

22171



National
Foreign
Assessment
Center

~~Secret~~

CIAISW

81-10058

Characteristics of the Kirov Nuclear-Powered Guided-Missile Cruiser

An Intelligence Assessment

**CIA HISTORICAL REVIEW PROGRAM
RELEASE AS SANITIZED
1999**

~~Secret~~

NF 81-10058
June 1981

COPY

Warning Notice

Intelligence Sources
and Methods Involved
(WNINTEL)

National Security
Information

Unauthorized Disclosure
Subject to Criminal Sanctions

Dissemination Control
Abbreviations

NOFORN (NF)

Not releasable to foreign nationals

NOCONTRACT (NC)

Not releasable to contractors or contractor, consultants

PROPIN (PP)

Caution - proprietary information involved

NEBONLY (NO)

NEB departments only

ORCON (OC)

Dissemination and extraction of information
controlled by originator

RFI

This information has been authorized for release to

IGI

Foreign government information

A microfiche copy of this document is available from OICR,
DSB (CSI-2133); printed copies
from OCO-IDC D (SI-5203).

Derivative classification &
Review 20 years from date
Derived from H9c.6.4

Regular receipt of NEAC
reports in either microfiche
or printed form can also be
arranged through OCO-IDC D.

All material on this page
is unclassified.



National
Foreign
Assessment
Center

~~Secret~~

Characteristics of the Kirov Nuclear-Powered Guided-Missile Cruiser

An Intelligence Assessment

*Information available as of 1 June 1981
has been used in the preparation of this report.*

This report was prepared by

_____ of the Office of
Scientific and Weapons Research, _____ of
the Office of Strategic Research and _____
_____ of the Office of Imagery Analysis. This
report was coordinated with the Offices of
Strategic Research and Imagery Analysis and with
the National Intelligence Officers for General
Purpose Forces and Strategic Programs. Comments
and queries are welcome and should be directed to

OSWR.

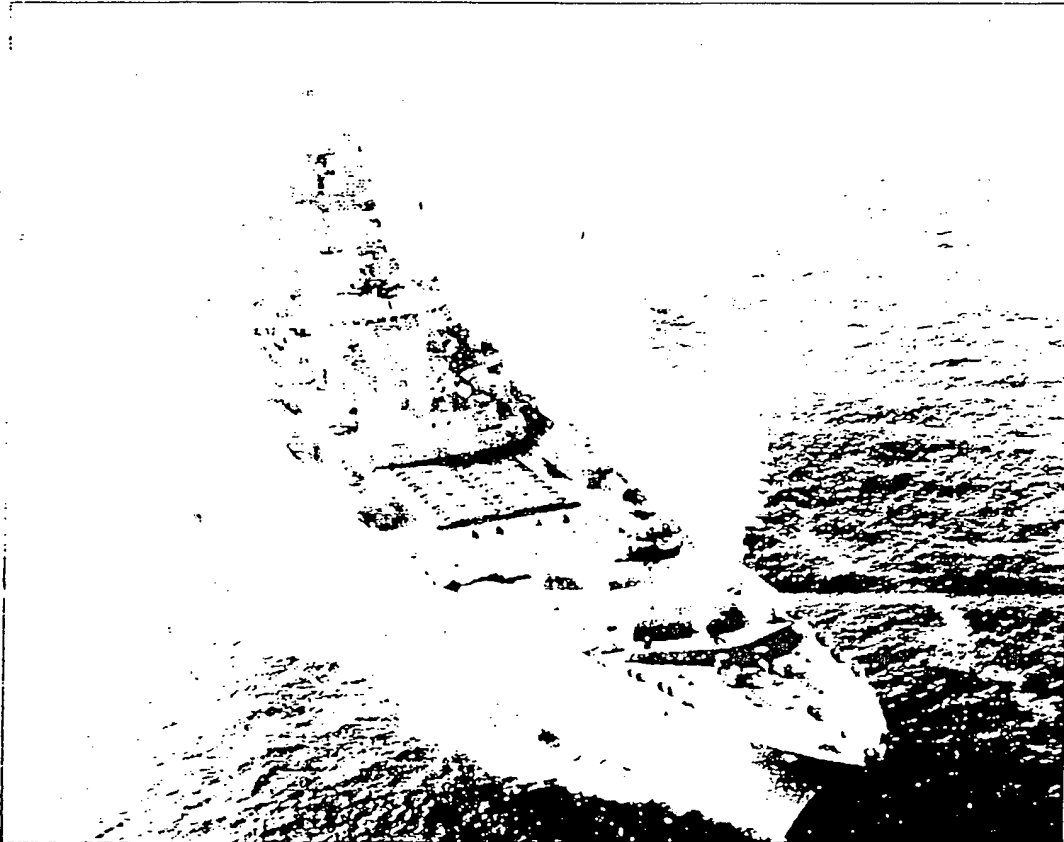
~~Secret~~

SWSI-10055
June 1981

~~Secret~~

Figure 1

Top View of the Kirov Nuclear-Powered Guided-Missile Cruiser



~~Secret~~

Characteristics of the Kirov Nuclear-Powered Guided-Missile Cruiser

Overview

The USSR's first nuclear-powered surface warship, the Kirov guided-missile cruiser, carries an array of weapons that makes it one of the most powerfully armed surface warships in the world (figure 1). It completed sea trials in the Baltic in summer 1980. A second ship of the class recently has been launched and may become operational in 1983 or 1984.

Equipped with a variety of weapons systems and an extensive communications suite, the Kirov is a multipurpose ship. Among its major wartime roles probably would be participation in Soviet efforts to establish control of ocean areas such as the Norwegian Sea. Such control would be sought primarily as a means of protecting Soviet territory and Soviet nuclear-powered ballistic missile submarine patrol areas. Kirov-class ships probably also will be used in peacetime "naval presence" operations in areas such as the Mediterranean Sea and the Indian Ocean.

The Kirov displaces 23,000 to 24,000 metric tons and has an estimated maximum speed of 32 to 33 knots. We believe it has excellent maneuvering capabilities []

The propulsion system probably is composed of twin nuclear reactors and probably has a fuel-oil-fired superheater for boost power. The superheater is a source of potential vulnerability because heat from the exhaust stack increases the chance of detection by antiship weapons using an infrared seeker. The nuclear propulsion plant gives the Kirov class the capability to remain at sea for extended periods of time. Even if the fuel for the superheater were exhausted, ships of this class would still be able to make an estimated 29 knots using only the nuclear plant.

The Kirov is the first surface ship to carry the SS-NX-19 antiship cruise missile system. The SS-NX-19 has demonstrated an effective range of about 500 kilometers (km). The Kirov also carries the SA-N-4 and the new SA-NX-6 missile systems (the latter is the naval version of the land-based SA-10). The combination of the SA-NX-6 and SA-N-4 systems and Gatling guns provides a defense against aircraft from the ship outward to a maximum range of 100 km and probably from target altitudes of about 15 to 30 meters to more than 27 km. The Kirov, therefore, is the first Soviet warship that can effectively defend a task force against aircraft. We believe that the air defense system will have difficulties defending the ship against small,

~~Secret~~

low-flying targets such as the Harpoon antiship missile. However, the second ship of the class will have a new weapon system. This may be an anti-air weapon to replace the SA-N-4. If so, it may be intended to provide improved defense against antiship missiles.

The Kirov also has been designed for sustained operations under wartime conditions. It carries 20 SS-NX-19 missiles, each in its own launcher. It carries up to 96 SA-NX-6 missiles in 12 launchers and 40 SA-N-4 missiles in two launchers. The Kirov also carries the first reloadable SS-N-14 antisubmarine cruise missile launcher. The ship has two reloadable launch tubes, having a reload capacity for up to 20 SS-N-14 missiles, more than twice the number of this missile carried by other Soviet warships.

The Kirov has two new sonar systems. One is a large variable depth towed sonar, the other is a large bow-mounted sonar. [

] Like other Soviet warships, the Kirov probably would have difficulty in detecting hostile submarines before they begin an attack.

The Kirov has an extensive electronics suite for command, control, and communications; for electronic countermeasures (ECM); and for electronic support measures (ESM). This suite is similar to that of the Kiev-class guided-missile vertical takeoff and landing aircraft carriers and indicates that the Kirov-class ships will have a major command, control, and communications role in providing operational and tactical control in naval operations. The ESM/ECM suite on the Kirov is similar to those on other Soviet naval ships and does not appear to improve significantly its ESM/ECM capabilities over those of other Soviet surface combatants.

~~Secret~~

Contents

Overview	<i>Page</i>
Introduction	iii
Ship Systems	1
Armament	1
Antiship Weapons	2
Antisubmarine Weapons	2
Antiair Weapons	2
Command, Control, and Communications	5
Missions	5
	6

Figures		
<hr/>		
1.	Top View of the Kirov Nuclear-Powered Guided-Missile Cruiser	ii
2.	The Kirov Cruiser: Ship Characteristics and Weapons	3

Characteristics of the Kirov Nuclear-Powered Guided-Missile Cruiser

Introduction

The Kirov nuclear-powered guided-missile cruiser (CGN) was laid down at the Baltic Shipyard 189 in Leningrad in 1973 (figure 2). It was launched in late 1977 and began sea trials in spring 1980. The second ship of the class, laid down immediately following the launch of the first, recently has been launched and may become operational in 1983 or 1984. The missile armament of the second ship may be different from that of the first, and larger caliber guns will be installed. We do not know yet how many, if any, additional ships of this class may be built.

Ship Systems

The Kirov CGN is 248 meters in length and displaces 23,000 to 24,000 metric tons. We estimate that the propulsion plant provides about 60,000 shaft horsepower to each of the two screws, which will drive the ship up to 33 knots. The propeller revolutions per minute at maximum speed is estimated to be about 200 rpm, typical for a twin-screw ship of this size and configuration.

The propulsion system, probably similar to the type used on the Arktika-class icebreaker, is composed of twin nuclear reactors that are augmented by a fuel-oil-fired superheater. The reactors probably supply about 36,000 shaft horsepower to each screw. Preliminary analysis indicates the superheater probably supplies an additional 24,000 shaft horsepower to each screw. This type of propulsion plant probably was selected because of a military requirement for the ship to make 32 to 33 knots. However, the only available surface ship nuclear plants (used in the Arktika-class icebreakers) would provide only enough power to make about 28 to 29 knots.

The disadvantage of this propulsion system is the high-thermal signature of the exhaust stack for the superheater, which increases the vulnerability of the ship to heat-seeking weapons when the boost power is in use.

Although it does not alleviate the need for other logistical support, nuclear propulsion provides a virtually unlimited capability to operate without refueling. Nuclear power also provides the Kirov CGN with the ability to sustain a high speed for long periods of time. The limiting factor for maximum high-speed endurance is the amount of fuel oil carried for the superheater.

The Kirov CGN has the same general hull form as previous Soviet warships. This hull form contributes to good seakeeping and stability characteristics. However, the extensive metal working, such as plate bending, makes the hull expensive to build. The increased analysis during design also probably adds to the expense.

Σ

3

~~Secret~~

[

]

Armament

Antiship Weapons. The primary antiship weapon on the Kirov CGNs is the SS-NX-19 antiship cruise missile system, which has demonstrated an effective range of about 500 km. It also may have a very limited capability against coastal targets. The Kirov carries 20 missiles in nonreloadable launchers just forward of the bridge. The installation of the SS-NX-19 on the Kirov is the first, and thus far only, installation of this missile on a surface ship. The only other SS-NX-19 installation to date is on the new O-class cruise missile submarine launched at the Severodvinsk shipyard in spring 1980. The SS-NX-19 improves the capabilities of the Kirov in antiship warfare (ASuW) over that provided by older Soviet weapons such as the SS-N-12.

[

Pre-launch targeting information is provided by over-the-horizon targeting sources such as helicopters, ocean surveillance satellites, and land-based patrol aircraft.

The Kirov also has a pair of multipurpose 100-mm naval guns that are effective to a range of about 12 km. These guns may be used for both antiaircraft and antiship warfare.

Antisubmarine Weapons. The primary antisubmarine warfare (ASW) weapon system of the Kirov is the SS-N-14 antisubmarine cruise missile system. The SS-N-14 missile has a range of 55 km and is fired from a twin-tube reloadable launcher located in the bow. There are up to 20 missiles in the magazine. The Kirov CGN is the first Soviet surface warship to have a

The second ship of the class probably will carry two 130-mm guns.

reloadable ASW missile system, and thus has an improved capability to sustain ASW operations. (The SS-N-14 also may be usable against surface ships.) KA-25/Hormone A helicopters are commonly used for targeting the missile system. We estimate three to five such Hormone helicopters may be carried in a below-decks hanger located near the stern. The Hormone helicopters also carry dipping sonar and sonobuoys to assist in the localization of submarines. The second ship of the class may carry nonreloadable SS-N-14 launchers similar to the installations on previous Soviet warships.

The Kirov CGNs also are equipped with up to 10 torpedo tubes. These are located behind shutters on each side of the hull. The torpedoes carried probably are a mix of ASW and ASuW torpedoes. We do not know how many reloads are carried.

Further antisubmarine capability is provided by three ASW rocket launcher systems (RBUs). One RBU system of 12 automatically reloading launchers is on the bow. It has a range of 6 km. Two additional RBU systems are located beside the after superstructure. These systems have six automatically reloading launchers each. The rockets have a range of 1 km.

We believe the sonars of the Kirov CGN have little improvement over other currently deployed Soviet sonar systems. The ASW sensors on the Kirov include not only the dipping sonar on the helicopters but a new variable depth towed sonar (VDS) and a large bow-mounted sonar.

~~Secret~~

Figure 2

The Kirov Cruiser: Ship Characteristics and Weapons

Ship Characteristics (dimensions in meters)

Length overall	248
Length waterline	220
Beam maximum	28.1
Beam waterline	23.8
Draft	8.0 (estimated)
Displacement	23,000 to 24,000 metric tons
Number of propellers	Two
Diameter of propellers	6.5 to 6.8 (estimated)
Type of propulsion system	Twin pressurized-water nuclear reactors (Arktika type) with fossil fuel superheater
Maximum rating of power plant	120,000 shaft horsepower (approximate) 72,000 shp from reactors 48,000 shp from superheaters
Maximum ship speed	32.33 knots (estimated) 29 knots when operating on nuclear power alone (estimated)
Propeller rpm at maximum speed	190-210 rpm (estimated)

Weapons

Weapon system	Primary Purpose
SS-N-14 [*]	Anti-air warfare
SS-N-14	Antisubmarine warfare (ASW)
SA-N-4 [*]	Anti-air warfare (AAW)
SA-N-4 [*]	AAW
100 mm guns [*]	AAW, ASuW
Gatling guns	AAW
RBU (short-range rockets)	ASW
Torpedoes	ASW, ASuW

* First ship, second ship possibly will have a different armament.
* First ship, second ship will be armed with 100 mm guns.

Weapons

Weapon system	Primary Purpose	Launchers/Magazines	Effective Range	Associated Sensors
SS-N-7 ²	Antisurface warfare (ASuW)	20 launchers/30 magazines	500 km	None known satellite targeting received by Punch Bow antenna; target data also received from aircraft and helicopter
SS-N-14	Antisubmarine warfare (ASW)	1 twin tube launcher up to 20 missiles in the magazine	55 km	Targeting provided by VDS or dipping sonar from Hornet helicopter. Command guidance provided by Eye Bow radar
SA-N-6 ³	Air warfare (AAW)	12 launchers each with up to 8 reloads	10-100 km	Top Dome radar
SA-N-4 ⁴	AAW	Two launchers/20 missile magazine	2-10 km	Pop Group radar
100 mm guns ⁵	AAW, ASuW	Two guns	12 km	Kite Screech radar
Gatling guns	AAW	Four pairs	2.5 km	Base Tilt radar
RBU (short-range) rockets	ASW	Three	6 km	Sonar
Torpedoes	ASW, ASuW	Two sets of five tubes	17 km	Sonar

² First ship; second ship possibly will have a different, new type AAW weapon
³ First ship; second ship will be armed with 130-mm guns

BLANK PAGE

The VDS is housed in a well in the stern of the ship.

The second ship of the class has positions for 16 launchers for a new weapon system. It is possible this ship will not have the SA-N-4 SAM. The new weapon may be a new short-range SAM intended to replace the SA-N-4. It may be intended to improve the ship's defenses against low-altitude small radar cross-section antiship missiles.

The Kirov carries up to 96 SA-NX-6 missiles in magazines below the 12 launch positions. This large magazine improves the AAW sustainability of the Kirov class over previous Soviet warships. The Kirov carries two SA-N-4 launchers, each with a 20 missile magazine.

Command, Control, and Communications

We believe the Kirov CGN will have a major command, control, and communications (C³) role in the Soviet navy. It is possible that, among the various missions for the Kirov-class ships, they are intended to replace the two Sverdlov-class cruisers that were modified for C³ in the mid-1960s and early 1970s. These cruisers were built in the early 1950s and are certainly near the end of their useful lives.

Anti-air Weapons. The anti-air warfare (AAW) capability of the Kirov CGN will be provided by the new SA-NX-6 surface-to-air missile system (SAM), the naval version of the land based SA-10) and the SA-N-4 SAMs, complemented by Gatling guns. The missile and gun systems combine to provide all-round coverage against aircraft from the ship outward to a maximum slant range of 100 km and probably from target altitudes of about 15 to 30 meters to more than 27 km in altitude. It is probable that the 100-mm guns can also be used for anti-air warfare.

The electronics suite on the Kirov is more extensive than that on other Soviet surface ships. Typical of these ships is the large amount of communications equipment intended to ensure survivable and reliable communications; the extensive gear for electronic countermeasures, electronic support measures, and electronic counter countermeasures; and the inclusion of ship-to-ship data links such as Bell Crown. Additionally, there is a proliferation of satellite-associated equipments as evidenced by several Pert Spring and Prim Wheel antenna installations and new multiband long-range antennas, such as the V-tube series.

Defense against antiship missiles such as the Harpoon may only be possible with the gun systems. Small radar cross-section antiship missiles at altitudes below about 30 meters may cause severe guidance and possibly fuzing problems for both the SA-N-4 and SA-NX-6 systems. Because of this, they may not yet provide a reliable low-altitude defense.

The communications equipment aboard the Kirov is intended not only to ensure reliable long-range communications at broadcast frequencies but also to ensure reliable close-in communications through the use of a large number of VHF/UHF systems. These communications systems increase the effectiveness of ships like the Kirov in task force and other close

~~Secret~~

coordinated operations where each individual ship is subordinated to an on-site officer in tactical command. Moreover, although the addition of a navigation satellite capability serves to improve the efficiency of general operations, it also allows the actual position of the ship—as opposed to only a relative position—to be passed over a data link included in automated battle management systems. The communications systems, data link, and satellite equipment on the Kirov are similar to the system deployed on the earlier Sverdlov-class command and control cruisers. The electronics suite on the Kirov is, therefore, indicative of a probable task-force-related command and control role.

Missions

Among the major wartime roles of the Kirov probably would be participation in Soviet efforts to establish control of ocean areas such as the Norwegian Sea. Such control would be sought primarily to protect Soviet territory and SSBN patrol areas. The Kirov, with its varied weapons systems and extensive communications suite, could participate directly in operations against Western surface ships and submarines, as well as coordinate the activities of other Soviet units. The ability of the Kirov to operate successfully in such an environment would be reduced, if as we suspect its AAW capability against low-altitude cruise missiles and its ability to locate Western submarines are poor.

During peacetime, Kirov probably also will be used in both routine and crisis reaction operations in areas such as the Mediterranean and the Indian Ocean. As a large heavily armed ship, it would serve as an example of modern Soviet naval technology and military power. As such it will be useful in "show-the-flag" missions.

~~Secret~~