

## Shoulder-Fired Missiles

### What are Shoulder-fired missiles or “MANPADS?”

Shoulder-fired missiles (SFMs) are known as man-portable air-defense missiles or “MANPADS.” They have been in use since the late 1960’s or early 1970’s. Originally designed to offer small groups of ground troops protections from air attack, they have been very effective in that purpose. They accounted for most of the planes brought down in the first Gulf War and are responsible for a number of shoot-downs in the current war in Iraq. The weapons literally turned the tide for the Mujahadeen in Afghanistan, forcing the Russians to change battle tactics because they couldn’t rely on using air attacks to kill Afghan soldiers. Since 1973, nearly half of all air losses in combat have been attributed to IR-guided surface-to-air missiles, many of them SFMs. Other sources estimate that 90% of worldwide combat aircraft losses were attributable to SFMs from 1984-2001.

Shoulder-fired missiles are most often heat-seeking missiles, employing sensors that home in on the airplane’s infrared signature, likely the engine. Their ability to accurately target aircraft from as far as 3 miles and as high as 20,000 feet, makes them very difficult to protect against.

### What is the threat of shoulder-fired missiles?

The millions of people who fly on American jets each year are at risk: Civil aircraft remain virtual “sitting ducks” to terrorists, who may have acquired Stinger missiles and quantities of Russian-made MANPADS. Every commercial flight is susceptible to an attack from terrorists armed with launchers that are small, relatively easy to obtain and surgically accurate.

Airplanes are very unlikely to survive an attack. In attacks on commercial jets, 69% of the planes were brought down. The weapons are a serious threat, and not enough is being done to deal with it. It’s simple to fire a shoulder-launched missile from a boat or big truck. The fear of MANPADS became a front-page story last November, when alleged terrorists fired two SA-7 surface-to-air weapons against a Boeing 757 airliner chartered to evacuate Israeli civilians out of Mombasa, Kenya.

Christopher Bolkcom, a Congressional Research Service analyst, cited FBI estimates that there have been at least 29 instances in which civilian planes have been hit by shoulder-fired missiles, causing up to 550 deaths. In a February study, Bolkcom also quoted a Rand report that concluded that as many as 40 civilian airliners were shot down by these weapons between 1975 and 1992, causing up to 760 deaths.

There are currently over 150,000 MANPADS in circulation throughout the world and CRS said the global inventory of MANPADS ranges from 500,000 to 700,000 systems, and that prices start at \$5,000, up to \$30,000 on the black market.

In 1973 the terrorist group “Black September” smuggled 14 SA-7’s into Italy to try and shoot down Israel PM Meir’s plane. They were caught only minutes before; one terrorist was holding a missile behind a hot dog stand near the airport. More recently, terrorist have tried to shoot down planes in Saudi Arabia, outside a U.S. airbase in May of 2002, in Mombasa, Kenya last November and in Baghdad at a C-141 this year.

## **What kind of defenses are available?**

You have to defeat heat with other sources of heat that aren't your engines. Chaff and flares typically are employed to deflect heat-seeking missiles. Other systems, including BAE's "Matador," use heat-transmitting lamps to confuse the missiles; these are less likely to work against the more sophisticated MANPADS (like the Stinger or the Russian SA-18). Many U.S. military transports have a directional IR countermeasure system, which can detect a missile plume, track the incoming threat and send a modulated beam of IR energy to the missile seeker, jamming the guidance signal and veering the weapon off course.

## **What is the military using to defend their aircraft?**

Approximately 50 percent of the Air Mobility Command fleet has anti-missile defensive systems. But 100 percent of AMC's C-17s (105 aircraft), and 90 percent of the C-130s (approximately 500) are so equipped. The C-130, C-17 and C-5 fleets have flare-based countermeasures systems. Only a handful of C-17s are being equipped with a new laser countermeasure system, called LAIRCM. Many C-130s have radar warning receivers and chaff. The tanker fleets of KC-135s and KC-10s have no defensive systems.

## **What happens to the errant missile?**

The missile, sent off course by the anti-shoulder-fired missiles, does not carry great explosive power (it relies on hitting the airplane's engine to do its damage).

## **Would improvements to ground security help?**

Airports throughout the world have become surrounded by development and lie in urban areas. This presents a problem, as it increases the potential locations from which an attack could occur. In addition, the flight patterns of commercial jets leave airplanes under 10,000 miles (and within range of the missiles) for 20-30 nautical miles, on predictable routes putting them within range of shoulder-fired missiles for more than 300 square miles around a runway.

## **What would the Israel-Boxer-Schumer Amendment do?**

The amendment announced today would begin expedited installation anti-missiles countermeasures on 300 of the aircraft used for a program called the Civilian Reserve Aviation Fleet (CRAF) program. Under the program, Department of Defense depends on the civil aviation to provide planes for transporting troops. Unlike many of the military-owned transport planes, the civil aircraft do not have anti-missile countermeasures. The Defense Department requested \$25 million for research and development of countermeasures on civilian aircraft used for transporting troops, but received on \$3 million of that request in the recently passed Defense Appropriations measure. At least nineteen shoulder-fired missiles have been launched against coalition aircraft since the president announced the end of the war in May.