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## Fact Sheet

Bureau of Political-Military Affairs, Office of Weapons Removal and Abatement  
Washington, DC  
July 31, 2008

# MANPADS: Combating the Threat to Global Aviation from Man-Portable Air Defense Systems (Second Edition)

Countering the proliferation of Man-Portable Air Defense Systems (MANPADS) is a top national security priority of the United States. MANPADS, shoulder-fired surface-to-air missiles, in the hands of criminals, terrorists, and other non-state actors pose a serious threat to passenger air travel, the commercial aviation industry, and military aircraft around the world (over 40 civilian aircraft have been hit by MANPADS missiles since the 1970's). The United States and other concerned countries have recognized this and taken steps to counter this threat. After the November 2002 attempted shoot-down by terrorists of a civilian airliner in Mombasa, Kenya, the United States redoubled its efforts to keep MANPADS from falling into the wrong hands, and is working closely with numerous countries and international organizations to keep the skies safe for all. With U.S. assistance, this cooperation has led to the destruction of over 26,000 excess, loosely secured, illicitly held, or otherwise at-risk MANPADS since 2003.

The White House launched an initiative in late 2002 to prevent the acquisition and use of MANPADS by terrorists and other non-state actors. At the direction of the White House, the U.S. Department of State, supported by the U.S. Department of Defense, leads the United States' international efforts on this critical issue. Within the Department, the Office of Weapons Removal and Abatement in the Bureau of Political-Military Affairs, and the Bureau for International Security and Nonproliferation have the lead responsibility in this area.

This updated fact sheet provides a brief description of MANPADS, their origins, examples of MANPADS attacks on civilian aircraft, and highlights some of the United States' efforts to cooperate with other countries to counter the threat.

## WHAT ARE MANPADS?

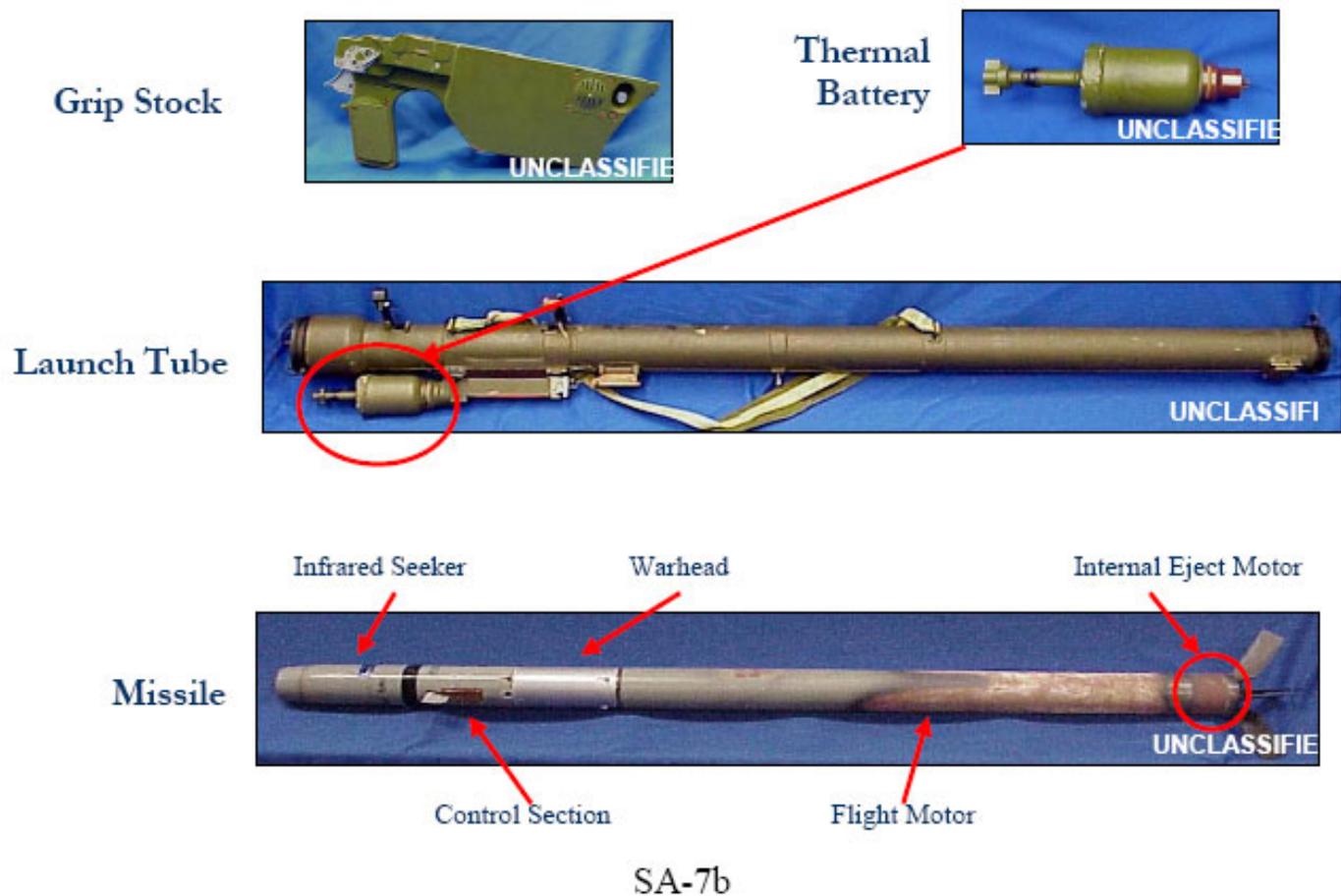
Man-portable air defense systems (MANPADS), commonly described as shoulder-fired anti-aircraft missiles, are surface-to-air missiles that can be carried and fired by a single individual or carried by several individuals and fired by more than one person acting as a crew. Most MANPADS consist of: 1) a missile packaged in a tube; 2) a launching mechanism (commonly known as a "gripstock"); and 3) a battery. More modern MANPADS also contain a separate missile ejection motor. The tubes, which protect the missile until it has been fired, are normally disposable. Rudimentary sights are mounted on the tube. The missiles themselves

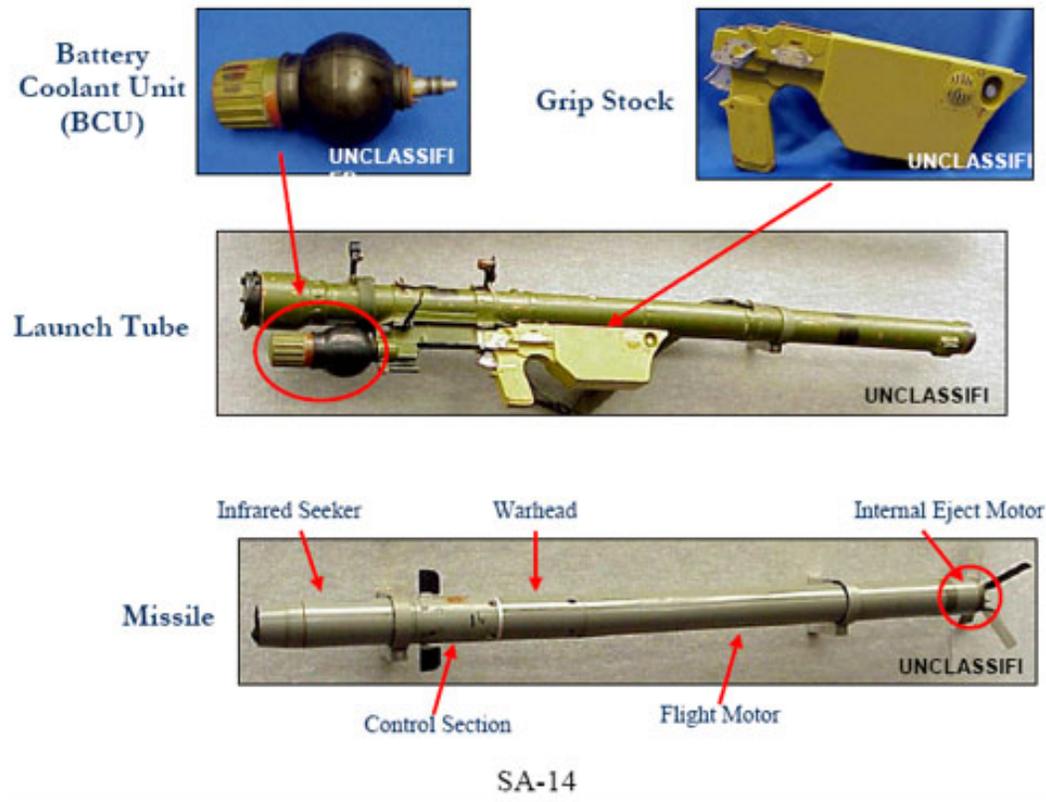


Two insurgents in Iraq with SA-7b and SA-14 MANPADS. (Photo Courtesy: U.S. Department of Homeland Security)

are usually comprised of a flight motor, a warhead, a control section and a guidance section that directs the missile toward the targeted aircraft. A single-use battery is typically used to power the missile prior to launch.

MANPADS launch tubes typically range from about 4 feet to 6 1/2 feet (1.2 to 2 meters) in length and are about 3 inches (72 millimeters) in diameter. Their weight, with launcher, ranges from about 28 pounds to just over 55 pounds (13 to 25 kilograms). They are easy to transport and conceal. Some of the most commonly proliferated MANPADS can easily fit into the trunk of an automobile.





Iraqi Security Force member performs a foot patrol, armed with an RPG. Photo: Courtesy of U.S. Marine Corps)

There are three main types of MANPADS: 1) **Infrared (IR)** seekers that hone in on an aircraft's heat source, usually the engine or the engine's exhaust plume; 2) **Command Line-of-Sight (CLOS)** systems whereby the MANPADS operator visually acquires the target aircraft using a magnified optical sight, and then uses radio controls to guide the missile into the aircraft; and 3) **Laser Beam Riders** in which the missile flies along the laser beam and strikes the aircraft where the operator has aimed the laser.

MANPADS were designed to be used by legitimate national military forces to protect their troops and facilities. With their relatively short range, MANPADS are regarded as the last missile-based air defense available to protect against aerial attack, to be deployed in tandem with gun-type systems that seek to defeat attacking aircraft by destroying them with a barrage of projectiles. They can attain a speed of about twice the speed of sound and strike aircraft flying at altitudes up to approximately 15,000 feet (4.57 kilometers) at a range of up to 3.2 miles (5 kilometers).

Although superficially similar in appearance, MANPADS should not be confused with rocket-propelled grenades (RPGs). RPGs are also portable and shoulder-fired. However, RPGs are unguided weapons designed primarily to be used against ground targets and are generally ineffective against aircraft, except at very close range. Some RPG attacks on low-flying aircraft have been mistaken for MANPADS attacks.



## WHEN HAVE MANPADS BEEN USED AGAINST CIVIL AVIATION?

Since the 1970s, over 40 civilian aircraft have been hit by MANPADS, causing about 28 crashes and over 800 deaths around the world. The following list is a sample of reported incidents involving civilian aircraft. All of the incidents listed below, except the Mombasa incident, took place in zones of conflict.



Iraqi insurgent firing a MANPADS.  
(Photo: Courtesy of U.S. Department of Homeland Security)



A DHL Airbus air cargo jet with left wing on fire returns to the airport in Baghdad to make a controlled landing shortly after being hit by a MANPADS fired by an Iraqi insurgent. Fortunately, there were no injuries to the crew. (Photo: Courtesy of U.S. Department of Homeland Security)

- **March 12, 1975**

A Douglas C-54D-5-DC passenger airliner, operated by Air Vietnam, crashed into inaccessible, hostile Vietnamese territory after being hit by a MANPADS. All six crew members and 20 passengers were killed in the crash.

- **September 3, 1978**

An Air Rhodesia Vickers 782D Viscount passenger airliner crash landed after being hit by a MANPADS fired by Zimbabwe Peoples Revolution Army rebels. Four crew members and 34 of the 56 passengers were killed in the crash. 10 survivors were shot to death afterwards.

- **December 19, 1988**

Two Douglas DC-7 spray aircraft, chartered by the U.S. Agency for International Development to eradicate locusts, en route from Senegal to Morocco, were struck by MANPADS fired by POLISARIO rebels in the Western Sahara. One DC-7 crashed killing all 5 crew members. The other DC-7 landed safely in Morocco.

- **September 22, 1993**

A Tupolev 154B aircraft operated by Transair Georgia was shot down by Abkhazian rebels, crashed onto the runway and caught fire, killing 108.

- **April 6, 1994**

A Dassault Mystère-Falcon 50 executive jet carrying the Presidents of Rwanda and Burundi and its French flight crew was shot down over Kigali, killing all aboard and sparking massive ethnic violence and regional conflict.

- **October 10, 1998**

A Boeing 727-30 Lignes Aeriennes Congolaises airliner was downed over the Democratic Republic of the Congo jungle by Tutsi rebels, killing 41.

• **December 26, 1998**

A United Nations-chartered Lockheed C-130 Hercules transport was shot down over Angola by UNITA rebels, killing 14.

• **January 2, 1999**

A United Nations Lockheed L-100-30 Hercules transport was shot down by UNITA rebels over rebel-held territory in Angola, killing 9.

• **November 28, 2002**

Terrorists fired two MANPADS at an Arkia Airlines Boeing 757-3E7 with 271 passengers and crew as it took off from Mombasa, Kenya. Both missiles missed.

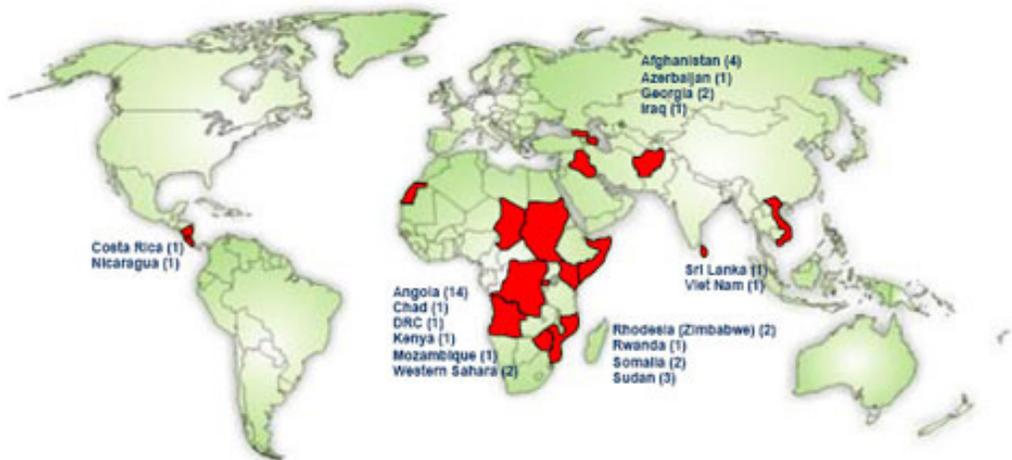
• **November 22, 2003**

A DHL Airbus A300B4-203F cargo jet transporting mail in Iraq was struck and damaged by a MANPADS. Though hit in the left fuel tank, the plane was able to return to the Baghdad airport and land safely.

• **March 23, 2007**

A Transaviaexport Ilyushin 76TD cargo plane was shot down over Mogadishu, Somalia, killing the entire crew of 11.

## MANPADS Attacks on Civil Aircraft Since 1975



(Image: Courtesy of Santo Polizzi, Transportation Security Administration)

### WHO MAKES AND POSSESSES MANPADS?

Some 20 countries have produced or have licenses to produce MANPADS or their components. These include Bulgaria, China, Egypt, France, Germany, Greece, Iran, Japan, the Netherlands, North Korea, Pakistan, Poland, Romania, Russia, Serbia, South Korea, Sweden, Turkey, the United Kingdom and the United States.

It is estimated that over 1 million MANPADS missiles have been manufactured worldwide since they were first produced in 1967. The United States believes that most of these systems are either in national inventories or have been destroyed. However, in many cases, these systems have not been accounted for properly.

MANPADS are found in the stockpiles of many countries around the world, including those of manufacturing military nations. The United States believes that thousands are outside of the control of national governments and a number of terrorist organizations, including al Qaida, have MANPADS in their possession. The total number of MANPADS remaining in the global inventory is difficult to estimate with precision because the destruction of MANPADS systems—either by warfare, accident or systematic demilitarization—is not always tracked or publicized. Even more uncertain is the number of operational systems within that total inventory, as a number of variables—age, storage conditions, and quality of maintenance—influence the life-expectancy of such systems. Even vintage systems may remain functional long after their projected life-span, particularly if properly stored and maintained.

Given the unique threat posed by MANPADS to aviation due to their ease of use, relatively small size and portability, the United States exercises strict controls over production, storage, and transportation of its MANPADS. The U.S. exercises diligence when selling them to other governments in order to ensure that they are properly secured and not sold or transferred to others without prior consent.

The black market cost of MANPADS can vary widely, ranging from as little as a few hundred dollars, to several thousand dollars, depending on the model and its condition. Given the relatively low cost of some of these systems, there is a heightened risk for acquisition by terrorists or other non-state actors.

## **WHAT IS THE UNITED STATES DOING TO COUNTER THE PROLIFERATION OF MANPADS?**

On January 24, 2008, the White House announced that in keeping with the priority placed on this issue, President Bush had accorded the Personal Rank of Ambassador to Lincoln P. Bloomfield, Jr., who serves as the Department of State's Special Envoy for MANPADS Threat Reduction (<http://www.state.gov/r/pa/prs/ps/2008/jan/99683.htm>). Special Envoy Bloomfield leads the interagency task force that is implementing the United States International Aviation Threat Reduction Plan -- a component of the broader National Strategy for Aviation Security-- to protect global aviation from MANPADS. The Special Envoy engages high-level foreign government officials on U.S. efforts to reduce the worldwide threat from excess, loosely-secured, or otherwise at-risk MANPADS.

The Office of Weapons Removal and Abatement in the Bureau of Political-Military Affairs (PM/WRA, [www.state.gov/t/pm/wra](http://www.state.gov/t/pm/wra)) manages the United States program to eliminate or better secure excess, obsolete, loosely secured, or otherwise at-risk MANPADS that could fall into the hands of non-state actors. WRA assists countries to secure their stockpiles, to maintain reliable inventories of their systems, and/or to destroy those MANPADS stocks that are not needed for national defense. Many MANPADS currently retained in national stockpiles are aged and obsolete, hence are relatively ineffective against modern military aircraft, but could still pose a threat to slower-moving civilian aircraft.

The Office of Conventional Arms Threat Reduction (CATR, <http://t.state.gov/t/isn/bureauorg/ocatr.htm>) in the Bureau for International Security and Nonproliferation works through bilateral and multilateral engagement, with an emphasis on responsible export controls, to prevent illicit transfers of MANPADS or the technology to produce the weapons.

The U.S. Department of Defense supports international negotiations by providing expertise on the proper management and control of MANPADS in foreign holdings, and by enforcing stringent physical security and accountability for MANPADS in U.S.

possession. The Department of Defense established the Golden Sentry program to monitor the end use of MANPADS sold through Foreign Military Sales to ensure that they are not diverted for unauthorized use. Golden Sentry is supported by the Defense Security and Cooperation Agency (DSCA), the Defense Threat Reduction Agency (DTRA, <http://www.dtra.mil/salw>), and the U.S. Army.

**MULTILATERAL EFFORTS.** Under the auspices of the Office of Conventional Arms Threat Reduction, the United States has worked in a number of international fora to obtain agreement with countries to strengthen controls over the export of MANPADS and to enhance weapons stockpile security. Over 95 countries have agreed to adopt measures that ensure the standards established are put in place.

At the June 2003 G-8 Evian Summit, leaders agreed to a U.S.-initiated MANPADS Action Plan that includes the following measures:

- provide assistance and technical expertise for the destruction of excess MANPADS;
- adopt stringent national export controls on MANPADS and their essential components;
- ban transfers of MANPADS to non-state end-users; MANPADS should only be exported to foreign governments or to agents authorized by a government;
- exchange information on uncooperative countries and entities;
- examine for new MANPADS the feasibility of adding specific technical performance or launch control features that preclude their unauthorized use; and
- encourage action in the International Civil Aviation Organization's (ICAO) Aviation Security Working Group on MANPADS (ICAO Resolution A-35-WP/50).

The G-8 continued to actively focus on implementation of these measures through 2004 and, in 2005 and 2006, the U.S. provided G-8 leaders with the implementation status of the MANPADS Action Plan. To date, preliminary discussions on possible MANPADS-specific agenda items are underway between the Department of State and its G-8 counterparts.

In December 2003, the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (<http://www.wassenaar.org/>), the first multilateral institution covering conventional weapons and sensitive dual-use goods and technologies, adopted strengthened guidelines for control over MANPADS transfers (<http://www.state.gov/t/pm/rls/othr/misc/82052.htm>). These guidelines detail how countries will evaluate exports of MANPADS; conditions they will set for recipients to receive the systems; and how systems will be stored, transported, used, inventoried, and inspected.

Similar guidelines were adopted by the Organization for Security and Cooperation in Europe (OSCE) in May 2004 ([http://www.osce.org/documents/html/pdf/tohtml/2965\\_en.pdf.html](http://www.osce.org/documents/html/pdf/tohtml/2965_en.pdf.html)). Asia-Pacific Economic Cooperation Forum (APEC) adopted these guidelines in November 2004. In June 2005, the 35<sup>th</sup> General Assembly of the Organization of American States (OAS) also adopted similar guidelines in Resolution AG/RES 2145 (XXXV-O/05; <http://www.state.gov/p/wha/rls/62391.htm>).

The United States is continuing efforts in all of these and other regional fora to emphasize the need for implementation. The United States has submitted to the Wassenaar Arrangement and the OSCE a detailed paper on how the United States controls MANPADS. Since then, over half of the participating states have submitted papers on their MANPADS control. In addition, the MANPADS guidelines were updated at the 2007 Plenary.

On February 18, 2005, the United States announced the start of a NATO Partnership for Peace Trust Fund Project to help Ukraine destroy stockpiles of its excess munitions, small arms, light weapons, and MANPADS (<http://www.state.gov/r/pa/prs/ps/2005/42472.htm>).

**BILATERAL COOPERATION.** United States bilateral efforts are focused on regions and countries where there is a combination of excess MANPADS stocks, poor control, or a demonstrable risk of proliferation to terrorist groups or other undesirable end-users. The United States works with countries whose MANPADS might be vulnerable to develop a nonproliferation strategy to reduce stocks, secure remaining weapons, and ensure that the host governments have in place appropriate policies and procedures for controlling exports.

On February 24, 2005, U.S. Secretary of State Condoleezza Rice and Russian Minister of Defense Sergey Ivanov signed the “United States-Russia Arrangement on Cooperation in Enhancing Control of Man-portable Air Defense Systems” (<http://www.state.gov/r/pa/prs/ps/2005/42647.htm>) in Bratislava, Slovakia to facilitate mutual destruction of obsolete or excess MANPADS, exchange information on controlling MANPADS including improving measures to enhance physical security, and to share information about MANPADS sales and transfers to third countries.

The Office of Weapons Removal and Abatement uses the Non-proliferation, Anti-terrorism, Demining and Related (NADR) Small Arms and Light Weapons Destruction Program funds ([www.gao.gov/new.items/d04521.pdf](http://www.gao.gov/new.items/d04521.pdf)) to:

- destroy obsolete MANPADS which have little military value but could be lethal against global aviation in the hands of terrorists; and
- improve physical safety and security as well as standards of inventory control and accountability of MANPADS that may be needed for legitimate self-defense purposes to ensure that remaining stocks are not stolen or illicitly transferred.

Since 2003, the U.S. Department of State has enabled the destruction of nearly 26,000 MANPADS in 25 countries in Africa, Central America, Eastern Europe, and South East Asia.



A group of Chechen separatists pose with MANPADS.  
(Photo: Courtesy of U.S. Department of Homeland Security)



MAG (Mines Advisory Group) America and the Burundian Army worked together under a U.S. Department of State Office of Weapons Removal and Abatement grant to safely destroy over 100 excess MANPADS in Burundi, January 2008. (Photo: Credit: Didier Leonard, MAG Burundi Technical Field Manager)

A few examples of some successes illustrate the Department of State’s extensive efforts. The Office of Weapons Removal and Abatement assisted Bosnia and Herzegovina in destroying its government-held stockpile of almost 6,000 MANPADS between 2003 and 2004, helped to destroy 45 MANPADS in Liberia in 2003, and helped Cambodia to destroy its entire stock of 233 MANPADS in 2004 as well as better secure other weapons kept for its national defense purposes. To date, PM/WRA has facilitated Hungary’s destruction of over 1,500 MANPADS, Macedonia’s destruction of 156 MANPADS, and Montenegro’s destruction of 1,500 MANPADS, and has funded the securing of over 100 MANPADS in Afghanistan as part of a broader weapons collection and destruction effort in that country.

The Office of Weapons Removal and Abatement’s MANPADS programs are supported by the DTRA’s Small Arms and Light Weapons Branch, which provides physical security and stockpile management seminars and assessments. DTRA’s programs orient host nation experts to international best practices, assess current host nation practices, and offer tailored advice to countries on how to better secure their MANPADS and other weapons retained for national defense purposes. All of this assistance is offered at little or no cost to the host nation. The Office of Weapons Removal and Abatement can, in some cases,

provide technical and financial assistance to implement DTRA's recommendations. Assistance may also be provided to countries at the request of the United States' Geographic Combatant Commanders or other elements of the U.S. Department of Defense.

The U.S. Department of Homeland Security (DHS, [www.dhs.gov](http://www.dhs.gov)) supports international efforts, and has established an International MANPADS Assist Visit (MAV) program within the Transportation Security Administration (TSA, [www.tsa.gov](http://www.tsa.gov)). This program assists host nations in conducting vulnerability assessments to identify potential launch areas around their international airports, and develop mitigation strategies to counter the threat. Since 2003, TSA has assisted 23 countries in conducting 29 MAVs.

## WHAT YOU CAN DO TO HELP

If you have information concerning the illegal possession of MANPADS, immediately contact the appropriate law enforcement authorities in your country.

Americans who are living or traveling overseas who wish to report the illicit possession of or location of illicitly-held MANPADS should contact the Regional Security Officer (RSO) at the nearest U.S. Embassy, or the Legal Attaché at the specific U.S. Embassies listed on this website [www.fbi.gov/contact/legat/legat.htm](http://www.fbi.gov/contact/legat/legat.htm), as soon as possible.

In the United States, American citizens, other residents, and visitors who have knowledge about the possession or location of illicit MANPADS, both in the United States or in other countries, should immediately report this information to the nearest field office of the Federal Bureau of Investigation (FBI) by telephone, or by e-mail using this web tip sheet: <https://tips.fbi.gov/>. Or, they may telephone the Bureau of Alcohol, Tobacco and Firearms (BATF) at this toll-free number: 1-888-ATF-BOMB (or 1-800-283-2662).



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