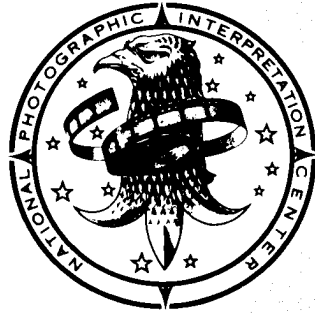


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PHOTOGRAPHIC
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REPORT

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**SOVIET TARGET BARGE
ACTIVITY AT FEODOSIYA
NAVAL BASE AND SHIP
REPAIR YARD AND
SEVERODVINSK
NAVAL BASE WEST (TSR)**



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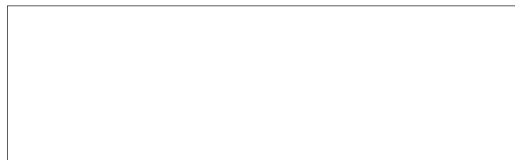
MARCH 1978

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SOVIET TARGET BARGE ACTIVITY AT FEODOSIYA NAVAL BASE & SHIP REPAIR YARD AND SEVERODVINSK NAVAL BASE WEST (TSR)

INTRODUCTION

1. (TSR) The Soviet Union uses target barges in support of a variety of research, development, testing, and evaluation (RDT&E) roles for gunnery and missile test firings. This report describes the physical characteristics of target barges generally seen in the Soviet Union. Specifically, it discusses barges at Feodosiya Naval Base and Ship Repair Yard [redacted] and Severodvinsk Naval Base West [redacted]—facilities associated with missile RDT&E in the Black and White Sea areas. This report also contains a chronology of target barge activity at these facilities. The term target barge as used here is a generic term and includes both floating targets (YGTN), which are not self propelled, and target service craft and ships (YAGT and AGT), which are self propelled. Technically the YAGTs and AGTs are not barges but for the sake of simplicity they will be referred to as barges in this report.

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SUMMARY

2. (TSR) Target barges at most naval installations in the Soviet Union are used for routine crew training and the maintenance of an operationally capable fleet, but barges at Feodosiya and Severodvinsk are used primarily for supporting the development and testing of new or modified naval missiles. A historical study of imagery of these barges indicates Feodosiya has had the capability to test missiles with infrared sensors since 1966. Moreover, the recent appearance of two additional heat-generating target barges at Feodosiya suggests that preparations are underway for testing a new or modified missile with an infrared homing guidance system (heat-seeking missile). A chronology of the movement of the barges at both facilities is provided in Tables 1 and 2.

DISCUSSION

3. (TSR) Target barges are in all four Soviet fleets and in the Caspian Sea Flotilla. The barges are used to support both RDT&E and operational gunnery and missile test firings. To provide the required support, various types of barges are used and can be divided into two broad categories—towed and self propelled. Towed target barges may be modified merchant ships or may be constructed from the keel up as target barges. Modified merchant ships are used mainly in the Caspian Sea and in the Pacific Fleet as targets for air-to-surface missiles (ASMs). They are usually permanently moored or beached and routinely sustain damage from missile impacts. Barges that are built from the keel up appear in one of two hull forms—catamaran or single hull. Catamarans vary in length from 25 to 69 meters and

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carry metal screens and radar reflectors to provide radar signatures for fire control radars (Figure 1). Single-hulled barges (Figure 2) vary in length from 92 to 110 meters. Single-hulled barges carry not only screens and radar reflectors but sometimes heat generators. Barges equipped with heat generators serve as targets for missiles with heat-seeking guidance system.

4. (TSR) Most self-propelled target barges are modified P-6 (YAGT) and Osa (AGT) hulls. The P-6 hulls are older carft with all of the armament removed, whereas the Osa hulls (Figure 3) are constructed as targets. Both vessels carry radar reflectors, but only the Osa carries heat generators. When present at a base or complex, the self-propelled barges are usually berthed near the patrol boats where service facilities and parts are available and not with the towed targets. In addition to the P-6 and Osa hulls, obsolete T-301 and M-40 minesweepers have also been converted to self-propelled targets.

Feodosiya

5. (TSR) Towed target barges have been in use at Feodosiya (Figure 4) since at least 1964, and self-propelled target barges have been in use there since at least 1966. The towed barges include 25-, 38-, and 68-meter catamarans and two 105-meter, single-hulled barges. The catamarans are usually equipped with the customary metal screens and radar reflectors. The single-hulled barges carry not only screens and reflectors but heat generators as well. Heat generators were first seen on the 105-meter barges in July 1966, indicating that the Soviets have had the capability to test heat-seeking missiles in the Feodosiya area since that time.

6. (TSR) Two types of self-propelled target barges also have been seen at Feodosiya. One type, based on refitted P-6 hulls, was used between July 1966 and April 1976. It carried a circular array of radar reflectors called SHEET NEST. In March 1977 the other type of self-propelled target barge was seen for the first time. It was based on an Osa hull and was equipped with radar reflectors and two heat generators. It was seen at Feodosiya until November 1977. Also arriving at the facility in March 1977 was a new 105-meter towed target barge. It was initially seen at the operational area and was subsequently transferred to the outfitting quay. It remained there until completed in October 1977 when it was seen with a newly installed heat generator. Its completion coincided with the departure of the Osa-type target barge. The appearance of these two types of target barges equipped with heat generators and the subsequent activity surrounding their movements suggest the following: 1) the Soviets are involved in a test program of a new or modified missile with an infrared sensor; 2) the Osa target may have been involved in the early static testing of the seeker (this could have been accomplished by suspending the missile from the boom at Feodosiya Probable Naval Weapons R&D Facility-[REDACTED]) and running the target

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by the facility at various distances, angles, and speeds); and 3) the departure of the Osa target and the completion of the 105-meter barge may have represented the end of the preliminary work and the beginning of the flight-test phase.

7. (TSR) Target barge activity is listed in Table 1. The table separates the base into four areas: the YGTN operational area, the YGTN repair/outfitting area, the YGTN construction area, and the YAGT/AGT operational area.

Severodvinsk

8. (TSR) Target barges at Severodvinsk Naval Base West (Figure 5) probably support both sea-based testing of missile systems tested at Nenoksa Naval Missile Test Center [redacted] and crew firings involving new and overhauled surface ships and submarines. Barges at Severodvinsk are generally seen at the holding area or the outfitting quay. Occasionally they appear at Severodvinsk Shipyard Yagry Island [redacted] and at Arkhangelsk Naval Operating Base [redacted]

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9. (TSR) Since March 1966 only towed barges have been seen at Severodvinsk and they have included 39-, 50-, 51-, and 69-meter catamarans and [redacted] 110-meter single-hulled barges. Each of the three smaller catamarans was one of a kind and has not been seen at Severodvinsk for a number of years. The 69-, [redacted] and 110-meter barges continue to support missile test activity in the White Sea. An example of such support was seen [redacted] when the Kiev-class CVSG (guided-missile, antisubmarine-warfare aircraft carrier) *Kiev* (newly transferred to the area), was observed off Severodvinsk with blast marks aft of its SS-N-12 missile launch tubes. On the same day a 69-meter catamaran was seen damaged and separated into two sections. The appearance of the barge and the ship suggests that the *Kiev* had successfully fired the SS-N-12 against the barge [redacted] a TUB BRICK electronic countermeasures (ECM) van was observed in a mechanized landing craft at Severodvinsk Naval Base West, suggesting that it, too, may have been involved in the test exercise and that the SS-N-12 firing was conducted under active ECM conditions.

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10. (TSR) Other significant activity involving target barges was observed in late 1977. During September a barge carrying a SIDE NET radar, used in the SS-NX-13 missile test program, was transferred from Mys Mishukov near the Rosta Naval Base and Ship Repair Yard [redacted] to Severodvinsk. The following month a second barge was transferred from the same area to Severodvinsk. By January 1978 both barges had returned to Rosta. The reason for this activity is not clear. One explanation is that they were sent to Severodvinsk to participate in a test program that was either cancelled or postponed.

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11. (TSR) Table 2 provides a chronology of activity at Severodvinsk and Arkhangelsk [redacted]

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Table 1. Target Barge Chronology at the Feodosiya Naval Base and Ship Repair Yard, USSR, [redacted]

This table in its entirety is classified TOP SECRET RUFF

YGTN Areas										YAGT/AGT Area		Comments
Operational (Moored)				Repair/Outfitting				Construction		YAGT	AGT	
25 m	38 m	68 m	105 m	25 m	38 m	68 m	105 m	25 m	38 m			
			1									No detail
			1									No detail
			1									No detail
			1									No detail
		1	1									No detail
1	2		1				1					No detail
1	2		1/h							3		The 105-meter barge at the operational area is prob the one that was at the repair/outfitting area [redacted] it is equipped with a rectangular heat generator that is raised above the deck of the barge; the barge that was at the operational area [redacted] cannot be located
1	1		2							2		No detail
1	1		2							2		No detail
1	1		2/h							2		One of the 105-meter barges has 2 conical heat generators; the other has the rectangular heat generator
1	1		1									No detail
1	1		2									Neither the heat generators nor the radar reflectors on the P-6 YAGTs can be seen
			2									No detail; catamaran barges cannot be seen
1	1		2							NC		The 38-meter barge is outside the harbor; the presence of heat generators cannot be determined

*This table separates the naval base into four areas for reporting purposes; these are the areas where YGTNs are moored, repaired, and constructed; and the area where P-6 YAGTs and Osa AGTs are berthed. The barges are listed by length. YGTNs of 25, 38, and 68 meters are catamarans; these barges are equipped with metal screens and radar reflectors. The 105-meter barges also carry metal screens and radar reflectors and also can carry heat generators.

Legend: /a--probable, /h--heat generator present, NC--position not covered, /b--possible, CC--position cloud covered

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Table 1. (Continued)*
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Operational (Moored)				YGTN Areas				Construction		YAGT/AGT Area		Comments
25 m	38 m	68 m	105 m	25 m	38 m	68 m	105 m	25 m	38 m	YAGT	AGT	
1			2							2		Little detail; the confirmed 25-meter barge is outside the harbor
1/b			2							2		The 25-meter barge outside the harbor has been moved & cannot be located
1/b			2							2		No detail
1	1		1					1		2		One 105-meter barge may have a rectangular heat generator
			1/poss h									
2			1/h				1/h	1		2		The 105-meter barge at the operational area has 2 conical heat generators; this is the last observation of conical heat generators on a YGTN at Feodosiya; all other heat generators except for 2 on an Osa AGT in 1977 are the rectangular type
2			1							1		Heat generators cannot be seen
2			1/h							1		
2		1	2/prob h							2		This is the first observation of a 68-meter YGTN at Feodosiya
2		1	2/h							2		
2			1				1					The presence of heat generators cannot be determined
1			1		1		1					The presence of heat generators cannot be determined
2			2/prob h				1/h			1		
2			2/prob h				1/h			1		

*This table separates the naval base into four areas for reporting purposes; these are the areas where YGTNs are moored, repaired, and constructed; and the area where P-6 YAGTs and Osa AGTs are berthed. The barges are listed by length. YGTNs of 25, 38, and 68 meters are catamarans; these barges are equipped with metal screens and radar reflectors. The 105-meter barges also carry metal screens and radar reflectors and also can carry heat generators.

Legend: /a--probable, /h--heat generator present, NC--position not covered, /b--possible, CC--position cloud covered

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Table 1. (Continued)*
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	YGTN Areas						YAGT/AGT Area		Comments				
	Operational (Moored)				Repair/Outfitting		Construction						
	25 m	38 m	68 m	105 m	25 m	38 m	68 m	105 m	25 m	38 m	YAGT	AGT	
	1			1/h	1			1/h			1		The 105-meter barge from the operational area is being towed out of the harbor by an ocean tug
	1			1/h				1/h			2		The 105-meter barge at the operational area has a gash varying in width from 5.0 [redacted] meters extending across its deck; this is the barge that was being towed from the harbor [redacted]
	2		1	1/h				1/h					The damaged barge is at the repair/outfitting area
	2		1	1/h				1/h					The operational 105-meter barge is outside the harbor; it has a line attached to an ocean tug
	2		1	1/h			1	1/h					
	2		2	1/h				1/h					
	2		1	1/h			1						The damaged 105-meter YGTN cannot be located
	2		1	1			1						No detail
	2		1	1			1						Heat generators cannot be seen
	2		1	1			1						Heat generators cannot be seen
	2		1	1/h			1	1/h			1		
	2		1	2/h			1						
	2		1	2/h			1						
	2		1	2/h			1						
	2		1	2/h			1				1		
	2		1	2/h			1						

*This table separates the naval base into four areas for reporting purposes; these are the areas where YGTNs are moored, repaired, and constructed; and the area where P-6 YAGTs and Osa AGTs are berthed. The barges are listed by length. YGTNs of 25, 38, and 68 meters are catamarans; these barges are equipped with metal screens and radar reflectors. The 105-meter barges also carry metal screens and radar reflectors and also can carry heat generators.

Legend: /a--probable, /h--heat generator present, /NC--position not covered, /b--possible, /CC--position cloud covered

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Table 1. (Continued)*
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Operational (Moored)				YGTN Areas				YAGT/AGT Area		Comments		
25 m	38 m	68 m	105 m	25 m	38 m	68 m	105 m	25 m	38 m		YAGT	AGT
3		1	1/h			1	1			1		The 105-meter YGTN which was moved to the repair/outfitting area between July and September has a 5.0-meter-square section removed (the depth of the missing section extends to the waterline); the heat generator has been removed, but the fuel tank for the heat generator is still present
3		1	1/h			1	1			1		
3		1	1/h			1	1			1		
3		2	1/h				1					Last observation of damaged 105-meter YGTN
5		1	1/h			1				1		
4		2								1		
2			1/h					1				The SHEET NEST radar reflector array which is carried by the P-6 YAGT is on the quay at the YAGT area
2		2	1/h					2				Same [redacted]
2		2	1/h					2				Same [redacted] the 105-meter barge is being towed out of the harbor
3		2	1/h									Same as [redacted]
3		2	1/h									Same as [redacted]
2		2	1/h					1				
3		2	1/h							1		
3		2					1/h					CC
3		2					1/h					1

*This table separates the naval base into four areas for reporting purposes; these are the areas where YGTNs are moored, repaired, and constructed; and the area where P-6 YAGTs and Osa AGTs are berthed. The barges are listed by length. YGTNs of 25, 38, and 68 meters are catamarans; these barges are equipped with metal screens and radar reflectors. The 105-meter barges also carry metal screens and radar reflectors and also can carry heat generators.

Legend: /a—probable, /h—heat generator present, NC—position not covered, /b—possible, CC—position cloud covered

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Table 1. (Continued)*
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Operational (Moored)				YGTN Areas				Construction		YAGT/AGT Area		Comments
25 m	38 m	68 m	105 m	25 m	38 m	68 m	105 m	25 m	38 m	YAGT	AGT	
3		2					1/h	1		1		
3		2	1/h					1		1		
3		2	1/h					1		1		
3		2	1/h					1	1	1		
3		2	1/h						1	1		
3		2	1/h						1			
3		2	1/h						1	CC		
2		2			1							The reflector array on the P-6 YAGT cannot be seen
1	1	2					1/h			1		
1	1	2	1/h		1			1		1		
1	1	2	1/h	1	1				1			
2		3	1/h		1							
	1	2	1/h	1	1	1		1	1		1/h	This is the first sighting of an Osa AGT at this base; first observation of 2 105-meter barges [redacted]
			1									
1	1	2	1/h			1			1		1/h	
			1									
1	1	3	1/h						1		1/h	
			1									
1		3	1		1		1/h				1/h	
			1									
1		3	1/h		1		1/h		1		1/h	The 105-meter barge which was first observed [redacted] was moved to the repair/outfitting area between August and October; a heat generator has been installed

*This table separates the naval base into four areas for reporting purposes; these are the areas where YGTNs are moored, repaired, and constructed; and the area where P-6 YAGTs and Osa AGTs are berthed. The barges are listed by length. YGTNs of 25, 38, and 68 meters are catamarans; these barges are equipped with metal screens and radar reflectors. The 105-meter barges also carry metal screens and radar reflectors and also can carry heat generators.

Legend: /a—probable, /h—heat generator present, NC—position not covered, /b—possible, CC—position cloud covered

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Table 1. (Continued)*
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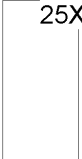
	YGTN Areas									YAGT/AGT Area		Comments	
	Operational (Moored)				Repair/Outfitting				Construction		YAGT		AGT
	25 m	38 m	68 m	105 m	25 m	38 m	68 m	105 m	25 m	38 m			
	1		3	1/h				1/h		1		1/h	
	1		3	1/h				1/h		1		1/h	
	1		2	1/h			1	1/h		1		1/h	The 68-meter catamaran at the repair/outfitting area has sustained damage to one hull
	1		2	1/h			1	1/h		1			
	1		2	1/h			1	1/h		1			

*This table separates the naval base into four areas for reporting purposes; these are the areas where YGTNs are moored, repaired, and constructed; and the area where P-6 YAGTs and Osa AGTs are berthed. The barges are listed by length. YGTNs of 25, 38, and 68 meters are catamarans; these barges are equipped with metal screens and radar reflectors. The 105-meter barges also carry metal screens and radar reflectors and also can carry heat generators.

Legend: /a--probable, /h--heat generator present, NC--position not covered, /b--possible, CC--position cloud covered

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Table 2. Target Barge Chronology at Severodvinsk and Arkhangelsk, USSR, [redacted]
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Severodvinsk						Arkhangelsk		Comments
Naval Base West				Yagri Island				
Outfitting Quay		Holding Area						
69 m	[redacted] 110 m	69 m	[redacted] 110 m	69 m	[redacted] 110 m	69 m	[redacted] 110 m	
	1/h		1	2		1/s		The barge at Arkhangelsk has a square platform extending over the stern; the barge with the heat generator has one conical heat generator
2		1	1/h	2		1/s		One of the 69-meter barges at Naval Base West has been severely damaged; only a 47-meter segment is still intact
2		1	1/h	2		1/s		Same [redacted]
CC				CC		NC		
3	1/h							An E-II SSGN (nuclear powered guided missile submarine) is at Naval Base West; the damaged section of barge has been moved and will no longer be reported
2	1	1				NC		
	1	1				NC		
			CC		CC	NC		
			2	1/h	1	NC		
				1/s		NC		
			2	1/h	1	NC		
				1/s				
			2	1/h	1	NC		
				1/s				
			2	1/s	1	NC		
			2	1/s	1			
			2	1/s	1			
			2	1/s	1			
			2	1/s	1			
			2	1/s	1			
			2	1/s	1			
			2	1/s	1			
			2	1/s	1			

*Barges are listed by length. The 69-meter barges are catamarans, and the [redacted] 110-meter barges are single hulled. Barges normally carry masts, screens, and radar reflectors.
 Legend: /h—heat generator, /s—square platform over stern, CC—position cloud covered, NC—position not covered, /d—damaged barge present, /r—SIDE NET radar.

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Table 2. Continued *
This table in its entirety is classified TOP SECRET RUFF

		Severodvinsk				Arkhangelsk				Comments
		Naval Base West		Yagri Island						
Outfitting Quay	Holding Area	69 m	110 m	69 m	110 m	69 m	110 m	69 m	110 m	
3				1/s 1/h	1					The barge with the heat generator uses a raised, rectangular heat generator
1				1/s 1/h	1					An E-II SSGN is at Naval Base West
CC CC				1	1			CC NC		
	1/h			1	1/d			CC		The Kiev-class CVSG <i>Kiev</i> is off Severodvinsk at 64-45-01N, 039-14-05E; blast marks are evident aft of the SS-N-12 launchers, and a 69-meter barge has sustained severe damage; the barge is separated into two sections; a TUB BRICK ECM van in a mechanized landing craft at Naval Base West prob was used in conjunction with the missile firing operation; in addition, a Kresta-II CG (guided missile cruiser) and a C-II SSGN are at Naval Base West
				1	1/d			NC		A Kresta-II CG and a C-II SSGN are at Naval Base West
				1	1/d			NC		
				1/h 1/d	1/s			NC		A C-II SSGN is at Naval Base West
				2	1/h	1		NC		
				1/d	1/s			NC		
1	1/h			1	1/d	1		NC		A Kresta-I CG, the <i>Vitse-Admiral Drozd</i> , is at Naval Base West; the barge with the heat generator has [redacted] circular opening in its deck
1	1/h	1		1	1/d			NC		Same [redacted]

*Barges are listed by length. The 69-meter barges are catamarans, and the [redacted] 10-meter barges are single hulled. Barges normally carry masts, screens, and radar reflectors.
Legend: /h—heat generator, /s—square platform over stern, CC—position cloud covered, NC—position not covered, /d—damaged barge present, /r—SIDE NET radar.

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Table 2. Continued*
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Severodvinsk					Arkhangelsk			Comments
Naval Base West				Yagri Island				
Outfitting Quay		Holding Area		69 m	110 m	69 m	110 m	
1	1/h					1/s		The barge at Arkhangelsk is in a floating dry dock; smoke is rising from the [] circular opening in the deck of the [] barge at the outfitting quay
	1/h	2	1			1/s		The barge at Arkhangelsk has been removed from the floating dry dock; the [] barge at the outfitting quay is covered with snow; no damage or openings are visible
			1/s	1			NC	
			1/s	1			NC	
		2,1/d	1/s	1			NC	
		2,1/d	1/s	1			NC	
		2,1/d	1/s	1			NC	
1		2,1/d	1/s	1			NC	
		1	1/s	1			NC	
		1/d					NC	
		2	1/s	1			NC	
		1/d					NC	
1 (at least)		CC					NC	
1 (at least)		1/d	1/s	1			NC	
1		1,1/d		1			NC	The damaged 69-meter barge is not present and has prob been taken Arkhangelsk
		1,1/d		1				
		1,1/d		1				
		1,1/d		1				
		1,1/d		1				
1				1	1			An E-II SSGN is at Naval Base West; the damaged 69-meter barge is in a floating dry dock at Arkhangelsk
NC	1	2					NC	An E-II SSGN is at Naval Base West
			NC		NC		NC	A [] barge is in Cheskaya Bay at 67-24-00N, 046-43-05E; a Kresta-II CG is to the south of the barge

*Barges are listed by length. The 69-meter barges are catamarans, and the [] 110-meter barges are single hulled. Barges normally carry masts, screens, and radar reflectors.
Legend: h—heat generator, s—square platform over stern, CC—position cloud covered, NC—position not covered, d—damaged barge present, r—SIDE NET radar.

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Table 2. Continued *
This table in its entirety is classified TOP SECRET RUFF

Severodvinsk										Comments
Naval Base West					Yagri Island			Arkhangelsk		
Outfitting Quay		Holding Area								
69 m	110 m	69 m	110 m	69 m	110 m	69 m	110 m			
NC		NC		NC		NC		NC		The 110-meter barge from Severodvinsk is in the northwest White Sea at 66-06-17N, 035-14-29E
			1	1				NC		The barge at Yagri Island is on the ledge of the wet basin
			1	1				NC		A J-SSG (guided missile submarine) is at Naval Base West
			1	1				NC		The barge at Yagri Island is in the water; the J-SSG remains at Naval Base West
			1	1				NC		Same as 30 Jul
CC			1	1				NC		The Kresta-I CG <i>Vitse-Admiral Drozd</i> is at Naval Base West
CC			1					NC		Same as 7 Aug
		NC						NC		Same as 7 Aug
1		1			CC			NC		Same as 7 Aug
		1						NC		Two J-SSGs, a C-I SSGN, and the Kresta-I CG <i>Vitse-Admiral Drozd</i> are at Naval Base West
		1			1			NC		The barge at Yagri Island is on the ledge of the wet basin; the 2 J-SSGs, the C-I SSGN, and the Kresta-I CG remain at Naval Base West
1		1			1	1				An E-II SSGN and the Kresta-I are at Naval Base West
CC		1			1			NC		The Kresta-I is at Naval Base West
CC			1		1			NC		Heavy cloud cover precludes a complete readout
1		1/r			1			NC		The Kresta-I CG is at Naval Base West; the barge with the SIDE NET radar was observed being towed out of the Kola Inlet on 4 Sep

*Barges are listed by length. The 69-meter barges are catamarans, and the 110-meter barges are single hulled. Barges normally carry masts, screens, and radar reflectors.
Legend: /h—heat generator, /s—square platform over stern, CC—position cloud covered, NC—position not covered, /d—damaged barge present, /r—SIDE NET radar.

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Table 2. Continued*
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		Severodvinsk				Arkhangelsk		Comments
		Naval Base West		Yagri Island				
Outfitting Quay	Holding Area	69 m	110 m	69 m	110 m	69 m	110 m	
				1				NC
				1/r				NC
				1		1		NC
				1/r				NC
CC				1		1		NC
				1/r				NC
				1		1		NC
				1/r				NC
				1		1		NC
				1/r				NC
1/h				1		1		NC
				1/r				NC
				1		1		NC
				1/r				NC
				1/h				NC
				1		1		NC
				1/r				NC
				1/h				NC

*Barges are listed by length. The 69-meter barges are catamarans, and the [redacted] 110-meter barges are single hulled. Barges normally carry masts, screens, and radar reflectors.
Legend: /h—heat generator, /s—square platform over stern, CC—position cloud covered, NC—position not covered, /d—damaged barge present, /r—SIDE NET radar.

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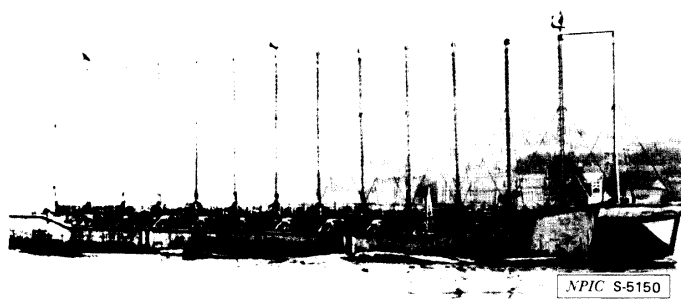


FIGURE 1. SOVIET 64-METER CATAMARAN-CLASS FLOATING TARGET BARGE UNDER TOW (CIA photograph)

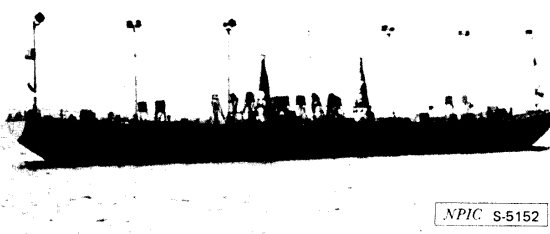


FIGURE 2. SOVIET SINGLE-HULLED FLOATING TARGET BARGE (CIA photograph)

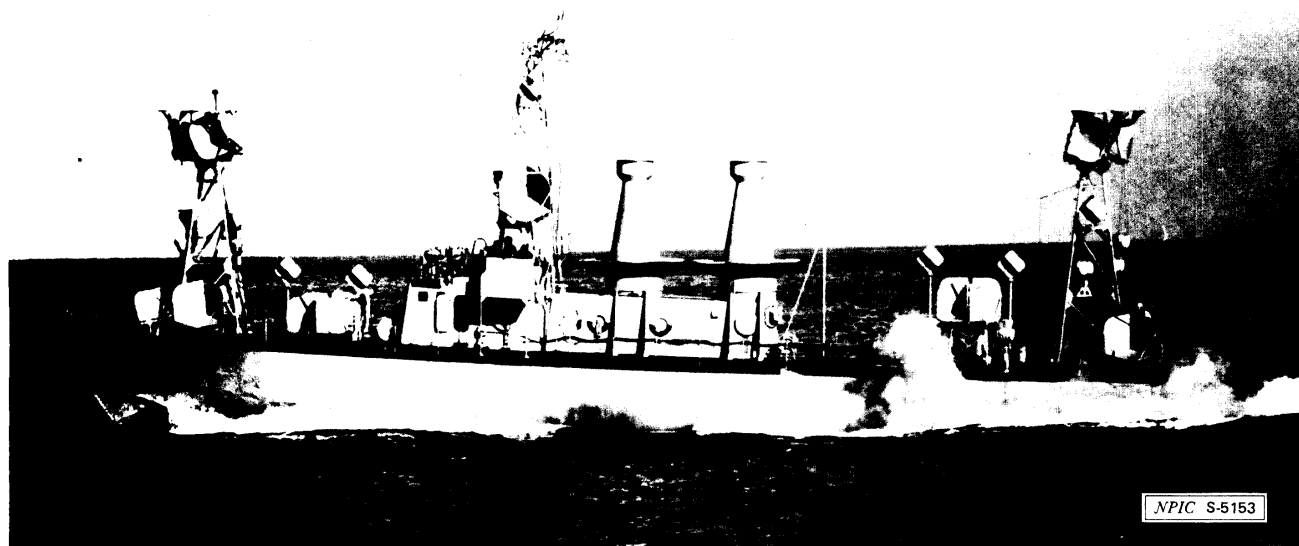


FIGURE 3. SOVIET OSA SELF-PROPELLED TARGET SERVICE SHIP (DIA photograph)

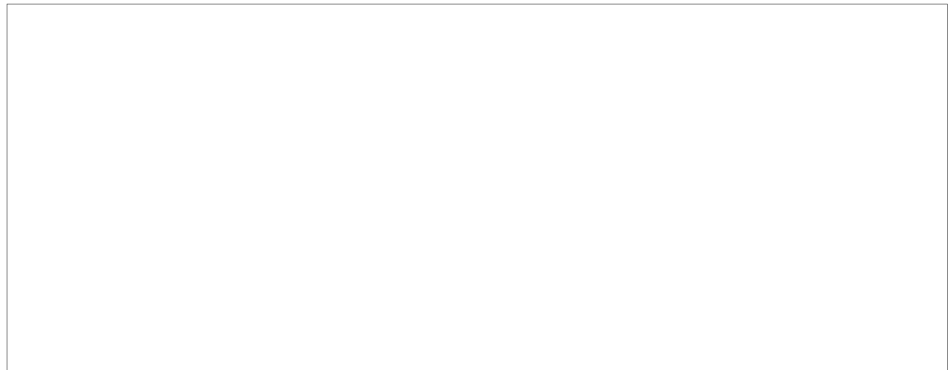
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REFERENCES



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MAPS OR CHARTS

DMAAC. US Air Target Chart, Series 200, Sheet 0249-16, scale 1:200,000 (UNCLASSIFIED)

DIA. USATC, Series 200, Sheet 0092-22, scale 1:200,000 (UNCLASSIFIED)

DIA. National Basic Reference Graphics, NDA-06/5061/77 (SECRET) [redacted]

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RELATED DOCUMENTS

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CIA [redacted] IAS/MD 584/74, *Target Barge Analysis—Severodvinsk (March 1966-June 1974)* 8 Aug 74 (TOP SECRET RUFF)

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CIA [redacted] IAS/MD 449/75, *Target Barges and Potential Launch Platforms at Severodvinsk and Arkhangelsk (June 1974-July 1975)*, 10 Oct 75 (TOP SECRET RUFF)

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NSA [redacted] *Soviet Northern Fleet Area Closure Manual*, 29 Mar 77 (SECRET) [redacted]

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REQUIREMENT

Project 143490NI



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List of Conversion Factors by Classification

UNITS OF LENGTH

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
MILLIMETERS	0.0394	INCHES
CENTIMETERS	0.3937	INCHES
INCHES	25.4000	MILLIMETERS
INCHES	2.5400	CENTIMETERS
FEET	0.3048	METERS
FEET	0.0003	KILOMETERS
YARDS	0.9144	METERS
METERS	3.2808	FEET
METERS	0.0005	MILES(NAUTICAL)
METERS	1.0936	YARDS
KILOMETERS	3280.8400	FEET
KILOMETERS	0.6214	MILES(STATUTE)
KILOMETERS	0.5400	MILES(NAUTICAL)
MILES(STATUTE)	1.6093	KILOMETERS
MILES(NAUTICAL)	6076.1154	FEET
MILES(NAUTICAL)	1.8520	KILOMETERS
MILES(NAUTICAL)	1852.0000	METERS

UNITS OF MASS

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
KILOGRAMS	2.2046	POUNDS(AVOIR.)
POUNDS(AVOIR.)	0.4536	KILOGRAMS
SHORT TONS	0.9072	METRIC TONS
METRIC TONS	1.1023	SHORT TONS
METRIC TONS	0.9842	LONG TONS
LONG TONS	1.0160	METRIC TONS

UNITS OF VOLUME

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
LITERS	0.2642	GALLONS
LITERS	0.0063	BARRELS(POL)
LITERS	0.0010	CUBIC METERS
GALLONS	3.7854	LITERS
GALLONS	0.1337	CUBIC FEET
GALLONS	0.0238	BARRELS(POL)
GALLONS	0.0038	CUBIC METERS
BUSHELS	0.0352	CUBIC METERS
CUBIC FEET	7.4805	GALLONS
CUBIC FEET	0.1781	BARRELS(POL)
CUBIC FEET	0.0283	CUBIC METERS
CUBIC YARDS	0.7646	CUBIC METERS
BARRELS(POL)	158.9873	LITERS
BARRELS(POL)	42.0000	GALLONS
BARRELS(POL)	5.6146	CUBIC FEET
BARRELS(POL)	0.1590	CUBIC METERS
CUBIC METERS	1000.0000	LITERS
CUBIC METERS	264.1721	GALLONS
CUBIC METERS	35.3147	CUBIC FEET
CUBIC METERS	28.3776	BUSHELS
CUBIC METERS	6.2898	BARRELS(POL)
CUBIC METERS	1.3080	CUBIC YARDS

UNITS OF AREA

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
SQUARE CENTIMETERS	0.1550	SQUARE INCHES
SQUARE INCHES	6.4516	SQUARE CENTIMETERS
SQUARE FEET	0.0929	SQUARE METERS
SQUARE YARDS	0.8361	SQUARE METERS
SQUARE METERS	10.7639	SQUARE FEET
SQUARE METERS	1.1960	SQUARE YARDS
SQUARE METERS	1.0000	CENTARES
SQUARE METERS	0.0002	ACRES
SQUARE METERS	0.0001	HECTARES
ACRES	4046.8564	SQUARE METERS
ACRES	0.4047	HECTARES
HECTARES	10000.0000	SQUARE METERS
HECTARES	2.4711	ACRES

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