URANIUM BULLETS

THERE IS NO SUCH THING AS 'PEACEFUL URANIUM MINING'

Nuclear bombs are not the only militaty use of uranium. As well, for close to a decade, armour piercing, incendiary bullets have been made out of depleted uranium (DU). Further, DU is used in bullets meant to hit people directly. This information has been a closely gaurded military secret.

Only US military use of DU in bullets is examined here. Following is a preliminary report from an ongoing investigation. The information presented is incomplete because of military secrecy and industry competitivness.

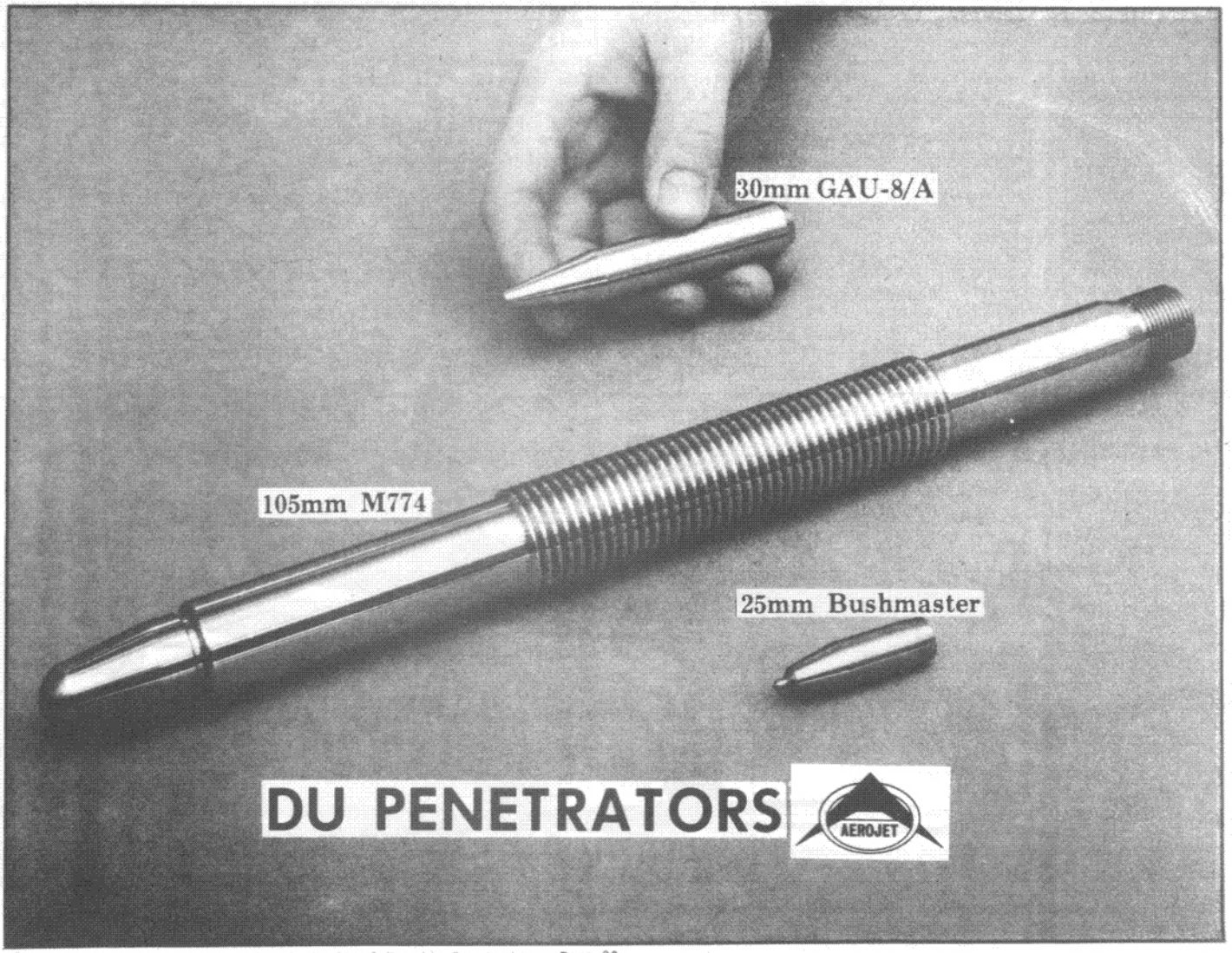
What Is Depleted Uranium?

In its natural state uranium (U) is always found mixed with other radioactive material, such as radium and thorium isotopes. The uranium milling process, which usually takes place at the mine site, is designed to separate out the uranium. The final product from a uranium mill, known as "yellowcake", typically contains 85-95% natural uranium. Together with residues of uranium, all the other isotopes are discarded and contaminate the area where they are dumped.

Natural uranium is made up of three radioactive isotopes, as follows: more than 99% U238, .7% U235, and less than .01% U234. The primary purpose of all the uranium processing stages, from milling to refining to enriching, is to extract the U235 for use in newkiller weapons and reactors. Material enters an enrichment facility containing less than 1% U235 and the final product may contain anywhere from 3 to 90% U235. This product is called "enriched uranium", as its quantity of U235 is increased. The material remaining is called "depleted uranium" because most of the U235 is taken out. DU has few uses, exists in large quantities, and is non-fissonable - meaning it can not cause an atomic explosion.

Armour Piercing, Incendiary DU Bullets

Depleted uranium is used in bullets because it: 1) has a high density - it is the heaviest non-man-made substance on Earth; 2) it is relativly soft compared to other metals; and 3) it is pyrophoric (starts on fire spontaneously) when finely divided. Bullets are specially made to take advantage of one or more of these three attributes. DU is also attractive because it is cheaper and more accesible than alternative substances, such as tungsten.



Source:Aerojet Ordnance Co. Undated. Depleted Uranium Penetrators. Page 20.

Because of its high density, bullets made out of DU are more efficient than any other material at passing through steel. According to the Davitt Report of June 1980 (Tank Ammo Section Report No. 107), "When the inherent penetration performance of the two materials (tungsten and DU) are compared, the DU is not only a superior armor penetrator, but in fact is required to penetrate modern targets with modern ammunition." The report includes results of a comparison study between performance of DU and tungsten penetrators against the "NATO Heavy Triple Target"-the most severe target threat known. DU was shown to be superior by more than 10%, and greater as the length-to-diameter of the penetrator increases.

Further, on impact with steel, pieces of superheated DU flake off and start on fire. Thus, DU bullets can pierce steel armour plating, come through the other side partly on fire, and ignite any ammunition or fuel it comes into contact with. This has the advantage of causing greater destruction, and at the same time allows easier observation of a hit. What is more, in the process of burning, toxic smoke is formed which can cause delayed effects if inhaled.

Single And Multiple-barreled Cannons

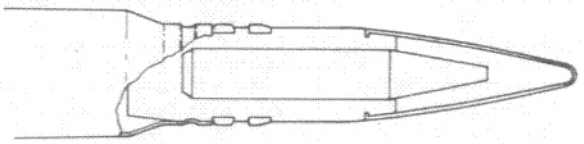
The US military uses DU in armour piercing, incendiary ammunition fired from single and multiple barreled cannons on land, water and in the air. The cannons are made to fire in bursts measured in seconds or fractions of a second. Multiple-barreled cannons are able to fire up to 6000 rounds per minute.

Five different sizes of DU ammunition are made: 20, 25, 30, 105, and 120mm. The 20mm is fired from the M61A1 Vulcan six-barreled cannon; the 25mm from the five-barreled GAU12U cannon, and the single-barreled M242 chain gun; the 30mm from the four-barreled GAU13A and the seven-barreled GAU8A cannons;and the 105 and 120mm shells are fired from a number of the US Army's tanks, including the main M1 battle tank. The multiple-barreled cannons named are produced by General Electric (GE) in Vermont, and the M242 is made by Hughes Helicopters in California. The 20mm ammunition is alloyed with 2% molybdenum, and the other rounds with .75% titanium.

Two US corporations manufacturing the different types of ammunition are Honeywell and Aerojet. For the 30mm GAU8 ammunition alone, they share a $1.3US billion contract to produce 100 million rounds. The Davitt Report states that tungsten cores cost 77% more than DU cores ($136.99US compared to $77.28US). The report concluded that if 500,000 rounds were made over 3 years, using DU instead of tungsten would save $30US million.

Aerojet produced the first 30mm DU bullets in 1975 as part of the A10 program of the US Air Force. The A10A Thunderbolt II close-support aircraft has a GAU8A cannon mounted in the nose. About 800 GAU8A's have been produced.

Aerojet began mass producing the 30mm round in 1977. Their total production of 30mm armour piercing, high-explosive, and target practice rounds is over 40 million. Honeywell's total production is over 32 million rounds.

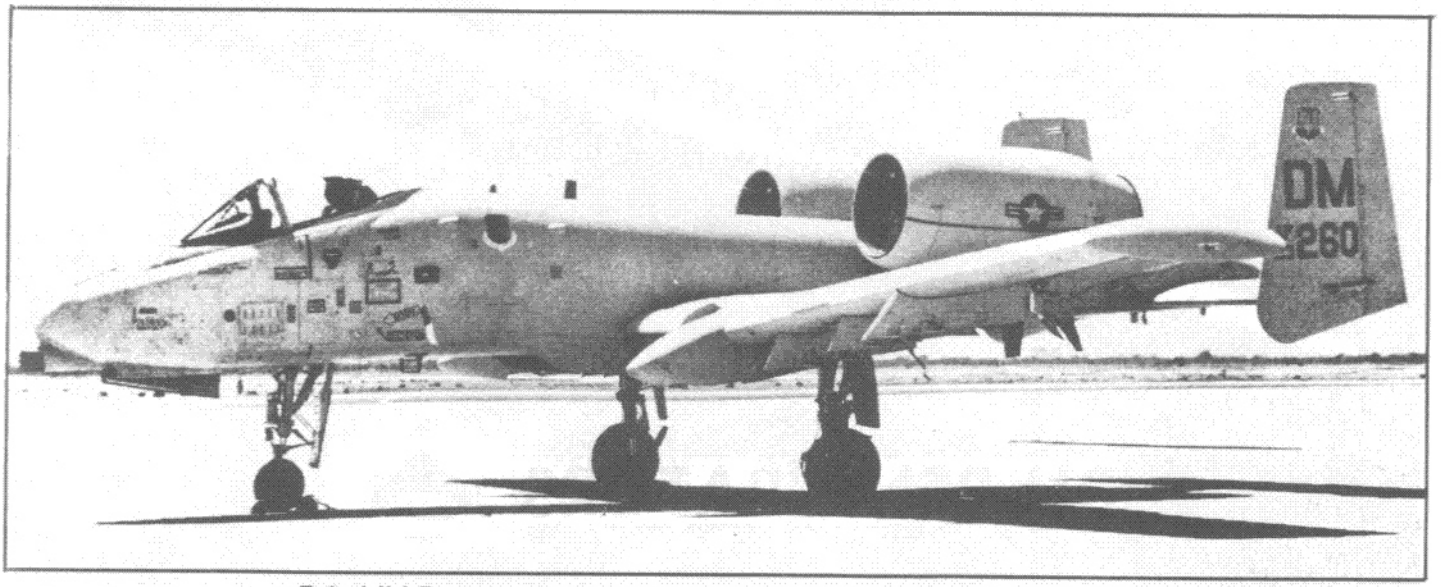


Aerojet 30mm DU armour piercing, incendiary bullet.
Source: Aerojet Ordnance Co. Undated promotion leaflet.

- Round length 290mm
- Round weight 727 gm
- Projectile weight 425 gm
- Muzzle velocity 983 m/sec

According to Ed Smith, Vice President of Communications at Aerojet, "Aerojet Ordnance Company is a leader in the military application of heavy metal." Their R&D includes a cluster bomb where small DU bomblets fall out of a dispenser and rain down on a target area. Aerojet has a special branch called "Heavy Metals Division" that has its headquarters near Jonesboro in northeastern Tennessee. There they manufacture DU rods of different diameters. The small diameter rods are shipped to the company's Compton, California facility, where the 30mm ammunition is made. The large-caliber DU cores are made in Tennessee, then sent to the US Army for assembly.

Aerojet produces the DU penetrator for the Phalanx system (see below), and large caliber DU cores for the 105 and 120mm tank vs. tank rounds. One 105mm DU core in the M774 shell weighs about 3.6 kilos (8 pounds). Several hundred thousand have been produced; it has been in volume production for a couple years. Full production of the 120mm DU core has just recently begun. The 120mm ammunition will be fired from a gun mounted on the US Army's M1 Abrams tank.



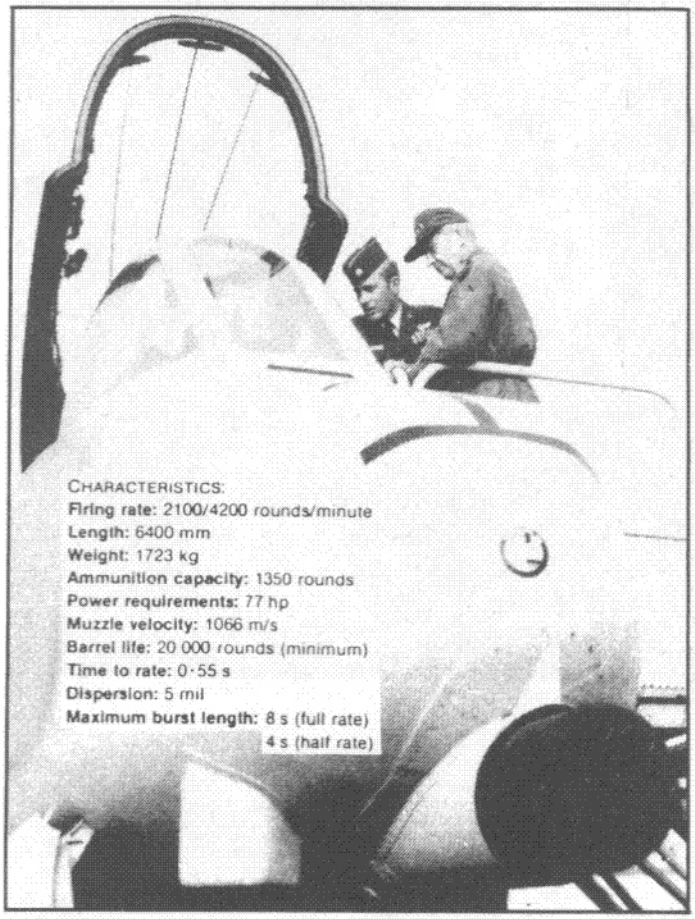
Fairchild Republic A-10A single-seat close-support aircraft

Source: Jane's Publishing. 1978. Jane's All The World's Aircraft, 1977-78

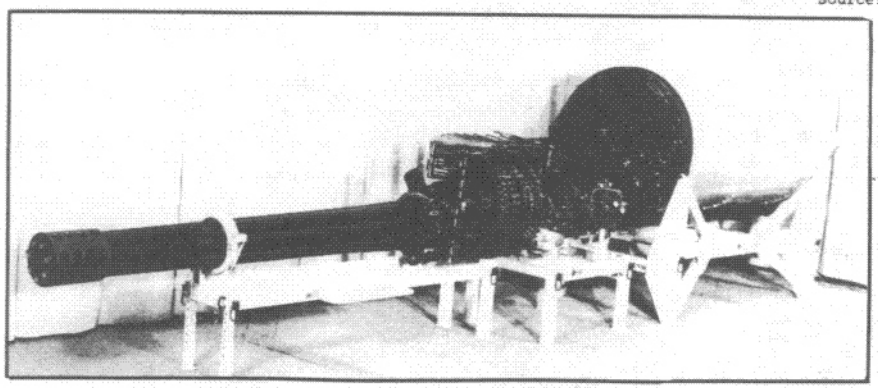
GAU-8/A 30 mm GUN SYSTEM

Ammunition for the GAU-8 weapon is manufactured by the Aerojet Ordnance and Manufacturing Company of Downey, California and Honeywell, Inc of Hopkins, Minnesota. The family consists of the following rounds: armour piercing incendiary (API), high explosive incendiary (HEI) and training practice (TP). The API round has a lightweight body which contains a sub-calibre high-density penetrator of depleted uranium which is a waste by-product of the nuclear fuel enrichment programme. In addition to its penetration capability, depleted uranium is a naturally pyrophoric material which enhances incendiary effects.

- Taken from Jane's Weapons Systems, 1981-82.



GAU-8/A mounted in Fairchild A-10 attack aircraft
(US Army Photograph)



General Electric GAU-8/A 30 mm gun system

Source: Jane's Publishing. 1978 & 1981. Jane's Weapons Systems. 1978 & 1981-82.

The MK 15 Phalanx Close-in Weapon System (CIWS)

The Phalanx CIWS is specially designed by the US Navy to act as a defence against sea skimming, cruise-type missils. Phalanx uses a radar controlled six-barreled 20mm Vulcan cannon to shoot up a cloud of DU bullets at a rate of 3000 per minute that will destroy any incoming objects. The weapon increases a ship's invulnerability, thus making it more dangerous, forcing "the other side" to esculate its weapons development in defence.

General Dynamics Corporation in California is the system contractor. They have sold the Phalanx CIWS to Australia, Japan, Saudi Arabia, and the UK. Because of handling and availability problems these countries may not be using DU bullets. During the 1982 Falkland Islands war the British Navy urgently purchased a number of Phalanx systems, and had two installed on each of the aircraft carriers HMS Invincible and Illustrious.

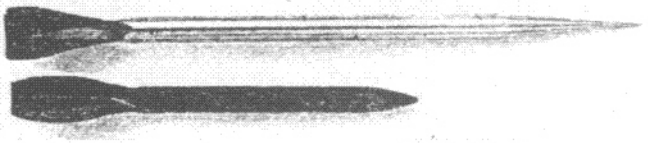
The first Phalanx system was completed in 1979. In May, 1983, the 100th USN Phalanx was declared operational aboard the frigate USS John A. Moore. A ceremony marking production of the 300th Phalanx CIWS was recently held by the US Navy. Well over 200 are now in the US fleet. In the 1984 report of the US Secretary of Defence, funding was proposed of $130.2US million and $169.1US million for the production of 40 and 49 Phalanx systems, in fiscal years 1984 and 1985 respectively.

DU has "qualified" as the ammunition material for the Phalanx .The testing process took about a year; and in addition, handling requirements of the US Newkiller Regulatory Commission had to be met.

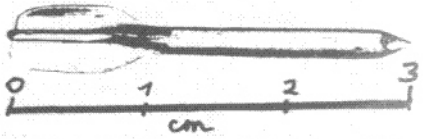
Anti-personnel Uranium Bullets

DU bullets are soft enough that when they hit human flesh they spread out; thus entering at a tiny point but leaving a big hole on the other side. The military refers to this effect as an "explosive type wound". In order to enhance the damage done bullets have been made out of 2 cm. long, needle-like darts or arrows, complete with fins, called flechettes. The flechette curls over into a hook shape on impact, thus maximizing the explosive effect; and may have a split tip to further increase wounding power. They may be made out of steel, DU, or other metals.

Flechettes are used in rockets and rifle and shotgun shells. Flechette cartridges have been made for the American M14 7.62mm rifle and the M16 5.56mm rifle. This type of ammunition has also been made for pistols by a French manufacturer.



Flechettes: Top, typical rifle version. Bottom, shotgun type.
Source: E.C. Ezell. 1977. Small Arms of the World.



Source: Dr. M. Lumsden. 1978. Anti-personnel Weapons.

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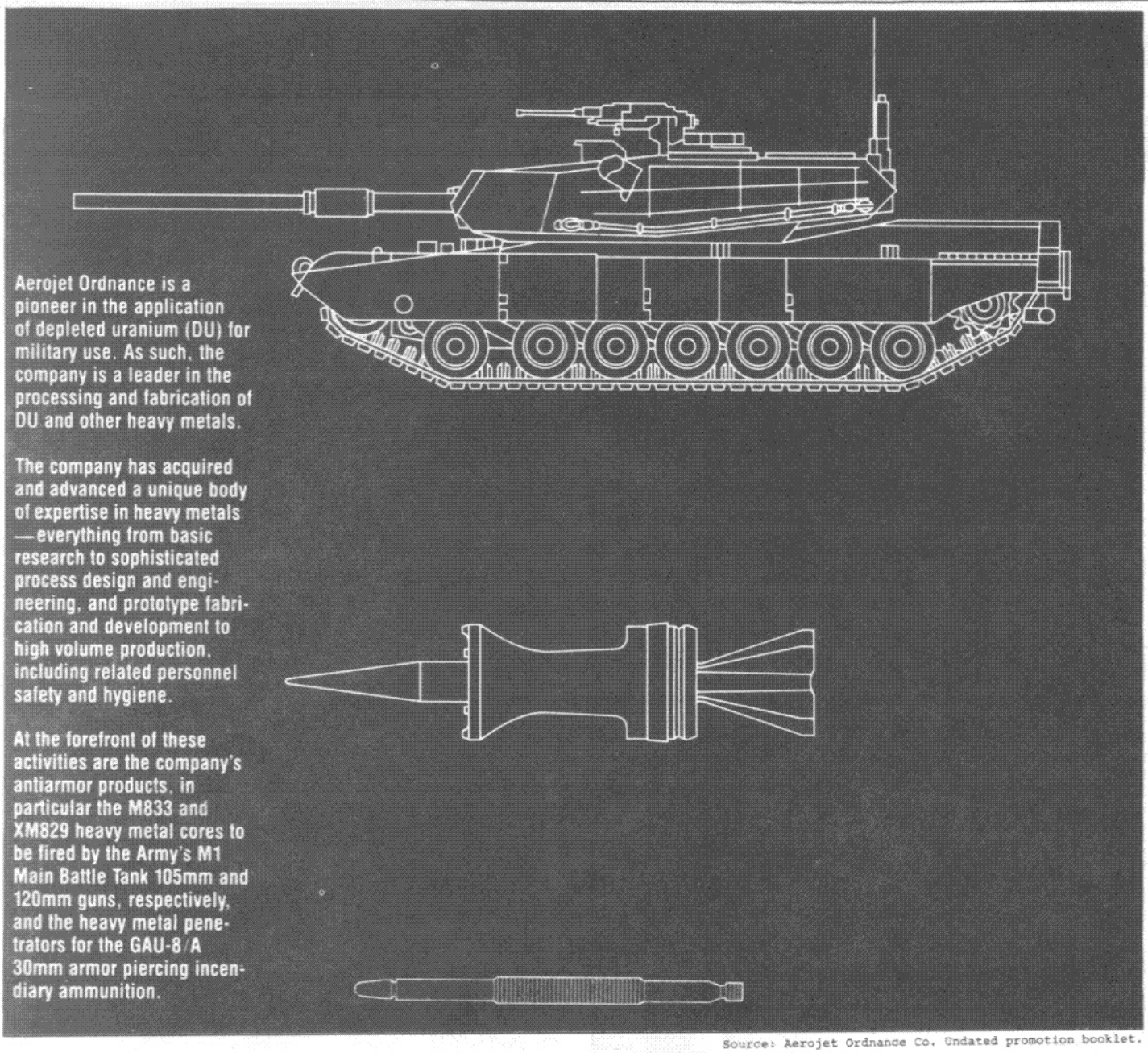

Source: Aerojet Ordnance Co. Undated promotion booklet.

How Much DU Has Been Used To Make Ammunition?

It is difficult to make an accurate estimate of how much DU has been used in ammunition production. However, just the information presented here indicates that at a miniumum the US military has consumed 6500 tonnes.+ This is a conservative estimate as it does not include the 25 and 120mm shells, nor flechettes.

Present annual US uranium production is about 20,000 tonnes, and total production to date is about 250,000 tonnes. Thus, in relation to the quantity of uranium mined, the amount of DU used in ammunition production is small, but not insignificant. About 6.5 million tonnes of solid radioactive waste had to be dumped somewhere in order to produce 6500 tonnes DU. Also, considering that up until the early 1970's, almost 90% of Saskatchewan uranium was sold to the US, it is of note that it took about 20 full years of mining at the Beaverlodge uranium mine in northern Saskatchewan to produce 6500 tonnes.

+ This is arrived at as follows: about 10,000 rounds for each of the GAU13 and 8's made (1100 in total) = 11 million, 30mm rounds each containing 423 grams DU = 4653 tonnes DU; 500,000 DU cores each containing 3.6 kilos DU in the 105mm shell = 1800 tonnes DU; 200 Phalanx units each with 10,000 rounds of 20mm DU ammunition containing 70 grams DU each = 140 tonnes DU; 4653+1800+140=6593 tonnes DU.

Referances

Aerojet Ordnance Company. Undated promotion materials: Untitled, color, glossy promotion booklet. 16pp; Family of 30mm GAU8A Ammunition, 2 pp.; Depleted Uranium Penetrators, 29pp; Heavy Metals Division, color, glossy booklet, 12pp. Aerojet Ordnance Company, 2521 Michelle Drive, Tustin, California, USA. 92680. Tel. 714-730 6004.

Boltd, Philip, L. May, 1983. The Tank Killers - Tungsten Vs. Depleted Uranium. National Defence, May-June, 1983. 6pp. American Defence Prepardness Assoc., Suite 900, 1700 N. More St., Arlington, VA. 22209. Tel. 703-522 1820. Published monthly. Subscriptons $20US/year for Assoc. members, otherwise $25US/year.

Ezell, Edward Clinton. 1977. Small Arms of the World. 11th revised edition. Stockpole Books, Cameron and Kelker Streets, Box 1831, Harisberg, PA. 17105. USA. 671pp.

Jane's Weapons Systems; Jane's Fighting Ships; Jane's All the World's Aircraft. Published annualy. Jane's Publishing Co. Ltd., 238 City Road, London, England. EC1V 2PU. Tel. 01-251 9281.

Lumsden, Dr. Malvern. 1975. Incendiary Weapons. 255pp.; and 1978. Anti-personel Weapons. 299pp. Stockholm International Peace Research Institute (SIPRI), Bergshamra, 171 73 Solna, Sweden. Tel. 08-559 700.

Prokosh, Eric. 1972. The Simple Art Of Murder, Anti-personnel Weapons And Their Developers. National Action/Research on the Military Industrial Complex (NARMIC) - A project of American Friends Service Committee, 112 South 16 St., Philadelphia, Pennsylvania, USA. 19102. 88pp.

Seideman, Paul. Jan., 1984. DU: Material with a Future. National Defence, Jan., 1984. 4pp. American Defence Prepardness Assoc., Suite 900, 1700 N. More St., Arlington, VA. 22209. Tel. 703-522 1820. Published monthly. Subscriptons $20US/year for Assoc. members, otherwise $25US/year.