

The Denmark Strait Battle, May 24th 1941

Written by ANTONIO BONOMI and translated by PHIL ISAACS.

Analysis of the famous engagement among major warships: *Bismarck* and *Prinz Eugen* against the *Hood* and *Prince of Wales* (plus *Norfolk* and *Suffolk*).

I am sure that to any of us that happened to look at photos of important naval battles and tried to associate them with the chronological series of events there are inconsistencies in the way the events are portrayed. When I examined photos of the Bismarck taken during the Denmark Strait battle against the Hood and against the Prince of Wales the captions under the photos were often contradictory. One day on the Internet looking at various forums dedicated to this battle I have even read about a theory that assumed some of the photos had always been printed reversed (1). There seemed to be no sense to what was written. For such an important historical event why are there still so many doubts, errors and approximations. Naval history, the Kriegsmarine and military strategy are my passion, so I decided to re-construct that battle in full detail with all the supporting information from films (2), photos, prints and paint or drawings available (3).

This article, consequently, does not have the intent to describe the whole Operation "Rheinübung" (4), but only to clarify the series of events which occurred during the Denmark Strait battle itself on the morning of Saturday May 24, 1941.

The approach

This engagement was composed of a German formation and two British Formations. The German formation included the battleship *Bismarck* (Kpt zur See Ernst Lindemann) with on board Admiral Gunther Lutjens, commander in chief of Kriegsmarine, and the heavy cruiser *Prinz Eugen* (Kpt zur See Helmut Brinkmann).

The first British formation, which was shadowing the German formation since the evening before, included the heavy cruiser *Norfolk* (Captain Alfred J.L. Phillips) with on board Rear-Admiral William F. Wake-Walker and *Suffolk* (Captain Robert M. Ellis); the second formation, which was converging on the area with the intent to engage the enemy by surprise, driven to this by the continuous signals received from the *Norfolk*, included the battlecruiser *Hood* (Captain Ralph Kerr) with on board Vice-Admiral Lancelot E. Holland and the battleship *Prince of Wales* (Captain John C. Leach) escorted by 6 destroyers (*Achates*, *Antelope*, *Anthony*, *Echo*, *Electra* and *Icarus*).

The strategic and tactical scenarios during the early hours of May 24, 1941 were different between the Germans and the British.

The Germans had been intercepted the evening before by *Suffolk*, at 19:22 (5) on the narrow area of the Denmark Strait between Greenland and Iceland. *Suffolk* had been joined almost immediately by her sister ship, *Norfolk*, which was patrolling the same area. The *Bismarck* was sailing in-line ahead, followed by the *Prinz Eugen*. The *Bismarck* reacted at once by firing at the *Norfolk* (5 salvoes of main guns at 20:30) who having just come out of a rainstorm found herself seriously exposed at a very short distance from the Germans (7 nautical miles – 13,000 meters) and had to quickly turn back re-entering the rainstorm she had come out of to avoid being hit by the *Bismarck*'s big guns (6).

The main gun salvoes fired by *Bismarck* damaged the forward main radar set of the German battleship: the equipment model FuMo 23, one on top of the main tower above the main rangefinder and the other on top of the forward rangefinder, went out of action leaving the German battleship blind ahead and with only the aft third radar set working.

Since it was not possible to repair them in a short time, and due to the coming darkness (even if on that period of the year at those latitudes the night darkness was only a few hours and at 4 am the light was comparable to a normal daylight) Admiral Lutjens ordered *Prinz Eugen* to exchange position (signal "NW") moving ahead to cover with her own radar set FuMo 27 the forward sectors of the German formation, while the *Bismarck* was to cover the aft ones with the only working radar set left of the 3 radar model FuMo 23 she had, the one placed on top of the aft rangefinder (7).

This maneuver, which occurred in darkness, was not observed by the British radar and passed un-noticed by either the *Suffolk*, which was shadowing on the aft starboard area on the west of the German formation, or by the *Norfolk* which was shadowing on the aft port side, to east.

On board *Suffolk* and *Norfolk* the radar situation was different **(8)**: the *Suffolk* was equipped with the latest radar version of the model type 284 modified, equipped with a rotating antenna (only a "blind area" sector on the stern), which could guarantee a coverage as far as 13 nautical miles (24,000 meters) in distance. Thanks to this capability, the *Suffolk* could follow the German formation from the west keeping a safe distance from the *Bismarck* main guns. The *Norfolk*, which was sailing on east of the German formation and was not equipped with same radar, could only count on the radar model type 286M, with fixed antenna and reduced range, covering only forward sectors and was forced to leverage the *Suffolk* radar data to hold contact.

The reason why the change of German ship position passed un-noticed by the British radars was a snowstorm which begun at **23:52** of May 23 **(9)**. This snowstorm caused noise and false echoes on the *Suffolk* radar screen which added to very strange optical effects of the arctic night. This made the British heavy cruiser commanders afraid that the German ships could have inverted course and take them by surprise: against the *Bismarck* main guns they would have had very little chance and could have been sunk in a short time.

When a spotter on top of *Suffolk* main tower signalled a big shadow which seemed to close in from south, the British heavy cruiser immediately reversed course and sailed away. Having realized the mistake, she returned on the old course but was so much back aft that it took almost 3 hours to regain radar contact with the German ships (at **02:47** of May 24).

Norfolk, on its own, was not able to keep radar contact, consequently for 3 hours the German ships remained out of any British radar range **(10)**.

It was in this situation that the position change between the *Bismarck* and the *Prinz Eugen* passed unnoticed by the 2 British heavy cruisers and was not communicated to the coming battlecruiser group (*Hood* and *Prince of Wales*). This force was coming in at 27 knots on a course of 295°. The escorting destroyers which, because of the rough sea and the speed, had found it difficult to maintain contact with the main units and were ordered by Admiral Holland to follow at the best speed possible **(11)**.

Admiral Holland, on board the *Hood*, having not received anymore precise information from *Suffolk*, became convinced that the German formation was trying to sail back into the Denmark Strait after having reversed course and consequently at **00:08** ordered the *Hood* and *Prince of Wales* together with the escorting destroyers to turn north on course 340° reducing their speed to 25 knots **(12)**.

At **00:30** Holland signalled again to *Prince of Wales* that, if before **02:10** the contact was not re-established, the battlecruiser group should take a course south, 180°, till the contact could be made again by the heavy cruisers. It was his intention to engage the *Bismarck* with the *Hood* and the *Prince of Wales* while the *Norfolk* and the *Suffolk* would have engaged the *Prinz Eugen* (confirmed by Admiral Sir John Tovey Commander of the Home Fleet). This order obviously was not transmitted immediately thru radio to either the *Suffolk* or *Norfolk* by Admiral Holland (because of the radio silence both British battleships) and was never received by both heavy cruiser commanders nor by Rear-Admiral Wake-Walker thru any other communication channel.

At **02:03**, while the brief arctic night was vanishing the two German ships had already changed their relative positions un-noticed, keeping the same course south, 170°, Admiral Holland, afraid that the *Bismarck* could sail away to south on the Atlantic ocean without being intercepted, ordered his two battleships to change course to 200° at 25 knots. Now the course of the British ships was almost parallel to the German formation.

The *Prince of Wales* turned on her radar type 284 (Captain Leach asked permission to use his radar type 281, but was refused due to interference between its type 281 and type 284 on board *Hood*). The destroyers were ordered to continue to search to the north, for precaution reason, taking a position of 15 nautical miles one from each other.

It was only at **02:47** that *Suffolk* resumed radar contact with the German ships and transmitted their exact position, course and speed (course 220° at 28 knots). Consequently, Holland could again verify their position in relation to his battle group. The Germans were now at 35 nautical miles (64,800 meters) to North-West. But it was not until **03:40** that Admiral Holland ordered a change of the course to 240° and only at **03:53** that he ordered an increase of the speed to 28 knots, both absolutely necessary to avoid becoming a greater distance from the German ships.

At **03:19** the *Suffolk* transmitted one of her reports on the enemy. This was very useful for Admiral Holland to evaluate the whole scenario. The *Suffolk* reported a battleship at 188° (from *Suffolk*) at a distance of 21,900 meters (24,000 yards) and one heavy cruiser at 185° at a distance 20,500 meters (22,500 yards). From this message it is clear that *Suffolk* was still reporting the *Bismarck* position as ahead of *Prinz Eugen* by 1,400 meters (1,500 yards), without having realized that the two German ships had changed their own positions a few hours before.

The naval groups now were running on converging paths, but the British battlecruiser group had lost its initial advantage. It could have cut the course of the German formation establishing the best course and angle of approach to the enemy during the coming engagement (the classical "cut of the T ").

At **04:30** the daylight was as such that the visibility was 12 nautical miles (22,000 meters).

On board the *Prince of Wales* the airplane "Walrus" was prepared for takeoff with the intention to utilize it during the coming battle for spotting purposes. But, due to water presence in the airplane fuel the launch of the airplane was postponed; the airplane was later damaged during the battle and jettisoned.

At **04:50** the *Prince of Wales* passed ahead of the British formation, on the *Hood's* starboard side, and kept that position until **05:05** when the *Hood* took back the lead position, again on port side of *Prince of Wales*. Meanwhile Admiral Holland ordered reparation for the upcoming battle. At **05:10** on board the British battleships the "Action Station" was ordered and everybody reached their battle positions.

At **05:21** the German ships changed course to 170° at 27 knots. At **05:32** they went back to a of course 220° at 27 knots (**13**), with the *Prinz Eugen* leading the *Bismarck* by 2,500 meters (2700 yards).

At **05:35** the spotters on board *Prince of Wales* signalled smoke on the horizon and at **05:37** the British battleship transmitted her interception radio signal from 34,700 meters (38,000 yards):

"Emergency to Admiralty and C in C Home Fleet. One battleship and one heavy cruiser, bearing 335, distance 17 nautical miles. My position 63-20 North, 31-50 West. My course 240. Speed 28 knots. "

This message could have been intercepted by the German ships, in fact at **05:37** the *Prinz Eugen* identified a ship (suspected light cruiser B-Dienst) on the port side (**14**), at a distance of 34,100 meters (37,300 yards). At the same time, the two British battleships turned 40° to starboard now on course of 280° still at 28 knots.

At **05:41** the *Norfolk*, closing the distance from east established visual contact with the enemy at 15 nautical miles or 30,000 yards (27,780 meters) and transmitted an interception message (**15**).

While distances were closing in, the *Hood* transmitted, but not until **05:43**, did she transmit her interception signal :

"Emergency to Admiralty and C in C Home Fleet. One battleship and one heavy cruiser, bearing 337, distance 17 nautical miles. My position 63-20 North, 31-50 West. My course 240. Speed 28 knots."

Probably, also intercepting this message from *Hood*, the *Prinz Eugen* identified another unit closing in at **05:43** and evaluated the distance at 31,484 meters (34,446 yards) or exactly 17 nautical miles, just as reported by the *Hood's* radio message, and with same bearing of 337°, or to be precise it should have been the opposite so 157°; the presence of 337° and 17 nautical miles. This was confirmed by the decryption of the *Hood* radio message from *Prinz Eugen* (**16**).

At **05:47** on board the German ships the "Alarm" was given and everybody sent to battle stations. (**17**).

Not satisfied with the approaching angle of his own ships, which would have exposed the lightly protected *Hood* bridge to the *Bismarck* plunging fire from a long distance, at **05:49** Admiral Holland ordered another turn of 20° to starboard **(12)**, changing course to 300°, closing the distance with the closest angle that would have still allowed the *Hood* to utilize her full set of main guns turrets **(18)**. Consequently he would have closed the distance as fast as he could with the maximum *Hood* firepower exposed for the minimum period of time to the *Bismarck* long distance firing; but doing so, unfortunately, forced the *Prince of Wales* to utilize only the forward turrets (A+B) because the quadruple aft one (Y) cannot be turned toward the enemy because of acute angle of approach chosen **(19)**.

At **05:50** on board Prinz Eugen *Prinz Eugen* **(20)** the enemy (*Hood* and *Prince of Wales*) were measured to have been at 30,000 meters (32,882 yards). The *Norfolk* was at 26,000 meters, the *Suffolk* at 30,000 meters, while the *Hood* and the *Prince of Wales* were only 25,000 meters away..

Compared to what Admiral Tovey probably had ordered **(21)** and that Admiral Holland had also communicated to *Prince of Wales* a few hours before – namely a simultaneous surprise attack of 4 British ships on which *Hood* and *Prince of Wales* would have engaged the *Bismarck* (obviously utilizing the full set of artillery and from very favourable position) while *Norfolk* and *Suffolk* would have engaged the *Prinz Eugen* – this had turned into a much different situation. The *Prinz Eugen* was ahead of the *Bismarck* and not behind to her, the *Norfolk* and *Suffolk* were still too far away and probably had not received any order to attack the *Prinz Eugen* which was now in a non favourable position being ahead and not in back of the German battleship, the two British battleships were attacking from a position where their full artillery could not be brought to bear. While the *Bismarck* and *Prinz Eugen* could use their full artillery against them; just the opposite of what was supposed to have been executed.

The surprise was the only thing that worked as the German ships were caught unprepared by the fast approach of the *Hood* and the *Prince of Wales*, but this was the only thing that worked well. In fact, on board the *Hood*, due to the fact that the German ships profile at great distance were very similar, they had not noticed that the leading ship was not the *Bismarck* but the *Prinz Eugen*. Consequently, Admiral Holland, at **05:49**, signalled to the *Prince of Wales* “G.S.B. 337 L1” that means engage the first ship on the left of the enemy formation bearing 337°, which was the *Prinz Eugen*.

But on board *Prince of Wales* the 1st Artillery Officer, Capt Ltnt Colin W. McMullen, just transferred from *Hood*, recognized the *Bismarck* ordering the artillery to be directed to the second ship on the line and not to the first one as was wrongly ordered assuming that it was the *Bismarck*.

It has been reported that on board the *Hood* they noticed the error just before opening fire and that Admiral Holland ordered to switch target to the second ship in the line (“G.I.C. and G.O.B. 1” = *shift target one ship right*). But even if Admiral Holland’s order was really issued, apparently it was never executed and consequently the *Hood* fired only on the *Prinz Eugen* all the way thru the engagement **(22)**.

The battle

At **05:52 and 30 seconds** the *Hood* opened fire from 22,800 meters (25,000 yards) on *Prinz Eugen* (on bearing 337° while on course 300°) executing the first order to open fire on the leading ship to the left. It is possible that because of the very acute approaching angle (around 37° on starboard) only the forward turrets group (A and B) opened fire, although the aft ones (X and Y) could bear on the enemy, so probably only 4 shells went out with the first salvo fired by the *Hood*.

After 30 seconds (at **05:53**) – as agreed previously between the 2 British battleship in order to be able to verify correctly the shell splashes independently – also the *Prince of Wales* opened fire from 24,221 meters (26,500 yards) on a bearing of 335°, but on the *Bismarck*. In this case surely only the forward turrets group (A and B) fired, (bearing 35° to starboard) so 2+4 = 6 shells of 356 mm went toward the *Bismarck*, falling long about 1,500 meters on the right, astern of the German battleship **(23)**.

On *Prinz Eugen* command bridge the distance of the *Hood* and *Prince of Wales* was estimated long. Their estimate was **05:53 (24)** 29,000 meters (31,728 yards). In reality, the *Hood* and *Prince of Wales* were only at 22,000 meters.

The *Bismarck* was increasing her speed to 30 knots, decreasing the distance with *Prinz Eugen* sailing ahead of her at 27 knots. The main artillery was ready to open fire and the First Artillery Officer, Korvetten Capitan Adalbert Schneider, requested on the command bridge permission to do so, but no answer came back to him **(25)**. The *Hood* second salvo fell close to *Prinz Eugen* which probably during this time used her depth charges type WBD in order to confuse enemy spotters **(26)**.

The *Prince of Wales* second salvo landed close to the *Bismarck* from 23,764 meters (26,000 yards) on a bearing of 334°; it was again long and with only 5 shells instead of 6 because 1 gun of the quadruple A turret went out of action (from that moment on, the *Prince of Wales* lost that gun and fired with 5 out of 6 forward 356 mm guns).

Kapitan Lieutenant Burkard von Mullheneim-Rechberg, third artillery officer and in charge of the *Bismarck* aft rangefinder, received from Admiral Lutjens the order to closely watch the movements of the two British heavy cruisers which were stationed aft on each side of the German formation. This order confirms the validity of Admiral Tovey's theory of the simultaneous attack of the four British ships against the two German ones. Even the German Admiral was expecting that this would probably happen **(27)**.

At **05:54** the British battleships changed their course again, turning 20° to port from 300° to 280°. This turn opened the 'A arc' allowing the *Prince of Wales* Y turret to bear toward the enemy and opened further the *Hood* aft turrets bearing angles. Now the turrets were firing at 56° to starboard for the *Hood* and at 54° to starboard for the *Prince of Wales* and this was allowing both the British battleships to fully utilize their main artillery.

Meanwhile the *Hood* fired her third salvo on the *Prinz Eugen* missing the target while the *Prince of Wales* fired her third salvo from 22,278 meters (24,375 yards) on a bearing of 334° and the fourth from 21,570 meters (23,600 yards) on a bearing of 333°, both with 5 guns.

On board *Prinz Eugen* distances started being correctly measured by the First Artillery Officer Capitan Lieutenant Paulus Jasper who, based on the rangefinder measurements, evaluated the target (the *Hood*) at 21,000 meters (22,975 yards), got ready to open fire **(28)**. He waited for permission to do so from the *Bismarck*. The estimate was correct and in line with the measurement of the *Hood* related to the *Prinz Eugen* and corrected the previous incorrect estimates made by the German cruiser command bridge done at 05:50 and at 05:53 (one can see that the distance between the 2 ships cannot be reduced by 8,000 meters within 1 minute by considering the ships relative position, course and speed).

On the *Bismarck* command bridge Kapitan zur See Lindemann heard through the interphone, for the second time, Schneider's request to have "freedom to fire", while the salvos of *Prince of Wales* fell around the German battleship. The engagement was ongoing and the Admiral did not yet give his approval to open fire. But his ship was clearly already engaged so he felt that it was his duty to respond immediately to the enemy fire. It has been reported that he said "(Ich lasse mir (doch) nicht mein Schiff unter meinem Arsch wegschiessen! Feuer eroeffnen!)" "I will not let them to shoot my ship from under my ass! Open fire!". Immediately after from *Prinz Eugen* the flag signal "JD" (Jot-Dora = permission to open fire on the enemy when ready) was seen. to target the first ship on the enemy line, the *Hood*.

It was *Prinz Eugen*, at **05:55**, the first German ship to open fire; Jasper was fast to shoot his guns after receiving the command from the bridge Kapitan zur See Brinkmann to do so with the order "freedom of fire" based on the signal "JD" from the *Bismarck* **(29)**.

Prinz Eugen's first salvo was fired at the *Hood* from a distance of 20,200 meters on a bearing of 150°, so 70° to port while the German cruiser was sailing on a course of 220°.

Immediately after also the *Bismarck* 380 mm (15 inches) main guns joined in firing from 22,000 meters (20,100 yards) on the *Hood* on a bearing of 150°.

The British noticed immediately that the Germans were firing alternating between the forward and aft turret groups **(30)**, delayed by a few seconds to allow the spotters to better assess the distance by the fall of shells on the enemies. By doing so, the time required to correct the ladder and the range were significantly reduced.

First 4 *Prinz Eugen* shells went over the *Hood*, while the next group of shells straddled the target with a spread of 400 meters, but the target was not hit **(31)**.

The *Bismarck*'s first salvo - of which the 8 shells of 380 mm (4 from the forward turrets A and B and 4 of the aft turrets C and D) were making much higher water columns than the 8 of 203 mm of *Prinz Eugen* - fell short ahead of the *Hood* bow.

At **05:55** the *Hood* fired the fourth salvo on the *Prinz Eugen*, once again with no hits. Meanwhile, the *Prince of Wales* fired her fifth salvo on the *Bismarck* from a distance of 20,199 meters (22,100 yards) and a bearing of 332°. This was the last salvo with 5 forward turret guns working. Another gun of the A quadruple turret went out of action. It was with only 4 guns firing from the forward group (which was made of 4 + 2 guns) that on the sixth salvo fired from 19,331 meters (21,150 yards) on a bearing of 331° that *Prince of Wales* “found the target”, and hit the *Bismarck* on the bow – below the capstan wheels on compartments XXI and XX (**32**). The 356 mm shell passed thru the hull from side to side entering from port and exiting on the starboard side **05:56 (33)**.

The *Norfolk*, was still at 24,000 meters from the German ships, the *Suffolk* was at 29,000 meters and both were still not joining in the engagement (**34**).

The *Bismarck* started leaking fuel from the bow (the hole had a diameter of 1,5 meters) and started flooding as well (at the end of the battle she will take on around 2,000 tons of water). But the *Bismarck* continued firing at the *Hood* with other 2 sequences of 4 shells (second salvo) from 20,000 meters which went over the target, between the *Hood* and the *Prince of Wales*.

Between the two German ships, the *Prinz Eugen* was the first to hit the enemy at **05:56**: while the first series of 4 guns of the second salvo fell short of the *Hood's* bow, the second set of 4 shells hit the target and one shell exploded between the second funnel and the mainmast starting a fiery fire. On the *Hood's* midship a very intense light was observed, first white than reddish (**35**). In fact, on the area where the *Prinz Eugen's* hit had exploded there were ready to use ammunitions for the anti-aircraft guns (8 shells of 4 inches or 102 mm) and several UP anti-aircraft rockets (**36**).

When the *Hood* fired her fifth salvo and soon after her sixth one only with the forward turrets still firing on the *Prinz Eugen*, but again the target was missed.

The *Prince of Wales* continued firing on the *Bismarck* and fired her seventh salvo from 18,120 meters (19,825 yards) on a bearing of 330° and after the eighth from 18,325 meters (20,050 yards) both groups of 4 shells over the target.

The *Prinz Eugen* fired her third salvo with 2 groups of 4 guns from 18,000 meters, missing the target.

Despite the 20° turn to port ordered by Admiral Holland at **05:54** to open the artillery arc of the *Prince of Wales* aft quadruple turrets and allow the *Hood's* to bear with more angle, the two British ships were still firing mainly with the forward turrets. The *Norfolk* was closing in from the east, now at 23,000 meters, while the *Suffolk* was still further back at 29,000 meters, north of the German ships.

At **05:57** both the *Bismarck* and the *Hood* had suffered hits. The German battleship was speeding up still following the *Prinz Eugen* which was sailing ahead of her in line of battle just off her port bow.

The *Prinz Eugen* fired in rapid sequence her fourth (turrets A+B and C+D) and fifth (turrets A+B and C+D) complete salvos from 17,000 meters on a bearing of 150°. The *Bismarck* fired her third complete salvo (turrets A+B and C+D) from around 18,500 meters on a bearing of 150°.

Two shells hit the *Hood*. A shell from the *Bismarck* hit the fire control tower killing most of the people in the tower. This left the *Hood* without central fire control.

Immediately after another shell fired by *Prinz Eugen* hit near the base of the main tower entering a room where about 200 sailors were, killing them all. This hit caused a local fire on the forward part of the ship which added to the one burning aft (**37**).

Distances now were quickly decreasing and were around the 18,000 meters so also the secondary gun turrets joined in, that means the three 150 mm turrets on *Bismarck's* port side (which fired on the *Prince of Wales*) and the four twin 133 mm starboard side of *Prince of Wales* which fired on the *Bismarck* from 17,000 meters (18,600 yards).

The *Hood* fired her seventh salvo probably still with the 4 forward 380 mm guns on *Prinz Eugen*, while the *Prince of Wales* fired her ninth salvo from 16,680 meters (18,250 yards) on a bearing of 330°. Finally she started using for the first time also the aft turret (turret Y with 4 guns of 356 mm). The target was still the *Bismarck* which was hit under the waterline on compartment XIV. The shell exploded against the torpedo bulkhead and opened also some fuel tanks located there causing fuel to leak from this area as well (**38**).

Admiral Lutjens decided that it was not possible anymore to leave the *Prince of Wales* firing unopposed against the *Bismarck* and at **05:58** ordered *Prinz Eugen* to change target and fire on the ship on the left of the British formation ("Wechsel auf linken gegner = change to left enemy"), *Prince of Wales* **(39)**. The *Prinz Eugen* First Artillery Officer Kpt Ltnt P. Jasper will write on his battle report that consequently the change of target caused the two German ships fire lanes to cross each others **(40)**.

The *Bismarck* fired on the *Hood* her fourth complete salvo (turrets A+B and C+D) from 17,000 meters which fell short but with correct ladder, while *Prinz Eugen* fired her sixth salvo still on the *Hood* (turrets A+B and C+D), to change target following the order received firing the seventh salvo on the *Prince of Wales* (turrets A+B and C+D) from 17,000 meters on a bearing of 150° trying to find the correct range and ladder. Both German ships were still on a course of 220° with the *Bismarck* following the *Prinz Eugen* on her starboard side astern at around 2,000 meters distance.

The tenth *Prince of Wales* salvo was fired from 15,675 meters (17,150 yards) on a bearing of 330° and the eleventh from 15,629 meters (17,100 yards); both were short of the *Bismarck*. Now the *Prince of Wales* was using the aft Y turret too, but one gun of the available 4 went out of action during the eleventh salvo.

On board the *Hood* there was fire in two places, just as reported by the reconnaissance plane "Sunderland" (RAF Z/201 - Pilot Flight Lieutenant R.J. Vaughn) arrived at that moment from Iceland and was flying above the battle area. One fire being at the base of the bridge superstructure (probably a *Bismarck* hit) and the other further aft (probably a *Prinz Eugen* hit).

In spite of those problems **(41)**, the *Hood* fired her eighth salvo followed by the ninth from 16,000 meters on a bearing of 330° probably with the forward turrets (A+B) on *Prinz Eugen*, but again missed the target.

Both British ships were now on a course of 280°. The *Prince of Wales* had successfully brought to bear her entire fire power using all turrets and main guns available, while the *Hood* was still mainly using the forward turret group.

At **05:59** the *Prinz Eugen* fired on the *Prince of Wales*, which was now her target at only 16,000 meters: 4 series of shells in rapid sequence, her eighth salvo (turrets A+B and C+D) and her ninth salvo (turrets A+B and C+D) which fired on the British battleships but did not hit the target.

The *Prince of Wales* fired her twelfth salvo with only 3 guns from 15,629 meters (17,100 yards) on a bearing of 330° but fell short. Soon after, firing the thirteenth from 15,035 meters (16,150 yards) which "found the target" and for the third time hit the *Bismarck* but only causing light damage. The impact occurred on centre ship, under the mainmast: the bow of a service boat was hit and splinters fell all over (damaging seriously the catapult system used to launch the Arado reconnaissance airplanes), than the shell emerged on the starboard side without exploding.

The *Hood* fired her tenth salvo apparently using also the aft guns on the *Prinz Eugen* from 14,000 meters on bearing 330°, still with no hits; soon after Admiral Holland decided to turn again to port to open further the artillery arcs of *Hood* and *Prince of Wales* aft turrets, so signalled a turn to port of 20° from course 280° to 260°.

The *Norfolk* was closing in and now was at 21,500 meters from the German ships while the *Suffolk* was still far back at 29,000 meters to the north.

The *Bismarck* fired her fifth salvo from 15,700 meters (16,200 yards) on a bearing of 155° with the two groups in sequence; the first 4 shells fired by turrets A and B fell in the water, but the next 4 of turrets C and D "found the target" and straddled the *Hood* **(42)** in the mainmast area. One shell hit the *Hood* in that area and entered the hull.

A few moments later, the "*Mighty Hood*", proud ship of the Royal Navy for more than 20 years exploded: it was **06:00**. The ship was hit just as she had executed the 20° turn to port ordered by Admiral Holland; only 8 minutes had passed from the when she had opened fire and only 5 from the when the *Bismarck* started firing on her **(43)**.

Captain Leach of *Prince of Wales*, from a distance only 750 meters (4 cables) from the British battlecruiser reported what he saw :

[...] I happened to be looking at the "Hood" at the moment when a salvo arrived and it appeared to be across the ship somewhere about the mainmast. In that salvo there were, I think, two shots short and one over, but it may have been the other way round. But I formed the impression at the time that something had arrived on board the "Hood" in a position just before the mainmast and slightly to starboard. It was not a very definite impression that I had, but it

was sufficiently definite to make me look at the "Hood" for a further period. I in fact wondered what the result was going to be, and between one and two seconds after I formed that impression an explosion took place in the "Hood" which appeared to me to come from very much the same position in the ship. There was a very fierce upward rush of flame the shape of a funnel, rather a thin funnel, and almost instantaneously the ship was enveloped in smoke from one end to the other. [...]

The explosion (most likely a very fast conflagration of main guns charges) was silent with a very high (around 400 meters) column of fire. First the fire was very clear then yellowish and reddish, immediately became a grey mushroom of smoke, dark and very dense. Debris was thrown all over as the explosion broke the ship into two separate pieces around the mainmast area; large quantities of oil started burning on the sea emitting a very dark grey smoke.

The *Hood* stopped and heeled heavily to starboard, than righted herself to start heeling heavily to port, never to come back and started sinking. The broken hull caused the stern section to sink first and very fast while the bow began to swing sharply upwards pointing to the sky at a 45° angle, started sinking very fast too. German witnesses reported that while she was sinking the '*Mighty Hood*' launched again her last proud message, as the forward turrets were reported to have fired **(44)** just as the forepart was going down **(45)**.

The RAF "Sunderland" was still flying in the battle area above the German formation which opened a very intense anti-aircraft fire.

The *Prinz Eugen* fired her tenth and eleventh salvos (turrets A+B and C+D) at the *Prince of Wales* from 14,000 meters obtaining no hits.

The *Prince of Wales* fired on the *Bismarck* her fourteenth salvo, probably with only 3 guns of the forward turrets, from 14,898 meters (16,300 yards) on a bearing of 330°, then the fifteenth from 13,710 meters (15,000 yards) on a bearing of 329°, while with the sixteenth fired from 13,801 meters (15,100 yards) on a bearing of 329° a gun previously loaded and out of action came back and fired, so 4 shells departed from the forward turrets. All salvos fell short of the *Bismarck*.

Everything happened so fast that *Bismarck* continued firing on the to *Hood* even when the British battlecruiser was sinking under a very dark grey smoke, so the sixth salvo (turrets A+B and C+D) from 15,000 meters were fired on the presumed position of the *Hood* and the shells all fell in the water.

The *Norfolk* was still closing in but turned to port at 21,000 meters from the German position just after the *Hood* explosion, the *Suffolk* remained at 28,000 meters.

At **06:01** the *Hood* sank in two separate pieces, both pieces complete sunk within 2-3 minutes. The *Prince of Wales* was executing the manoeuvre ordered by Admiral Holland (a turn of 20° to port side) and doing that was on a collision course with the sinking British battlecruiser. To avoid the collision, Captain Leach ordered an emergency turn to starboard, temporarily directing his ship towards the enemy.

On board the *Prinz Eugen*, First Artillery Officer Kpt Ltnt P. Jasper, noted the *Prince of Wales* manoeuvre in his battle report. Also, the German Heavy cruiser commander Kpt zur See H. Brinkmann, saw what had happened and having realized that he was coming close to the launching range of its 533mm torpedoes (range 12,000 meters at 30 knots) ordered his Torpedo Officer, Kpt Ltnt Ernst Reimann, to get ready to launch torpedoes as soon as the enemy was within range. Kpt zur See Brinkmann had expected that moment to come very soon due to the two ships relative course and speed **(46)**.

The *Bismarck* meanwhile had changed its target to the *Prince of Wales*. Since the British battleship was very close to the wreckage of the *Hood*, the needed corrections were very minimal. The seventh salvo of the German battleship (turrets A+B and C+D) was fired to acquire range and ladder from around 15,000 meters. In fact the *Prinz Eugen* which was still in the lead of the German formation, ahead by about 1,500-1,800 meters, fired her twelfth salvo (turrets A+B and C+D) and soon after her thirteenth (turrets A+B and C+D) from around 14,500 meters.

The RAF "Sunderland" (Z/201 - Pilot Flight Ltnt R.J. Vaughn) flew into the clouds because of the very intense anti-aircraft fire from both German ships.

The *Prince of Wales* found herself in big trouble with both German ships targeting her with main and secondary guns while the British battleship was forced by the turn to avoid the wreckage of the *Hood* could only bring her forward guns to bear. In addition, this manoeuvre and the consequent turns made it difficult for her artillery to keep the salvos on target. The

Hood fired her seventeenth salvo with 4 guns from 12,887 meters (14,100 yards) on a bearing of 328° and the eighteenth from 13,253 meters (14,500 yards) on a bearing 328°, both against the *Bismarck*. Both salvos fell very short of the German battleship.

The situation was becoming tense on board the *Prince of Wales*; at **06:02**, the *Bismarck* fired her eighth complete salvo from 14,000 meters and hit the British battleship on the command tower (*compass platform*), the shell passed thru not exploding but killing almost all of the officers within **(47)**. The *Prince of Wales* ceased fire **(48)**. Luckily her Captain, J.C. Leach, was still alive and, after a few moments, desperately worked to bring his ship out of that dangerous position. He completed the turn around the sinking *Hood* and started an evasive manoeuvre, turning to port to disengage.

The *Prinz Eugen* fired on the *Prince of Wales* her fourteenth complete salvo (turrets A+B and C+D) from less than 14,000 meters.

At this point the *Norfolk* opened fire on the *Bismarck*, with 3 main gun salvos of the 203 mm from 20,000 meters (21,800 yards) that all fell short. While the *Suffolk* was still too far to the north at 28,000 meters.

At **06:03** the *Hood* was totally sunk, with oil fires still burning with a very dark grey smoke from 2 different places. The oil kept on burning for a very long time after the British battlecruiser had sunk **(49)**.

The *Prince of Wales* turned 160° to port executing a clear disengagement manoeuvre and covered herself with a smoke screen while she was still under a very precise and close German gunnery fire.

The *Bismarck* fired her ninth complete salvo (turrets A+B and C+D) from less than 14,000 meters, and hit the *Prince of Wales* with two shells: one shell under the waterline (but the shell did not explode) and one shell that hit the starboard 133 mm secondary guns fire control station which put it out of action.

The *Prinz Eugen*, which was still leading the line ahead of *Bismarck* by some 1500 meters, fired her sixteenth salvo (turrets A+B and C+D) and soon after her seventeenth salvos (turrets A+B and C+D) from 13,000 meters and this time hit the *Prince of Wales* under the waterline on the stern.

The *Prinz Eugen* Torpedo Officer, Kpt Ltnt Reimann, at this point wrongly analyzed the distances. He did not realize that for a short time he had been inside his port side 3+3 torpedo tubes launching range**(50)** and despite the second order he received from his ship commander to do so, at this time he did not launch any torpedo on the British battleship. This occurrence was the reason to convene an Official Navy Board of Commission that Kriegsmarine did after the arrival of the *Prinz Eugen* in France **(51)**.

Also the *Prinz Eugen's* port side heavy anti-aircraft guns (3 twin turrets of 105 mm) joined in at this time fired on the *Prince of Wales* and confirmed the very short distance between the two ships.

The situation had gotten worse for the British battleship, which received hits while trying to disengage**(52)**. Suddenly, on the *Prinz Eugen* an alarm signal was transmitted to the *Bismarck*, an incoming torpedo on a course of 279° **(53)**. The alarm which was initially issued from the sound listening room (G.H.G. - *Gruppen-Horch-Gerät* of the *Prinz Eugen*) was immediately confirmed by the *Prinz Eugen* commander Kpt zur See H. Brinkmann who went out on the command bridge and verified the two torpedo tracks approaching and noted them in his German heavy cruiser war diary **(54)**.

The torpedo origin was not identified with certainty, but it was assumed they could have been launched either by the *Hood* before sinking (the British battlecruiser was equipped with torpedo launching tubes on both sides close to her stern) or by the airplane that suddenly appeared in the sky above the German formation (but the plane was a "Sunderland" and they should have realized that it was not torpedo equipped).

The *Bismarck* immediately turned to starboard 50°, now on a course of 270°, sailing away and consequently out of any torpedo range. By doing this it appears to have confirmed that the torpedo origin was assumed to have been the *Hood* **(55)** and that the torpedoes were at their maximum range. The *Prinz Eugen*, which had just missed an opportunity to launch her own set of torpedoes on the enemy (an opportunity she had for at least 2 minutes), prepared for the turn to starboard of 50° to a course of 270° in order to avoid the incoming torpedoes **(56)**.

This occurrence gave the *Prince of Wales* a momentary pause from battle. She kept on sailing away covering herself with a smoke screen and firing while she was turning to port. The nineteenth salvo from *Prince of Wales* was fired on local control by the aft quadruple Y turret but again only 2 guns fired and the salvo fell very short of the *Bismarck* (as well evident by an existing photo).

The *Hood* was sunk; the *Norfolk* ceased fire from 20,500 meters while the *Suffolk* was still north of the German ships by 28,000 meters.

At **06:04** the *Prince of Wales* was still in clear range but the German units were sailing away. Her gunnery, which was on target when the torpedo alarm was issued by *Prinz Eugen*, now needed to be re-adjusted because of the evasive turn. The smoke screen from the *Prince of Wales* had been effective and progressively was covering her from the enemy view. Distance was quickly increasing since now the two groups were sailing in opposite directions and was again more than 14,000 meters. No torpedoes had been launched by the *Prinz Eugen* (even if the course change of 160° by the *Prince of Wales* would have cleared any danger from that initiative); the British battleship could sail away to south east more safely.

The *Bismarck* fired her complete salvo (turrets A+B and C+D) while sailing on a course west (270°) from 15,500 meters, and hit for the fourth and last time the *Prince of Wales* in the centre, destroying the port side crane and splintered some boats, making a hole on the second funnel and damaging the Walrus airplane that was there from the beginning of action.

After having turned to starboard on a course of 270°, the *Prinz Eugen* fired her eighteenth complete salvo (turrets A+B and C+D) from 14,500 meters, and hit the *Prince of Wales* with 2 shells. One on the stern below the waterline, and the other on the fourth 133 mm turret ammunition depot on port side, but luckily for the British battleship, this shell had not exploded either.

The *Prince of Wales* fired the twentieth salvo from 15,000 meters with the Y turret on local control but that turret had another gun going out of action so only 1 gun fired out of the 4 the turret had. The shell fell short to the stern of the *Bismarck* (as it is possible to be seen in a photo and in the available film).

Meanwhile the *Norfolk* and the *Suffolk* continued their shadowing from 21,000 and 28,000 meters.

Distances were increasing and at **06:05** the *Prince of Wales* was more than 15,000 meters from the *Prinz Eugen* and more than 16,000 meters from the *Bismarck*, while her smoke screen had been very effective. The German battleship fired with no more hits her eleventh complete salvo (turrets A+B and C+D) from over 16,000 meters and the *Prinz Eugen*, while turning to port, fired her own nineteenth (turrets A+B and C+D) from over 15,000 meters also with no more hits (**57**).

The *Prince of Wales* fired her last salvo, the twenty-first, from over 16,000 meters on local control with Y turret which had only 1 gun left working. The last shell fell ahead of the *Bismarck* bow (as seen in the photo and film). After three terrible minutes (06:02-06:04) on which she got 7 hits (3 from *Bismarck* and 4 from *Prinz Eugen*) no more shells hit her and the damaged British battleship was now retreating to the south-east under her own smoke screen.

Fire from westward sailing German ships had become progressively less accurate by the turning sequences made by them as well as by the *Prince of Wales*. The *Prince of Wales* after the initial 160° turned again twice under her own smoke screen and made it very difficult for the *Bismarck* and for the *Prinz Eugen* to hit the British battleship again.

This allowed the *Prince of Wales* at **06:06** to be 16,000 meters from *Prinz Eugen* and 17,000 meters from *Bismarck* increasing distances very fast while heading in the opposite directions. The smoke screen was now very effectively covering the *Prince of Wales* when the *Bismarck* turned 50° to port back on a course heading of 220°. The German heavy cruiser did the same.

The *Bismarck* fired against the retreating *Prince of Wales* the first group of her twelfth salvo (only turrets A+B) so the forward group from 17,000 meters. The *Prinz Eugen* fired her twentieth complete salvo (turrets A+B and C+D) from 16,000 meters, then executed another turn to starboard back on a 270° course due to another torpedo alarm (**58**).

This turn was the reason why the two *Prinz Eugen* forward turrets (A and B) could not be brought to bear on the enemy anymore and ceased fire (**59**). At this time the *Prinz Eugen* artillery direction passed from Kpt Ltnt Jasper, on the top rangefinder that was obscured by the tunnel smoke and could not see, to the Kpt Ltnt Albrecht on the secondary artillery station located on the aft rangefinder (**60**).

The *Prince of Wales* continued sailing away to the south-east and at **06:07** she was at 17,000 meters from *Prinz Eugen* and 18,000 from *Bismarck*. The smoke screen now very effectively covered her and the *Prinz Eugen*, because of the last turn to starboard, passed ahead of *Bismarck* bow firing only with the aft turrets (turrets C+D) her own twenty-first salvo from 17,000 meters **(61)**.

The *Bismarck* fired on the *Prince of Wales* the second group (turrets C+D) of her twelfth salvo only with the aft turrets from 18,000 meters. The *Prinz Eugen*, passed from port to starboard side of the *Bismarck* on her bow, than turned to port back on a course of 220° while continuing to fire at the *Prince of Wales* only with her aft turrets and for the first time was no longer the closest German ship to the British battleship **(62)**.

From the *Bismarck* the manoeuvre executed by *Prinz Eugen* was noticed as she passed on the bow from port to starboard while firing the aft turrets, and consequently at **06:08** the *Bismarck* signalled to the *Prinz Eugen* not to shoot over the flagship **(63)**; the *Bismarck* soon after crossed the *Prinz Eugen*'s wake, now on the port side of the heavy cruiser that was turning to port to come back on a 220° course, parallel to the German battleship.

The *Prince of Wales* was now successfully disengaging to the south-east well covered by her own smoke screen, she was more than 18,000 meters when the *Prinz Eugen* fired her twenty-second salvo (turrets C+D) and the *Bismarck* fired her first group (turrets A+B) of her own thirteenth salvo with the forward group.

At **06:09** the *Prince of Wales* was at 18,500 meters from *Bismarck* and more than 19,000 meters from *Prinz Eugen*. The *Prinz Eugen* fired her twenty-third salvo (turrets C+D), the two German ships were now sailing a parallel course of 220° with the *Bismarck* faster - probably 30 knots against 27. The *Bismarck* passed ahead of the *Prinz Eugen* on her port side. The *Bismarck* fired her second group (turrets C+D) of her own last thirteenth salvo from 18,500 meters and soon after Admiral Lutjens ordered both ships to cease fire.

Kpt zur See E. Lindemann on board *Bismarck* was not in agreement with his Admiral and wanted to pursue the *Prince of Wales* to finish her off. But Admiral Lutjens, followed the orders he had received for the operation which prohibited any engagement by his units unless it was necessary to sink merchant ship convoys. Following the *Prince of Wales* could have exposed his ships further and he was concerned that the Royal Navy was probably converging on the battle area **(64)**.

The disengagement

At **06:10** the battle was over and all units had ceased fire. The *Hood* was sunk, the *Prince of Wales* had received 7 hits (4 from *Bismarck* and 3 from *Prinz Eugen*), the *Bismarck* had been hit 3 times by *Prince of Wales* while the *Prinz Eugen*, even if was targeted by the *Hood*, did not suffer any hit. The *Norfolk* and the *Suffolk* had never been targeted by any artillery during this action.

The *Prinz Eugen* was now on the *Bismarck*'s starboard side and the battleship was passing ahead, so she increased speed to 32.5 knots to regain the lead of the German formation **(65)**. The RAF "Sunderland" Z/201 (Flight Cdr R.J. Vaughn) came out of the clouds just above the German formation **(66)** and was immediately targeted by intense anti-aircraft fire. The *Prince of Wales* was now 18,500 meters from *Bismarck* and at around 19,000 from *Prinz Eugen*; the *Norfolk* was at 21,500 meters to the east and the *Suffolk* was 28,000 North-West of the German formation.

For some minutes (until **06:19**) the *Prinz Eugen* continued anti-aircraft fire, while the German ships sailed to south-west and the *Bismarck* was again back on the wake of the German cruiser. At **06:14** they turned again on a course heading of 270° because of another torpedo alarm, while *Prince of Wales* was now safely at a distance of more than 22,000 meters.

At **06:15** the *Prinz Eugen*, executing another evasive manoeuvre to avoid torpedoes, went onto the *Bismarck*'s port side, turning to a course of 320° **(67)**, toward the *Suffolk*. The *Bismarck* which was following the cruiser after the turn on 270°, crossed again the *Prinz Eugen*'s wake.

The *Prince of Wales* was now at 24,000 meters, the *Norfolk* was at 21,500 meters while the *Suffolk*, that was at 28,000 meters, suddenly noticed at **06:16** the *Prinz Eugen* was closing in fast.

At **06:17** the *Bismarck* was reducing speed waiting for the *Prinz Eugen* to come back ahead to the lead position since the cruiser had turned 100° to port, back to a course of 220°.

At **06:18** the *Suffolk*, now at 26,000 meters from *Prinz Eugen*, readied to open fire.

The *Bismarck* slowed down on a course of 270°, to allow *Prinz Eugen* to pass ahead while coming back from her starboard side.

On board the *Suffolk*, because of an error reading the radar data, they estimated the *Prinz Eugen* at only 17,800 meters (19,400 yards), while in reality it was at 27,000 meters (29,540 yards), and for this reason the British cruiser opened fire against the German cruiser believing she was closing in **(68)**.

The *Suffolk's* first salvo fell well short, followed by the second at **06:20** from her 203 mm guns from 28,000 meters against the *Prinz Eugen*. The *Bismarck* reacted turning the main guns forward turrets toward the *Suffolk* (but did not open fire) while the *Prinz Eugen* that had just ceased the anti-aircraft fire to the "Sunderland", was sailing back on the line ahead of the German battleship.

The *Norfolk* was stationed at 23,000 meters east while the *Prince of Wales* came out of the smoke screen to fire a salvo from 30,000 meters (32,800 yards) which fell well short of the *Bismarck*.

While the two German ships went back on the line formation, with the *Bismarck* slowing down and turning 50° degree to port from a course of 270° to 220°, the *Suffolk* fired another 3 salvos at the *Prinz Eugen* (all short by 10,000 meters) from over 28,000 meters **(68)**; the *Prince of Wales* ceased fire going back into the smoke screen from where she had just come out to fire that salvo.

At **06:24**, the *Suffolk*, after having fired the sixth and last salvo, noticed that there was clearly something wrong, ceased fire. At the same moment the British cruiser identified an airplane (it was the "Sunderland" Z/201) flying away, above the German formation. Now the *Prinz Eugen* was back in position on the line ahead of the *Bismarck* and at **06:25** the two German units were sailing in the original formation with an average interval of 2000 meters after having zeroed the turrets and the guns.

The *Norfolk* was still at 23,500 meters east, the *Prince of Wales* 35,000 meters south-east and the *Suffolk* at 29,000 meters north-west (31,700 yards) from the German ships.

At **06:29** the *Suffolk* transmitted a radio message to the British Admiralty: "German ships are 18 Nautical Miles (36,000 yards/33,300 meters) on a bearing of 240° from me"; meanwhile she made a circular turn (to keep distance and check radar azimuth references) and restarted shadowing the German Battleships.

At **06:30** the distance of the *Prince of Wales* was 41,500 meters south-east **(69)**.

The German ships were entering the Atlantic Ocean with *Prinz Eugen* leading the *Bismarck* which was following at 2,000 meters on course 220° and a speed 28 knots.

The battle of the Denmark Strait, initially thought by the British to be a mortal trap for the *Bismarck*, ended with a victory for the German formation.

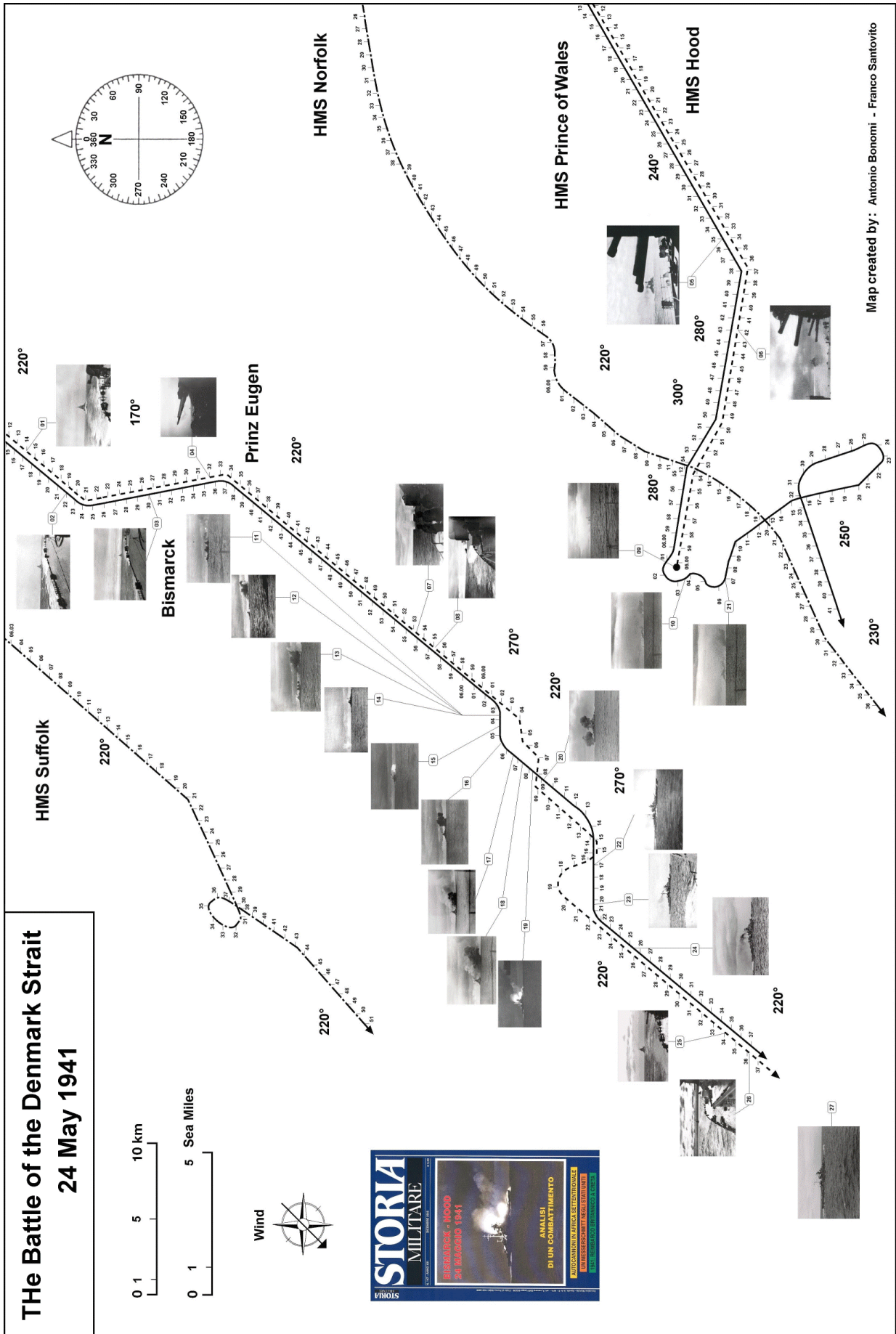
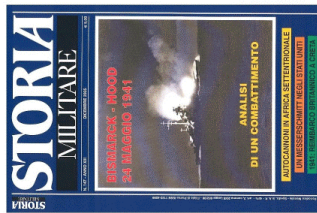
The *Hood*, considered one of the most powerful ships in the world was sunk. The modern *Prince of Wales* retreated damaged and the *Bismarck* came out of the battle seriously damaged too.

Now the hunt for the *Bismarck* had begun, and it was going to end up with her being sunk by the Royal Navy three days after on May 27, 1941, at around 400 nautical miles west of Brest, on the French Atlantic coast **(70)**.

A. Bonomi

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The Battle of the Denmark Strait 24 May 1941



Notes:

- (1) The reversed photo theory, lately proven with no basis, has been published by Robert J. Winklareth, *The Bismarck Chase*, London, Chatham Publishing, 1997.
- (2) The battle film is owned by Bundesarchiv-Potsdam (Berlin) and it is viewable on the internet at: <http://www.hmshood.com/ship/history/bshood/film.html>
- (3) The battle photographs have all been taken from on board the cruiser *Prinz Eugen* from war reporter Lagemann, which was part of the PK (*Propaganda Kompanie*). Similarly belonging to the same organization PK were Korvetten Kapitän (reserve) Fritz Otto Busch (director of German war magazine "Kriegsmarine") and the war artist-painter (Kriegsmaler) Kapitän Lieutenant (reserve) Julius Caesar Schmitz (Westerholt), all of them on board the heavy cruiser *Prinz Eugen*.
- (4) For a complete description of the Operation Rheinübung refer to: *Bismarck* on "STORIA militare" n. 111 – December 2002 by Enrico Cernuschi.
- (5) Ref. ADM 234-509 HMS *Suffolk*. Paragraph of May 23, 1941 page 157.
- (6) Ref. ADM 234-509 HMS *Norfolk*. Paragraph of May 23, 1941.
- (7) Ref. F.O.Busch - Prinz Eugen *im ersten Gefecht*- Page 118.
- (8) Ref. a) B.B. Schofield, *The loss of the Bismarck*, page 91. The *Norfolk* was equipped with a radar model 286 P (working on 1.5 m wavelength) and 2 fixed antenna. The *Suffolk* was equipped with a radar model 279 and one model 284: the first, working on 1.5 m wavelength with rotating antenna, utilized for spotting; the second one working on a 50 cm wavelength, used for artillery direction. b) Information confirmed by ADM 234-509 HMS *Suffolk* on the paragraph *Remarks*.
- (9) Ref. ADM 234-509 HMS *Suffolk*,. Paragraph May 23, 1941, page 158.
- (10) Ref. ADM 234-509 HMS *Suffolk*, Paragraph May 24, 1941, page 159.
- (11) Ref. ADM 116-4352 *Narrative* Captain J.C. Leach – Friday May 23, 1941.
- (12) Ref. ADM 116-4352 *Narrative* Captain J.C. Leach – Saturday May 24, 1941.
- (13) War diary - Kriegstagebuch K.T.B *Prinz Eugen* – Saturday May 24, 1941.
- (14) Reference a) Battle map - Gefechtskizze *Prinz Eugen* – First reference. b) B. von Müllenheim-Rechberg, *Battleship Bismarck* (Italian edition translated by E. Bagnasco), Parma, Albertelli, 1984. page 140.
- (15) Ref. ADM 234-509 HMS *Suffolk*, Paragraph May 24, 1941, page 160.
- (16) Ref. Battle map - Gefechtskizze *Prinz Eugen*. All other distances are on the graphic are written in hectometres (100 meters) and not in nautical miles (nm = nautical mile, equal 2,020 yards or 1,847 meters). Only this particular reference is written "337° 17 nm "exactly as the *Hood* transmitted it using his enemy bearing (337°) for Prinz Eugen; of course the *Hood* was 157° bearing from *Prinz Eugen*.
- (17) Ref. War diary - Kriegstagebuch K.T.B *Prinz Eugen* – saturday May 24, 1941. Time 05.47 : "Allarm ! Smoke on the horizon quickly approaching".
- (18) Ref. *Hood* guns data, turrets bearing, hits received and related documentation drawing.
- (19) Ref. *Prince of Wales's* guns data, turrets bearing, hits received and related documentation drawing.
- (20) Ref. War diary - Kriegstagebuch K.T.B *Prinz Eugen* - Saturday May 24, 1941. "*Hood* and *King George (Prince of Wales)* on fast approach, distance more than 300 hectometers ". To be noticed that during the entire engagement the *Prince of Wales* was always reported as the *King George V* (first ship of this class to be built).
- (21) Ref. Supplement to the "London Gazette" of 14 (16) October 1941 – Admiral Sir J. Tovey's report to the Admiralty – paragraph 17.
- (22) References: a) ADM 116-4352 *Narrative* Captain J.C. Leach – Saturday May 24, 1941. b) Lieutenant Commander Colin Mc Mullen letter (First Artillery Officer HMS *Prince of Wales*) to Sir L. Kennedy regarding the HMS *Prince of Wales* opening fire at Denmark Strait. c) The *Hood* survivors reported that their ship fired at least two salvos to the *Prinz Eugen* before the order was issued from the *Hood* command platform to change target to the *Bismarck*; while Captain J.C. Leach (*Prince of Wales*) reported that the order to switch target to the right ship was received before both *Hood* and *Prince of Wales* opened fire. From the German side, veterans from *Prinz Eugen* reported that the *Hood* only fired at them, while the *Bismarck* survivors reported that *Hood* fired only on them. The fact remains that the hits the *Bismarck* received were always associated with the *Prince of Wales* by their radio reports. D) Ltnt Cdr A.G. Skipwith HMS *Prince of Wales* spotting Officer reported no *Hood* shells ever falling in the vicinity of the – D.Mearns R.White book 'Hood and Bismarck' Channel 4 books 2001, London

pages 99 and 100 – R. Grenfell book ‘ The Bismarck episode ‘ Phanter book 1948 London, pages 41 and 42.

- (23) Ref. ADM 234-509 HMS *Prince of Wales* gunnery report.
- (24) Ref. War diary - Kriegstagebuch K.T.B *Prinz Eugen* - saturday May 24, 1941. “*Hood and King George (Prince of Wales)* opening fire from 290 hectometres [29,000 meters]”.
- (25) B. von Müllenheim-Rechberg, *Battleship Bismarck*, page 129 and 130.
- (26) Evidence from photos of the *Prinz Eugen* stern before and after the battle demonstrate the utilization of the depth charges during the engagement as the charges went from 3 to 1.
- (27) B. von Müllenheim-Rechberg, *Battleship Bismarck*, page 132.
- (28) Ref. Official battle report - attachment to KTB *Prinz Eugen* - by First Artillery Officer Kapitän Lieutenant Paulus Jasper.
- (29) F.O.Busch - *Prinz Eugen im ersten Gefecht*, page 147. On the command bridge, the commander said smiling to the navigation officer: ‘ Paulus, (referencing to First Artillery Officer Paulus Jasper) our fire director has never fired so quickly after having received permission to fire ‘.
- (30) Ref. ADM 234-509 HMS *Prince of Wales* gunnery report. Paragraph E - Notes on enemy fire.
- (31) After the first salvo (*vollsalvo* – probably with 2 turrets and 4 guns) usually a 400 meters scaled salvo sequence was ordered (*vier – 4 - hectometres - gabelgruppe*) with the next salvos always using 4 guns: one short, one centered (*standsalvo* or *range*) and one long. Afterwards a ‘rapid fire’ was ordered on the one of the three that had straddled the target.
- (32) Ref. *Bismarck* guns data, turrets bearing, hits received and related documentation drawing.
- (33) Ref. ADM 234-509 - HMS *Prince of Wales* gunnery report; *salvo plot* Enclosure / Attachment IV (a).
- (34) Ref. Original battle map of *Norfolk* and *Suffolk* during the engagement – Exhibit A.
- (35) References: a) F. O. Busch, *The story of the Prince Eugen*, page 40. b) B. von Müllenheim-Rechberg, *Battleship Bismarck*, page 134. c) B.B. Schofield, *The loss of the Bismarck*, page 34. d) L. Kennedy, *Pursuit*, page 91. e) ADM 116-4351 Loss of HMS *Hood* board of inquiry final report, page 37 – 42.
- (36) Ref. *Hood* guns data, turrets bearing, hits received and related documentation drawing.
- (37) Ref. a) AIR 14/415. RAF Report Z/201 “Sunderland” Flying Lieutenant R.J. Vaughn. b) Midshipman William Dundas report regarding bodies falling from the *Hood*, spotting tower probably had been hit. C) ADM 116-4351 Ordinary Signalman Tedd Briggs report about a Lieutenant’s body falling from *Hood* spotting tower. D) Able Seaman R. Tilburn about hit on main tower base room – from ‘The Navy 1939 to the present day ‘ M. Arthur – Coronet Book 1977 London E) Bruce Taylor - The battlecruiser HMS *Hood* – Annapolis USNI Press 2005 pages 220 and 221.
- (38) Ref. B. von Müllenheim-Rechberg, *Battleship Bismarck*, page 142.
- (39) Ref. Battle map - Gefecthskizze *Prinz Eugen* – “Time 05.59: Change target to the left ship (*Wechsel auf Linken Gegner*)”.
- (40) Ref. Official battle report - attachment to KTB *Prinz Eugen* - by First Artillery Officer Kapitän Lieutenant Paulus Jasper. “*Zielwechsel links auf den 2 gegner, wodurch nunmehr Bismarck und Prinz Eugen uber kreuz schossen*”.
- (41) Ref. ADM 116-4351 Loss of HMS *Hood* board of inquiry final report. Page 198–203 Evidence of ship’s personnel. Captain J.C Leach and Lieutenant Commander G.W. Rowell (HMS *Prince of Wales*).
- (42) Ref. ADM 234-509 - HMS *Prince of Wales* gunnery report. Salvo plot, Exhibit IV B - bearings and distances when the *Hood* was hit.
- (43) References a) ADM 116-4351 Loss of HMS *Hood* board of inquiry final report, page 1–59. b) B. Jurens, *The loss of HMS Hood* in “Warship International” publications.
- (44) References: a) B. von Müllenheim-Rechberg, *Battleship Bismarck*, page 134. b) F.O.Busch, *Prinz Eugen im ersten Gefecht*, page 156.
- (45) Ref. Official battle report - attachment to KTB *Prinz Eugen* - by Second Artillery Officer Kapitän Lieutenant Paul Schmalenbach.
- (46) Ref. Letter of July 17, 1941 of *Prinz Eugen* commander (Kpt zur See H. Brinkmann) about his cruiser torpedo release missing opportunity during the Denmark Strait battle occurred on May 24, 1941 responding to the letter of the board of commission of Admiral Carls (Group

Naval North high command) after having read the report of Vice-Admiral Schmudt (German Cruisers high command).

(47) Ref. *Prince of Wales's* guns data, turrets bearing, hits received and related documentation drawing.

(48) References: a) B. von Müllenheim-Rechberg, *Battleship Bismarck*- Page 136. b) B.B. Schofield, *The loss of the Bismarck* – Page 36 c) L. Kennedy, *Pursuit* – Page 95.

(49) References: a) B. von Müllenheim-Rechberg, *Battleship Bismarck*- Page 134. b) F.O.Busch - *Prinz Eugen im ersten Gefecht*- Page 159. c) Official battle report - attachment to KTB *Prinz Eugen* - by Second Artillery Officer Kapitän Lieutenant Paul Schmalenbach.

(50) Ref. Letter of July 10, 1941 by Kapitän Lieutenant E. Reimann Torpedo Officer on board *Prinz Eugen* responding to Vice-Admiral Schmudt about the missing torpedo release on May 24, 1941 during the battle of Denmark Strait by the *Prinz Eugen*.

(51) Ref. Letters of Vice-Admiral Schmudt (German Cruisers High Command June 16, 1941 and August 11, 1941); of Admiral Carls (Group Naval North High Command) of July 7, 1941; of Admiral Schniewind (Kriegsmarine Fleet High Command) of July 22, 1941 and of the High Command Inspector of torpedo weapons of August 18, 1941 about the *Prinz Eugen* missing torpedo launch during Denmark Strait battle on May 24, 1941.

(52) References: a) F. O. Busch, *The story of the Prinz Eugen*, page 46-8; b) B. von Müllenheim-Rechberg, *Battleship Bismarck*, page 136-7; c) B.B. Schofield, *The loss of the Bismarck*, page 36-7; d) L. Kennedy, *Pursuit*, page 95-96.

(53) Ref. Battle map - Gefechtskizze *Prinz Eugen* – “Time 06.03. Torpedo noise (*Torpedo Gerausche*) on bearing 279° ”.

(54) Ref. War diary - Kriegstagebuch K.T.B *Prinz Eugen* - Saturday May 24, 1941. “Time 06.03: the ship manoeuvre to avoid 3 torpedoes approaching of which the noise had been heard by the listening room (GHG). The torpedoes could have been launched only by the *Hood* considering distances and bearings, despite the fact that there was an airplane in the vicinity. The tracks of the second and third torpedoes had been viewed personally by the ship commander (Kpt zur See H. Brinkmann) from outside of the command bridge.

(55) The final *Hood* board of inquiry established that the *Hood* never opened the torpedo doors, and the order to do so was never given. The airplane “Sunderland” was not torpedo equipped, neither the *Norfolk* or the *Suffolk* launched torpedoes. Consequently there were no torpedoes in the water at that moment or during the entire battle.

(56) References : a) Conference of the Führer June 6, 1941 at Berghof Document SKL 885-41; b) OberKommando Kriegsmarine Nr. OKM 15543; c) Bundesarchiv Document Nr. 1448 on Op. Rheinübung; d) F. O. Busch, *The story of the Prince Eugen*, page 49.

(57) Ref. Battle map - Gefechtskizze *Prinz Eugen* – “Time 06.05. Turn to port on course 220° ”.

(58) Ref. Battle map - Gefechtskizze *Prinz Eugen* – “Time 06.06. Torpedo tracks (*Torpedo Laufbahn*) on bearing 270° ” and “Time 06.07. Torpedo noise (*Torpedo Gerausche*) on bearing 345° ”.

(59) Ref. F. O. Busch, *The story of the Prince Eugen*, page 48 : Paulus Jasper said : “ I should like to know why we are suddenly dashing about the place at high speed like a flying bedstead ! The forward turret group cannot get the target now ! Control from the after platform ! ” because he missed the Commander previous message : “ Ship avoiding torpedo lanes ! ”.

(60) Ref. Official battle report - attachment to KTB *Prinz Eugen* - by First Artillery Officer Kapitän Lieutenant Paulus Jasper. “At the twenty eighth salvo (counting turret group salvos from the beginning of fire against the *Prince of Wales*), the ship had turned so far (away) that [our view] of the target from the foretop was obscured by stack (exhaust) fumes. Simultaneously, the forward turrets were in their extreme turning position (at maximal rotation). I gave the order to transfer [fire control] to 1st Lieutenant Albrecht in the aft (gunnery) position, who continued to fire well-placed, rapid, and partial salvos while keeping the battery on target with minor range corrections until cease-fire”.

(61) References: a) Battle map - Gefechtskizze *Prinz Eugen* – Ship course and bearing of turrets at 06.07 which demonstrate the impossible use of the forward group (A+B); b) Post battle *Prinz Eugen* stern photo which shows used cartridges on the upper deck below D turret on the back. Those used cartridges can be there only if the D turret fired straight back thru the stern due to the turret unload mechanism that releases the used cartridges from the back/bottom of the turret.

(62) Ref. Battle map - Gefechtskizze *Prinz Eugen* - “Time 06.08. Turn to port on course 220° ”.

- (63) Ref. Official battle report - attachment to KTB *Prinz Eugen* - by First Artillery Officer Kapitän Lieutenant Paulus Jasper. "During the battle our own ship turned sharply thrice. Firing continued during those turning manoeuvres. The battery was twice temporarily and laterally dislodged from the target in this context. *Bismarck* came directly into the line of fire after the third avoidance manoeuvre (at 06.08). Accordingly I received the order from the ship's command: "Do not fire over *Bismarck*!" and immediately thereafter: 'Cease fire! ". Firing ceased at 06.09 hours".
- (64) Ref. B. von Müllenheim-Rechberg, *Battleship Bismarck*, page 138-139.
- (65) Ref. Official *Prinz Eugen* speed chart – Speed graphic of May 24, 1941.
- (66) Ref. Battle map - Gefecthskizze *Prinz Eugen* "Time 06.10, 06.12 and 06.13. Airplane alarm! (*Fliegeralarm*)".
- (67) Ref. Battle map - Gefecthskizze *Prinz Eugen* "Time 06.15. Torpedo noise (*Torpedo Gerausche*) on bearing 360°".
- (68) Ref. ADM 234-509. HMS *Suffolk*. Paragraph May 24, 1941, page 160.
- (69) Ref. Official battle map HMS *Prince of Wales* – Attachment 001B of June 4, 1941.
- (70) The *Prinz Eugen*, once separated from the *Bismarck* during May 24, 1941 evening, arrived at Brest on June 1, 1941.

Sources and Bibliography

German Documents:

Reconstructed *Bismarck* War Diary, Part 1/Group North
Prinz Eugen Official War Diary, May 1941
Prinz Eugen Official Battle Map for Denmark Strait
Prinz Eugen official speed chart and machinery log
Prinz Eugen 1st Artillery Officer Report (Kpt Ltnt Paulus Jasper)
Prinz Eugen 2nd Artillery Officer Report (Kpt Ltnt Paul Schmalenbach)
Prinz Eugen Torpedo Officer Report (Kpt Ltnt Ernst Reimann) and related maps
Prinz Eugen Commander Report about Torpedo (Kpt zur See Helmut Brinkmann)
Cruiser *Prinz Eugen* torpedo related matters regarding the naval engagement on May 24, 1941
Position Statement of the Commander of Cruisers, Vizeadmiral Schmudt regarding *Prinz Eugen* War Diary
Position Statement of Admiral Carls on *Prinz Eugen* battle conduct.
Position Statement of the Fleet Commander, Admiral Schniewind, regarding *Prinz Eugen* War Diary
Prinz Eugen Rheinübung original Film from Bundesarchiv-Potsdam (Berlin)
German Shells Flight Times
Rivista "Signal". September 1941 – *The annihilation of the Hood* - Kpt Ltnt J.C. Schmitz – Westerholt.
Ober Kommando Kriegsmarine – Document Nr. OKM 15543 - Operation Rheinübung
SKL document number 885-41 – Admiral Reader report to A. Hitler at Berghof on June 6, 1941.
Bundesarchiv Document Number 1448 – Operation Rheinübung.

Most of the reference document listed can be found on the following Internet sites :

<http://www.kbismarck.com/archives/index.html>

<http://hmshood.com/denmarkstrait/index.html>

British Documents:

ADM 1/11726 - Loss of HMS *Hood* in action with German battleship *Bismarck*: report of Board of Inquiry.
ADM 1/30817 - Loss of HMS *Hood* in action with German battleship *Bismarck*: report of Board of Inquiry.
ADM 116/4351 - Loss of HMS *Hood* in action with German battleship *Bismarck*: Boards of Inquiry.
ADM 116/4352 -Loss of HMS *Hood* in action with German battleship *Bismarck*: Boards of Inquiry.
ADM 234/509 - Sinking of the *Bismarck* 27 May 1941: Official Dispatches which contains following 4 sections :
1) Admiral Sir John Tovey's Dispatch
2) Narrative of H.M.S. *Suffolk* Operations 23 - 26 May 1941
3) H.M.S. *Norfolk*'s Gunnery and R.D.F. During Operations against "Bismarck"
4) H.M.S. *Prince of Wales* Gunnery Aspects Report
AIR 15/415 - Report from Sunderland aircraft of *Hood*'s loss.
Supplement to the "London Gazette" - Adm Sir J. Tovey July 5, 1941 Despatch to Admiralty
HMS *Suffolk* official war diary and battle map.
HMS *Norfolk* official war diary and battle map.
HMS *Prince of Wales* official battle map.
Captain John Catteral Leach (HMS *Prince of Wales*) Narrative Report.
HMS *Prince of Wales* log for 24. May 1941.
HMS *Hood* survivors' interviews.
ADM 1-19140 Sinking of HMS *Hood* by long range torpedo (inquiry).
Lieutenant Commander Colin William Mc Mullen (HMS *Prince of Wales* First Artillery Officer) letter to Sir L. Kennedy regarding the HMS *Prince of Wales* opening fire at Denmark Strait.

Bibliography

- B. von Müllenheim-Rechberg, *Battleship Bismarck* (Italian Edition by E. Bagnasco), Parma, Albertelli, 1984.
- L. Kennedy, *Pursuit*, Milano, Arnoldo Mondadori, 1977.
- B.B. Schofield, *Loss of the Bismarck*, Milano, Mursia, 1975.
- F.O. Busch, *Das Geheimnis der Bismarck*, Munchen, Goldmann, 1976. ISBN 3-442-03523-6
- F.O. Busch, *Prinz Eugen im ersten Gefecht*, Gutersloh, C. Bertelsmann, 1943.
- F.O. Busch, *The story of the Prince Eugen*, London, Robert Hale, 1976. ISBN 0-7091-5743-6
- R. Grenfell, *The Bismarck Episode*, London, Panther, 1957.
- T.V. Tuleja, *Twilight of the Sea Gods*, Milano, Longanesi, 1966.
- P. Schmalenbach, *Kreuzer Prinz Eugen ... unter 3 flaggen*, Herford, Koehlers, 1985. ISBN 3-7822-0374-7
- G. Von Hase, *Die Kriegsmarine im Kampf um den Atlantik*, Leipzig, Hase & Koehlers, 1942.
- D. Mearns - R. White, *Hood and Bismarck*, London, Channel 4 Books, 2002. ISBN 0-7522-6513-X
- M. Skwiot E.T. Prusinowska, *Operacja Rheinübung*, Gdansk, AJ-Press, 1999. ISBN 83-7237-022-2
- S-Breyer – G- Koop, *Schlachtschiff Bismarck*, Freidberg, Podzun-Pallas, 1990. ISBN 3-7909-0397-3
- U. Elfarth – B. Herzog, *Schlachtschiff Bismarck*, Freidberg, Podzun-Verlag, 1975. ISBN 3-7909-0029-X
- R. G. Robertson, *HMS Hood - Profile Warship Nr. 19*, Windsor, Profile Ltd, 1972.
- P.Schmalenbach, *KM Bismarck – Profile Warship Nr. 18*, Windsor, Profile Ltd, 1972
- P.Schmalenbach, *KM Prinz Eugen – Profile Warship Nr. 6*, Windsor, Profile Ltd, 1971
- P. Caresse, *Un cuirasse a detruire : Le Bismarck*, Lela Press, 2004
- B. Jurens, *The loss of HMS Hood* in "Warship International" publications.

Internet Sources:

- <http://www.warship.org/no21987.htm>
- <http://www.hmshood.com>
- <http://www.kbismarck.com/>
- <http://www.bismarck-class.dk/>
- <http://www.schlachtschiff.com/>
- <http://www.deutschekriegsmarine.de/>
- <http://www.warship.org/>