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ANTIPERSONNEL

EFFECTS OF

ANTIVEHICLE MINES

INFORMATION PAPER



# WHY ANTIVEHICLE MINES SHOULD ALSO BE BANNED

**GERMAN INITIATIVE TO BAN LANDMINES**

— German Initiative to Ban Landmines

Bread for the World ■ Christoffel Mission for the Blind ■ German Justitia et Pax Commission ■ German Committee for Freedom from Hunger ■ German Caritas ■ Social Service Agency of the Evangelical Church in Germany ■ EIRENE International ■ Handicap International Germany ■ Jesuit Refugee Service (JRS) ■ Kindernothilfe (Help for Children in Need) ■ medico international ■ Misereor ■ OXFAM Germany ■ Pax Christi ■ Solidarity Service International ■ terre des hommes ■ UNICEF Germany

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Cover photo: Sean Sutton / MAG (Booby trap with AT mines and mortar ammunition  
fuzed by an antipersonnel mine. Found in Angola)

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## ANTIPERSONNEL EFFECTS OF ANTIVEHICLE MINES

### INTRODUCTION

As is generally known, the Ottawa Convention tries to impose a total ban on anti-personnel (AP) mines, yet at the same time denies that anti-tank/anti-vehicle (AT/AV) mines and anti-handling devices are, or were, ever part of the problem. Not only do AT/AV-mines cause severe civilian suffering, due to their sensitive fuzes and anti-handling devices (AHD), they often function just like AP mines.

Furthermore, the data presented increases the perception, that a lot of existing AT/AV mine types are suspected to violate the CCW- and Ottawa-Treaty. This discussion paper indicates that international law must address these misfittings in order to overcome the worldwide landmine problem.

The German Initiative to Ban Landmines takes the position that AT/AV mines also represent a significant burden and danger to civilians in almost all mine affected nations. AT/AV mines are deliberately used against civilians, just like AP mines. AT/AV mines pose a considerable threat to the civilian population, and claim many victims. Especially since their explosive force makes their impacts all the more devastating, and usually fatal for several victims. Often AT/AV mines are laid together with AP mines to increase their destructive power yet further. Buildings, railway lines, roads and other infrastructures are often blocked with AT/AV mines. Due to the sensitive fuze technologies of AT/AV mines, which can also cause a mine explosion from an unintentional act, individual people are basically threatened by such mines when they move (*either with or without a vehicle!*) over/past/close to such a mine.

Therefore the German Initiative to Ban Landmines is calling for a world-wide ban on the development, production, export and use of *all* types of landmines, including all types of AT/AV mines.

### STEP 1: OTTAWA

From the German Initiative perspective, the *first* steps towards a total ban on landmines should be: Following the Ottawa "diplomatic history" all

member states should be asked to reconfirm that AT/AV mine types equipped with, or suppliable with, anti handling devices and/or magnetic (influence) fuzes are banned by the treaty if they can be detonated by an unintentional act. All Ottawa Member States should also be asked to confirm that AT/AV mines, like antipersonnel mines, cause a significant threat to civilians in mine affected nations. An addendum with these confirmations should be attached to the existing treaty.

### STEP 2: CCW

The CCW protocol 2 prohibits at least the use of mines, booby-traps or other devices which employ a mechanism or device specifically designed to detonate the munition by the presence of commonly available mine detectors as a result of their magnetic or other non-contact influence during normal use in detection operations (Article 3.5.). Article 3.6. prohibits the use of a self-deactivating mine equipped with an anti-handling device that is designed in such a manner that the anti-handling device is capable of functioning after the mine has ceased to be capable of functioning.

Among other things the data collected in this discussion on paper, increases the perception, that many existing AT/AV mine types equipped with an AHD and/or a magnetic (influence) fuze violate against these two CCW protocol II articles.

All CCW and Ottawa member states should be asked to report all existing AT/AV mine stockpiles to the UN General Secretary. Ottawa Member States should provide this information within their article 7 reports.



DM-31  
(Germany)  
Anti tank mine  
equipped with  
a magnetic fuze and  
an anti handling  
device

<sup>1</sup> Bread for the World, Christoffel Mission for the Blind, German Justitia et Pax Commission, German Committee for Freedom from Hunger, German Caritas, Social Service Agency of the Evangelical Church in Germany, EIRENE International, Handicap International Germany, Jesuit Refugee Service (JRS), Kindernothilfe (Help for Children in Need), medico international, Misereor, OXFAM Germany, Pax Christi, Solidarity Service International, terre des hommes, UNICEF Germany

### STEP 3: EXPORT MORATORIA

All CCW protocol II and all Ottawa member states should be asked to install an unilateral export moratorium for at least AT/AV mines with anti handling devices and/or magnetic (influence) fuzes, comparable to the export ban on AP mines already in place in a significant number of states.

### STEP 4: EFFECT ORIENTED DEFINITIONS

In the view of the German Initiative to Ban Landmines an effect oriented mine definition has to be installed in existing landmine ban treaties like the Ottawa Convention or CCW protocol II. Effects of munitions, in addition to the design of munitions, should be of primary importance when considering the legality of weapons.

At any rate, one member of the German Government (of the Social Democratic Party of Germany), already came out in support of a tighter ban on landmines at the “Bad Honnef II” meeting of the German Initiative to Ban Landmines. The German Federal Secretary for Economic Cooperation and Development said that the Ottawa Convention, through which mines that target human beings were banned two years ago, could “...only be a start... We should prepare an Ottawa-2 Convention in which other weapons are also condemned, such as anti-vehicle mines”.

#### The papers key questions are:

1. Which technological developments and production of landmine systems have taken place in the recent past?
2. Are AT/AV mines (still) an integral component of military strategies?
3. Are AT/AV mines also being (or have they been) used against civilians in crisis regions, and if so on what scale?
4. What makes AT/AV mines a danger to civilians/personnel?
5. Are AT/AV mines causing civilian deaths in crisis regions?



AT-2 (Germany)  
Anti tank mine with  
anti handling  
device. Prohibited  
by the Italian Law  
No. 374, 1997,  
rules for the ban  
of antipersonnel  
mines



Mazac (France)  
Sensor fuzed area  
defence mine

#### Which technological developments and production of landmine systems have taken place in the recent past?

As the Ottawa Convention was being drawn-up, the fear was often expressed that this Convention would bring in its wake extensive further technological development of non-prohibited mine systems. In retrospect, this fear appears to have been warranted. Some State Parties to the Convention have in many cases already completed integration of AP effects (e.g. anti-handling devices) into their AT/AV systems, which has also made it significantly easier for those states to support the Ottawa process. From 1990-1994 Germany for instance spent a good DM 2.2 billion on modernising (procurement only) the mine equipment of its Federal Armed Forces. Besides Germany also other countries such as the UK, the USA and Australia will all continue to be involved in modernisation and procurement activities over the next few years. During that period, Germany will spend at least DM 745 million on militarily-motivated mine technology.

*The example of Germany  
(mine-related military expenditure  
in the next few years):<sup>2</sup>*

System	Time frame	Costs (in DM, as at 1999)
ARGES off-route AT mine (procurement 11,000 units)	2004-2006	218.7 million
procurement conventionally-laid AT mine DM 31 stage 2/3 (including technical conversion and mine-delivery equipment MiVS 85), GPS positioning of DM 31 mine	2005-2007	100.1 million
R&D for technical conversion DM 31 and MiVS 85	1999-2002	22.1 million
FEAMIS (R&D for fitting remote control to mines, including ARGES AT mine)	1998-2002	30.2 million
FEAMIS systems procurement	2004-2006	23.65 million
R&D simulator for AT directional mine	1999-2000	0.8 million
support to technological development of mine delivery system (Skorpion)	1999-2000off	2.4 million
technological studies of military demining systems	1999-2000off	2.0 million
R&D AAMIS minefield reconnaissance	1999-2000off	2.6 million
R&D mobile mine detection and clearance unit (MMSR)	1999-2000off	18.6 million
procurement mine clearance ladder 80 (1,680 units)	1999-2000	33.0 million
mine protection for armoured infantry fighting vehicle MARDER	2002-2003	144.6 million
mine clearing tank Keiler (procurement 2 lots)	2000-2004	146.0 million
<b>Total</b>		<b>744.75 million</b>

Non-signatories such as Pakistan, India, Russia and the USA are currently having alternative APM weapons and/or modern mine systems ("self-healing minefields") developed at considerable expense (Defense News, 20.09.1999). With respect to the development of alternative APM weapons, the US Department of Defense is hoping for broad, international participation by mine-producing companies (Defense News, 20.09.1999). This is

because in South Africa, Sweden, Germany and the UK, research is under way into alternative APM weapons. In addition, a glance at current patent statistics for land-mine technology reveals uninterrupted and comprehensive development activity in the field of modern mine technology. Here it is European, and especially German, companies which are still seen to be particularly active.

The UK for instance is procuring an area defence mine, for which Rheinmetall has submitted a bid with COBRA. Australia intends to procure the new DASA submunition dispenser TAURUS 350A, and many other countries are procuring rocket launchers (e.g. MARS) or other dispenser weapons (AFDS, DWS 39) with which AT/AV mines can be remote-delivered. Area defence mines are currently also being offered as an optional module in complex surveillance technology systems (Jane's International Defense Review, 01/99). Fuzes (e.g. tilt-rod fuzes) are also being offered for retrofit with older AT/AV mines.

The key focus of mine modernisation activities is on developing mines/mine systems that can be remote-delivered, that can be programmed, that utilise new explosives and multiple sensors to generate increased and certain destructive power, and that can be remote-controlled. Furthermore, almost all modern AT/AV mines possess fuze types or anti-handling devices which mean they can be activated by people. As such they are clearly also de facto AP mines.

<sup>2</sup> This does not include the costs for increasing the battle effectiveness of the mine launcher Skorpion (150 vehicles), and of the rocket launcher/AT-2 rocket-launched mines (154 vehicles). Development phases (2002-2004), procurement (from 2005). Wehrtechnik III/1999, p. 36.

### **Are AT/AV mines (still) an integral component of military strategies?**

Mine warfare still has a future – despite the Ottawa Convention. The above-mentioned modernisation and procurement activities speak for themselves. Investment in mine combat continues, despite some precarious reductions in investment expenditure in the arms sector, e.g. in Germany. Mines continue to play a pivotal role in the military strategies of armies. In response to an enquiry made by the German Federal Foreign Office concerning the necessity of AT/AV mines, the German Federal Ministry of Defence explained that in recent years the Federal Armed Forces had become even more dependent on technical resources (e.g. mines) for guaranteeing national and alliance defence interests, due to the reduction in personnel numbers. “Abandoning the use of anti-tank mines in defence operations would increase the risk faced by forces on the ground to an unwarranted degree.” (Welt am Sonntag, 24.01.1999). Mines are also an elementary component of the equipment of German crisis response forces.

Basically speaking it is to be feared that, the further the militarisation of foreign policy proceeds, and the more the conviction that crises can be solved through the use of modern weapons technology gain the upper hand, then the more the use of modern types of weapons will increase. The most recent examples of this were provided by the NATO states (use of AT/AV mines, cluster bombs in Kosovo), Russia (use of AT/AV and AP mines in Chechnya), or India and Pakistan (use of AT/AV and AP mines in the Kashmir war). States such as the USA, China, Pakistan and India still consider the use of mines AP as absolutely essential. The EU member state Finland (which secures its border with Russia), and the NATO members



Helicopter Mine  
(Austria)

Turkey (use of mines against the Kurds, mining of the “buffer zone” in Cyprus) and Greece (mining of the border with Turkey, mining of the “buffer zone” in Cyprus) take a similar stance.

### **Are AT/AV mines also being (or have they been) used against civilians in crisis regions, and if so on what scale?**

The widespread view that AT/AV mines are not found that often in mined areas (European Security 10/99) is easy to refute. Even the highly incomplete UN/DHA mine database identifies approximately 10 million AT/AV mines laid worldwide, not including e.g. Egyptian minefields, where around 10 million AT/AV mines are presumed to have been in place since the 2<sup>nd</sup> World War.

AT/AV mines are also used against civilians deliberately, just like AP mines. Often, AT/AV mines are laid together with AP mines to increase their destructive power yet further. Buildings, railway lines, roads and other infrastructures are often blocked with AT/AV mines.

The intention is to cut off the food supply to the population, as in Rwanda for instance: “...In Rwanda, food distributions in Ruhengeri and western Gitarama prefectures remain suspended after anti-tank mine incident in early September in Ruhengeri...” WFP Emergency Report No. 38 of 1998, Date: 25 September 1998). Similar events are occurring in the Angolan civil war, where AT/AV mines – fitted with modern light-sensitive fuzes manufactured in Yugoslavia – are used to block

paths and roads, which is currently preventing the population there from receiving vital food supplies. The mines also target demining teams, who now feel barely able to clear these extremely dangerous mines. According to expert opinion, clearing AT/AV mines is basically significantly more dangerous, time-consuming and thus more costly than is the case with AP mines. This alone provides a good argument for voting in favour of extending the ban. Not least, these demining activities indirectly tie-up resources urgently needed to aid victims. In Burundi too, for instance, UNO is expressing concern over the growing threat posed by AT/AV mines: "Anti-tank mines are becoming a growing concern on Burundi's major roads." (DHA/ Humanitarian Coordination Unit P.B. 1490 Bujumbura, Burundi, 1997).

Even the military are warning against the growing threat posed by AT/AV mines. 26% of all US American soldiers who died during Operation Restore Hope (Somalia) were the victims of AT/AV mines. Whereas the rate of vehicle loss due to AT/AV mines in the US Army during the 2<sup>nd</sup> World War was still only 23%, this figure rose to 56% during the Korean War, and finally reached 70% in the Viet Nam war (Wilhelm Schneck, Counter-mine Systems Directorate, Ft. Belvoir, VA 1995). A further indicator of this trend can be seen in the increased investment activity by many armies in improving mine protection for their vehicles. As indicated above, Germany for instance is intending to spend some DM 144 million on improved mine protection for the MARDER tank. This can only be considered a response to the threat posed by AT/AV mines, since AP mines are hardly likely to pose any threat to this model of tank. The decision to procure fully-protected transport vehicles, which had been specially developed for deployment in Kosovo, also seems to have been similarly motivated. This because the vehicle is supposedly



armoured such that not even anti-tank mines or anti-tank grenades can damage it (Handelsblatt, Sunday, 31 October 1999).

Experience shows that 90% of all injuries suffered by the victims of war in today's crisis regions are caused by small arms, which also include land-mines. The planned accession to NATO by Eastern European states (which in some cases has already taken place) raises the probability of an increase in exports of small arms of this kind. The standardisation of weapons systems in these countries which is associated with accession will render many of the older types of weapons in the arsenals of the Eastern European states simply obsolete. This, in turn, could encourage those states to become active on "black markets", thus generating an increase in exports to conflict regions. With respect to AP mines, of the new NATO members only

Hungary and the Czech Republic have ratified the Ottawa Convention. To date, Poland has only signed. The same applies to Romania. At a recent British arms fair, a Romanian company was even still offering AP mines for sale. Of the other potential candidates for accession, for instance the Baltic states, so far only Lithuania has signed the Convention. All these Eastern European states are known to possess in some cases considerable mine production capacities, or to have large stockpiles of mines in their army depots.

M-15 (USA)  
Anti-tank mine  
with anti handling  
device, used in  
Angola, Cambodia,  
Cyprus, Eritrea,  
Ethiopia, Rwanda  
and Somalia

HPD Anti-tank Mine  
(France)  
Anti-tank mine  
with magnetic fuze  
and anti handling  
device

## What makes AT/AV mines a danger to civilians/personnel?

Activation of an AP mine usually requires direct contact with its fuze. An AT/AV mine can be activated in the same way, although in many cases there is a considerably more complex range of possible ways to detonate them. If for instance a person steps on an AP mine without touching its pressure-activated fuze, the mine usually does not explode. However, if this happens with a pressure-activated AT/AV mine which is also fitted with an anti-handling device or a tilt-rod, the mine will explode, resulting in the certain death of the victim.

Besides this AT/AV mines are unable to (reliably) distinguish between military and civilian vehicles. This applies to all AT/AV mines, regardless of whether they are activated by pressure-sensitive fuzes, pull-activated fuzes, tilt-rod fuzes or by sensors, even though this is often disputed by the mine-producing industry and the military. The German COBRA mine for instance, fitted with seismic and acoustic sensors, is designed to "...reliably identify and not combat light commercial and utility vehicles" (German Federal Minister of Finance, 1995). However, no explanation is provided of how the mine reacts to heavy vehicles including civilian buses or the like. Military trade journals at least are warning against the existing risks of this sophisticated development (COBRA), especially when rocket-delivered (Soldat und Technik, 1996).

When AT/AV mines are fitted with an anti-handling (anti-lift, anti-disturbance) device, the potential risk to civilians is even higher (see below). Merely approaching such mines, standing close to them or touching them gently can cause them to explode, which means certain death for the victim. Anti-handling devices are, after all, designed to make the separate deployment of AP mines superfluous, and prevent an AT/AV mine from being cleared. Without a doubt, this means that AT/AV mines possess characteristics of AP mines, by virtue of



**DM-11 (Germany)**  
Anti tank mine, used in Somalia. The mine is fuze with the DM 46 pressure type fuze with a Belleville spring and the DM 21 detonator. The DM-11 has two secondary fuze wells, one in the side of the mine and one in the bottom. The mine can be equipped with an anti handling device.  
Photo: Norwegian Peoples Aid



**Rocket Launcher  
MARS/MLRS  
(Germany)**  
Scatters AT-2 mines



**PT-Mi-U  
„Prominent“  
(Czech Republic)**  
Anti tank mine  
with tilt rod fuze



**ARGES  
(Germany, France,  
UK)**  
Sensor fuze off  
route mine

**Magnetic / seismic sensor (South Africa)**  
The device will initiate without the direct contact of a vehicle (pressure). The seismic sensor activates the magnetic sensor upon contact with a vehicle. The magnetic sensor is capable of identifying an appropriate target and detonate the mine under the more vulnerable vehicle belly. The sensitivity threshold is factory pre-set upon user requirements. Any tilting, movement or magnetic field disturbance will automatically initiate the device.  
Photo: Norwegian Peoples Aid



**TMRP-6 AT-Mine (Former Yugoslavia)**  
Anti-tank mine with tilt rod fuze. The mine can also be activated by trip wire and can be used as a victim-operated off route mine.

the mere fact that they are victim-activated. Many states now have considerable stockpiles of anti-tank/anti-vehicle mines fitted with such anti-handling devices. These types of mines are supplied almost exclusively complete with anti-handling devices "ex factory", and older models can be easily retrofitted with corresponding fuzes (e.g. tilt-rod fuzes).

People are basically threatened by AT/AV mines when they move (either with or without a vehicle!) over/past/close to such a mine (see page 10). In the view of experienced demining experts (Rae McGrath, 1997: Definitions and Anti-Handling Devices, Discussion Paper), AT/AV mines can be activated by persons/civilians *when*:

- AP mines are used to detonate AT/AV mines.
- the AT/AV mine is activated like an AP mine at a very low pressure threshold: NaMiBa (Czech Republic), MIAC 51 (France).
- AQT/AV mines have a tilt-rod fuze. Here too, only a few kilos of pressure on the mine are sufficient to "tilt" it (10-20°), and thus activate the fuze. Mine types: TM-46 and TM-57 (Russia), M21 (USA) TMRP-6 (Yugoslavia), PM 3000 (Austria), PZ Mi 85 M (Austria), PT-Mi-U (Czech Rep.), MI AC CC 54 (France), DM-21 (Germany).
- AT/AV mines are detonated like AP mines by means of a trip wire. Here too only a few kilos of pressure on the fuze are sufficient. Mine types: MIAC 51 (France).
- AT/AV mines are activated by a break wire. Here too, as with the trip wire, a few kilos of pressure are sufficient to break an electric circuit in a wire, which leads to explosion of the mine. Mine types: MIACAH (France), M24 (USA), PD-Mi-PU (Czech Republic), TM-62B (Poland).
- AT/AV mines are fitted with magnetic-type fuzes. The fuze registers the change in a magnetic field, caused e.g. by an approaching vehicle. But the mine can also be activated for instance by a portable radio receiver or other metal objects next to the fuze. Mine types: AT-2 (Germany), DM-31 (Germany), FFU 028 (Sweden).



**Anti handling device (South Africa)**  
DEVA - Electronic mine initiator. Tilting to a 40 degree angle or more will initiate the mechanism and detonate the explosive charge.  
Photo: Norwegian Peoples Aid

- AT/AV mines are fitted with an anti-handling/anti-disturbance/anti-lift device. An anti-handling device can be placed beneath an AT/AV mine in the form of a separate explosive charge (e.g. DM-39 [Germany]), and is activated by a pressure-release fuze, e.g. when a person lifts the mine. When the anti-handling device is an integral component of the AT/AV mine, it can explode merely when touched or approached by a person, like an AP mine. Mine types: AT-2 (Germany), DM-31 (Germany), MIFF (Germany).
- AT/AV mines are detonated or activated by means of sensors. Mine types: COBRA (Germany), PARM 1 & 2 (Germany), HORNET (US), ARGES (Germany, France, UK), MIFF (Germany), MAZAC (France).
- Seismic sensors react to vibrations in the ground. These sensors cannot distinguish between "similar" vibrations, caused for instance either by a tank or by a civilian HGV.
- Acoustic sensors react to the noise made by a vehicle engine. They function like a dynamic microphone and can for instance suppress the sound of wind. These sensors too are unable to distinguish (reliably) between the engine noise made by civilian and military vehicles.
- Infrared sensors react to radiated heat. Of course they too cannot distinguish between e.g. the heat given off by a tank engine and that given off by a "civilian" engine.
- Fibre-optic cables react to being driven over. Here too it would not appear possible to distinguish between civilian and military vehicles. The question also remains of whether merely treading on this cable might not be enough to activate the mine.



- Light-sensitive sensors are used with buried mines, and react to the light falling on the mine when the soil above it is removed. A farmer for instance would be a certain victim of an AT/AV mine of this type if s/he were to remove the earth above it when working in the field. Yet even a heavy rain shower which washed away the soil covering the mine would be sufficient to make it explode.
- Sensors that react to movement function on a similar basis to movement detectors used in civilian alarm or illumination systems. These sensors also do not distinguish between military and civilian personnel.
- Optical sensors utilise a database programmed to store silhouettes e.g. of tanks which are attacked upon "non-recognition". Yet this method cannot be considered reliable either. The manufacturers (Honeywell) of these sensors themselves say that they ".....would not recommend any German tank to remain in the vicinity of a German off-route mine (e.g. ARGES)..." (Honeywell Eurosatory Interview 1996).

Modern AT/AV mines are often equipped with a mix of sensors in which the acoustic or the seismic sensor "wakes up" the mine, and the infrared or the optical sensor then seeks the target and finally detonates the mine.

A third basic potential threat is posed by the rate of duds among scatterable mines (10 – 30%). The Falklands War, the 2<sup>nd</sup> Gulf War and the Kosovo War provide examples of this. This means for instance that the self-destruct mechanisms fail to go off, and the mines may as a result remain "live" for years. In at least 800,000 Iraqi mines used in Kurdistan these mechanisms subsequently failed (Financial Times, 29/07/1994). The German mine producer DASA for instance even admitted that as the use of scatterable munition increases, the dud rate will rise considerably (TDA brochure on the reliable disposal of explosive ordnance, 1996).

For approximately 3 years the industry has been describing the "Claymore" types of mine as anti-vehicle or directional fragmentation mines, whereas they are in fact anti-personnel mines. The industry attempted to keep these mines outside the ban simply by pointing out that they are now no longer marketed with trip wires and are supplied without pull-type fuzes. The attempt was successful, because the Ottawa Convention does not ban this type of mine. Yet it is a simple matter to retrofit these mines with trip wires or pull-type fuzes. Austrian manufacturers of these mines also go no further than instructing the purchaser: "Don't use with trip wire".



ATM 2000 E (Austria) Anti-tank mine equipped with a magnetic fuze and an anti handling device

### Are AT/AV mines causing civilian deaths in crisis regions?

Publicly accessible UNO statistics on victims have demonstrated for some time that anti-tank/anti-vehicle mines also pose a considerable threat to the civilian population, and claim many victims. Especially since their explosive force makes their impacts all the more devastating, and usually fatal for several victims. Newspapers frequently contain reports of accidents caused by AT/AV mines (see Annex). UN/DHA statistics on mine victims indicate that in Angola alone for instance, 111 people became the victims of AT/AV mines during the period from 04/95 to 01/96. These statistics represent only a segment of all mine accidents caused by AT/AV mines in that country. Even the Pope almost became the distinguished victim of an AT/AV mine during his visit to Sarajevo in September 1997, when an attempt was made to blow up his vehicle with 20 AT/AV mines placed under a bridge.

There is a basic complaint to be raised that, incomprehensibly, data on mine accidents are only made public to a limited extent. A complete and centrally-organised collection and analysis of such data would be a welcome development, if only to produce a more reliable analysis of the potential threats posed by mines.

## Concluding remarks

In summary, it seems more than clear that civilians are under threat from mines officially defined as “non-AP mines”, i.e. that civilians can activate these mines and become their victims. Moreover, these mines are also so dangerous that it is extremely difficult to clear them, thus generating high demining costs. British manufacturers of demining equipment also believe that “Scatterable area denial munition systems are the major threat in modern warfare.” (Aardvark Clear Mine Limited, company brochure).

At present, the willingness of military establishments and politicians to agree to a ban on AT/AV mines appears low. Nevertheless, support for an extension of the ban (as called for by the German Initiative to Ban Landmines) is growing. In May 1999, ICRC published an information paper (entitled “Anti-vehicle mines equipped with anti-handling devices”) calling for a technical modification of AT/AV mines with anti-handling devices. According to ICRC, it would be possible to adjust the anti-handling device such that it does not explode when touched unintentionally or by chance.

Besides anti-handling devices these technical discussions must include sensors, fuzes and explosives in order to prevent the deadly threat for civilians, which presently exists with many AT/AV mines in use. The Ottawa Convention must address the severe antipersonnel effects of AT/AV mines if it does not want to become obsolete. However the German Initiative questions if technical modifications on AT/AV mines sufficiently prevent civilian casualties. When scattering mines there would for instance be a high risk of malfunction, quite apart from the issue of whether the “adjustment” itself would function reliably or not. At any rate, this method would not prevent “normal” activation of the mine, e.g. by a school bus filled with passengers. In the light of the current warfare praxis and the landmine technology developments the German Initiative calls for a ban on all types of mines.



Minelauncher  
Skorpion (Germany)  
Scatters AT-2 mines

## The key arguments in favour of extending the ban can be summarised as follows:

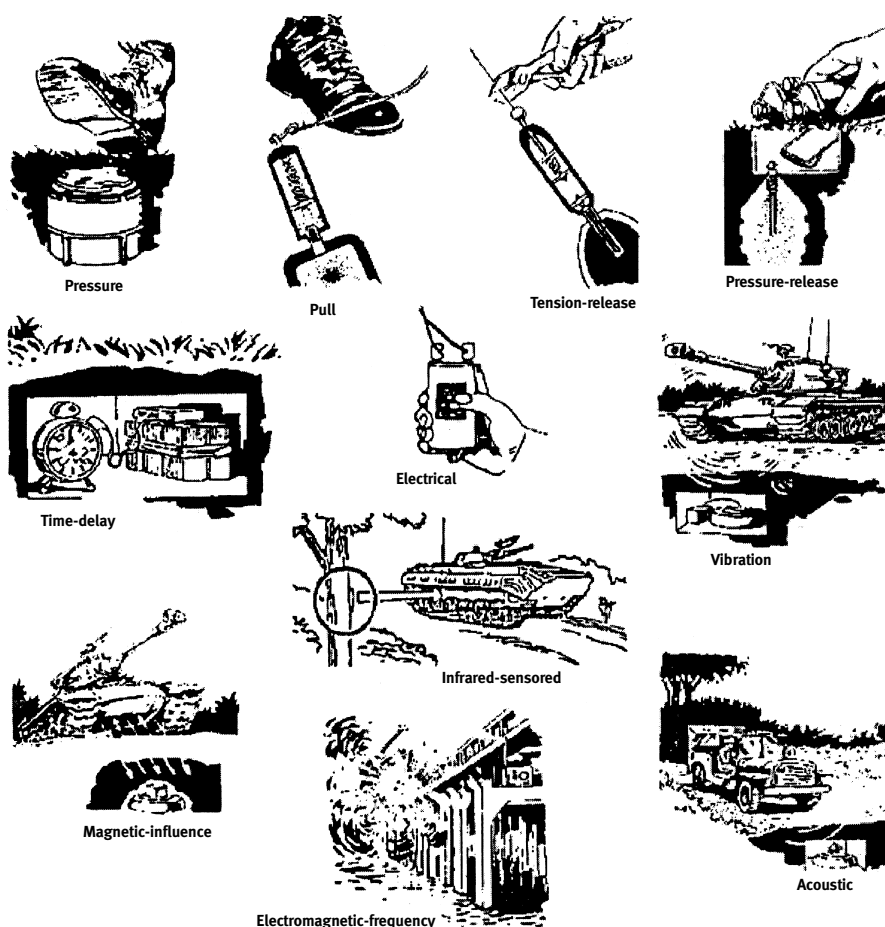
- AT/AV mines have been and still are being used very readily, thus cutting people off from food supplies and, like AP mines, claiming victims among the civilian population on an almost daily basis.
- Due to their enormous explosive power, AT/AV mines cause significantly more devastation than AP mines.
- AT/AV mines are often equipped with fuzes or sensors which also enable the mines to be activated by people.
- AT/AV mines fitted with an anti-handling device are by virtue of that fact also aimed against people. AT/AV mines kill indiscriminately. In this respect they are no different from the prohibited AP mines.
- For the most part AT/AV mines are significantly more difficult to clear, due to the fact that their activation by various types of fuze and sensor makes it virtually impossible to approach them without risk. The high demining costs which that entails are usually met indirectly at the expense of the budget for mine victim assistance.
- Many states are continuously engaged in the further development and production of AT/AV mines, in some cases involving enormous financial inputs. These resources too are being mobilised at the expense of humanitarian demining and victim assistance or, conversely, would be more appropriately deployed in those areas.



Civilian truck hit  
by an AT mine  
in Angola  
Photo:  
Sean Sutton MAG

## EXAMPLES OF INCIDENTS CAUSED BY ANTIVEHICLE MINES

### TYPES OF MINE FUZES



#### AFGHANISTAN

**Date: 10/22/98** ■ AT-Mine Incident in Afghanistan – This is an update on a tragic Afghan wedding party mine incident. It is based on the report transmitted by the radio operator of Mine Clearance Planning Agency (MCPA) from Kandahar. Date of incident: 22 October 1998 Time of incident: 3:20 PM Afghan Time Place of incident:, old city of Kandahar province Type of vehicle: Military bus belonging to government Type of mine: Anti-tank. The bus was hired by the local people for transportation of participants of a wedding ceremony. The road where the incident took place was unpaved and is used by the local transport. This unfortunate bus had left the usual road by one meter and was travelling on the road side when it hit an anti-tank mine and blew up. Number of people killed: 41 (forty one) Number of people wounded: 39 (thirty nine) Due to serious injuries caused to the victims of the incident, the death toll is rising. It is worth mentioning that the mines were laid during the war between Mujahideen and the Russian invading troops in the years between 1982 – 1984. No mine clearance operation has been carried out in the

area of the incident. However, it was surveyed under the general survey program but no technical survey has been conducted there so far.

Source: [http://www.osjspm.org/\\_vti\\_bin/shtml.exe/landmine.htm](http://www.osjspm.org/_vti_bin/shtml.exe/landmine.htm)

#### ALGERIA

**Date: 05/04/99** ■ Seven members of the Algerian forces died in an ambush when their vehicles struck several AT mines. Source: DPA

#### ANGOLA

**Date: 10/12/99** ■ A vehicle belonging to the International Committee of the Red Cross involved in the delivery of relief aid to displaced people in Angola was destroyed Friday by an anti-tank mine on the Huambo-Petroleo road, the Angolan news agency reported Tuesday, quoting Red Cross officials. Source: Panafican News Agency October 12, 1999 Huambo, Angola (PANA)

**Date: 09/99** ■ Angolan military official was killed on Friday when an anti-tank landmine exploded, military sources said.

Source: <http://www.mg.co.za/mg/za/news.html>

**Date: 01/14/96** ■ Comments: Two Britons and two Filipinos were killed when their truck struck an AT mine in northern Angola, at Andrada in Lunda Norte province. The victims all worked for the Endiama mining company. The news was reported by the UN in Angola.

**Date: 11/24/95** ■ Comments: Four people were killed and 16 injured when their truck ran over an AT mine in Benguela province, the Angop State News Agency reported. The incident happened on Friday on a road close to Benguela town which had previously been demined.

**Date: 11/10/95** ■ Comments: In the latest in a string of mine attacks on civilian buses, nine people were seriously wounded when their bus struck an AT mine and was then attacked by UNITA rebels. The incident occurred in Cuvelei in Cunene province. Source: Agence France Presse

**Date: 11/06/95** ■ Comments: Five people were killed and 20 wounded when a bus with 50 passengers on board hit an AT mine in northern Angola, said a government official. His statement was reported by Reuters. The bus hit the mine in the afternoon, approximately 40 kms from Andrada, while travelling along a road linking Dundo with Lucapa to the south.

**Date: 10/18/95** ■ Comments: A civilian truck detonated an old AT mine on the Cubal-Ganda road (160 kms south-east of Lobito) injuring the driver. UNAVEM will request that the FAA again clear this road of mines.

**Date: 09/17/95** ■ Comments: The UN reported an AT mine blast north of Lucapa, near a bridge, killed two civilians.

**Date: 08/28/95** ■ Comments: Seven Angolans were killed and 20 injured when a truck ran over an AT mine in northern Angola, reported Portugal's Lusa news agency. The truck veered from the path of its military escort and tripped a mine 600 miles east of Luanda.

**Date: 08/25/95** ■ Comments: On 25 Aug 95 a World Food Programme vehicle detonated an AT mine, 30 kms west of Malange, on the Malange-Cacuso road. Two persons were killed and one was injured.

**Date: 08/24/95** ■ Comments: UNICEF reported that a civilian truck struck an AT mine on the road between Matala and Jamba, in Hula province. The incident occurred close to Macosse township, 30 km from Matala. There was no data on possible casualties.

**Date: 07/21/95** ■ Comments: A UNAVEM Toyota vehicle hit a freshly laid AT mine on a road frequently used by the FAA on the Chongoroi-Quilinguese road. There were no casualties, but the vehicle was badly damaged.

**Date: 04/19/95** ■ Comments: Fourteen people were killed and seven injured when the vehicle they were in detonated an AT mine near the town of Cunje, in Bie province. The tragedy was initially reported by Angola State Radio, overheard by the BBC, and then relayed to Reuters.

## **BOSNIA AND HERZEGOVINA**

**Date: 12/15/99** ■ Three Bosnians were killed and five injured when an anti-tank mine from the 1992-1995 war exploded in a Sarajevo suburb on Tuesday, an official of Bosnia's Mine Action Center (MAC) said on Wednesday. Reuters, 15.12.1999

**Date: 01/24/96** ■ Comments: In the second serious incident involving IFOR personnel and landmines today, a British combat vehicle ran over an AT mine in central Bosnia, blowing the vehicle's track off and damaging three road wheels.

**Date: 01/23/96** ■ Comments: A tank with the Danish battalion struck an AT mine 15 km south of Doboj, leaving four personnel injured. They were evacuated to Tuzla.

**Date: 12/30/95** ■ Comments: An American soldier was wounded when his vehicle struck an AT mine in Bosnia.

**Date: 12/23/95** ■ Comments: Two British soldiers were wounded when their vehicle struck an AT mine while on patrol in the Croat-held area of Sanski Most.

**Date: 02/07/95** ■ Comments: The driver of a private vehicle in Sarajevo was slightly injured when his car struck an AT mine on a recently reopened road, UN officials said.

**Date: 06/25/94** ■ Comments: An UNPROFOR peacekeeper was wounded when his vehicle hit an AT mine.

**Date: 05/01/94** ■ Comments: Two American journalists were killed and a third wounded when their vehicle struck an AT mine near Mostar.

**Date: 04/29/94** ■ Comments: At 1515 hrs LT a British landrover detonated an AT mine northwest of Gornji Vakuf, killing a British officer and injuring two other personnel.

**Date: 10/10/92** ■ Comments: Four Ukrainian UNPROFOR peacekeepers were casualties of an AT mine on a road at Blazuj, west of Sarajevo. Three survived the explosion but were injured; the fourth perished.

**Date: 09/22/92** ■ Comments: A Kenyan contingent member was wounded when an AT mine detonated.

**Date: 07/23/92** ■ Comments: Four French peacekeepers were wounded when their APC hit an AT mine.

**Date: 07/05/92** ■ Comments: A French peacekeeper was wounded when his APC hit an AT mine.

**Date: 06/27/92** ■ Comments: A French peace-keeper was injured when his truck hit an AT mine.

#### **CROATIA**

**Date: 09/27/95** ■ Comments: The UNMO team at Ogulin, including a Canadian and a Dutchman, was involved in a mine incident at Milinkovici, Sector North. Their vehicle was patrolling a secondary route when they detonated an AT mine, resulting in a driver receiving serious injuries and two others being injured. All were transported to the UN hospital in Pleso.

**Date: 11/15/99** ■ For Austrian and two Croatian hunters were killed when their vehicle struck an AT mine in a northern region of Croatia. Source: Salzburger Nachrichten

**Date: 06/09/95** ■ Comments: Three Canadian soldiers were injured in Sector South when their UN vehicle ran over an AT mine.

**Date: 04/28/95** ■ Comments: Three Jordanian peace-keepers were injured when their vehicle struck an AT mine.

**Date: 12/16/93** ■ Comments: A peacekeeper from Argentina was killed while on patrol when his vehicle hit an AT mine in Novoselo, Croatia.

**Date: 07/14/93** ■ Comments: A train was derailed by an AT mine, killing four Serbian civilians and wounding 27 others while crossing a bridge west of the town of Glina. This incident was reported by the UN Secretary-General's Special Rapporteur on Human Rights, Mr. Tadeusz Mazowiecki, in UN document E/CN.4/1994/47.

**Date: 10/28/92** ■ Comments: Two members of the Canadian UNPROFOR contingent were wounded when their APC struck an AT mine 2.5 km SW of Lipik.

#### **EGYPT**

**Date 04/29/99** ■ Four young Egyptians were killed when their vehicle hit an AT mine. Source: Reuters

#### **GEORGIA**

**Date: 06/24/99** ■ Two civilians were killed and 13 were wounded when their bus struck an AT mine in Abkhazia. Source: dpa, in: Frankfurter Rundschau

#### **KOSOVO**

**Date: 09/07/99** ■ Unidentified attackers destroyed a Serb school chapel in southern Kosovo by exploding five antitank mines, the KFOR peace-keeping force said Tuesday. KFOR said the incident had occurred late Monday night in Prizren, Kosovo's second largest city. No one was wounded in the attack, the international peacekeeping force said. Source: Reuters, 7.9.99



Photo:  
Tim Grant

#### **LEBANON**

**Date: 12/11/88** ■ Comments: Three Norwegian personnel were injured when their vehicle tripped an AT mine while on patrol.

**Date: 09/25/82** ■ Comments: A Finnish officer, Irish officer, and two American officers, all with the UNTSO mission, were killed when their vehicle hit an AT mine at Zandukhah, approx. 10 kms east of Beirut.

#### **RWANDA**

**Date: not given** ■ Comments: UNMOs in Sector 5A reported that an RPA vehicle detonated an AT mine at a bridge in Ruhengiri. One soldier was killed and three others received moderate injuries.

**Date: 11/01/95** ■ Comments: A bus travelling from Cyangugu to Kibuye, hit an AT mine at the Uwingabu Bridge. Three were killed, several others wounded, and they were evacuated by ICRC to Kibuye hospital.

**Date: 10/30/95** ■ Comments: Three persons were killed and six wounded when an AT mine detonated at Gasharu, reported ICRC. In Sector 4C, at Kibuye, UNMOs reported that an AP mine injured a local when he stepped on a mine in Gashuru.

**Date: 10/03/94** ■ Comments: UNAMIR reported a woman injured when her vehicle struck an AT mine.

Source: UN/DHA-Landmine database, other sources listed separately

## MINE TYPES ENCOUNTERED IN DIFFERENT COUNTRIES AND THEIR ORIGIN

### AFGHANISTAN

#### Existing Mines

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT 2,000,000

AP 8,000,000

#### Cleared Mines:

158,000\*

#### AP-Mines found:

G-Vata-6 Russian Federation?, Mark-2 United Kingdom?, Mark-7 United Kingdom?, MD-2 Pakistan?, MON-100 Russian Federation, MON-200 Russian Federation, MON-50 Russian Federation, MON-90 Russian Federation, NR-127 Belgium?, OZM-3 Russian Federation, OZM-4 Russian Federation, OZM-72 Russian Federation, OZM-UUK-AP Russian Federation, P2-Mark 3 Pakistan, PDM-2 Russian Federation(shallow water mine), PFM-1 Russian Federation, PFM-15 Russian Federation?, PGMDM Russian Federation, PMA-1A Yugoslavia, PMD-6 Russian Federation, PMD-6M Russian Federation, PMN Russian Federation, PMN-2 Russian Federation, PMP Russian Federation, POMZ Russian Federation, POMZ-2 Russian Federation, POMZ-2M Russian Federation, PP-MI-SR Czech Republic, PP-MI-SR-II Czech Republic, PT-MI-K Czech Republic?, Pt-Mi-K Czech Republic, RAP-2 Zimbabwe, SB-33 Italy, Type 72 non-met China, VS-MK2 Singapore

#### AT-Mines found:

SH-55 Italy, TC-2.4 Italy, TC-3.6 Italy, TC-6-AT Russian Federation, TM-41 Russian Federation, TM-46 Russian Federation, TM-57 Russian Federation, TM-62 Russian Federation, TM-62M Russian Federation, TMA-5 Yugoslavia, TMB-44AT Russian Federation, TMDB Russian Federation, TMK-2 Russian Federation, TMN-46 Russian Federation, Type 69 China

#### Remarks:

There was also widespread use of AT mines, which have the capacity to destroy vehicles of any size and kill and injure dozens of victims.

### ANGOLA

#### Existing Mines

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT 3,000,000

AP 12,000,000

#### Cleared Mines:

AT 28,000

AP 60,000

#### AP-Mines found:

APM-1 Austria, APM-2 Austria, Gyata-64 Hungary, M 14 India, M 59(Mi APDV 59) France, M/966 Portugal, M-16A1 United States, M16A2 United States, M18A1 United States, M2A2 South Africa, Mark-7 United Kingdom?, MON-100 Russian Federation, MON-200 Russian Federation, MON-50 Russian Federation, No 4 Israel, NR 409 Belgium, OZM-4 Russian Federation, OZM-72 Russian Federation, Ploughshare Zimbabwe, PMA-1 Yugoslavia, PMA-2 Yugoslavia, PMD-6 Russian Federation, PMN Russian Federation, PMN-2 Russian Federation, POMZ-2M Russian Federation, PPM-2 China, PPM-2 Germany, PP-Mi-D Czech Republic, PP-Mi-Sk Czech Republic, PP-MI-SR Czech Republic?, PRB M35 Belgium, PSM-1 Bulgaria, R2M1 South Africa, RAP-1 Zimbabwe?, Type-72b China, Valmara 69 Italy, VAR-100 Italy, VAR-40 Italy, VS-50 Italy, VS-MK2 Italy, VS-Mk2 Italy

#### AT-Mines found:

M-15 United States, M-19 United States, M-24 United States, M7A2 United States, MAT 76 Romania, No. 8 South Africa, PT-Mi-Ba-III Czech Republic, TM-46 Russian Federation, TM-57 Russian Federation, TM-62 Russian Federation, TM-62M Russian Federation, TMA-2 Yugoslavia, TMA-3 Yugoslavia, TMA-4 Yugoslavia, TMA-5 Yugoslavia, TMN-46 Russian Federation, TMDB Russian Federation, Type 69 China, TMD-44 Russian Federation, Type-72a China

#### Remarks:

The TMA-3, made in Yugoslavia, is an anti-tank mine that is non-detectable with hand-held metallic detectors (there is no metallic content in the mine fuse or body).

### BOSNIA AND HERZIGOVINA

#### Existing Mines

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

1,000,000 – 3,000,000\*

#### Cleared Mines:

49,010\*

#### AP-Mines found:

MRUD Yugoslavia, PMA-1 Yugoslavia, PMA-2 Yugoslavia, PMA-3 Yugoslavia, PMR-2 Yugoslavia, PMR-2A Yugoslavia, PMR-3 Yugoslavia, PROM-1 Yugoslavia, PROM-2 Yugoslavia, TM-100 Yugoslavia, TM-500 Yugoslavia

**AT-Mines found:**

TMA-1A Yugoslavia, TMA-2 Yugoslavia, TMA-3 Yugoslavia, TMA-4 Yugoslavia, TMA-5 Yugoslavia, TMM-1 Yugoslavia, TMR-P6 Yugoslavia

**CAMBODIA****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

6,000,000\*

**Cleared Mines:**

83,000\*

**AP-Mines found:**

DH 10 Viet Nam?, MBV 78 A2 Viet Nam, MON-100 Russian Federation, MON-200 Russian Federation, MON-50 Russian Federation, NR 409 Belgium, OZM-1 Russian Federation, OZM-3 Russian Federation, OZM-4 Russian Federation, P-40 Viet Nam, PMD-6 Russian Federation, PMN Russian Federation, PMN-2 Russian Federation, POMZ-2M Russian Federation, PSM-1 Bulgaria, Type-72a China, Type-72b China?, Type-MON-50 China

**AT-Mines found:**

Pt-Mi-K Czech Republic, TM-46 Russian Federation, TM-57 Russian Federation, TM-62 Russian Federation, Type 69 China

**CROATIA****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

400,000 – 3,000,000\*

**Cleared Mines:**

8,000\*

**AP-Mines found**

MRUD Yugoslavia, PMA-1 Yugoslavia, PMA-2 Yugoslavia, PMA-3 Yugoslavia, PMR-2 Yugoslavia, PMR-3 Yugoslavia, PROM-1 Yugoslavia, PROM-2 Yugoslavia, TM-100 Yugoslavia, TM-500 Yugoslavia, TMR-P6 Yugoslavia, VS-50 Italy

**AT-Mines found:**

TMA-1A Yugoslavia, TMA-2A Yugoslavia, TMA-3 Yugoslavia, TMA-4 Yugoslavia, TMA-5 Yugoslavia, TMN-1 Yugoslavia

**Remarks:**

In Jan. 95 Croatia estimated there were 3,000 tonnes of unexploded munitions on its territory. Officials said there are 1.5 million AP mines and 500,000 AT mines to be cleared. "The borders of the existing mine fields are also unknown as mines

were mostly laid without proper plans and records, mostly in 1991... it is difficult to find them because of overgrowth and changes on the soil surface due to regular natural erosion."

**ERITREA****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

1,000,000\*

**AP-Mines found:**

M-3 United States, MON-100 Russian Federation, MON-200 Russian Federation, MON-50 Russian Federation, OZM-3 Russian Federation, OZM-4 Russian Federation, OZM-72 Russian Federation, PM-60 Germany, PM-60 Russian Federation, PMD-57 Russian Federation, PMD-6M Russian Federation, PMN Russian Federation, PMN-2 Russian Federation, PPM-2 Germany

**AT-Mines found:**

M-15 United States, M7A2 United States, TM-57 Russian Federation, TM-62M Russian Federation, TMK-2 Russian Federation

**ETHIOPIA****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT 100,000

AP 400,000

**AP-Mines found**

MON-100 Russian Federation, MON-200 Russian Federation, MON-50 Russian Federation, OZM-3 Russian Federation, OZM-4 Russian Federation, OZM-72 Russian Federation, PM-60 Germany, PMD-57 Russian Federation, PMD-6M Russian Federation, PMN Russian Federation, POMZ-2 Russian Federation, PPM-2 Germany

**AT-Mines found:**

TM-57 Russian Federation, TM-62M Russian Federation, TMK-2 Russian Federation

**FALKLANDS****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

25,000\*

**Cleared Mines:**

4,220\*

**AP-Mines found**

C3B Spain, FMK-1 Argentina, M1 Argentina?, No 4 Israel, No 6 Israel, P4B Spain, SB-33 Italy

**AT-Mines found:**

FMK 3 Argentina, SB-81 Italy

**Remarks:**

In Jun. 95 the Government of the Republic of Argentina reported the previous UN assessment of 30,000 to be incorrect; the real figure is 25,000 land mines. Of those, approximately 5,000 are AP and 20,000 AT mines.

**GEORGIA****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

150,000\*

**AP-Mines found:**

MON-100 Russian Federation, MON-200 Russian Federation, MON-50 Russian Federation, MON-90 Russian Federation, OZM-72 Russian Federation, PMN Russian Federation, PMN-2 Russian Federation, TS 50 Italy

**AT-Mines found:**

TM-57 Russian Federation, TM-62 Russian Federation, TM-62P Russian Federation

**IRAN****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT 4,000,000

AP 12,000,000

**Cleared Mines:**

200,000\*

**LEBANON****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT 367

AP 8,428

**Cleared Mines:**

17,292\*

**AP-Mines found:**

D459 France?, F1 France?, GVAT A64 Russian Federation?, M-14 United States, M18A1 "Claymore" United States, , M51 France?, M53 France?, , NMH2 China?, No 4 Israel, PMN Hungary, PPM-2 Czech Republic, TS 50 Italy, Type 72 Russian Federation?

**AT-Mines found:**

M-19 United States, M7A2 United States, TM-46 Russian Federation, TM-57 Russian Federation, TMA-4 Yugoslavia, TMA-5 Yugoslavia, VS27-1.6 Italy

**LIBERIA****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT 1,750

AP 16,500

**AT-Mines found:**

MAT 62B Romania, MAT 76 Romania

**MOZAMBIQUE****Existing Mines**

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT 400,000

AP 600,000

**Cleared Mines:**

58,000\*

**AP-Mines found:**

Black Widow Portugal, Claymore M18A1 United States, Claymore-Type South Africa, Dancing Mine Portugal, DM-11 Germany, DM-31 Germany, M 14 India, M/966 Portugal, M/969 Portugal, M-14 United States, M16A1 United States, M16A2 United States, M18A1 United States, M2A2 South Africa?, M59 France, Mini-Claymore South Africa, MON-100 Russian Federation, MON-50 Russian Federation, No.6 United Kingdom, No.69 South Africa, OZM-3 Russian Federation, OZM-4 Russian Federation, OZM-72 Russian Federation, Ploughshare Zimbabwe, PMD-6 Russian Federation, PMN Russian Federation, PMN-2 Russian Federation, POMZ-2 Russian Federation, POMZ-2M Russian Federation, PPM-2 China, PPM-2 Germany, PP-MI-SR-II Czech Republic, PRB M409 Belgium, PROM-1 Yugoslavia, PSM-1 Bulgaria, RAP-1 Zimbabwe, RAP-2 Zimbabwe, Type-72a China, VAR-100 Italy, VAR-40 Italy, VS-50 Italy

**AT-Mines found:**

TM-46 Russian Federation, TM-57 Russian Federation, TM-62D Russian Federation, TM-62M Russian Federation, TM-62P Russian Federation, TMK-2 Russian Federation, TMN-46 Russian Federation, Type 69 China

## SOMALIA

### Existing Mines

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

1,000,000\*

### Cleared Mines:

32,511\*

### AP-Mines found:

M-14 United States, M16-A2 United States, MON-100 Russian Federation, MON-200 Russian Federation, MON-50 Russian Federation, NMH2 China?, No. 4 dual purp Czech Republic, P2 Mk2 Pakistan, P2-Mark 3 Pakistan, P4 Mk.2 Pakistan, PFM-1 Russian Federation, PFM-15 Russian Federation?, PMD-6 Russian Federation, PMD-6M Russian Federation, PMN Russian Federation, PMN-2 Russian Federation, PMP-71 Germany, POMZ Russian Federation, POMZ-2 Russian Federation, POMZ-2M Russian Federation, PP-MI-SR Czech Republic, PRB M35 Belgium, SB-33 Italy, Type-72a China, Valmara 69 Italy, VS-50 Italy

### AT-Mines found:

M/71 Egypt, DM-11 Germany, M-15 United States, M7A2 United States, PT-Mi-Ba-III Czech Republic, SACI Italy, T-72 AT China, TM-46 Russian Federation, TM-57 Russian Federation, TM-62 Russian Federation, TM-62M Russian Federation, TMN-46 Russian Federation, Type-72b China

## SUDAN

### Existing Mines

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

1,000,000\*

### AP-Mines found:

M14 United States, M16 United States, Maus Italy, MPRB N33A1 Belgium?, No 4 Israel, OZM-3 Russian Federation, OZM-4 Russian Federation, PMD-6M Russian Federation, PMD-7 Russian Federation, PMN Russian Federation, POMZ-2 Russian Federation, POMZ-2M Russian Federation, PRB M35 Belgium, T 79 Egypt, Type 58 China, Type 72 China, Valmara 69 Italy, VS-ER-83 Italy, VS-Mk2 Italy

### AT-Mines found:

M15 United States, TM-46 Russian Federation, TM-57 Russian Federation, TM-62 Russian Federation, Type 69 China

## YEMEN

### Existing Mines

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

100,000\*

### Cleared Mines:

65,000\*

### AP-Mines found:

M-62 Hungary, OZM-4 Russian Federation, PMD-6 Russian Federation, PMD-6M Russian Federation, PMN Russian Federation, POMZ-2M Russian Federation, PP-MI-SR Czech Republic, VS-50 Italy

### AT-Mines found:

Pt-Mi-K Czech Republic, TM-46 Russian Federation, TM-57 Russian Federation, TM-62 Russian Federation, TM-62M Russian Federation, TMN-46 Russian Federation, UKA-63 Hungary

### Remarks:

Number of Mines Yemen 100,000. Figure provided by the UN. Yemeni authorities informed the UN in Apr. 95 that they estimated there to be 400,000 kg of AP mines, 720,000 kg of AT mines, and 15,000 kg of unexploded ordnance to be cleared.

## YUGOSLAVIA

### Existing Mines

**AT=Anti-Tank, AP=Anti-Personnel (no stockpiles):**

AT & AP mines

500,000\*

### AP-Mines found:

MRUD Yugoslavia, PMA-1 Yugoslavia, PMA-2 Yugoslavia, PMA-3 Yugoslavia, PMR-2 Yugoslavia, PMR-3 Yugoslavia, PROM-1 Yugoslavia, PROM-2 Yugoslavia, TM-100 Yugoslavia, TM-500 Yugoslavia, VS-50 Italy

### AT-Mines found:

TMA-1A Yugoslavia, TMA-2A Yugoslavia, TMA-3 Yugoslavia, TMA-4 Yugoslavia, TMA-5 Yugoslavia, TMM-1 Yugoslavia, TMR-P6 Yugoslavia

Sources: UN/DHA Landmine Database 1999,

\*United States Department of State (1998): Hidden Killers



Rocket Launcher  
LARS (Germany)  
Scatters AT-2 mines



Civilian truck hit  
by an AT mine  
in Angola  
Photo:  
Sean Sutton MAG

**Mine incidents caused by Anti-Vehicle  
and Anti-Personnel Mines in the area of Luena  
(Angola) 4/98 – 9/99**

Date	Civilians/Men	Military/Men	Civilians/Women	Total	AT-Mine Victims	AP-Mine Victims
4/98	6	0	0	6	0	6
5/98	2	0	0	2	0	2
6/98	1	0	0	1	0	1
7/98	3	2	0	5	0	5
8/98	0	8	0	8	6	2
9/98	3	3	2	8	2	6
10/98	3	28	2	33	27	6
11/98	18	3	5	26	5	21
12/98	3	7	1	11	0	11
1/99	10	3	7	20	6	14
2/99	1	2	2	5	0	5
3/99	0	1	2	3	0	3
4/99	2	5	4	11	0	11
5/99	4	2	2	8	0	8
6/99	5	3	1	9	0	9
7/99	10	2	0	12	0	12
8/99	6	9	10	25	10	15
9/99	7	9	8	24	0	24
10/99	13	1	11	25	3	22
<b>Total</b>	<b>97</b>	<b>88</b>	<b>57</b>	<b>242</b>	<b>59</b>	<b>183</b>
Percent	40,08 %	36,36 %	23,55 %	100 %	24,38 %	75,61 %

Source: medico international



# GERMAN **TO** INITIATIVE **BAN** LANDMINES

