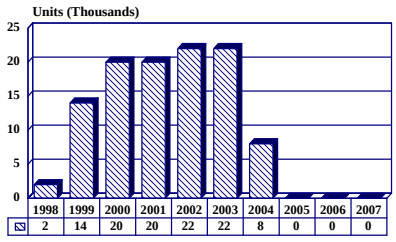
Landmines (United States) - Archived 3/99

Outlook

- Production of anti-personnel landmines in the United States is essentially dormant as a result of the ongoing efforts to control production
- New development efforts in the United States to concentrate on smart mines
- Bar graph to the right is for the M94 Scatterable Lightweight Attack Munition/Demolition Attack Munition

10 Year Unit Production Forecast
1998 - 2007



Orientation

Description. Ground and aerial deployed anti-personnel, area denial and anti-armor mines.

Sponsor. The development of the landmines covered in this report is funded and conducted by the United States Department of Defense through the United States Army Armament Material Readiness Command, located at Rock Island Arsenal, Rock Island, Illinois; the United States Army Munitions & Chemical Command, and Research & Development Center, both located at Picatinny Arsenal, Dover, New Jersey.

Contractors. The following firms are related in some way to the manufacture of landmines or the dispensing thereof: AAI Corporation, Accuracy Systems Incorporated, Action Manufacturing Company, Aerojet Ordnance Company, Alliant Techsystems, Atlantic Research Corporation, Chamberlain Manufacturing Corporation, Explosives Corporation of America, Motorola Incorporated, Olin Ordnance, Raytheon Corporation, (including Raytheon TI Systems), Textron Defense Systems, Thiokol Incorporated and United Defense. In addition to the manufacture of various landmines at government owned/contractor operated facilities, the United States has also acted as its own prime contractor for the manufacture of various landmines.

Licensees. A number of United States developed mines have been or are manufactured under license (or in an unlicensed manner) in other nations; these nations are detailed in the Landmines (Europe) and Landmines (International) reports in this section.

Status. Development through production. Current development is centered on the design of reduced signature mines, more advanced and sophisticated electronics related to the detection and fuzing of landmines and enhanced anti-disturb devices.

Total Produced. Since 1970 and through January 1, 1998, approximately 31.611 million anti-armor and anti-personnel landmines had been manufactured in the United States. As of late 1996, the United States held approximately 17.32 million landmines of all types.

Application. To maim and kill personnel; to immobilize armored vehicles.

Price Range. The mines covered in this report range in price from $11.21 for the M77 to $24,350 for the M93 Hornet (Wide Area Mine). In 1993 dollars, the M15 was listed at $184.62. The popular M18A1 Claymore

lists for around $16 in "quantity" buys. These unit prices are in Fiscal 1998 dollars and are based on purchases of a million units for the M77 and an unspecified number of "serially produced" M93 Hornet Wide Area Mines.

SPECIAL NOTE

As a result of the growing international (especially in Europe) move to ban or at least limit the production and international trade in anti-personnel landmines, the worldwide market for landmines is presently in a state of confusion. Some nations are promoting the possibility of banning the manufacture outright while others are studying the possibility of limiting the manufacture to certain types. Still others are examining the placing of severe export restrictions on landmines of all types, but for anti-personnel mines in particular. Also being examined by several nations is the employment of various technological devices, which would limit the active lifetimes of mines or ease in their detection following self-deactivation, following a proscribed period of activity. Another avenue of technology being examined is where the mine would somehow be made to be easier to locate following self-deactivation, which would follow a prescribed period of activity after deployment. Various factions in the United States have and continue to advocate one or more of these proposals; this began in the early nineties. While the various options are being considered, in October of 1992, the United States enacted a one year ban on the export of anti-personnel mines; this ban has been continued and, as of early 1998, is still in effect.. In December of 1993, the United States sponsored a resolution in the United Nations, which called for a three year halt in the international trade in anti-personnel landmines. Further on, the United States adopted the position that anti-personnel mines should be equipped with a self-destruct mechanism and be fabricated from components that allow them to be detectable.

It is worthy of note that, since the United Nations has endorsed controls on anti-personnel landmines, all member nations have agreed to such controls in a de jure manner. However, as is the norm in international politics, the reality is somewhat different. In mid-1996, the United Nations Landmine Review Conference held in Geneva, Switzerland failed to ban outright the production, use and export of anti-personnel landmines although the members decided that anti-personnel landmines should eventually be manufactured so as to be easily detectable and/or self-deactivating. The next meeting of the Landmine Review Conference is scheduled for 2001. However, in a turnaround probably induced by international pressure, in December of 1996 the United Nations Committee on Disarmament and International Security voted 141-0 (with ten abstentions) in favor of a resolution to "pursue vigorously" a legally binding international agreement to ban the development, production, stockpiling, export and use of anti-personnel landmines. However, Canada has long sought to speed up the process even further and, shortly before the United Nations Committee on Disarmament and International Security resolution, proposed an international meeting in Ottawa for December of 1997. A preliminary conference was held in October of 1996 during which 71 nations supported a total ban on anti-personnel landmines. The Canadian effort was supported by the Fourth International Conference of Non-Governmental Organizations which held its meeting in February of 1997 in Maputo, Mozambique. In September of 1997, Norway jumped on the bandwagon by hosting a conference aimed at the banning of production, use and export of anti-personnel landmines with the agreed upon document available for signature in Ottawa. While the Ottawa conference was duly held, the United States by and large decided to bypass this process, instead favoring the development and implementation of international controls through the United Nations. A total of 123 nations signed the Ottawa Treaty.

In May of 1996, the Clinton Administration announced the United States's policy regarding anti-personnel landmines. The policy stated that the United States would aggressively pursue an international agreement to ban the use, stockpiling, production and transfer of anti-personnel landmines with a view to completing the negotiation as soon as possible. However, since the United States views the Korean Peninsula as a special case, the United States would protect its right to use anti-personnel landmines in that area of the world until alternatives become available or the risk of aggression has been removed.

The May, 1996 policy announcement also stated that the United States would immediately and on a unilateral basis undertake (with the exceptions noted following) not to use all non-self-destructing anti-personnel landmines; these mines are being placed in the inactive stockpile and are to be destroyed by the end of 1999. The exceptions are mines needed to train personnel in countermine and demine operations as well as a sufficient number of these mines that are deemed required for the Korean contingency. Our research indicates that the United States presently holds 7.9 million non self-destructing anti-personnel landmines and that around 4.7 million of these anti-personnel landmines will be destroyed under this program; it will cost approximately ten million dollars.

The policy statement further noted that between the date of the announcement and the time of a future

international agreement on anti-personnel landmines, the United States would reserve the option to use self-destructing and/or self-deactivating anti-personnel landmines subject to the restrictions of the United Nations' Convention on Conventional Weapons. A "substantial" program to develop improved mine detection and clearing technology is to be undertaken.

As of the time of this research, the United States Congress is examining further legislation related to the production and export of anti-personnel land mines.

Technical Data

As is the norm with many areas of military technology, the area of landmines is replete with confusing acronyms; these are mixed with names, some of which (such as the Wide Area Mine) have been recently changed (to the Wide Area Munition) in order to be rid of the now politically incorrect "mine" name in the designation. The following table will aid the reader in this confusing area.

Designation	**Type**
ADAM:	The M692/M731 Area Denial Artillery Munition
AHM:	The Anti-Helicopter Mine; covered in a separate report in this section
ARMS:	Army River Mine System
DAM:	Demolition Attack Munition
DST:	Service Destructor Mine, a variety of standard aerial bombs modified to mines
ERAM:	Extended Range Anti-Armor Munition; a dead Air Force program with the technology transferred to the Wide Area Mine program
FASCAM:	Family of Scatterable Mines
Gator:	The BLU-91/B and BLU-92/B mines of the Family of Scatterable Mines program
GEMSS:	Ground Emplaced Mine Scattering System
ICOMS:	Improved Conventional Mine System
M42:	Mine used in the M483A1 carrier projectile
M77:	Mine (submunition) for Phase I MLRS warhead and other dispensers
MOPMS:	Modular Pack Mine System (M131)
MOWAM:	Mobile Water Mine
ORATMS:	Off-Road Anti-armor Mine System
RAAMS:	M718/M741 Remote Anti-Armor Mine System
SLAM:	Selectable Lightweight Attack Munition
STM:	Self-Transporting Munition
STORM:	Sense Tank Off-Route Mine (currently the Off-Road Anti-armor Mine System)
UMIDS:	Universal Mine Dispensing System
Volcano:	Nickname for Universal Mine Dispensing System
WAAPM:	Wide Area Anti-personnel Mine, the BLU-42/B and BLU-54/B
WAM:	The Wide Area Mine (more recently, the Wide Area Munition and named the Hornet); covered in a separate report in this section
M1	Anti-tank boobytrap training device
M2/A1-A4	Bounding type anti-personnel mine
M3	Fragmentation type anti-personnel mine
M7A1/2	Metallic anti-personnel/anti-armor mine
M8/M8A1	Inert practice mine for M2A1-A4
M10	Inert practice anti-armor mine with smoke marker
M12/M12A1	Inert practice mine for M15
M14	Conventional non-metallic blast type anti-personnel mine
M15	Conventional metallic heavy anti-armor mine
M16/M16A1/M16A2	Bounding type anti-personnel mine
M16A1 Inert	Inert practice mine for M16/A2

Designation	**Type**
M17	Inert practice mine for M14
M18A1	Directional anti-personnel mine (Claymore)
M19	Conventional non-metallic anti-armor mine
M20	Inert practice mine for the M15
M21	Conventional metallic heavy anti-armor mine
M23	Chemical agent (VX) mine
M24	Off-route anti-armor mine
M26	Bounding type anti-personnel mine
M35	Training/practice mine for the M26
M42	Scatterable anti-armor mine for M483 projectile
M56	Scatterable anti-armor mine
M66	Off route anti-armor mine; the M24 with seismic detector
M67 ADAM	Scatterable anti-personnel mine
M68	Practice mine for the M18
M69	Inert practice mine for the M66
M70 RAAM	Scatterable anti-armor mine
M72 ADAM	Scatterable anti-personnel mine
M73 RAAM	Scatterable anti-armor mine
M74 GEMSS	Scatterable anti-personnel mine
M75 GEMSS	Scatterable anti-armor mine
M78 MOPMS	Scatterable anti-armor mine
M79	Inert practice mine for the M74/M75
M80	Inert practice mine for the M19
M81	Inert practice mine for the M16A1
XM84 WASPM	Special purpose anti-armor mine
M86 PDM	Special purpose anti-personnel mine
M87 Volcano	Canister holding five M75 and one M74 mines
M88	Practice anti-personnel mine
M89	Scatterable anti-armor mine
M90	Scatterable anti-personnel mine
M93 Hornet Wide Area Mine	Anti-armor mine
M94 SLAM/DAM	Selectable fuzing anti-armor and demolition mine
M131 MOPMS Mine	Scatterable anti-armor/vehicular mine
M131 MOPMS Mine	Scatterable anti-personnel mine
M139 VOLCANO	Scatterable anti-armor mine
M163 VOLCANO	Scatterable anti-armor mine modified for British Army
M510 Minimore	Fragmentation type anti-personnel mine
M515 Miniplatter	Directional type anti-material/vehicular mine

In addition, the United States still holds a number of various mines that are delivered by air. These mines were developed during the Vietnam War and are usually associated with some sort of cluster bomb unit (CBU). Among these mines, which may or may not still be in service are the BLU-42/B Wide Area Anti-personnel Mine (CBU-34/A), the BLU-43/B Short Dragon Tooth (used in the CBU-28/B), the BLU-44/B Long Dragon Tooth (used in the CBU-37A), the BLU-45/B anti-armor/vehicular mine (used in the CBU-33/A), the BLU-54/B Wide Area Anti-personnel Mine (used in the CBU-42/A).

MINE DISPENSING SYSTEMS The following is a list of mine dispensers as used by the United States Army. The various (and numerous) other dispensers, as used by the United States Air Force and Navy as mounted on aircraft, are described in Appendix IV in the back of this book.

Designation	Type
AAI Projector	Private development for portable (truck mount) dispenser for M74 and M75 mines
M56	Helicopter mounted system (two SUU-13/A dispensers) each holding 80 M56 mines
M57 ATMDS	Towed side lift plow with side insertion of M15 mines
M128 Frisbee Flinger	Towed system; holds 800 M74 or M75 mines
M131 MOPMS	Ground emplaced dispensing module holding 21 mines
M138 Flipper	Portable (truck mount) dispenser for M74 and M75 mines
M139 Volcano	Ground vehicle or aerial dispenser holding 960 BLU-91/B and BLU-92/B mines
M692/M731 ADAM	M483 artillery projectiles holding 36 M692/M731 mines (submunitions)
M718/741 RAAMS	M483 artillery projectiles holding nine M70/M73 mines (submunitions)

Variants/Upgrades

Not applicable; enhanced or modified designs are given new designations.

Program Review

Background. Landmines fall into two groups: anti-armor mines and anti-personnel mines. Anti-armor (often called anti-tank) mines are designed to channel and stop armored vehicles so that they can be destroyed by direct fire; a fundamental principle of laying minefields is that they should always be covered by fire. Anti-personnel mines are usually designed to maim rather than kill. There are some exceptions - anti-personnel mines designed to be used in ambushes will be made as lethal as possible, for obvious reasons. This report covers United States landmines that are delivered by air or land vehicles or hand emplaced. While there is a fine line as to what consists of a mine versus a submunition, the systems we have included here are, for the most part, considered mines. Other submunitions are covered in separate reports in this section. The primary service responsible for mine development is the United States Army.

In the past five years, there has been an increasing level of concern, especially in Europe and the United States, over the massive proliferation of landmines, especially the anti-personnel type, in the world. Adding to this concern is the fact that modern manufacturing technology has made these mines especially hard if not impossible to detect. These mines are also long-lived; after deployment, they can remain active for two decades and even longer. Our research indicates that about 114 million anti-personnel landmines are presently deployed in various nations around the world. While this phenomenon is acute in over a dozen nations, it has probably been best exemplified in nations such as Afghanistan, Angola, Cambodia and Kuwait, although clearance efforts in the latter nation are strenuous. Another good example of the persistence of anti-personnel landmines is the Falkland (Malvinas) Islands, where many areas are still off limits due to landmines, well over a decade after the war was over.

The increasing concern over the international trade in landmines has resulted in a number of international seminars, conferences and other meetings sponsored by the United Nations, International Red Cross and other organizations. While some nations, (including the United States - as detailed above), have already banned the export of landmines, the international trade continues essentially unabated in much of the world. This trend is expected to continue for some time; it will take a worldwide consensus and effective enforcement to effectively stop this often lucrative trade.

The United States Army's landmine program is presently geared toward developing and deploying increasingly sophisticated (read intelligent) anti-armor mines. Limited work on anti-personnel mines continues to avoid technological surprise, especially in reference to the detection and clearing of these mines; self-neutralization and/or self destruction have also been the goals for the latter although this is now almost moot. Major developments have also been made in the area of remotely placed scatterable mines, relying on a wide variety of unconventional delivery methods. These new mine designs incorporate sophisticated electronic arming and sensing devices in contrast to the mechanical configuration of earlier mines.

M15 Anti-Tank Mine: Although somewhat dated, the M15 heavy anti-tank mine is still considered a useful item in the inventory. In 1988, a tilt-rod fuze system was developed and integrated with the M15. In 1989, the United States Army initiated another product

improvement program for the M15; the goal of this program is to give the mine a full width attack capability. However, as of early 1998, this program has yet to be funded.

Family of Scatterable Mines: The Army's primary effort in the mine development field over the past decade or so has been the Family of Scatterable Mines. This program aimed at developing a family of mines that could be remotely scattered by a wide range of techniques, and employ novel, interrelated warheads, sensors and arming devices to facilitate assembly, cut costs and ease the manufacturing process. All the mines of the family are based on similar precision-trimmable, thick film resistors and custom-designed large-scale integrated circuits. These features help to minimize the number of separate components handled by assemblers, thereby cutting costs and increasing reliability.

A major effort in the Family of Scatterable Mines program has been to improve these designs with features like hybrid micro-circuitry and electrically programmed integrated sensors and micro-computers. When these features are developed for a particular mine, the technology is thereby applicable to the whole family, or a significant portion of the family. The electronics of these systems is powered by an ammonia or lithium battery. The safety and arming devices have had to be tailored to the requirements of each type of mine, but all share a common electro-explosive device.

The development of the Family of Scatterable Mines system represented a major enhancement in the United States' mine warfare capability. The Family of Scatterable Mines landmines have the advantage of being rapidly implacable by a wide variety of means. This means that minefields no longer have to be emplaced well in advance of an enemy attack, but can actually be emplaced during the course of an attack, further enhancing their shock and disruptive value.

The M131 Modular Pack Mine System and Gator safe and arm mechanisms are identical, and are similar to those used in the Ground Emplaced Mine Scattering System safe and arm mechanism. All of the Family of Scatterable Mines system mines share a common clearing charge design. Four of the mine systems (the Area Denial Artillery Munition, Modular Pack Mine System, Ground Emplaced Mine Scattering System and Gator) use tripline detonation systems that have substantial commonality. Also, many of the mines share common individual parts, which has substantially reduced tooling costs.

Ground Emplaced Mine Scattering System

The Ground Emplaced Mine Scattering System is a member of the Family of Scatterable Mines program. It consists of the M128 Frisbee Flinger and M138 Flipper mine dispenser units, M74 anti-personnel and M75 anti-armor mines, the M79 inert practice mines, and associated shipping containers and special tools. The M128 and M138 dispenser units are mounted on a four ton, tandem axle M794 trailer. The M794 incorporates modifications to the yoke to accept both truck and M113 towing pintles. The dispenser unit has two magazines, each with a capacity of 400 mines each, a conveyor reloading system for each magazine, a launcher oscillator, a military standard 4-cylinder, liquid-cooled diesel engine and a remote control console with cable allowing for operation of the dispenser from the towing vehicle.

The M74 anti-personnel, M75 anti-armor and M79 inert mines are 6.35 centimeters high by 12.07 centimeters in diameter, and weigh 1.81 kilograms each. The M74 anti-personnel mine is a ground blast fragmentation mine activated by disturbing any of four tripwires. The M75 anti-armor mine has a magnetic influence fuze. Additionally, the M74 and M75 mines have a built-in self-destruct capability. The M128 dispenser sows the mines much like a skeet launching device and can cover a wide area while being towed behind an armored vehicle or truck.

Procurement of the Ground Emplaced Mine Scattering System began with Fiscal 1980 funding. The mines were developed by Alliant Techsystems and have been manufactured by Lockheed Martin and Quantic. The dispenser was originally manufactured by United Defense (then FMC Corporation), but AAI Corporation won some subsequent contracts for the manufacture of additional batches. Southwest Truck Body has manufactured the trailer on which the dispenser is mounted.

To date, the M74/M75 production ratio has averaged about 4-to-1 in favor of the M75. The mines are also called Gator, originally the name of the air delivered version. The Ground Emplaced Mine Scattering System is used when high volume delivery is required. The Army received $8.2 million for 23 M128 Ground Emplaced Mine Scattering System dispensers in Fiscal 1983, $5.8 million for 19 M128 dispensers in Fiscal 1984, and $10 million for 25 dispensers in Fiscal 1985. No additional dispenser procurement funding has been requested since Fiscal 1985, although limited procurement of the associated M74 and M75 mines resumed in Fiscal 1988 for two years. The Ground

Emplaced Mine Scattering System is now fully fielded in Europe, the Republic of Korea and the United States based units.

M692 and M731 Area Denial Artillery Munition and M718 and M741 Remote Anti-Armor Mine System

The Area Denial Artillery Munition is a 155 millimeter howitzer-launched anti-personnel mine system, delivered in cargo type artillery projectiles which dispense the wedged-shape mines. The M692 version contains 36 anti-personnel mines which are fuzed to self-destruct about a day after sowing. The M731 version also contains 36 anti-personnel mines, but they are fuzed to self-destruct after a few hours. The M718 Remote Anti-Armor Mine System contains nine anti-armor mines, which self-destruct after a period greater than one day. The M741 version of the Remote Anti-Armor Mine System projectile also contains nine anti-armor mines, but these self-destruct after a few hours. A single howitzer can lay 2,400 Area Denial Artillery Munition mines or 600 Remote Anti-Armor Mine System mines in the course of an hour's firing. The production of these projectiles and the associated mines was completed in the early nineties.

M131 Modular Pack Mine System

The Modular Pack Mine System is intended for infantry use to deploy small combined anti-tank and anti-personnel minefields. The dispenser was developed by Aerojet, with Alliant Techsystems responsible for the mines and systems integration and Hughes for the command electronics. Operational testing commenced in late 1981 and initial procurement commenced in late 1985, at which time approximately 1,300 units were procured for $15.1 million.

The Modular Pack Mine System is a large container, weighing 68 kilograms (149.6 ponds) and portable by four soldiers, which contains seven launch tubes that dispense 17 M131 anti-armor and four M131 anti-personnel mines; these mines are related to the Ground Emplaced Mine Scattering System/Gator family. The M131 anti-armor mine is activated by a magnetic sensor mechanism while the M131 anti-personnel mine is tripwire activated. In contrast to conventional mines which must be laid before enemy action, this system allows the infantry to lay the system in a defensive location and activate or not activate the launchers depending on tactical requirements.

Anti-Helicopter Mine: This relatively new development effort which is now almost dormant due to a lack of funding and changes in doctrine.

Volcano: The Volcano (originally called the Universal Mine Dispensing System) is a derivative of the Gator system developed by Alliant Techsystems. In contrast to the Gator/SUU-64/B cluster bomb configuration, the Volcano M132 system is a 960-mine array that can be helicopter or vehicle launched. The M78 mines are boosted from the launch unit, rather than relying on free-fall as in the case of SUU-64/B sowing. The Volcano system uses the same mines as the Gator, and is intended mainly for use by the Army. The Volcano complements both the Ground Emplaced Mine Scattering System and the M56, since the Volcano can be ground deployed like the Ground Emplaced Mine Scattering System, or helicopter launched like the M56 Helicopter Emplaced Mine System. Procurement of the Volcano commenced in Fiscal 1986 with production having begun in late 1990. Brunswick Defense supplies the dispenser while Alliant Techsystems provides the mines and is the overall system integrator. Volcano has also been procured by the British Army although it will dispense only anti-armor mines.

M56 Helicopter Emplaced Mine: The M56 Helicopter Emplaced Mine System is based on the SUU-13D/A dispenser. A UH-1 helicopter carries two SUU-13D/A dispensers which contain 40 stations, each with two M56 mines, for a total of 160 mines per helicopter. The SUU-13D/A dispensers were developed in the early 1970s, and procurement for the system took place beginning in late 1976. This was the original member of the Family of Scatterable Mines program, and is no longer being procured.

M86 Pursuit Deterrent Munition: The M86 Pursuit Deterrent Munition is a derivative of the Area Denial Artillery Munition anti-personnel mine. This hand emplaced anti-personnel mine is based on the Area Denial Artillery Munition mine adopted for hand emplacement. Serial production of the M86 began in January 1990; Alliant Techsystems is the prime contractor. A total of 52,419 M86 Pursuit Deterrent Munitions has been procured.

Robotic Mines: The Army has been developing a number of robotic mines, though details of the systems are not entirely clear and are mostly classified. In 1982, Grumman Aerospace was contracted to examine the feasibility of such weapons. At least two approaches were considered: the Helkeath, a transient-contact, ground-effects system and the Ranger, a small, wheeled system.

The Helkeath was developed to satisfy an Army requirement for a system that could autonomously search out enemy tanks and attack them at speed. The Helkeath would be launched within a few hundred yards of likely targets and would seek them out and attack them while traveling at speeds up to 100

kilometers (62.1 miles) per hour. The Helkeath's configuration is that of a small canard ground effects aircraft.

The Ranger is a small robotic vehicle which would propel itself into a likely staging area, sense out enemy tanks, and attack them by running into them and detonating a warhead. The Army continues this work, lately called Self-Transporting Munitions; these programs are detailed in our Unmanned Vehicles service.

XM84 Wide Area Side Penetrating Mine: The Army has attempted over the past decade to develop a large, off-the-road side-attack mine for the anti-armor role. This program was initially called STORM, and then subsequently Off-Road Anti-Tank Mine System, with engineering development by General Motors/Hughes Aircraft starting in Fiscal 1982. In 1984, the Army announced that it was negotiating with Motorola Scottsdale for development of the XM84 Wide Area Side Penetrating Mine which is the follow-on to this idea. Aerojet is supplying the 17.8 centimeter flat cone-shaped charge warhead for this program which, as of early 1998, is still in development at a slow pace.

Improved Conventional Mines: The United States Army has indicated that it has a requirement for Improved Conventional Mines, though few details have been provided about the types of mines sought. However, the Army has indicated that it views the Improved Conventional Mine program as a possible candidate for a joint United States-European NATO cooperative effort. Since the signing of the Ottawa Treaty, any further joint development under this program will be related to anti-armor mines.

M93 Hornet Wide Area Mine: The Wide Area Mine program is aimed at the development of a new family of more effective mines offering extended range coverage against multiple targets. This program is covered in detail in the pertinent report in this section.

M94 Selectable Lightweight Attack Munition and Demolition Attack Munition: This new lightweight mine is designed for use by United States Army Special Forces, Ranger and similar units. It can be used as a command or sensor- activated anti-armor mine (the Selectable Lightweight Attack Munition) or as a command type demolition charge (the Demolition Attack Munition). The specifications demanded by the Army for these munitions include a weight of under 1.362 kilograms (three pounds) and a size that will allow two of the mines to be fitted in a standard ammunition pouch. The Selectable Lightweight Attack Munition has several fuzing options, ranging from magnetic to tripwire, to allow for maximum tactical flexibility. The Selectable Lightweight Attack Munition/Demolition Attack Munition was being competitively developed by the team of Sparta/Lockheed Martin, another team consisting of Valentec Dayron and Marconi Command and Control Systems, and Alliant Techsystems on its own; subsequently, Alliant Techsystems won the full-scale development contract which ended in late 1995. The company was awarded an initial production contract worth 4.5 million dollars in late November of 1995; further details are provided below.

Other Programs: The firm Accuracy Systems Incorporated has privately developed and placed in production two mines. The M510 Minimore is a directional anti-personnel mine. Somewhat similar to the 1M18 Claymore in operation, the M510 is more compact than the M18/M18A1. The height is 14 centimeters (5.51 inches) and width is nine centimeters (3.54 inches); the M510 weighs 500 grams (1.1 pounds). A fragmentation/ incendiary version of the M510 is also available. The customers of the M510 (if any) are unknown.

The M515 Miniplatter mine is a directional anti-material/anti-vehicular mine that weighs 500 grams (1.1 pounds). This mine uses an explosive charge to form a steel plate into a slug. An incendiary version has also been developed. As with the M510, the customers of the M515 are unknown.

Funding

Below is the most recent available funding for United States mine systems. The funding data on the M42/M77, Wide Area Mine, Area Denial Artillery Munition M692/M731, Remote Anti-Armor Mine System M718/M741, BLU-91/B and BLU-92/B, and the Anti-Helicopter Mine will be found in the pertinent reports in this section.

The considerable advantages of the new generation landmines were clearly reflected in the dramatic growth in landmine procurement funding between Fiscal 1981 and 1987, which grew from $118 million in Fiscal 1981 to $450 million in Fiscal 1987, nearly a 380 percent increase. Although part of this was due to inflation, a major factor was the proliferation of the Family of Scatterable Mines derivatives. The widespread utility of the system's mines led to an increase of 170 percent in procurement funding from Fiscal 1984 to Fiscal 1987, largely traceable to the

continued heavy acquisition. However, beginning in the early nineties and continuing today, procurement levels have been declining in a precipitous manner as the desired (reduced) inventory levels have been attained and as a result of the major changes in the United States' threat scenario. Despite this major change in the threat scenario, which no longer is concerned with a major armored confrontation in northwest Europe, the next generation of even more effective mines, as exemplified by the XM93 Wide Area Mine (covered in a separate report), is under development.

US FUNDING

	FY91		FY92		FY93		FY94	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
Procurement								
US Army								
M87	46	74.4	0	0.0	15	30.0	0	0.0
Training	NL	1.6	NL	8.2	NL	3.0	NL	2.5
US Marine Corps								
All	0	0.0	0	0.0	0	0.0	NL	3.2
Total	-	76.0	-	8.2	-	33.0	-	5.7

	FY95		FY96		FY97		FY98	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
Procurement								
US Army								
M87	14	43.9	10	29.2	6	15.0	-	0.0
Training	NL	5.4	NL	3.7	NL	1.9	-	0.0
US Marine Corps								
All	0	0.0	0	0.0	NL	19.6	-	0.6
Total	-	49.3	-	32.9	-	36.5	-	0.6

	FY99		FY00		FY01		FY02	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
Procurement								
US Army								
M87	-	0.0	-	-	-	-	-	-
Training	-	0.0	-	-	-	-	-	-
US Marine Corps								
All	-	0.0	-	-	-	-	-	-
Total	-	0.0	-	-	-	-	-	-
	-	0.0	-	-	-	-	-	-

All funding amounts are in millions of dollars; NL=not listed, TBD=to be determined.

Note: quantities in the above chart are not totaled due to the different types of systems. The Marine Corps line item is listed in the procurement documents as "Demolition Munitions, all types". The M87 quantities are in thousands. The Wide Area Mine program funding is listed in a separate report in this book.

Recent Contracts

Much of the recent major contracts for United States landmines are related to the Wide Area Mine and are detailed in that report. Of course, second and third level component contracts, such as those for mine bodies, fuzes, and so on, are common. In May of 1995, Alliant Techsystems was awarded contract number DAAA21-94C-0090 worth $43,151,795 for the procurement of 12,000 M87A1 Volcano canister assemblies. In October of 1995, Alliant Techsystems was awarded a contract worth 4.5 million dollars for the production of 5,000 units of the Selectable

Lightweight Attack Munition and 800 units of the Demolition Attack Munition. In April of 1997, Alliant Techsystems was awarded a $6,751,500 contract for 4,240, M87A1 Volcano canister assemblies.

Timetable

By the turn of the century, increased integration with sophisticated sensors by a number of firms will result in a number of new off route mine systems. The domestic and international sanctions against some types of landmines has essentially eliminated any export of United States' anti-personnel mimes.

Worldwide Distribution

Countries. The distribution of the landmines manufactured by the United States is worldwide, with a number of the designs manufactured under license or in unlicensed programs in several nations.

As a result of the increasing demands for restrictions in the worldwide trade of landmines, the United States has placed an embargo on the sale of indigenously manufactured landmines. This embargo, which went into effect in 1992 and reiterated in late 1994, is expected to be permanently maintained.

Forecast Rationale

Our 1998 forecast for the production of anti-armor and anti-personnel landmines in the United States is based on the known and anticipated domestic requirements for these mines subject to the most recent revisions resulting from the May 1996 policy statement. Included in this estimate is a projection of the replacement rate of mines (now mainly of the anti-armor type) currently in war stock and reaching the end of their storage life.

The production of landmines in the United States America for the types detailed in this report should continue to be at a much lower level than in the past. This will be due to several factors, including the international control efforts, the lack of export (now banned for the anti-personnel type), the use of smarter mines that require fewer units in order to achieve the same results as the older types, and the changed threat scenario. In addition, the 227 millimeter Multiple Launch Rocket System is increasingly taking on the task of mine dispensing for the United States Army, affecting these more conventional mine programs in a major way. The forecast below is for mines as detailed in this report. It **does not** include the mines/submunitions outlined at the beginning of this report or any aircraft dispensing system except those contained in this report.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

		High Confidence Level			Good Confidence Level			Speculative Level				
Designation	through 97	98	99	00	01	02	03	04	05	06	07	Total 98-07
M18A1 Claymore	2,944	0	0	0	0	0	0	0	0	0	0	0
M74/M75 Gator(a)	4,864	7	11	9	0	0	0	0	0	0	0	27
XM/M84 Wide Area Side Penetrating Mine(b)	0	1	9	11	10	12	10	10	7	0	0	70
M86 Pursuit Deterrent Munition	52	0	0	0	5	0	0	0	0	0	0	5
M131 mines	232	1	0	0	0	0	0	0	0	0	0	1
M94 Scatterable Lightweight Attack Munition/ Demolition Attack Munition(b)	1	2	14	20	20	22	22	8	0	0	0	108

All numbers are for units in thousands, the through 1997 figure representing production since 1970. Due to the different technologies involved, the quantities are not totalled vertically.

(a)For all applications except the Air Force/Navy submunitions dispensers, but including the M87 canister for the Volcano system which holds six mines (five M75s and one M74).
(b)Prototypes only through 1996 with first production deliveries in mid-1997.