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# Intelligence Handbook

## *Soviet Guided Missiles*

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# WARNING

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
May 1969

INTELLIGENCE HANDBOOK

# Soviet Guided Missiles

This handbook describes Soviet guided missiles used in all types of weapon systems including those carried on ships and aircraft. It provides a general summary of the characteristics, performance, and operational status of each missile. User countries in addition to the USSR are noted.

Entries are listed by letter-number designations (e.g. SS-9) and code names (Scarp) used by the US and NATO.

For each deployed weapon system the year of its initial operational capability (IOC) is noted. By this date the first operational unit has been trained and equipped with a few weapons of the given type.

Circular error probability (CEP) indicates the accuracy of the weapon system, stated as the radius of a circle centered on the target. Statistically, half of all warheads fired would impact within this circle.

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*This handbook was produced solely by CIA. It was prepared by the Office of Strategic Research and coordinated with the Office of Scientific Intelligence, the Office of Economic Research, and the Foreign Missile and Space Analysis Center.*

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Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

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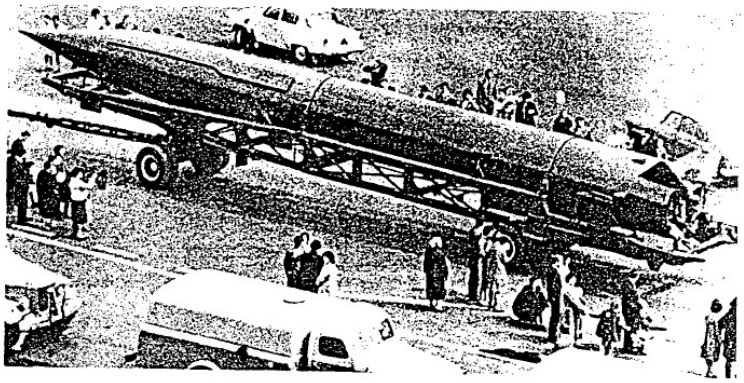
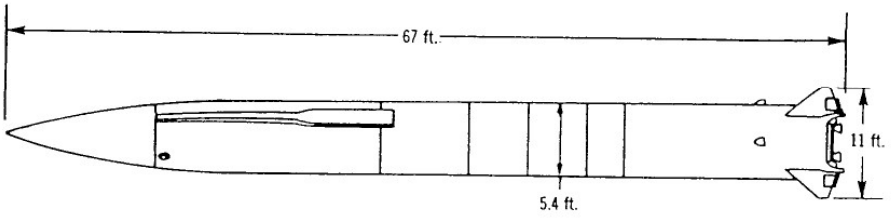





Medium-Range Ballistic Missile

| | |
|---|---|
| IOC | 1956 |
| Configuration | single stage |
| Propellant | nonstorable liquid |
| Launch weight | 60,000 lbs |
| Re-entry vehicle | 3,350 lbs |
| Warhead (nuclear) | 2,700 lbs |
| Maximum range | 630 nm |
| Guidance | radio-inertial |
| CEP | 1.0-1.75 nm |

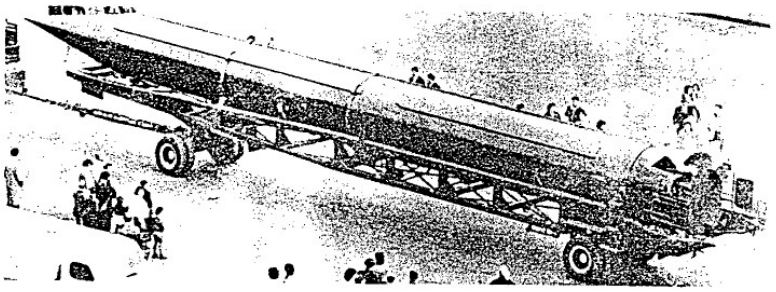
Remarks

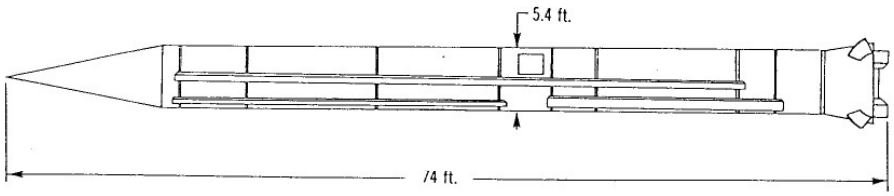
Now obsolete. Possibly operational as late as 1966. Flight testing began in 1954.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-4 Sandal






Medium-Range Ballistic Missile

| | |
|---|---|
| IOC | 1958 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | 88,000 lbs |
| Re-entry vehicle | 3,300 ± 500 lbs |
| Warhead (nuclear) | 2,200 ± 500 lbs |
| Maximum range | 1,020 nm |
| Guidance | inertial |
| CEP | 1.25 nm |

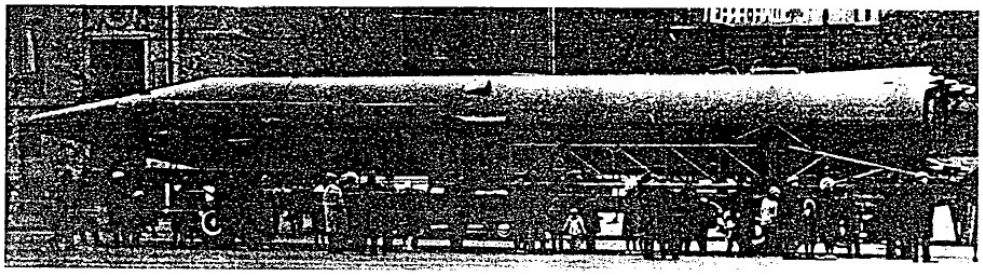
Remarks

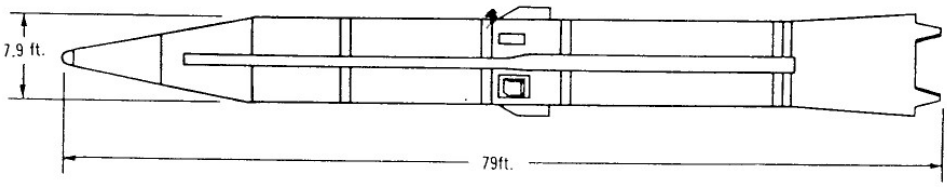
Deployed in both soft and hard sites located primarily in the European USSR. First publicly displayed in Moscow parade of November 1960. First flight test in June 1957. Much larger conventional warhead could be delivered to shorter ranges, e.g. about 4,000 lbs to 800 nm.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-5 Skean






Intermediate-Range Ballistic Missile

| | |
|---|---|
| IOC | 1961 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | about 200,000 lbs |
| Re-entry weight | 3,500 ± 500 lbs |
| Warhead (nuclear) | 2,800 ± 400 lbs |
| Maximum range | 2,200 nm |
| Guidance | inertial |
| CEP | 1 nm |

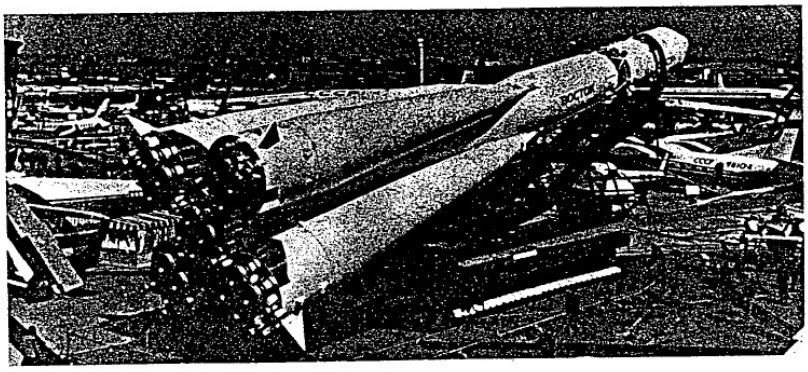
Remarks

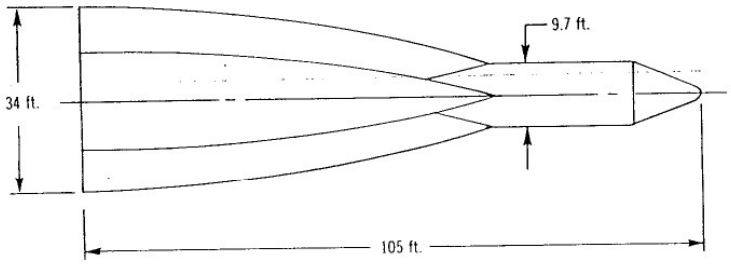
Deployed in both hard and soft sites located primarily in European USSR. First publicly displayed in Moscow parade of November 1964. First flight test in June 1960. Much larger conventional warhead could be delivered to shorter ranges, e.g. 8,000 lbs to 1,500 nm.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-6 Sapwood






Intercontinental Ballistic Missile

| | |
|---|---|
| IOC | 1960 |
| Configuration | 1½-stage parallel |
| Propellant | nonstorable liquid |
| Launch weight | 500,000 lbs |
| Re-entry vehicle | 8,000 ± 1,000 lbs |
| Warhead (nuclear) | 6,000 ± 1,000 lbs |
| Maximum range | 6,000 nm |
| Guidance | radio-inertial |
| CEP | 2 nm |

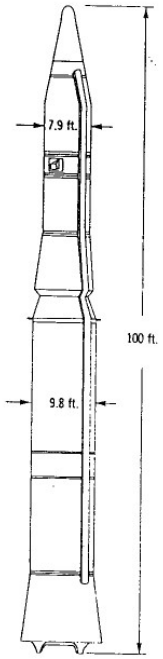
Remarks

First-generation Soviet ICBM. Not deployed extensively and now probably retired from operational inventory. Continues to be used as basic space booster in configuration displayed in 1967 Paris air show (photograph above).

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-7 Saddler




Intercontinental Ballistic Missile

| | |
|---|---|
| IOC | 1962 |
| Configuration | 2-stage tandem |
| Propellant | storable liquid |
| Launch weight | 325,000 lbs |
| Re-entry vehicle | 3,500 ± 500 lbs |
| | 4,200 ± 500 lbs* |
| Warhead (nuclear) | 2,800 ± 400 lbs |
| | 3,300 ± 400 lbs* |
| Maximum range | 6,500 nm |
| | 5,500 nm* |
| Guidance | inertial |
| CEP | 1.0-1.25 nm |

*Two operational re-entry vehicles

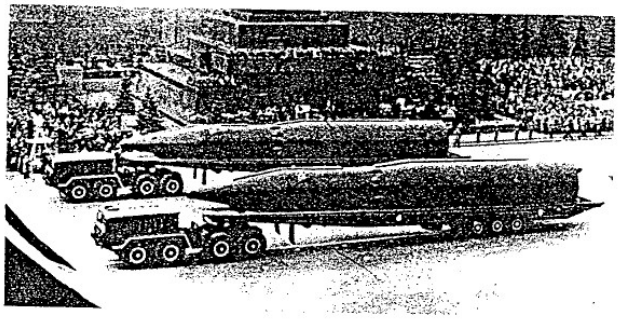
Remarks

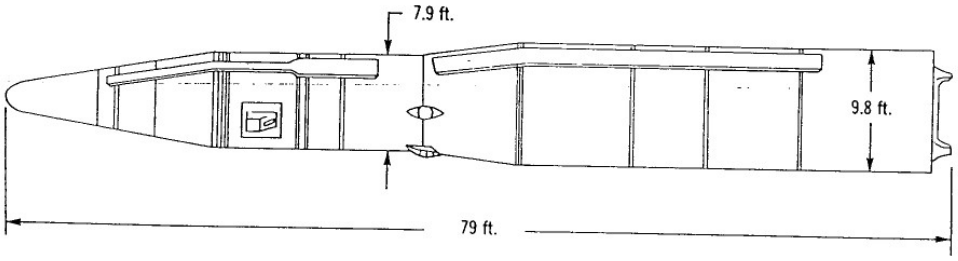
First Soviet ICBM to be widely deployed. First flight test in October 1960.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-8 Sasin






Intercontinental Ballistic Missile

| | |
|---|---|
| IOC | 1963 |
| Configuration | 2-stage tandem |
| Propellant | nonstorable liquid |
| Launch weight | 165,000 lbs |
| Re-entry vehicle | 3,500 ± 500 lbs |
| Warhead (nuclear) | 2,800 ± 400 lbs |
| Maximum range | 6,000 nm |
| Guidance | radio-inertial |
| CEP | 1 nm |

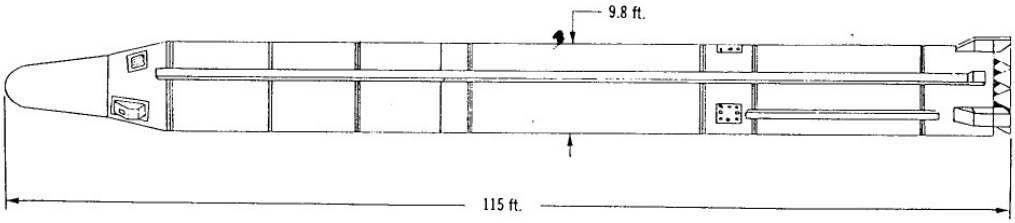
Remarks

Probably given only limited deployment. First publicly displayed in Moscow parade of November 1964. First flight test in April 1961.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-9 Scarp




Intercontinental Ballistic Missile

| | |
|---|---|
| IOC | 1966 |
| Configuration | 2-stage tandem |
| Propellant | storable liquid |
| Launch weight | 400,000 lbs |
| Re-entry vehicle | 10,000 ± 1,000 lbs |
| | 13,500 ± 1,000 lbs* |
| Warhead (nuclear) | 8,000 ± 1,000 lbs |
| | 10,000 ± 1,000 lbs* |
| Maximum range | 6,500 nm |
| | 5,000 nm* |
| CEP, radio-inertial guidance | 0.5 nm |
| inertial guidance | 0.75 nm |

* Two operational re-entry vehicles

Remarks

Largest and most accurate Soviet ICBM. Extensively deployed in USSR. First displayed in Moscow parade of November 1967. First flight test in December 1963. Also employed as launch vehicle for SS-X-6 and maneuverable satellites.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-10

Intercontinental Ballistic Missile

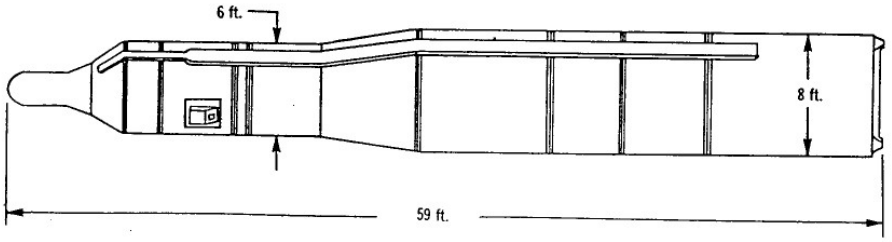
| | |
|---|---|
| IOC | never achieved |
| Configuration | 2-stage tandem |
| Propellant | storable liquids of unknown composition |
| Launch weight | about 275,000 lbs |
| Re-entry vehicle | 4,000-8,000 lbs |
| Warhead (nuclear) | 3,200-6,500 lbs |
| Maximum range | 6,000 nm |
| Guidance | radio-inertial |
| CEP | probably about 1 nm |

Remarks

Never shown in Moscow parades. First flight test in April 1964, last in October 1964.

Soviet Guided Missiles
SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-11




Intercontinental Ballistic Missile

| | |
|---|---|
| IOC | 1966 |
| Configuration | 2-stage tandem |
| Propellant | storable liquid |
| Launch weight | 93,000 lbs |
| Re-entry vehicle | 1,500 ± 300 lbs |
| Warhead (nuclear) | 1,100 ± 300 lbs |
| Maximum range | 5,500 nm |
| Guidance | inertial (possibly radio-inertial) |
| CEP | 1.0-1.5 nm |

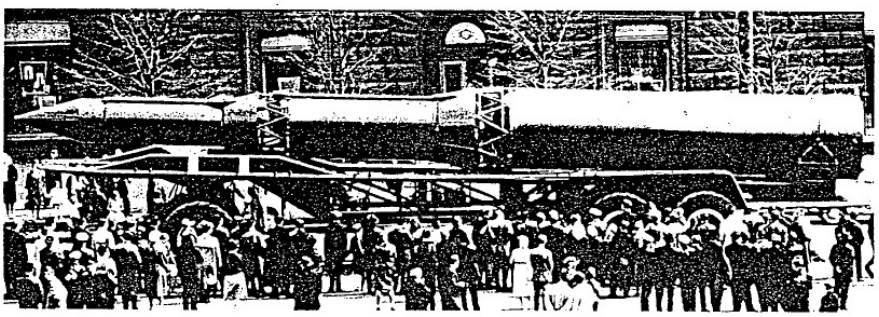
Remarks

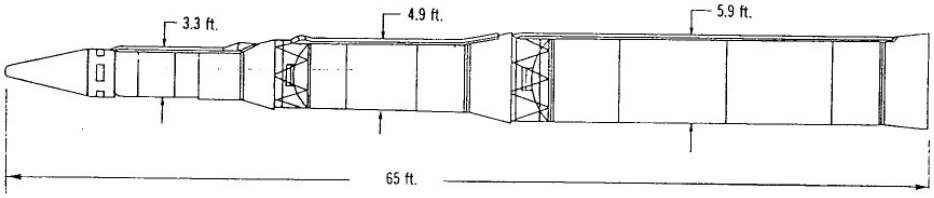
Smallest Soviet ICBM tested to date. Deployed extensively throughout USSR. Never publicly displayed. First flight test in April 1965.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-13 Savage






Intercontinental Ballistic Missile

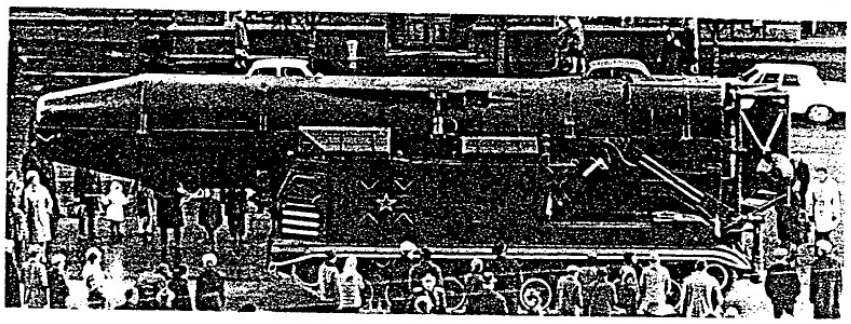
| | |
|---|---|
| IOC | 1969 |
| Configuration | 3-stage tandem |
| Propellant | solid |
| Launch weight | 105,000 lbs |
| Re-entry vehicle | 1,200 ± 300 lbs |
| Warhead (nuclear) | 900 ± 200 lbs |
| Maximum range | 5,000 nm |
| Guidance | inertial |
| CEP | about 1 nm |

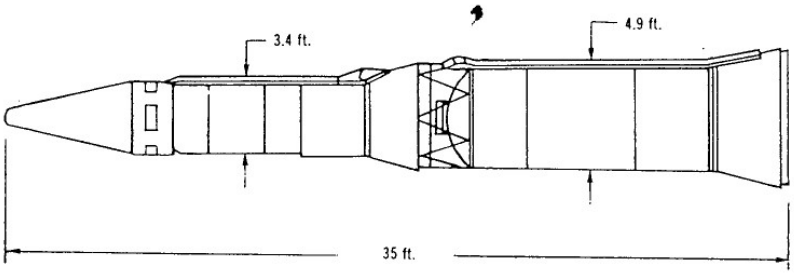
Remarks

Estimated to become operational in fixed sites in 1969. May be deployed later in mobile launchers. First flight test in November 1965. First publicly displayed in Moscow parade of May 1965.

Soviet Guided Missiles
SURFACE-TO-SURFACE STRATEGIC MISSILES

## SS-14 Scamp






Intermediate-Range Ballistic Missile

| | |
|---|---|
| IOC | 1969-70 |
| Configuration | 2-stage tandem |
| Propellant | solid |
| Launch weight | about 35,000 lbs |
| Re-entry vehicle | 1,200 ± 300 lbs |
| Warhead (nuclear) | 900 ± 200 lbs |
| Maximum range | about 1,500 nm |
| Guidance | inertial |
| CEP | 0.5-1.5 nm |

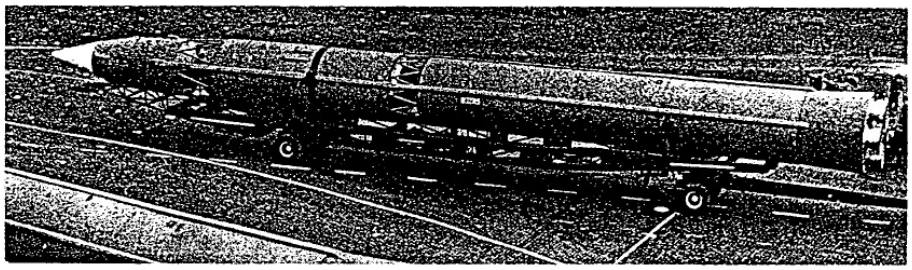
Remarks

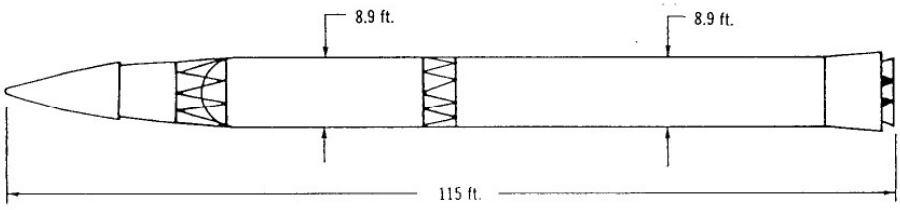
Also designated Scapegoat. Tranporter-launcher first displayed in Moscow parade of May 1965. SS-14 missile first shown in May 1968. First flight test in September 1965. Probably will be deployed both in fixed sites and mobile launchers. Resembles second and third stages of SS-13 Savage.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

## Scrag






Intercontinental Ballistic Missile

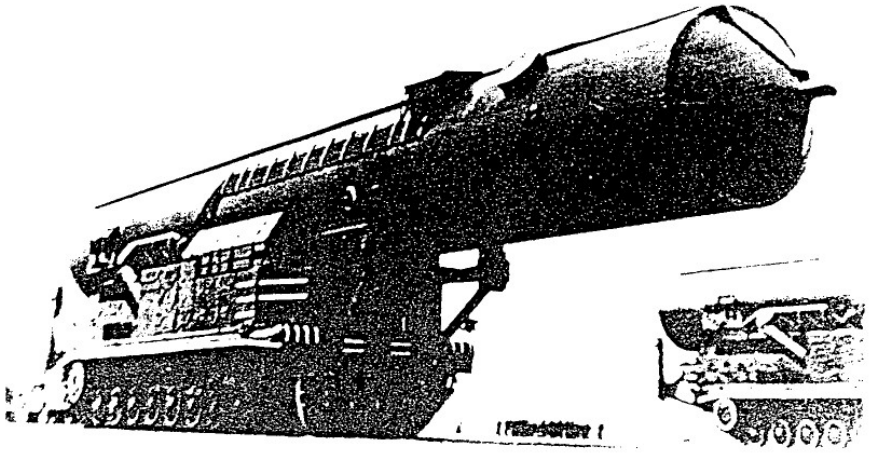
Remarks

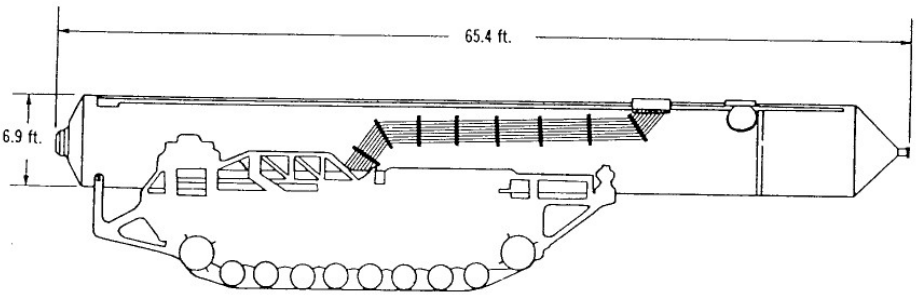
First publicly displayed in Moscow parade of May 1965. Not identified with any known flight test program. Soviets claim this is an orbital weapon.

Soviet Guided Missiles

SURFACE-TO-SURFACE STRATEGIC MISSILES

**Scrooge**






Intercontinental Ballistic Missile

Remarks

First publicly displayed in Moscow parade of November 1965. At that time a Soviet colonel told a US attache that this was a solid-propellant weapon with range in excess of 2,700 nm and operational since 1963. Not yet identified with any known flight test program.

Soviet Guided Missiles
SURFACE-SURFACE STRATEGIC MISSILES

## SS-X-6

Depressed Trajectory
Intercontinental Ballistic Missile

| | |
|---|---|
| Configuration | 2-stage and deboost |
| Propellant | storable liquid |
| Launch weight | 400,000 lbs |
| Re-entry vehicle | 2,000-4,000 lbs |
| Warhead (nuclear) | 1,600-3,200 lbs |
| Maximum range | about 6,000 nm |
| Guidance | inertial |
| CEP | 1-2 nm |

Remarks

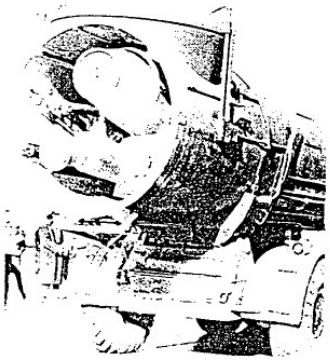
SS-X-6 weapon system is composed of SS-9 ICBM and deboost stage with warhead. First flight test in December 1965. Operational status undetermined. As DICBM, SS-X-6 in its current configuration is capable of striking US.

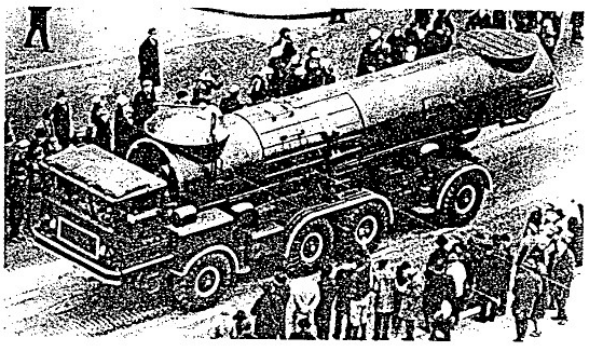
May also be used as fractional orbit bombardment system (FOBS) which places warhead in low earth orbit about 100 miles high. Deorbit engine kicks warhead out of orbit toward target before weapon has completed one revolution of earth. System lacks necessary energy to make it effective orbital weapon against US. Major changes in either warhead size or booster are necessary.

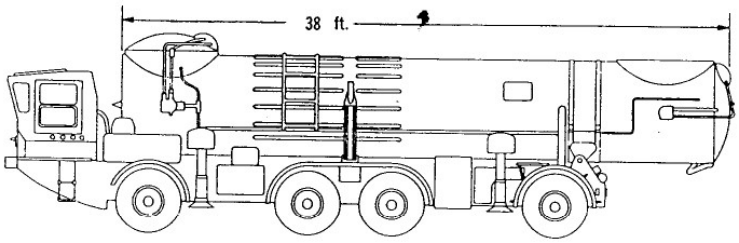
Soviet Guided Missiles

GROUND TACTICAL MISSILES

**SS-C-1A Shaddock**








Short-Range Cruise Missile

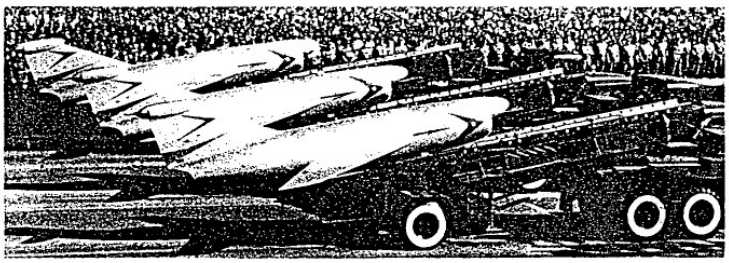
| | |
|---|---|
| IOC | 1963 |
| Propulsion | rocket-boosted turbojet |
| Launch weight | 10,000 lbs |
| Warhead (HE, nuclear) | 1,000-2,000 lbs |
| Maximum range | 300 nm |
| Trajectory | low altitude |
| Speed | low supersonic |
| Guidance | autonomous with possible radio link |

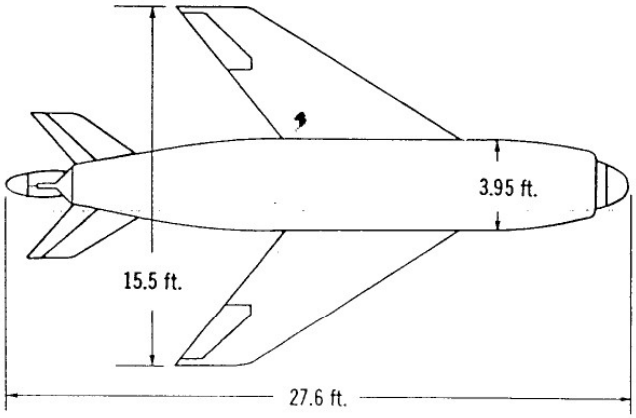
Remarks

Ground force version of SS-N-3 naval cruise missile. First displayed in Moscow parade of November 1961. Extent of deployment unknown. Operation at full range requires information on targets beyond the horizon.

Soviet Guided Missiles
GROUND TACTICAL MISSILES

## SS-C-2A Salish






Short-Range Cruise Missile

| | |
|---|---|
| IOC | 1957 |
| Propulsion | rocket-boosted turbojet |
| Launch weight | 6,000 lbs |
| Warhead (HE, possibly nuclear) | 2,200 lbs |
| Maximum range | 60 nm |
| Cruising altitude | under 1,500 ft |
| Cruising speed (sea level) | Mach 0.8 |
| Guidance | probably beam rider |
| CEP | 300-500 ft |

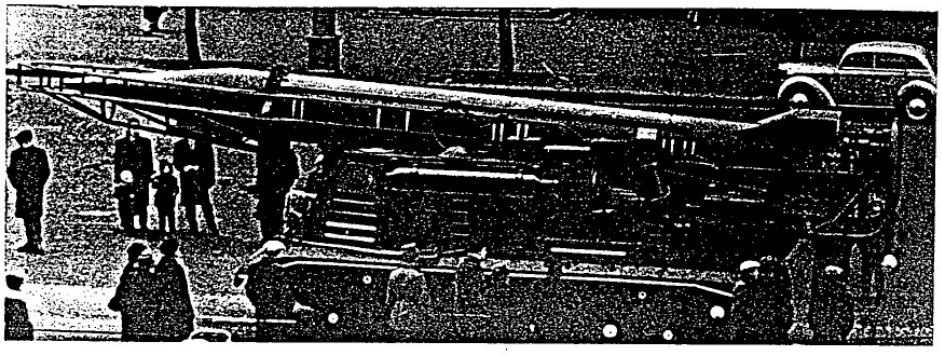
Remarks

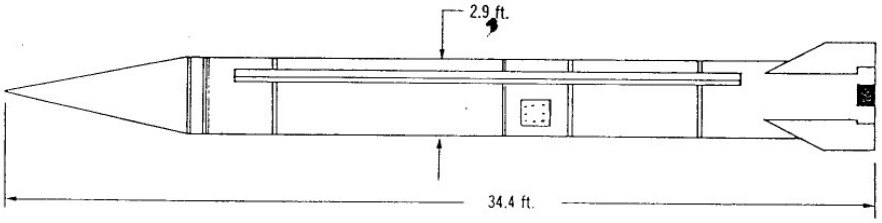
Ground force version of AS-1 Kennel air-to-surface missile. First publicly displayed in Havana parade of January 1965. Observed with Soviet forces in East Germany and assumed to be deployed in USSR.

Soviet Guided Missiles

GROUND TACTICAL MISSILES

## SS-1B Scud-A






Short-Range Ballistic Missile

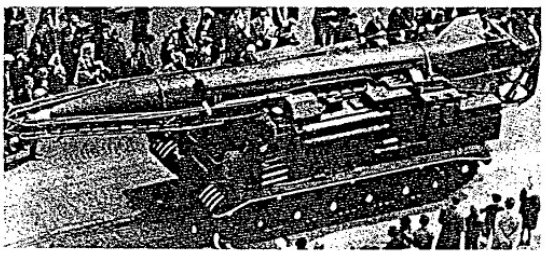
| | |
|---|---|
| IOC | 1957 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | 12,500 lbs |
| Warhead | |
| HE, chemical | 1,200 lbs |
| nuclear | 1,600-2,000 lbs |
| Maximum range | |
| with lighter warhead | 160 nm |
| with heavier warhead | 80 nm |
| Guidance | inertial |
| CEP | 0.3 nm |

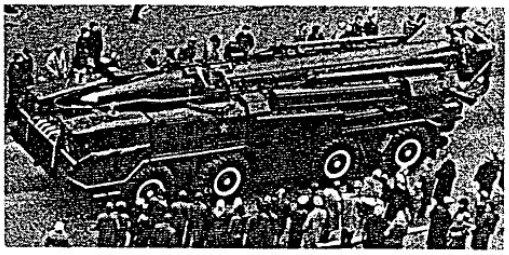
Remarks

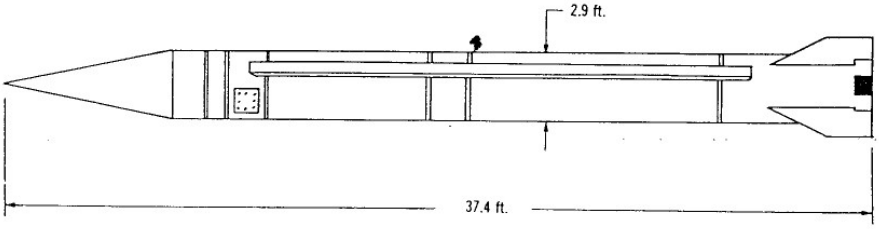
First displayed in Moscow parade of November 1967. Used by East European forces with conventional warhead. Only Soviet forces have nuclear version available. Naval version of Scud missile developed for surface launching from modified Z-class submarines.

Soviet Guided Missiles
GROUND TACTICAL MISSILES

## SS-1C Scud-B








Short-Range Ballistic Missile

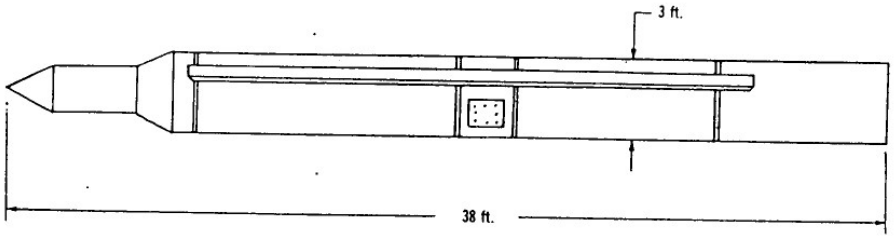
| | |
|---|---|
| IOC | 1961 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | 13,400 lbs |
| Warhead (HE, nuclear) | 1,600-2,000 lbs |
| Maximum range | 160 nm |
| Guidance | inertial |
| CEP | about 0.3 nm |

Remarks

First displayed in Moscow parade of November 1961. Eight-wheeled transporter-launcher first shown in November 1965. Scud-B deployed extensively with Soviet forces. East Germany only other country known to have this missile.

Soviet Guided Missiles
GROUND TACTICAL MISSILES

## SS-12




Short-Range Ballistic Missile

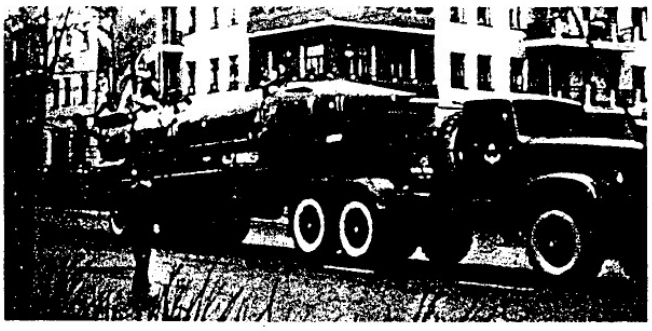
| | |
|---|---|
| IOC | 1965 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | 18,800 lbs |
| Re-entry vehicle | 1,500 ± 500 lbs |
| Warhead (HE, nuclear) | 1,200 ± 500 lbs |
| Maximum range | about 500 nm |
| Guidance | inertial |
| CEP | 0.25-0.5 nm |

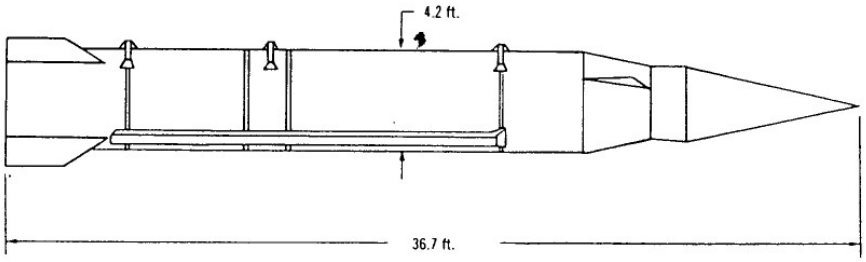
Remarks

Tactical mobile system designed to fill gap between 150-mile and 1,000-mile systems. Flight testing began in March 1964. May be deployed with front ground forces to supplement coverage of battle zone.

SS-12 may be associated with Scaleboard mobile system (photograph) first displayed in November 1967. Scaleboard is deployed at three locations along Soviet border with China.

## SS-N-4






Short-Range Ballistic Missile

| | |
|---|---|
| IOC | 1960 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | 25,300 lbs |
| Re-entry vehicle | about 2,700 lbs |
| Warhead (nuclear) | about 2,200 lbs |
| Maximum range | 300 nm |
| Guidance | inertial |
| CEP | 1-2 nm |

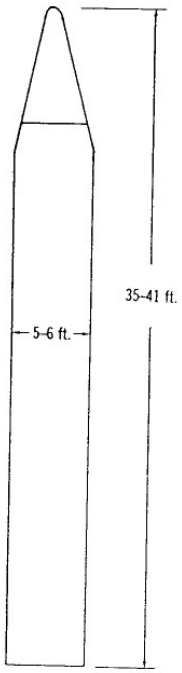
Remarks

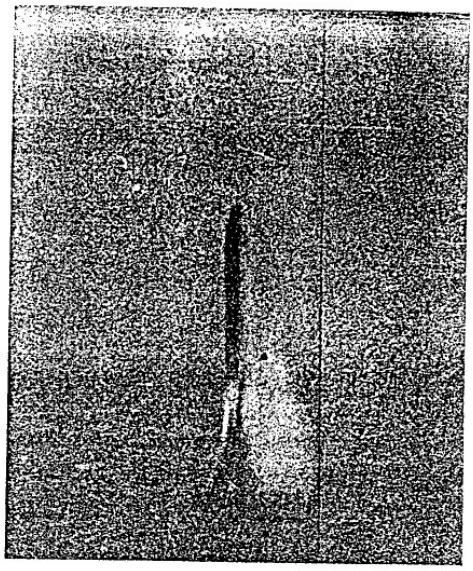
Launched from G-I and converted Z class submarines. Submarine surfaces prior to launch. Was also launched from H-I class submarines. First confirmed public appearance in Murmansk parade in November 1967. May have been shown on Soviet-East European TV and movies since 1965.

Soviet Guided Missiles

SUBMARINE MISSILES

## SS-N-5



(Possible SS-N-5)

Medium-Range Ballistic Missile

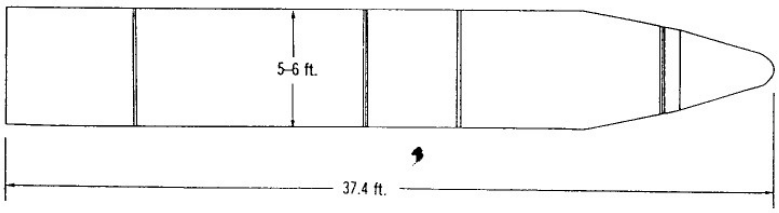
| | |
|---|---|
| IOC | 1963 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | 39,000 lbs |
| Re-entry vehicle | 2,400 ± 400 lbs |
| Warhead (nuclear) | 2,000 ± 400 lbs |
| Maximum range | 650 nm |
| Guidance | inertial |
| CEP | 1-2 nm |

Remarks

Launched submerged from G-II and H-II class submarines.

Soviet Guided Missiles
SUBMARINE MISSILES

## SS-N-6




Medium-Range Ballistic Missile

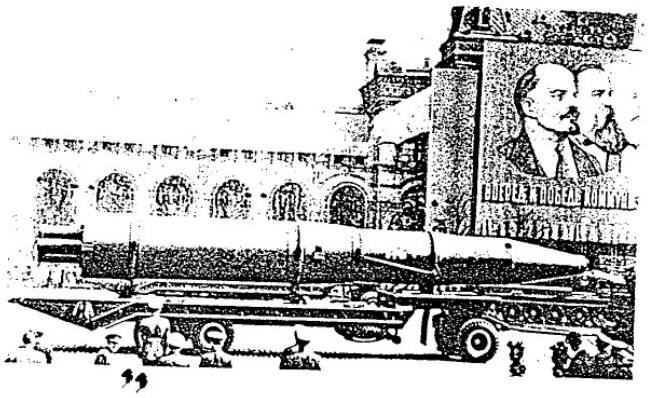
| | |
|---|---|
| IOC | 1968 |
| Configuration | single stage |
| Propellant | storable liquid |
| Launch weight | unknown |
| Re-entry vehicle | 1,500 ± 500 lbs |
| Warhead (nuclear) | 1,200 ± 500 lbs |
| Maximum range | 1,500 nm |
| Guidance | inertial |
| CEP | about 1 nm |

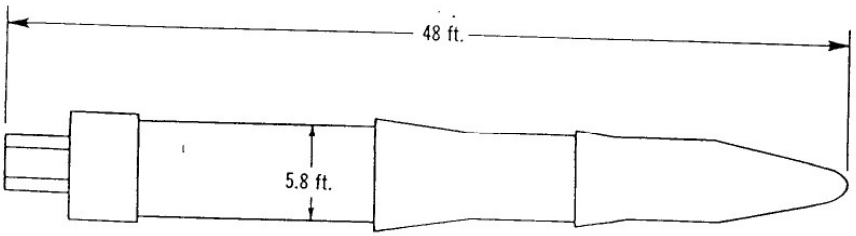
Remarks

Probably carried by 16-tube Y class ballistic missile submarine. Launched submerged.

Soviet Guided Missiles
SUBMARINE MISSILES

**Sark**





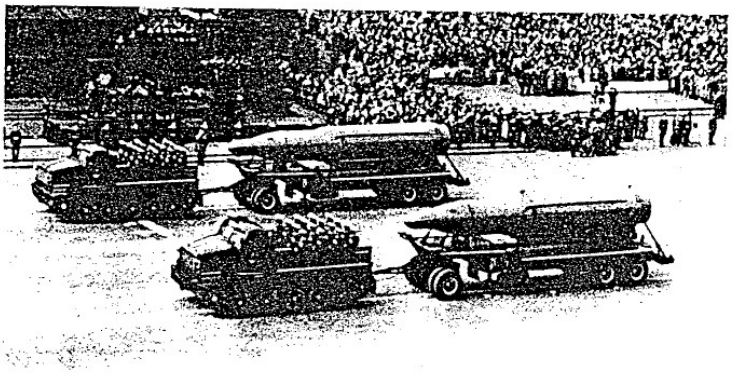

Medium-Range Ballistic Missile

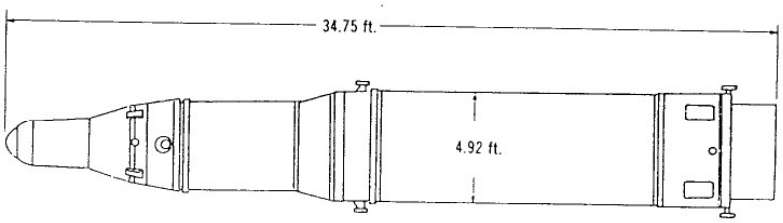
Remarks

First publicly displayed in Moscow parade of November 1962. Never identified with any test flight program. Probably prototype for Serb. Soviets claimed this missile can be launched from submerged submarines, but its length appears to rule out use on current submarines.

Soviet Guided Missiles
SUBMARINE MISSILES

## Serb





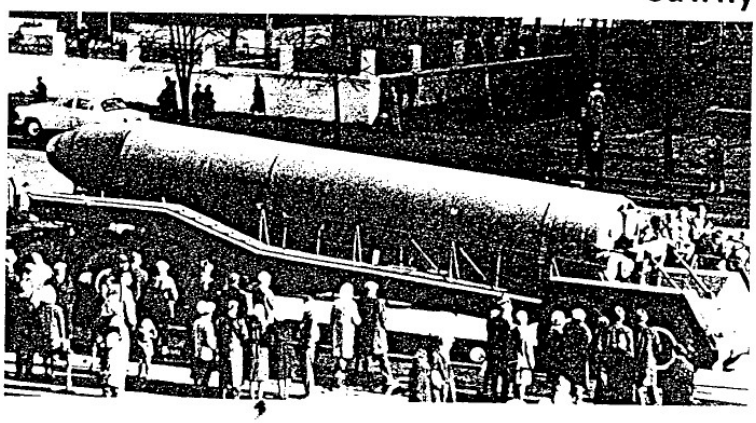

Medium-Range Ballistic Missile

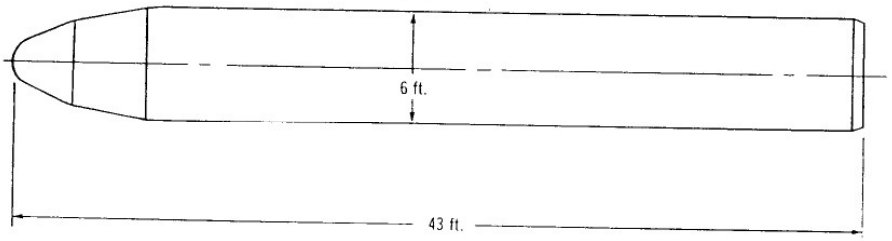
Remarks

Probably a development of Sark. Did not become operational in this configuration. First publicly displayed in Moscow parade of November 1964. Test launch of what was probably a modified Serb was shown on Soviet-East European television in 1965.

Soviet Guided Missiles
SUBMARINE MISSILES

**Sawfly**





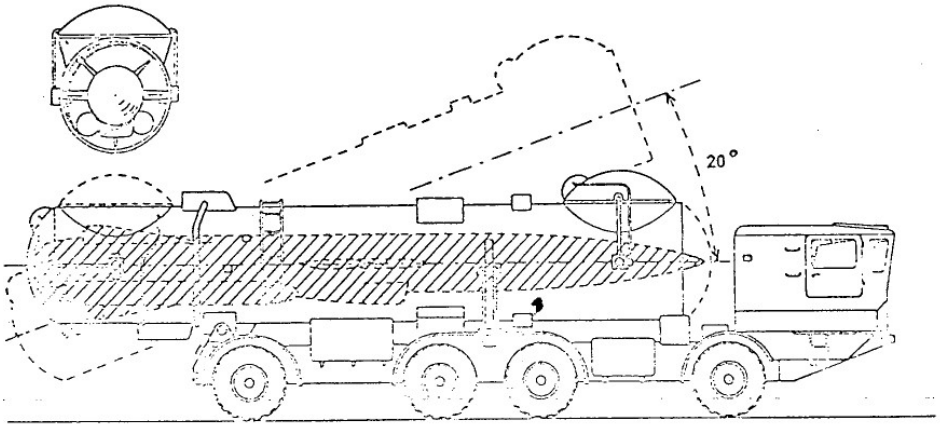

Intermediate-Range Missile

Remarks

First publicly displayed in Moscow parade of November 1967. Probably two-stage, solid-propellant test vehicle. Status unknown.

Soviet Guided Missiles
ANTISHIP MISSILES

## SS-C-1B Shaddock




Coastal Defense Cruise Missile

| | |
|---|---|
| IOC | 1963 |
| Propulsion | rocket-boosted turbojet |
| Launch weight | 10,000 lbs |
| Warhead (HE, chemical, nuclear) | 1,000-2,000 lbs |
| Maximum range | 270 nm |
| Cruising altitude | 1,000-3,000 ft |
| Cruising speed | low supersonic |
| Guidance | command/terminal homing |

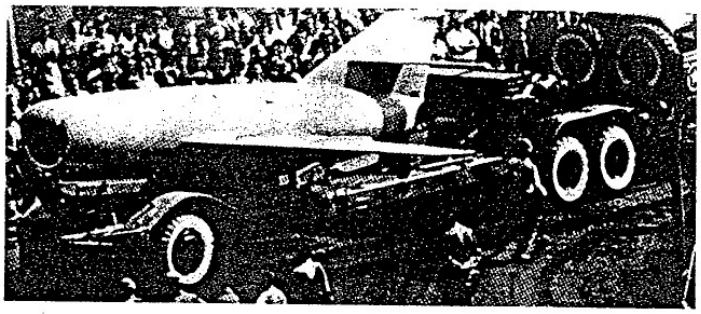
Remarks

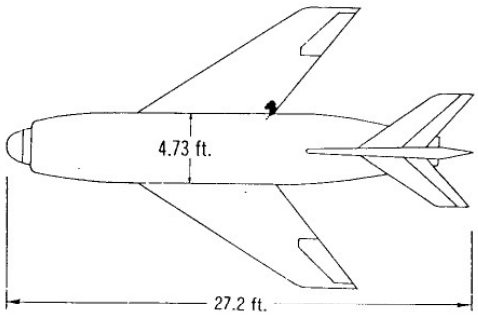
Coastal defense version of SS-N-3 Shaddock. First displayed on Moscow television in mid-1965. Probably intended as replacement for earlier SS-C-2B Samlet. Probably being deployed at principal straits, inlets, and naval bases.

Soviet Guided Missiles

ANTISHIP MISSILES

## SS-C-2B Samlet






Coastal Defense Cruise Missile

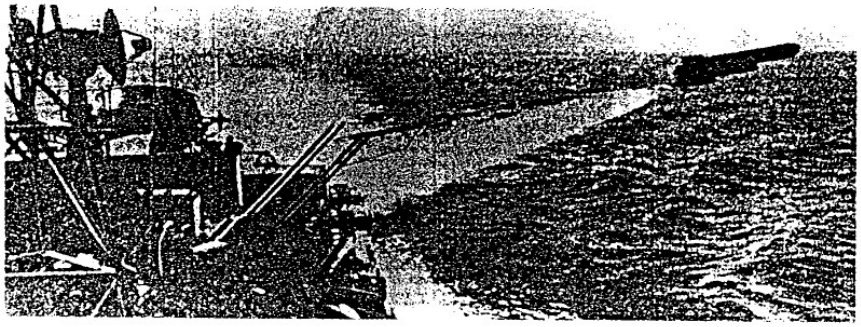
| | |
|---|---|
| IOC | 1956 |
| Propulsion | rocket-boosted turbojet |
| Launch weight | 6,000 lbs |
| Warhead (HE, chemical) | 2,200 lbs |
| Maximum range | 25-45 nm |
| Cruising altitude | 300-1,500 ft |
| Cruising speed | Mach 0.8 |
| Guidance | beam rider/terminal homing |

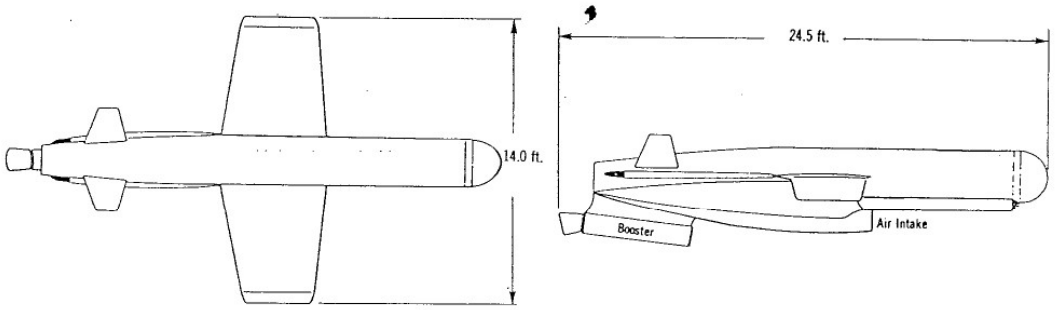
Remarks

Coastal defense version of AS-1 Kennel air-to-surface missile. Maximum range depends on elevation of guidance radar and height of target ship's superstructure. First publicly displayed in January 1963 parade in Havana. Deployed in coastal areas of USSR in defense of naval installations.

User countries include Bulgaria, Communist China, Cuba, Egypt, East Germany, North Korea, and Poland.

## SS-N-1 Scrubber






Naval Short-Range Cruise Missile

| | |
|---|---|
| IOC | 1958 |
| Propulsion | rocket-boosted turbojet |
| Launch weight | unknown |
| Warhead (HE, nuclear) | 1,000-2,000 lbs |
| Maximum range | 30-80 nm |
| Cruising altitude | 1,000-10,000 ft |
| Cruising speed (sea level) | Mach 0.75 |
| Guidance | preset autopilot/ possible command override/terminal homing |

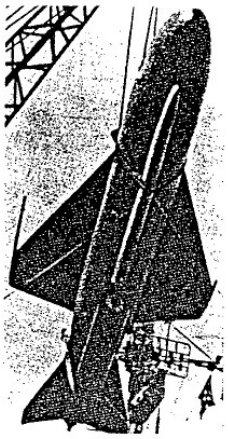
Remarks

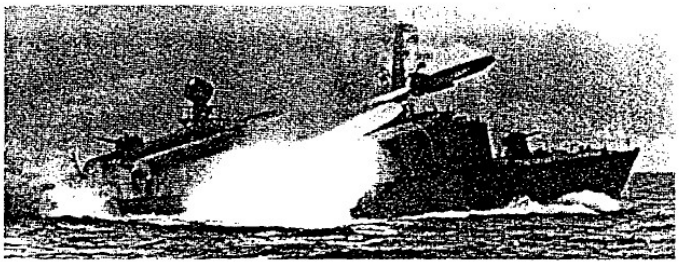
Carried by Kildin and Krupnyy class destroyers and used against both ships and shore targets. At ranges beyond approximately 30 nm a target spotter aircraft or surface vessel must supply range and bearing data.

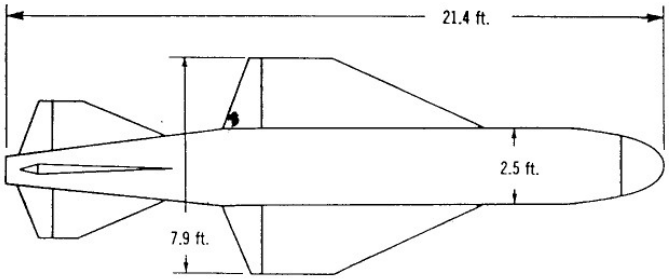
Soviet Guided Missiles

ANTISHIP MISSILES

## SS-N-2 Styx








Naval Short-Range Cruise Missile

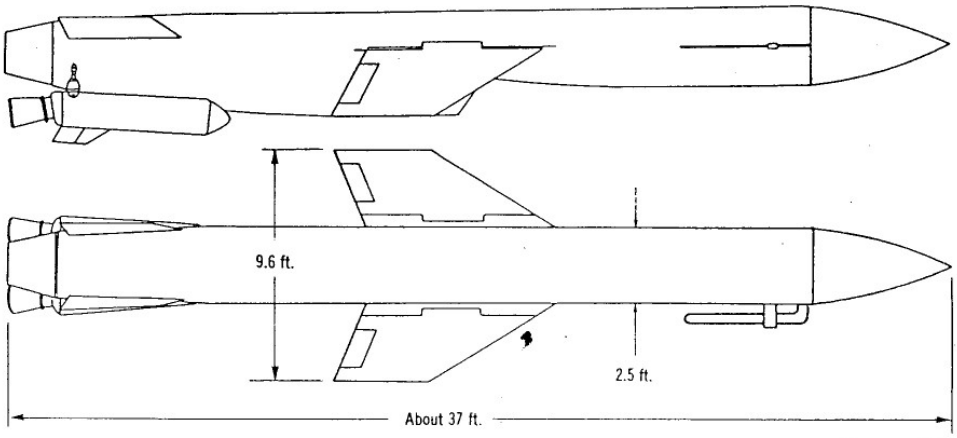
| | |
|---|---|
| IOC | 1959 |
| Propulsion | rocket-boosted storable-liquid-fuel rocket |
| Launch weight | 4,600 lbs |
| Warhead (HE) | 1,100 lbs |
| Maximum range | 25 nm |
| Cruising altitude | 300-1,000 ft |
| Cruising speed (sea level) | Mach 0.9 |
| Guidance | preset autopilot/ terminal homing |

Remarks

Carried by Komar- and Osa-class patrol boats. Primarily antiship missile but can also be used against land targets. There is new version of Osa patrol boat and evidence of modified Styx missile for it.

Styx-equipped patrol boats have been exported to Algeria, Communist China, Cuba, Egypt, East Germany, Indonesia, North Korea, Poland, Syria, and Yugoslavia.

## SS-N-3 Shaddock




Naval Short-Range Cruise Missile

| | |
|---|---|
| IOC | 1961 |
| Propulsion | rocket-boosted turbojet |
| Launch weight | 10,000 lbs |
| Warhead (HE, chemical, nuclear) | 1,000-2,000 lbs |
| Maximum range | 250 nm |
| Cruising altitude | 1,000-40,000 ft |
| Cruising speed | Mach 0.9-1.7 |
| Guidance | preset autopilot/ possible command override/terminal homing |

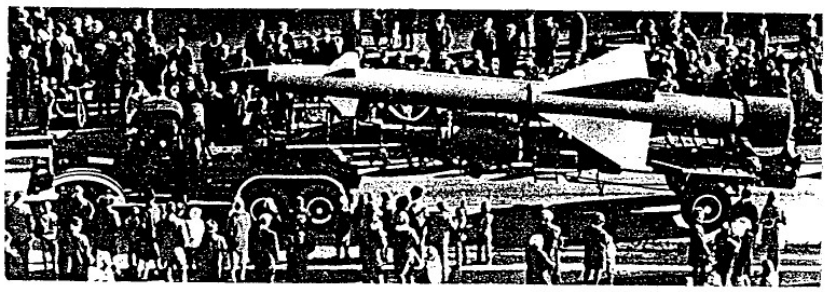
Remarks

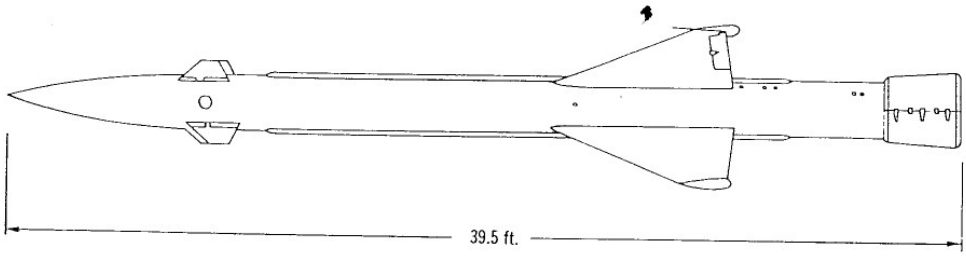
Carried by J- and modified W-class submarines, E-I and E-II nuclear-powered submarines, and Kynda- and Kresta-class cruisers. Submarines must surface to launch.

In primary role as antiship missile, most likely operational range is 250 nm when launched from submarine and 150 nm from surface ship. This weapon could also be used against land targets with CEP of 1-2 nm.

Soviet Guided Missiles
SURFACE-TO-AIR AND ABM MISSILES

## SA-1 Guild





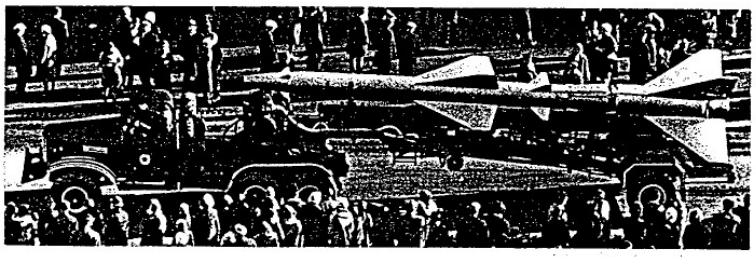

Surface-to-Air Missile

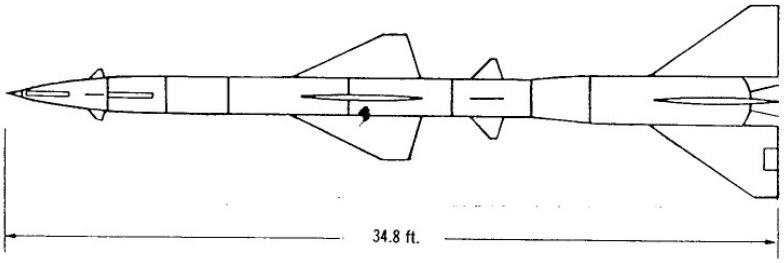
| | |
|---|---|
| IOC | 1954 |
| Propulsion | single-stage liquid |
| Warhead (HE) | 465 lbs |
| Maximum operational range | 18-24 nm |
| Effective altitude, | |
| maximum | 60,000-80,000 ft |
| minimum | 3,500 ft |
| Speed | Mach 3 |
| Guidance | command |
| CEP | 100-200 ft |

Remarks

Introduced in 1954 as part of fixed Moscow area defenses. Not deployed elsewhere.

## SA-2 Guideline
## Mod I, II






Surface-to-Air Missile

| | |
|---|---|
| IOC | Mod I 1959, Mod II 1960 |
| Propulsion | solid booster, liquid sustainer |
| Warhead (HE) | 420 lbs |
| Maximum operational range | Mod I 17 nm<br>Mod II 21 nm |
| Effective altitude, | |
| maximum | 80,000-90,000 ft |
| minimum | 1,500 ft |
| Speed | about Mach 4 |
| Guidance | command |
| CEP | 75-100 ft |

Remarks

No external features have been identified to distinguish Mod I from Mod II. Mod I is employed with Fan Song B S-band radar, Mod II with Fan Song C C-band radar.

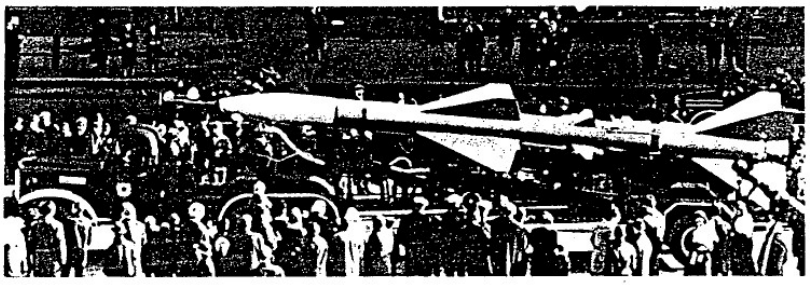
Mod I is no longer operational in USSR. Exported to Warsaw Pact countries and to Afghanistan, Algeria, Communist China, Cuba, Cyprus, Egypt, India, Indonesia, Iraq, North Korea, North Vietnam, and Yugoslavia.

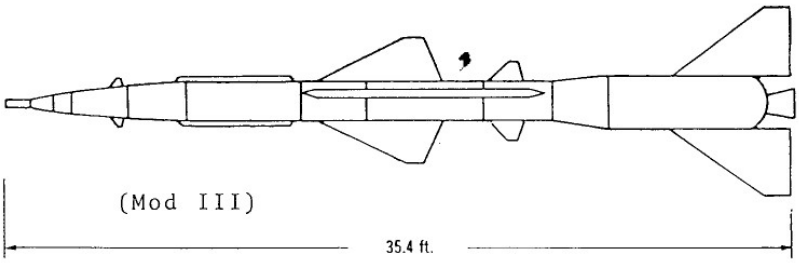
Mod II still operational in USSR. Deployed with Soviet forces in Cuba and exported to some Warsaw Pact countries.

Soviet Guided Missiles

SURFACE-TO-AIR AND ABM MISSILES

## SA-2 Guideline Mod III, IV






Surface-to-Air Missile

| | |
|---|---|
| IOC | Mod III 1962, Mod IV 1966 |
| Propulsion | solid booster, liquid sustainer |
| Warhead (HE, nuclear) | about 420 lbs |
| Maximum operational range | 27 nm |
| Effective altitude, | |
| maximum | 90,000 ft |
| minimum | 1,000 ft |
| Speed | about Mach 4 |
| Guidance | command |
| CEP | about 75 ft |

Remarks

Employed with Fan Song E C-band radar.

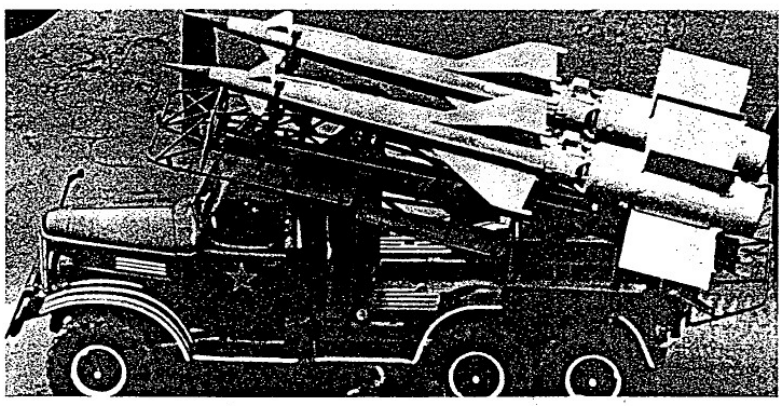
Mod III constitutes primary weapon of Soviet SAM defenses. Exported to most Warsaw Pact countries and Yugoslavia. Also deployed with Soviet forces in Eastern Europe and Mongolia.

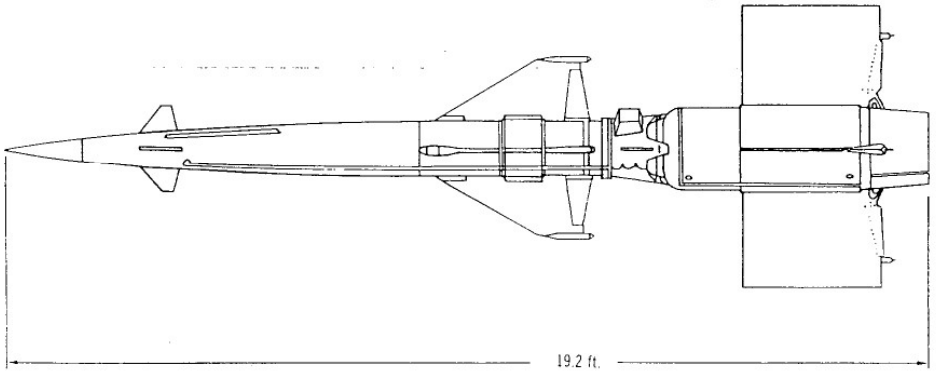
Mod IV, first displayed in November 1967, probably has nuclear warhead. Probably deployed only in USSR.

Soviet Guided Missiles

SURFACE-TO-AIR AND ABM MISSILES

## SA-3 Goa






Surface-to-Air Missile

| | |
|---|---|
| IOC | 1961 |
| Propulsion | solid booster & sustainer |
| Warhead (HE) | 140 lbs |
| Maximum operational range | about 13 nm |
| Effective altitude, | |
| maximum | about 50,000 ft |
| minimum | about 500 ft |
| Speed | Mach 2.5 |
| Guidance | command |
| CEP | about 30 ft |

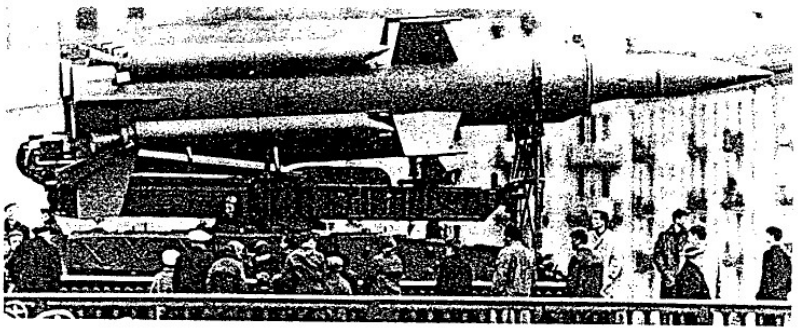
Remarks

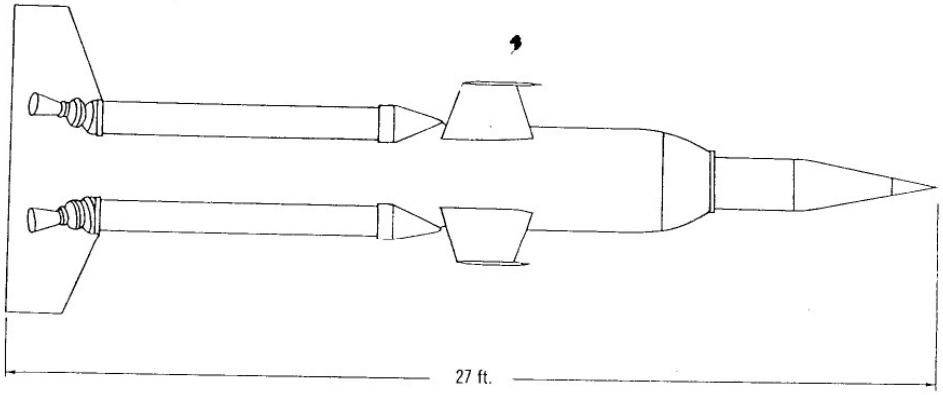
Deployed at over 150 sites around Moscow, Leningrad, and some border approaches. Also deployed at Soviet tactical airfields in East Germany, Poland, and Hungary.

Soviet Guided Missiles

SURFACE-TO-AIR AND ABM MISSILES

**SA-4 Ganef**





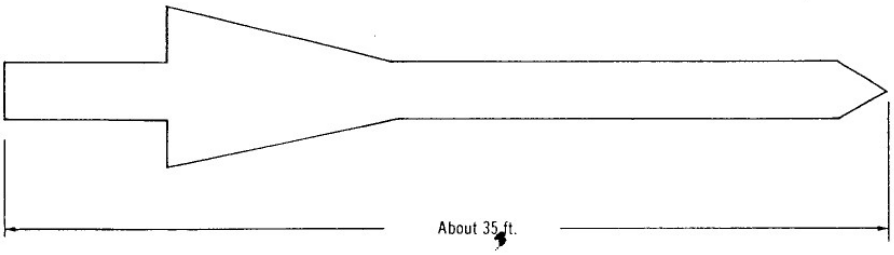

Surface-to-Air Missile

| | |
|---|---|
| IOC | 1967 |
| Propulsion | 4 solid strap-on boosters, ramjet sustainer |
| Warhead (HE) | 400 lbs |
| Maximum operational range | 25-30 nm |
| Effective altitude, | |
| maximum | 65,000 ft |
| minimum | 1,000-1,500 ft |
| Speed | Mach 2.6 |
| Guidance | command/terminal homing |
| CEP | 150 ft |

Remarks

Mobile system used for tactical air defense of Soviet ground forces. First displayed in Moscow parade of May 1964.

## SA-5




Long-Range Surface-to-Air Missile

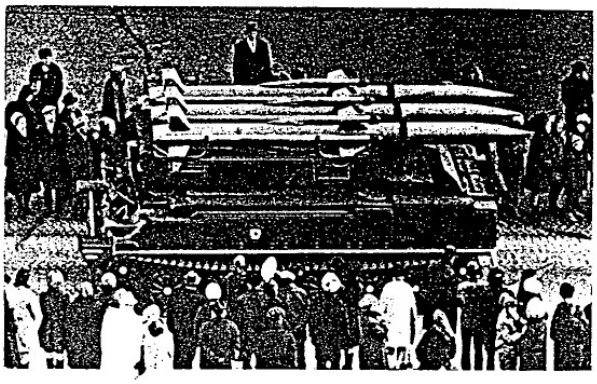
| | |
|---|---|
| IOC | 1967 |
| Propulsion | solid booster, liquid sustainer |
| Warhead (HE, nuclear) | 700-750 lbs |
| Maximum operational range | 50-100 nm |
| Effective altitude, | |
| maximum | 110,000 ft |
| minimum | unknown |
| Speed | Mach 4.5 |
| Guidance | command/terminal homing |
| CEP | 100-200 ft |

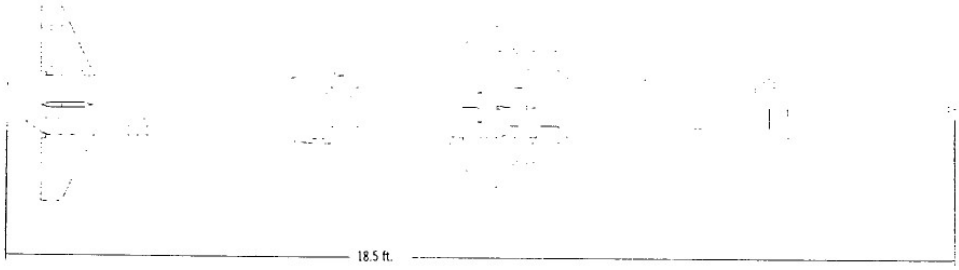
Remarks

Designed to defend against medium- and high-altitude aircraft and standoff weapons threat. Deployed extensively throughout USSR. Never publicly displayed.

Soviet Guided Missiles
SURFACE-TO-AIR AND ABM MISSILES

## SA-6 Gainful





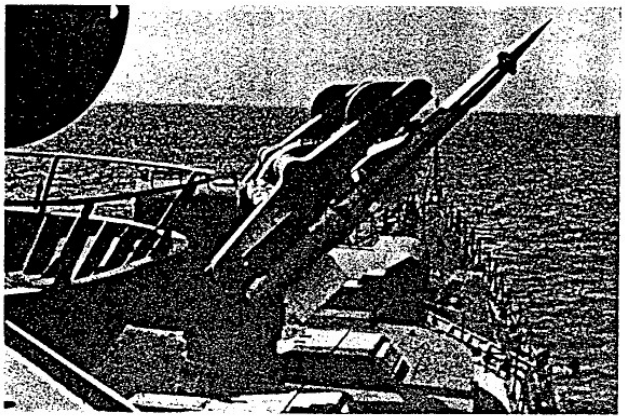

Surface-to-Air Missile

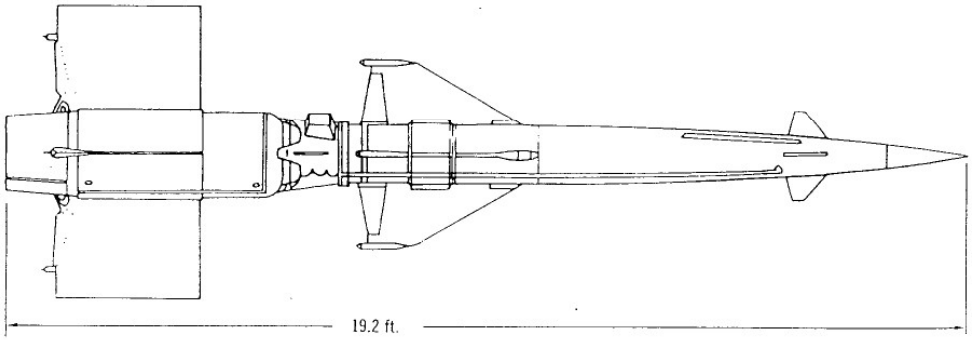
| | |
|---|---|
| IOC | 1970-71 |
| Propulsion | unknown |
| Warhead (HE) | 100-200 lbs |
| Maximum operational range | 10-20 nm |
| Effective altitude, | |
| maximum | 30,000 ft |
| minimum | under 500 ft |
| Speed | Mach 2.5 |
| Guidance | command/terminal homing |
| CEP | 20-30 ft |

Remarks

Soviets have stated that this mobile system is intended for low-altitude defense. Will be deployed with air defense troops of ground forces.

## SA-N-1






Naval Surface-to-Air Missile

| | |
|---|---|
| IOC | 1962 |
| Propulsion | solid booster & sustainer |
| Warhead (HE) | 100-200 lbs |
| Maximum operational range | 12 nm |
| Effective altitude, | |
| maximum | 25,000-50,000 ft |
| minimum | about 500 ft |
| Speed | Mach 2.5 |
| Guidance | command |
| CEP | about 50 ft |

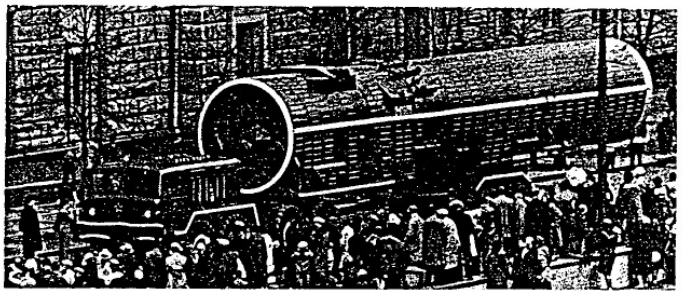
Remarks

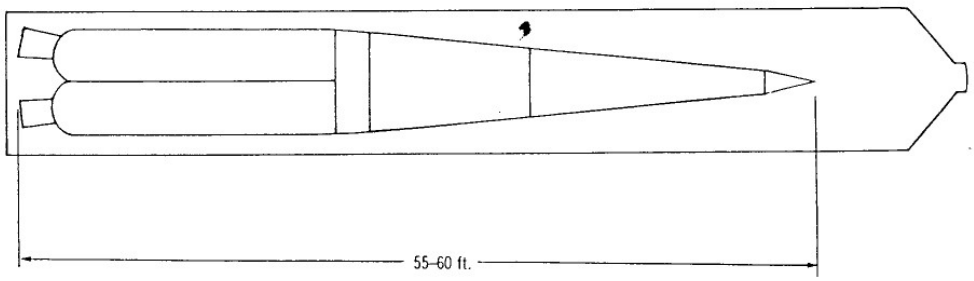
Naval version of SA-3 Goa. Carried on Kashin and converted Kotlin class destroyers, and Kresta and Kynda class cruisers.

Soviet Guided Missiles

SURFACE-TO-AIR AND ABM MISSILES

## Galosh (ABM-1)






ABM Missile

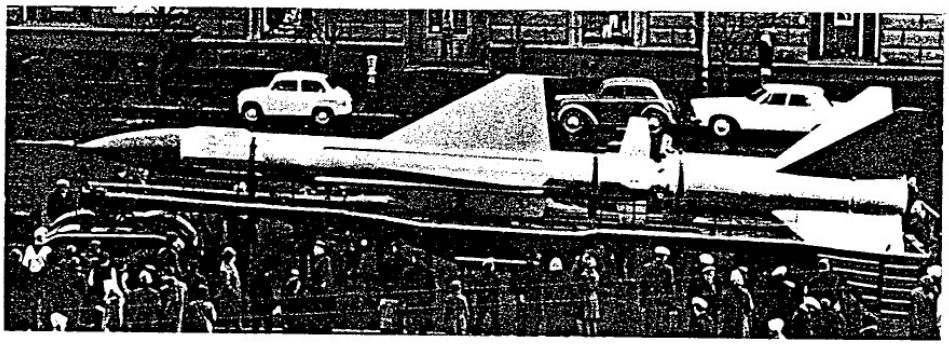
| | |
|---|---|
| IOC | 1968 |
| Propulsion | solid booster with probable liquid sustainer |
| Warhead (nuclear) | 2,000-3,000 lbs |
| Maximum operational range | 350 nm |
| Effective altitude, | |
| maximum | 200-300 nm |
| minimum | 100,000 ft |
| Speed | 11,500-14,500 ft per second |
| Guidance | probably command type using small Try Add radars |

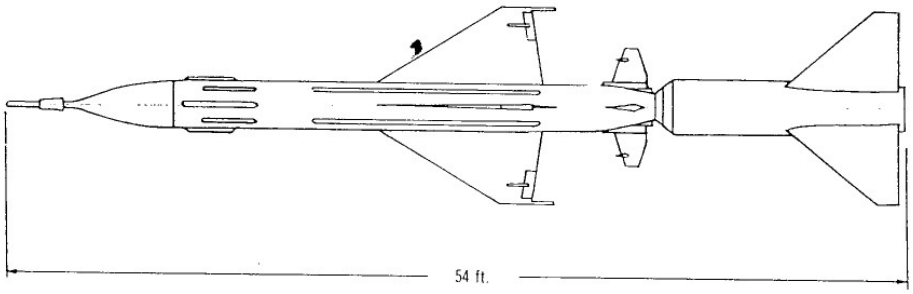
Remarks

Deployment limited to Moscow area. Estimated to provide limited defense capability against ballistic missile attack.

Soviet Guided Missiles
SURFACE-TO-AIR AND ABM MISSILES

## Griffon





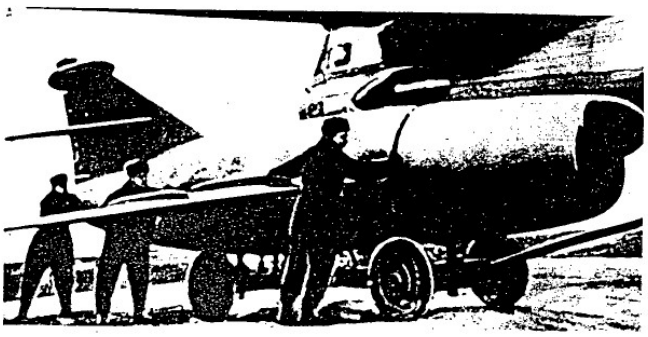

| | |
|---|---|
| IOC | never operational |
| Propulsion | solid booster, liquid sustainer |
| Warhead (HE, nuclear) | 600-1,000 lbs |
| Maximum operational range | about 100 nm |
| Effective altitude, maximum | about 100,000 ft |
| minimum | unknown |
| Speed | 5,500-6,000 ft per second |
| Guidance | command/possible terminal homing |
| CEP | unknown |

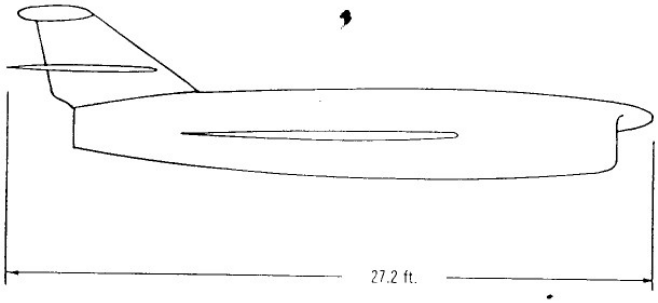
Remarks

First shown in Moscow parade of November 1963. Described in Soviet literature both as surface-to-air and anti-ballistic missile. Not known to be deployed.

Soviet Guided Missiles
AIR-TO-SURFACE MISSILES

## AS-1 Kennel





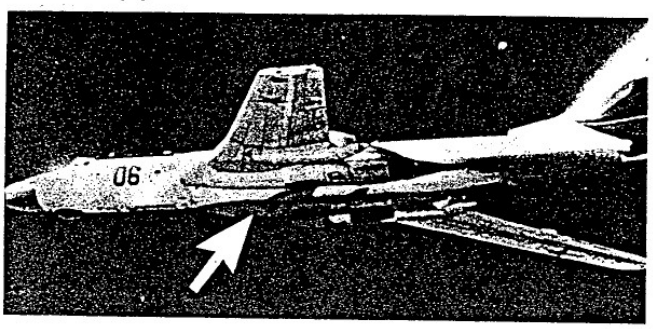

| | |
|---|---|
| IOC | 1957 |
| Propulsion | turbojet |
| Launch weight | 6,000 lbs |
| Warhead (HE, possibly chemical) | 2,000 lbs |
| Range | 50 nm |
| Speed | Mach 0.80-0.85 |
| Guidance | beam rider/terminal homing |
| CEP, against ships | 150 ft |
| against land targets | 1 nm |
| Carrier:load | TU-16 Badger B : two |

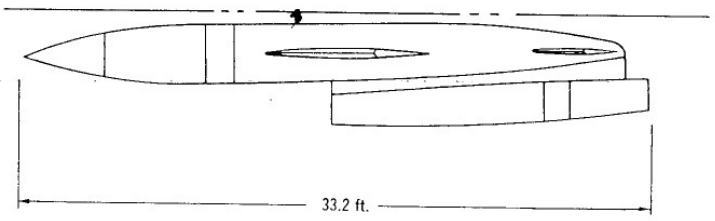
Remarks

First Soviet antiship missile. Most or all of AS-1s allocated to Soviet naval air forces probably replaced by AS-5s. Exported to Indonesia and Egypt.

Soviet Guided Missiles
AIR-TO-SURFACE MISSILES

## AS-2 Kipper



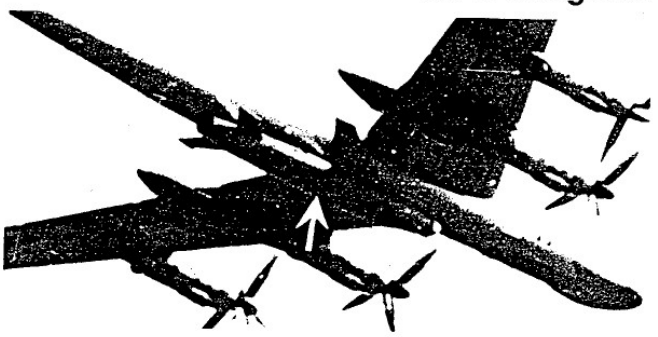

| | |
|---|---|
| IOC | 1960-61 |
| Propulsion | turbojet |
| Launch weight | 9,100 lbs |
| Warhead (HE, nuclear) | 2,200 lbs |
| Range | 100 nm |
| Launch speed, at 36,000 ft | Mach .8 |
| Maximum cruise speed, | |
| high altitude | Mach 1.7 |
| low altitude | Mach 1.2 |
| Guidance | autopilot with command override/terminal homing |
| CEP, against ships | 150 ft |
| against land targets | 1-2 nm |
| Carrier:load | TU-16 Badger C : one |

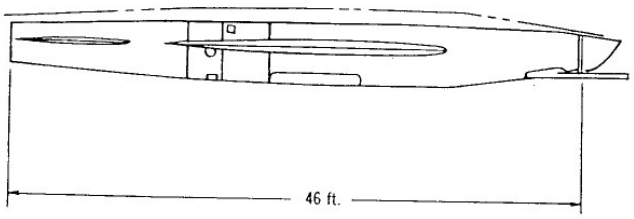
Remarks

Used only by Soviet naval air forces, primarily in antiship role.

Soviet Guided Missiles
AIR-TO-SURFACE MISSILES

## AS-3 Kangaroo



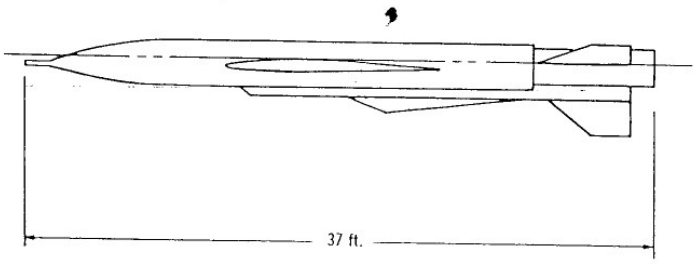



| | |
|---|---|
| IOC | 1960-61 |
| Propulsion | turbojet |
| Launch weight | 25,000 lbs |
| Warhead (nuclear) | 4,500-5,500 lbs |
| Maximum range | 350 nm |
| Speed | Mach 1.8-2.0 |
| Guidance | autopilot with command override |
| CEP | 1-3 nm |
| Carrier:load | TU-95 Bear B,C : one |

Remarks

Designed as standoff weapon for strategic attack against large land targets.

## AS-4 Kitchen



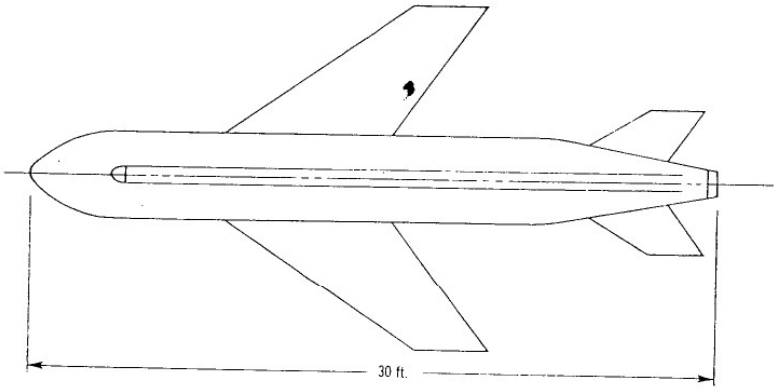

| | |
|---|---|
| IOC | 1968 |
| Propulsion | liquid rocket |
| Launch weight | 14,000 lbs |
| Warhead (HE, nuclear) | 2,200 lbs |
| Range, against ships | 150 nm |
| against land targets | 250 nm |
| Speed | Mach 3.5 |
| Guidance | unknown |
| CEP | 1-2 nm |
| Carrier:load | TU-22 Blinder B : one |

Remarks

Apparently designed for use against land and ship targets.

Soviet Guided Missiles
AIR-TO-SURFACE MISSILES

## AS-5 Kelt

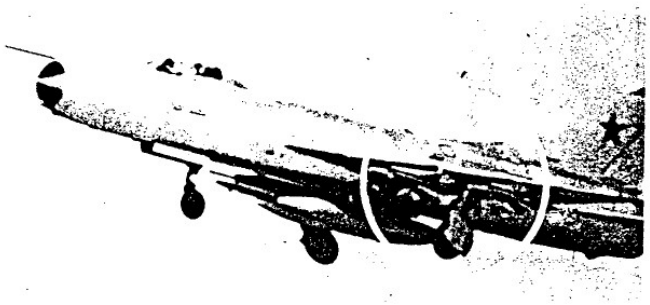


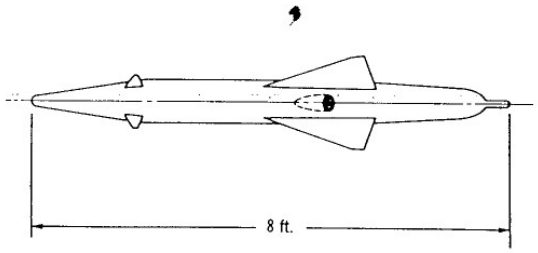

| | |
|---|---|
| IOC | 1963-65 |
| Propulsion | liquid-fuel rocket |
| Launch weight | about 6,000 lbs |
| Warhead (HE, nuclear) | 1,000-2,000 lbs |
| Range | 120 nm |
| Speed | Mach .9-1.2 |
| Guidance | unknown, possibly preset autopilot with command override/possibly terminal homing in antiship role |
| CEP, against land targets | 1-2 nm |
| against ships | 150 ft |
| Carrier:load | TU-16 Badger B : two |

Remarks

Launch occurs at altitude of 30,000-35,000 feet at about 440 knots. Began to replace AS-1 about 1963. Has extended the useful life of TU-16 Badger B.

## AA-1 Alkali






| | | |
|---|---|---|
| IOC | | 1957-59 |
| Launch weight, | AA-1B | 187 lbs |
| | AA-1C | 205 lbs |
| Warhead (HE) | | 35 lbs |
| Maximum range | | 3-4 nm |
| Guidance | | beam rider |
| CEP | | 20 ft |
| Carrier:load | MIG-19 Farmer E | : four |
| | SU-9 Fishpot B | : four |
| | MIG-21 Fishbed D,F | : two |

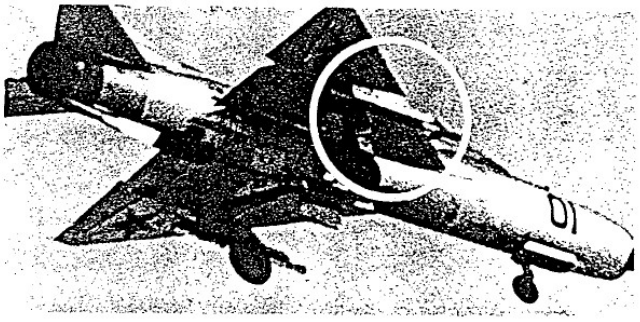
Remarks

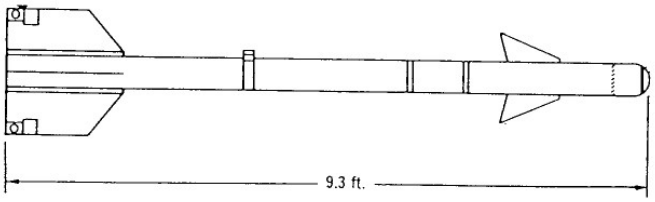
All-weather tail attack system. Has limited attack capability at low altitude down to sea level in fixed beam mode.

Soviet Guided Missiles

AIR-TO-AIR MISSILES

## AA-2 Atoll





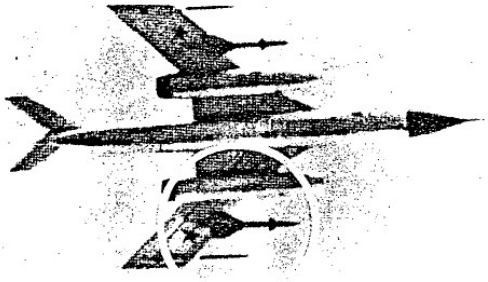

| | |
|---|---|
| IOC | 1959-60 |
| Launch weight | 167 lbs |
| Warhead (HE) | 25 lbs |
| Maximum range | 5-6 nm |
| Guidance | infrared homing |
| CEP | 10-15 ft |
| Carrier:load | MIG-21 Fishbed C, D,E,F,H : two |

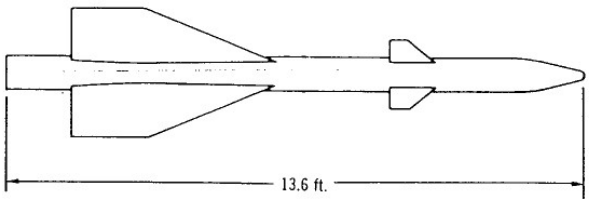
Remarks

Soviet version of US Sidewinder. Does not have all-weather capability. Exported to Afghanistan, Algeria, Cuba, Egypt, India, Indonesia, Iraq, Syria, and Yugoslavia.

Soviet Guided Missiles
AIR-TO-AIR MISSILES

## AA-3 Anab





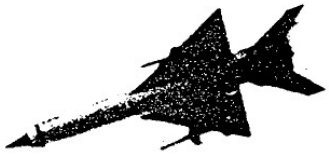

| | |
|---|---|
| IOC | 1964 |
| Launch weight | 600 lbs |
| Warhead (HE) | 75 lbs |
| Maximum range | 10-12 nm |
| Guidance, | |
| AA-3A | radar homing |
| AA-3B | infrared homing |
| CEP, AA-3A | 20-30 ft |
| AA-3B | 10-15 ft |
| Carrier:load | YAK-28 Firebar : two |
| | SU-9 Fishpot C : two |
| | SU- Flagon A : two |

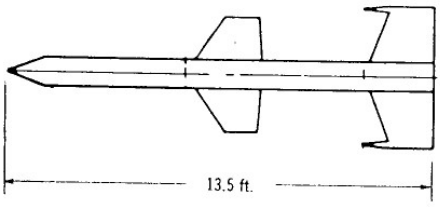
Remarks

AA-3A is all-weather tail or nose attack system. AA-3B is limited to tail attack and does not have all-weather capability.

Soviet Guided Missiles
AIR-TO-AIR MISSILES

## AA-4 Awl



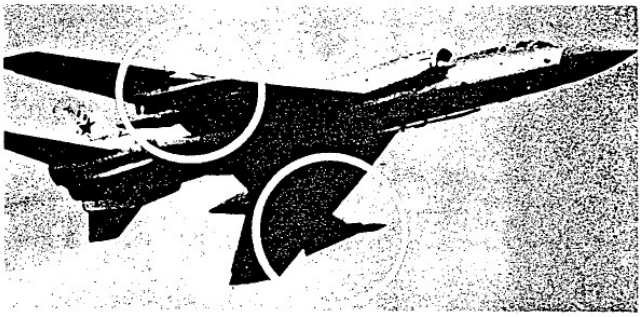


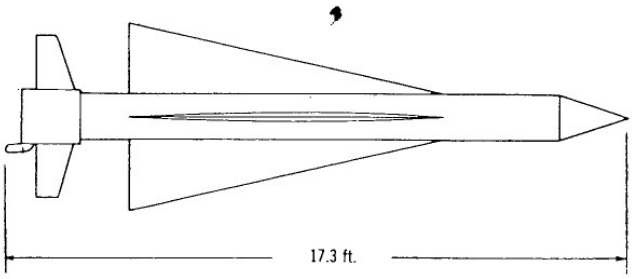

| | |
|---|---|
| IOC | deployment unlikely |
| Launch weight | 750 lbs |
| Warhead (HE) | 125-150 lbs |
| Maximum range | 9-11 nm |
| Guidance | unknown |
| CEP | unknown |
| Carrier:load | Flipper : two |

Remarks

Observed only at 1961 Tushino air show, on Flipper interceptor. Flipper did not reach operational status.

## AA-5 Ash






| | |
|---|---|
| IOC | 1966 |
| Launch weight | 1,000 lbs |
| Warhead (HE) | 150 lbs |
| Maximum range | 12-16 nm |
| Guidance, | |
| AA-5A | radar homing |
| AA-5B | infrared homing |
| CEP, AA-5A | 25-50 ft |
| AA-5B | 20-25 ft |
| Carrier:load | TU-28 Fiddler : four |

Remarks

AA-5A is all-weather system capable of attack from any direction. AA-5B is limited to tail attack and does not have all-weather capability.