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CENTRAL INTELLIGENCE AGENCY

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Units of the new Soviet type of cruiser were observed more closely for the first time in 1953. The evaluation of their exterior appearance was mainly based on observations made at the following times:

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The approximate physical data of the type are:

Length 200/212 meters; beam 21 meters; draught 6.5 meters; displacement 13,700 tons.

Armament: Twelve 150 mm guns in triple turrets;
Twelve 100 mm AA guns in twin mounts;
Thirty-two 37-mm AA guns in twin mounts;
Ten torpedo tubes in two quintuple mounts;
About 200 mines.

Exterior appearance

The SVERDL[redacted]uiser looks attractive and quite modern [redacted] The general design, which undoubtedly dated bac[redacted]riod before the summer of 1941, was obviously based on [redacted] characteristics of Italian designs and prototype[redacted] thirties, whose influence cannot possibly be denied. T[redacted]atively great distance between the two smokestacks and the second tripod mast in a position forward of the after smoke-stack are most characteristic features in this respect and were seen on the Italian he[redacted] 25X1

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to the DUCA D'AOSTA-Class. The arrangement of the smokestacks seems to indicate that the propulsion plant of the SVERDLOV--Class is subdivided into independent power units and the boilers and turbines driving one propeller shaft form a complete unit as in the Italian ships. It may also be accepted that the design, particularly in the engine plant installation, was taken from the German Cruiser LUETZOW, which became USSR property in 1939. This was the case after the war when the experiences and knowledge obtained were fully evaluated in regard to a new design for the class. Many details of the shape of the ship also reveal German influence unmistakably. Another characteristic feature of the exterior of the cruiser is the fact that a superstructure, which is between 12 and 15 meters long, and extends from one side of the ship to the other around the forward smokestack, continues forward and forms a large three-storied, partially even a four-storied deckhouse.

The extremely small number of portlights on a ship of this size is another notable characteristic of its exterior. Actually, standard--size portlights are only visible in the deck structure noted above and in the accommodation deck which is presumed to be arranged below the foredeck. Judging from the position of the portlights in relation to the bend in the sheerstrake, the accommodation deck probably has a headroom of 2,4 or 2,5 meters.

Shape of the Ship's Hull.

On the whole, the shape of the topsides of the ship is similar to German and Italian prototypes. The concentration of the volume in the middle section of the topsides is partially due to Italian influence. As such topside design must necessarily harmonize with the underwater lines, the conclusion is that the ships has relatively sharper ends than, for example, modern British designs. This arrangement might cause certain difficulties in stowing ammunition for the main guns.

The frames of the forward section in way of the waterline are remarkably straight and steeply set and only in the upper third are they more pronouncedly bent. Nevertheless, the foredeck does not overhang too much, as its width is reduced according to the sheerstrake, which is 0,5 meters [redacted]

In contrast to the foredeck, st[redacted]taining as much deck space as possible aft with[redacted]g room for four parallel-running mine trac[redacted]t the deck curvature at the after edge of [redacted] rather irregular. The deck sheer is comparatively slight, as is the case with the Italian and older German ships. The midship and after sections of the ship run parallel to the designed waterline, while the forward section in front of turret A is slightly raised, with the result that the stem, which is about 8,5 meters high, is about 1,3 to 1,5 meters higher than the ship's side amidships. On the whole, the sheer seems to be considerably smaller than is deemed necessary even, indispensable, for ocean cruising of a ship of this type. The sharp bend of the sheer approximately between the after edge of the breakwater at the ships sides and the fore edge of turret A (as [redacted] German K-type cruisers) was noted. It therefore seems proba[redacted]temming a long swell, the ship will quite often ship [redacted]ed rather quickly, or be forced to reduce speed for safety'[redacted]rmation at the ship seems to be normal. The permanently fixed [redacted]uard is fitted so low that it is submerged and produces spray when the ship is laden.

Structure of the Hull.

Closely following the German system of construction, the hull is built on the combined longitudinal and transverse principle and entirely welded. The transverse frames are spaced about 1.5 meters apart, or the spacing used in the large German ships. As [redacted] plating in the topsides above the waterline strake [redacted] ened by longitudinal tie plates, it is supposed that [redacted] s are fitted also in the lower parts of the ship to [redacted] n the longitudinal frames. In the upper parts of the ship, these bands run across the protective armor, parallel to its upper edge and to the upper edge of the designed waterline, and are spaced between 0.60 and 0.65 meters. The lowermost longitudinal band is fitted close to the upper edge of the waterline strake, the uppermost band about 0.30 to 0.35 below the lower edge of the portlights, [redacted] the longitudinal bands in the raised section of the [redacted] t of the ship also run parallel to the waterline an[redacted] bend of the sheer strake.

It is impossible to give a de[redacted] luation of the welding workmanship. Seen from the ou[redacted], the welding on SVERDLOV [redacted] ormity with the specifications of the former German Navy. It is believed that the shipyard which built SVERDLOV did not fully master the tensions occurring during the welding operations at the time of her construction, since the welding points on the inner [redacted] of the skin plating connecting the frames and longi[redacted] ties are all visible on the outside of the topside[redacted] addition, flat dents cl[redacted] ow the areas between [redacted] nd the longitudina[redacted] de from such parts of [redacted] where, as, f[redacted] part of the shi[redacted] convexities conce[redacted] n extent). The workmanship in the welc[redacted] ws considerable progress in the techni[redacted] ver, possible that the skin of the topsides of this ship is a little thinner to save weight, with the result that the skin was not strong enough to withstand the loads due to local tensions.

Ground Tackle, Boats, etc.

Ground Tackle.

The cruiser has two bow anchors and one stern anchor. The bow anchors are carried in hawse pipes fitted close to the stem and just under the edge of the foredeck which, however, were not fairlead hawses similar to those found on the latest ships of the German Navy. The cruiser had no fore-and-aft bow hawse. The capstans work in opposite directions and their entrance parts to the chain pipes are arranged one forward of the other (the starboard one being the foremost). The stoppers for each chain are fitted mid-way between the hawse pipe and the capstan.

The stern anchor fits into a recess in the middle of the round stern, and its capstan is only five meters forward of it.

Boats.

The motorboats are stowed on the roof of the deckhouse between the after mast and the forward smokestack and are hoisted out and in by a derrick on the after mast.

The lifeboats are carried in pairs of swing davits resting on neck bearings and fitted at each side of the ship aft of [redacted] onal accommodation ladd[redacted] are on each side [redacted] ts are distributed over [redacted] ection: [redacted] urrets B and C; another [redacted] wed in p[redacted] of the [redacted] t of the after smokesta[redacted] the ship on the deckhouse immedi[redacted] them resting on a launching slope permitt[redacted]

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Miscellaneous.

A protected look-out position fitted with a sheet iron bulwark, open at the rear side and permitting removal if necessary, is erected at the outermost end of the foredeck.

The upperdeck is planked all over and it was noted that the planks were laid in transverse tiers in short pieces, about 1½ meters long.

Armor Protection.

The armor protection, clearly visible in the waterline, is executed as a strenghened waterline strake which forms part of the girder system of the skin and extends from the forward edge of the screw guard to the forward edge of turret A in uniform width and thickness. Its upper edge lies about 2 meters above the designed waterline. Its thickness gradually tapers as was the case with ships of the German Navy and forms a broad transition into the normal outer skin overlying it. The lower edge is probably fitted in a similar manner.

The thickness of the waterline strake is estimated at not less than 50, and not over 80 millimeters, the small figure being more probable, considering the size, type and caliber of her main gun armament.

The waterline strake extends forward as far as the stem and forms a strengthened plate strake probably meant to serve more as an ice strengthening than as armor protection. Its thickness, apparently of not more than at best twice that of the normal skin thickness, is between 25 and 30 millimeters. The overlapping butt between the waterline strake and the aforementioned plate strake is a notable feature.

A normal skin plating butts on the after edge of the waterline strake. Local stiffenings presumed to be located only near permanently fixed propeller guards.

If the ship is fitted with an armored deck of similar design and make as found on the former German cruisers, its horizontal part would at least be level with the upper edge of the waterline strake, presumably a little lower (between 150 and 500 millimeters) than the waterline strake. In this case, the horizontal part of the armored deck would be between 25 millimeters and 30 millimeters thick, while the slopes would probably range between 40 and 50 millimeters thick.

The armor protection of the 150-mm gun turrets will not afford more than splinter protection. The thickness of the revolving turrets is supposed to range between 45 and 60 millimeters according to their positions, and the same seems to apply to the thickness of the barbettes or the reinforced cylindrical substructures of the turrets used instead of barbettes.

The armor protection of the conning and fire control stations is obviously copied from the modern German heavy cruisers. The old-type conning tower with its fairly thick walls seems to have been replaced by a number of rooms separated by splinter-proof walls. The foot of the tower-like mast is surrounded by a house made of splinter-proof material at the height of the unprotected steering position. Its width is about that of the tower-shaped mast extending, however, forward as far as the signal deck atop, while its after edge seems to be flush with that of the tower-shaped mast. This conning house is supposed to accommodate the conning staff in action.

The next story of the tower-mast with its round portlights is unprotected, as is also the signal deck level with it. It forms a small shelter fitted between the legs of the mast proper and serves to accommodate the personnel taking down signals. The next story is also made of splinter-proof material and fitted with eyeslit-like lookout openings in regular all-round arrangement. The next story, which is much broader, seems to be the main action station of the

captain's or admiral's staff. It is fitted with a splinter-proof armor and has larger eye slits. An observation opening looking aft and fitted on each side forms a pyramid-shaped extension and seems to indicate that there is a partition wall in the interior of this house. - Atop the main action station is a large platform with well designed windscreen arrangements, which is probably used by the captain's or admiral's staff as long as no enemy counter-action is expected. Lookout men and action observers are also supposed to be posted there. The after part of the platform is bulkheaded off at each side and seems to house three target indicators and spotting gear on each side, but may well be used by the torpedo department. The middle of the platform accommodates the main fire control station. Its revolving hood probably consists of splinter-proof material 10 to 12 millimeters thick and offers certain protection from splinters. It is presumed that no heavier weight could be placed there.

Main Gun Armament.

The ship mounts four triple turrets with guns of an estimated caliber of 150 millimeters. The rear ends of the barrels seem to be rather thick and were burnished rather than painted in the latest ships. Turrets B and C are superimposed on turrets A and D respectively. The distances between the individual guns indicate that they are installed on single cradles and single mounts and thus can be elevated individually.

It is inferred from the height of the loop holes that the guns can be given an elevation exceeding 45 degrees or even as much as 60 degrees. This arrangement seems to indicate that the main armament is also intended to be used for antiaircraft defense, although the relatively heavy weight of the masses to be turned in these turrets is a serious handicap in antiaircraft firing. On the other hand, high-angle fire at shore targets, especially those under cover, must be taken into consideration.

It is believed that the gun-handling platform does not extend as far as the rear wall of the turrets, because each turret has a large 8-meter-base rangefinder at its rear wall. The result is that the breeches and the trunnions of the barrels are necessarily fitted rather closely to the frontal plates of the turrets, which is also necessary for the high elevation.

The barrel length is estimated at between 55 and 60 calibers assuring thus a high initial velocity (v_o). All turrets are accessible through doors in the rear wall, the superposed guns being fitted with an easily removable catwalk from the structure at its rear or a detachable ladder. The empty cartridge cases are probably removed by throwing them through openings fitted in the floor of the overhanging parts of each of the four towers. It is believed that the overhangs of turrets A and D are high enough above the deck to permit the throwingout the empties in a horizontal position. It seems also possible to throw them out of flaps fitted in the rear wall.

Sighting slits are fitted in small hoods arranged at each side of the turret roofs at the points of extreme width. No sighting slits are visible in the front plates of the turrets. In addition, turrets B and C are fitted with cylindrical hoods with hemispherical tops about 0.7 meter in diameter and about 1.3 or 1.4 meters high, and placed on the right hand side abaft the middle of the roof. They are supposed to be radar devices, in which case the hoods would be made of ray-penetrable plastics and contain the dipoles.

The flat and broad protective casings of the rangefinders in the turrets are notable features. Their cross sections seem to indicate that each instrument has two traces of rays, one being that of the rangefinding proper, while the other is probably used for stereoscopic spotting.

On the whole, the firing angle of the turrets is rather wide and with low elevations can be traversed as near as 20 degrees from the fore-and--aft line.

At these extreme traversing angles, however, the crews of the nearby AA guns must leave their stations.

Fire Control for Main Guns.

The fire control station on the forward tower mast and after fire control station are of identical design. Each houses two superposed staggered rangefinders with an estimated 8-meter-base and a direction--indicator sighting column. There are four sight slits fitted with flaps (deadlights) in the upper part of the fire control station, one looking forward, one looking aft and one each to port and to starboard; in the step below are two slits, one looking forward and one looking aft. It cannot be said whether these openings belong to special optical instruments. The two stations seem to house optical instruments only, and the general design of the fire control stations shows the characteristic features of Zeiss-made installations of this kind.

Antiaircraft Armament.

Heavy AA Guns.

Three twin-mounts with barrels of about 100-mm caliber and long protective shields are at each side of the ship. Their exterior shape seems to indicate that the gun mounts are stabilized and undoubtedly copied from German types. By enlarging the splinter-proof protection, which now protects the entire gun crew, forming a kind of AA-gun turret, the German design of 105-mm twin mounts was improved.

The trunnions of the barrels are fitted close to the rear side of the shields, leading to the conclusion that the length of the barrels is 60 calibers or upwards. The supporting cylinders are rather large in diameter and make it probable that ammunition is hoisted through these substructures. It is also believed that, although the trunnions are not arranged too far from the after edges of the supporting cylinders, the breeches enter the supporting cylinders at high elevations.

The elevation can be as much as 90 degrees; the firing height of the barrels is notable; it is estimated at about 2.2 meters. It seems probable that, following the German example, the breeches were made quite heavy to shorten the recoil distances as much as possible. It is also believed that the cartridges used are rather long, and thus a muzzle velocity of 950 meters per second, as with the German 105-mm AA gun, is probably reached.

Since the turret-like shields are closed at the rear, it seems rather certain that the ammunition hoists are fitted inside. There is reason for believing that the cartridges, with the shells pointing upwards, arrive in a vertical position, when they are grabbed by their heads by a swinging device and moved parallel to the fuse-setting machines, which are fitted to the breech, and follow the movement and finally roll into them.

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Two large doors at the rear of the shields serve the purpose of throwing out the spent cartridge cases at low elevations, while at higher elevations the cases are dropped into the supporting cylinder. The gun crews enter the gun positions through lateral doors. Starting from the rear side, a narrow passage fitted with a rail runs along the two sides of the shield as far as the two doors at each side of the lateral shields in order to assure a safe access to outboard-side door even if the gun mount is in secured position.

The laying mechanisms of the gun mounts lie in the forward ends of the protective shields. A radar aiming device, fitted with hood with a cupola-shaped top similar to those fitted on the tops of the main turrets B and C, is installed on the right hand side. Their dimensions seem to be of similar size or only a little smaller than those of the main gun turrets. The hoods lean forward with their front faces at right angles to the roof of the shield. A hood with a square opening for optical laying gear is fitted on the left hand side. The space between the barrels and their arrangement in the protective shields as well as the shape of the latter show that the designs for the third axle (the leveling axle) were executed on the German model.

The training angles are excellent. [redacted] ain elevation and upwards, the two after mounts even [redacted] oss the fore-and-aft line, in which case, however, the tw[redacted] AA gun positions must be evacuated.

AA Fire Control System.

A spherical AA fire cont[redacted] with a small projection atop [redacted] ar devic[redacted] ed at each side of the ship. The [redacted] uisers [redacted] the Arctic Sea and on the [redacted] a rada[redacted] dipols at their front assuring [redacted] electric measurement of training or accurate determination [redacted] relative bearing of targets. No reflector for measuring altitudes was seen. The built-in optical rangefinder had an estimated basis of 3.5 meters. Each control station can sweep the spherical quarter of its own ship's side and, in addition, cross the fore-and-aft line to the opposite side up to an intersecting angle of about 40 degrees. In this case, however, partial hinderances due to the after mast and the after smokestack must be considered.

These stations are obviously exact copies of the German Gema-Zeiss designs. Their existence indicates that the entire heavy AA gun armament is fitted with automatic gyro-stabilization.

Medium AA Guns.

The medium AA gun armament consists of eight mounts at each side of the ship. Since each mount carries two 37-mm caliber barrels closely fitted in pairs, a total of 32 barrels of this caliber is aboard. The gun mounts have a cylindrical protective shield with no top protection and are entirely unroofed. No ammunition carrying facilities or special fire control arrangements are visible.

Light AA Guns.

The ship obviously carries no single-mount or multiple-mount light AA guns. This seems to indicate that, because of the poor effect of lighter calibers, medium-caliber AA guns with fully automatic operation (drum magazines or clip magazines) are deemed appropriate.

Torpedo Armament.

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Torpedo Armament.

A quintuple torpedo mount with a torpedo control for the torpedo gunner is fitted aft of AA fire control station at each ship's side. The general arrangement is probably influenced by German designs. The torpedoes have a caliber of 533 millimeters. It is believed that the spare torpedoes and the adjusting station are located under the waist. The torpedo control arrangement is supposed to be housed in the forward bridge structure.

Mines.

The mine tracks will permit a load of at least 200 mines. The four tracks on the after deck are connected by 2 cross tracks. The longitudinal tracks are arranged in pairs at each ship's side and join a launching way fitted in appropriate ports at the stern.

Radio and Radiolocation Equipment.

Antennas.

According to [redacted] the following 25X1

Antennas for Long-, Medium- and Shortwaves are available:

1. One long-wave antenna with five horizontal wires;

2. One stay between the masts with two separate antennas; one, a shortwave antenna, leads down between the foremast and the fore smokestack, while the other, a mediumwave antenna, is fitted aft of the forward smokestack with the lead-in between the two AA-fire control stations;

3. A cage antenna suspended from the port hand arm of the after antenna yard with a lead-down to the radio transmitting room;

4. Three Y-shaped antennas, one each on the portside, on the starboard side, and forward of the mast-tower serving as mediumwave antennas.

The large number of antennas seems to indicate that the ship is well equipped with means of radio signal communication.

The antennas and their lead-down seem to indicate that the ship had three separate radio rooms. The after radio room situated close to the after smokestack seems to be of greatest importance, since both the extraordinarily large longwave antenna, the cage antenna, and several other antennas are led into this room.

VHF Antennas.

1. Rod (buggy whip) antennas

a.	Two each at each side of the fore top position	total 4
b.	two each at each side of the fore smokestack	total 4
c.	Two each at each side of the after smokestack	total 4
d.	Two at the after fire control station	total 2
e.	Aft of the after platform of the foremast	1
f.	One each at each yard arm	total 2
g.	At forward edge of platform of after mast	1

2. One wire antenna is attached to lower side forward of the platform of the military mast and leads to an arm fixed to the lower edge of the main conning station located below. 1

grand total: 19

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It is possible that the antennas at the fore top position (a) and at the after position (d) serve gun firing purposes, whereas the other antennas are used for general signal communication. The large quantity of equipment leads to the conclusion that the transmission of communications both between vessels of the same group or squadron and the target spotters is effected exclusively by VHF transmission. Some of the antennas available are probably also used for shortwave transmission.

For nautical purposes, a cross-loop direction finder, a now outmoded Telefunken-D/F type, is fitted on the fore mast. The use of this outmoded type on a modern ship is rather striking since cross-loop antennas with goniometers are now in general use.

Direction Finders (D/F).

1. Radar Equipments: (Funkkenngeraet) (FuKG). Radar recognition set. An omnidirectional antenna of the shape used in the USA is fitted on each of the uppermost platforms of the two masts, which radiates all round the horizon and receives horizontally polarized rays.

2. Panoramic Gear. A narrow reflector is visible on the upper platform of the fore mast. This is probably the reflector of a standard-type marine radar, working on waves ranging between 3 and 9 centimeters.

3. Search Gears.

   a. A small reflector (fitted below the D/F loop), possibly a panorama radar scanner, with a broad blind angle at the rear side probably works in the decimeter range and is fitted on the fore mast.

   b. A parabolic reflector is on the upper platform of the after mast: It has several lines with 2 dipoles in the focus (decimeter wave). This gear seems to be the main antiaircraft search equipment and therefore can be trained horizontally and vertically.

4. Search Radar: (Radar Searching Gear) (FuMG). A comparatively broad reflector with a dipole is installed atop the platform of the tripod of each mast. It seems to be the target-searching instrument for the main gun armament. The low position of the reflectors in this case is considered sufficient, because they are required only to sweep the area within the range of the guns. Panorama gears are not required and it is therefore not necessary to train the reflectors all round the horizon.

5. Cylindrical, domed, and enclosed hoods are fitted on the superimposed turrets of the main guns as well as on all mountings of the heavy AA guns. The latter have a forward inclination of their axis of between 15 and 20 degrees because they are vertically installed on covering plates of the turrets and the shields. They are probably made of plastic which permits the passage of rays and are supposed to house an electric aiming and measuring device.

6. The purpose which the Yagi-type antennas on the fore mast and the after mast are serving cannot be positively determined. It may be a vertically polarized radar device working in the decimeter range (about 50 centimeters), but may be as well as VHF direction finder. It is most improbable that it is used as a long-base device in which the similar gears on the fore mast and the after mast work together.

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Distinguishing Characteristics.

The individual characteristics of the SVERDLOV-Class cruisers were stated to be as follows:

1. General features:

All ships detailed for good-will state visits abroad have white bulwarks and white canvas covers for their guns and other equipment, whereas the ships serving in the Arctic waters have gray covers and tarpaulins, etc.

2. Peculiarities of individual ships.

a. 1. SHDANOV. The platform with two twin-barreled 37-mm AA guns at the after end of the forward smokestack is mounted one deck height lower than on SVERDLOV and ORDZHONIKIDZE.

2. The spherical AA fire control stations are each fitted with a horizontal radar reflector.

b. ORDZHONIKIDZE.

1. A bracket projecting far forward and carrying an additional radar reflector is mounted above the bridge at the mast tower.

2. Inside the tripod of the after mast is a third platform about one deck height lower than the hood of the smokestack.

3. An inclined black surface is fitted below the crow's nest on the after mast.

4. See a. 2.

Opinion.

This type of cruiser gives a well balanced impression in general, and war experiences have been turned to account to a large extent. It is, however, noticed that torpedo armament has not been given up as it could at best be of value when attacking enemy convoys. The type does not seem to be intended for ocean work, as it lacks certain ocean-going qualities, and the Soviet Navy has no aircraft carriers or suitable fast auxiliary vessels for operations in the open sea. It is therefore supposed that this type of cruiser is mainly intended for strategic-defensive tasks in the Baltic and in the Arctic Sea and, in addition, to be used in cooperation with land forces. This would also account for the quality of equipment of the main artillery with optical instruments for range-finding, gun laying and spotting. The numerous aiming devices at the fire control stations and in the turrets are equipped with, including possibility of using the individual turrets against separate targets, constitute an arrangement which is of particular value for shelling shore targets. The possibility of giving the barrels high elevations makes possible of high-angle firing possible ranging from 45 to 90 degrees. The large number of VHF antennas finally indicates that they are needed for communications with the various spotters posted far away at sea or ashore. The employment of the ship for such special missions with the particular order-transmitting and communication facilities they involve, demands most careful instruction and training.

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Radio and Radar Arrangement on Cruiser SVERDLOV

Legend.

Einzelne Peitschen-Antenne	Single rod antenna
Peitschen-Antenne an Stb.u.Bb.	Two rod antennas, one each on starboard and port
Panorama-Geraet f. Navigation	Panorama device for navigational purposes
FuKG an Stb.	Recognition radar on starboard
FuKG (Sende u. Empfg.)	Recognition radar transceiver
Hauptgeraet fuegen.Seitenpeilg.	Main gear for relative bearing
F. Sprechfunk	For voice radio
5fach Langw.	Five long-wave wires
Peilrahmen mit Richtungsantenne	D/F hoop with directional antenna
FuMG	Radar
FuMG f. H.A.	Radar for high-angle firing
Funkrah Bb. Nock	Radio yard, port arm
FuMB, ca. 40 cm Dipol	Observation radar, about 40-cm dipole
Reuse Mittelw. Bb.	Cage antenna for medium-wave (port side)
Kurzw.	Short-wave
Mittelw.	Medium-wave
Kurzw. Stb.	Short-wave (starboard)
Langw.	Long-wave
Y-Antenne vorn	Forward Y-antenna
Y-Antenne a. Stb. u. Bb.	Two Y-antennas, one each on port and starboard
UKW-Antenne	VHF antenna
Reuse	Cage antenna
Kurzwelle	Short-wave
Langwelle	Long-wave

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About 200 mines.

Exterior appearance.

The SVERDLOV Class cruiser looks attractive and quite modern [redacted] The general design, which undoubtedly dated back to the period before the summer of 1941, was obviously based on essential characteristics of Italian designs and prototypes of the thirties, whose influence cannot possibly be denied. The comparatively great distance between the two smokestacks and the second tripod mast in a position forward of the after smokestack are most characteristic features in this respect and were seen on the Italian heavy and light cruisers ranging from the A. DIAZ Class 25X1

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to the DUCA D'AOSTA Class. The arrangement of the smokestacks seems to indicate that the propulsion plant of the SVERDLOV Class is subdivided into independent power units and the boilers and turbines driving one propeller shaft form a complete unit as in the Italian ships. It may also be accepted that the design, particularly in the engine plant installation, was taken from the German Cruiser LUETZOW, which became USSR property in 1939. This was the case after the war when the experience and knowledge obtained were fully evaluated in regard to a new design for the class. Many details of the shape of the ship also reveal German influence unmistakably. Another characteristic feature of the exterior of the cruiser is the fact that a superstructure, which is between 12 and 15 meters long, and extends from one side of the ship to the other around the forward smokestack, continues forward and forms a large three-storied, partially even a four-storied deck-house.
The extremely small number of portlights on a ship of this size is another notable characteristic of its exterior. Actually, standard--size portlights are only visible in the deck structure noted above and in the accommodation deck which is presumed to be arranged below the foredeck. Judging from the position of the portlights in relation to the bend in the sheerstrake, the accommodation deck probably has a headroom of 2.4 or 2.5 meters.

Shape of the Ship's Hull.

On the whole, the shape of the topsides of the ship is similar to German and Italian prototypes. The concentration of the volume in the middle section of the topsides is partially due to Italian influence. As such topside design must necessarily harmonize with the underwater lines, the conclusion is that the ship has relatively sharper ends than, for example, modern British designs. This arrangement might cause certain difficulties in stowing ammunition for the main guns.
The frames of the forward section in way of the waterline are remarkably straight and steeply set and only in the upper third are they more pronouncedly bent. Nevertheless, the foredeck does not overhang too much, as its width is reduced according to the sheerstrake, which is 0.5 meters high.
In contrast to the foredeck, stress was laid on obtaining as much deck space as possible aft with a view to acquiring room for four parallel mine tracks. It is noted that the deck curvature at the after edge of turret D seems to be rather irregular. The deck sheer is comparatively slight as is the case with the Italian and older German ships. The midship and after sections of the ship run parallel to the designed waterline, while the forward section in front of turret A is slightly raised with the result that the stem, which is about 8,5 meters high, is about 1,3 to 1,5 meters higher than the ship's side amidships. On the whole, the sheer seems to be considerably smaller than is deemed necessary even indispensable for ocean cruising of a ship of this type. The sharp bend of the sheer approximately between the after edge of the breakwater at the ships sides and the fore edge of turret A (as with the German K-type cruisers) was noted. It therefore seems probable that when stemming a long swell, the ship will quite often ship seas, lose speed rather quickly, or be forced to reduce speed for safety's sake. Wave formation at the ship seems to be normal. The permanently fixed screw guard is fitted so low that it is submerged and produces spray when the ship is laden.

Structure of the Hull.

Closely following the German system of construction, the hull is built on the combined longitudinal and transverse principle and entirely welded. The transverse frames are spaced about 1.5 meters apart, the spacing used in the large German ships. As the skin plating in the topsides above the waterline strake is stiffened by longitudinal tie plates, it is supposed that such bands are fitted also in the lower parts of the ship to strengthen the longitudinal frames. In the upper parts of the ship, these bands run across the protective armor, parallel to its upper edge and to the upper edge of the designed waterline, and are spaced between 0.60 and 0.65 meters. The lowermost longitudinal band is fitted close to the upper edge of the waterline strake, the uppermost band about 0.30 to 0.35 below the lower edge of the portlights, while the longitudinal bands in the raised section of the forward part of the ship also run parallel to the waterline and join the bend of the sheer strake.

It is impossible to give a detailed evaluation of the welding workmanship. Seen from the outside, the welding on SVERDLOV is not in conformity with the specifications of the former German Navy. It is believed that the shipyard which built SVERDLOV did not fully master the tensions occurring during the welding operations at the time of her construction, since the welding points on the inner side of the skin plating connecting the frames and longitudinal ties are all visible on the outside of the topsides and, in addition, flat dents clearly show the areas between the frames and the longitudinal bands (aside from such parts of the skin where, as, for example, in the after part of the ship, convexities conceal the weldings to a certain extent). The workmanship in the welding of [redacted] shows considerable progress in the technique of welding. It is, however, possible that the skin of the topsides of this ship is a little thinner to save weight, with the result that the skin was not strong enough to withstand the loads due to local tensions.

Ground Tackle, Boats, etc.

Ground Tackle.

The cruiser has two bow anchors and one stern anchor. The bow anchors are carried in hawse pipes fitted close to the stem and just under the edge of the foredeck which, however, were not fairlead hawses similar to those found on the latest ships of the German Navy. The cruiser had no fore-and-aft bow hawse. The capstans work in opposite directions and their entrance ports to the chain pipes are arranged one forward of the other (the starboard one being the foremost). The stoppers for each chain are fitted mid-way between the hawse pipe and the capstan.

The stern anchor fits into a recess in the middle of the round stern, and its capstan is only five meters forward of it.

Boats.

The motorboats are stowed on the roof of the deckhouse between the after mast and the forward smokestack and are hoisted out and in by a derrick on the after mast.

The lifeboats are carried in pairs of swing davits resting on neck bearings and fitted at each side of the ship aft of turret D. Conventional accommodation ladders are on each side abreast turret C. Life rafts are distributed over the midship section: One each placed on turrets B and C; another six stowed in pairs one on top of the other, aft of the after smokestack; and three rafts on each side of the ship on the deckhouse immediately aft of the bridge, one of them resting on a launching slope permitting the raft to slip instantaneously in case of "Man Overboard".

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Miscellaneous.

A protected look-out position fitted with a sheet iron bulwark, open at the rear side and permitting removal if necessary, is erected at the outermost end of the foredeck.

The upperdeck is planked all over and it was noted that the planks were laid in transverse tiers in short pieces, about 1½ meters long.

Armor Protection.

The armor protection, clearly visible at the waterline, is executed as a strengthened waterline strake which forms part of the girder system of the skin and extends from the forward edge of the screw guard to the forward edge of turret A in uniform width and thickness. Its upper edge lies about 2 meters above the designed waterline. Its thickness gradually tapers as was the case with ships of the German Navy and forms a broad transition into the normal outer skin overlying it. The lower edge is probably fitted in a similar manner.

The thickness of the waterline strake is estimated at not less than 50, and not over 80 millimeters, the small figure being more probable, considering the size, type and caliber of her main gun armament.

The waterline strake extends forward as far as the stem and forms a strengthened plate strake probably meant to serve more as an ice strengthening than as armor protection. Its thickness, apparently of not more than at best twice that of the normal skin thickness, is between 25 and 30 millimeters. The overlapping butt between the waterline strake and the aforementioned plate strake is a notable feature.

A normal skin plating butts on the after edge of the waterline strake. Local stiffenings presumed to be located only near permanently fixed propeller guards.

If the ship is fitted with an armored deck of similar design and make as found on the former German cruisers, its horizontal part would at least be level with the upper edge of the waterline strake, presumably a little lower (between 100 and 500 millimeters) than the waterline strake. In this case, the horizontal part of the armored deck would be between 25 millimeters and 30 millimeters thick, while the slopes would probably range between 40 and 50 millimeters.

The armor protection of the 15 cm gun turrets will not afford more than splinter protection. The thickness of the revolving turrets is supposed to range between 45 and 50 millimeters according to their positions, and the same seems to apply to the thickness of the barbettes or the reinforced cylindrical substructures of the turrets used instead of barbettes.

The armor protection of the conning and fire control stations is obviously copied from the modern German heavy cruisers. The old-type conning tower with its fairly thick walls seems to have been replaced by a number of rooms separated by splinter-proof walls. The foot of the tower-like mast is surrounded by a house made of splinter-proof material at the height of the unprotected steering position. Its width is about that of the tower-shaped mast extending, however, forward as far as the signal deck atop, while its after edge seems to be flush with that of the tower-shaped mast. This conning house is supposed to accommodate the conning staff in action.

The next story of the tower-mast with its round portlights is unprotected, as is also the signal deck level with it. It forms a small shelter fitted between the legs of the mast proper and serves to accommodate the personnel taking down signals. The next story is also made of splinter-proof material and fitted with eyeslit-like lookout openings in regular all-round arrangement. The next story, which is much broader, seems to be the main action station of the

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captain's or admiral's staff. It is fitted with a splinter-proof armor and has larger eye slits. An observation opening looking aft and fitted on each side forms a pyramid-shaped extension and seems to indicate that there is a partition wall in the interior of this house. - Atop the main action station is a large platform with well designed windscreen arrangements, which is probably used by the captain's or admiral's staff as long as no enemy counter-action is expected. Lookout men and action observers are also supposed to be posted there. The after part of the platform is bulkheaded off at each side and seems to house three target indicators and spotting gear on each side, but may well be used by the torpedo department. The middle of the platform accommodates the main fire control station. Its revolving hood probably consists of splinter-proof material 10 to 12 millimeters thick and offers certain protection from splinters. It is presumed that no heavier weight could be placed there.

Main Gun Armament.

The ship mounts four triple turrets with guns of an estimated caliber of 150 millimeters. The rear ends of the barrels seem to be rather thick and were burnished rather than painted in the latest ships. Turrets B and C are superimposed on turrets A and D respectively. The distances between the individual guns indicate that they are installed on single cradles and single mounts and thus can be elevated individually.

It is inferred from the height of the loop holes that the guns can be given an elevation exceeding 45 degrees or even as much as 60 degrees. This arrangement seems to indicate that the main armament is also intended to be used for antiaircraft defense, although the relatively heavy weight of the masses to be turned in these turrets is a serious handicap in antiaircraft firing. On the other hand, high-angle fire at shore targets, especially those under cover, must be taken into consideration.

It is believed that the gun-handling platform does not extend as far as the rear wall of the turrets, because each turret has a large 8-meter-base rangefinder at its rear wall. The result is that the breeches and the trunnions of the barrels are necessarily fitted rather closely to the frontal plates of the turrets, which is also necessary for the high elevation.

The barrel length is estimated at between 55 and 60 calibers assuring thus a high initial velocity (v_o). All turrets are accessible through doors in the rear wall, the superposed guns being fitted with an easily removable catwalk from the structure at its rear or a detachable ladder. The empty cartridge cases are probably removed by throwing them through openings fitted in the floor of the overhanging parts of each of the four towers. It is believed that the overhangs of turrets A and D are high enough above the deck to permit throwing out the empties in a horizontal position. It seems also possible to throw them out of flaps fitted in the rear wall.

Sighting slits are fitted in small hoods arranged at each side of the turret roofs at the points of extreme width. No sighting slits are visible in the front plates of the turrets. In addition, turrets B and C are fitted with cylindrical hoods with hemispherical tops about 0.7 meter in diameter and about 1.3 or 1.4 meters high, and placed on the right hand side abaft the middle of the roof. They are supposed to be radar devices, in which case the hoods would be made of ray-penetrable plastics and contain the dipoles.

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The flat and broad protective casings of the rangefinders in the turrets are notable features. Their cross sections seem to indicate that each instrument has two traces of rays, one being that of the rangefinding proper, while the other is probably used for stereoscopic spotting.

On the whole, the firing angle of the turrets is rather wide and with low elevations can be traversed as near as 20 degrees from the fore-and--aft line.

At these extreme traversing angles, however, the crews of the nearby AA guns must leave their stations.

Fire Control for Main Guns.

The fire control station on the forward tower mast and after fire control station are of identical design. Each houses two superposed staggered rangefinders with an estimated 8-meter-base and a direction--indicator sighting column. There are four sight slits fitted with flaps (deadlights) in the upper part of the fire control station, one looking forward, one looking aft and one each to port and to starboard; in the step below are two slits, one looking forward and one looking aft. It cannot be said whether these openings belong to special optical instruments. The two stations seem to house optical instruments only, and the general design of the fire contrd stations shows the characteristic features of Zeiss-made installations of this kind.

Antiaircraft Armament.

Heavy AA Guns.

Three twin-mounts with barrels of about 100 mm caliber and long protective shields are at each side of the ship. Their exterior shape seems to indicate that the gun mounts are stabilized and undoubtedly copied from German types. By enlarging the splinter-proof protection, which now protects the entire gun crew, forming a kind of AA-gun turret, the German design of 105 mm twin mounts was improved.

The trunnions of the barrels are fitted close to the rear side of the shields, leading to the conclusion that the length of the barrels is 60 calibers or upwards. The supporting cylinders are rather large in diameter and make it probable that ammunition is hoisted through these substructures. It is also believed that, although the trunnions are not arranged too far from the after edges of the supporting cylinders, the breeches enter the supporting cylinders at high elevations.

The elevation can be as much as 90 degrees; the firing height of the barrels is notable; it is estimated at about 2.2 meters. It seems probable that, following the German example, the breeches were made quite heavy to shorten the recoil distances as much as possible. It is also believed that the cartridges used are rather long, and thus a muzzle velocity of 950 meters per second, as with the German 105 mm AA gun, is probably reached.

Since the turret-like shields are closed at the rear, it seems rather certain that the ammunition hoists are fitted inside. There is reason for believing that the cartridges, with the shells pointing upwards, arrive in a vertical position, when they are grabbed by their heads by a swinging device and moved parallel to the fuse-setting machines, which are fitted to the breech, and follow the movement and finally roll into them.

Two large doors at the rear of the shields serve the purpose of throwing out the spent cartridge cases at low elevations, while at higher elevations the cases are dropped into the supporting cylinder. The gun crews enter the gun positions through lateral doors. Starting from the rear side, a narrow passage fitted with a rail runs along the two sides of the shield as far as the two doors at each side of the lateral shields in order to assure a safe access to outboard-side door even if the gun mount is in secured position.

The laying mechanisms of the gun mounts lie in the forward ends of the protective shields. A radar aiming device, fitted with hood with a cupola-shaped top similar to those fitted on the tops of the main turrets B and C, is installed on the right hand side. Their dimensions seem to be of similar size or only a little smaller than those of the main gun turrets. The hoods lean forward with their front faces at right angles to the roof of the shield. A hood with a square opening for optical laying gear is fitted on the left hand side. The space between the barrels and their arrangement in the protective shields as well as the shape of the latter show that the designs for the third axle (the leveling axle) were executed on the German model.

The training angles are excellent. On reaching a certain elevation and upwards, the two after mounts even permit firing across the fore-and-aft line, in which case, however, the two aftermost light AA gun positions must be evacuated.

AA Fire Control System.

A spherical AA fire control position with a small projection atop containing a radar device is installed at each side of the ship. The spheres on the cruisers proceeding to the Arctic Sea and on the ORDZHONIKIDZE had a radar mirror with dipols at their front assuring undoubtedly correct electric measurement of training or accurate determination of the relative bearing of targets. No reflector for measuring altitudes was seen. The built-in optical rangefinder had an estimated basis of 3.5 meters. Each control station can sweep the spherical quarter of its own ship's side and, in addition, cross the fore-and-aft line to the opposite side up to an intersecting angle of about 40 degrees. In this case, however, partial hinderances due to the after mast and the after smokestack must be considered.

These stations are obviously exact copies of the German Gema-Zeiss designs. Their existence indicates that the entire heavy AA gun armament is fitted with automatic gyro-stabilization.

Medium AA Guns.

The medium AA gun armament consists of eight mounts at each side of the ship. Since each mount carries two 37-mm caliber barrels closely fitted in pairs, a total of 32 barrels of this caliber is aboard. The gun mounts have a cylindrical protective shield with no top protection and are entirely unroofed. No ammunition carrying facilities or special fire control arrangements are visible.

Light AA Guns.

The ship obviously carries no single-mount or multiple-mount light AA guns. This seems to indicate that, because of the poor effect of lighter calibers, medium-caliber AA guns with fully automatic operation (drum magazines or clip magazines) are deemed appropriate.

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Torpedo Armament.

A quintuple torpedo mount with a torpedo control for the torpedo gunner is fitted aft of AA fire control station at each ship's side. The general arrangement is probably influenced by German designs. The torpedoes have a caliber of 533 millimeters. It is believed that the spare torpedoes and the adjusting station are located under the waist. The torpedo control arrangement is supposed to be housed in the forward bridge structure.

Mines.

The mine tracks will permit a load of at least 200 mines. The four tracks on the after deck are connected by 2 cross tracks. The longitudinal tracks are arranged in pairs at each ship's side and join a launching way fitted in appropriate ports at the stern.

Radio and Radiolocation Equipment.

Antennas.

According to [redacted] the following 25X1

Antennas for Long-, Medium- and Shortwaves are available:

1. One long-wave antenna with five horizontal wires;

2. One stay between the masts with two separate antennas; one, a shortwave antenna, leads down between the foremast and the fore smokestack, while the other, a mediumwave antenna, is fitted aft of the forward smokestack with the lead-in between the two AA-fire control stations;

3. A cage antenna suspended from the port arm of the after antenna yard with a lead-down to the radio transmitting room;

4. Three V-shaped antennas, one each on the portside, on the starboard side, and forward of the mast-tower serving as mediumwave antennas.

The large number of antennas seems to indicate that the ship is well equipped with means of radio signal communication.

The antennas and their lead-down seem to indicate that the ship had three separate radio rooms. The after radio room situated close to the after smokestack seems to be of greatest importance, since both the extraordinarily large longwave antenna, the cage antenna, and several other antennas are led into this room.

VHF Antennas.

1. Rod (buggy whip) antennas

a.	Two each at each side of the fore top position	total 4
b.	two each at each side of the fore smokestack	total 4
c.	Two each at each side of the after smokestack	total 4
d.	Two at the after fire control station	total 2
e.	Aft of the after platform of the foremast	1
f.	One each at each yard arm	total 2
g.	At forward edge of platform of after mast	1

2. One wire antenna is attached to lower side forward of the platform of the military mast and leads to an arm fixed to the lower edge of the main conning station located below. 1

grand total: 19

It is possible that the antennas at the fore top position (a) and at the after position (d) serve gun firing purposes, whereas the other antennas are used for general signal communication. The large quantity of equipment leads to the conclusion that the transmission of communications both between vessels of the same group or squadron and the target spotters is effected exclusively by VHF transmission. Some of the antennas available are probably also used for shortwave transmission.

For nautical purposes, a cross-loop direction finder, a now outmoded Telefunken-D/F type, is fitted on the fore mast. The use of this outmoded type on a modern ship is rather striking since cross-loop antennas with goniometers are now in general use.

Direction Finders (D/F).

1. Radar Equipment: (Funkkenngeraet) (FuKG). Radar recognition set. An omnidirectional antenna of the shape used in the USA is fitted on each of the uppermost platforms of the two masts. It radiates all round the horizon and receives horizontally polarized rays.

2. Panoramic Gear. A narrow reflector is visible on the upper platform of the fore mast. This is probably the reflector of a standard-type marine radar, working on waves ranging between 3 and 9 centimeters.

3. Search Gears.

   a. A small reflector (fitted below the D/F loop), possibly a panorama radar scanner, with a broad blind angle at the rear side probably works in the decimeter range and is fitted on the fore mast.

   b. A parabolic reflector is on the upper platform of the after mast: It has several lines with 2 dipoles in the focus (decimeter wave). This gear seems to be the main antiaircraft search equipment and therefore can be trained horizontally and vertically.

4. Search Radar: (Radar Searching Gear) (FuMG). A comparatively broad reflector with a dipole is installed atop the platform of the tripod of each mast. It seems to be the target-searching instrument for the main gun armament. The low position of the reflectors in this case is considered sufficient, because they are required only to sweep the area within the range of the guns. Panorama gears are not required and it is therefore not necessary to train the reflectors all round the horizon.

5. Cylindrical, domed, and enclosed hoods are fitted on the superimposed turrets of the main guns as well as on all mountings of the heavy AA guns. The latter have a forward inclination of their axis of between 15 and 20 degrees because they are vertically installed on covering plates of the turrets and the shields. They are probably made of plastic which permits the passage of rays and are supposed to house an electric aiming and measuring device.

6. The purpose which the Yagi-type antennas on the fore mast and the after mast are serving cannot be positively determined. It may be a vertically polarized radar device working in the decimeter range (about 50 centimeters), but may be as well a VHF direction finder. It is most improbable that it is used as a long-base device in which the similar gears on the fore mast and the after mast work together.

Distinguishing Characteristics.

The individual characteristics of the SVERDLOV Class cruisers were stated to be as follows:

1. General features:

All ships detailed for good will state visits abroad have white bulwarks and white canvas covers for their guns and other equipment, whereas the ships serving in the Arctic waters have gray covers and tarpaulins, etc.

2. Peculiarities of individual ships.

a. 1. ŻDANOV. The platform with two twin-barreled 37 mm AA guns at the after end of the forward smokestack is mounted one deck height lower than on SVERDLOV and ORDŻHONIKIDZE.

2. The spherical AA fire control stations are each fitted with a horizontal radar reflector.

b. ORDŻHONIKIDZE.

1. A bracket projecting far forward and carrying an additional radar reflector is mounted above the bridge at the mast tower.

2. Inside the tripod of the after mast is a third platform about one deck height lower than the hood of the smokestack.

3. An inclined black surface is fitted below the crow's nest on the after mast.

4. See a. 2.

Opinion.

This type of cruiser gives a well balanced impression in general, and war experiences have been turned to account to a large extent. It is, however, noticed that torpedo armament has not been given up as it could at best be of value when attacking enemy convoys. The type does not seem to be intended for ocean work, as it lacks certain ocean-going qualities, and the Soviet Navy has no aircraft carriers or suitable fast auxiliary vessels for operations in the open sea. It is therefore supposed that this type of cruiser is mainly intended for strategic-defensive tasks in the Baltic and in the Arctic Sea and, in addition, to be used in cooperation with land forces. This would also account for the quality of equipment of the main artillery with optical instruments for range-finding, gun laying and spotting. The numerous aiming devices the fire control stations and the turrets are equipped with, including possibility of using the individual turrets against separate targets, constitute an arrangement which is of particular value for shelling shore targets. The possibility of giving the barrels high elevations makes possible high-angle firing ranging from 45 to 90 degrees. The large number of VHF antennas finally indicates that they are needed for communications with the various spotters posted far away at sea or shore. The employment of the ship for such special missions with the particular order-transmitting and communication facilities they involve, demands most careful instruction and training.

Radio and Radar Arrangement on Cruiser SVERDLOV

Legend.

Einzelne Peitschen-Antenne	Single rod antenna
Peitschen-Antenne an Stb.u.Bb.	Two rod antennas, one each starboard and port
Panorama-Gerset f. Navigation	Panorama device for navigational purposes
FuMG an Stb.	Recognition radar on starboard
FuMG (Sende u. Empfg.)	Recognition radar transceiver
Hauptgerset f.ger.Seitenpeilg.	Main gear for relative bearing
F. Sprechfunk	For voice radio
5fach Langw.	Five long-wave wires
Peilrahmen mit Richtungsantenne	D/F hoop with directional antenna
FuMG	Radar
FuMG f. H.A.	Radar for high-angle firing
Funkgah Bb. Nock	Radio yard, port arm
FuMB, ca. 40 cm Dipol	Observation radar, about 40 cm dipole
Kaefig Mittelw. Bb.	Cage antenna for medium-wave (port side)
Kurzw.	Short-wave
Mittelw.	Medium-wave
Kurzw. Stb.	Short-wave (starboard)
Langw.	Long-wave
Y-Antenne vorn	Forward Y-antenna
Y-Antenne a. Stb. u. Bb.	Two Y-antennas, one each port and starboard
UKW-Antenne	VHF antenna
Kaefig	Cage antenna
Kurzwelle	Short-wave
Langwelle	Long-wave