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Human Rights Watch Backgrounder
February 25, 2002

Antivehicle Mines with Sensitive Fuzes or Antihandling Devices

Note: Information in this backgrounder was originally distributed in Geneva, Switzerland on February 1, 2002 in memorandum for delegates to the fifth meeting of the Intersessional Standing Committee on the General Status and Operation of the 1997 Mine Ban Treaty. This backgrounder is a revised version of that memorandum and incorporates factual corrections and additional information received from delegates.

Since the conclusion of the negotiations for the 1997 Mine Ban Treaty, Human Rights Watch has emphasized that, according to the treaty's definitions, antivehicle mines (AVM) with antihandling devices (AHD) that explode from an unintentional or innocent act are considered antipersonnel mines and therefore prohibited. Additionally, if a fuzing mechanism for an AVM is sensitive enough to be activated by the unintentional act of a person, thus functioning as a *de facto* AHD, that AVM meets the definition of an antipersonnel mine in the Mine Ban Treaty and is prohibited.

The purpose of this backgrounder is to document the practice established by States Parties since entry-into-force of the treaty with respect to AVM with sensitive fuzes or AHD. It is regrettable that limited progress has been made in clarifying what specific types of AVM and AHD are permissible and which are prohibited under the treaty. The universalization of the treaty and the international norm is being hindered by the lack of action on the part of States Parties on this issue. Human Rights Watch urges States Parties to make meaningful progress on the issue of AVM with sensitive fuzes and AHD prior to the Fourth Meeting of States Parties in September 2002. Both the President's Action Program emerging from the Third Meeting of States Parties and the Report of the General Status Standing Committee to the Third Meeting of States Parties have stressed the importance of progress on this issue.

This backgrounder consists of three parts:

- Part I introduces the issue and chronicles work to date.
- Part II addresses sensitive fuzing mechanisms.
- Part III examines antihandling devices.

The backgrounder also has three attachments:

- The first lists AVM reportedly stockpiled by States Parties.
- The second lists AVM produced and exported by certain other states.
- The third is a diplomatic history regarding AVM with AHD.

Information regarding the complete composition of any country's stockpiles of AVM is generally not publicly available nor is there any transparency requirement for such data in any international treaty or agreement. The information set forth in this memorandum is likely incomplete. Still, the International Campaign to Ban Landmines' (ICBL) *Landmine Monitor* research initiative has been quite successful in documenting the practice of States Parties and this memorandum draws significantly from the three reports published to date.

PART I: INTRODUCTION AND PROGRESS TO DATE

Treaty Background

During the Oslo treaty negotiations in 1997, the ICBL identified as "the major weakness in the treaty" the sentence in the Article 2 Paragraph 1 definition of antipersonnel mine that exempts AVM equipped with AHD: "Mines designed to be detonated by the presence, proximity or contact of a vehicle as opposed to a person, that are equipped with anti-handling devices, are not considered anti-personnel mines as a result of being so equipped." The ICBL expressed its belief that many AVM with AHD could function as antipersonnel mines and pose similar dangers to civilians.

To address this concern, which was shared by many government delegations, negotiators changed the draft definition of an AHD (which had been identical to the one in Protocol II of the Convention on Conventional Weapons, or CCW) by adding the words "or otherwise intentionally disturb": "'Anti-handling device' means a device intended to protect a mine and which is part of, linked to, attached to or placed under the mine and which activates when an attempt is made to tamper with *or otherwise intentionally disturb* the mine." It was emphasized by Norway, which proposed the language, and others, that the word "intentionally" was needed to establish that if an AVM with an AHD explodes from an unintentional act of a person, it is to be considered an antipersonnel mine, and banned under the treaty. This language was eventually accepted by all delegations (see Attachment 3 for a diplomatic history).

The ICBL expressed concern that there had not been adequate recognition by States Parties that AVM with AHD that function like antipersonnel mines are in fact prohibited by the Mine Ban Treaty, nor discussion of the practical implications of this. The ICBL has repeatedly called on States Parties to be more explicit about what types of AVM and AHD are permissible and prohibited. Human Rights Watch, the International Committee of the Red Cross (ICRC), Landmine Action UK, and the German Initiative to Ban Landmines all produced lists and publications regarding AVM of concern.

ICRC Seminar

Acting upon recommendations made in Standing Committee meetings in 2000, the ICRC hosted a technical experts meeting on "antivehicle mines with sensitive fuses or with sensitive antihandling devices" on March 13-14, 2001 in Geneva. Governments that sent representatives to this seminar include: Austria, Belgium, Canada, Czech Republic, Finland, France, Germany, Nicaragua, Norway, South Africa, Sweden, Switzerland, United Kingdom, and the United States.

Discussion at the seminar centered on identifying the specific technical measures that States Parties can adopt to minimize the risk to civilians posed by AVM with sensitive fuze mechanisms and AHD that might be activated by an unintentional act. The result of the seminar was the development of a number of recommended best practices regarding the design and use of sensitive fuzes and antihandling devices. Key among them were establishing a minimum

pressure threshold for AVMs and discontinuing use of AVMs with tripwires, breakwires and tilt rod fuzes, because they function as antipersonnel mines.

Subsequent Developments

This issue was further discussed at the meeting of the General Status Standing Committee in May 2001, where several delegations expressed their support for the establishment of best practices such as those identified at the ICRC seminar. The report of the Standing Committee submitted to the Third Meeting of States Parties in Managua in September 2001 recommended that States Parties review their AVM inventories in order to minimize risks to civilians, and encouraged States Parties "to consider and to adopt, as appropriate, relevant best practices of the type identified in the report of the ICRC…."

The President's Action Program that emerged from the Third Meeting of States Parties also encourages review of AVM inventories and consideration of best practices. It further states, "The [Standing Committee] Co-chairs and other interested parties will promote such best practices and encourage reporting on State practice in this regard."

In statements made at the Third Meeting of States Parties, France, Germany, Japan, and the United Kingdom expressed the view that AVM should be considered in the context of the CCW and not the Mine Ban Treaty.

At the Second Review Conference of CCW in December 2001, states agreed to form a group of governmental experts with a broad mandate to study issues concerning AVM. This group was formed after consensus could not be reached to adopt a new AVM protocol initially submitted by the United States in December 2000 and co-sponsored by States Parties Denmark, Germany, Hungary, Japan, Slovakia, and the United Kingdom.

At the General Status and Operation Standing Committee meeting on February 1, 2002, states were urged by the co-chairs to come to the next meeting prepared in May 2002 prepared to discuss national positions and issues related to Article 2. The ICRC also distributed an information paper titled "Understanding the Ottawa Treaty definition of an anti-personnel mine under basic rules of treaty interpretation" at this meeting.

Statements of National Policy

During 2001, officials of a number of States Parties made policy statements on the issue of AVM with AHD in various domestic and international venues or in communications with Landmine Monitor researchers. These statements include:

- At the Standing Committee meeting on May 11, 2001, **Austria** aligned itself with the view expressed by the Netherlands, that the issue should be dealt with by adopting and reporting on voluntary "best practices."
- Legislation banning AHD, or interpreting existing law to ban AHD, has been proposed and studied in **Belgium**.
- The Bolivian Defense Minister stated that **Bolivia** is not using and does not reserve the right to use other munitions which might function like antipersonnel mines and pose danger to civilians, such as AVM with AHD.
- A representative from Brazil said at the February 1, 2002 Standing Committee meeting that Brazil favored a ban on AVM with AHD, repudiated the use of AHD on humanitarian grounds, and, "that the wording of Article 2 Paragraph 3 does make clear that AVMs equipped with AHDs which may be detonated by the unintentional act of a person constitute, for all practical purposes, anti-personnel mines, and are therefore banned by the Convention..

- A statement made by **Canada** during the Standing Committee meeting in May 2001 noted, "Canada does not accept the argument that all antihandling devices could be activated by unintentional disturbance. Canada is currently undertaking work to better explain what we consider to be antihandling devices that would conceivably be banned by the Convention and those that we would consider not banned by the Convention."
- The French Ambassador for Mine Action has asserted that the Mine Ban Treaty does not cover the AVM currently stockpiled by **France**. The National Commission for the Elimination of Antipersonnel Mines (CNEMA) in France reported on issues related to AVM in its report released late in 2001.
- **Germany** holds that AVM with AHD do not fall within the scope of the Mine Ban Treaty, but Parliamentarians are considering options to ban AVM unilaterally.
- **Italy** noted that its stringent national legislation banning antipersonnel landmines (Law 374/97), "adopts a wide definition of [antipersonnel mines] which does not foresee an exception for anti-vehicle mines equipped with antihandling devices." A representative from Italy reinforced this at the Standing Committee meeting on February 1, 2002 by stating that this law does not permit AVM with AHD.
- The **Netherlands** at a Standing Committee meeting in May 2001 supported the call for the issue of AVM with AHD to be dealt with by "best practices" because this "has the advantage of being voluntary but allows States to deal with humanitarian concerns whilst recognizing military needs."
- The Ministry of Defense of **Norway**, in an April 2001 letter to Landmine Monitor, stated that use of AVM would continue as and when necessary.
- An official of the Ministry of Defense of **Slovakia** stated in a January 2001 interview, "Slovakia is not obliged to provide information on antivehicle landmines and antihandling devices, since no nation has done so, moreover there is no obligation emanating from the Ottawa Treaty that requires it or any other State to do so. However, Slovakia has interest and unreservedly supports the destruction of antivehicle landmines and antihandling devices on a world-wide basis."
- The Foreign Ministry of **Spain** noted that Law 33/98 refers to mines designed to explode in the presence, proximity or contact with a person, thus AVM with AHD "will not be treated as antipersonnel landmines."
- According to Defense officials from the **United Kingdom**, very sensitive anti-disturbance devices are not found among UK stocks. According to Parliamentary statements, "all UK weapons systems have been checked for compliance with the provisions of the Mine Ban Treaty. There are no weapons or munitions in the UK inventory which fall under the Ottawa definition of an antipersonnel mine."

PART II: SENSITIVE FUZES

Several different types of fuzes are used to initiate AVM. Generally, AVM are not intentionally designed to explode by the presence, proximity, or contact of a person when they operate as designed. However, some of these fuzes may be sensitive enough to be initiated by a person because a consequence of their design causes the mine to explode by the presence, proximity, or contact of a person. Additionally, some AVM fuzes lend themselves to modification that makes them more susceptible to being activated by a person. For example, a

tilt rod fuze manufactured in the former Yugoslavia has a hole in the tilt rod to permit the attachment of a trip wire.

Accordingly, the ICBL has expressed the view that if the fuzing mechanism for an AVM is sensitive enough to be activated by the unintentional act of a person, that AVM meets the definition of an antipersonnel mine in the Mine Ban Treaty and is prohibited (AHD are addressed in the following section). This section will address the following types of AVM fuzes and highlight any steps taken by States Parties to insure their compliance with the Mine Ban Treaty:

- Pressure Activated
- Tripwires
- Breakwires
- Tilt Rods
- Scratch Wires
- Magnetic Influence
- Acoustic and Seismic

Pressure Activated

Pressure activated AVM are quite common in the inventory of States Parties. Because some AVM are designed to activate at relatively low pressure thresholds, experts at the ICRC seminar recommended establishing a minimum pressure threshold of 150 kilograms or that design of these types of mines be altered in a way that pressure must be exerted over a "significant area" as opposed to a single point. It was noted that at least one existing antivehicle mine already is configured to account for weight distribution. At the Standing Committee meeting in May 2001, Landmine Action presented research conducted with Loughborough University, which showed that the forces exerted by a person in a variety of circumstances, including while running, alighting from a truck or skipping, could far exceed the equivalent of 150 kilograms. There are also reports that demining organizations have encountered during clearance operations AVM with the pressure plates removed, which dramatically lowers the pressure threshold necessary for activation of the mine. Such a type of modification would create a large *de facto* antipersonnel mine.

Summary of Practice by States Parties on Pressure Activated Fuzes

- No States parties have reported on measures taken to insure that pressure activated fuzes cannot be activated by the presence, proximity, or contact of a person.
- The following twenty-seven States Parties are reported to stockpile pressure activated fuzes: **Argentina**, **Austria**, **Brazil**, **Bulgaria**, **Chile**, **Colombia**, **Croatia**, **Czech Republic**, **Denmark**, **France**, **Germany**, **Italy**, **Honduras**, **Hungary**, **Japan**, **Jordan**, **Norway**, **Peru**, **Portugal**, **Romania**, **Slovakia**, **Slovenia**, **Spain**, **Sweden**, **Thailand**, **Tunisia**, and the **United Kingdom**.
- At least two States Parties are reported to stockpile pressure activated AVM capable of functioning below 150 kilograms of pressure: **Brazil** and **Bulgaria**.

Tripwires

Experts at the ICRC seminar broadly agreed that an AVM that relies on a tripwire as its sole firing mechanism should be considered an antipersonnel mine and removed from service. There was no apparent consensus among the experts regarding AVM with multiple fuze systems, one of which is a tripwire. The experts noted that equipping AVM with a tripwire as the sole firing mechanism is not a common practice and that such mines are being removed from arsenals. Additionally, one tilt rod fuze manufactured by the former Yugoslavia has a hole in it for the attachment of a tripwire.

Experts at the ICRC meeting recognized that infrared sensors could, in some circumstances, act like a tripwire. This is particularly true when active infrared sensors are used as the sole initiating mechanisms in an AVM. Experts recommended that infrared activated fuzes never be used alone in AVM and that active infrared sensors be avoided. The experts could not provide an example of an AVM using this type of fuze stockpiled by a States Party.

Summary of Practice by States Parties on AVM with Tripwire Fuzes

- Two States Parties are reported to stockpile AVM with tripwires: **Czech Republic** and **Slovakia** (Both possess an off route AVM called the PD-Mi-PK. In addition to a tripwire as a fuze, this mine also has contact wire and command detonation options. This mine was offered for sale by a Czech company at an arms fair in the Czech Republic in May 2001.)
- **Sweden** is reported to possess an AVM that uses a tripwire or infrared sensor.

Breakwires

Experts at the ICRC seminar noted that two types of breakwire are used: fine wire and fiber optic. Because a person can easily activate breakwires, experts recommended that neither be used as the sole fuze mechanism. Fine wire breakwires were deemed extremely sensitive and not capable of discriminating between vehicles and other targets thus acting as a tripwire. It was noted that one unidentified country has reclassified an AVM using a fine wire breakwire as an antipersonnel mine and had destroyed its stocks. Experts also noted that fine wire breakwires are not practical for use in multi-sensor fuze mechanisms. The other type of breakwire relies on crushing a fiber optic cable. Some designs rely on this action to cue other sensors capable of distinguishing between vehicles and persons.

Summary of Practice by States Parties on AVM with Breakwire Fuzes

- Four States Parties are reported to stockpile AVM that used a breakwire fuze: **France**, **Germany**, **Netherlands,** and **Sweden**.
- In a response by the Ministry of Defense of **France** to the CNEMA, it was acknowledged that the non-intentional act of a person could function the breakwire and cause the MIACAH F1 and MIACAH F2 AVM to explode. The CNEMA report also notes that Ministry of Defense is currently studying ways to replace the breakwire system with a mechanism that allows discrimination between vehicles and people.

Tilt Rods

The low amount of lateral pressure necessary to activate an AVM with tilt rod fuze makes it susceptible to be activated by a person. The experts at the ICRC meeting noted that it is difficult to modify tilt rod fuzes and that a more discriminating fuze system should replace it. Several States Parties have removed from service and destroyed AVMs with tilt rod fuzes or destroyed the tilt rod fuze. Canada and France previously declared destroying their inventories. Mali recently declared having destroyed half of its inventory of TM-57 AVMs with MVSh-57 tilt rod fuzes and stated its intention to destroy the rest. The United Kingdom destroyed 21,200 L39A1B1 tilt rod fuzes between April 1995 and April 1996. Hungary indicated in March 2000 that it had destroyed half its inventory of UKA-63 AVM with tilt rod fuzes, and would destroy the remaining 100,000 by March 2002. Czech authorities admit that the PT-Mi, PT-Mi-P, and PT-Mi-U AVM can be used with a tilt rod fuze but have said their AVM "are considered obsolete" and "are supposed to be put out of the armament in the course of the next 15 years."

Summary of Practice by States Parties on Tilt Rod Fuzes

- Five States Parties have destroyed, or have committed to destroy, their tilt rod fuzes: **Canada**, **France**, **Hungary**, **Mali**, and the **United Kingdom**.
- The **Czech Republic** acknowledges possessing tilt rod fuzes, which it considers obsolete and which are to be destroyed in the next 15 years.
- Eleven other States Parties are reported to stockpile tilt rod fuzes: **Bulgaria**, **Chile**, **Croatia**, **Honduras**, **Jordan**, **Norway**, **Romania**, **Slovakia**, **Slovenia**, **Sweden**, and **Thailand**.

Scratch Wires

This type of fuzing mechanism was not specifically addressed at the ICRC seminar. However, the AT2 uses a fuze described as a "scratch wire." The reference publication *Jane's Mines and Mines Clearance, 2000-2001* describes the AT2's fuzing mechanism as follows:

> …to the side of the assembly is the S3 target sensor, which initiates the mine (after an appropriate delay) when it contacts any part of the target vehicle. In this 'scratch-wire' system, a short semi-flexible probe scrapes along the belly of the vehicle; the resultant vibrations are transmitted to the electronic fuze which validates the signal and initiates the mine. The fuze will also be initiated by direct pressure if run over (p. 464).

The Full Width Attack Mine fuze used with the United Kingdom's Barmine system also includes a sensor mast that is reported by the same source (p. 500) to operate in a similar way.

Summary of Practice by States Parties on Scratch Wire Fuzes

- Four States Parties stockpile the AT2: **Germany**, **Italy**, **Norway**, and the **United Kingdom**.
- The **Czech Republic** and **Slovakia** stockpile a mine similar to the AT2 called the PT-Mi-D1M.
- Two States Parties stockpile the Barmine: **Denmark** and the **United Kingdom**.

Magnetic Influence

Magnetic influence fuzes can be activated by the presence of metallic objects, and by a change in the magnetic field around the mine. The issue of AVM with magnetic influence fuzes potentially being prohibited by the Mine Ban Treaty is contentious given that many modern AVM rely on this type of fuze mechanism. For example, in the late 1990s, the United Kingdom imported the U.S. manufactured M87A1 Volcano AVM, which it calls the L35A1 Shielder. According to the U.S. manual on mine warfare, the mine does not have an internal AHD, but it "may detonate when moved, because the mine may sense a significant change from its original orientation." The design of early generation magnetic influence fuzes is of particular concern because the sensitivity of the fuzes may make them be more susceptible to explode from an innocent act.

Experts at the ICRC meeting noted that these types of AVM are designed to destroy or damage armored vehicles and that manufacturers should design these fuzes in a way not to be activated by small amounts of metal. However, experts did note that in theory, small amounts of metal could activate the mines. Because a change (caused by rotating or moving) in the magnetic field a mine with a magnetic influence fuze could also cause the mine to explode, it was also suggested that a secondary fuze or sensor be used in conjunction with magnetically activated fuzes to assure target discrimination. No thresholds or criteria were recommended.

Summary of Practice by States Parties on Magnetic Influence Fuzes

- Thirteen States Parties are reported to stockpile AVM with magnetic influence fuzes: **Austria**, **Belgium**, **Bulgaria**, **Canada**, **Denmark**, **France**, **Germany**, **Italy**, **Netherlands**, **Norway**, **Sweden**, **Switzerland**, and the **United Kingdom**.
- Some have raised questions about the FFV-028 (DM-31) and the possibility that it can explode when swept by a mine detector. The FFV-028 is stockpiled by **Canada**, **Germany**, **Netherlands**, and **Sweden**. The Netherlands has stated that it is investigating adapting this mine, but if this proves infeasible, it will remove these mines from service.
- **Italy** has determined that one aerially delivered AVM with a magnetically activated fuze, MIFF, is an antipersonnel mine and has included them in destruction plans. **Germany** also stocks the MIFF and has apparently made the opposite determination.
- The 2001 report of the CNEMA in **France** notes that in theory, the magnetic influence fuzes in the HPD F2, HPD F3, and Disp F1 AVM should not explode due to the proximity of a person. The CNEMA recommends that these mines be tested to confirm that they are permitted under the Mine Ban Treaty.

Acoustic and Seismic

Experts at the ICRC meeting did not identify any AVM that exclusively relies on these fuze types as its sole initiating mechanism. They recommended that such fuzes not be used and should be designed in a way not to be activated by stimuli and signatures of persons.

Italy has determined that one aerially delivered mine, MUSPA (an airfield denial anti-material and antipersonnel munition with an electronic/acoustic fuze system), is an antipersonnel mine and has included them in destruction plans. Germany also stocks the MUSPA and has apparently made the opposite determination.

PART III: ANTIHANDLING DEVICES

There are many types of and terms for devices, features, and characteristics designed to "protect" AVM. Some AVM can be expediently equipped with an AHD in the field using common ordnance items such as firing devices (igniters). Some AHD are built into the mine and no deliberate action is necessary to activate them during the mine's employment. Other AHD are the result of deliberate modification, attachment, or activation during the emplacement of the mine. In this instance, the mine itself has either a primary or secondary feature that allows the deliberate modification of the mine for antihandling purposes. Additionally, several AVM have sensitive fuzes resulting from intended and unintended design consequences that may serve as a *de facto* AHD (sensitive fuzes are addressed and analyzed in the previous section).

Participants in the ICRC seminar had trouble developing recommendations on the best practices for AHD. Experts noted the difficulty in distinguishing or quantifying the differences in physical stimuli between an intentional attempt to tamper or neutralize an AVM with an AHD and an unintentional act. No recommendations were agreed upon for best design practices to minimize the risk to civilians from AVM with AHD while still preserving the military function of the AHD. The experts called upon states to examine the sensitivities of their AHD with the goal of establishing a minimum level needed to fulfill their function.

States Parties have been reluctant to report on the measures taken to insure that AVM with AHD are compliant with the Mine Ban Treaty. Some States Parties have simply indicated that their AVM with AHD are compliant with the treaty. Unfortunately, States Parties have not provided technical detail to support this determination.

Firing Devices and Manually Emplaced AHD

Most AVM with auxiliary fuze wells can be fitted with AHD by the attachment of a firing device and activator. Anti-lift and anti-removal fuzes, designed to deter military countermine clearance, can also be built into the primary fuze. The sensitivity of these devices may also be dependent on whether the mine is placed on the surface or buried.

Some firing devices work on the same principle as a mousetrap and are activated by the release of as little as 2.25 kilograms of pressure. Lifting or removing a restraining weight releases a hinged striker to fire it. Other types of firing devices can function by the application of pressure (11 kilograms or more), release of pressure (between 2 and 67 kilograms), application tension (3 kilograms or more), or the release of tension. Activators are detonator boosters that magnify the explosive force generated by a firing device. The activator also performs the function of an adapter for attaching the firing device to the mine.

States Parties that are reported to have produced anti-lift, anti-disturbance, or anti-removal fuzes include the Bulgaria, Czech Republic, Denmark, and the United Kingdom. The former Yugoslavia and the former Soviet Union produced and widely proliferated these devices, which can be fitted to many types of mines because of the common screw threading in auxiliary fuze wells.

Summary of Practice by States Parties on Firing Devices or Anti-Lift Fuzes

- Belgium has banned pressure and tension release firing devices (igniters) as booby traps.
- France has destroyed a number of unspecified pressure and tension release fuzes.
- Germany states that the DM-39 anti-lift device is no longer in the inventory.
- Slovakia destroyed all of its PT-Mi-K antivehicle mines with anti-lift firing mechanisms.

Inherent Antihandling Features

Several types of AVM have an AHD installed at the time of manufacture. Often, there is no observable indication for presence of the AHD on these types of mine. There is insufficient data to render judgment regarding the stimuli or forces necessary to activate the mine's kill mechanism for these AHD.

Prototype AVM were often marketed by the manufacturers as having an antihandling capability, but it is not publicly known whether a state produced or purchased the mine with the feature. International reference publications and databases often list the AVM as having some kind of inherent antihandling feature without indication whether the feature was included in the mines currently in stockpile. For example, according to *Jane's Mines and Mine Clearance 2000-2001* the anti-disturbance feature of the FFV-028 was discontinued, but States Parties have not explicitly clarified if the FFV-028 procured and stockpiled by them possess the feature.

Certain AVM are factory equipped with an AHD called a "ball in cage" mechanism. Detonation of the mine occurs when the mine is moved and a metal ball bearing inside a metal housing (cage) moves to complete a simple electrical circuit. This mechanism is dependent on a battery to provide power and will become inert once the battery expires. AVM reported to have a "ball in cage" antihandling mechanism include the SB-81/SB-81AR and the AT2.

Practice by States Parties on AVM Reported to have an Inherent AHD

Mine Type	Stockpiling Country	Notes
ACPRF1	France	• **France** acknowledges in the 2001 CNEMA report, that the ACPRF1 does possess an auxiliary fuze well for a pull type AHD, but it is forbidden to use the mine in this way.
AT2	Germany, Italy, Norway, United Kingdom	--
Disp F1	France	• **France** has stated that the Disp F1 is not produced with a device specifically conceived as an anti-lifting system.
FFV-028 (DM-31)	Canada, Germany, Netherlands, Sweden	• Some have raised questions about the FFV-028 and the possibility that it can explode when swept by a mine detector.
HPD F2	France, Belgium, Switzerland	• **Belgium** acknowledged stocking the HPD F2, but states that the forces necessary to activate are greater than those of an unintentional act. • **France** has stated that the HPD F2 is not produced with a device specifically conceived as an anti-lifting system. • **France** states that any attempt to remove the HPD F2 could not be considered an unintentional act as the mine is buried. • **Switzerland** acknowledged owning AVM fitted with AHD.
PT-Mi-D1M	Czech Republic, Slovakia	• The **Czech Republic** confirmed it produced and supplied to its army a remotely delivered AVM with AHD
Pz 88	Austria	• **Austria** has confirmed that the Pz-88 has an AHD but states that the amount of disturbance necessary to initiate the mine would be greater than an unintentional act.
SB-81 SB-81AR	Portugal, Spain	• **Spain** confirmed that it stockpiles some versions of the C-5 (SB-81) that have antihandling devices. • **Portugal** reportedly produced the M453 (SB-81), but the Portuguese Ministry of Defense declared it does not possess a stockpile of the mines.
TMD-1	Bulgaria	--

Sources

Jane's Mines and Mine Clearance, 2000-2001; "Report on the Technical Expert Meeting on anti-vehicle mines with sensitive fuses or with sensitive anti-handling devices, hosted by the ICRC in Geneva, 13-14 March 2001," prepared by Robert Gravett, April 2001; ORDDATA II, Version 1.0 CD-ROM; MINEFACTS, Version 1.2 - a CD-ROM; *Landmine Monitor Reports (1999,2000,2001)* published by the ICBL; and, materials contained in Human Rights Watch's files.

ATTACHMENT 1: Types and Characteristics of Antivehicle Mines Reported to be Stockpiled by States Parties to the 1997 Mine Ban Treaty

Country	Mine	Emplacement Method	Primary Fuzing Mechanism	Antihandling Capability
Argentina	FMK-3	Manual	Pressure (150-250 kg)	--
	FMK-5	Manual	Pressure (300 kg)	--
Austria	Pz 75	Manual	Pressure	Auxiliary Fuze Well
	Pz 88	Manual, Mechanical	Magnetic Influence	Reported
Belgium	HPD F2	Mechanical	Magnetic Influence	Reported
Brazil	AE T1	Manual	Pressure (60-140 kg)	--
	T-AB-1	Manual	Pressure (200 kg)	--
Bulgaria	PTM-80P	Manual	Pressure (150-600 kg)	--
	TM-46 TMN-46	Manual, Mechanical	Pressure (120-400 kg), Tilt Rod (21 kg lateral)	Auxiliary Fuze Well
	TM-57	Manual, Mechanical	Pressure (120-400 kg), Tilt Rod (21 kg lateral)	Auxiliary Fuze Well
	TM-62M PZ	Manual, Mechanical	Pressure (150-600 kg), Magnetic Influence	Fuze dependant
	TMD-1	Remotely Delivered	Contact, Magnetic Influence	Reported
	NV-PDTM Fuze	--	Contact, Magnetic Influence	--
Canada	FFV-028	Manual, Mechanical	Magnetic Influence	Reported
Chile	APVL 83 F4	Manual	Pressure	Unknown
	M-15	Manual	Pressure (158-338 kg) Tilt Rod (1.7 kg)	Auxiliary Fuze Well
	M-19	Manual	Pressure (157-225 kg)	Auxiliary Fuze Well
	MAT-80 F5	Manual	Pressure	Auxiliary Fuze Well
	MAT-84 F5	Manual	Pressure	Auxiliary Fuze Well
Colombia	M-19	Manual	Pressure (157-225 kg)	Auxiliary Fuze Well
Croatia	TMRP-6	Manual, Mechanical	Pressure (150-360 kg) Tilt Rod (1.5kg)	Auxiliary Fuze Well Tilt Rod has trip wire capability
Czech Republic	PD-Mi-PK	Manual (Off Route)	Contact Wire, Tripwire	--
	PT-Mi-BA (three variants)	Manual, Mechanical	Pressure (200-450 kg)	Compatible with Anti Lift and Removal Fuzes
	PT-Mi-D1M	Remotely Delivered	Contact, Scratch Wire	Reported
	PT-Mi-K	Manual, Mechanical	Pressure (330 kg)	Auxiliary Fuze Well
	PT-Mi-P	Manual	Tilt Rod (5 kg)	--
	PT Mi-U	Manual, Mechanical	Pressure, Tilt Rod	Auxiliary Fuze Well
	RO-3 Fuze	--	Anti Lift Fuze	--
	RO-4 Fuze	--	Anti Lift Fuze	--
	RO-7-III Fuze	--	Anti Removal Fuze	--
Denmark	M/52	Manual	Pressure	Unknown
	M/75 Pansermine (Barmine)	Manual, Mechanical	Pressure, Additional Fuzes (Contact, Magnetic, Seismic)	M/88 Fuze adds anti-disturbance capability
	M/88 Fuze	--	Anti Lift Fuze	--
France	ACPR F1	Manual, Mechanical	Pressure (153 kg)	Auxiliary Fuze Well
	Disp F1	Mechanical, Remotely Delivered	Magnetic Influence	Reported
	HPD F2	Mechanical	Magnetic Influence	Reported
	HPD F3	Mechanical	Magnetic Influence	Reported
	MIACAH F1	Manual (Off Route)	Breakwire	--
	MIACAH F2	Manual (Off Route)	Breakwire	--

Country	Mine	Emplacement Method	Primary Fuzing Mechanism	Antihandling Capability
Germany	AT-2	Vehicle Scattered, Remotely Delivered	Scratch Wire	Reported
	DM-11	Manual	Pressure (150-400kg)	Auxiliary Fuze Well
	DM-12 (PARM-1)	Manual (Off Route)	Breakwire	--
	DM-21	Manual	Pressure (180-350 kg)	Auxiliary Fuze Well
	DM-31 (FFV-028)	Manual, Mechanical	Magnetic Influence	Reported
	MIFF	Remotely Delivered	Acoustic, Magnetic Influence	Unknown
	MUSPA	Remotely Delivered	Acoustic, Contact, Random Self-Destruct	Unknown
Italy	AT-2	Vehicle Scattered, Remotely Delivered	Scratch Wire	Reported
	MATS/1.4	Manual, Remotely Delivered	Pressure (180-310 kg)	--
	MATS/2	Manual, Mechanical, Remotely Delivered	Pressure (180-310 kg)	--
	MATS/2.6	Manual, Mechanical, Remotely Delivered	Pressure (180-310 kg)	--
	SB-81 SB-81 AR	Manual, Remotely Delivered	Pressure (150-310 kg)	Feature in Electronic Fuze
	SH-55	Manual, Mechanical	Pressure (180-220 kg)	Auxiliary Fuze --
	TC/3.6	Manual, Mechanical	Pressure (180-310 kg)	--
	TC/6	Manual, Mechanical	Pressure (180-310 kg)	--
	VS-SATM VS-SATM-1	Manual, Remotely Delivered	Magnetic Influence	--
Honduras	M-15	Manual	Pressure (158-338 kg) Tilt Rod (1.7 kg)	Auxiliary Fuze Well
	M-19	Manual	Pressure (157-225 kg)	Auxiliary Fuze Well
Hungary	UKA-63	Manual, Mechanical	Pressure, Tilt Rod	Auxiliary Fuze Well
Japan	Type 63/63B	Manual	Pressure (200 kg)	Auxiliary Fuze Well
Jordan	M-15	Manual	Pressure (158-338 kg) Tilt Rod (1.7 kg)	Auxiliary Fuze Well
Mali	TM-57	Manual, Mechanical	Tilt Rod (21 kg)	Auxiliary Fuze Well
Netherlands	FFV-028	Manual, Mechanical	Magnetic Influence	Reported
	NR29 (MIACAH F1)	Manual (Off Route)	Breakwire	--
Norway	AT-2	Vehicle Scattered, Remotely Delivered	Scratch Wire	Reported
	HPD F2	Mechanical	Magnetic Influence	Reported
	M-15	Manual	Pressure (158-338 kg) Tilt Rod (1.7 kg)	Auxiliary Fuze Well
Peru	MGP.31	Manual	Pressure	--
Portugal	M453 (SB-81 AR)	Manual, Remotely Delivered	Pressure (150-310 kg)	Anti-Removal Feature in Electronic Fuze
Romania	MAT-46	Manual	Pressure	--
	MAT-62B	Manual	Pressure (200 kg)	--
	MAT-76	Manual	Pressure (200 kg)	--
	MAT-87	Manual	Pressure	--
	MC-71	Manual	Tilt Rod (10-20 kg)	--
Slovakia	PD-Mi-PK	Manual (Off Route)	Contact Wire, Tripwire	--
	PT-Mi-D1M	Remotely Delivered	Pressure, Scratch Wire	Unknown
	PT Mi-U	Manual, Mechanical	Pressure, Tilt Rod	Auxiliary Fuze Well
Slovenia	TMRP-6	Manual, Mechanical	Pressure (150-360 kg) Tilt Rod (1.5kg)	Auxiliary Fuze Well Tilt Rod has trip wire capability

Country	Mine	Emplacement Method	Primary Fuzing Mechanism	Antihandling Capability
Spain	C-3-A C-3-B	Manual	Pressure (275 kg)	--
	C-5 (SB-81 AR)	Manual, Remotely Delivered	Pressure (150-310 kg)	Antihandling Feature in Electronic Fuze
Sweden	FFV-016	Manual (Off Route)	Command, Infrared, Breakwire	--
	FFV-028	Manual, Mechanical	Magnetic Influence	Reported
	M/41-47	Manual	Pressure (200-400 kg)	--
	M47-52B	Manual	Tilt Rod (14.5 kg)	--
	M/52 M/52B	Manual	Pressure (250 kg), Tilt Rod (14.5 kg)	--
	Mine Fuze 15	--	Tilt Rod	--
	Mine Fuze 16	--	Magnetic Influence	--
Switzerland	HPD F2	Mechanical	Magnetic Influence	Reported
Thailand	M-15	Manual	Pressure (158-338 kg) Tilt Rod (1.7 kg)	Auxiliary Fuze Well
	M-19	Manual	Pressure (157-225 kg)	Auxiliary Fuze Well
Tunisia	M-19	Manual	Pressure (157-225 kg)	Auxiliary Fuze Well
United Kingdom	AT-2	Vehicle Scattered, Remotely Delivered	Scratch (Contact) Wire	Reported
	Barmine	Manual, Mechanical	Pressure, Additional Fuzes Available (Contact, Magnetic, Seismic)	RO-150 Fuze adds anti-disturbance capability
	L35A1 Shielder	Vehicle Scattered	Magnetic Influence	--
	RO 150 Fuze (Danish M/88 Fuze)	--	Anti Lift/Disturbance	--

ATTACHMENT 2: Types and Characteristics of Antivehicle Mines Produced by Other Countries and Known to Have Been Exported

CHINA				
Mine	**Emplacement Method**	**Primary Fuzing Mechanism**	**Antihandling Capability**	**Notes**
Type 69 Type 72 Type 81	Manual, Mechanical	Pressure (300-800 kg)	--	Used in Angola, Bosnia, Eritrea, Ethiopia, Iraq, Jordan, Kuwait, Somalia, Zambia

FORMER YUGOSLAVIA				
Mine	**Emplacement Method**	**Primary Fuzing Mechanism**	**Antihandling Capability**	**Notes**
TMA-1 TMA-1A	Manual, Mechanical	Pressure (100 kg)	Auxiliary Fuze Well	Used in Bosnia, Croatia
TMA-2 TMA-2A	Manual, Mechanical	Pressure (100 kg)	Auxiliary Fuze Well	Used in Angola, Bosnia, Croatia, Namibia, Zambia
TMA-3	Manual, Mechanical	Pressure (180 kg)	Auxiliary Fuze Well	Used in Angola, Bosnia, Croatia, Eritrea, Ethiopia, Namibia, Zambia
TMA-4	Manual	Pressure (100-200 kg)	Auxiliary Fuze Well	Used in Angola, Bosnia, Croatia, Lebanon, Namibia, Zambia
TMA-5 TMA-5A TAM-5	Manual, Mechanical	Pressure (100-300 kg)	Auxiliary Fuze Well	Used in Afghanistan, Angola, Bosnia, Chad, Croatia, Lebanon, Namibia, Zambia
TMD-1/2	Manual	Pressure (200 kg)	--	Used in Bosnia, Croatia
TMM-1	Manual, Mechanical	Pressure (130-420 kg)	Auxiliary Fuze Well	Used in Bosnia, Croatia
TMRP-6	Manual, Mechanical	Pressure (150-360 kg) Tilt Rod (1.5kg)	Auxiliary Fuze Well; Tilt Rod	Used in Bosnia, Croatia
Yu-S-AT (KB-2)	Remotely Delivered	Magnetic Influence	Possible	Unknown

FORMER SOVIET UNION				
Mine	**Emplacement Method**	**Primary Fuzing Mechanism**	**Antihandling Capability**	**Notes**
PTM-1S	Remotely Delivered	Pressure	--	Similar in principle to PFM-1 AP mine Used in Afghanistan
TM-46 TMN-46	Manual, Mechanical	Pressure (120-400 kg) Tilt Rod (21 kg)	Auxiliary Fuze Well	Used in Afghanistan, Angola, Cambodia, Egypt, Eritrea, Ethiopia, Iraq, Kuwait, Lebanon, Mozambique, Namibia, Rwanda, Somalia, Yemen, Zambia, Zimbabwe
TM-57	Manual, Mechanical	Pressure (120-400 kg) Tilt Rod (21 kg)	Auxiliary Fuze Well	Used in Afghanistan, Angola, Cambodia, Eritrea, Ethiopia, Iraq, Korea, Kuwait, Lebanon, Mozambique, Namibia, Nicaragua, Rwanda, Somalia, Vietnam, Zambia, Zimbabwe
TM-62 B	Manual, Mechanical	Pressure (120-750 kg)	--	Used in Afghanistan, Angola
TM-62 M	Manual, Mechanical	Pressure (150-550 kg) Magnetic Influence	Possible	Used in Afghanistan, Angola, Cambodia, Eritrea, Ethiopia, Iraq, Korea, Kuwait, Lebanon, Mozambique, Namibia, Nicaragua, Rwanda, Somalia, Vietnam, Zambia, Zimbabwe
TM-72	Manual, Mechanical	Magnetic Influence	Possible	Used in Afghanistan
TMK-2	Manual	Tilt Rod (8-12 kg)	--	Used in Afghanistan, Angola, Ethiopia, Mozambique, Namibia

PAKISTAN				
Mine	**Emplacement Method**	**Primary Fuzing Mechanism**	**Antihandling Capability**	**Notes**
P2 Mk. 2	Manual	Pressure (180-300 kg) If pressure plate removed, can be initiated with 10 kg	Auxiliary Fuze Well	Uses P2 Mk. 2 AP mine as fuze/booster, packed with detector ring for recovery, used in Afghanistan, Eritrea, Ethiopia, Somalia, Tajikistan
P2 Mk. 3	Manual	Pressure (180-300 kg) If pressure plate removed, can be initiated with 10 kg	Auxiliary Fuze Well	Uses P4 Mk. 1 AP mine as fuze/booster, packed with detector ring for recovery, used in Afghanistan, Eritrea, Ethiopia, Somalia
P3 Mk. 1	Manual	Pressure (180-300 kg) If pressure plate removed, can be initiated with 10 kg	Auxiliary Fuze Well	Uses P4 Mk. 1 AP mine as fuze/booster, used in Afghanistan, Somalia
P3 Mk. 2	Manual	Pressure (200 kg)	Auxiliary Fuze Well	Uses P4 Mk. 1 AP mine as fuze/booster

UNITED STATES OF AMERICA				
Mine	**Emplacement Method**	**Primary Fuzing Mechanism**	**Antihandling Capability**	**Notes**
M-15	Manual	Pressure (158-338 kg) Tilt Rod (1.7 kg)	Auxiliary Fuze Well	Used in: Afghanistan, Angola, Cambodia, Cyprus, Eritrea, Ethiopia, Rwanda, Somalia Exported to: Chile, Greece, Honduras, Iran, Israel, Jordan, Saudi Arabia, Singapore, South Korea, Taiwan, Thailand, Turkey
M-19	Manual	Pressure (157-225 kg)	Auxiliary Fuze Well	Used in: Angola, Chad, Iran, Iraq, Korea, Lebanon, Zambia Also Manufactured by: Chile, Iran, South Korea, Turkey Exported to: Cambodia, Chad, Colombia, Honduras, Iran, Israel, Lebanon, Singapore, Thailand, Tunisia, Turkey
M-21	Manual	Pressure (130.5 kg) Tilt Rod (1.7 kg)	--	Four exported to the United Kingdom in 1992
M87A1	Vehicle or Remotely Delivered	Magnetic Influence	--	Exported to United Kingdom.
RAAMS	Remotely Delivered	Magnetic Influence	Percentage have Integrated Antihandling Device	Exported to: Greece, South Korea, Turkey
M-5 Firing Device	Auxiliary Fuze	Pressure Release (2.25 kg)	--	Can be fitted to M-15 and M-19 mines
M-142 Firing Device	Auxiliary Fuze	Pressure (11 kg) Pressure release (2-67 kg) Tension (3 kg) Tension Release	Acts as antihandling device when attached in fuze well	--

ATTACHMENT 3: The Diplomatic History Regarding Antivehicle Mines with Antihandling Devices

Prepared by Stephen Goose, deputy head of the official ICBL delegation to the Oslo Diplomatic Conference

On September 1, 1997, the opening day of the Diplomatic Conference on an International Total Ban of Anti-personnel Landmines in Oslo, President Selebi formed five working groups to work on difficult articles. One was the Working Group on Article 2 (Definitions), chaired by Ambassador Thomas Hajnoczi of Austria. Ambassador Hajnoczi was the person mainly responsible for producing the draft treaty that formed the basis for the negotiations.

The Article 2 Working Group first met on September 3, with some 28 governments participating, as well as the ICBL and ICRC. The United States made a proposal to permit its "mixed mine" systems (with both antipersonnel and antitank mines in a single canister) under the definition of antihandling device – a proposal that was eventually rejected by the negotiators. Among its arguments, the United States maintained that its mixed mine systems were less dangerous to civilians than the antivehicle mines (AVM) with antihandling devices (AHD) permitted under the draft treaty. Canada and Norway responded that AVM with AHD that functioned as antipersonnel mines that exploded from an innocent act were not permitted under the treaty. Further discussion was deferred until the following day.

On September 4 the Working Group met again, and discussed Article 2(3), the definition of antihandling device. The language in the draft treaty was identical to the CCW Protocol II: "'Anti-handling device' means a device intended to protect a mine and which is part of, linked to, attached to or placed under the mine and which activates when an attempt is made to tamper with the mine."

The United Kingdom offered an amendment: "…tamper with OR OTHERWISE DISTURB the mine." Norway then proposed to add the word "intentionally": "…tamper with OR OTHERWISE INTENTIONALLY DISTURB the mine." A discussion ensued, with Canada, Belgium, Zimbabwe (on behalf of the OAU), Chile, ICBL and ICRC supporting Norway, and Sweden supporting the language proposed by the United Kingdom. Those supporting Norway repeatedly emphasized that the word "intentionally" was needed to establish that if an AVM with an AHD explodes from an unintentional or innocent act, it is an antipersonnel mine, and banned under the treaty. The chair, Ambassador Hajnoczi, stated the Norwegian proposal had the most support and asked for consensus. The United Kingdom asked for additional time to consider the Norwegian proposal. The following day the chair again asked for consensus on the issue, and the United Kingdom said it would accept "intentionally." The United States reserved the right to raise the issue again.

On Monday, September 8, Ambassador Hajnoczi reported to the Committee of the Whole the deliberations and recommendations of the Definitions Working Group, including a summary of the discussion on the UK and Norway proposals, and the agreed upon Norwegian language. No comments or objections were made from any delegation. That afternoon, President Selebi went back through articles in the Committee of the Whole, asking for comments, objections, or amendments to the recommendations of the working groups, and seeking agreement on each. In the Article 2 discussion, Australia noted the importance of a record of proceedings to assist in interpretations, and asked for recognition of a clear consensus on a number of things, including that antivehicle mines functioning as antipersonnel mines are prohibited by the convention. No dissent or objection was raised by any delegation.

President Selebi left the article open due to a controversy over another matter. The following day that controversy was solved and the Committee of the Whole agreed to all of Article 2. No attempt was made to re-open Article 2 by any delegation during the rest of the negotiations, and the convention was formally adopted on September 18. In its closing remarks, the ICBL noted the importance of the clear understanding of the negotiators that antivehicle mines with antihandling devices that explode from an unintentional act are to be considered antipersonnel mines and banned by the convention.