SCHARNHORST- The Last Signal

Notes by Ken Lloyd

Christmas, December 1943, in the cold winter Artic seas north of Norway.
SCHARNHORST; Kriegsmarine Battleship; feared raider of allied convoys sent her final radio signals.
"Heavy Battleship…am in Action…"
"We shall fight to the last shell"
Shells aimed with radar smashed through her armour, torpedoes exploded through her sides; battered and burning SCHARNHORST rolled over and sank beneath the waves.

SCHARNHORST had targeted the 19 Cargo ships and crews of Convoy JW-55B protected by a close escort including HMCS HAIDA. The convoys carried war supplies from Britain to the Russian ports of Murmansk and Archangel. These convoys supported Russia in its fight against Nazi Germany. During the summer months the German U-boats and aircraft took a heavy toll of cargo ships. Convoy PQ 17 lost 24 ships out of 36, convoy PQ18 following behind lost 13 ships. The Admiralty realised the convoys could not be protected in the long summer days and changed to winter convoys where freezing seas and winds made U-boat and aircraft attacks more difficult for the attackers. The Kriegsmarine directed its surface fleets to attack the winter convoys.

Operation OSTFRONT

In December 1943 the Kriegsmarine issued Operation OSTFRONT ordering the 1st Battle Group to eliminate convoy JW-55B. The 1st Battle Group included SCHARNHORST and the 4th Destroyer Flotilla anchored in Altenfjord only 100 miles from the expected route of JW-55B.

Convoy JW-55B

JW-55B comprising of 19 Cargo ships with a Close Escort of 9 warships including Destroyers HMCS HAIDA, HURON and IROQUOIS and an Ocean escort of 8 Home Fleet Destroyers led by HMS ONSLOW.

JW-55B was due to coincide with convoy RA-55A near Cape North returning empty from Russia to the UK with 22 cargo ships. Close Escort of 7 warships including HMCS ATHABASCAN and an Ocean escort 6 Home Fleet Destroyers led by HMS MILNE.

The German Commander-in-Chief Adolf Hitler was furious when JW-55A the first winter convoy reached the Russians in Murmansk. In winter the Artic seas created dangerous conditions for shipping. B-Diesnst, after sending the ship KOMET to the Artic recommended that surface vessels were more suitable than U-boats or aircraft. The 1st German Battle Group were anchored and ready. Operation OSTFRONT combined a surface fleet of a Battlecruiser, a Destroyer Flotilla, Luftwaffe reconnaissance aircraft, U Boats in support, a signals intelligence unit experienced in reading convoy codes and a radio interception team. Admiral Bey was ready to prove to Hitler that the Kriegsmarine surface fleet was still a major force.

As convoys JW-55B and RA-55A sailed past the anchorage of 1st German Battle Group, SCHARNHORST led the Group out to engage the convoys. The convoys ran north, away from the Battle Group. There was a snow squall and SCHARNORST separated from its destroyers and was trapped between Force 1 and Force 2 of the British Home Fleet. She sank after a heavy engagement from 14-inch guns guided by radar and destroyers closing in with torpedoes.

This was the last battleship engagement in European waters fought without aircover. It was the end of the German surface raiders and removed a potent threat for the D-Day planners.

This presentation begins with an overview of 'SCHARNHORST-last signal' followed by the signals story of radio and radar.

Factors that influenced the battle

There were a number of factors that impacted how this engagement was fought.

The Weather

The weather dominated the battle, Artic winter seas, snow squalls, winds of Force 7-8, only two hours of twilight, then darkness with blacked out ships. Harry de Wolf Captain of close escort Destroyer HMCS HAIDA described it as, "Christmas Day was spent at sea under unusual conditions in the Artic in bad weather and almost constant darkness escorting a straggling convoy, shadowed and reported by enemy aircraft and with the SCHARNHORST and unknown number of U-Boats in the vicinity"

Command & Control

Kriegsmarine. Rear Admiral Bey on board SCHARNHORST had command of 1st Battle Group. During Operation OSTFRONT he reported to a chain of command which included:

-The Supreme Commander (Hitler);
-The Commander in Chief of German Naval Command (Grand Admiral Doenitz);
-Naval Group North, Admiral Northern Waters;
-Navy North Norway, Admiral Polar Coast.
Rear Admiral Bey was directed that "the tactical situation must be exploited with skill and daring…use your own judgement as to when engagement will be broken off. If a superior force is encountered you are to disengage."
The orders directed Admiral Bey to exploit opportunity and avoid risk.

The Admiralty in November 1943 restarted winter convoys to Murmansk and Archangel. The Home Fleet Commander-in-Chief Admiral Bruce Fraser was tasked with this mission and delegated with complete responsibility to conduct operations. The immediate aim was the safe arrival of JW-55B to Russia and the safe return of RA-55A to Scotland.

A secondary aim was to confront SCHARNHORST with his Battleship HMS DUKE OF YORK. The Battle ship had heavier firepower with proven radar control. Admiral Fraser had command over his own Force 2 and Admiral Burnett's Force 1 that was escorting convoy RA-55A. Admiral Fraser received direct information and Intelligence through the Admiralty Operational Intelligence Centre (OIC.)

Technology

Technology influenced the tactics used. A naval historian Fritz-Otto Busch describes SHARNHORST as being able to "inflict more damage in the two hours of twilight than a whole U-boat flotilla could inflict in 6 months." (quoted in "HMS HAIDA, Battle Ensign flying")

The SCHARNHORST, a Battle Cruiser armoured and capable of speeding 4 knots faster than any British capital ship; she had 'SEETAKT" radar, which in 1939 as a Dete variant could locate a ship at 22.0 kilometers. Armament of 11-inch guns as main fire power; fourteen 4.1-inch guns and numerous anti-aircraft as near range weaponry. The SCHARNHORST was built and tasked as a Convoy Raider.

The DUKE OF YORK and the Cruisers BELFAST, NORFOLK and JAMAICA had the latest Type 273Q surface radar which could locate SCHARNHORST in adverse weather. On 26th December the type 284 Gunnery radar enabled DUKE OF YORK to gain a first hit on SCHARNHORST at 5,500 yds. This knocked out her forward gun turret. As SCHARNHORST sped away outpacing her pursuers at a reported speed of 30 knots the type 284 radar-maintained contact enabling the DUKE OF YORK to continue firing with 13 hits from her 14inch guns, which penetrated her armour, knocking out a boiler and halving her speed. The type 273 and 284 radars enabled contact to be kept with SCHARNHORST despite adverse weather and darkness.

Direction Finding

Direction Finding with the HRO radio was key to locating the signals from SCHARNHORST. The HRO used on HMS DUKE OF YORK for Direction finding of signals could cover the entire Short-Wave Band suitable for AM, CW (Continuous Wave) and SSB (Single side band) signals. SCHARNHORST 's signals were picked up, copied and located by Y service operators on both ship and shore. The technology in this radio was also used by the Germans and manufactured by Siemens and Korting.
The B-Dienst Intercept and Direction-Finding stations were too few and lacked a "decent" Base Line of stations to accurately locate allied transmissions. (referenced in German Naval Code Breakers by Jak P. Mallmann Showell)

Signals intelligence

Signals Intelligence. Information gathered from the messaging systems of the enemy with the intent to find, fix and destroy the enemy. The successful delivery of a message relies on:

- protecting **the message**. Using the German Naval Enigma cipher or the Admiralty Naval Code;
- selecting a **method** for sending the message. Using High frequency radio, or keeping radio silence and sending by flags or Aldis lamp.
- **the moment**. Can the message be delivered in time to influence the action? Deciphering German ciphers and sending to HMS DUKE OF YORK took at least 10 hours. Luftwaffe reconnaissance reports took 3 hours to get to the SCHARNHORST.

The German Kriegsmarine received intelligence on Allied Navies and Convoys from the B-Dienst (Beobachtungsdienst, the observation service).

This was a department of the German Naval Intelligence Service and reported to the German Naval Command. They specialised in radio interception, decoding and analysis. The B-Dienst were very effective in reading the British Naval cipher and providing signals intelligence against the Allied convoys in the Siberian Sea Passages

On 10th June 1943 Admiralty Naval Cipher No5 was introduced and B-Diest were unable to decode these signals. Previously the B-Dienst knew when the convoys sailed, what they carried where each ship was positioned in the convoy and where they were going. Now, they only knew when they sailed and where they were going. The naval signals war was turning in favour of the Allies

B-Dienst analysis identified the Allied Radio transmitter at Port Dikson on the Kara Sea as the main control station for convoys in the Artic.

B-Dienst asked that the station be destroyed by the Battle Cruiser Admiral Scheer. The attack was driven off by heavy defensive fire from an concealed gun emplacement. It was recorded that "B-Dienst supplied a wealthy file of data and …drew the correct conclusion…Germany was just not able to get its firepower in range, frustrating what appeared to have been quite a simple operation…U-Boats, aircraft

and heavy surface ships were sent north, although much of the action did not turn out as planned" (German Naval Codebreakers. Jak. P. Mallmann Showell.)"

The B-Dienst complained that their ability to locate Allied shipping was reduced by a shortage of accurate charts identifying ice and unchartered islets. Further, their Direction Finder system lacked a "decent" Base Line of stations and was unable to accurately locate allied transmissions. (German Naval Codebreakers. Jak. P. Mallmann Showell.)"

The convoys when at sea, maintained radio silence. Signals were usually by Light; Flags and Semaphore. B-Dienst was unable to locate the convoys except by U-Boat sightings and Luftwaffe flights. The Kriegsmarine and the Luftwaffe did not have a shared frequency, the aircraft could not inform the Battle Group of their information while flying.

The Admiralty unlike the German Intelligence which divided intelligence gathering amongst independent competing organisations, Bletchley Park collected, decrypted and analysed the radio transmissions emanating from the German Navy, Army and Airforce as well as the Abwehr, other secret agencies as well as the Supreme Command teleprinter network.

There were two principal ciphers used by the Kriegsmarine during OPERATION OSTFRONT, the Naval ENIGMA Cipher and the additional OFFIZIER procedure used for command messages. The ciphers changed daily and monthly and this created delays in deciphering from 8 – 12 hours or longer for the Offizier messages. Once deciphered the messages could be analysed by Bletchley and the Admiralty then transmitted as intelligence to Admiral Fraser on board HMS DUKE OF YORK within 50 minutes. On board with Admiral Fraser were an Intelligence support team of specialists such as Commander Thomas the ULTRA officer and specialists to intercept and locate Luftwaffe and Kriegsmarine transmissions.

Admiral Fraser had faith in ULTRA intelligence received through the Admiralty Operational Intelligence Centre (OIC). In September 1943 he had been informed that SCHARNHORST was exercising as a prelude to operations against Artic convoys. Then the XX Committee monitoring German spies arrested an agent observing the Fleet anchorages in Loch Ewe. The spies were using captured SOE radios whose frequencies were monitored by British Y-stations. Admiral Fraser decided he would use his Battleship HMS DUKE OF YORK to protect JW-55B. On 18 Dec 1943 Admiral Fraser sailed from Kola Inlet to Iceland, refueled and on 23 Dec 1943 went to protect the convoys.

Radio Silence.

Both B-Dienst and Bletchley Park depended on the High Frequency radio transmissions made be their opponents. These transmissions were in Morse Code and encrypted by different and changing ciphers.

Admiral Fraser went on air for tactical changes, otherwise maintaining radio silence

Admiral Bey had confidence in the Naval ENIGMA cipher and used HF radio when he needed to inform his multiple chains of command on his situation, and the impact of the deteriorating weather on his Destroyers.
The machine used was a 3 rotor Naval Enigma using Allgemein (general) setting key Heimich Heinish (named Hydra for U Boats and ships in the Home waters North Sea and Atlantic. Bletchley called it Dolphin. Some messages used the Offizier setting of the Heimisch key meaning that the Enigma code had to be deciphered first and then the Heimisch key procedure applied.

Radio silence was critical for the convoys

The German 4th Destroyer Flotilla comprising of Z29; Z30; Z32; Z34, and Z38 were anchored in Alten Fjord. They were the eyes and ears of the 1st Battle Group.

The B-Dienst knew when the Allied convoys departed, the Luftwaffe and U-boats reported their positions.

HMS HAIDA and the escorts of JW55B had driven off U-Boats, U 601 and U 716 from the EISENHART group of U-Boats. SCHARNHORST had the speed to attack and run before HMS DUKE OF YORK with heavier firepower could get close. Radio silence was security.

The Convoys

The two convoys were predicted to pass North Cape at the same time were JW-55B heading for Murmansk and RA-55A returning to Scotland from Murmansk.

Convoy JW-55B had 19 loaded freighters, an escort from Scarpa Flow of destroyers and other vessels commanded by HMS ONSLOW. It included the Destroyers HMCS HAIDA; HURON; IROQUOIS with HMS ONSLAUGHT; ORWELL; IMPULSIVE; OBDURATE; WHITEHALL; and WRESTLER. Also, the corvettes HMS OXSLIP and HONEYSUCKLE with the minesweeper HMS GLEANER.

Admiral Fraser aimed to support this convoy with Home Fleet FORCE 2 and was returning from refueling at Akureyi in Iceland. Rear Admiral Fraser was on board the Battleship HMS DUKE OF YORK; accompanied by the cruiser HMS JAMAICA and Destroyers HMS SAVAGE; SCORPION; SAUMAREZ, and Royal Norwegian Destroyer STORD.

Convoy RA-55A had 22 freighters in ballast from Murmansk with an escort of destroyers and corvettes commanded by HMS MILNE. It included the destroyers HMCS ATHABASKAN; HMS ASHANTI; MUSKETEER; OPPORTUNE; VIRAGO; MATCHLESS; BEAGLE and WESTCOTT. Also, the corvettes HMS DIANELLA, POPPY and ACANTHUS.

Vice Admiral Burnett with the Cruisers of Home Fleet FORCE 1, HMS BELFAST, HMS SHEFFIED and HMS NORFOLK were returning from Murmansk and the Kola Inlet with convoy RA-55A.

The Signals Battle begins

B-Dienst intercepted an Operational URGENT signal sent to the Allied submarines off Murmansk. This and other signals led B-Dienst to assess that a convoy was due. Since Archangel port was frozen, the ships would probably head to Murmansk. The target was convoy JW-55B.

The North Norway Naval Squadron was ordered to sea on 25th December 1943 comprising of SCHARNHORST and escorting Destroyers.

A reminder, SHARNHORST is described as being able to “inflict more damage in the two hours of twilight than a whole U-boat flotilla could inflict in 6 months.” (quoted in “HMS HAIDA, Battle Ensign flying”)

The Signals Battle

20 Dec 1943 Convoy JW-55B sails from Loch Ewe, North West Scotland.
Admiral Fraser is heading to Akureyri Fjord, Iceland to refuel.
ULTRA message informs Admiral Fraser that 2 days ago. “German Battle Group was at 3 hours notice to move.”

21 Dec 1943 Admiral Bey, German Battle Group (GBG) is ordered to be at 3 hours notice to move

22 Dec 1943 Convoy JW-55B, with close escort HMS HAIDA at sea, driving off enemy recce aircraft.

22 Dec 1943 ULTRA message informs Admiral Fraser that a Luftwaffe aircraft has sighted the convoy and incorrectly identified it as 40 troopships.

22 Dec 1943 German Admiral Northern Waters informs Admiral Polar Coast “to make preparations for departure of Battle Group. Flag Officer Group North in Kiel ordered U-Boats to take station at the entrance of Alten Fjord.”

23 Dec 1943 At 11:35 am 2 German recce aircraft and a U Boat shadowing JW-55B. Aircraft also spots returning convoy of 22 ships RA55A.

23 Dec 1943 At 11:45 am the Senior British Naval Officer for North Russia, Murmansk reports a German recce aircraft has identified a convoy 300 miles South East Jan Mayen island. Aircraft makes no report of any covering force.

23 Dec 1943 ULTRA informs Admiral Fraser that German 1st Battle Group is on 3 hours notice to move since 22nd Dec (delay in deciphering due to message sent using Offizier code)

23 Dec 1943 Admiral Fraser takes Home Fleet to sea to protect JW55B. Fraser knows from Ultra that JW-55B had been sighted by Luftwaffe recce and that SCHARNHORST is preparing for sea.

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24 Dec 1943 ULTRA informs Admiral Fraser that on 22nd Dec German Admiral Northern Waters asked Admiral Polar Coast “to make preparations for departure of Battle Group.

ULTRA informs Admiral Fraser that on 22nd Dec that Luftwaffe are ordered to make reconnaissance over convoy on 24 Dec.
Fraser wrote “convoy…was entirely unsupported and I was uneasy lest a surface attack should be made.”
Admiral Fraser knows from the RAF Y service operators on board HMS DUKE OF YORK, whether the convoys or the covering forces have been spotted by the Luftwaffe reconnaissance flights. .

24 Dec 1943	1:25 pm Admiral Fraser on HMS DUKE OF YORK breaks Radio silence by ordering convoy JW-55W to reverse course for 3 hours. The intention is to delay the enemy finding the convoy in daylight. However, the seas were so rough, the convoy can only reduce speed and is unable to reverse course. HMS ONSLOW orders the convoy to reduce speed. 3 German Y stations report this transmission. B-Dienst cannot decipher the message in Naval Code No4. The assessment is that this is a freighter trying to rejoin the convoy. Admiral Bey is not informed.
24 Dec 1943	EISENHART group of U-Boats, U 601 and U 716 are driven off away by HMCS HAIDA and escorts from convoy JW55B.
25 Dec 1943	JW-55B convoy speed drops to 7 knots in bad weather
25 Dec 1943	Admiral Fraser is receiving ULTRA updates through Commander Thomas and Y Service personnel on board HMS DUKE OF YORK. He is aware of the German U-Boat dispositions and knows his radio transmissions are being detected.
25 Dec 1943	B-Dienst records show they had intercepted an urgent British Admiralty signal to the allied submarines off Murmansk advising of arrival of allied merchant ships in their area.
25 Dec 1943	B-Dienst records show that the German 1st Battle Group was ordered to sea on 25 Dec 1943. SCHARNHORST and destroyers led by Admiral BEY, the target is convoy JW55B. B-Dienst records show that because of Allied Radio silence the Allied Cruiser Force has not been located.
25 Dec 1943	Admiral Fraser sends radio orders for 4 destroyers HMS MUSKETEER; OPPORTUNE; VIRAGO; and MATCHLESS from RA-55A to JW-55B.
25 Dec 1943	At 10:56 am Offizier message to Admiral Bey. “Battle group is to be at 1 hour’s readiness from1300/25/12, SCHARNHORST…to acknowledge.”
25 Dec 1943	At 11:58 am ENIGMA Naval message from Battle Group to unknown vessel “EMERGENCY- Proceed to SCHARNHORST in Langfjord. Further orders there” This message is deciphered by Bletchley on 25th Dec at 8.50 pm, sent to the Admiralty OIC and forwarded to Admiral Fraser on 25th Dec at 9:42 pm.
25 Dec 1943	At 2.30 pm German U-Boat reports convoy JW55B. Does not report any covering force. Admiral Doenitz Commander in Chief German Navy orders SCHARNHORST to sail.
25 Dec 1943	At 3:16 pm Offizier message “Battle group ready for sea at 16:20 hrs.” (this message will not be deciphered by Bletchley until after the action).
25 Dec 1943	At 3.28 pm ENIGMA Naval message “From Admiral Northern Waters to Battle Group and Admiral Polar Coasts: “MOST IMMEDIATE. “OSTFRONT” 1700/25/12.” This message is sent using the new days ENIGMA settings. Bletchley deciphers this message on 26 Dec at 12:30 am. It is sent immediately to the Admiralty OIC who forwards it to Admiral Fraser at 3:28 pm on 26th Dec. It is agreed between OIC and

Bletchley that any further messages referencing OSTFRONT will be given the Codename EPILEPSY.

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26 Dec 1943 At 1:30 am Message from Admiralty to Admiral Fraser, HMS DUKE OF YORK. “At 15:30A 25 December Admiral Commanding Northern Waters informed Battle Group and Admiral Polar Coast Codeword EPILEPSY 1700AA/25 December. Comment, meaning not yet evident. ULTRA information will be available with a delay of some hours until 1200A/26 December but will not necessarily be complete for North Norway area.”

26 Dec 1943 At 1:33 am ULTRA message from Bletchley to Admiralty OIC. “From Scharnhorst to other vessel, SCHARNHORST will pass outward bound as from 18:00. Act in accordance with t-days written instructions.”

26 Dec 1943 At 2.17 am From Admiralty to Admiral Fraser “EMERGENCY, SCHARNHORST probably sailed 1800A/25th December.”

26 Dec 1943 At 2.18 am The Admiralty send to Admiral Fraser “A patrol vessel presumably in the Altenfjord area was informed at 17:15 that SCHARNHORST would pass outward bound from 1800A/25th December.”

26 Dec 1943 At 12:43 am ENIGMA Offizier message to U-Boats in the Artic “Own Battle Group consisting of SCHARNHORST and 5 Destroyers left Lopphavet 2300/25 with the intention of attacking the convoy at about 0900/26” (this message would not be deciphered by Bletchley until after the action).

26 Dec 1943 At 03:00 am Bletchley decrypts an ENIGMA Offizier message from ‘Von Kampfgruppe (from SCHARNHORST Battle Group) To German Naval Command.
“[SCHARNHORST] MIT FUENF NEUE ZERSTOERER ZWO DREI NULL NULL UHR LOPPHAVET AUS. (“SCHARNHORST with 5 Destroyers 23:00hrs out of Lopphavet.”)

26 Dec 1943 On board HMS ONSLOW (lead escort for convoy JW-55B) during the early morning Watch, a telegraphist, Derek Wellman is monitoring U Boat frequencies and picks up a background signal. He re-tunes his HRO radio, and finds morse code messaging, it has a normal pitch not a U Boat. Locating the signal with DF (Direction Finding) it is at sea, between the convoy and the Norwegian coast. Signaler Wellman is experienced in German radio protocols. This is a PRIORITY Signal; it has to be SCHARNHORST at sea. This is reported immediately to Admiral Fraser.

26 Dec 1943 At 03.39 am Admiralty message to Admiral Fraser “26 0319 Admiralty appreciated that SCHARNHORST was at sea.”

26 Dec 1943 At 04:01 am Admiral Fraser breaks radio silence, to order JW-55B to steer north away from the SCHARNHORST contact. Admiral Fraser knows that if SCHARNHORST attacks in daylight and immediately returns to Altenfjord, DUKE OF YORK is still too far away to cut her off.

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26 Dec 1943 At 05:39 am Admiral Fraser with Force 2, is 200 miles behind JW-55B. Admiral Burnett with Force 1, is150 miles away from RA-55A.

26 Dec 1943 Y service operator on board HMS DUKE OF YORK, using an HRO 5 receiver capable of locating signals on Amplitude Modulation (AM); Continuous Wave used for Morse telegraphy (CW) and Single side Band (SSB) picked up transmissions from SCHARNHORST.

BEAR ISLAND and NORTH CAPE

26 Dec 1943 the fleets are converging between Bear island and North Cape.

26 Dec 1943 At 07:30 am Admiral Bey 1st German Battle Group deploys 4th Destroyer Flotilla to the south east to search for JW-55B.

CRUISER ENGAGEMENT

26 Dec 1943 At 08:40 am Admiral Burnett Cruiser Force 1, using the new Type 273Q surface radar locates SCHARNHORST approaching from the south at 5,500yds.

26 Dec 1943 At 09:21 am Admiral Burnett's cruisers commence fire on SCHARNHORST, she is hit and turns away. In winds of Force 7 to 8 in rough seas SCHARNORST turns south then north to find JW-55B. Admiral Burnett cannot match Scharnhorst's speed, so turns to place Force 1 between Scharnhorst and JW-55B.

26 Dec 1943 At 10:00 am a Luftwaffe aircraft reports "5 Warships one apparently a big one" Luftwaffe and Kriegsmarine do not have a common radio frequency. This message not passed for another 3 hours.

26 Dec 1943 At 12:05 am Type 273 radar on HMS BELFAST finds SCHARNHORST and opens fire at 12:21 am for 20 minutes. HMS NORFOLK is hit twice, damaging a turret and leaving only one radar functional. SCHARNHORST moves away again.

At 1:06 pm A second flight later in the day by Luftwaffe Group Lofoten reports a British force heading westward as 1 heavy vessel and light ships but in the repeating the message there is no mention of a heavy vessel. This report of a second group of warships message is not passed to the German Battle Group for another 3 hours by which time SCHARNHORST is already in action.

26 Dec 1943 At 2:18 pm SCHARNHORST orders the 4th Destroyer Flotilla to cease the convoy search and return to Altenfjord. Admiral Bey reports his concerns for the destroyers in the Artic weather.

26 Dec 1943 At 2:18 pm Admiral Burnett's Cruiser Force 1 shadowing SCHARNHORST reports their position to Admiral Fraser.

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26 Dec 1943 At 4:17 pm SCHARNHORST now delayed by the Force 1 Cruisers is located by HMS DUKE OF YORK using her Type 273 radar at 25 miles. HMS DUKE OF YORK closes to within 4,500 yards. SCHARNHORST is now plotted by two sets of type 273 surface radars.

26 Dec 1943 At 4:50 pm HMS DUKE OF YORK and HMS JAMAICA open fire. SCHARNHORST turrets still fore and aft as seen by starshell. SCHARNHORST swings away then back again away from Admiral Burnett and the Force 1 cruisers.

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26 Dec 1943 HMS SCORPION observes HMS DUKE OF YORK firing Starshell at SCHARNHORST "…could see her so clearly, that she had her turrets fore and aft and what a lovely sight she was at full speed. She was almost at once obliterated from sight by a wall of water from the DUKE's first salvo…when she re-appeared her turrets wore a different aspect."

26 Dec 1943 At 4:50 pm SCHARNHORST fires at HMS DUKE OF YORK with 11-inch shells, increases speed and is soon 4 miles to the south-east.

26 Dec 1943 SCHARNHORST continues to fire and increase her distance from HMS DUKE OF YORK. One of two shells pass between the masts of HMS DUKE OF YORK, one explodes damaging the wireless aerials and knocking the Type 284 gunnery control radar out of alignment. Lt Bates, a Naval Reservist Signals officer is at his station close to the antenna mast. He climbs the mast in the freezing Force 8 gale, realigns the radar antenna and reconnects the cabling. HMS DUKE OF YORK can now continue firing as SCHARNHORST disappeared into the snowstorm. Bates was awarded the Distinguished Service Cross and dubbed "Bare hands Bates" by the British press and treated as a national hero with images of him in the newspapers holding two electric cables together with his bare hands.

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26 Dec 1943 At 4:56 pm a message from SCHARNHORST to Gruppe Nord-Flotte "MOST IMMEDIATE 72o 39' North, 26o 10' East. Heavy Battleship. Am in action."

26 Dec 1943 At 5:16 pm from SCHARNHORST to Gruppe Nord Flotte "Opponent is firing by radar. Location is more than 1800 (range)…speed 26knots."

26 Dec 1943 5:22pm From SCHARNHORST surrounded by heavy units."

26 Dec 1943 6:02 pm from SCHARNHORST to Admiral of the Fleet. Commander in Chief." SCHARNHORST will ever reign supreme"

26 Dec 1943 At 6:20 pm the HMS DUKE OF YORK's firing with 14-inch shells is increasing trajectory using a Type 284 gunnery radar. The shells are falling on SCHARNHORST at a steeper and increasing angle.

26 Dec 1943 At 6:20 pm SCHARNHORST 'A 'turret hit; magazines flooded. Damage to starboard boiler room. Speed reduced "ULTRA message sent to Admiralty OIC at 11:47pm

26 Dec 1943 At 6:25pm Signal is sent from Admiral Northern Waters to all "SCHARNHORST surrounded by heavy units."

26 Dec 1943 6:25pm From SCHARNHORST to Commander in Chief “We shall fight to the last shell”.

26 Dec 1943 At 6:47 pm Admiral Fraser radios to Admiral Burnett “I see little hope of catching Scharnhorst and am proceeding to support convoy.”

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26 Dec 1943 At 6:50 pm With the hit in her boiler room, SCHARNHORTS speed is reduced and 2 destroyers catch up with her. She puts her wheel over and turns away. HMS SCORPION reports SCHARNHORST became ... “an onrushing target at a fine inclination became a sitting bird…” the destroyers close in with torpedoes.

26 Dec 1943 At 6:50 pm HMS SAVAGE; SAUMAREZ; SCORPION; Norwegian Destroyer STORD from FORCE 2 close in on SCHARNHORST and launch torpedoes from 1800-2100 yds. Three torpedoes hit.

26 Dec 1943 At 7:00 pm HMS DUKE OF YORK and HMS JAMAICA open fire from 5 miles. SCHARNHORST replies only with her secondary armament as main armament out of action. HMS NORFOLK and BELFAST open fire.

26 Dec 1943 7:25 pm from Scharnhorst “steering for Tanafjord at 20 knots.

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26 Dec 1943 At 7:30 pm Admiral Fraser orders HMS JAMAICA and BELFAST to use torpedoes. HMS MUSKATEER, MATCHLESS, OPPORTUNE, VIRAGO fired 55 torpedoes and 11 hit SCHARNHORST.

26 Dec 1943 At 7:45 pm SCHARHORST capsizes 72o 16’ north, 28o 41’ east.

26 Dec 1943 At 7:45 pm Radio Message from Admiral Northern Waters to all, reports “SCHARNHORST last message for the Fuhrer, we shall fight to the last shell”.

26 Dec 1943 Admiral Fraser wrote “all that could be seen of the SCHARNHORST was a dull glow through a dense cloud of smoke, which the starshell and searchlights of the surrounding ships could not penetrate…it seems fairly certain that she sank after a heavy underwater explosion which was heard and felt in several ships about 19:45hrs.”

26 Dec 1943 The radar officer on HMS DUKE OF YORK saw the echo fade on his screen. Admiral Fraser told him to retune the set. After speaking to Admiral Burnett, Admiral Fraser breaks radio silence again and sends to the Admiralty, “SCHARNHORST sunk.”

The Admiralty replies “Grand. Well-done.”

26 Dec 1943 Bletchley received the SCHARNHORST signal timed 6:19 pm and forwarded the deciphered message to the Admiralty at 11:47 pm.

CONCLUSION

ULTRA Signals Intelligence enabled Admiral Fraser to anticipate the enemy battle plan and to monitor its preparation into engagement.

During the Cruiser action, ULTRA, Direction Finding and Radio interception assisted in finding a fast and elusive raider. The use of surface and gunnery radar enabled Force 1 and 2 to maintain contact and ultimately outgun SCHARNHORST.

The loss of SCHARNHORT'S forward ranging radar in a night action with a storm, challenged Admiral Bey's capability to return fire. The German Ranging crews had excellent optics for visual ranging on the Flash from the of Duke of York's broadsides. However, it was dark with poor visibility and the Home Fleet were using reduced flash propellant. SCHARNHORST was straddled by 31 of 52 radar directed salvoes from HMS DUKE OF YORK with 13 hits from her 14-inch guns. The Cruisers 6-inch guns achieved 12 hits fand 11 hits by torpedoes. From her crew of 1,800, 36 were picked up and rescued.

Admiral Doentiz remarked "Surface ships are no longer able to fight without effective radar equipment."

After the action Admiral Fraser briefed his officers.

"Gentlemen the battle against the Scharnhorst has ended in victory for us. I hope that if any of you are ever called upon to lead a ship in action against an opponent many times superior, you will command your ship as gallantly as SCHARNHORST was commanded."

The final words are for Admiral Fraser in his report on the action and giving reasons for his success.

He wrote

"…the speed of wireless communications and the exceptional performance of radar reflects the greatest credit on the personnel concerned and in this night battle contributed in the greatest measure to its success."