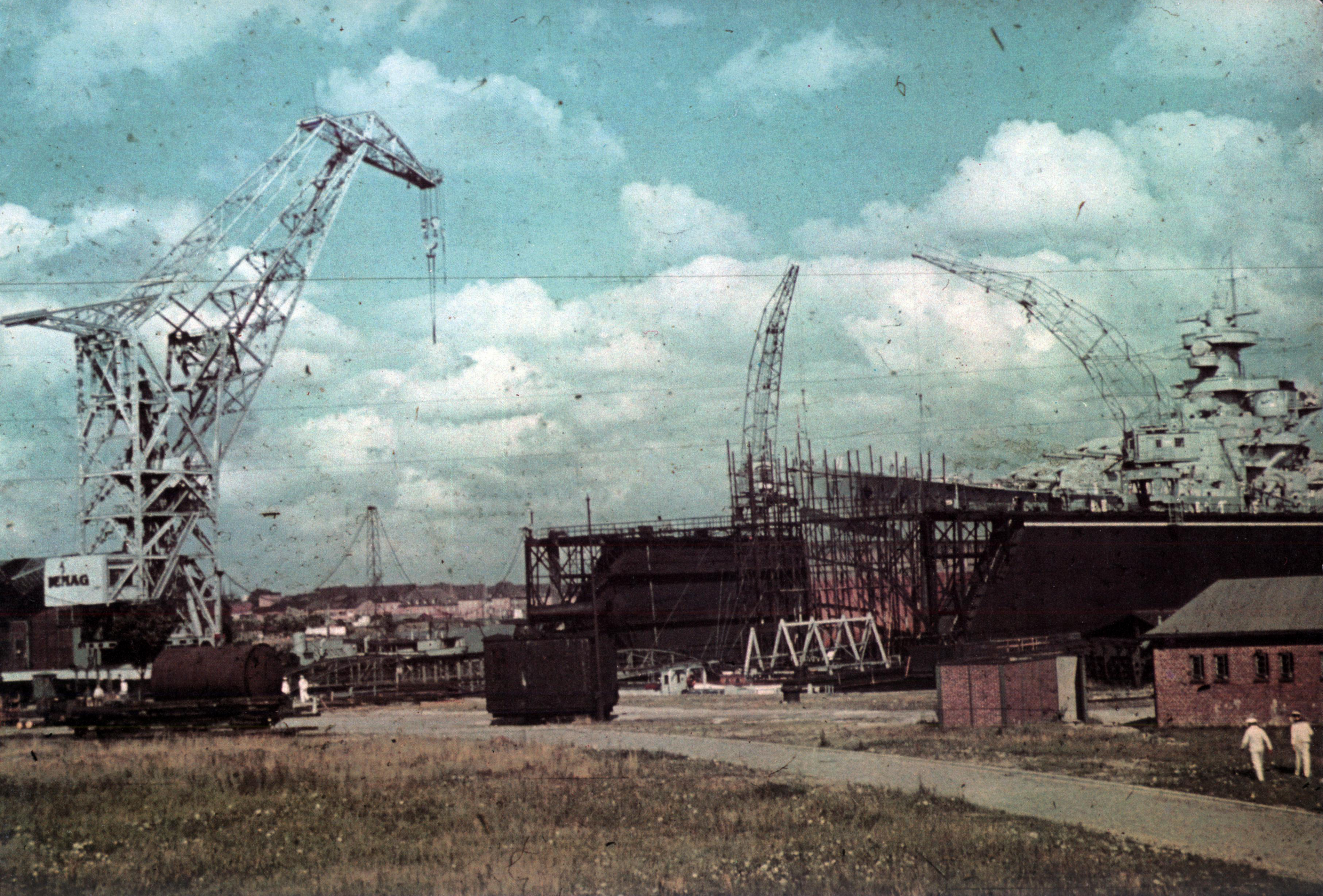
• THE GERMAN BATTLESHIP •

SCHARNHORST

SIEGFRIED BREYER

SCHIFFER MILITARY HISTORY

With Special Section
"Current Naval Information"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THE GERMAN BATTLESHIP

SCHARNHORST

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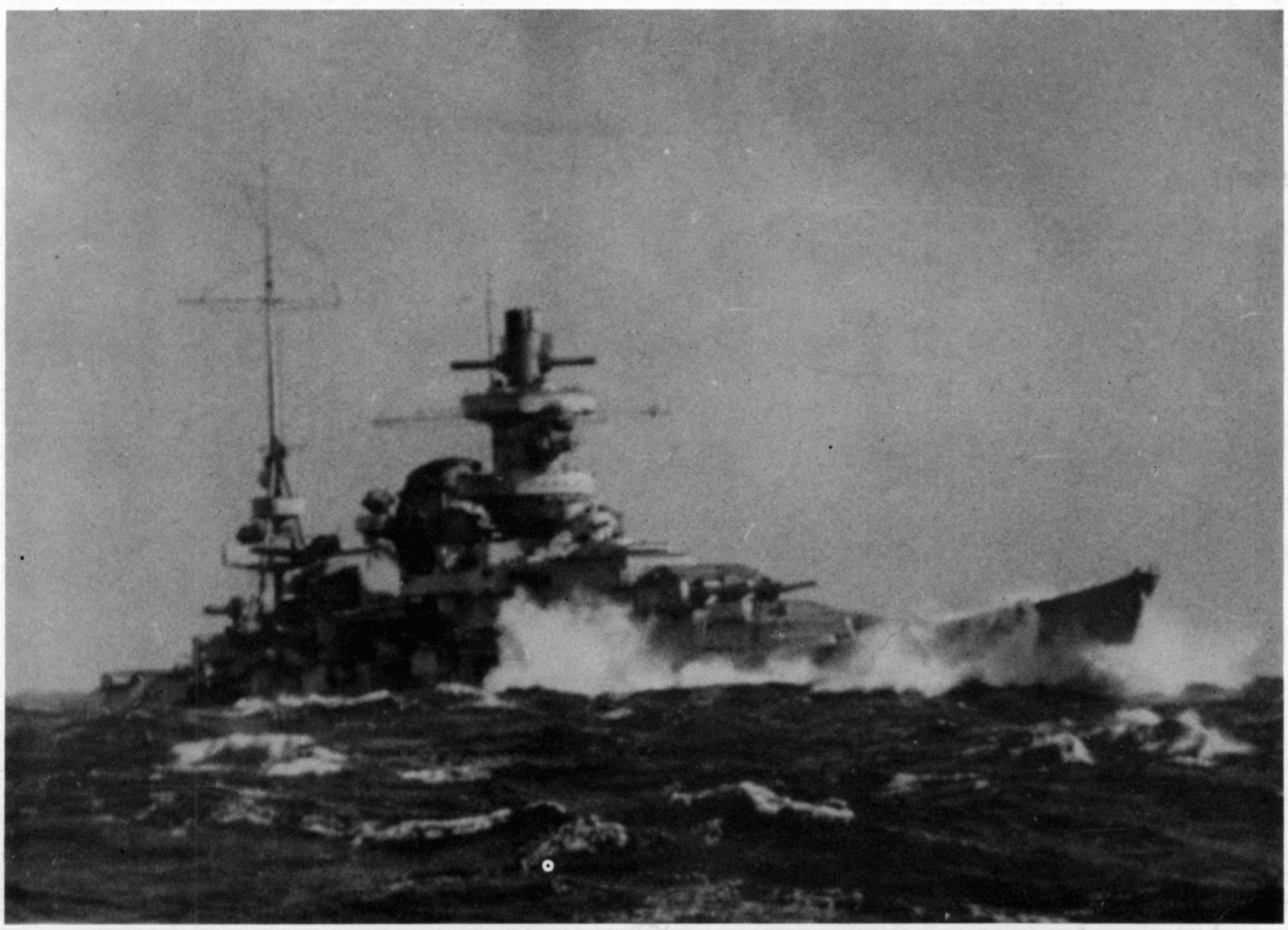

SCHIFFER MILITARY HISTORY
West Chester, PA

PHOTO CREDITS

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Color picture, inside cover:
In a 40,000-ton floating dock in Wilhelmshaven, taken in July 1939, shortly after rebuilding began. The mainmast situated behind the funnel has already been removed, the bow is scaffolded to be reshaped.

FOREWORD

The battleship SCHARNHORST was a sister ship of the battleship GNEISENAU and identically built in almost every detail. For that reason, the SCHARNHORST will be described here more or less summarily and, in general, the GNEISENAU volume will be referred to as the source of detailed information. The publishers' thanks for the success of this volume go — as they did for the preceding second volume — to the Federal Archives in Koblenz, the author and all the gentlemen and offices who made photographs and other materials from their collections available.

Translated from the German by Dr. Edward Force,
Central Connecticut State University.

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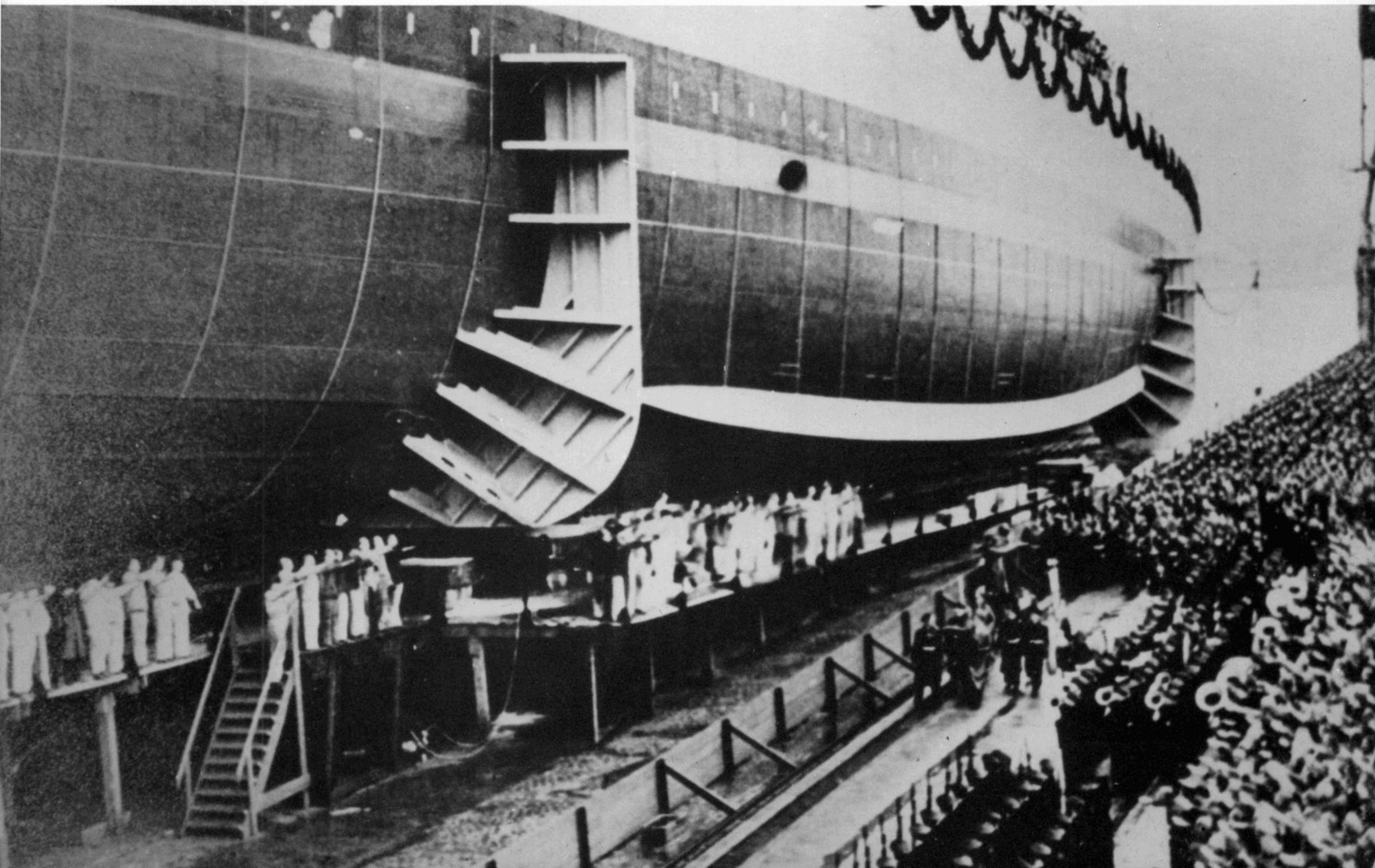
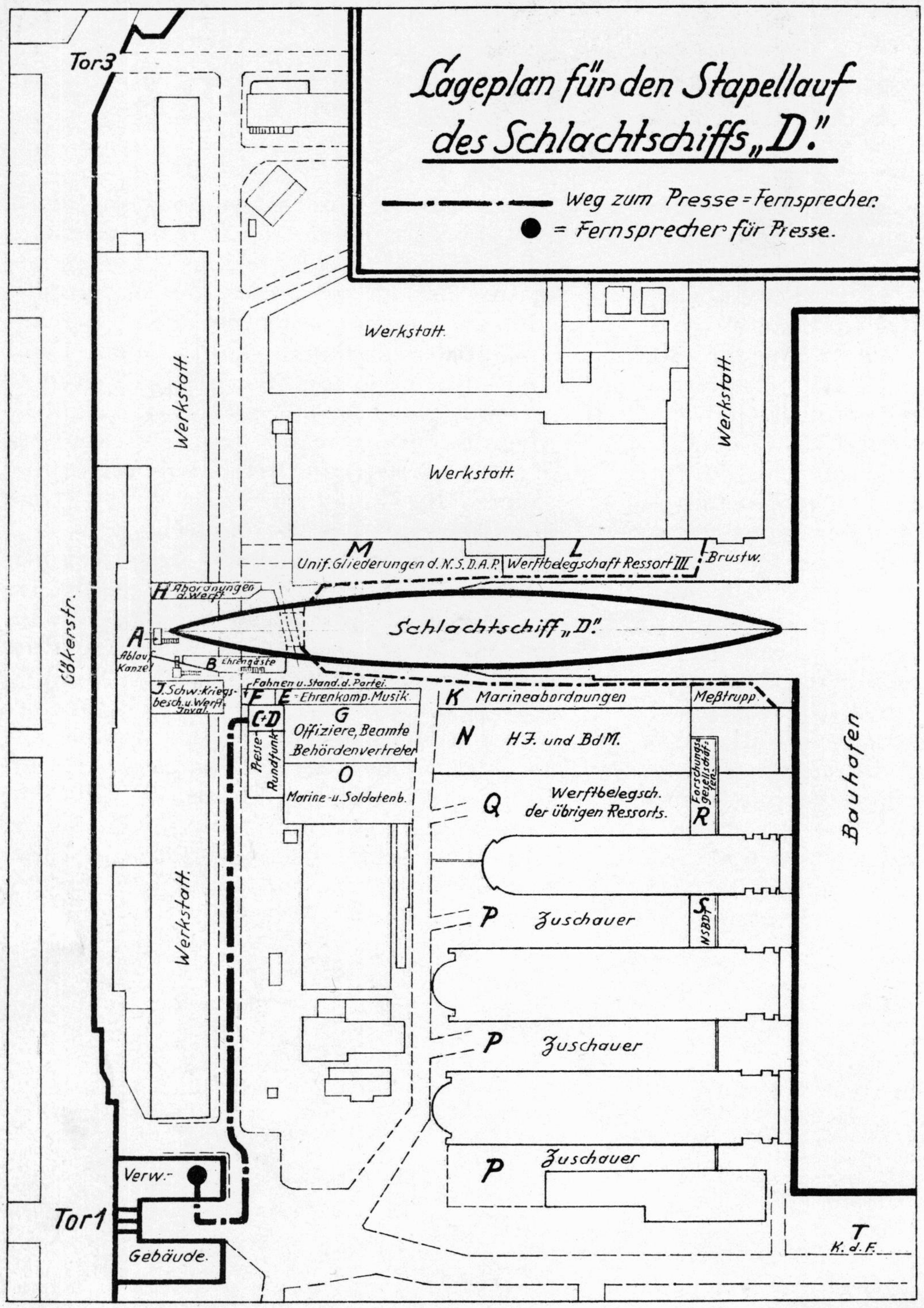
CONSTRUCTION HISTORY

The contract for a replacement for the obsolete battleship ELSASS, designated "Armored Ship D" in the German Navy's construction plans, was given on January 25, 1934 and envisioned a pocket battleship "inflated" to a type displacement of about 20,000 tons, continuing the series that began with the pocket battleship DEUTSCHLAND. Its increased weight was to be devoted mainly to its durability (armor and underwater protection); its armament of six (or perhaps eight, with the possibility of quadruple turrets) 28-cm and eight 15-cm guns was to remain unchanged, but its powerplant was to be different: Power was to be supplied by steam turbines in order to assure the required speed of some 29 knots. This necessarily meant the loss of the advantages of motor drive gained in the pocket battleships of the DEUTSCHLAND class. But at this point industry did not consider itself in a position to build motors with the required performance within the time limit. It would have been possible only several years later. The keel of the ship, which was given construction number 125, was laid at the naval shipyards in Wilhelmshaven on February 14, 1934.

But work was ordered stopped on July 5, 1934. This was attributable to Hitler's changed mind. He, who had previously spoken out against stronger armaments out of consideration for England, now was convinced by the naval leadership that this ship would be hopelessly inferior to the French DUNKERQUE, presently under construction, with its eight 33-cm guns. For that reason he gave his approval of a third three-gun turret, but not for a larger caliber. This, though, made a whole new design necessary and thus a completely new ship, which involved considerable delays. Shortly after the construction was halted, the slipway was cleared of the built-up material. After the new design was finished, construction work could begin anew; the keel was laid on June 15, 1935, again at the Wilhelmshaven naval shipyard and under the construction number 125. Seventeen months later, on October 3, 1936, the ship was launched and christened with the name SCHARNHORST. It was put into service on January 7, 1939; its total building time thus took up about 42 months, almost half a year longer than the GNEISENAU.

October 3, 1936: Hitler and his retinue arrive at the naval shipyard in Wilhelmshaven to take part in the launching of the SCHARNHORST. The port bilge-keel is clearly visible; braking shields have been welded on forward and aft of it to shorten its run into the narrow construction harbor.





One of the press cards given out for the launching, showing a map of the area. The launch of a large warship was, as in other lands, a very festive occasion in which the public always took a keen interest. In the "Third Reich" this was even more true, since Hitler always attended these events, his first being the SCHARNHORST (and subsequently the GNEISENAU, the heavy cruiser PRINZ EUGEN and the aircraft carrier GRAF ZEPPELIN in 1938, and the battleships BISMARCK and TIRPITZ in 1939).

Pressekarte

(einschließlich Bild- u. Filmberichterstatter)

für Herrn Hans Krause

zur Teilnahme an dem Stapellauf des Schlachtschiffes „D"

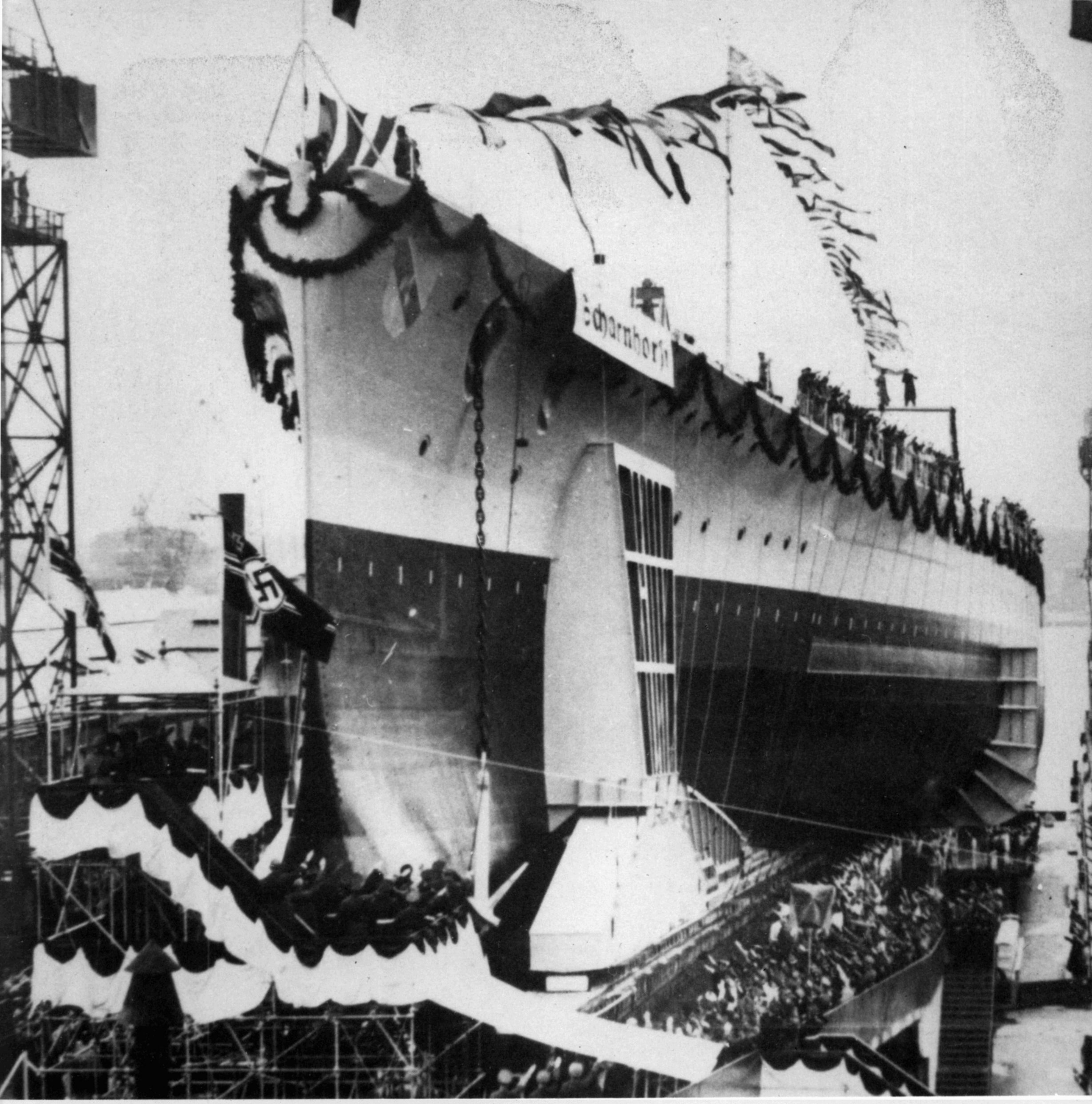
am 3. Oktober 1936.

Zeit: 12 Uhr.

Ort: Marinewerft Bauhafen.

Es wird gebeten, sich pünktlich zu Formalgelegt: Admiralstabsgebäude, Adalbertstr. 19, 10.45 Uhr einzufinden zum Empfang einer durch Wimpelzeichen bezeichneten Anzahl, die allein zum Betreten des Festplatzes und Benutzen der Tribünen berechtigt. Anschließend Führung zur Marinewerft. Die Gültigkeit des Ausweises erlischt mit Beendigung des Vorgangs. Es ist zusammen mit den Anzahlen beim Verlassen der Marinewerft bei Tor I abzugeben.

Heil!



The christening is completed, the covers have fallen from the name board and coat of arms at the bow, and the giant begins to move.

Here the hull of the battleship is seen on the slipway, ready to be launched . . .

. . . and here it is in its element. Tugs have already taken it in tow and brought it to the equipping pier.

This picture was taken during the work of fitting out the ship, presumably in 1937. The "Anton" turret is already mounted. Behind the barbette of the "Bruno" turret, the raw structure of the armored bridge can be seen.

This picture was probably taken toward the end of 1937 — maybe even later. Here the superstructures have been erected and the 15-cm twin turrets installed. Behind the already installed catapult tower the shafts for installing the machines and boiler can be seen, and are not yet closed off.

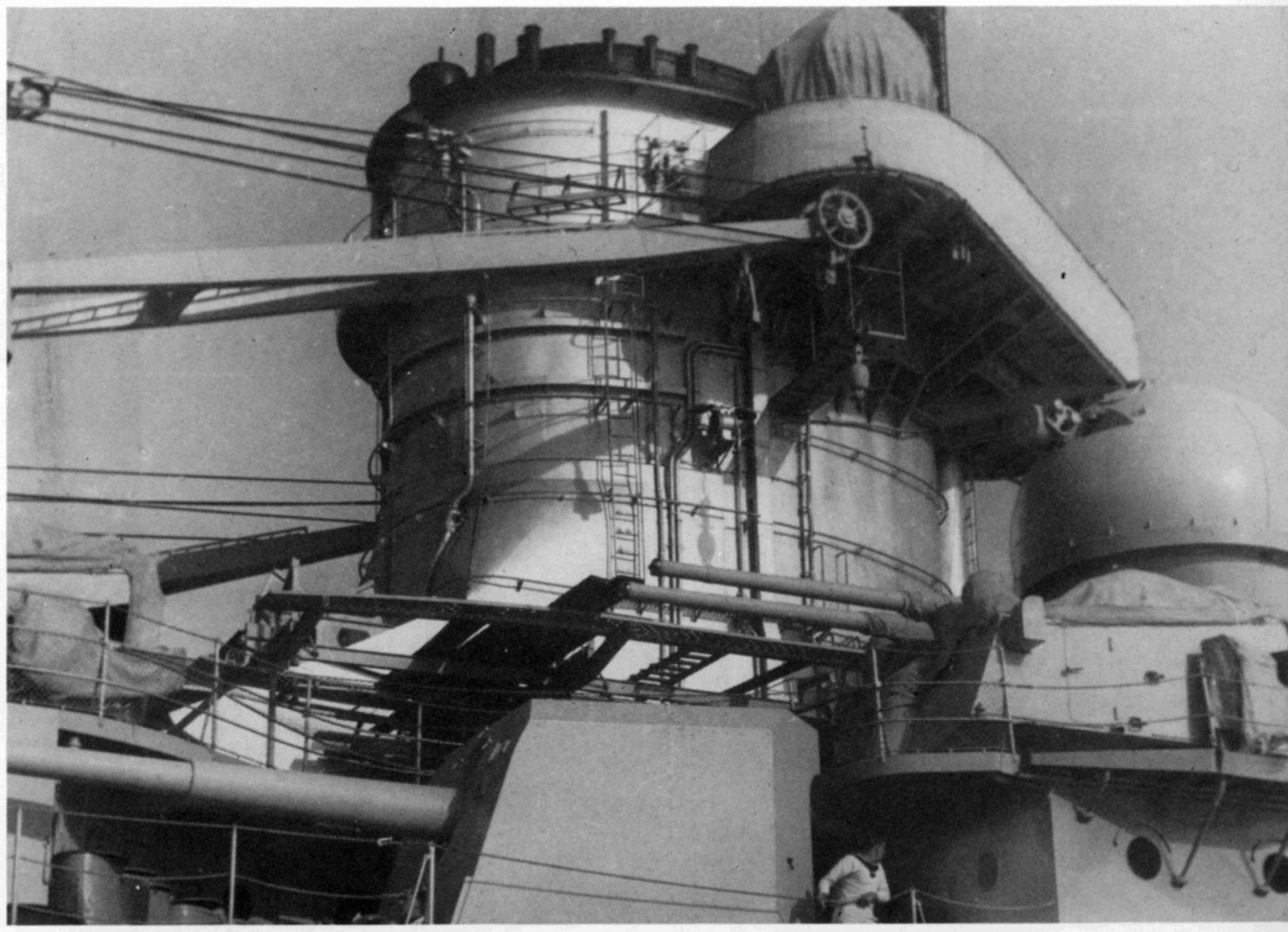
With the help of tugboats, the SCHARNHORST moves into the Scheer Harbor to be docked there. Here it is just passing the Kaiser Wilhelm Bridge.

Progress by early 1939: The ship is just about to go into service. Future crew members are coming aboard with their sea bags.

A look at the port side of the stern. The "name board" is easy to see, as is the wedge-shaped attachment of the heavy side armor. Farther back is the deployed propeller protector.

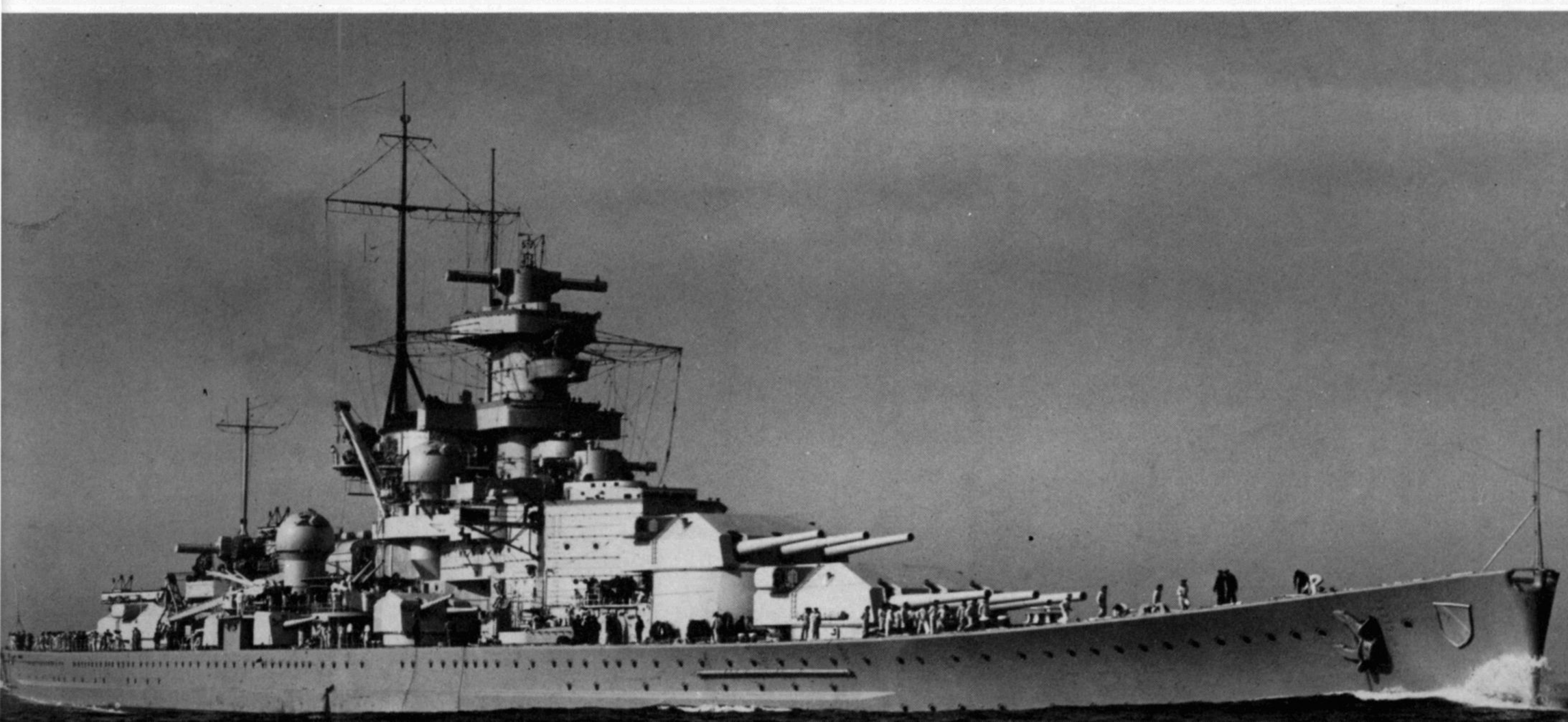
January 7, 1939: The ship is put into service by its commander, Kapitän zur See Otto Ciliax. Here he stands on a podium erected on the "Cäsar" turret and speaks to the crew. A little later the flags and pennants were flown to the music of the national anthem.

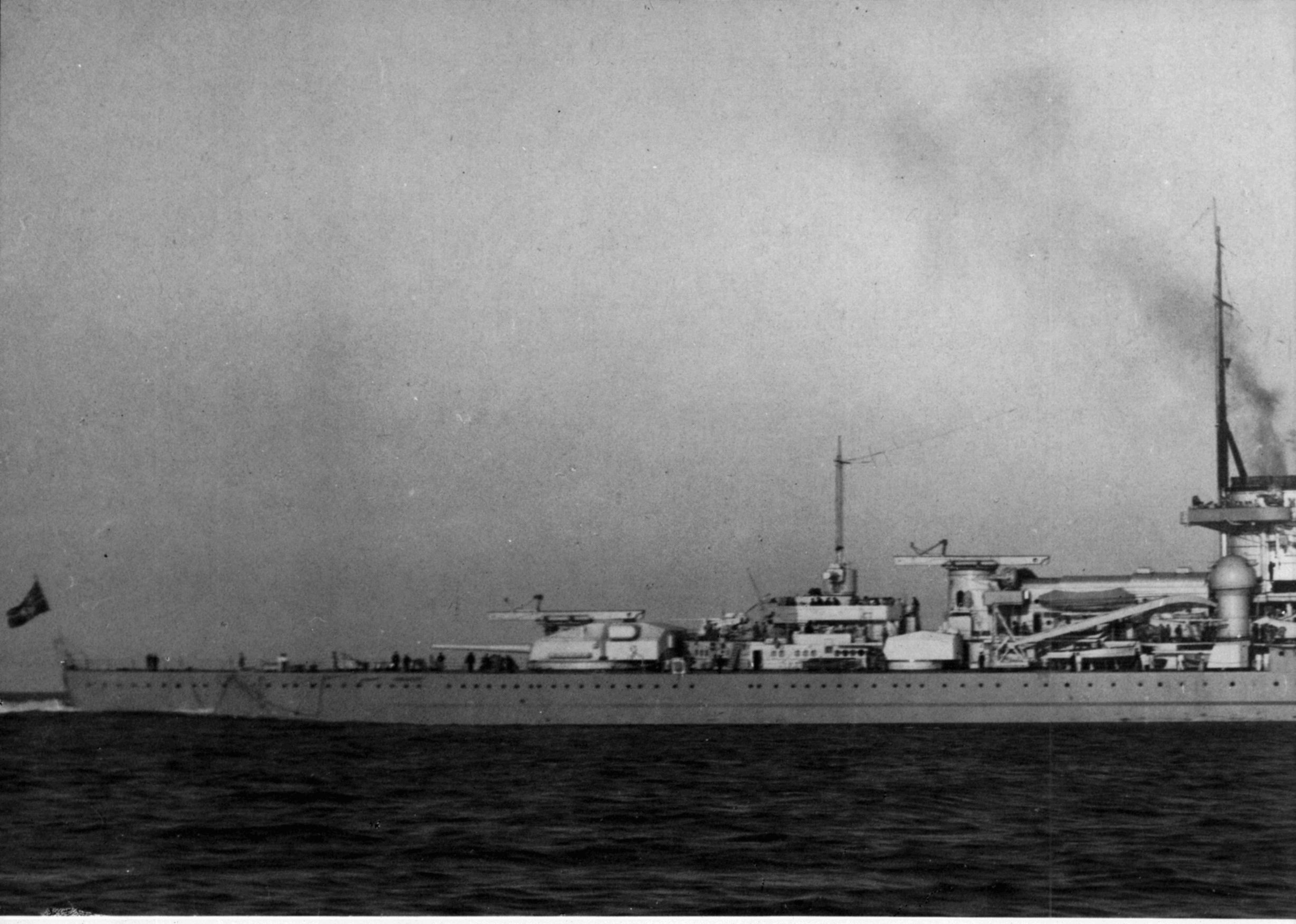
Even with its vertical prow and without a funnel cap, the outward appearance of the SCHARNHORST offered a very impressive picture. This was taken on April 13, 1939.



Amidships on the port side, with funnel, medium artillery, heavy flak and an anti-aircraft fire control system. Around the funnel cap is a platform ring with 20mm FlaMG C/30 machine guns (not visible here) and floodlights (covered with tarpaulins). Below is the grid with mounts for the ship's boats, with a boat crane over it on each side. In the foreground is a 15-cm gun in single mantelet and, rising behind it, twin 105mm anti-aircraft guns.

The SCHARNHORST returning to Kiel after a training cruise in the spring of 1939.



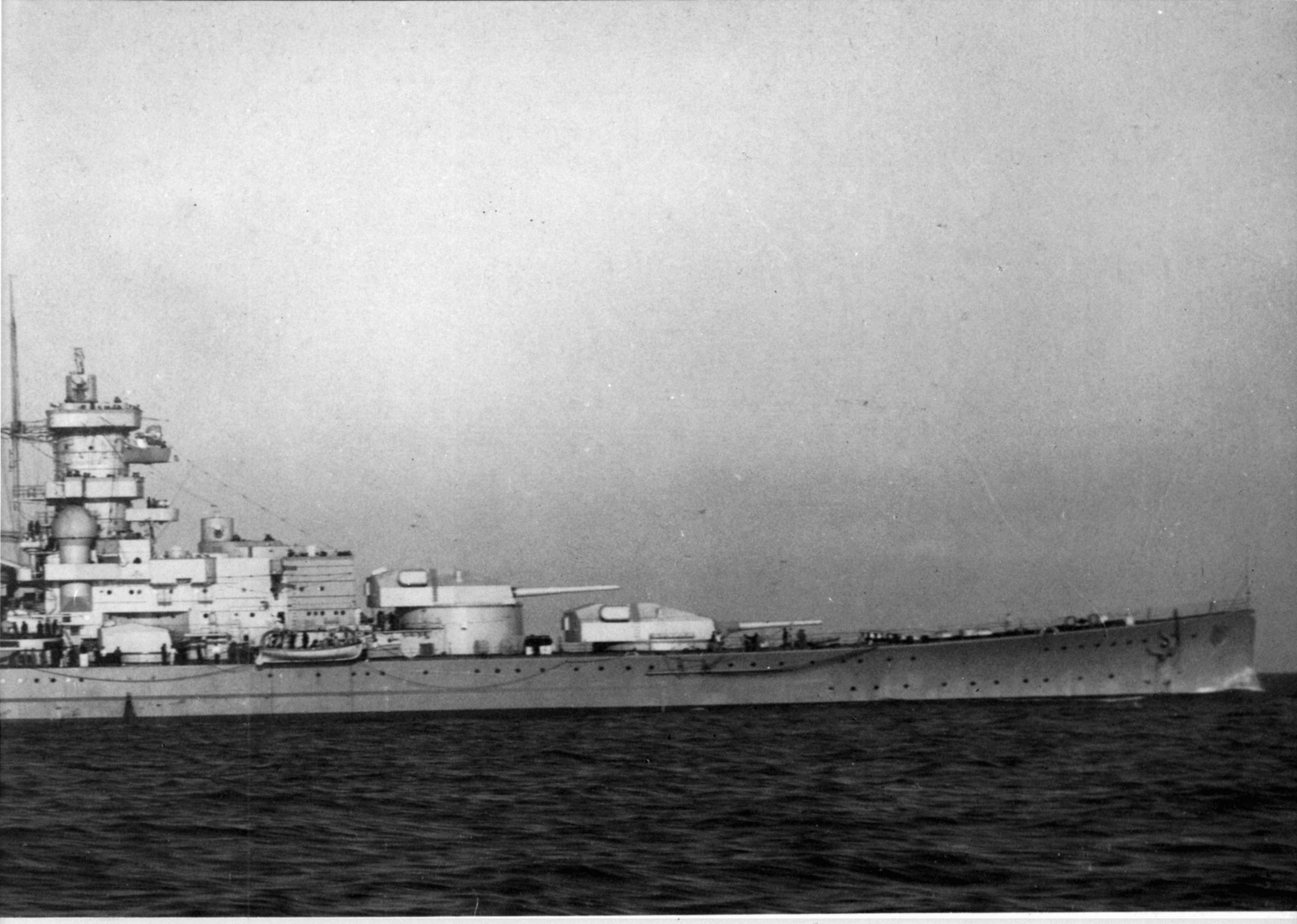


The SCHARNHORST seen from the side, photographed on April 13, 1939. From this perspective the airplane hangar, considerably larger than that of the GNEISENAU, can be seen.

PROTECTIVE ARMOR

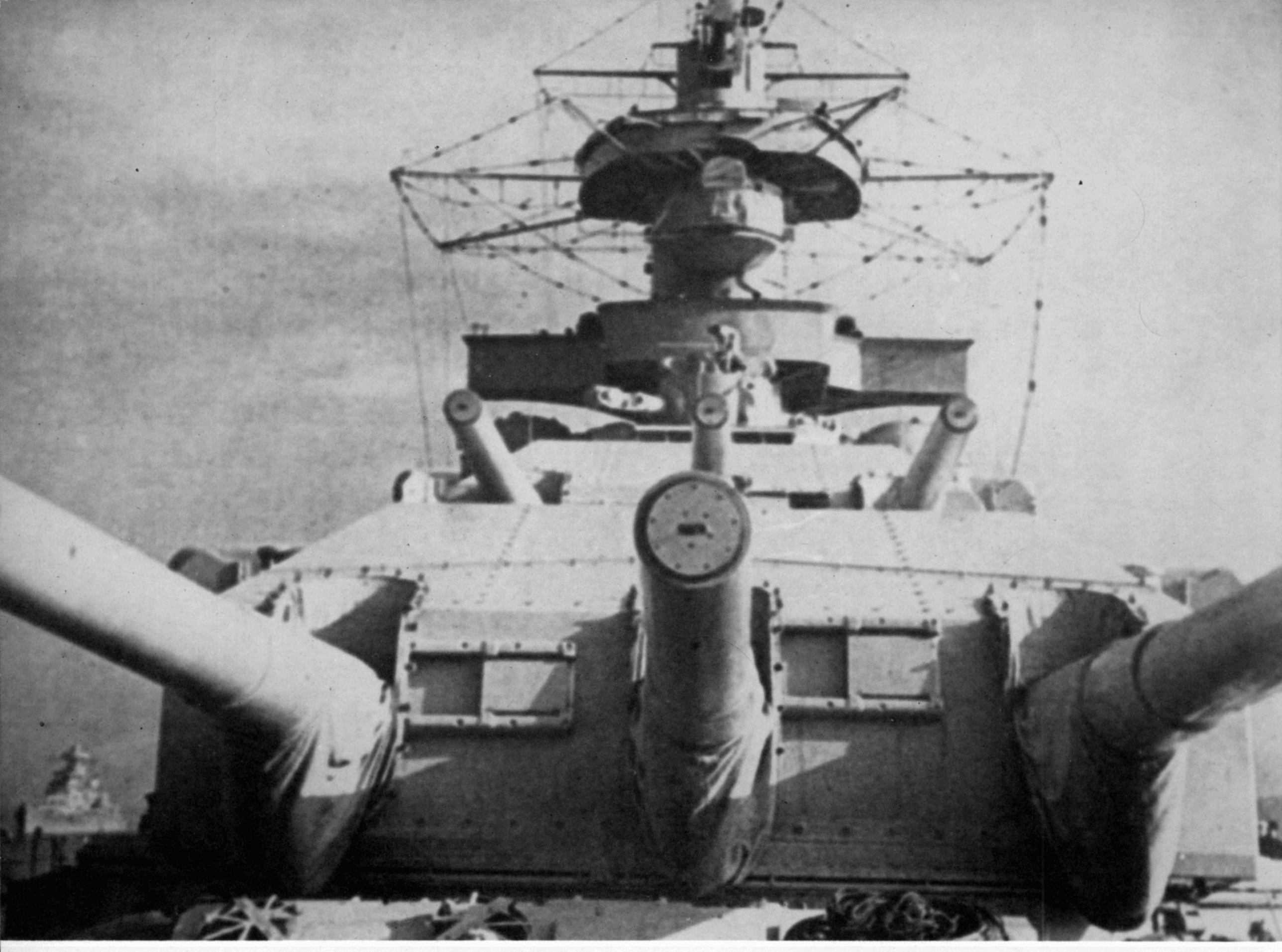
The armor thicknesses in individual areas were:
Side armor: 350mm, decreasing downward to 170mm, at the ends 150mm (bow) to 200mm (stern).
Armored bulkheads: 150 to 200mm.
Citadel armor: 45mm in the area of the heavy side armor, 35mm aft, 20mm forward.
Longitudinal shrapnel bulkheads in the citadel area: 20mm.
Upper deck: 50mm.
Armor Deck: 80 to 95mm, slopes 105 to 110mm.
Torpedo bulkhead: 45mm.
Forward command post: 350mm.
Aft command post: 100mm.
28-cm turrets: 360mm, barbettes 250mm.
15-cm turrets: 140mm, barbettes 150mm.
Total armor weight: 6580 tons.

The ship's hull was divided into 21 watertight compartments and had a double bottom for about 79% of its length.



POWERPLANT

The SCHARNHORST had high-pressure hot-steam drive to three propeller shafts. The machinery consisted of three four-chambered Brown, Bovery & Co. turbine units with 44-ata operating pressure and 470-degree steam temperature, and a planned total power of 160,050 horsepower. Power transmission took place by means of gear drive, each to one three-bladed propeller of 4.45-meter diameter. The steam was produced in twelve Wagner high-pressure steam boilers with natural water circulation; the boiler pressure was 50 atü, the steam temperature 480 degrees. This powerplant was planned to provide a top speed of 31 knots. The SCHARNHORST attained 31.65 knots with a power of 161,764 horsepower. The electrical energy was produced by five generators with four Diesel and three turbine generators. The total electric power was 4120 kilowatts at 220 volts.



The forward turrets seen from the pier. The "Bruno" turret has been swung to port. The opened shell ejection shaft for the left barrel is clear to see. On the rear wall of the turret are the coverings for the turret ventilation system. On the raised deck by the "Bruno" turret is a 20mm FlaMG C/30.

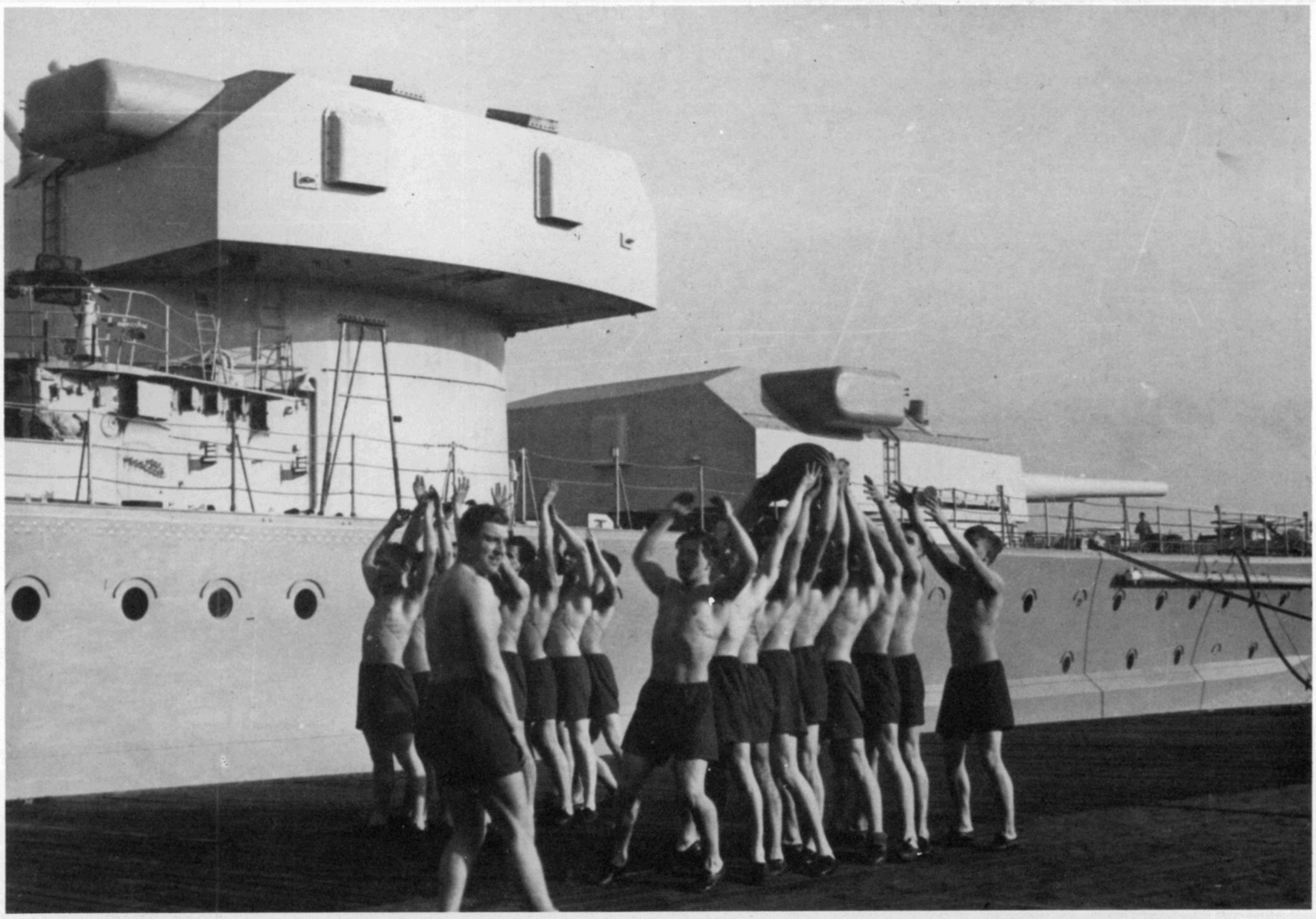
ARMAMENT

The main armament was the heavy artillery (SA), consisting of nine 28-cm quick-loading L/54.5 C/24 cannons in C/34 rotating turrets; these were divided among three triple turrets, two forward and one aft. Each gun had an ammunition supply of 150 shells available, including equal numbers of armor-piercing shells, explosive shells with percussion fuses, and explosive shells with nose fuses. The guns fired to a range of 40 hm at 40-degree barrel elevation.

The medium artillery (MA) consisted of twelve 15-cm L/55 C/28 guns, eight of them in (closed) twin turrets and four in (open) single mantelets with shields. The total ammunition supply for the MA was 1600 rounds. The anti-aircraft artillery was especially strong and numerous: 14 105mm Flak L/65 C/33 in double mantelets, 16 37mm Flak L/83 C/30, likewise in double mantelets, and ten 20mm FlaMG C/30 in socket mantelets in single positions.

A later rearmament to six 38-cm guns in three twin turrets was also considered for the SCHARNHORST, but was not included in the design. According to peacetime planning, this was considered for the winter of 1940-41, but the war prevented its realization.

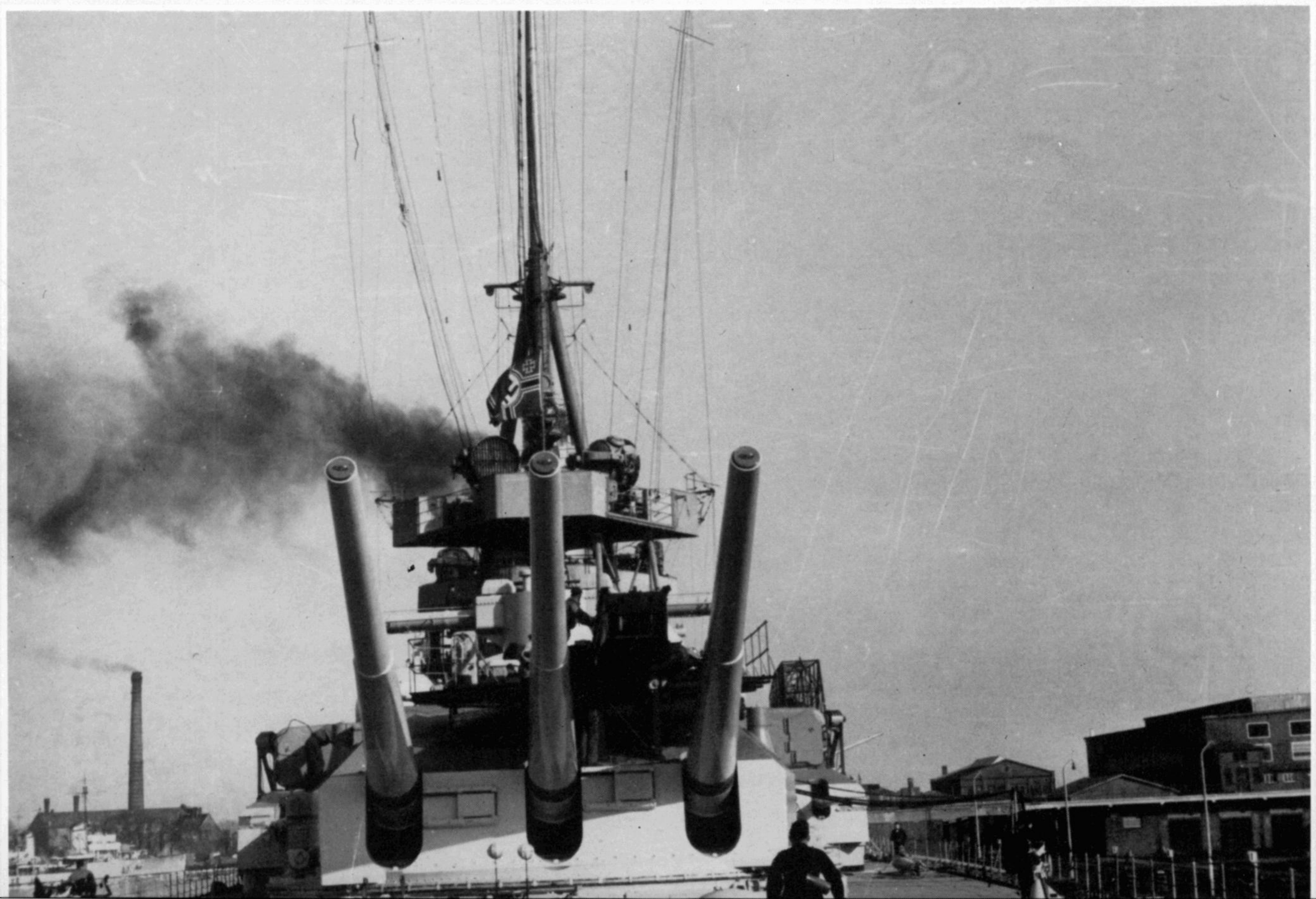
In contrast to its sister ship GNEISENAU, the SCHARNHORST had a functioning airplane hangar from the start, for two planes at first and —after it was lengthened — for three. There were two catapults for them, one in direct proximity to the hangar, the second on the third 28-cm turret. Three Arado 196 naval reconnaissance planes were carried. In order to be able to lift them safely on board from the surface of the water, a Heinsche Landing Sail was used on a deployable spar at the post deck at the height of the hangar. This was already dispensed with, though, in the summer of 1939 because other ways to take the planes on board had meanwhile been devised, and the use of the landing sail had proved to be too time-consuming and troublesome for wartime use.



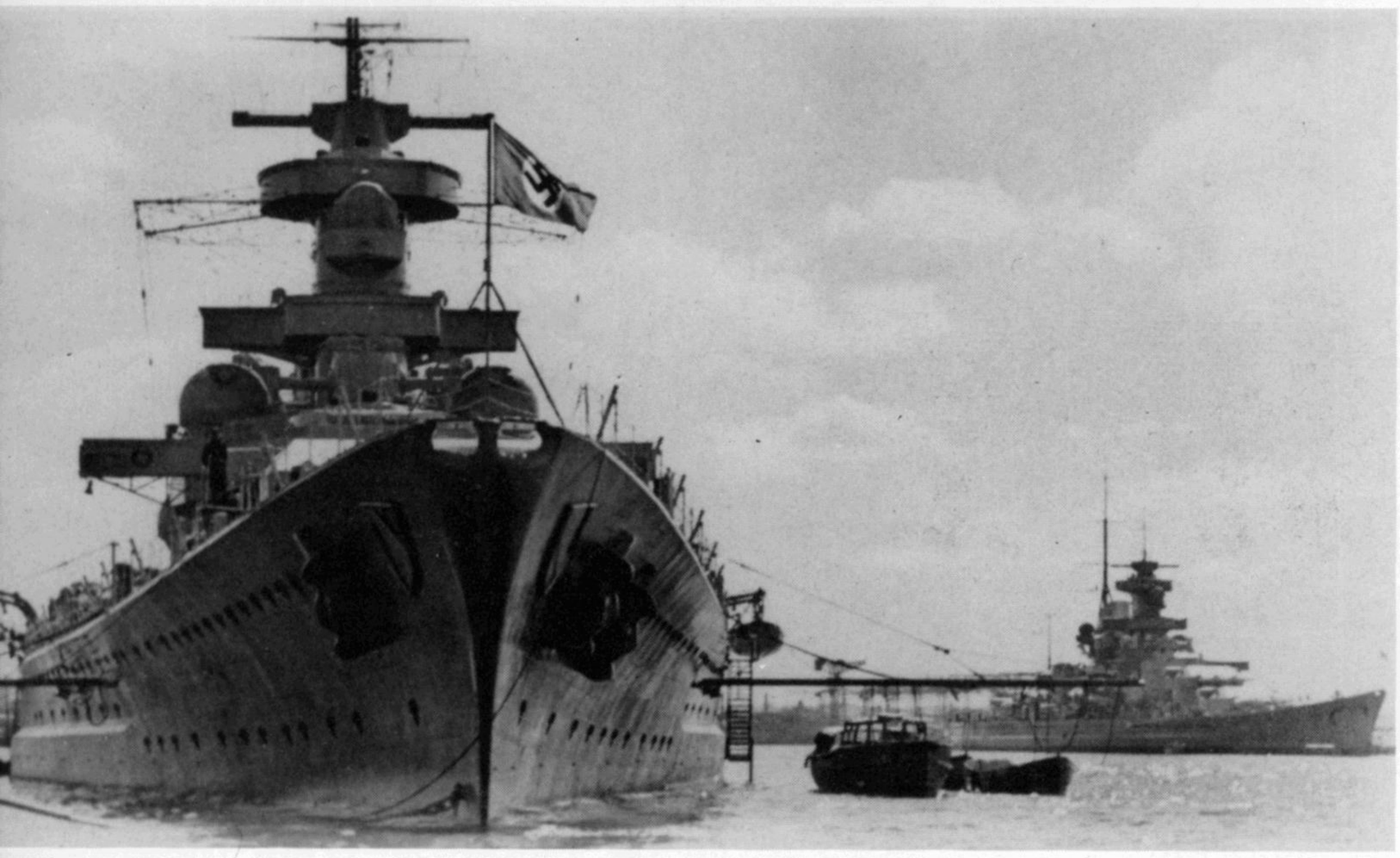
A view of the "Cäsar" turret with raised barrels. At the right edge of the picture is a 20mm FlaMG C/30. In the left background is a destroyer. The picture was taken in Wilhelmshaven in 1939.

OTHER EQUIPMENT

The SCHARNHORST generally resembled the GNEISENAU in terms of its equipment and, like it, had five large floodlights, ten (later only eight) boats, two aircraft and two boat cranes, three bow and one stern anchors.

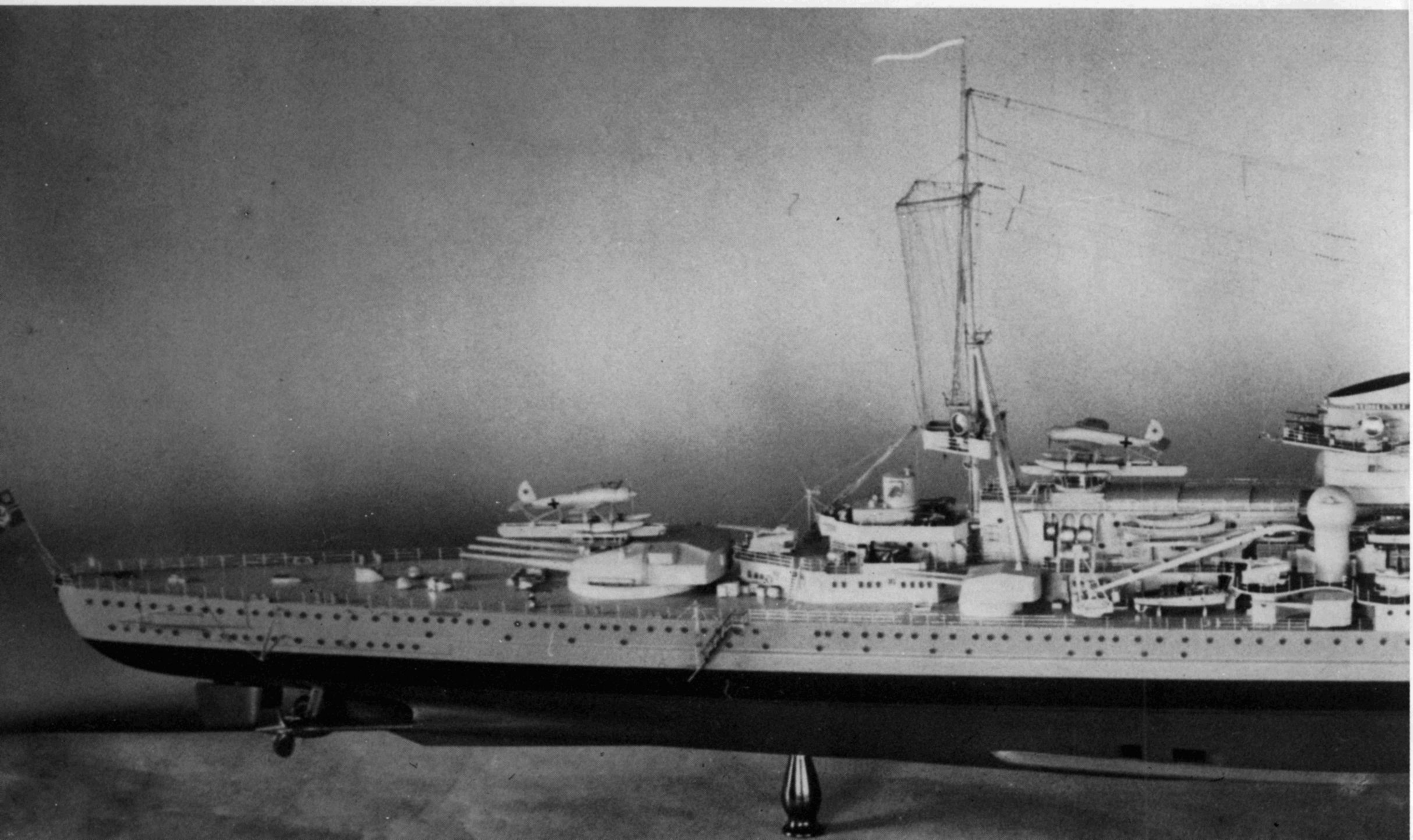


The forward 28-cm turrets. The left-side electric range finders on the turret sides can be seen clearly. This picture was taken early in 1940, under heavy ice conditions in Wilhelmshaven. In the far background (to the right of the large floating crane) is the sister ship GNEISENAU in a dock, farther to the right the cruise ship TANGANJIKA of the Woermann Line of Hamburg, used as a barracks ship, and even farther right the target ship ZAHRINGEN.



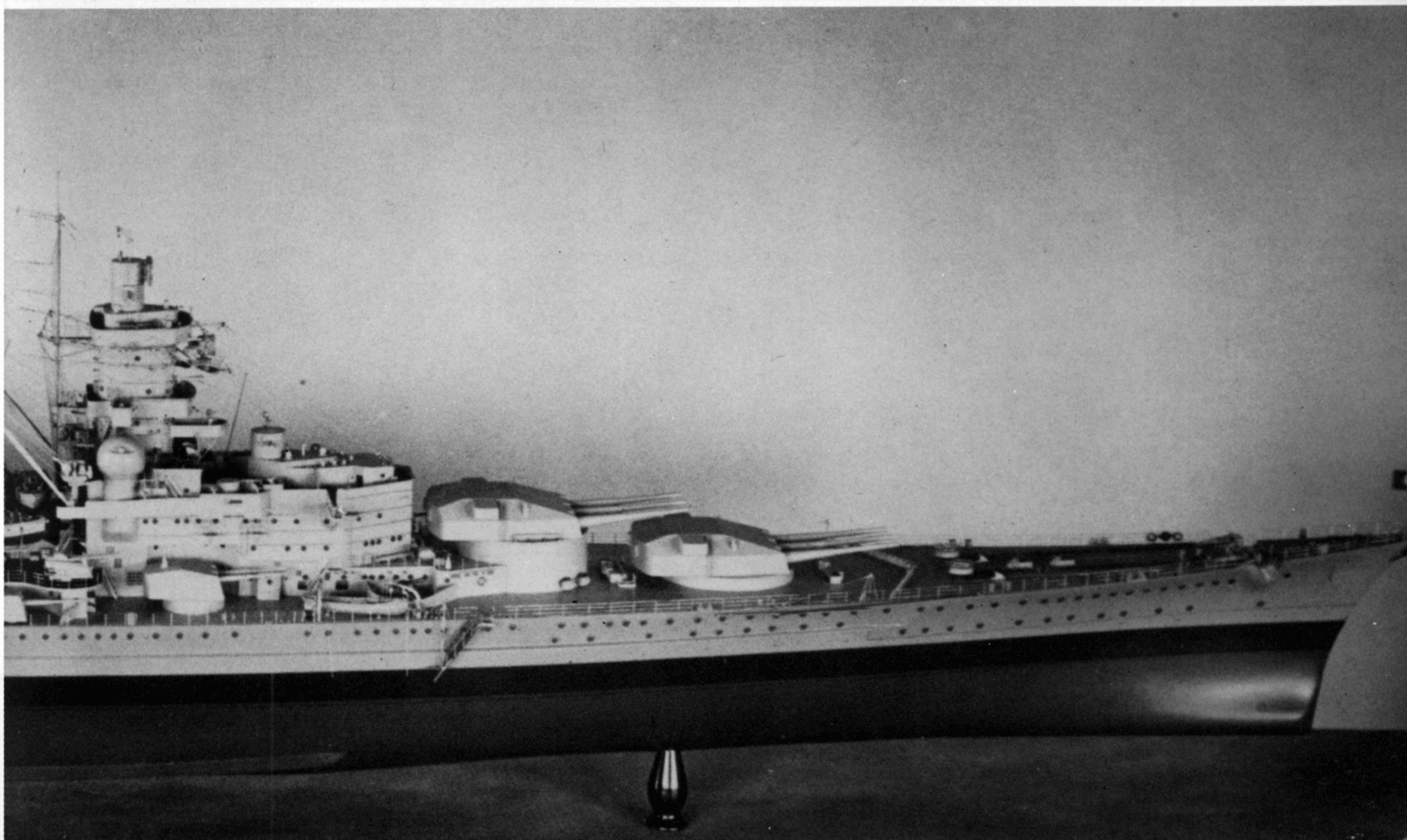
The battleships SCHARNHORST (foreground) and GNEISENAU never completely resembled each other in outward appearance. This picture, taken at Kiel in the spring of 1939, shows the two ships together for the first time. While the SCHARNHORST is still seen in its original form, the GNEISENAU already shows the signs of its rebuilding.

This model of the SCHARNHORST, in the Naval High Command offices, shows the changes in its appearance caused by rebuilding.



A view aft from the starboard end of the bridge. The three 105mm twin anti-aircraft guns on this side can be seen, as well as a tender, the "wobbly pot" anti-aircraft fire-control device and one of the two aircraft cranes. The passage at right leads to the head of the bridge. This picture was taken in Wilhelmshaven in 1940.

This view, seen from the port end of the bridge, is much the same as the previous picture, with a reflection added. This picture was also taken early in 1940 at icy Wilhelmshaven; here the battleship is being brought to the pier. The Kaiser Wilhelm Bridge can be seen in the background.



REBUILDING IN 1939

Beginning at the end of June 1939, the SCHARNHORST underwent rebuilding at the naval shipyard in Wilhelmshaven. It was divided into the following stages:

1. To improve sea capability, the bow was given a new rib pattern and, along with it, a so-called "Atlantic stem." This lengthened the ship by 5.1 meters. At the same time, above-deck hawseholes for the starboard and rear anchors and a stem hawsehole for the bow anchor were installed to replace the relatively low-set side hawseholes.
2. To make more room for airplanes on board, the hangar was lengthened by some eight meters after the original catapult apparatus was removed. The catapult was mounted on a frame above the hangar roof.
3. The mainmast located behind the funnel was removed; in place of it, a three-legged mast with floodlight pedestal, a high topmast and three spars was installed 27 meters farther aft, ending directly at the hangar.
4. Finally, the top of the funnel was fitted with a slanting cap to achieve better exhaust-gas discharging.

WAR-REQUIRED CHANGES

The following changes, most of them required by war conditions, were undertaken:

1. In 1940, an MES cable loop was moved to the heavy side armor at the height of its upper rim.
2. The second aircraft catapult, mounted on Turret C, was removed, as was the shifting crane on the port side (February or March 1940).
3. The closed admiral's bridge existed since the summer of 1942; in 1941 both ends of the bridge had been shortened by about half.
4. The ring platform around the top of the funnel was enlarged to carry quadruple 20mm anti-aircraft guns.
5. Platforms were installed on either side of the catapult carrier frame, about halfway up, each holding quadruple 20mm anti-aircraft guns (1942).
6. Installation of radar devices (in December of 1939 an FuMO 22 was installed on top of the revolving cover of the foretop; later it was replaced by an FuMO 27; a second device was installed on the after revolving cover later).
7. In February of 1942, the range finder was removed from Turret A and its covers; openings were sealed.
8. In 1941, two sets of three 53.3-cm torpedo tubes, each with an armored torpedo storage box, were installed on the side decks at the height of the hangar (these tubes were previously used on the light cruiser NURNBERG).
9. Shortly before the channel breakthrough, the light anti-aircraft weapons (quadruple 20mm guns on each of the forward 15-cm turrets and another — only for the duration of this operation — atop the "Bruno" turret).

The port aircraft crane lifts an Arado 196 recon. plane aboard. The rotating foretop cover is already fitted with a radar antenna.

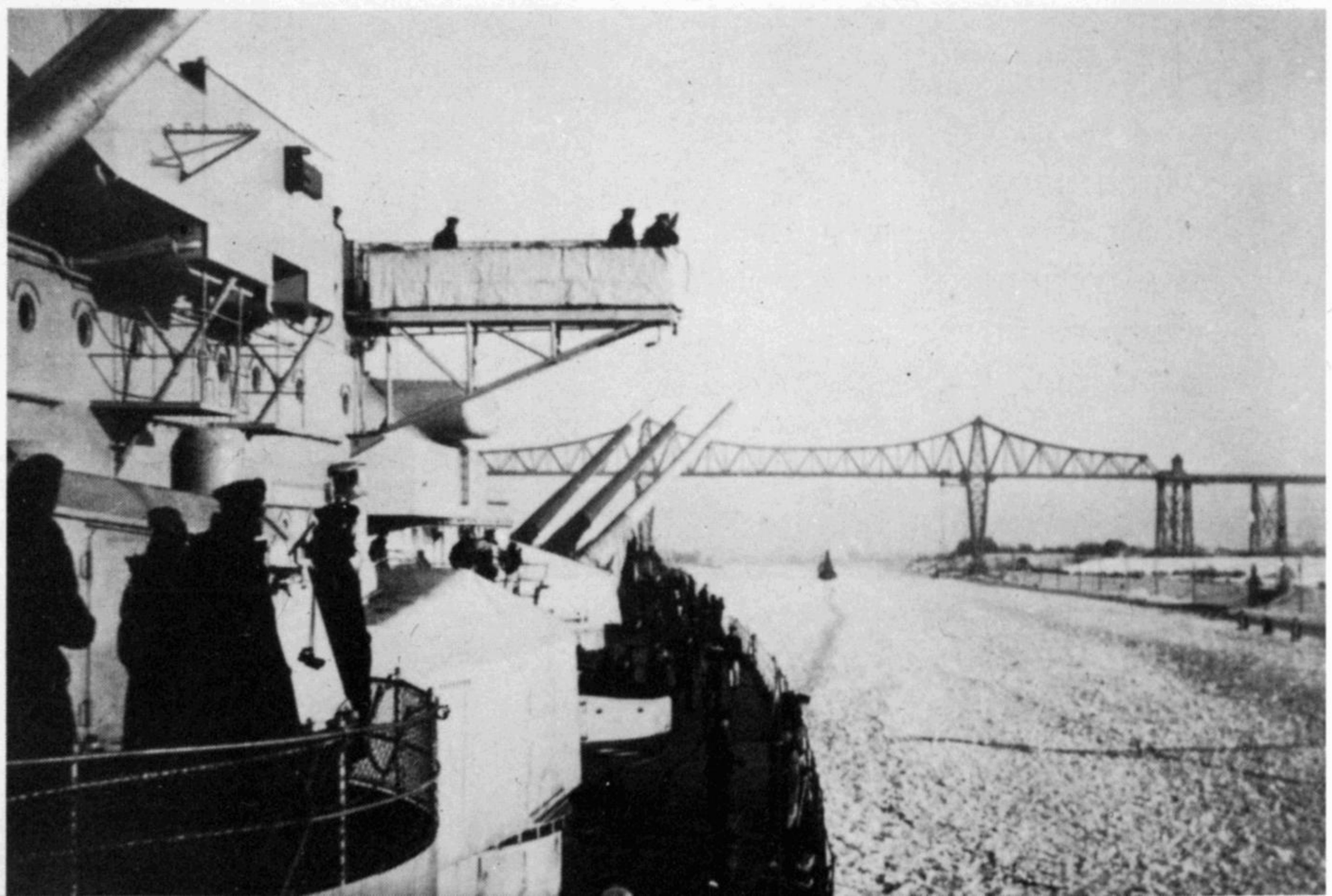
There was obviously something special to be seen here: Crewmen crowd onto the bridge, superstructure and upper deck. This picture may well have been taken in peacetime.

The SCHARNHORST amid thick ice at the mooring buoy in January of 1940.

The inner harbor at Kiel in the summer of 1939: At this time, no one seriously believed war would come. The SCHARNHORST lies in the foreground, at left behind it its sister ship GNEISENAU, and beyond it a K-class cruiser (probably the KONIGSBERG) and the pocket battleship ADMIRAL SCHEER. Behind the latter is the light cruiser NURNBERG, and to the right presumably a destroyer.

Routine on board: Swabbing the decks of the SCHARNHORST, carried out by members of the seamen's divisions. The "Cäsar" turret with the substructure of the rear catapult can be seen clearly.

Cruising through the icy Kiel Canal in the war winter of 1939-40. In the background is the high bridge at Rendsburg.



TECHNICAL DATA

Type displacement (planned)	tons	26,000
Type displacement (1943)	tons	31,847
Combat displacement (1943)	tons	38,092
Same with war additions	tons	39,017
Length at construction waterline	meters	226.00
Overall length before rebuilding	meters	229.80
Same after rebuilding	meters	234.90
Width at construction waterline	meters	30.00
Overall width	meters	30.00
Side height	meters	14.05
Draught for type displacement	meters	9.10
Draught for combat displacement	meters	9.93
Power	WPS	160,050
Speed according to design	knots	31.00
Maximum fuel capacity	tons	6345
Range	(nautical miles/knots)	7100/19
Crew		60 officers, 1908 NCO & men

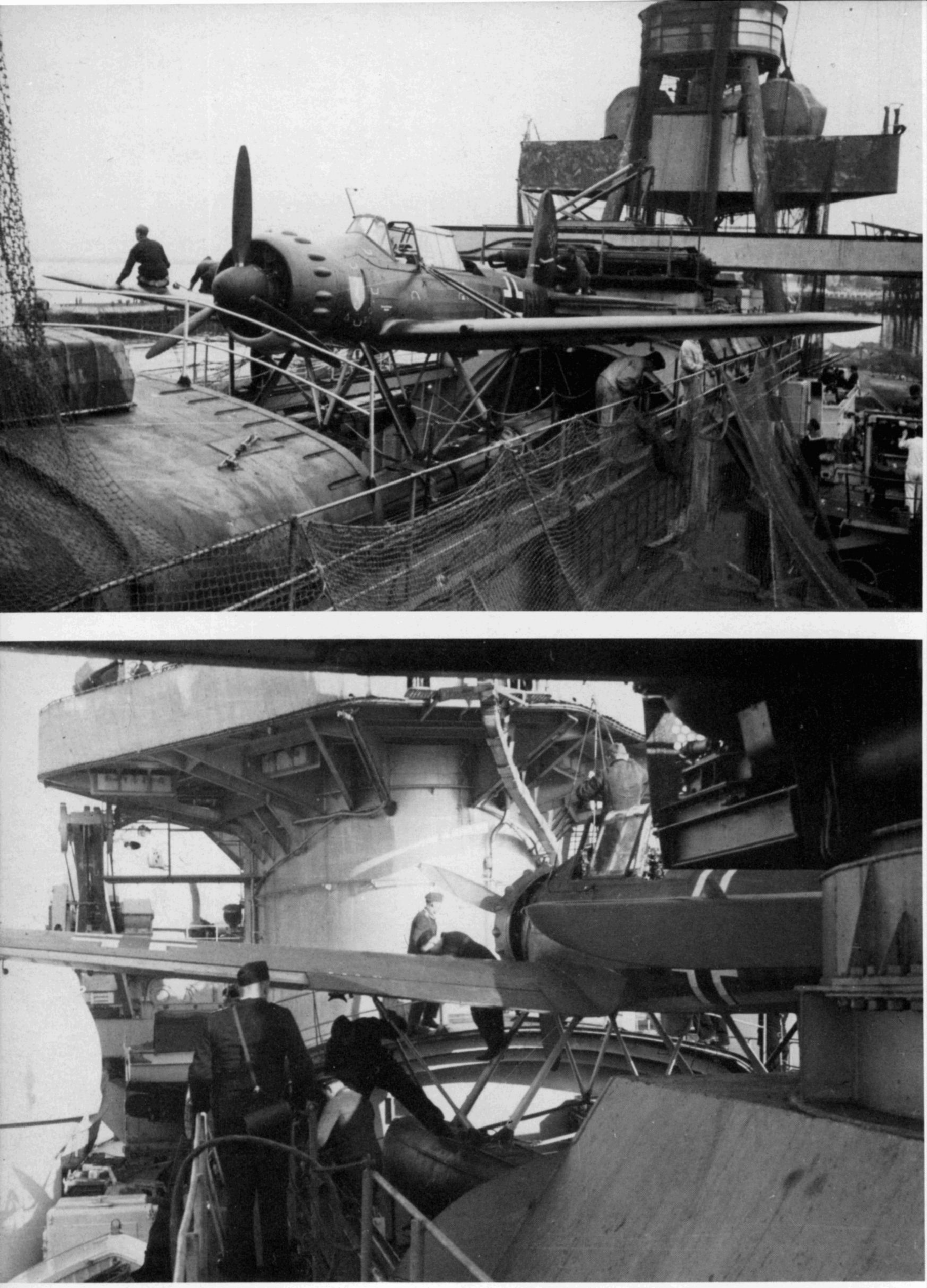
Weight Groupings [2]

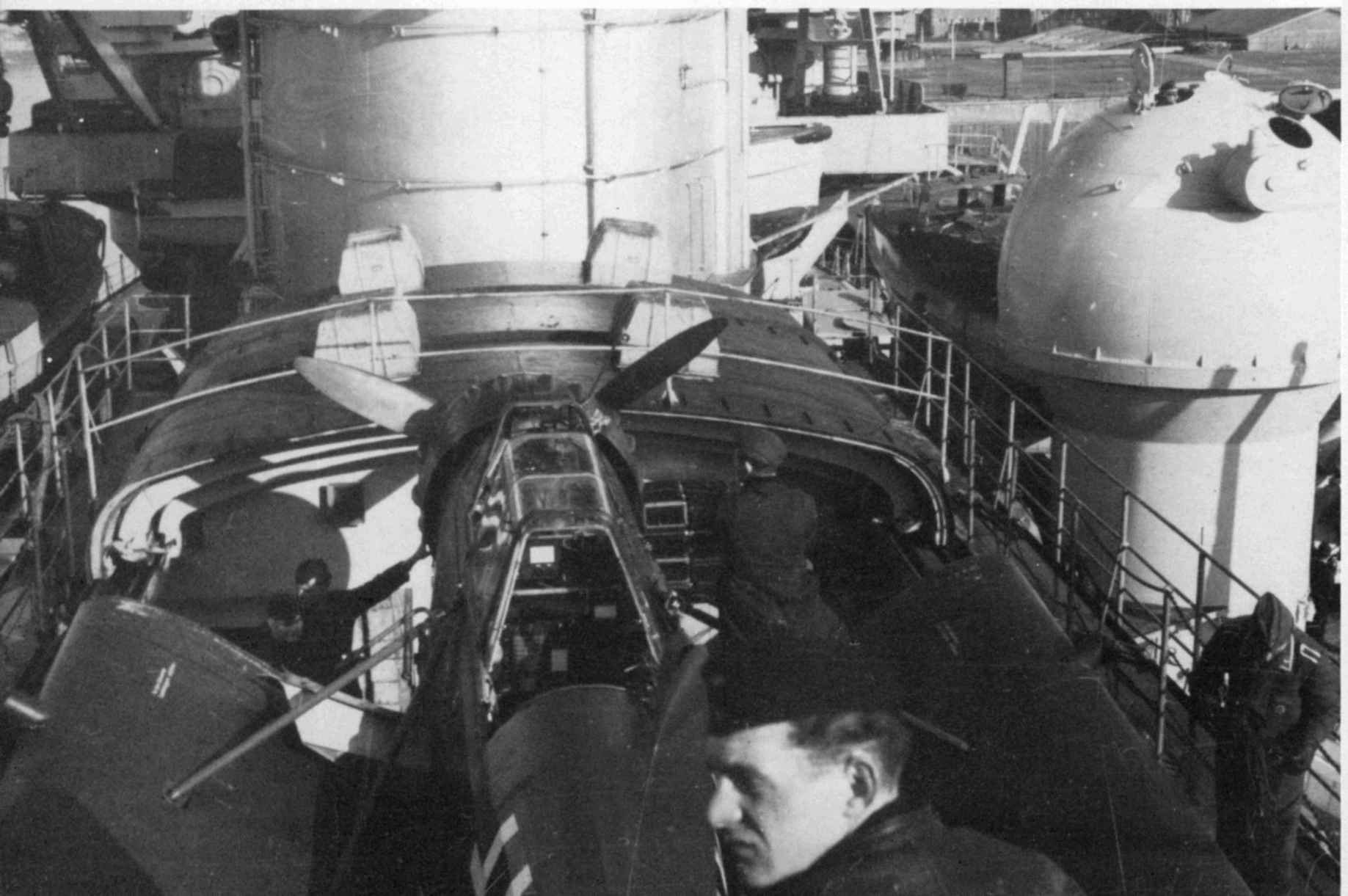
Ship's hull					
S I (ST 45, ST 52)	tons	7366			
S I (armor material)	tons	7665			
S II (cabinetwork)	tons	660			
S III (carpentry work)	tons	190			
S IV (paintwork)	tons	100			
S (ship's weight)	tons	15,981	15,981	=	48.86%
KC armor					
SA (barbettes and command post)	tons	2469			
MA (barbettes)	tons	467			
Side armor	tons	3440			
Armored bulkheads	tons	204			
	tons	6580	6580	=	20.12%
Machinery	tons	2909	2909	=	8.90%
Weapons and ammunition	tons	5401	5401	=	16.51%
Equipment	tons	1837	1837	=	5.61%
Standard displacement	tons	32,708	32,708	=	100.00%
Fuel oil capacity	tons	6345	6345	=	19.40%
Combat displacement	tons	39,053	39,053	=	119.40%

Weight Grouping Proportions

Ship's hull without armor	tons	8316	25.42%
Armor	tons	14,245	43.55%
Machinery	tons	2909	8.90%
Weapons and ammunition	tons	5401	16.52%
Equipment	tons	1837	5.61%
Standard displacement	tons	32,708	100%

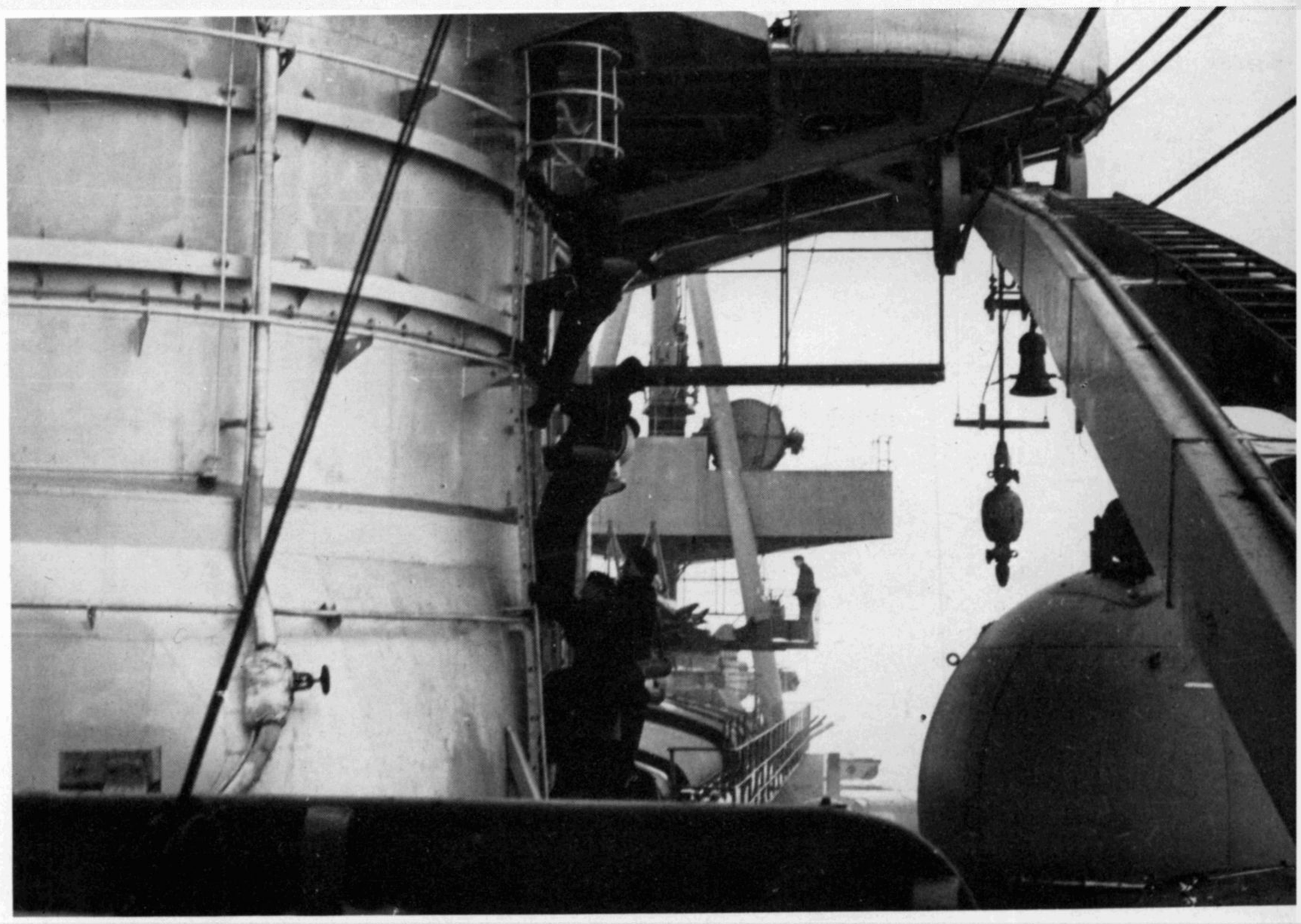
[1] Essentially as in Groner, *Die deutschen Kriegsschiffe 1815-1945*, in part also from other sources.
[2] According to documents in the Witte legacy.



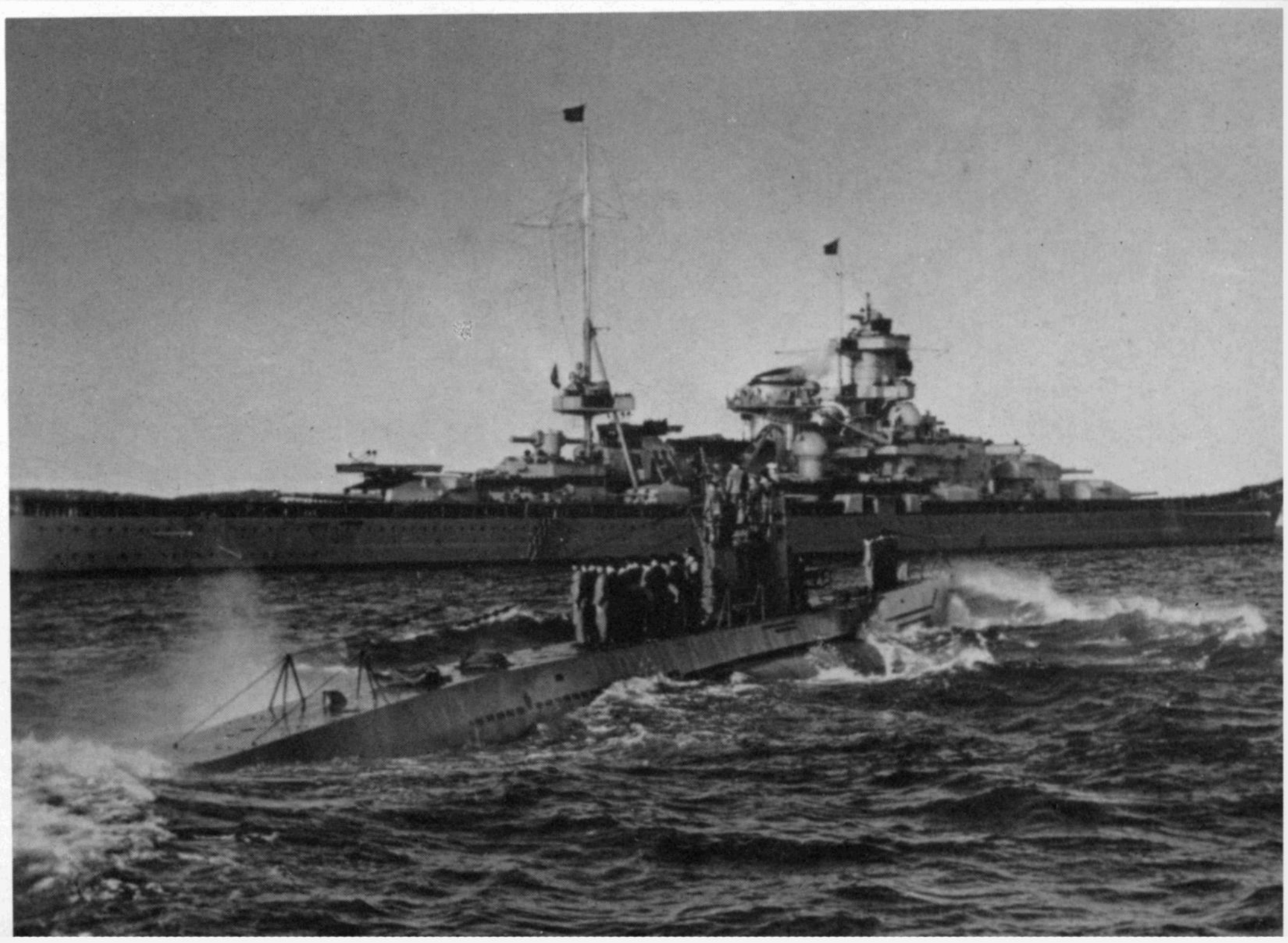


Views of the opened hangar from various positions. An Arado 196 reconnaissance plane has been lifted up, its wings are already mounted, in a short time it will be set on the catapult which has been swung up, and prepared for catapult takeoff. These pictures were taken at Brest in the spring, at the beginning of the time spent in shipyard there.

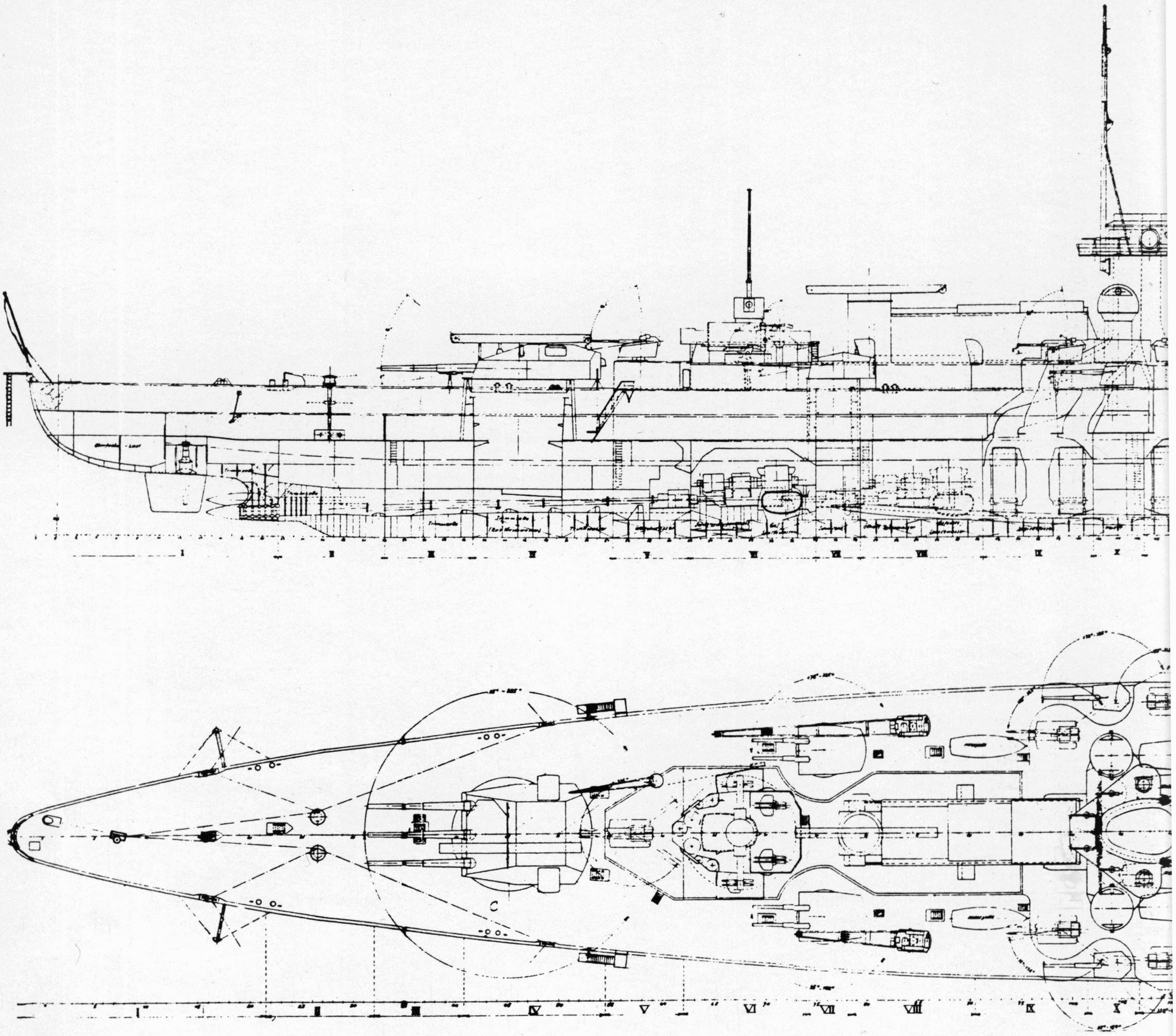
One of the last peacetime pictures of the SCHARNHORST, seen here after rebuilding.



A look aft from the tower mast. In the left foreground is the funnel with the ring platform for floodlights and anti-aircraft guns (upper edge of picture), in the right foreground the port aircraft crane, under it the after port "wobbly pot" anti-aircraft fire control device. In the background are the mainmast and the hangar.

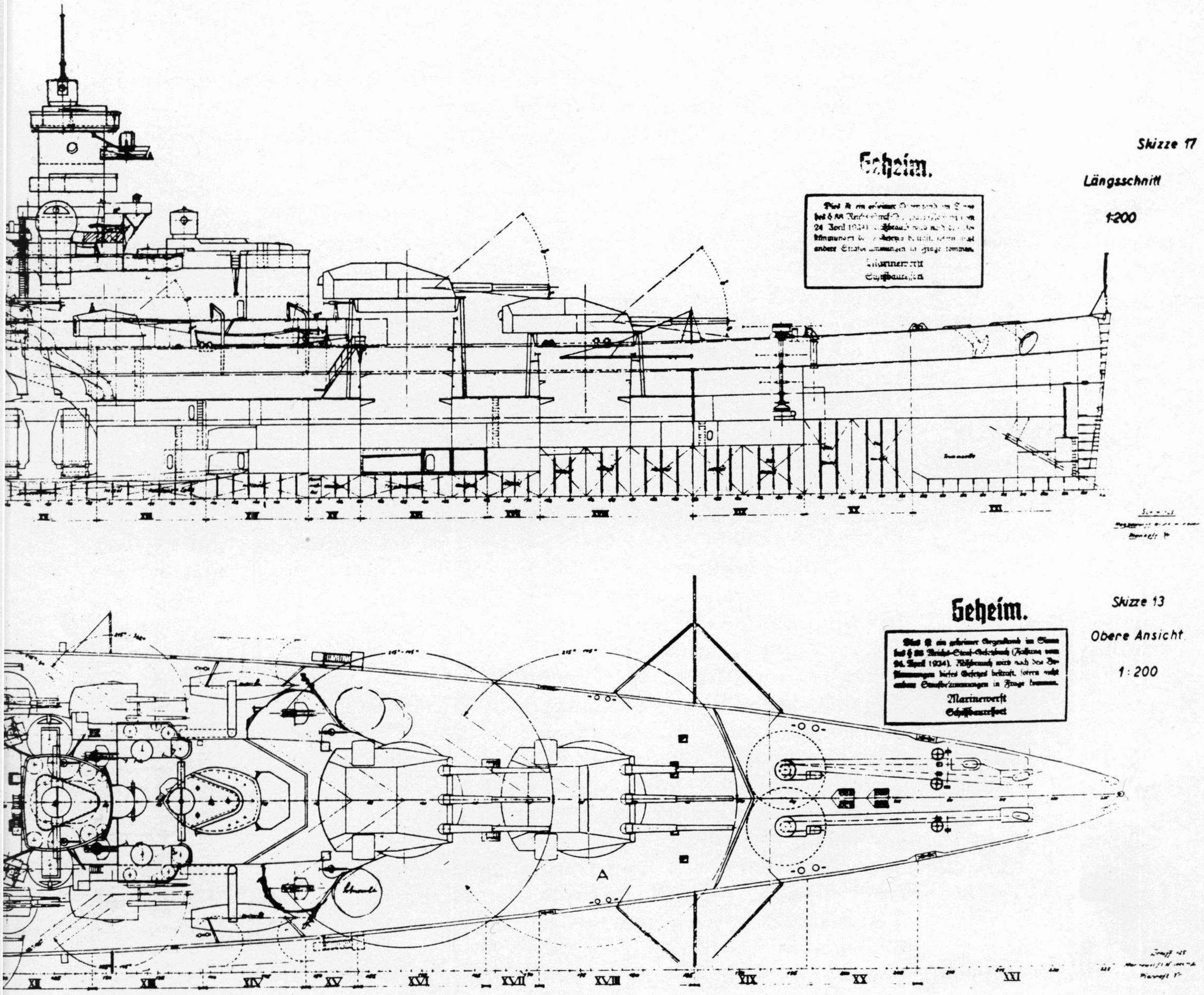


The SCHARNHORST parading at Kiel to greet the successful U-boat U 27 on its return from penetrating the hard-to-reach British fleet support point at Scapa Flow and sinking the 29,150-ton battleship ROYAL OAK there.



CAREER IN BRIEF

June 15, 1935:	Keel laid at Wilhelmshaven Naval Shipyard as construction number 125.
October 3, 1936:	Launch and christening with name SCHARNHORST.
January 7, 1939:	Commissioning.
April 1, 1939:	Hitler aboard the SCHARNHORST on occasion of launch of TIRPITZ, there he promoted the Commander of the Navy, Generaladmiral Dr. h.c. Raeder, to Grossadmiral.
June-August 1939:	Rebuilding at Wilhelmshaven Naval Shipyard.
September 4, 1939:	Unsuccessful British air attack on battleships SCHARNHORST and GNEISENAU, lying at Brunsbüttel.
November 21-27, 1939:	Sortie with sister ship GNEISENAU into waters south of Iceland, sank British auxiliary cruiser RAWALPINDI there.
February 18-20, 1940:	Operation "Nordmark", advanced with GNEISENAU, heavy cruiser ADMIRAL HIPPER and two destroyers to latitude of Shetland Islands and southern Norway. No enemy contact.
April 7-12, 1940:	Participation in Operation "Weserübung" (occupation of Denmark and Norway); securing warship groups running to Narvik and Trondheim. On April 9, combat action with British battle cruiser RENOWN.
April 12, 1940:	Return home.



June 4-10, 1940: Operation "Juno": Fleet advance to relieve German forces under pressure in northern Norway with GNEISENAU, heavy cruiser ADMIRAL HIPPER and four destroyers, encountered hitherto unknown British transfer movement out of Norway. On June 8, met British carrier GLORIOUS and escort destroyers ACASTA and ARDENT, sinking them all. Before ACASTA sank, she launched a torpedo which hit SCHARNHORST on starboard side at height of Turret C, killing 48 crewmen. With 2500 tons of water in ship, SCHARNHORST ran into Trondheim on June 9.

June 13, 1940: In a British air raid, the SCHARNHORST, lying at Trondheim, was hit by a 225-kg bomb, which did not detonate.

June 20, 1940: Return home to Kiel, docked at Deutsche Werke. Repaired until late autumn of 1940.

December 28, 1940-January 2, 1941: Left Kiel with GNEISENAU to break through to the Atlantic with assignment of waging war on British merchant shipping. Caught in heavy storm, in which GNEISENAU suffered heavy sea damage, which forced breaking off operation and returning home.

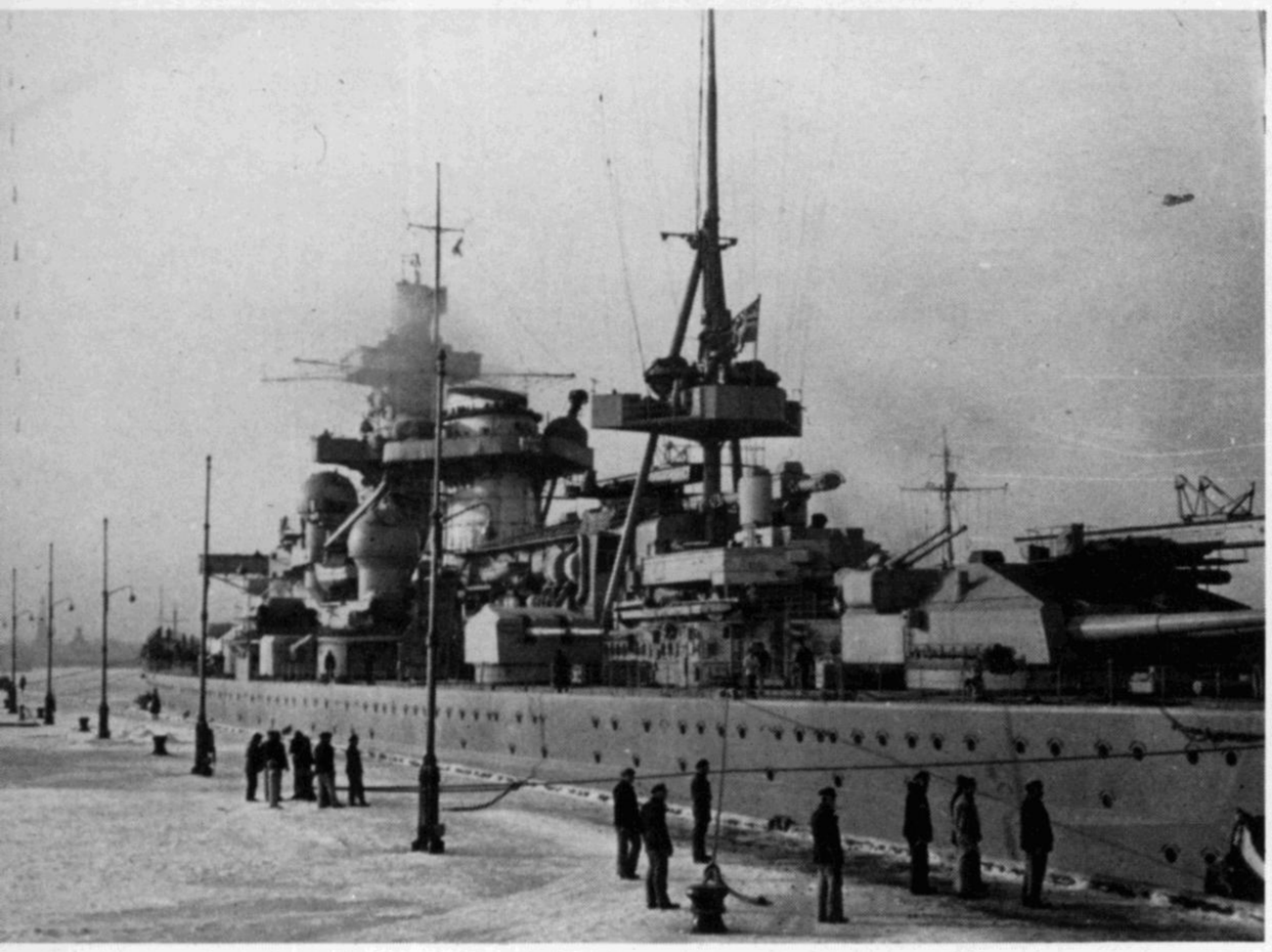
January 22, 1941: Advanced with GNEISENAU on Operation "Berlin", successful break-

	through into Atlantic on January 3-4. Carried out assignment of waging war on British merchant shipping there.
February 8, 1941:	Sighted Convoy HX 106 but did not attack, as convoy was secured by British battleship RAMILLIES.
February 22, 1941:	Some 500 nautical miles east of Newfoundland, the two battleships sank five merchant ships of a scattered convoy, totaling about 25,800 tons.
March 7-8, 1941:	Operation against Convoy SL 67. Attack broken off after British battleship MALAYA was recognized. Summoned U-boats which sank five ships of convoy with 28,500 tons.
March 15-16, 1941:	In mid-North Atlantic the two battleships met ships of a scattered US-Britain convoy, sank and raided several ships.
March 22, 1941:	Ran in to Brest to end Operation "Berlin." Total success for SCHARNHORST: Eight ships with 49,300 tons.
March 30-31, 1941:	Unsuccessful attack of RAF on the battleships lying at Brest.
April 3-4, 1941:	Further unsuccessful RAF air attack. Simultaneous mining of approaches to Brest.
July 1941:	Transfer to La Pallice, to remove ship from steadily increasing air threat.
July 24, 1941:	RAF attack on SCHARNHORST lying at La Pallice, ship hit by five bombs; three broke through to double bottom but did not detonate, other two caused severe damage to cables inside ship.
August 1941:	Return to Brest for repairs.
February 12-13, 1942:	Operation "Cerberus": Return of SCHARNHORST, GNEISENAU and heavy cruiser PRINZ EUGEN to Germany for transfer from there to Norway (broke through Channel). SCHARNHORST hit two mines in process but could proceed and reached Wilhelmshaven on February 13.
February 15, 1942:	Transfer to Kiel, repaired at Deutsche Werke until October 1942.
January 17, 1943:	Transfer cruise to Norway broken off after group — besides SCHARNHORST, also heavy cruiser PRINZ EUGEN and three destroyers — was sighted by British air reconnaissance.
March 8-12, 1943:	Transfer to Norway with intermediate stop in Bergen, at first to Trondheim, from there to Bogenbucht near Narvik on March 11 with battleship TIRPITZ, destroyers and torpedo boats.
March 22-24, 1943:	Transfer to Altafjord.
September 6-9, 1943:	Operation "Sicily" along with battleship TIRPITZ and nine destroyers, against Spitzbergen, there fired on and destroyed important harbor and industrial facilities. Returned to Altafjord.
September 21-22, 1943:	British Operation "Source" against heavy German units in Altafjord. Intended attack on SCHARNHORST had to be given up because of loss of some small U-boats in approach.
December 26, 1943:	SCHARNHORST sunk in battle with far superior British fleet north of North Cape.

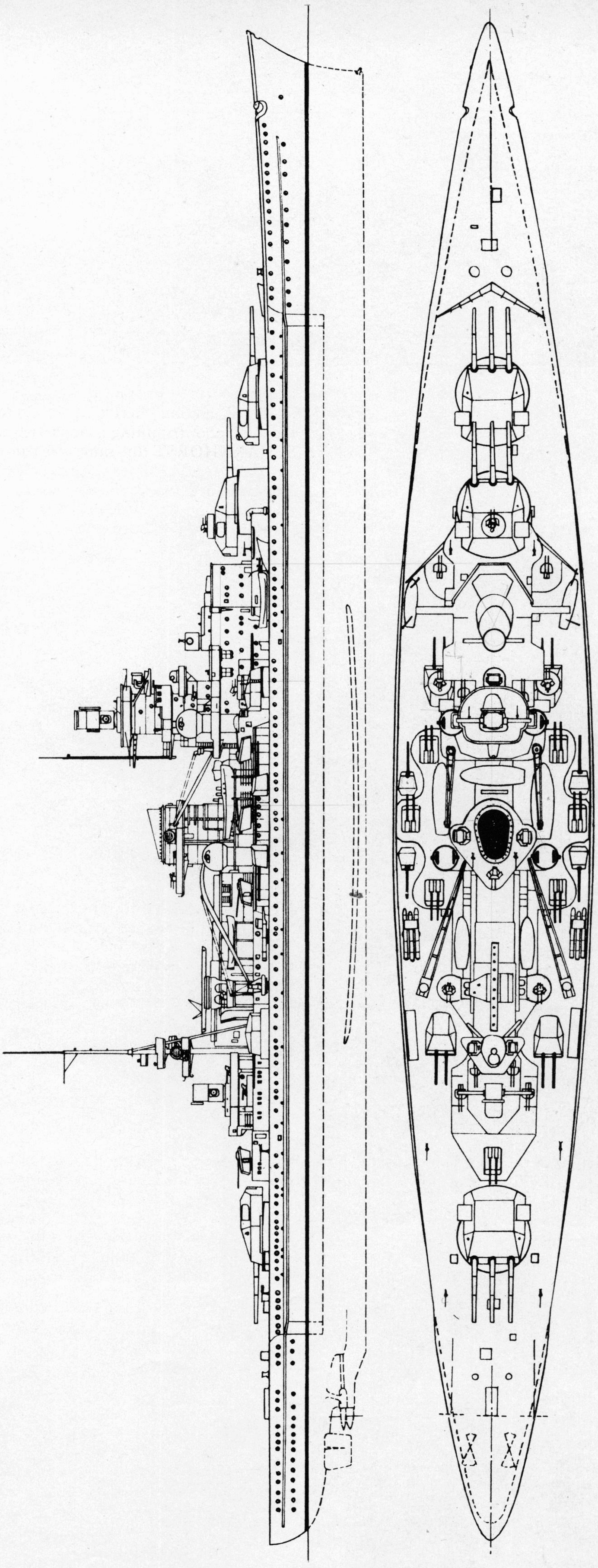
Instruction in the operation of the ship is given on the pier. Obviously, new members of the machine-room crew are being acquainted with the technical "inner life" of their ship. Many details can be seen very clearly in these pictures, such as the aft command post, the base of the tripod mast, the airplane catapult and the starboard airplane crane. On the port side is "High Henry" — as the largest floating crane in Wilhelmshaven was called — which is removing the catapult mounted on the rear 28-cm turret.

The pictures were probably taken in February or March 1940.

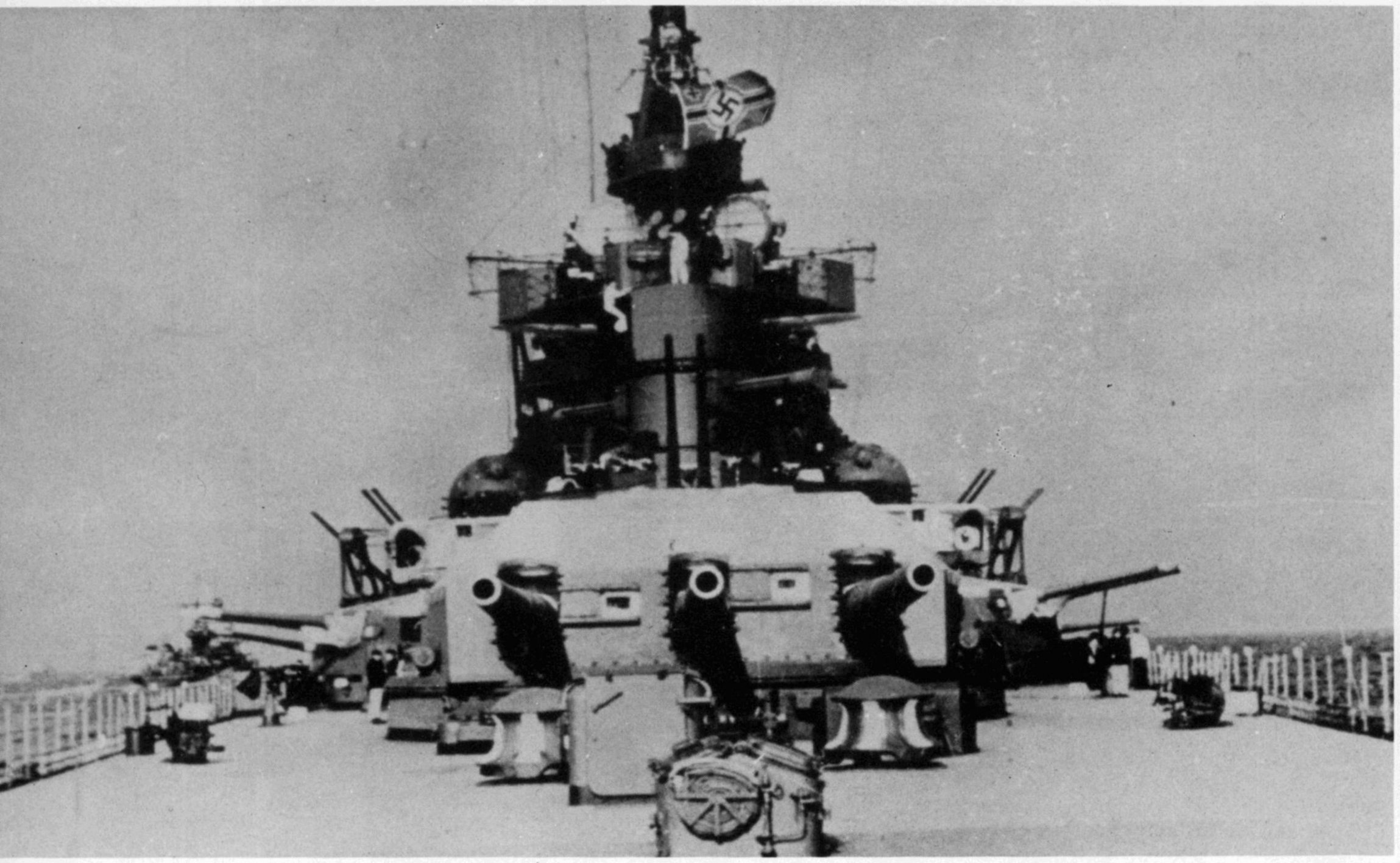
In the swells of the Atlantic. This picture was taken during Operation "Berlin" (January to March 1941). Here the poor trimming characteristics of the SCHARNHORST (the same was true of the sister ship GNEISENAU) became especially clear. As a result of the great weight forward, the bow took a great deal of water; rebuilding did very little to change it. The forward turret was always bothered by it.



Early in February 1940: The SCHARNHORST runs in to Wilhelmshaven; here it is seen locking through the third entrance. This winter was especially severe and resulted in heavy icing in the Baltic as well as the North Sea.



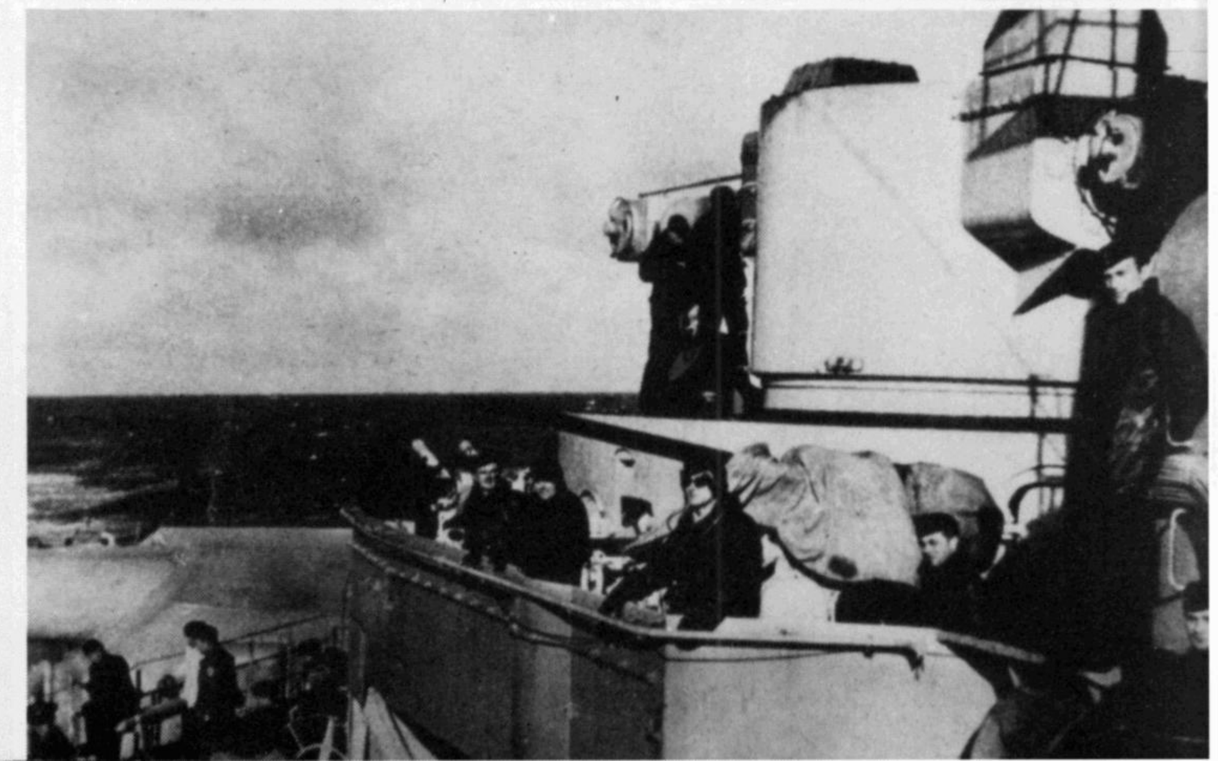
1943 in Norway: Here the SCHARNHORST lies close to the land, protected by a torpedo net.



The SCHARNHORST seen from the stern: a look at the "Cäsar" turret, above it the raised barrels of the after 105mm twin anti-aircraft guns, and behind them the after range finder cover, here already having a radar antenna on top.

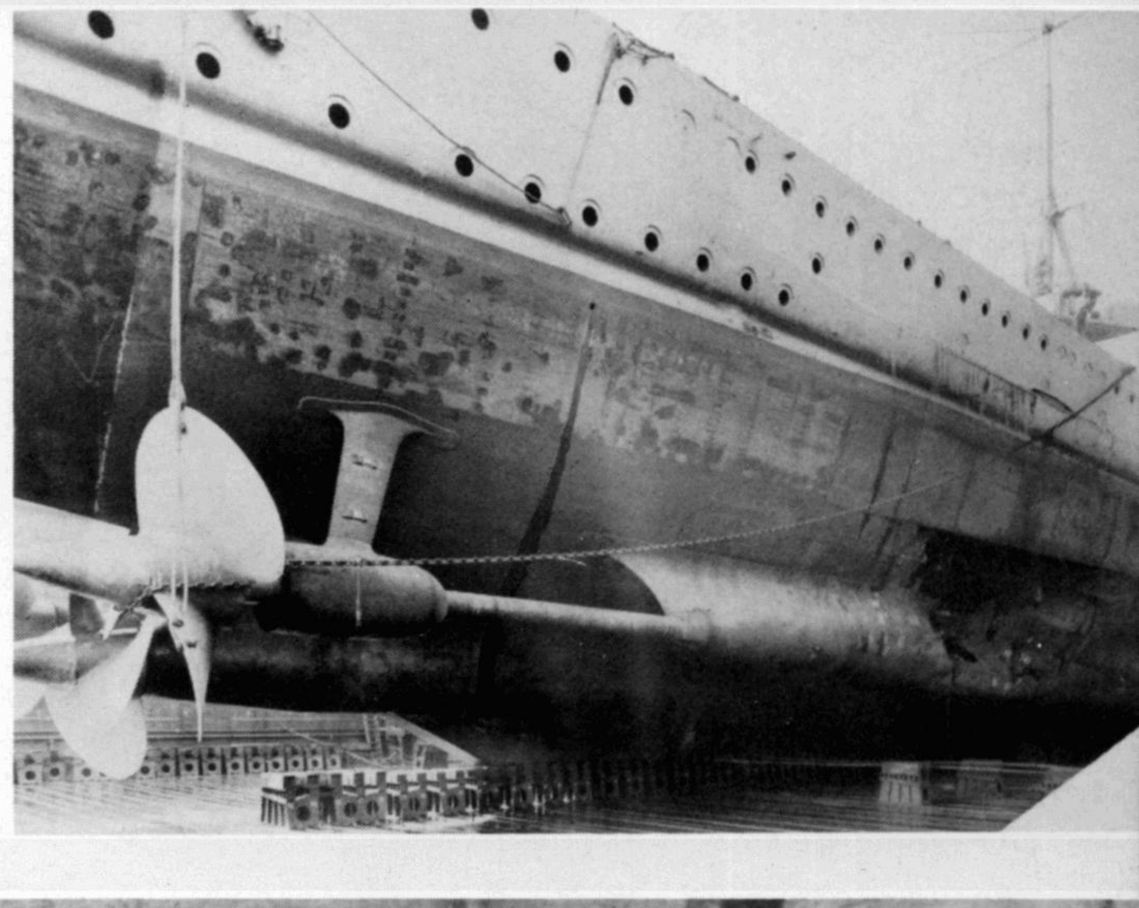
A view from aft along the port side deck. Ahead is the after 15-cm twin turret, over it the overhanging platform with a quadruple 20mm mantelet. Sports activities are being conducted on the upper deck.

The after command post with the range-finder cover swung out. At the right edge of the picture the "Cäsar" turret can be seen.



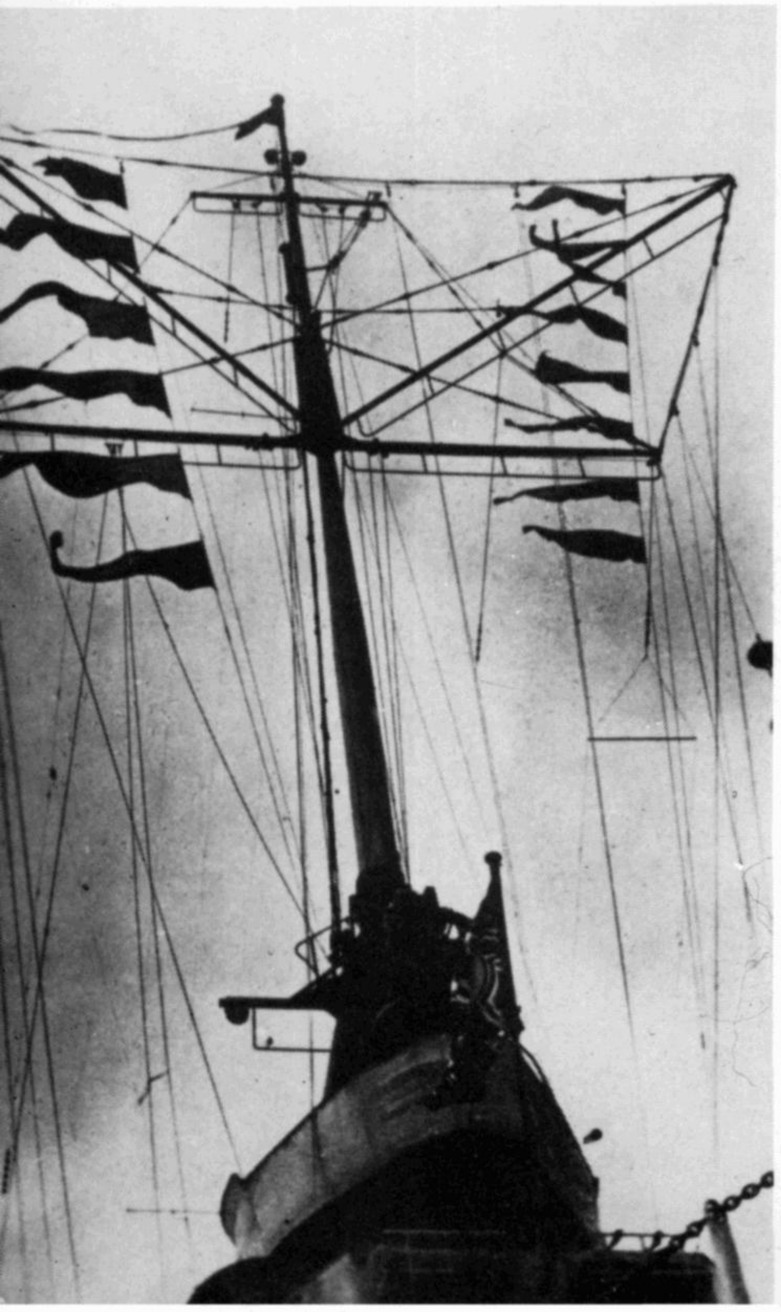
Taken during caliber firing: One of the forward turrets has just fired. The heavy wash indicates a high rate of speed.

During Operation "Juno" the SCHARNHORST took a torpedo hit on the starboard side at the height of the "Cäsar" turret, that resulted in the death of 48 crewmen. Despite 2500 tons of water in the ship, Trondheim could be reached. After temporary repairs were made there, the SCHARNHORST transferred to Kiel in July of 1940 for permanent repairs. They were made in the floating dock of the Deutsche Werke, where these two pictures were taken. The area of the hit is easy to see.

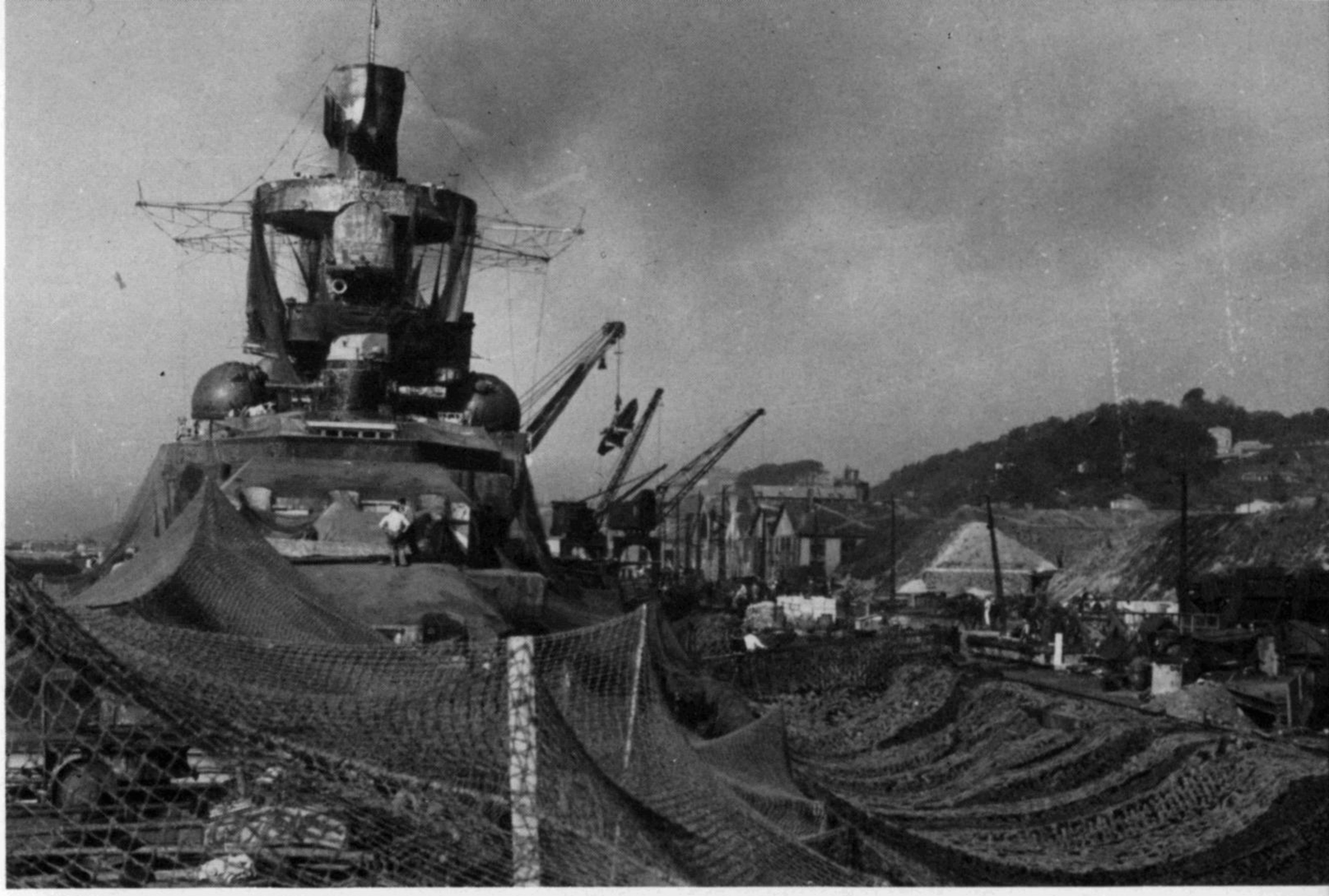


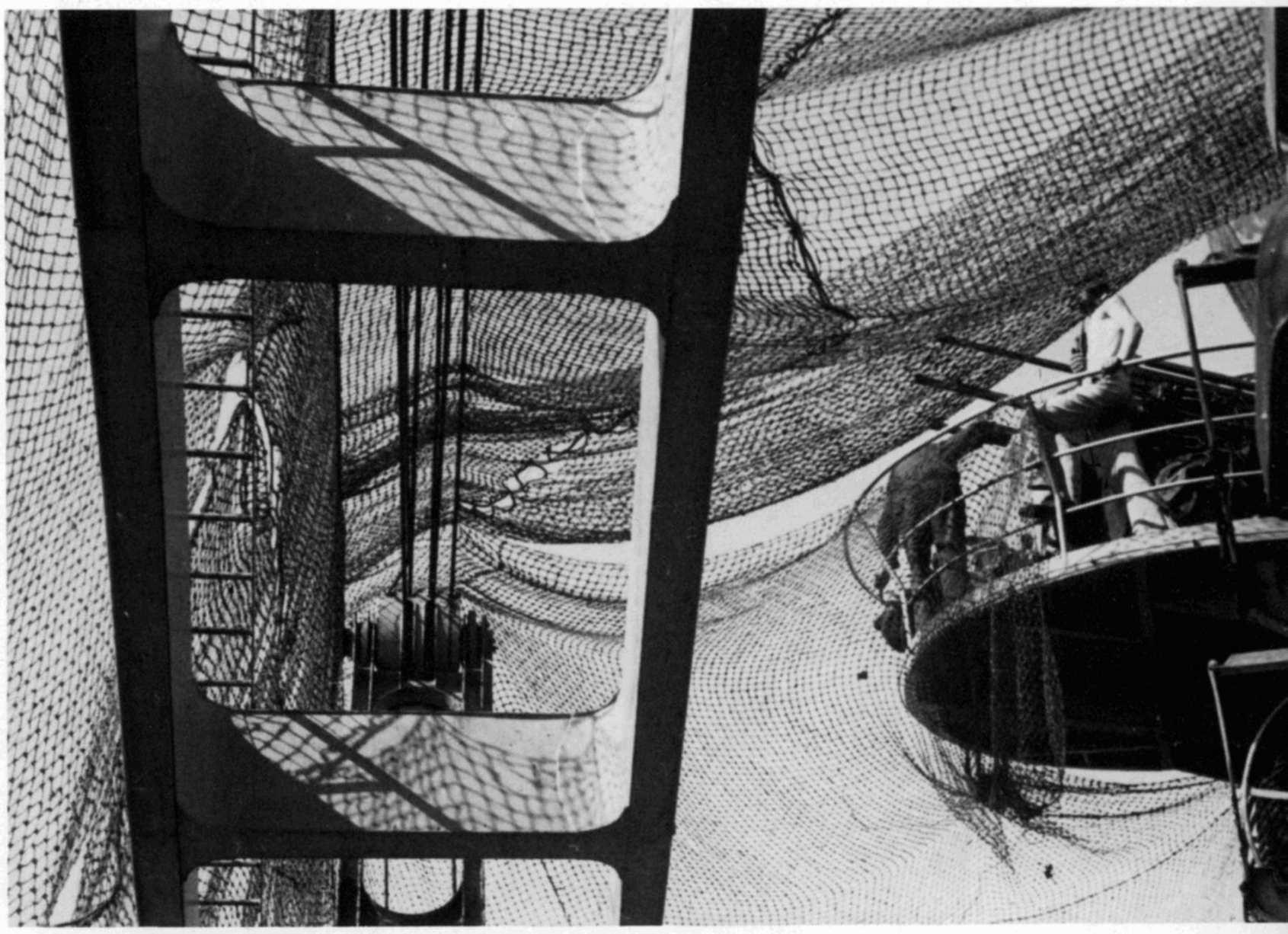
A look at the forward bridge structure. The SCHARNHORST holds a high speed, and the bow is covered with heavy spray. At the left edge of the picture is the forward command post, which was armored especially heavily. At right is a targeting device, behind it is a crewman at work with a small portable range finder. The picture may well have been taken during Operation "Berlin."

Meeting in the Atlantic during Operation "Berlin." In the foreground is U 124, in the background the halted SCHARNHORST, on which the EMS cable added in the autumn of 1940 is visible. This picture was taken on March 6, 1941.

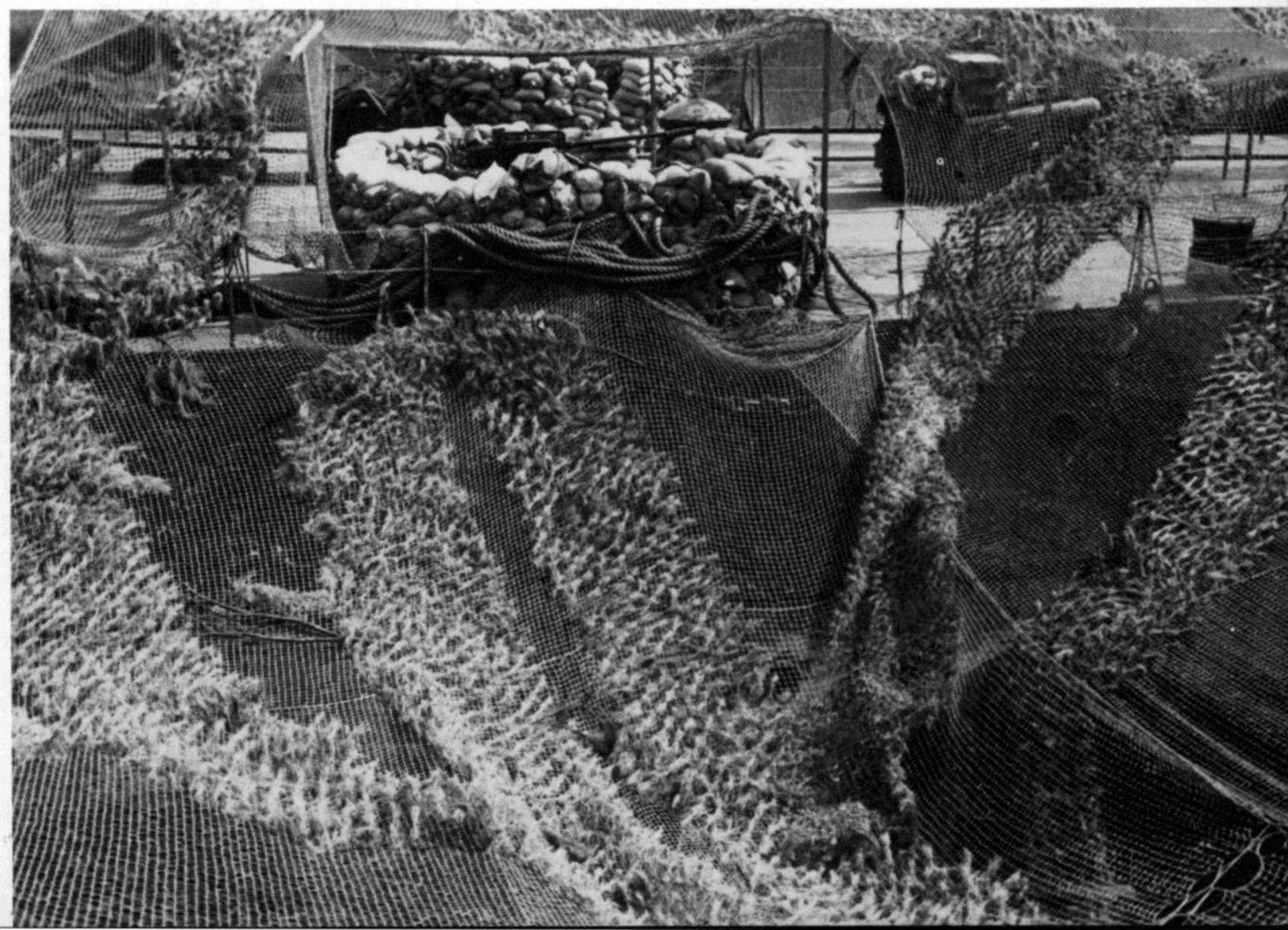


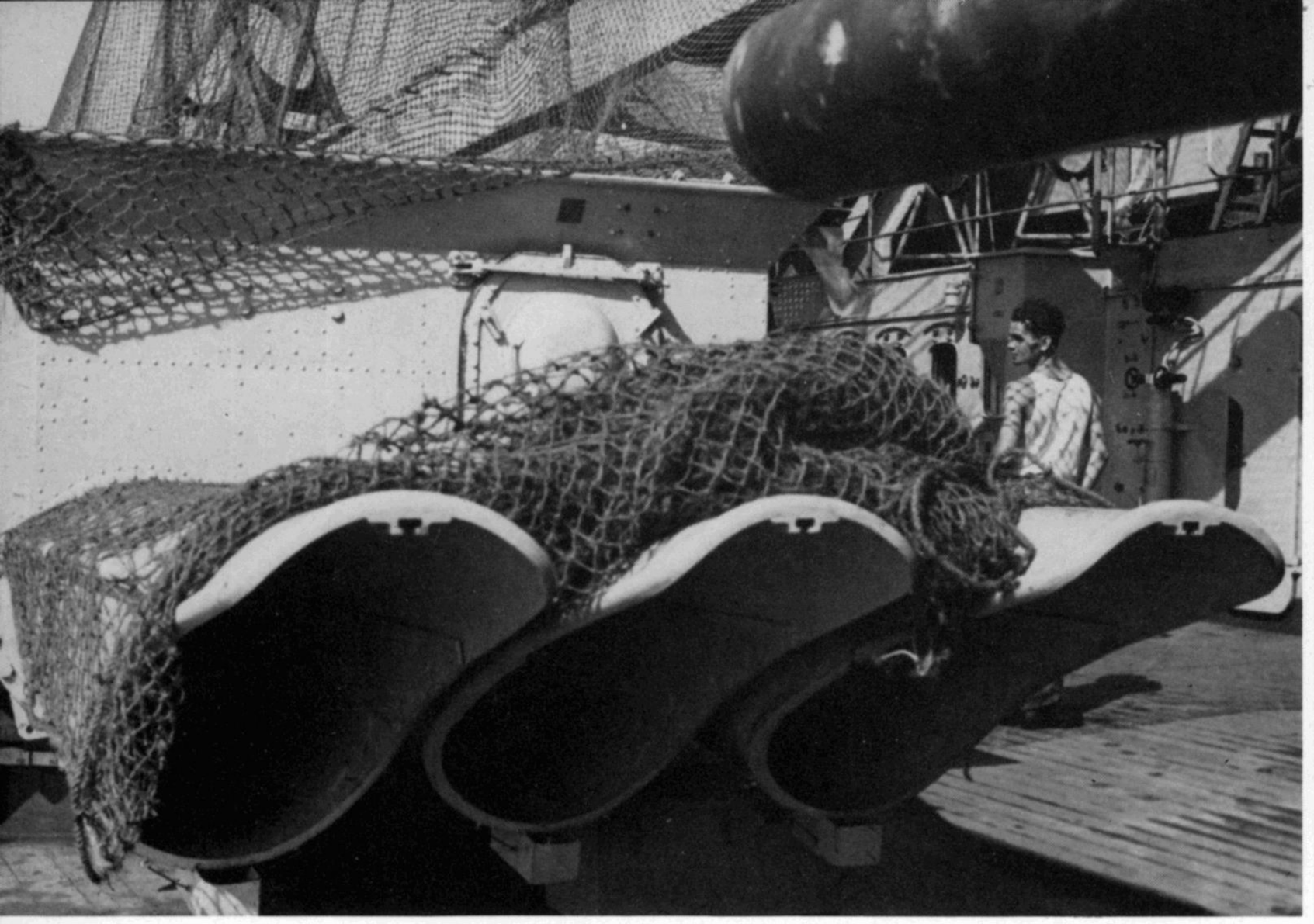
The mainmast seen from aft. The pennants on the spars announce the success of Operation "Berlin."





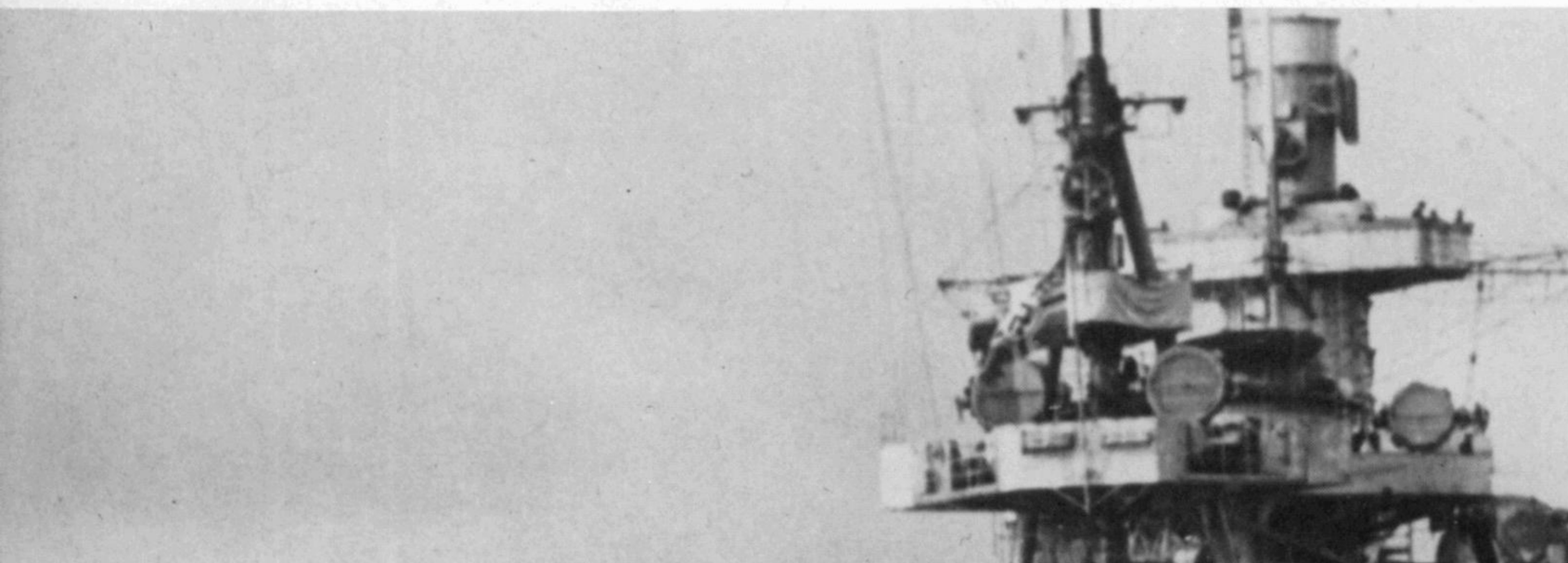
After running in to Brest, the SCHARNHORST was docked in one of the large drydocks there and covered with camouflage nets to make it harder to spot from the air. The upper picture was taken from the bow. When an air-raid alarm sounded, artificial smoke was also supposed to make discovery difficult. The picture in the middle shows the starboard airplane crane at left and, at right, one of the consoles that were installed toward the end of 1940 at both sides of the airplane catapult and on which quadruple 20mm anti-aircraft guns were mounted. The lower picture shows the stern. The two 20mm FlaMG C/30 guns mounted there are protected by walls of sandbags, for which openings in the camouflage nets have been left, out of which the guns can fire on low-flying planes. The pictures were taken in April of 1941.





As a result of experience gained during Operation "Berlin", torpedo tubes were installed on both sides shortly after the ship arrived at Brest. The SCHARNHORST was equipped with two three-tube sets of tubes which had previously been used on the light cruiser NURNBERG.

The SCHARNHORST at the pier in Brest. This picture was probably taken toward the end of 1941. An "M-boot 35" has tied on at the stern.



The SCHARNHORST is shown again lying at the pier in Brest. The crew had assembled on the afterdeck, presumably to be mustered by the commander. On the pier, soldiers of the army are chance observers of the scene.

Early 1943 before Wilhelmshaven: The SCHARNHORST lies ready to set off on the transfer cruise to Norway. This operation, which began on January 17, had to be broken off prematurely because the group was spotted early by British air reconnaissance.

The forward port 15-cm turret has been swung out, ready for action. This picture was taken in June of 1940 during Operation "Juno." Ahead is the GNEISENAU.

Two of the 105mm anti-aircraft guns grouped on the starboard side. The crew is performing firing drill. The picture was taken before the war began.

The SCHARNHORST during Operation "Cerberus."

February 1942: Operation "Cerberus" is in progress; the heavy units (battleships SCHARNHORST and GNEISENAU and heavy cruiser PRINZ EUGEN) cannot be kept in Brest any longer because of the ever-increasing enemy air attacks and have been called forth. Tactically the operation was a complete success, but strategically it meant a defeat, because from now on action in the Atlantic from support points in western France was no longer possible. These pictures, with the SCHARNHORST in the middle, were taken during Operation "Cerberus", in which she was damaged by two mines.

Taken from a British reconnaissance plane at great height in March of 1942: The SCHARNHORST at the Deutsche Werke in Kiel during repairs. At the outside of the quay running at an angle to her is the cruiser NURNBERG. Only in October of 1942 was the battleship fully repaired.

After being released from the shipyard, the SCHARNHORST at first stayed home for a thorough training program. From Gotenhafen it took numerous training and exercise cruises in the Baltic Sea. Here she is seen steaming at her mooring place at the Sea Depot in Gotenhafen. One of her airplanes has been set on the pier.

In March of 1943 the SCHARNHORST transferred to Norwegian waters. This picture, taken there, shows it with camouflage-painted hull, probably for a brief troop test.

Taken a few months before sinking: The SCHARNHORST in the summer or autumn of 1943, before the typical scenery of the Norwegian fjordlands. The bow and stern have been painted to stand out from the dark gray paint, so as to shorten the silhouette for camouflage purposes. At right in the background is the destroyer ERICH STEINBRINK.

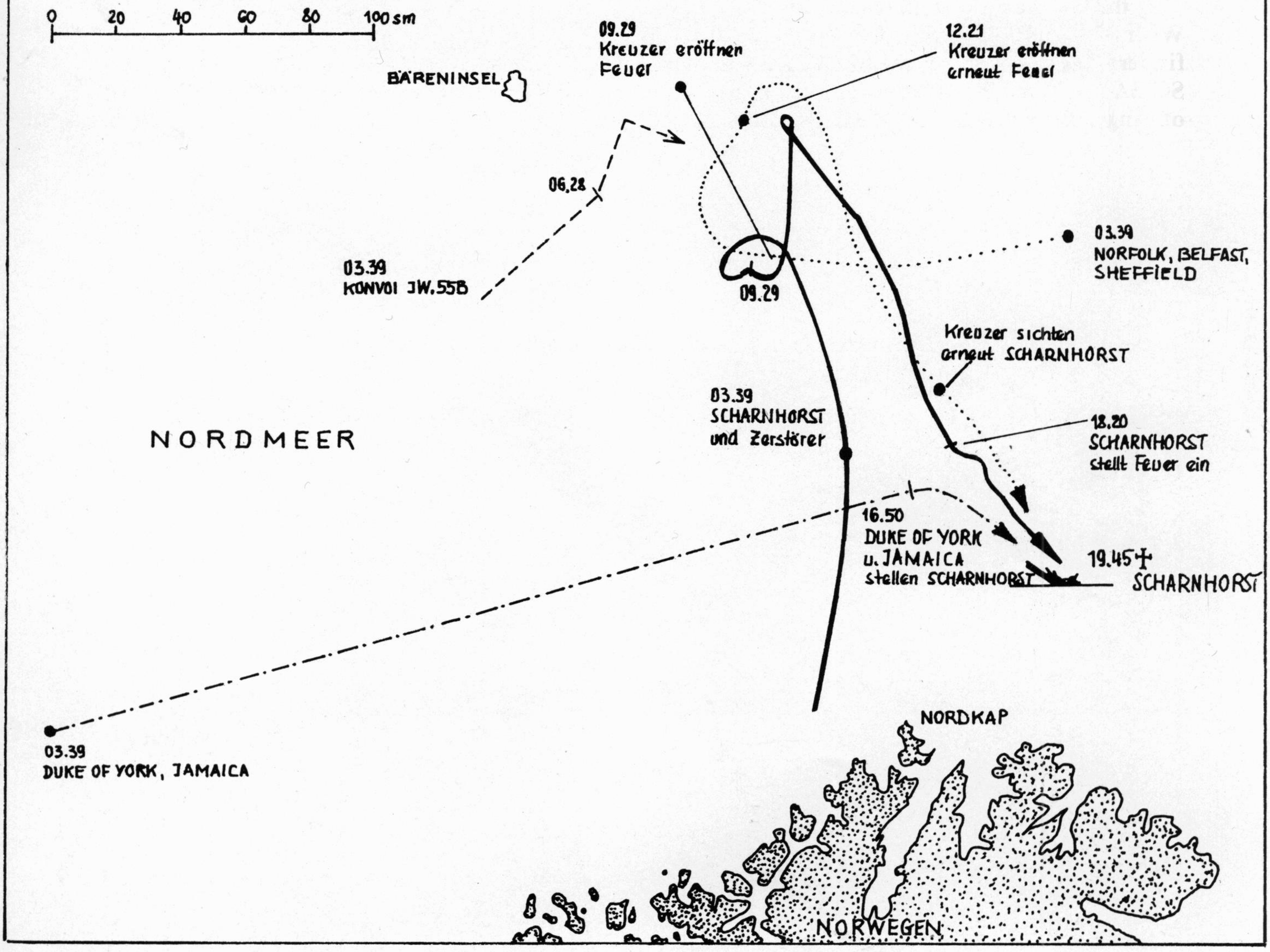
THE TRAGEDY OF NORTH CAPE

In the last December days of the war year of 1943, large convoy operations were carried on in the Arctic Ocean. Since December 12, Convoy JW 55A, consisting of 19 ships, was cruising on course for the northern Russian ports of Murmansk and Archangelsk. At the same time, a long-range cover group of the Royal Navy was at sea, made up of the battleship DUKE OF YORK, the cruiser JAMAICA and four destroyers. This group had the task of guarding a convoy, JW 55B, leaving Loch Ewe on December 20; its short-range escort consisted of ten destroyers and three smaller units. Both convoys had been found by German air reconnaissance, but an attack flown against them by numerous Ju 88 fighter planes was unsuccessful. As of December 23 a third convoy, RA 55A, was at sea; it left the Kola Fjord and steered a westward course. With it were ten destroyers and four smaller units, while a cruiser group made up of the cruisers BELFAST, SHEFFIELD and NORFOLK was operating in the Barents Sea for long-range protection. Most of the German U-boats called in against Convoy JW 55B were kept away, though. Therefore the commander of the Navy, Grossadmiral Dönitz, ordered the use of a battle group under the command of Konteradmiral Bey. It was composed of the battleship SCHARNHORST and the 4th Destroyer Flotilla, with Z 29, Z 30, Z 33, Z 34 and Z 38. In his command it was stated:

"1. The enemy wants to make the heroic fight of our eastern forces more difficult by this important convoy of food and weapons for Russia. — We must help.

2. Attack the escort group with the SCHARNHORST and destroyers.

3. Capably and daringly make the most of the tactical situation, do not end the battle with halfway success, break through tight positions.



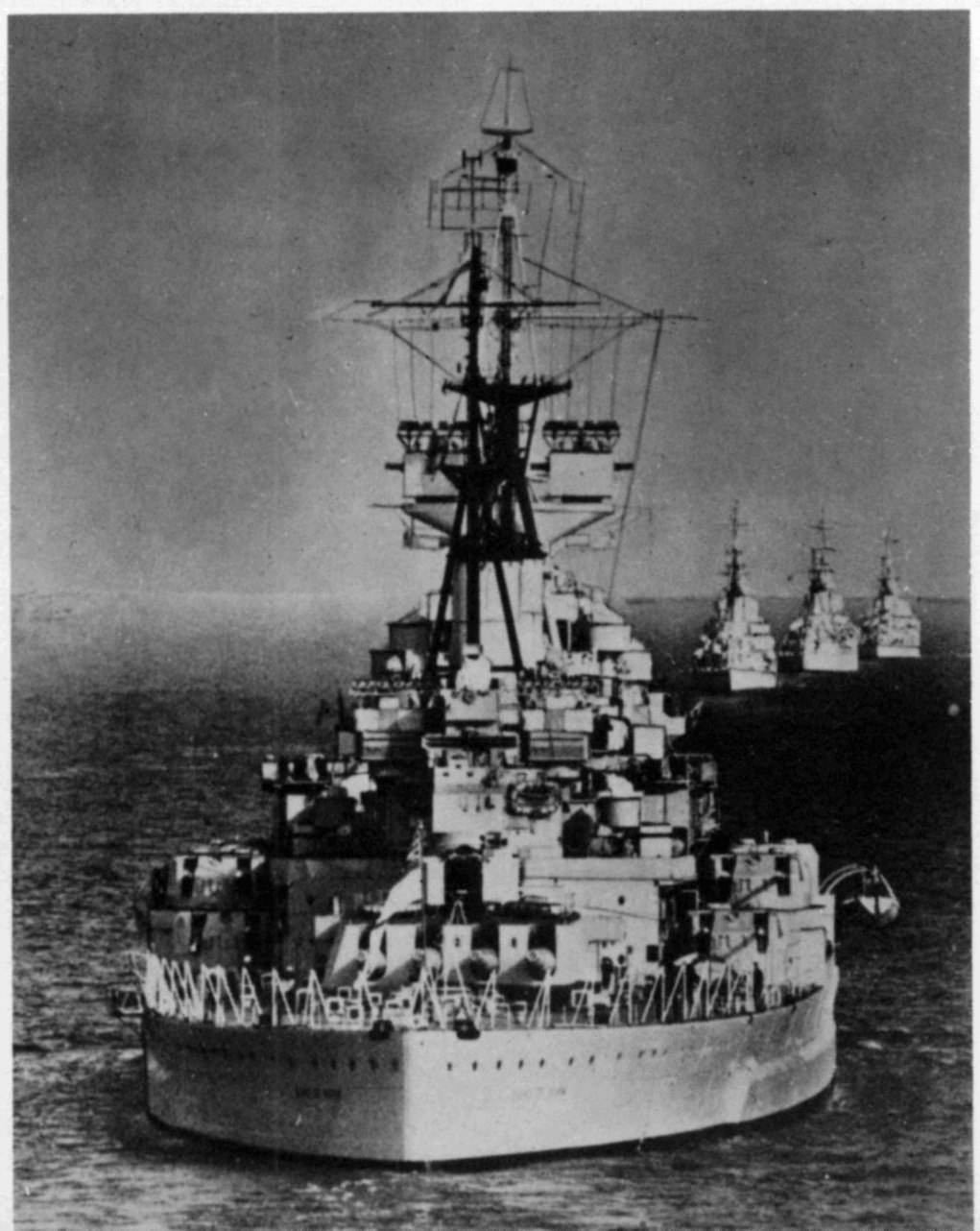
Our best chance is the superior artillery of the SCHARNHORST. Therefore strive to involve her. Deploy destroyers accordingly.
4. Break off at your own discretion. In principle, break off when heavy units arrive.
5. Apply crews in this sense. I believe in your combative spirit. Hail and victory!"

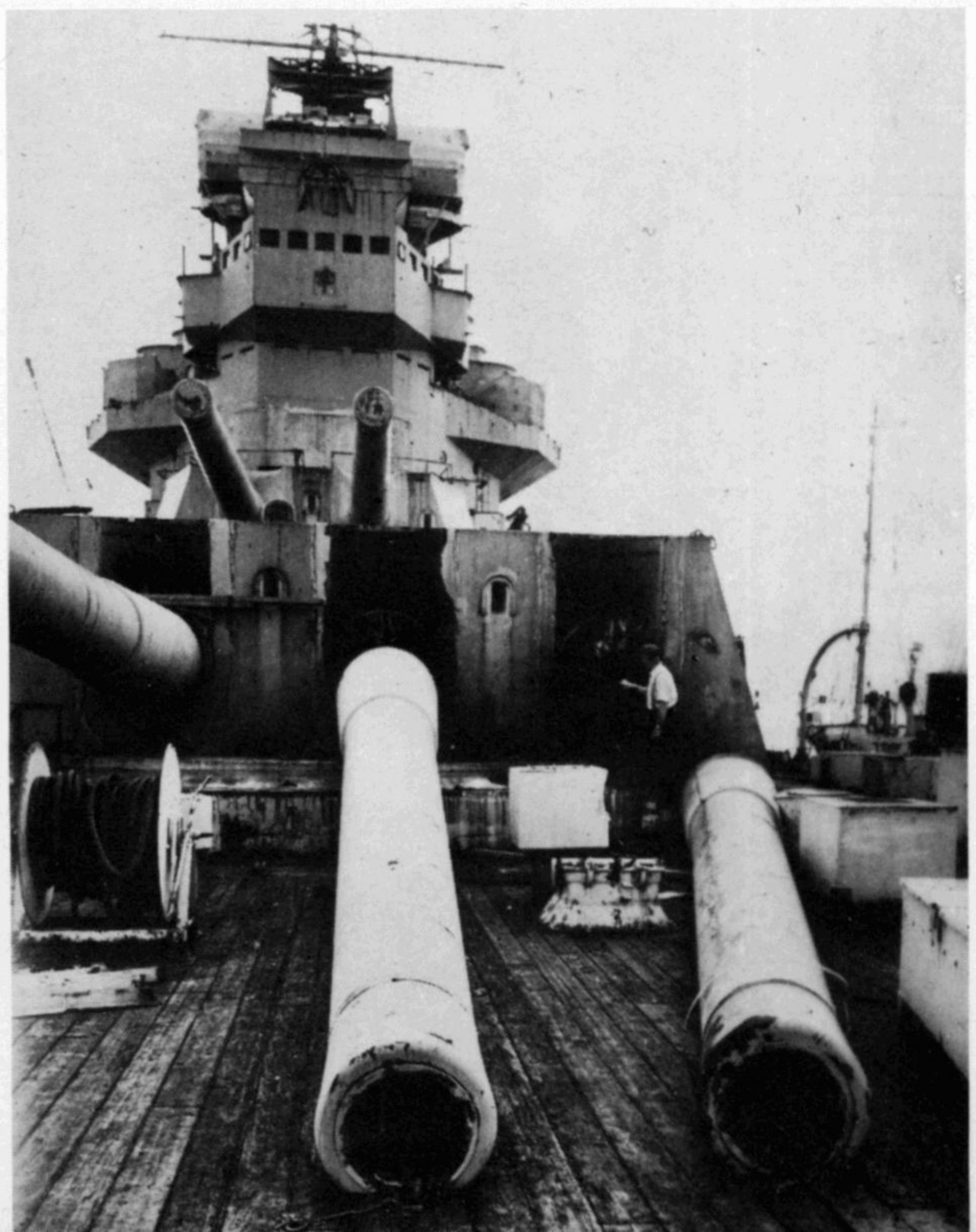
The battle group weighed anchor at 7:01 P.M. on December 25 and reached the open sea area about 11:00 P.M., where they were met by the full fury of the stormy seas. In view of the difficult sea conditions for the destroyers, the group commander gave them the order, about noon on December 26, to break off the operation and return to the support point. Now left alone, the SCHARNHORST, in search of the convoy, encountered the British cruiser group; in two encounters the SCHARNHORST and NORFOLK each scored two hits, but the British were able to drive the SCHARNHORST away. In this encounter the SCHARNHORST took a very unlucky hit: it destroyed the forward range finder and made it almost completely "blind." After the SCHARNHORST was able to get away from the British, the battleship DUKE OF YORK and the cruiser JAMAICA came steaming up from the southwest at high speed after the German ship and tried to block its way. With the help of their far superior range finders, they scored several hits, but again the SCHARNHORST was able to get away and out of range. But then British destroyers were able to pick up the trail again and draw nearer. Within a short time they were able to score four torpedo hits, so that their victim lay dead in the water. Then the DUKE OF YORK, BELFAST and NORFOLK, which had again come near, carried on the job; the SCHARNHORST was shot up by them and sank at 7:45 P.M. after the British had scored another ten to twelve torpedo hits on her. Of the crew, only 36 men survived, all taken prisoner by the British.

The sinking of the SCHARNHORST and the death of more than 1900 of her crewmen was a unique tragedy. "The seamanly, nautical and artillery experience of these well-trained men remained meaningless as opposed to the fact that the SCHARNHORST was almost blind in the darkness and the twilight of the few hours of daylight, while her opponents could observe her thanks to their long-range radar devices. British cruisers shadowed the SCHARNHORST, pushed her away when she came too near the convoy, and finally brought on a superior battleship that recognized her surprised opponent on radar at 42 kilometers and soon destroyed her with well-aimed fire."[1] It was decisive in the end that the British were able to decrease the speed of the ship: Only thus could they attack it; otherwise it would have been able to get away from further pursuit.

[1] Quoted from Cajus Bekker, *Die versunkene Flotte*, page 64.

The main opponent of the SCHARNHORST: The British battleship DUKE OF YORK . . . and its end 15 years later: in 1958 it was broken up and scrapped.

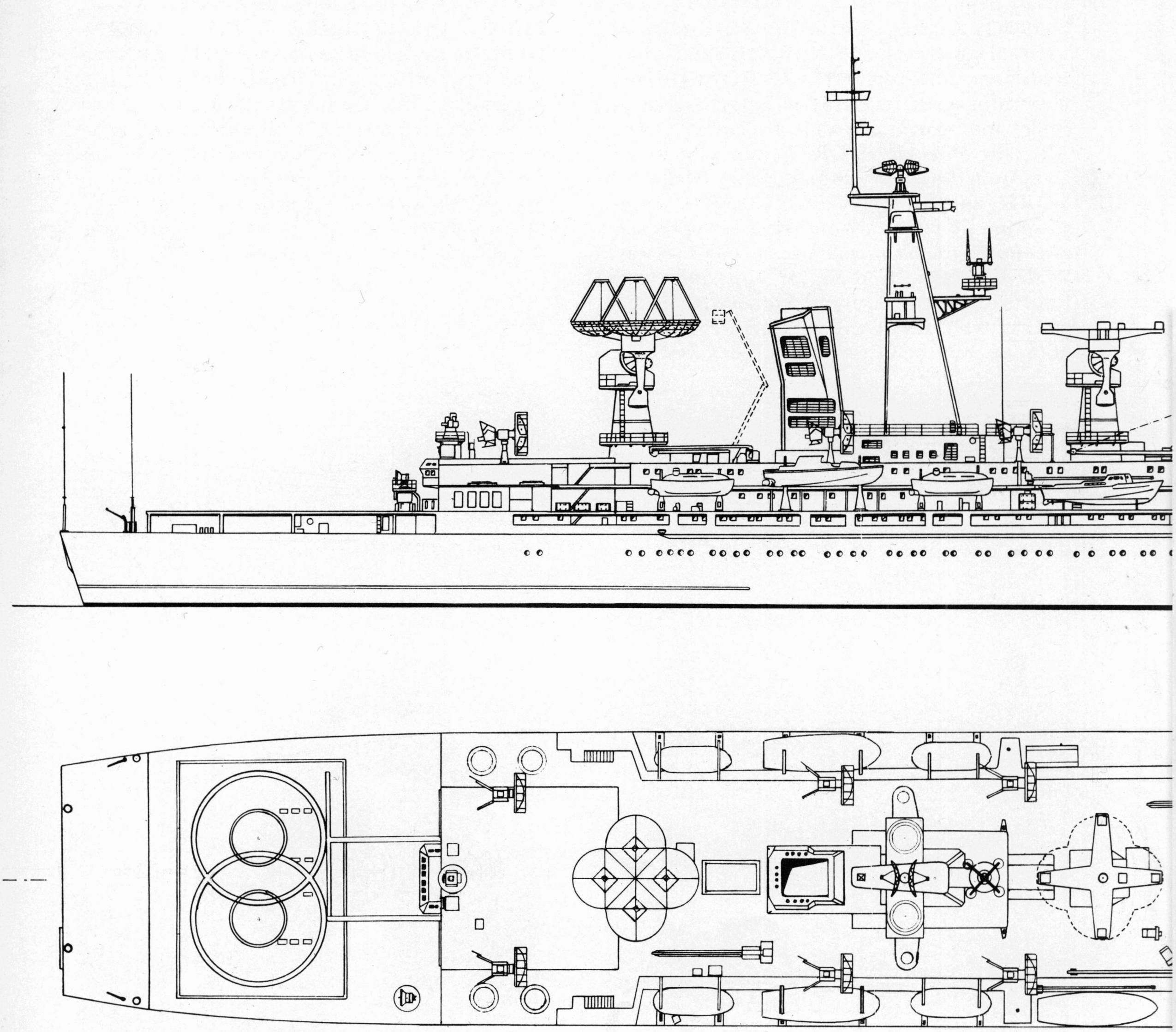




NAVAL INFO UPDATE

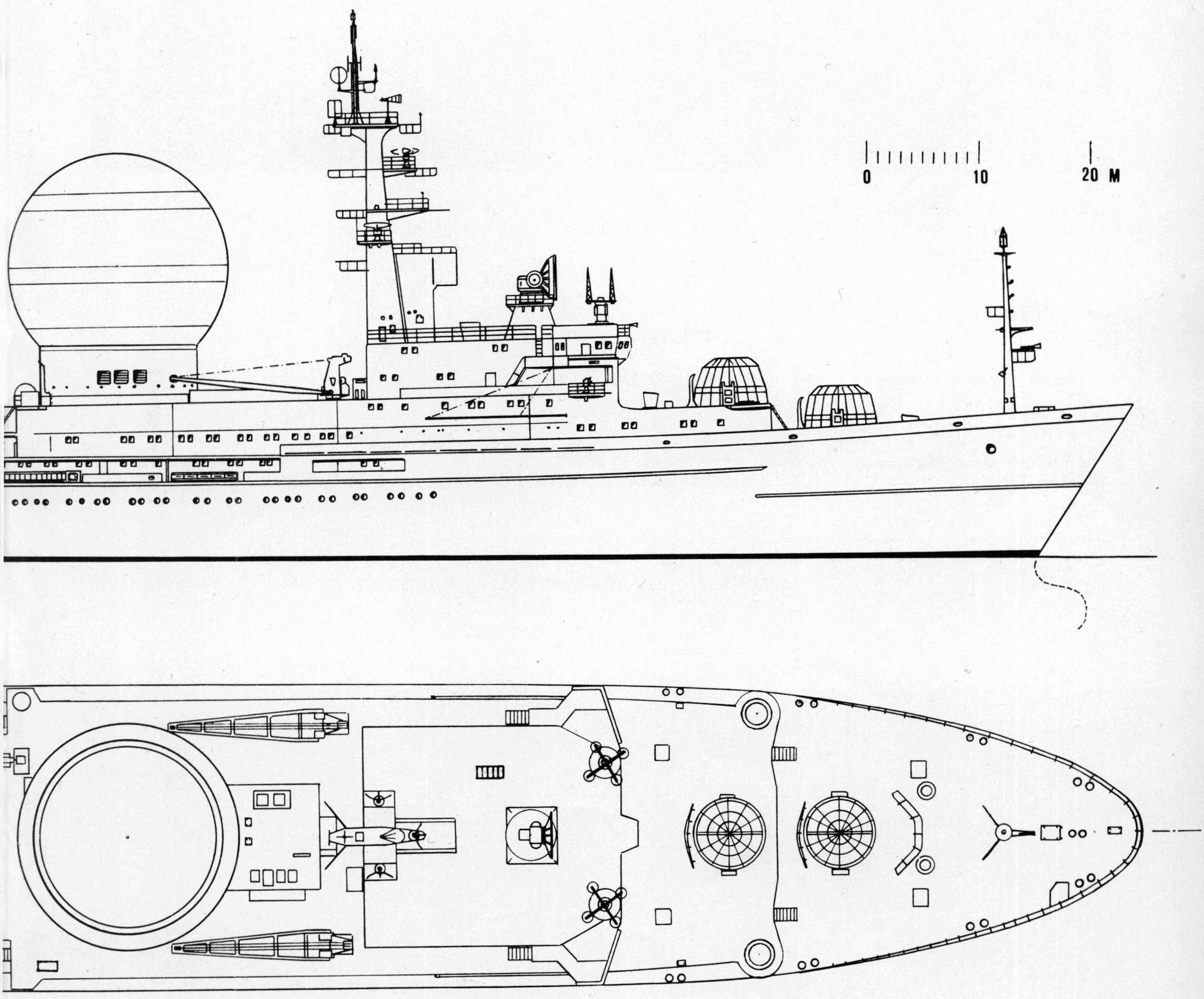
UNUSUAL IN SIZE AND EXTENT OF CAPABILITY: THE FLOATING ROCKET TRACKING BASE "MARSHAL NEDELIN"

At the beginning of 1984 the Leningrad Admiralty Shipyards delivered an unusual special ship named MARSHAL NEDELIN. It was a "Missile Range Instrumentation Ship" that had the task of observing and tracking the trajectories of test rockets. With its displacement of 24,000 tons and its large-size exterior dimensions, it is an unusually large auxiliary ship. It can be recognized by the large round 22-meter-high radar dome with a maximum diameter of almost 20 meters. Within this dome there is thought to be a modern, probably computer-guided satellite communications antenna. The next most important device in terms of size is a radar system composed of four parabolic mirror segments carried on a pylon twelve meters high. This has a maximum elevation of 90 degrees and can traverse 360 degrees. A second device on a similarly constructed pylon is obviously planned for but not yet installed. In addition, there are numerous other sensors, devices and antennae that are positioned all over the ship. Preparations for defensive armament for use in case of conflict are also present: Apparently planned for are six six-barreled 30-mm Gatling cannons for anti-aircraft use; this is probable on



the basis of the mounts provided. It is possible that several launchers for "S-A N-5" or "S-A N-8" anti-aircraft rockets can be added, such as are in use by land forces as one-man shoulder weapons. A hangar is integrated into the superstructure at the stern, in which two helicopters of the Ka-27 "Helix" type can be housed. Meanwhile the MARSHAL NEDELIN — the ship bears the name of a deceased commander of the Soviet strategic rocket troops — has been transferred to the Far East and seems to be on duty at the firing areas in the Sea of Okhotsk, at which new land- and sea-supported strategic rockets are often tested.

A second ship of this class is still being equipped and could be delivered by 1988. It is possible that both were planned from the start so that they could be used as command ships for certain theaters of naval war.



MARSHAL NEDELIN

Thoroughly equipped with electronic devices, the MARSHAL NEDELIN is seen here obliquely from forward, with a view of the port side. The exterior of the ship is dominated by the massive radar dome located amidships.

PRINCIPAL DATA

Combat displacement	ca. 24,000 tons
Overall length	213.0 meters
Maximum width	27.1 meters
Maximum draught	7.7 meters
Powerplant	Steam turbines with electric transmission) or Diesel engines
Number of shafts	Two
Speed	22 knots
Crew	150 men (+ 250 scientists?)
Armament	Six 30-mm six-barrel AA guns (only in case of war)

One of the mighty antenna systems, shown here on another Soviet rocket tracking ship. The system mounted behind the funnel of the MARSHAL NEDELIN is identical.

This picture of the MARSHAL NEDELIN, taken from astern, provides a particularly good view of the helicopter deck. The superstructure ends at it and includes a built-in double hangar; over it the control tower for helicopter takeoffs and landings can be seen.

GERMAN U-BOATS FOR INDIA'S NAVY

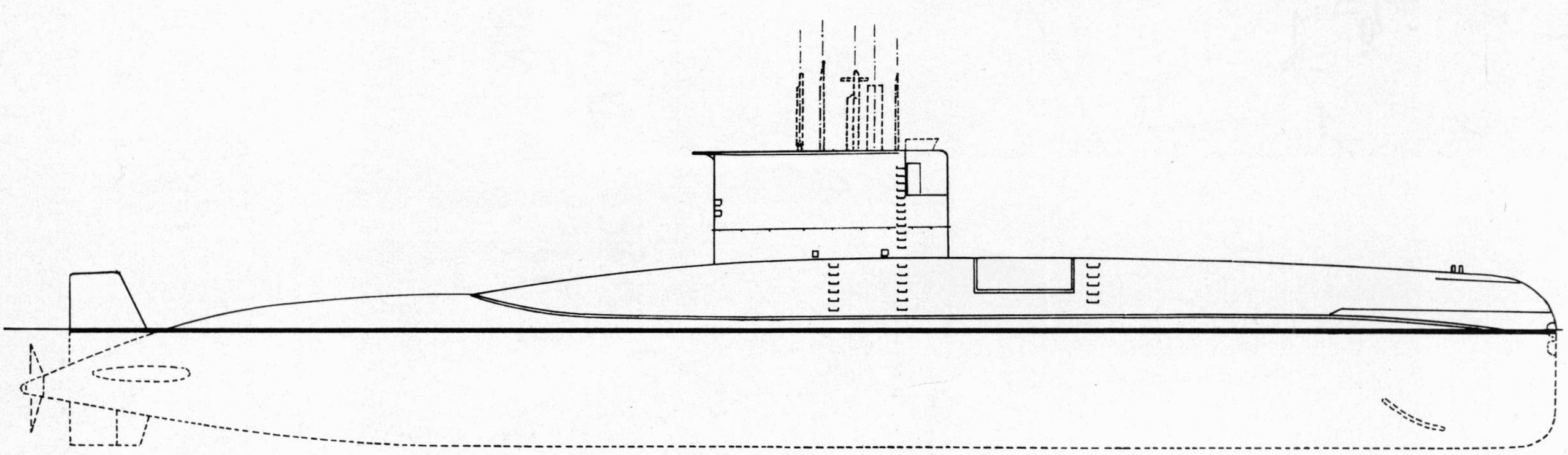
India's navy is now receiving a series of four new U-boats, of which the Howaldt Works/ Deutsche Werft (HDW) in Kiel has built two, while the other two are being built under license by the Indian Magazon Shipyard in Bombay. The two HDW boats are already delivered, and their sister ships being built in Bombay are to follow soon. The design for this class was made by Ingenieurkontor Lübeck (IKL). India's navy had originally wanted the Type 209 developed jointly by HDW and IKL, but it then transpired that, in terms of range, time at sea, diving depth, etc., the requirements could be met better with an enlarged type. This new development, officially designated "Type 1500" differs from Class 209 not only in terms of size, but also shows important design differences. In addition to a larger pressure hull diameter, it is not only the first HDW type to have a pressure-tight sectioning, but is also the first U-boat type in the world to have a rescue system for the crew. This consists of a rescue capsule integrated into the pressure hull, with its own propulsion pod. This new system is usable to the destruction depth of the U-boat; there is room for the entire crew in the rescue capsule, and it is independent of any rescue measures controlled from outside. The system was tested in the Skaggerak in October of 1985 during its test and acceptance runs. In the process the SHISUMA — this is the name of the first boat — went to a diving depth of 80 meters; the capsule was then released and rose to the surface of the water in less than one minute, as expected, with a median ascent speed of 1.5 meters per second.

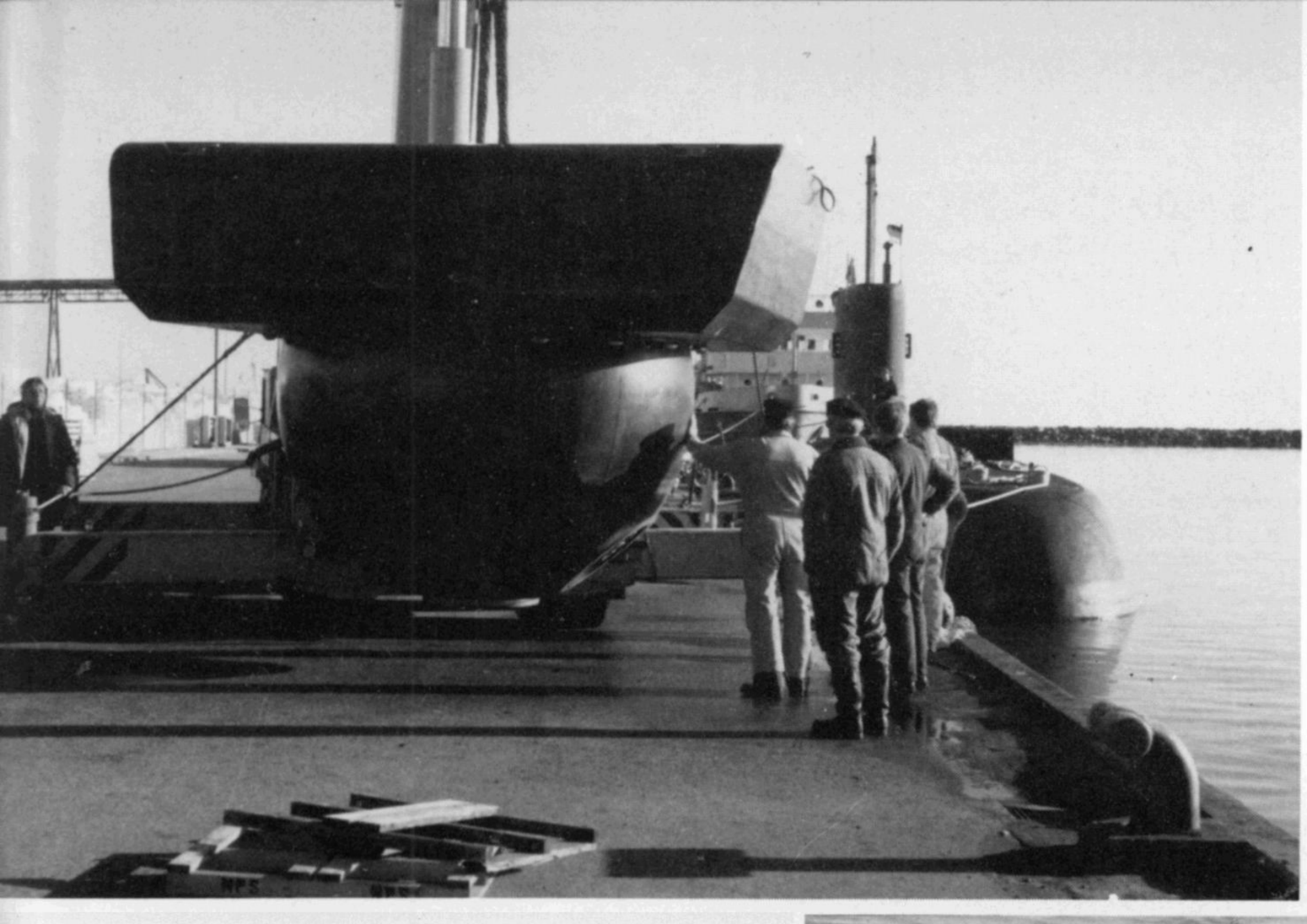
The calculated performance of the rescue capsule, also tested in model form, were completely confirmed after its release from the U-boat and during its ascent in the test.

PRIMARY DATA OF THE TYPE 1500 U-BOAT

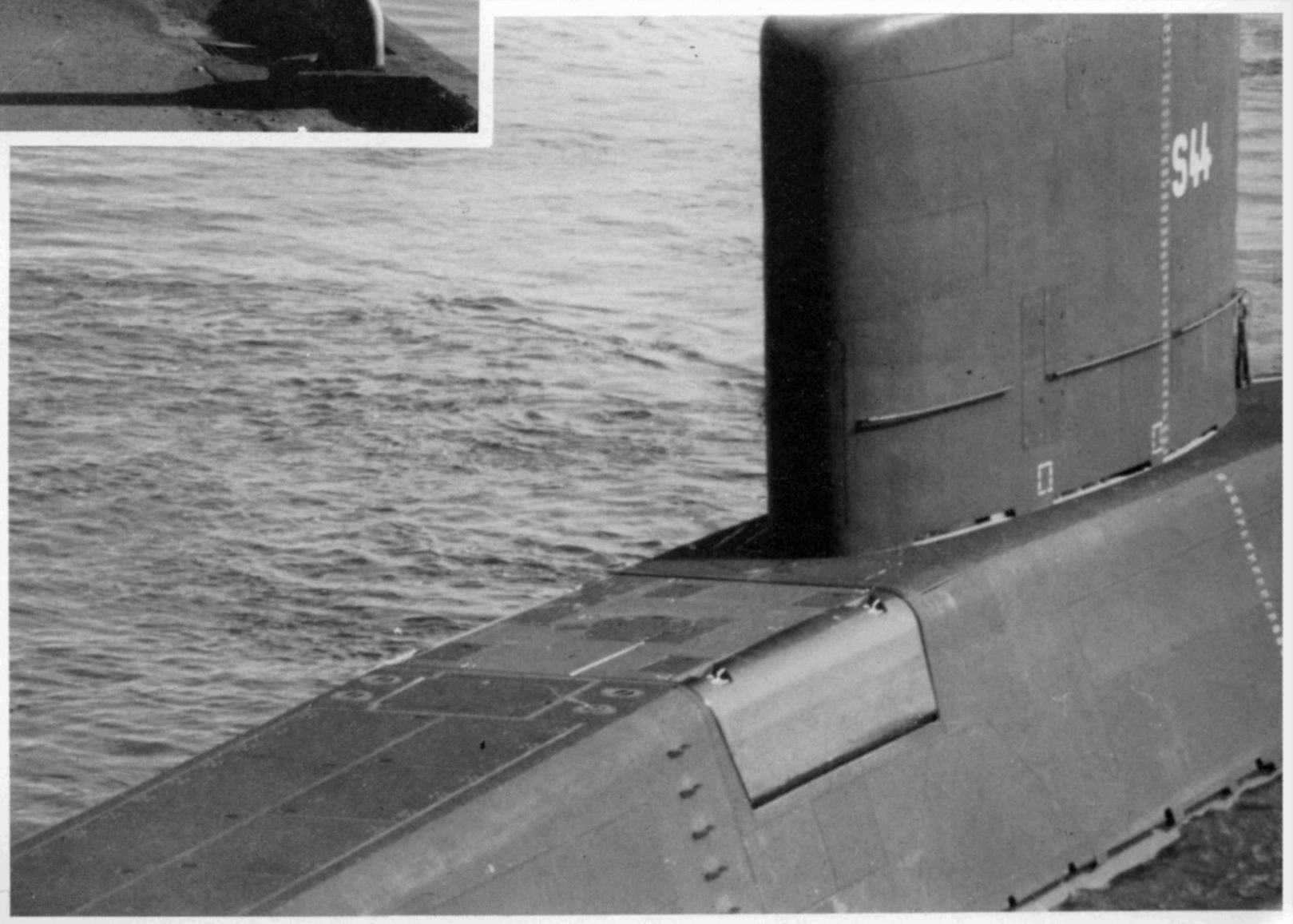
Surface displacement	1660 tons
Underwater displacement	1860 tons
Overall length	64.4 meters
Width	6.5 meters
Draught	5.5 meters
Powerplant	4 MTU Diesel motors, each 440 kW (600 HP), four 450-kW generators, 2 motors, combined power of 3680 kW (5000 HP)
Shafts	One
Surface/submerged speed	11.0/21.5 knots
Fuel capacity	118 tons
Surface/submerged range	8200 sm at 8 knots/524 sm at 4 knots
Armament	8 bow torpedo tubes with 14 torpedoes
Crew	40 men

Side view drawing of U-boat Type 1500 (Indian SHISHUMA class)





A view of the new rescue system before its installation in the U-boat. The rescue capsule is under the power pod.



From this perspective the rescue system can be seen to be integrated in the ship's hull forward of the tower. The power pod stands out clearly from the hull.

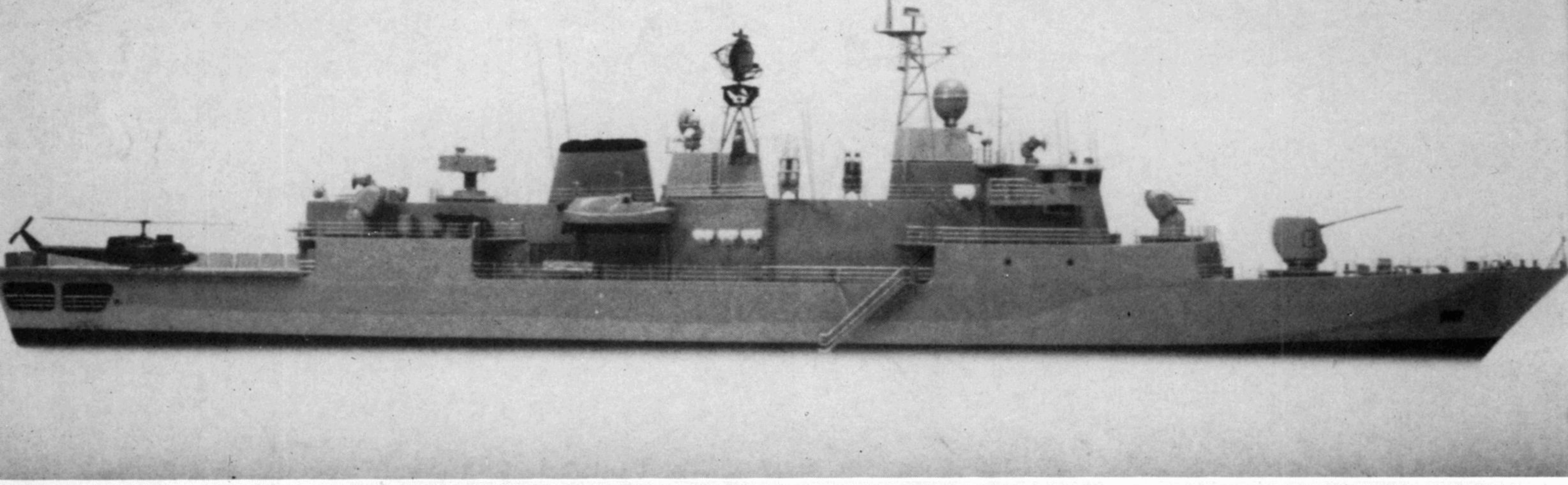
The rescue system in action: From a depth of 80 meters it reached the surface in exactly 58 seconds.

Shortly thereafter the U-boat surfaced. Forward of its tower is the aperture in which the rescue system was located.

MEKO FRIGATES FOR THE TURKISH NAVY

The MEKO principle for modern frigates, developed in the Federal Republic of Germany by the Blohm & Voss Shipyard in Hamburg and subsequently known and acclaimed throughout the world, has reached a new high point in the newest units of the Turkish YAVUZ class. Of the four units contracted for, two were built in the Federal Republic (one each at Blohm & Voss and the Howaldt Works/Deutsche Werkt in Kiel) and the other two in Turkey (Gölcük State Shipyard). The first of these was delivered and put into service in 1987. It bears the traditional name YAVUZ. This was the name of the heavy cruiser GOEBEN of the Imperial German Navy that was surprised by the war in the Mediterranean in 1914, landed in Turkey and was turned over to that country, and was wrecked there only in the Seventies.

This class — officially designated the MEKO 200-T Type (MEKO is the acronym for Mehrzweck-Kombination: multipurpose combination, and the numbers refer to the standard displacement while the "T" stands for "Turkey") — will play a decisive role in modernizing the very outmoded Turkish fleet; with it the Turks gain access to modern maritime technology. The ships, 110.5 meters long, 13.25 meters wide and 3.94 meters in draught, displace 2784 tons fully equipped and have a powerplant of four Diesel engines with a combined power of 29,440 kilowatts (= 40,000 HP), with which they attain a top speed of 27 knots. Their armament consists of American "Harpoon" ship-to-ship (4 x 2 launchers) and "Sea Sparrow" anti-aircraft missiles (one eight-fold launcher), one 127-mm cannon, three 25-mm quadruple anti-aircraft guns, six submarine torpedo tubes (2 x 3) and one sub-chaser helicopter. By the end of this decade the series should be complete.



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