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RECOGNITION AID

**SOVIET SURFACE-TO-SURFACE MISSILES
AND
GROUND SUPPORT EQUIPMENT**

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**CENTRAL INTELLIGENCE AGENCY
AND
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DIA REVIEW COMPLETED



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This recognition aid has been prepared to aid intelligence collectors in reporting on the transfer or shipment of Soviet surface-to-surface missiles to non-Soviet areas of the world. The aid contains general information concerning selected missile systems, [REDACTED]

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Listed ranges, weights, and dimensions are intended only to provide general information about each missile system.

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I N D E X

	<u>Pages</u>
<u>STRATEGIC MISSILES</u>	
SANDAL (SS-4)	1-4
SKEAN (SS-5)	5-6
SCAMP	7-8
<u>TACTICAL MISSILES AND ROCKETS</u>	
SCUD A (SS-1b)	9-13
SCUD B (SS-1c)	9-13
FROG 3,4,5,6,7	14-17
SS-12	18
<u>TACTICAL CRUISE MISSILES</u>	
SHADDOCK (SS-C-1)	19-20
KENNEL (SS-CD-1) coastal defense missile	21-23
KENNEL ground forces version	21-23
<u>NAVAL CRUISE MISSILES</u>	
STYX (SS-N-2)	24-25

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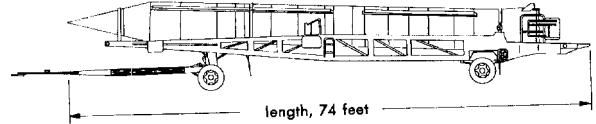
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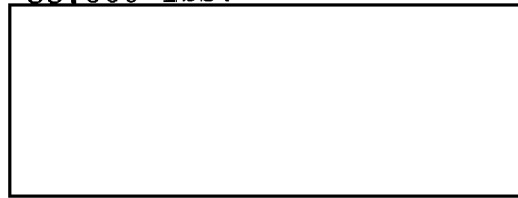
SANDAL (SS-4) MEDIUM RANGE BALLISTIC MISSILE

The Sandal is a medium-range ballistic missile widely deployed in the USSR at both soft and hard launch sites. It was deployed briefly at soft launch sites in Cuba in late 1962. The missile became operational in late 1958 and was first publicly displayed in the November 1960 Moscow parade. An SS-4 regiment has two to three battalions with four launchers each.



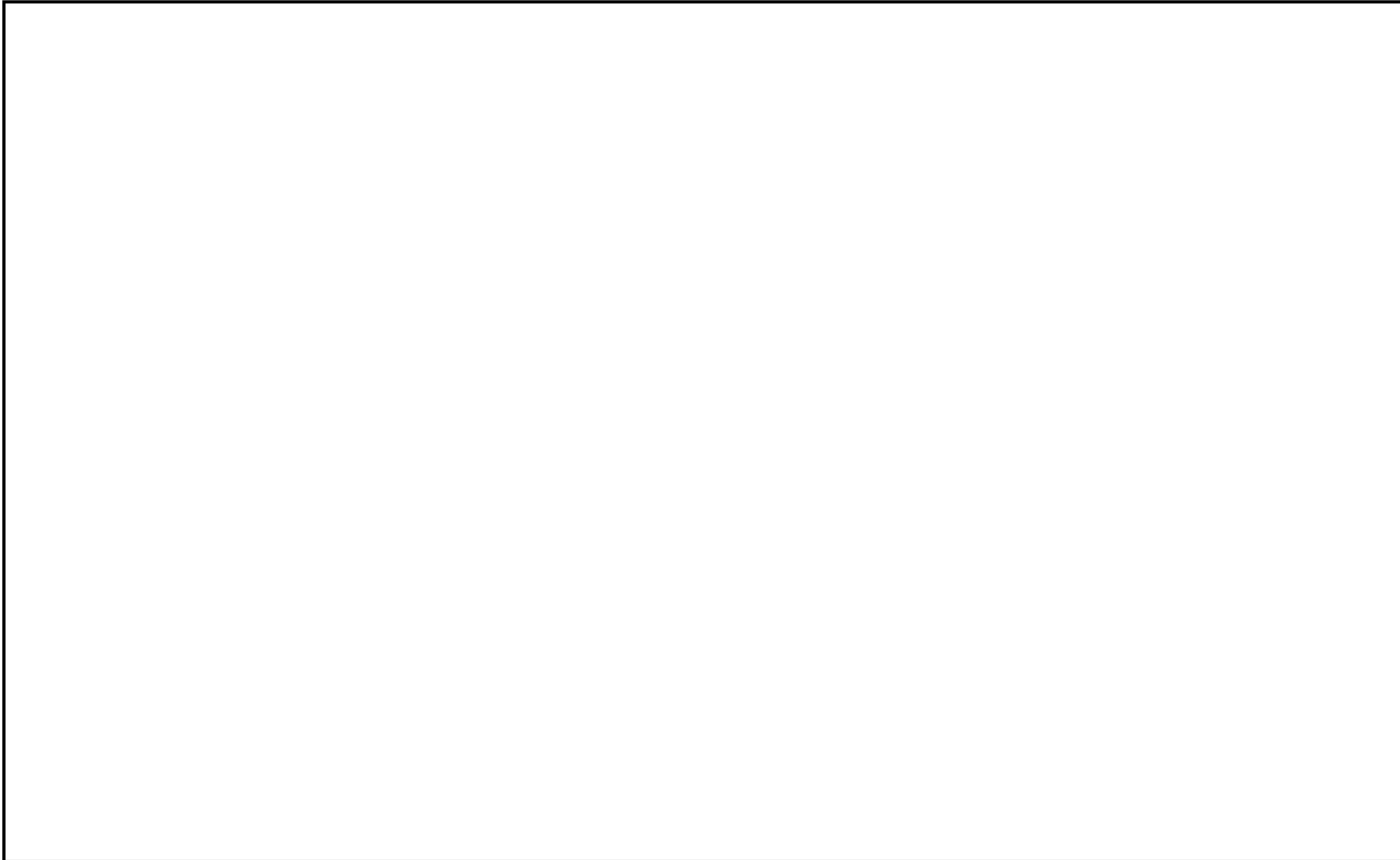
Range
Configuration
Propellant
Guidance
Launch weight
Warhead

1,020 n.m.
single stage
storable liquid
inertial
88,000 lbs.



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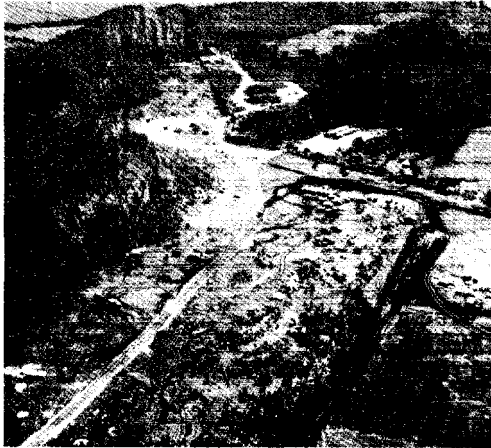
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SANDAL (Continued)

Deployment: SS-4 battalions in the Soviet Union are normally based at fixed launch sites, either soft or hard. However, all of the equipment is road-mobile, and a battalion can deploy to a field site with few advance preparations required. The minimum field site requirements are accurate surveying and sufficient open space to allow the positioning of the

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MRBM site in Cuba

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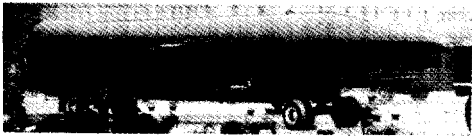
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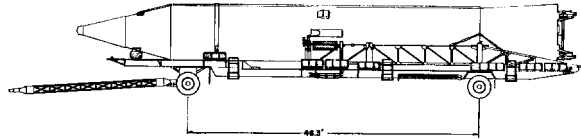
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SKEAN (SS-5) INTERMEDIATE RANGE BALLISTIC MISSILE



length, 78 feet



The SS-5 became operational in late 1961 and was first displayed in the November 1964 Moscow parade. In the USSR it is deployed at both hard and soft launch sites. SS-5s were scheduled for deployment to Cuba in late 1962, but the soft sites for them were not completed and the missiles never reached Cuba. An SS-5 regiment has 9-12 launchers.

Range	2,200 n.m.
Configuration	single stage
Propellant	storable liquid
Guidance	inertial
Launch weight	about 200,000 lbs.
Warhead	

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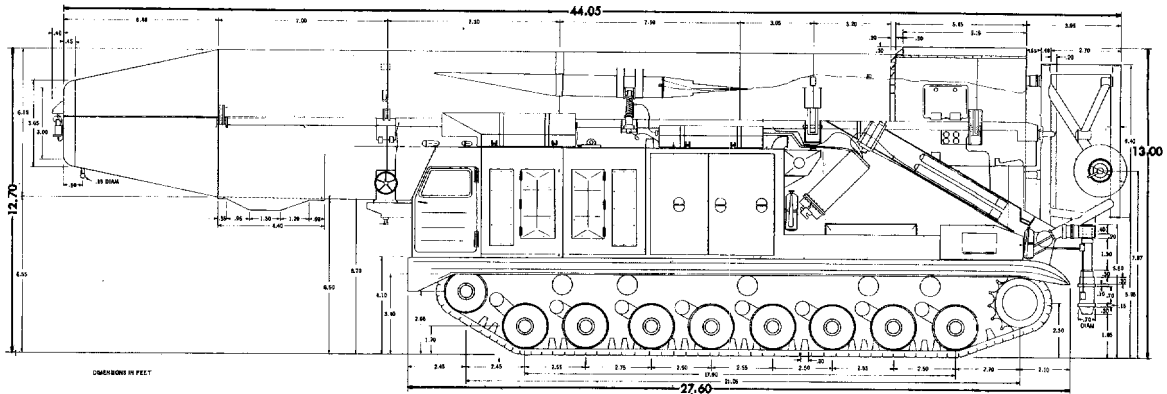
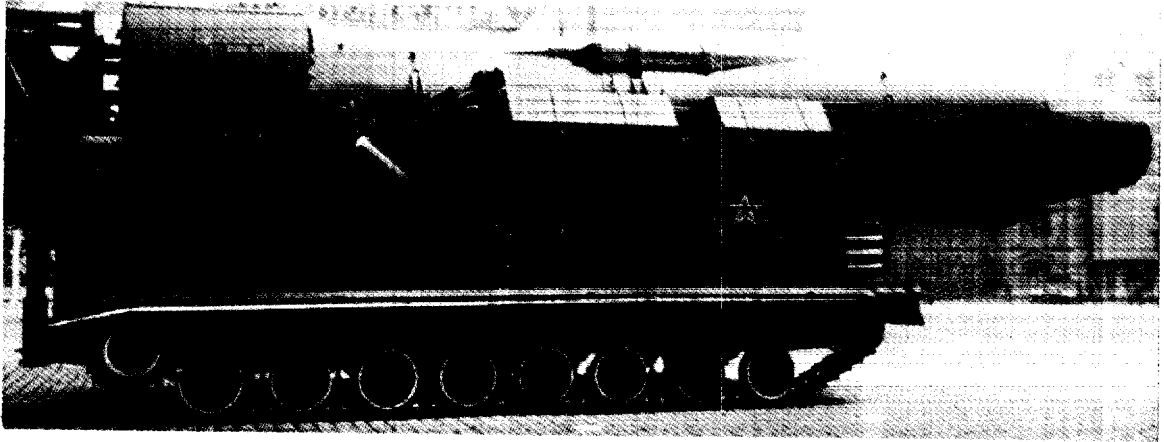
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SCAMP MOBILE BALLISTIC MISSILE



The Scamp was first displayed in the May 1965 Moscow parade, and very little is known about it except what Soviet spokesmen have stated. The missile is housed in an environmental control pod mounted on a tracked transporter-erector-launcher. The vehicle has more cross-country mobility than vehicles associated with other missiles systems, and it may reach speeds up to 20 mph on good roads. Its operational status is not known.

Range	2,150 n.m. (claimed by Soviets)
Propellant	probably solid
Configuration	probably two stage
Guidance	probably inertial
Warhead	 25X1B

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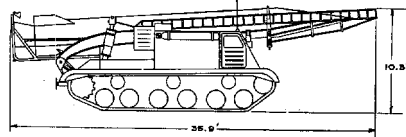
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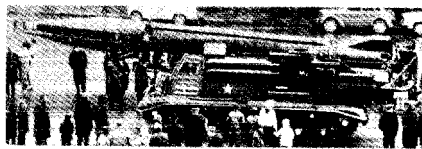
SCUD TACTICAL BALLISTIC MISSILE



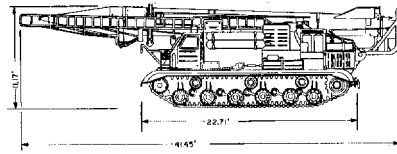
SCUD A



SCUD A



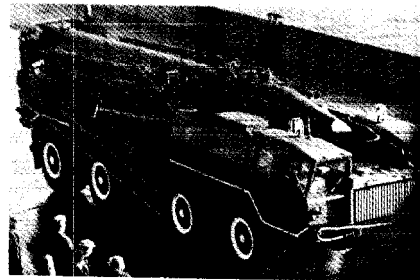
SCUD B



SCUD B



SCUD B on wheeled
transporter-launcher
length, 44 feet



SCUD B on wheeled
transporter-launcher

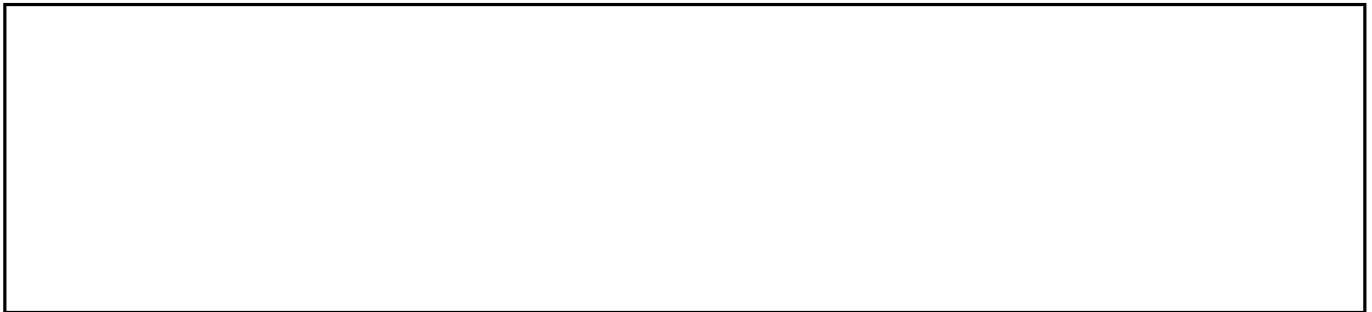
The Scud is a short-range tactical ballistic missile used in Soviet and Satellite ground forces at front and army level. Two versions have been identified: The SS-1b (Scud A) and the SS-1c (Scud B). The Scud A is mounted on a tracked transporter-launcher; Scud B is somewhat longer and is carried by either a tracked or eight-wheeled transporter-launcher. There may also be a lightweight transporter erector-launcher for both the Scud A and the Scud B. Both versions can carry nuclear, chemical, or high-explosive warheads, though the Scud A's range is greatly reduced with a nuclear warhead. The Soviets have furnished a nonnuclear version of the Scud A to some Eastern European armed forces, but the Scud B is only deployed with Soviet ground forces. A Scud brigade has two or three battalions with three launchers each.

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SCUD (Continued)

	<u>Scud A</u>	<u>Scud B</u>
Range		
w/nuclear warhead	80 n.m.	160 n.m.
w/HE or CW warhead	150 n.m.	160 n.m.
Configuration	single-stage	single-stage
Length	35 ft.	37 ft.
Diameter	3 ft.	3 ft.
Launch weight	11,800 lbs.	12,800 lbs.
Guidance	inertial	inertial
Propellant	storable liquid	storable liquid
		25X1B
HE or CW	1,500 lbs.	1,800-2,000 lbs.
Transporter weight	70,000 lbs.	70,000 lbs.

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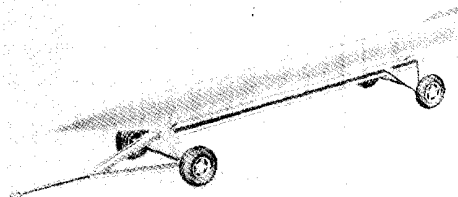
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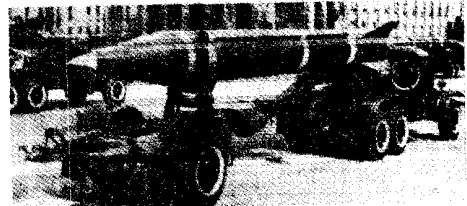
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Shipment: Scud missile units would be transported long distances by rail or ship. For short distances, they can move by either rail or road. In addition, missiles could be re-supplied to deployed units by either helicopter or cargo aircraft. Scud missiles would probably be shipped without nose cones in a sealed cylindrical container. The nose cone would be shipped separately and mated to the missile at the support site. Scud missiles can be carried on lightweight transporter trailers.



SCUD lightweight missile transporter trailer



SCUD lightweight missile transporter trailer

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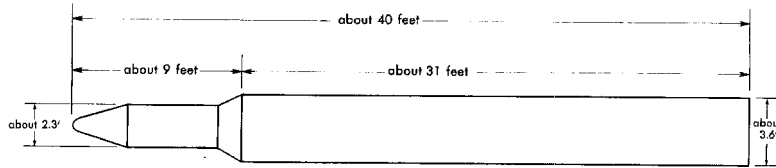
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SS-12 TACTICAL BALLISTIC MISSILE



Possible configuration

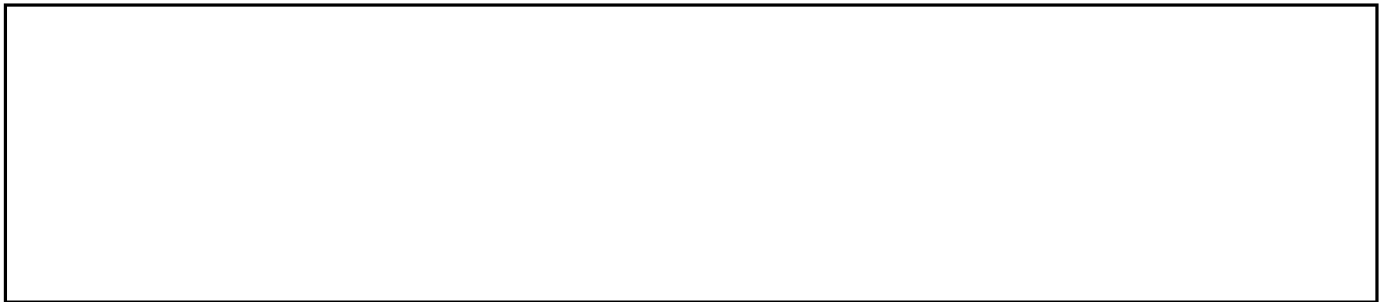
The SS-12 is a new tactical ballistic missile which is believed to have become operational recently. It fills the range gap between previous tactical missiles, such as the Scud and Shaddock, and the MRBMs in Soviet Strategic Rocket Forces. The missile has never been seen by Western observers. It is very likely carried on a transporter-launcher, possibly the new eight-wheeled vehicle which carried a Scud B in the November 1965 Moscow parade.

Range	450-500 n.m.
Configuration	probably single stage
Propellant	probably storable liquid
Warhead	probably nuclear

Support equipment: None identified to date.

Deployment: Unknown, but perhaps similar to Scud deployment.

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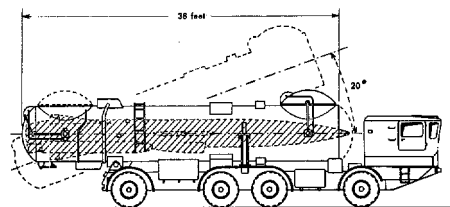
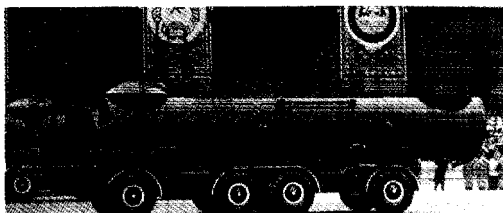


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SHADDOCK (SS-C-1) TACTICAL CRUISE MISSILE



SKETCH OF COASTAL DEFENSE MISSILE LAUNCHER

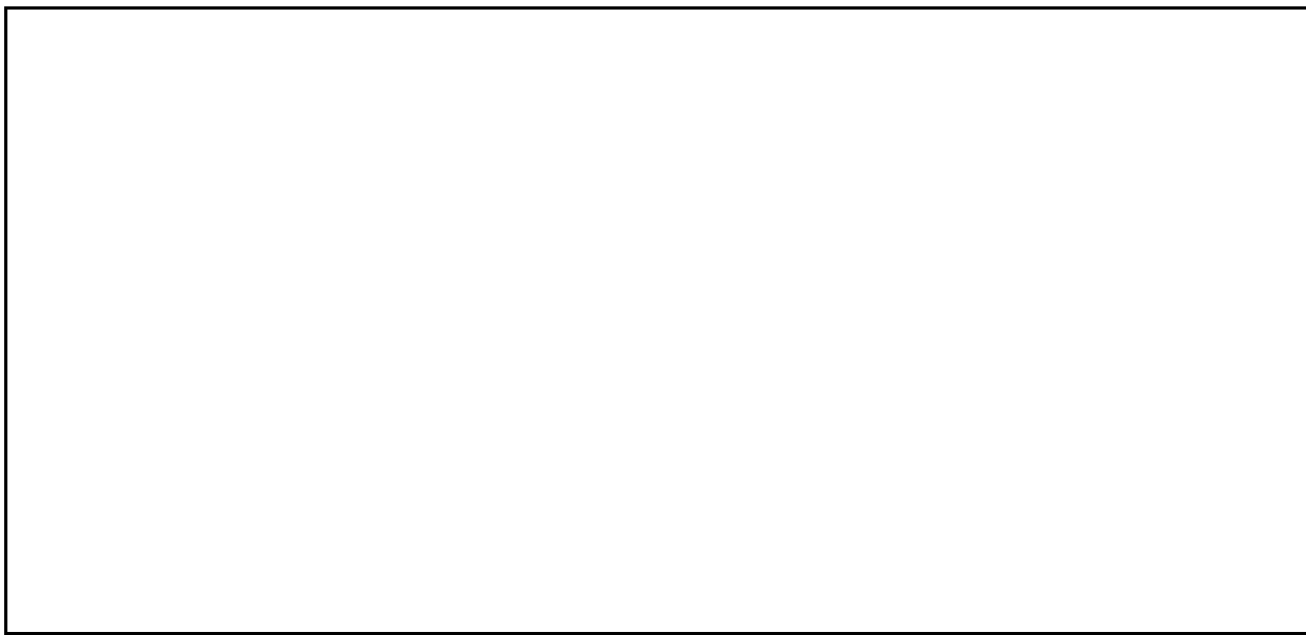
The Shaddock is a tactical cruise missile transported in a launch tube on a wheeled vehicle. The tube elevates for firing. The missile is launched by two rocket boosters and is then powered by a turbojet engine to target. The vehicle has good mobility on highways and limited mobility on secondary roads. It is believed to be deployed as a front-level tactical missile in regiments of eight launchers. A similar system is used as a mobile coastal defense missile against ships.

Range	up to 300 n.m.
Propulsion	turbojet engine with 2 rocket boosters
Speed	Mach 1.2
Length	about 38 ft.
Guidance	self-contained (coastal defense version probably incorporates terminal homing)
Launch weight	10,000 lbs.
Warhead	



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SHADDOCK (Continued)



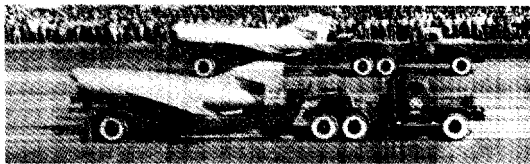
Coastal defense version of SHADDOCK elevated for firing

Shipment: The Shaddock transporter can be shipped by rail or sea, although North Vietnamese railroads cannot accommodate anything of this size. The missile itself could be carried by AN-12 transport aircraft.

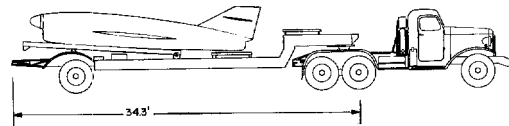
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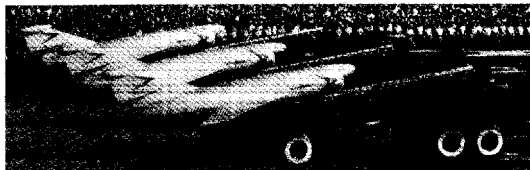
KENNEL VARIANT SHORT-RANGE CRUISE MISSILE



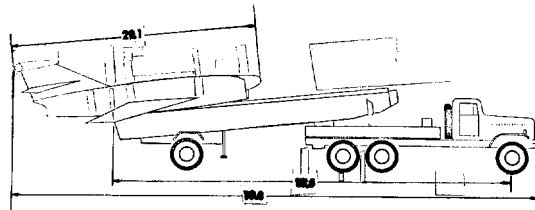
Coastal defense KENNEL



Coastal defense KENNEL



Ground Forces KENNEL



Ground Forces KENNEL

Two surface-to-surface variants of the Kennel air-to-surface missile have been identified. One, the SS-CD-1, is for coastal defense. It was first publicly displayed in the January 1963 Havana parade on a transporter. The other is a ground forces tactical version and was first seen in the January 1965 Havana parade on a transporter-launcher. While Cuba has both types, only the coastal defense version is known to be deployed in the USSR, where it is used primarily for defense of naval bases.

	Coastal Defense Version	Ground Forces Version
Range	25-50 n.m., depending on launch site elevation	60-70 n.m.
Propulsion	Turbojet with RATO	Turbojet with RATO
Guidance	Radar beam rider with semiactive radar homing	Probably radar beam rider
Launch weight	6,000 lbs.	6,000 lbs.
Warhead	[REDACTED]	

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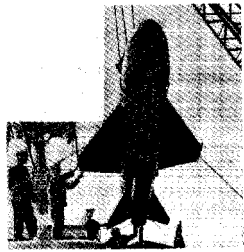
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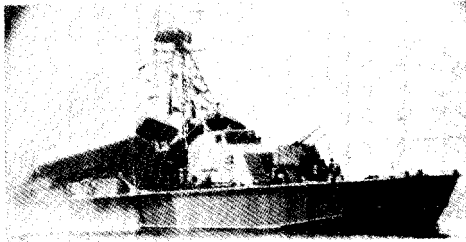
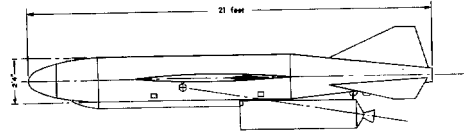
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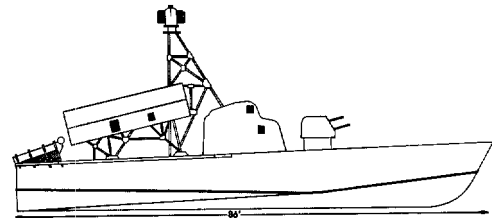
STYX (SS-N-2) NAVAL CRUISE MISSILE



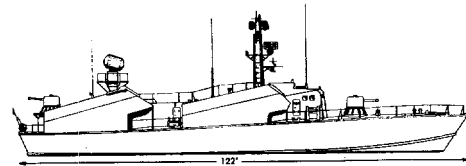
STYX missile



KOMAR missile patrol boat



OSA missile patrol boat



The Styx is a rocket-powered short-range naval missile used by both the Komar-class (two launchers) and Osa-class (four launchers) guided missile patrol boats. It has terminal homing guidance and is primarily an antiship weapon, but it can also be used for shore bombardment and possibly as a coastal defense missile as well. Styx-equipped patrol boats have been sold to Cuba, Egypt, and Indonesia, as well as to Communist bloc countries.

Missile Characteristics

Range	20 n.m.
Propulsion	rocket with RATO boost
Fuel	storable liquid
Guidance	present autopilot with active terminal homing
Launch Weight	4,600 lbs.
Warhead	500-1,000 lbs. HE

Patrol Boat Characteristics

	<u>Osa</u>	<u>Komar</u>
Range	675 n.m.	460 n.m.
Maximum speed	37-39 knots	36 knots
Crew	25	19
Displacement	205 tons	78 tons
Length	122 ft.	86 ft.

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