: Mainichi, 1952), p. 84, and an undated questionnaire completed by Minoru Genda, by then a lieutenant general.

35. Hitoshi Tsunoda interviewed Kusaka and Genda around 1969 while preparing the *Senshi Soshō* volume on Midway. They both maintained that the sighting report was not received in Nagumo's command center until about 0800. Interview with Tsunoda at Chiba Prefecture, Japan, 25 July 1993.

36. There is another report of the battle, written by some of Nagumo's staff officers in 1947. It is entitled *Japanese Monograph No. 93: Midway Operation*. It was produced in Japan by General MacArthur's Allied Translator and Interpreter Section (ATIS) but never published. It is very detailed and appears to incorporate much of Nagumo's official report. It also states that the *Tone* 4 sighting report was received in *Akagi*'s flag bridge at "about 0800" and contains no data inconsistent with that time. (It has the countermand order being issued after 0800.)

37. *Senshi Soshō*, pp. 313–4.

38. Bates, p. 89; and Official Report, p. 14.

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39. The various procedures involved in the rearming operation and the approximate times they took were obtained from the following Mobile Force air group veterans during interviews conducted in Japan in October 1992 and July 1993: Kattutaro Akimoto, torpedo mechanic, *Akagi*; Takeshi Arakawa, dive-bomber mechanic, *Hiryu*; Fukuji Inoue, torpedo plane pilot, *Akagi*; Mr. Itazu, dive-bomber gunner, *Hiryu*; Yaroku Jinnouchi, Zero mechanic, *Hiryu*; Yuichi Kobayashi, chief of Zero squadron maintenance, *Hiryu*; Takeshi Maeda, torpedo plane pilot, *Kaga*; Tokayoshi Morinaga, torpedo plane pilot, *Kaga*; Mr. Motake, torpedo mechanic, *Soryu*; Yasaharu Mouri, dive-bomber mechanic, *Hiryu*; Tatsuya Ohtawa, torpedo plane pilot, *Soryu*; Moushichi Santou, dive-bomber mechanic, *Akagi*; Kanzo Sawada, dive-bomber mechanic, *Akagi*; Makato Tutumi, torpedo plane mechanic, *Hiryu*. Other Midway veterans with helpful information on events during the rearming operation were Hiseo Mandai, engineer, *Hiryu*; and Chuichi Yoshioka, staff officer, *Akagi*.

40. Interviews with Akimoto, Inoue, Kobayashi, Morinaga, and Motake.

41. Official Report, p. 7.

42. Fuchida and Okumiya, p. 168; and Prange, p. 218.

43. Fuchida and Okumiya, p. 167.

44. Prange, pp. 217, 224–5; and *Senshi Soshō*, p. 288.

45. *Senshi Soshō*, p. 313.

46. Tsunoda interview.

47. Official Report, p. 16. This indicates that few if any torpedo planes were on the flight deck of *Akagi*, contrary to the assumption of the standard scenario that at least half the squadron was on the flight deck, rearmed with land bombs.

48. The landing schedule on *Kaga* was probably similar. However, on *Hiryu* and *Soryu* it had been delayed, because at least half of their dive-bombers were on the flight decks and had to be stricken below first. (Genda states that all were on the flight decks [Prange, p. 232], but Jinnouchi, who helped rearm the *Hiryu* dive-bombers, recalls that only half were on that ship's flight deck.) Consequently, only about half of the Midway strike-force torpedo planes had been landed by 0918. *Senshi Soshō*, pp. 326–7. See also Action Report of *Soryu*, WDC 160985B, p. 18.

49. They were not all spotted on *Akagi*'s flight deck when the bombs hit at 1025; *Kaga*'s torpedo planes were even more behind schedule. The attacks by American torpedo bombers after the 1030 launch had been scheduled had delayed matters. The Zero seen taking off from *Akagi* by American pilots at 1025—widely assumed to have been the first of the attack group—was actually being launched for combat air patrol. *Senshi Soshō*, pp. 329–30.

50. Fuchida and Okumiya, p. 161; Prange, p. 214; and Toland, p. 381.

51. Lord, p. 118; Lundstrom, p. 337; and *Senshi Soshō*, p. 289.

52. While there is some evidence that all the dive-bombers were rearmed on the flight decks, it is more likely that half were rearmed in the hangar decks. Interviews with Jinnouchi, Kobayashi, and Mouri. However, this would not preclude their having been raised back to the flight decks before 0830.

53. Statement of Itazu (dive-bomber gunner, *Hiryu*.) See also Lundstrom, p. 384.

54. There is evidence that the radio room on *Hiryu* picked up the *Tone 4*'s sighting report and gave it to Yamaguchi before 0800. William Ward Smith, *Midway, Turning Point of the Pacific* (New York: Thomas Y. Crowell, 1966), p. 90; also Tsunoda statement. It appears that Yamaguchi then on his own initiative ordered the rearming of the dive-bombers reversed. This would explain how the dive-bombers got switched back to antiship bombs by 0830.

55. *Senshi Soshō*, p. 308.

56. Yamamoto's flagship, *Yamato*, had received the *Tone 4* sighting report and forwarded it to the flag bridge at 0740. Matome Ugaki, *Fading Victory: The Diary of Admiral Matome Ugaki, 1941–1945* [hereafter *Ugaki Diary*], trans. Masataka Chihaya, ed. Donald M. Goldstein



and Katherine V. Dillon (Pittsburgh: Univ. of Pittsburgh Press, 1991), p. 149. This may be one of the reasons (apart from the message entries in the “composite log” of Nagumo’s official report) why it is generally assumed that Nagumo received the sighting report before 0745. However, Yamamoto—unlike Nagumo—suspected that American carriers might be in the Midway area and apparently had put his communications staff on alert for such reports. (As mentioned in note 54, Yamaguchi may also have independently received the sighting report from *Tone* 4 before 0800.)

57. A naval analyst critical of the time it took has commented, “Delays of this nature in the decoding and delivery of important messages are serious at any time, but in air warfare where minutes and seconds have such a vital effect on relative position, they can be an important contributing factor to the victory or defeat of any force. Plain English, authenticated, would have saved vital minutes in this case.” Bates, p. 122.

58. Fuchida and Okumiya, p. 170; Lord, p. 131; and Prange, p. 232.

59. Although Japan had a total of about 3,500 naval pilots, the vast majority were land-based-aircraft and seaplane pilots. Masatake Okumiya and Jiro Horikoshi, *Zero!* (New York: Ballantine Books, 1957), pp. 34–6. The number who were carrier pilots appears to have been less than five hundred. The figure of four hundred I use for “first-line” experienced pilots is derived from the number used in the attack on Pearl Harbor; see Gordon W. Prange, *At Dawn We Slept* (New York: Penguin Books, 1982), p. 375, and n. 13 for chap. 46, p. 768. The Mobile Force’s normal complement of around 380 pilots had been specially reinforced with about twenty of the most experienced pilots from the light carriers. Samuel Eliot Morison, *History of United States Naval Operations in World War II*, vol. 3, *The Rising Sun in the Pacific, 1931–April 1942* (Boston: Little, Brown, 1988), p. 85. The remaining carrier pilots on the light carriers, numbering only about seventy, were considered “second-line,” and few of them developed into first-line fleet carrier pilots.

60. Official Report (in narrative, not message log), p. 7.

61. *Senshi Soshō*, p. 290.

62. One hundred seventy-five miles was, in fact, the combat radius for the newly embarked F4F-4 model. Lundstrom, p. 140.

63. Bates, p. 92; and *Senshi Soshō*, pp. 308–9. See chart.

64. *Senshi Soshō*, pp. 310–1.

65. The pilot had just been transferred in from a seaplane carrier less than a month before, and there had not been time “properly [to] train him for his new reconnaissance duties.” *Ibid.*, p. 308.

66. Official Report, p. 16.

67. Bates, p. 123.

68. *Ibid.*

69. *Ibid.*

70. Fuchida and Okumiya, p. 236; and Prange, p. 372.

71. Lord, p. 119; Morison, vol. 4, p. 106; and Prange, p. 186.

72. Fuchida and Okumiya, p. 168; Lord, p. 128; Morison, vol. 4, p. 107; and Prange, p. 217.

73. *Senshi Soshō*, p. 305. See also Bates, p. 126.

74. Official Report, p. 14.

75. *Ibid.*, p. 42.

76. *Senshi Soshō*, pp. 309, 311. Bates also inferred this (see his diagram D-2).

77. But as the *Tone* plane left a half-hour late, it arrived at the same point only a little over a half-hour earlier than it otherwise would have.

78. A typical comment on the failure of the *Tone* 4 pilot to identify a carrier for fifty-two minutes is, “Nobody could miss anything that big for long”; Lord, p. 128. More scathing is Wouk’s

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portrayal in *War and Remembrance* (p. 406): "Having turned in this sorry performance, he vanished from history; like the asp that bit Cleopatra, a small creature on whom the fortunes of an empire had briefly and sadly turned."

79. James H. Belote and William M. Belote, *Titans of the Seas* (New York: Harper and Row, 1975), p. 95; Fuchida and Okumiya, pp. 165–6; and Tuleja, p. 107.

80. *Senshi Soshō*, pp. 308, 312.

81. Bates, p. 126.

82. *Senshi Soshō*, p. 312.

83. The reported course of the "ten ships" seen by *Tone 4* at 0728 was 150. However, carriers turned into the wind during launching operations; at 0730 the wind was from 135; Bates, p. 126. The track chart (reproduced in Prange, p. 369) for the *Enterprise* air group shows the carrier on a course of between 135 and 140 at 0730.

84. Bates, p. 126.

85. The five heavy cruisers in Task Force 16 were the *Minneapolis* (CA 36), *New Orleans* (CA 32), *Northampton* (CA 26), *Pensacola* (CA 24), and *Vincennes* (CA 44). There were a total of nine destroyers in that task force. Morison, vol. 4, p. 91.

86. Official Report, p. 7. The message log entry, on p. 16, merely says, "The enemy is accompanied by what appears to be a carrier," omitting the last phrase, "in a position to the rear of the others." This is the version of the sighting report to which most commentators refer, and of course it conveys the idea that the carrier had been with the other ships all along.

87. *Enterprise* track chart, in Prange, p. 369.

88. Lundstrom, p. 338. This appears to be the basis for the assumption that *Tone 4* was this far away at 0728.

89. Edwin T. Layton, *And I Was There* (New York: William Morrow, Quill, 1985), p. 415.

90. *Ibid.*, p. 433.

91. Fuchida and Okumiya, p. 123.

92. *Ibid.*, p. 108.

93. Ugaki Diary, p. 140. Ugaki was Yamamoto's chief of staff.

94. Although it is possible that Nagumo believed that the American carriers were still in the South Pacific, his official report states that he estimated that there were two or three carriers in the Hawaii area, which "would sortie in the event of an attack on Midway" (p. 3).

95. Fuchida and Okumiya, pp. 119–20, 129; and Ugaki Diary, p. 135.

96. Fuchida and Okumiya, p. 129.

97. *Ibid.*, p. 124.

98. Prange, p. 146 (citing interview with Kuroshima). See also Lord, p. 44.

99. Official Report, p. 3.