



Threat Background

MANPADS

FBI Warning

- WASHINGTON (CNN) -- Although the FBI is saying it has not received specific warnings, the agency is alerting law enforcement agencies to be on the lookout for any signs of terrorist plans to use shoulder-fired missiles against U.S. targets, especially commercial airliners.
- The alert comes after investigators concluded al Qaeda operatives might have tried to shoot down a U.S. military plane in Saudi Arabia earlier this month.

FBI Warning

- The FBI warning stressed the United States had no specific intelligence that al Qaeda is planning an attack using shoulder-fired missiles.
- "The FBI possesses no information indicating that al Qaeda is planning to use 'Stinger' missiles or any type of MANPAD [portable anti-aircraft] weapons system against commercial aircraft in the United States," the warning said

Purpose

Provide the update on the threat of transnational terrorist activity from MANPADS

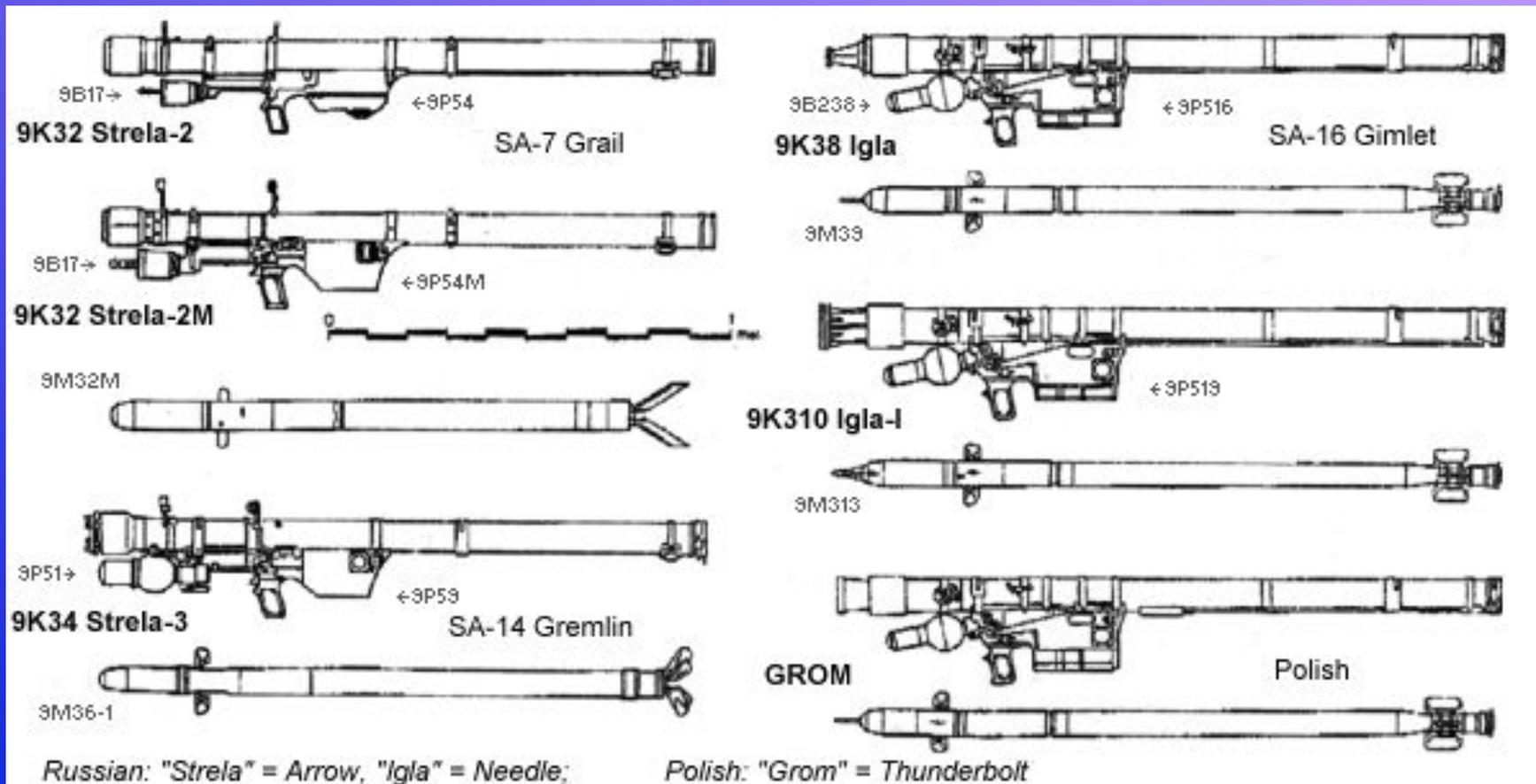
MANPADS are defined as surface-to-air missile systems designed to be carried by an individual or by individuals, including complete systems, components, spare parts, models, training systems, and simulators. They include, but are not limited to, all man-portable variants of the Blowpipe, Hamlet, Javelin, Mistral, RBS-70, Redeye, SA-7, SA-14, SA-16, SA-18, Starburst, Starstreak, Stinger.

MANPADS

- Example systems
 - Blowpipe, Hamlet, Javelin,, Mistral, RBS-70, RBS-70 Mk-2, Redeye, SA-7, SA-14, SA-16, SA-18, Starburst, Starstreak, Stinger.



Outline of the Russian Family of MANPADS



SA-7 GRAIL



- 9K32M Strela-2
HN-5 (Hongying 5) China
Anza MKI - Pakistan
Ayn as Saqr - Egypt
- The SA-7 GRAIL (Strela-2) man-portable, shoulder-fired, low-altitude SAM system is similar to the US Army REDEYE, with a high explosive warhead and passive infrared homing guidance. The HN-5 (*Hong Nu* = Red Cherry) is an improved Chinese version with upgraded capabilities. The SA-7 was the first generation of Soviet man portable surface-to-air missiles.

SA 7

- Although classed as "fire and forget" types, the missiles were easily overcome by solar heat and, when used in hilly terrain, by heat from the ground. The SA-7 seeker is fitted with a filter to reduce the effectiveness of decoying flares and to block IR emissions. The system consists of the missile (9K32 & 9K32M), a reloadable gripstock (9P54 & 9P54M), and a thermal battery (9B17). An identification friend or foe (IFF) system can be fitted to the operators helmet
- The SA-7a (9K32 Strela-2) was introduced for service in 1968, but was soon replaced by the SA-7b (9K32M Strela-2M) which became the most common production model.

SA-7

- The SA-7b, differs from the SA-7a primarily by using a boosted propellant charge to increase range and speed. The SA-7a had a slant range of 3.6 km and a kill zone between 15 and 1500 meters in altitude, with a speed of about 430 meters per second (Mach 1.4). The SA-7b has a slant range of about 4.2 km, a ceiling of about 2300 meters, and a speed of about 500 meters per second (Mach 1.75). Both the SA-7a and SA-7b are tail-chase missile systems, and its effectiveness depends on its ability to lock onto the heat source of low-flying fixed- and rotary-wing aircraft targets.

SA 14

- SA-14 GREMLIN
9K34 Strela-3
- SA-14 GREMLIN (Strela-3 9K34) man-portable SAM is the successor to the SA-7/SA-7b (Strela-2 9K32 and Strela-2M 9K32M). The system consists of the 9P59 gripstock, 9P51 thermal battery/gas reservoir, and 9M36-1 missile. The external appearance of the SA-14 is very similar to the SA-7, and the gripstock, launch canister and aft missile body are almost identical. The most significant differences are the new seeker system and the substitution of a ball-shaped 9P51 thermal battery and gas reservoir for the SA-7's canister shaped battery.

SA14

- The enhanced seeker allowed the SA-14 to be fired against targets from much broader angles, as well as defeating countermeasures such as exhaust shrouds. The warhead of the SA-14 was nearly doubled in weight over the small warhead of the SA-7. The guidance electronics were reduced in weight and a new solid-propellant motor was introduced, compensating for the heavier warhead and improving aerodynamic performance. The SA-14 has a maximum range of 4500 meters, and a altitude of 3000 meters.



SA 16

- SA-16 GIMLET
Igla-1 9K310
- SA-16 GIMLET (Igla-1 9K310) man-portable surface-to-air missile system, a further development from the SA-7 & SA-14 series, is an improved version of the SA-18 GROUSE, which was introduced in 1983, three years before the SA-16. The SA-16 features a new seeker and modified launcher nose cover. Whereas the the SA-18 9M39 missile is fitted with an aerodynamic spike on the nose, the 9M310 missile of the SA-16 has the spike replaced with an

SA 16

- aerodynamic cone held in place with a wire tripod. On the SA-18 the protective cover of the seeker is conical, on the SA-16 it is tubular with a prominent lip at the forward edge. The SA-16 has a maximum range of 5000 meters and a maximum altitude of 3500 meters

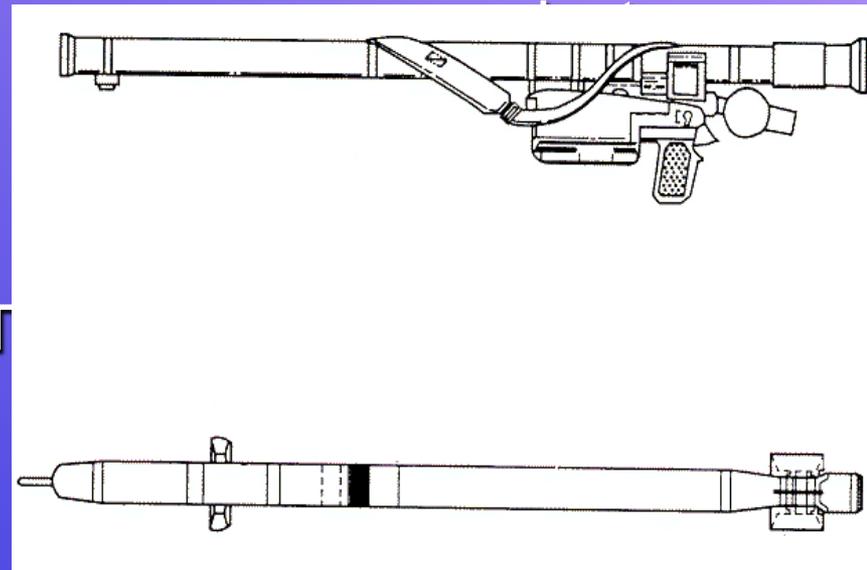


SA 18

- SA-18 GROUSE
Igla 9K38
SA-N-10 GROUSE
Igla-M
- The SA-18 GROUSE (Igla 9K38) is an improved variant in the the SA-7 & SA-14 series of manportable SAMs. As with the earlier SA-14, the SA-18 uses of a similar thermal battery/gas bottle, and the SA-18 has the same 2 kilogram high-explosive warhead fitted with a contact and grazing fuse. But the missile of entirely new design with substantially improved range and speed,. The new seeker and aerodynamic improvements extend its effective range, and its higher speed enables it to be used against faster targets.

SA 18

- The SA-18 has a maximum range of 5200 meters and a maximum altitude of 3500 meters. The 9M39 missile SA-18 employs an IR guidance system using proportional convergence logic. The new seeker offers better protection against electro-optical jammers; the probability of kill unprotected at 30-48%, and the use of jammers only 24-30%.
naval version.



RBS 70



The new BOLIDE missile is using a unique unjammable laser beam riding guidance, providing an incomparable accuracy. BOLIDE has an intercept range of more than 8 km and an altitude coverage exceeding 5,000 m. A high capability against small targets such as cruise missiles and UAVs is provided by a unique adaptive proximity fuze function, optimizing the initiation point of the warhead. The missile's combined warhead, with more than 3,000 tungsten pellets and shaped charge, provides a high kill probability against any aerial threat.

Mistral 2

- MISTRAL 2 is a short range, fire and forget surface-to-air missile, which can be fired by various launching systems. It is fully autonomous after its "fire and forget" firing.

MISTRAL 2 is capable of engaging aerial targets having a low infrared signature, be they helicopters, UAVs or supersonic aircraft. The missile maximal speed is Mach 2.5 and its maximal interception range is 6 000 meters.



Mistral 2

- Missile weight 18,7 kg
- Length 1.86 m
- Diameter 90 mm
- Warhead 3 kg, with fragments of tungsten
- Propulsion solid rocket booster
- Speed > Mach 2.7
- Range 6km; 3,000 m altitude
- Guidance-control Passive IR homing guidance by highly sensitive cooled multicell seeker
- Propulsion solid rocket booster with short combustion time
maximum speed: Mach 2.5
- SSKP 93% (probability of kill)

Starburst



Range 6000 meters
Warhead Frag-HE
Guidance Laser

Starstreak

- This is an advanced British ADATS missile, primarily employed from vehicle mounts, but also available in a shoulder launcher. It is laser guided, with a triple warhead, making hitting easier.
- It is a hypervelocity missile, using high-speed kinetic energy penetrators (KEP). Weight: 6 kg;
- ADATS (Air Defense Anti tank system)



Starstreak

- This triple launcher for the Starstreak may be ground or vehicle mounted. The LML is a basic mount carrying three Starstreak missile tubes, a tripod, and a power source for the missiles and launcher. Weight: (with 3 missiles): 51 kg
- Laser guided
- Kinetic Energy Projectile
- Range 7,000 meters



Javelin

- The Javelin is a shoulder-fired MANPADS missile incorporating advanced guidance capability. Developed as a replacement for the Blowpipe, the Javelin is now the standard man-portable anti-aircraft missile for the British and several NATO and Commonwealth nations. Weight: 9 kg;
- Range 4000 meters
- Radar guided
- Frag-HE



Blowpipe

- The Blowpipe is an older, British, shoulder-fired anti-aircraft missile, replaced in British service the Javelin, but used home defense and units. The missile guided its entire
Weight: 6.2 kg;
- Range 3500 meters
- Frag-HE



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STINGER

FIGURE 1. STINGER WEAPON SYSTEM.

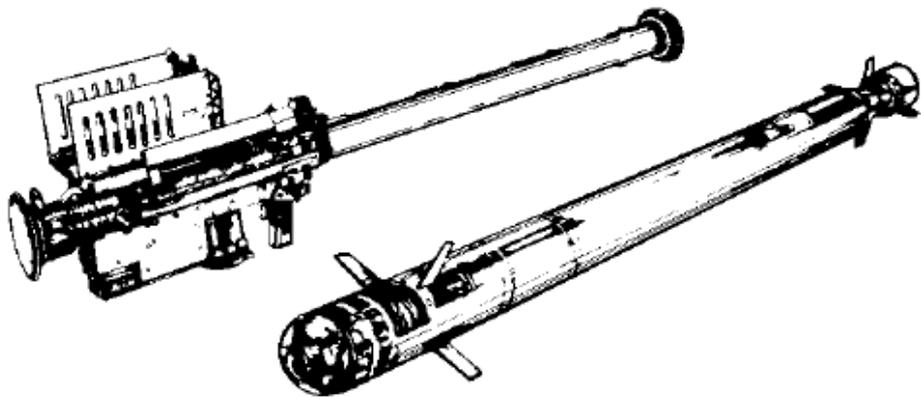
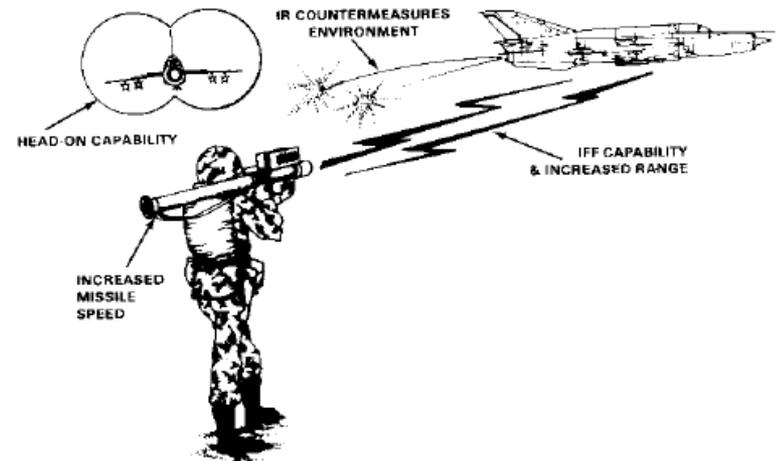


FIGURE 2. STINGER ADVANTAGES OVER REDEYE.



Stinger

FIM-92A Stinger

Short-range,
IR shoulder-fired missile

Length: 5 ft

Launch weight: 10.1 kg

Body diameter: 2.75 in

Speed: 2,445 ft/sec

Maximum range: 3 mi

Max altitude: 12,464 ft

Warhead: Penetrating high-explosive

Impact: Fuze

Propulsion: Solid propellant

Range: 4.5 km

FIGURE 3. STINGER WEAPON-ROUND.

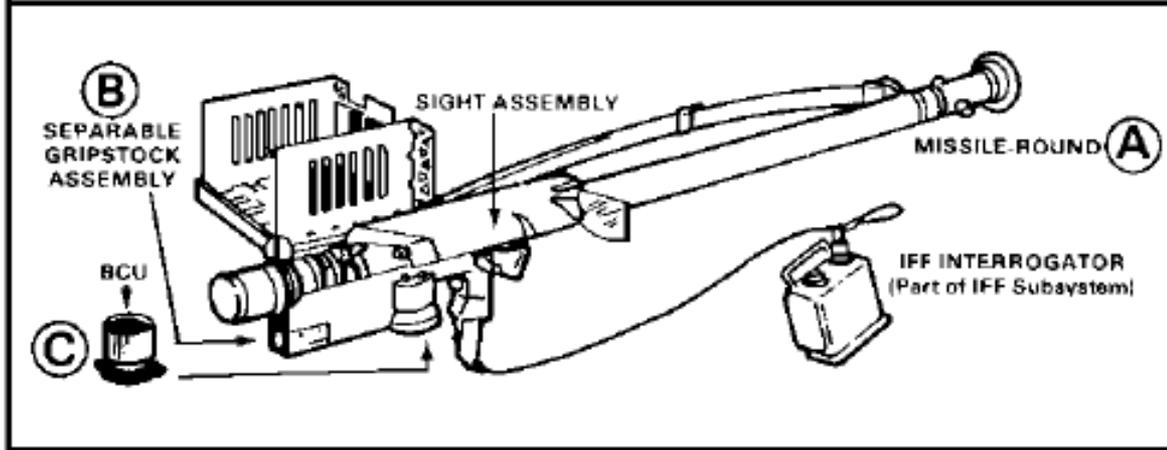
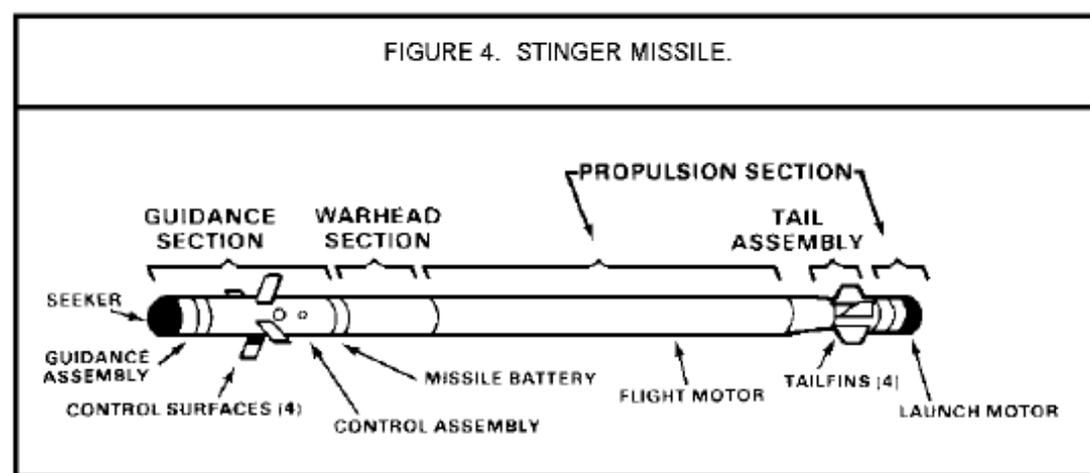


FIGURE 4. STINGER MISSILE.



Stinger

The Stinger weapon system is a man portable (34.5 pounds), shoulder-fired, supersonic missile system designed to counter high-speed, low-level, ground attack aircraft. Stinger is effective against helicopters, unmanned aerial vehicles, and observation and transport aircraft. Once fired, Stinger uses proportional navigation algorithms to guide the missile to a predicted intercept point. The Stinger missile can be used as a man portable air defense system (MANPAD) when the weapon is fired from the gunner's shoulder, mounted aboard the Avenger weapons system, or mounted in the light armored vehicle-air defense variant (LAV-AD).

Stinger reprogrammable microprocessor (RMP) (the Stinger missile's most recent variant) is a dual-channel, passive infrared (IR) and ultraviolet (UV) tracking seeker and proportional navigational guidance missile system. The spectral discrimination of the seeker detector material, when supercooled by the argon gas in the battery coolant unit, enables Stinger to acquire, track, and engage targets in any aspect (incoming, outgoing, or crossing). Stinger is a true "fire

Stinger

and forget” missile, requiring no inputs from the gunner once the weapon is fired. This allows the gunner to take cover, move to an alternate position, or engage additional targets. Stinger also possesses an integral identification, friend or foe (IFF) subsystem to assist the gunner in identifying friendly aircraft. The Stinger missile is comprised of the guidance, tail, propulsion, and warhead sections. The tail assembly consists of four folding tail fins that provide roll and stability while the missile is in flight. See figure 2-1.

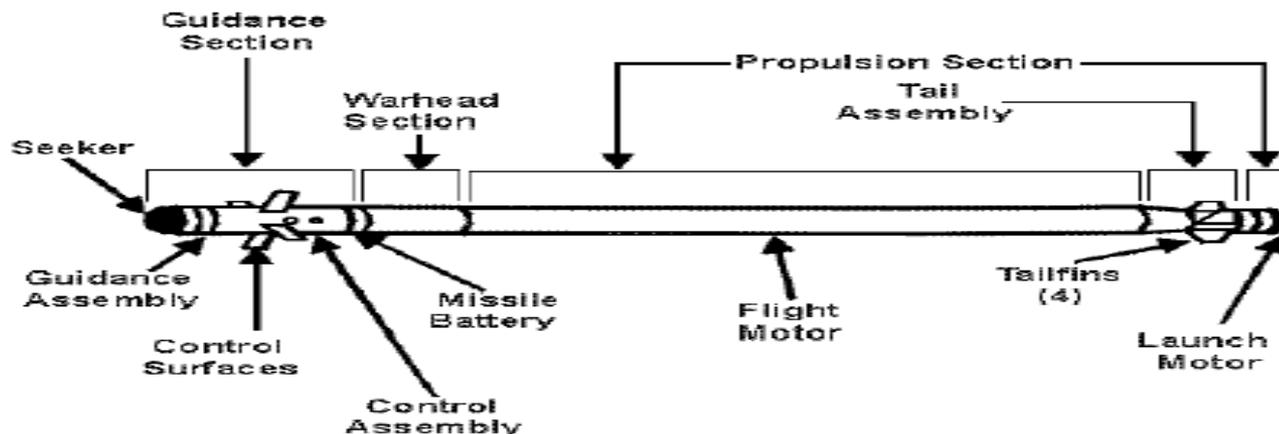


Figure 2-1. Stinger Missile.

REDEYE



- The Redeye weapon is a man-transportable, shoulder-fired, low-altitude, air defense system. The Redeye weapon is composed of two basic elements, the missile and the launcher. The missile comes sealed in the launcher and cannot be removed in the field except by firing.
- Size - 4 feet long and 3 inches in diameter. The Redeye weapon weighs 28.5 pounds.



Sources

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- <https://hosta.atasc.eustis.army.mil/cgi-bin/atdl.dll/accp/ad0575/lesson1.htm#le1>
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