

A Supplement for *TORG: ROLEPLAYING THE POSSIBILITY WARS*™

ZORG

KANAWA HEAVY WEAPONS



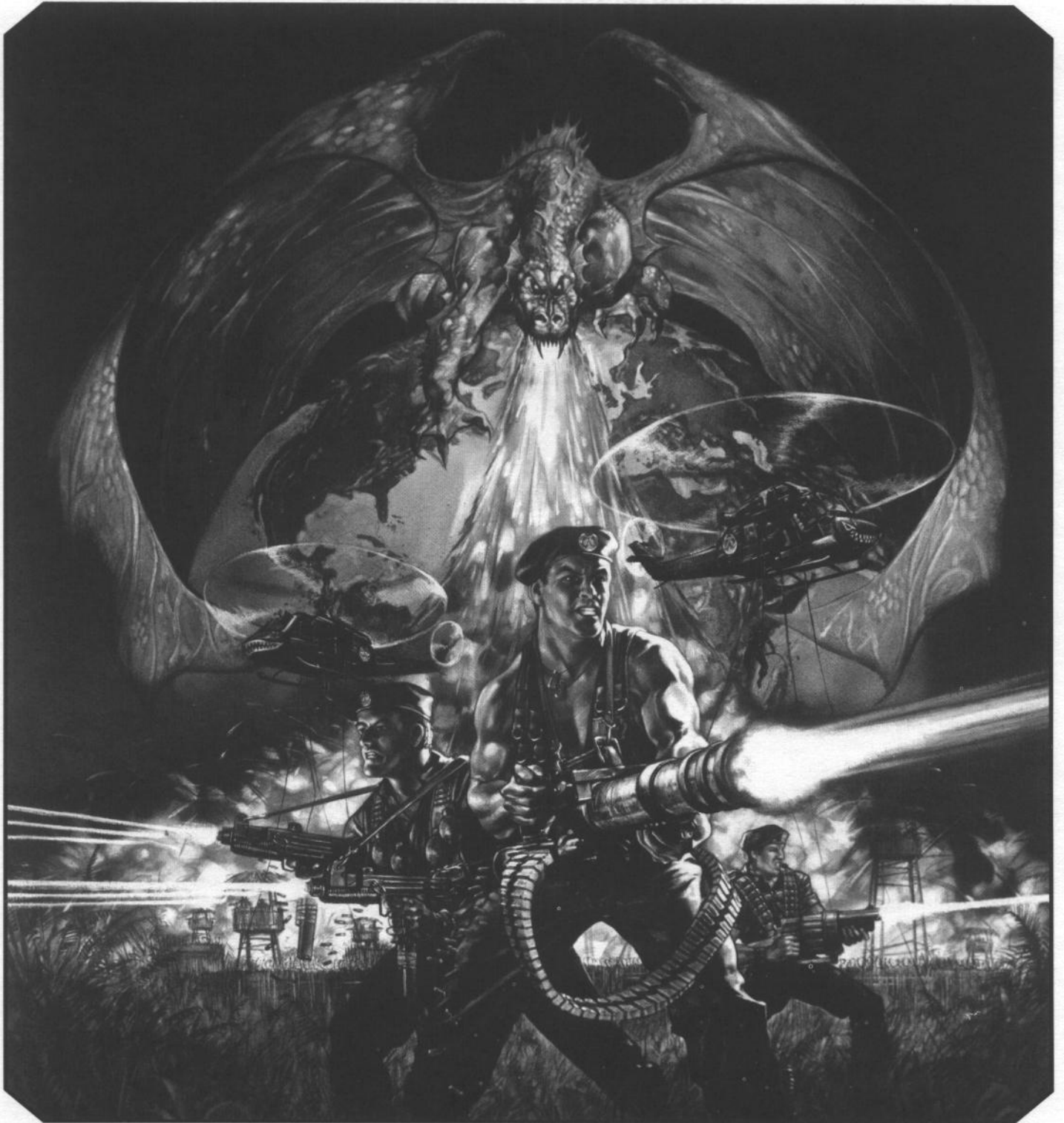
Arms Catalog for the Possibility Wars™

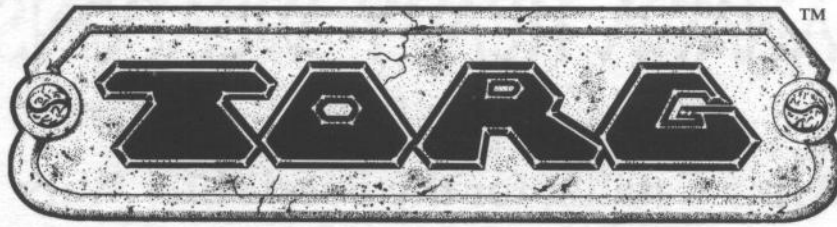
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KANAWA HEAVY WEAPONS

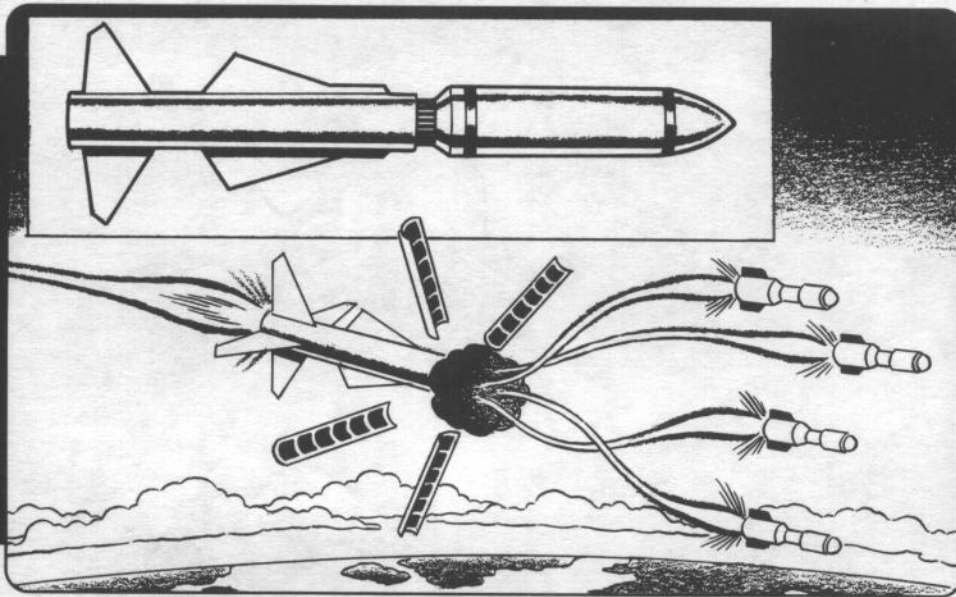
By Nigel Findley

Arms Catalog for the Possibility Wars





Roleplaying the Possibility Wars™



A. McClellan

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HACHIMAN ARMS

GREETINGS

FROM OUR DIRECTOR

Welcome to the Hachiman Weapons Division's newest Heavy Weapons Catalog! Regular subscribers will notice few changes from our last edition, with the notable exception of an expanded "Evaluator's Comments" section with each weapon entry. In addition, in response to requests from you our subscribers, these Comments no longer undergo any editing whatsoever, and reflect the personal preferences, complaints and questions of our evaluators.

To those of you joining us for the first time, welcome. The Hachiman Weapons Division of the Kanawa Corporation is dedicated to your success. To this goal, we offer the widest range of heavy weapons available anywhere in the entire world. Hachiman's weaponry experts have combed the planet for the finest selection of long-range, high-yield, stand-off and emplaced weapons and explosives. Although the entries in this catalog list the weapons under the names of their original manufacturers, the vast majority of items are constructed in Hachiman's own weapons shops, guaranteeing the highest level of quality, the quality associated with the name Hachiman. Hachiman prides itself on offering weapons based on a variety of technologies and technological levels. This makes the catalog more useful for clients in those parts of the world where the recent changes have made it impossible to use sophisticated technological devices or, alternatively, where abnormally sophisticated devices will function. Obviously, the most effective weapon for a particular locale uses the most advanced technology supported by that locale. By offering a wide range of technological levels, Hachiman makes this determination easier and more precise, while offering you the freedom of choice and the commitment to quality that you demand!

Each catalog entry comprises the following information:

Weapon Name/Identification
Description

Historical Background
Evaluator's Comments (including strengths, weaknesses significant quirks, etc.)
Statistics (damage, range, price, etc.)

For ease of ordering, we have classified the weapons by the "realm" or the area of the world where they would find the most applicability. As discussed above, this classification makes it easy to pick the most advanced weapon that will work in a particular region. (For example, in the region of the world now known as Orrorsh, the "Valkyrie" BHA-15 (Bomb, High-Yield, Air-Delivered) is the most advanced piece of ordnance that can be depended on to function normally.) Obviously, less advanced weapons will function normally in regions that support high technological levels; however, their effectiveness will be somewhat limited. (Take, for example, the case of a group trying to overthrow the Diet in Tokyo with a catapult...) The one exception to this rationale is the last section, entitled "Advanced Technology." This chapter deals with products that are at the absolute cutting edge of weapon technology. The vast majority of these products are still experimental, or only at the prototype stage. For this reason, there is a chance that they will not work reliably on some battlefields.

To order any of these fine weapons, contact your nearest Kanawa Corporation representative. This resource is complemented by the Hachiman Personal Weapons Catalog. Hachiman continues proudly as your only source for quality weaponry.

Eichiro Kasigi, M.Sc., M.B.A.
Managing Director
Hachiman Weapons Division
Kanawa Corporation
Tokyo, Japan

WEAPONS OF AYSLE

This section details selected weapons that will find their greatest applicability in the "realm" known as Aysle. Perceptive readers will note that the price figures for these weapons may seem totally inappropriate. These figures reflect the difficulty of acquiring appropriate materials, and applying appropriate techniques, that will function normally in this low-technology region of the world.

Aysle is a realm that closely matches the precepts of much "fantasy" fiction. It is a place of dreams and nightmares, of folk both magical and mundane, of creatures of light and darkness. In Aysle, sorcery determines the standard of living; technology, on the other hand, is at the level of Renaissance Europe. Hachiman has taken this into account when presenting the following weapons for your perusal.

Certain medieval or "fantasy" heavy weapons have not been included in this catalog, as Hachiman Arms is currently working on developing the most effective means of production and use. Hachiman will be including updates to these weapons as they are developed into their best possible form.

BUILDING YOUR OWN

When constructing your own weapons from a medieval reference or fantasy source, use the weapons in this section as a guideline. Remember to take into account the technological limitations involved in the construction and operation of each weapon, as the "realm" of Aysle does hinder certain types of development.

The best way to design your own version of a fantasy weapon is to come up with a basic concept

for the weapon, and then contact your nearest Hachiman representative. It is quite likely that the weapon is in development or, if not, Hachiman can specially construct such a weapon for a reasonable fee. If you do, however, wish to construct these weapons yourself, either because you are a hobbyist or have difficulty with transporting your weapon from one place to another, Hachiman Arms also can provide kits and specifications that allow you to construct your own heavy weapon from the materials at hand.

HACHIMAN ANNOTATION:

While Hachiman Arms is well aware that unusual resources are available in Aysle (such resources are known to most people as "magic"), Hachiman Arms has included in this catalogue only such weapons as can be used by most of the residents and "temporary forces" that practice the art of war in that realm. While some have been designed with magic in mind, please note that this magic is generally of the simplest kind, usable by many Ayslish residents.

By no means does Hachiman Arms discourage or disparage the use of magic in daily life or on the battlefield. Quite the contrary. Should you or your armed force require a custom-made weapon that makes the most of the "eccentricities" prevalent in the realm of Aysle, Hachiman Arms will be more than happy to produce such a weapon, either as a single prototype or as a mass order. Please contact the Hachiman Arms Development and Testing Department for further details.



SIEGE TOWER

DESCRIPTION

Historically, siege towers have ranged from simple structures hastily lashed together from felled trees, to elaborate wheeled buildings sporting multiple stories, arrow slits, and even drawbridges. The former variety offer little to no protection for those troops within, while the latter can be elaborate and strong enough to resist fire from even large missile engines such as ballistae.

The Hachiman model takes a middle ground, trading versatility for specialization. It is 14 meters in height, with a square base 4 meters on a side. It has two interior floors, and an open "combat platform" on top. This platform is surrounded on three sides by protective guard rails. The floors are connected by stout wooden ladders. The entire structure is sheathed by thin planking, pierced by arrow slits, which provides excellent concealment and good cover for troops within the structure. [This is slightly less than "medium" cover, giving an armor add of +8 to a maximum of 21.]

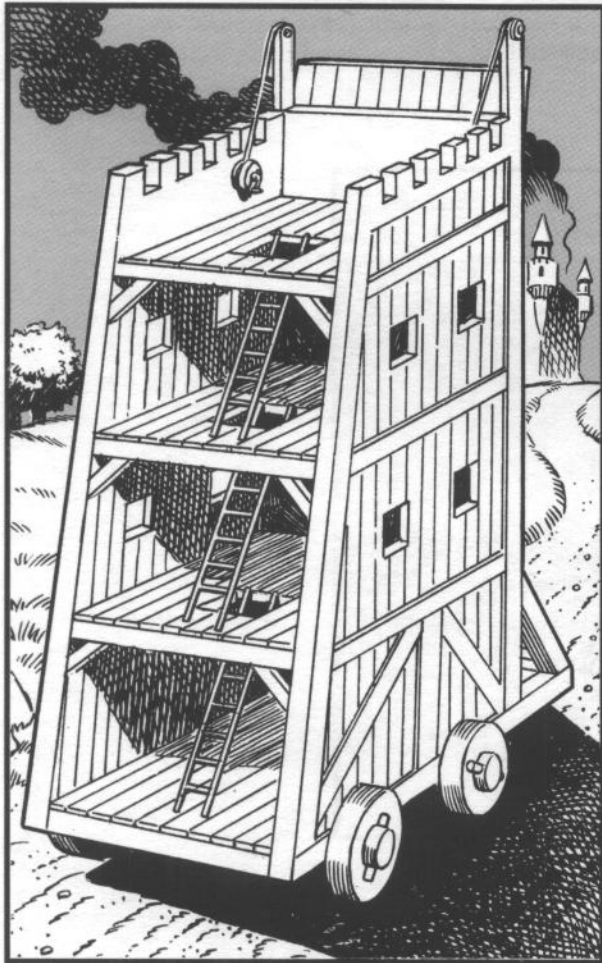


Illustration by A. McClellan

HISTORICAL BACKGROUND

Siege engines of one type or another have been in use on the battlefields of the world since the time of the Romans, and perhaps even earlier. The Hachiman model is based on illustrations of siege warfare in Medieval Europe.

EVALUATOR'S COMMENTS

This contraption is unstable and treacherous on all but the smoothest and most level ground. In addition, its four wooden wheels are easily wrecked, totally immobilizing it [Vital Blow required to strike wheels]. Finally, it is susceptible to fire, unless the troops using it cover it with soaked burlap, green hides, or the like. These should not be taken as criticisms of this particular construction, but of the entire class of siege engines.

On the positive side, this is a highly useful device in the right circumstances, and one should not underestimate the terror inspired by the sight of such a juggernaut rumbling towards one's battlements.

Hamish MacDonald
Master at Arms, MacDonald Clan, Scotland

SIEGE TOWER

TECH	SPEED KPH/MPH/VALUE	PASS. TOUGH	PRICE (VALUE)
8	1.6/1/2	12/14	60K (24)



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BALLISTA

DESCRIPTION

The Hachiman ballista is a large, bow-like device, powered by two "torsion skeins" (lengths of twisted cord). The two limbs of the bow are each approximately 1.75 meters in length, and the device fires a "bolt" or oversized spear, massing 4.5 kg. The bow-string is drawn back by a windlass-and-ratchet assembly. [This process takes one minute, six rounds, for one person, or only three rounds if two people man the windlass.] The ballista has an effective range of 450 meters, and is thus an ideal weapon for neutralizing an enemy force at great distance.

HISTORICAL BACKGROUND

The first ballista-like weapon appeared on the scene in 211 BC. It and many other such "engines" were designed by Archimedes to defend Syracuse when the city was besieged by the Romans. The "modern" design of the ballista dates from the Dacian Wars (101-107 AD), when the weapon was used by Roman legionaries.

EVALUATOR'S COMMENTS

Although the measured maximum range of this engine of destruction is between 400 and 450 paces, it is so hideously inaccurate at this extreme distance

as to be virtually valueless on the field of battle. With trained operators, it is an effective weapon at no more than 350 paces.

The ten-pound missile flies well, and delivers an impact easily capable of reducing a plate-armored horseman to scrap metal, or of shattering a wooden gate. The most significant disadvantage with this weapon seems to be the dearth of troops skilled in its use, or even capable of learning the skill.

Major Douglas Farquharson
House Guard, Stornoway Castle, Scotland

BALLISTA

TECH	DAMAGE VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
11	18*	1	3-150	250	375	25K (22)

* The "moment of inertia" of such a long, heavy projectile is incredible. To reflect this, all armor adds are reduced by four for any character struck by a ballista bolt.

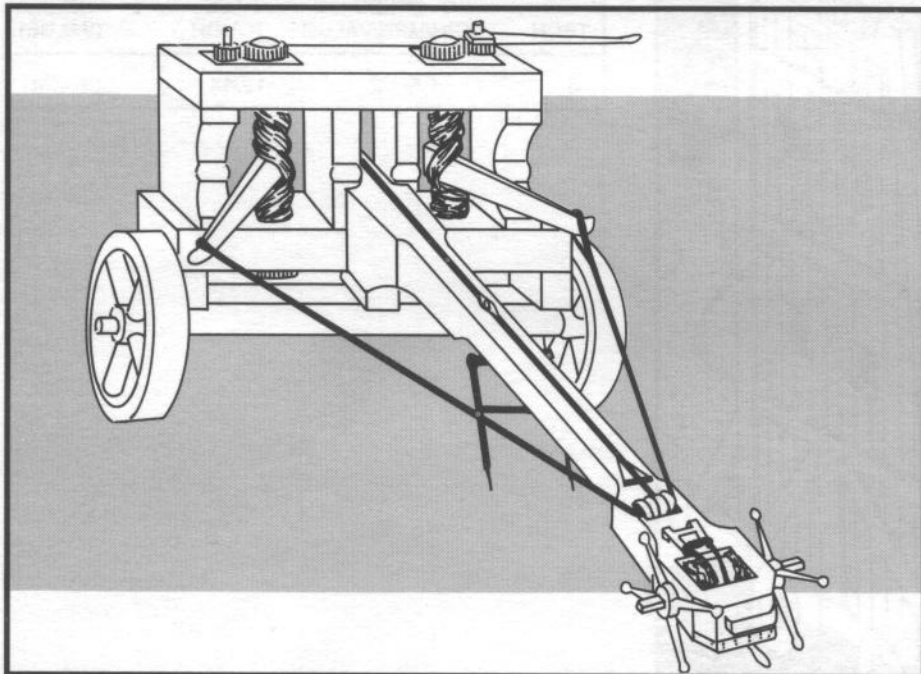
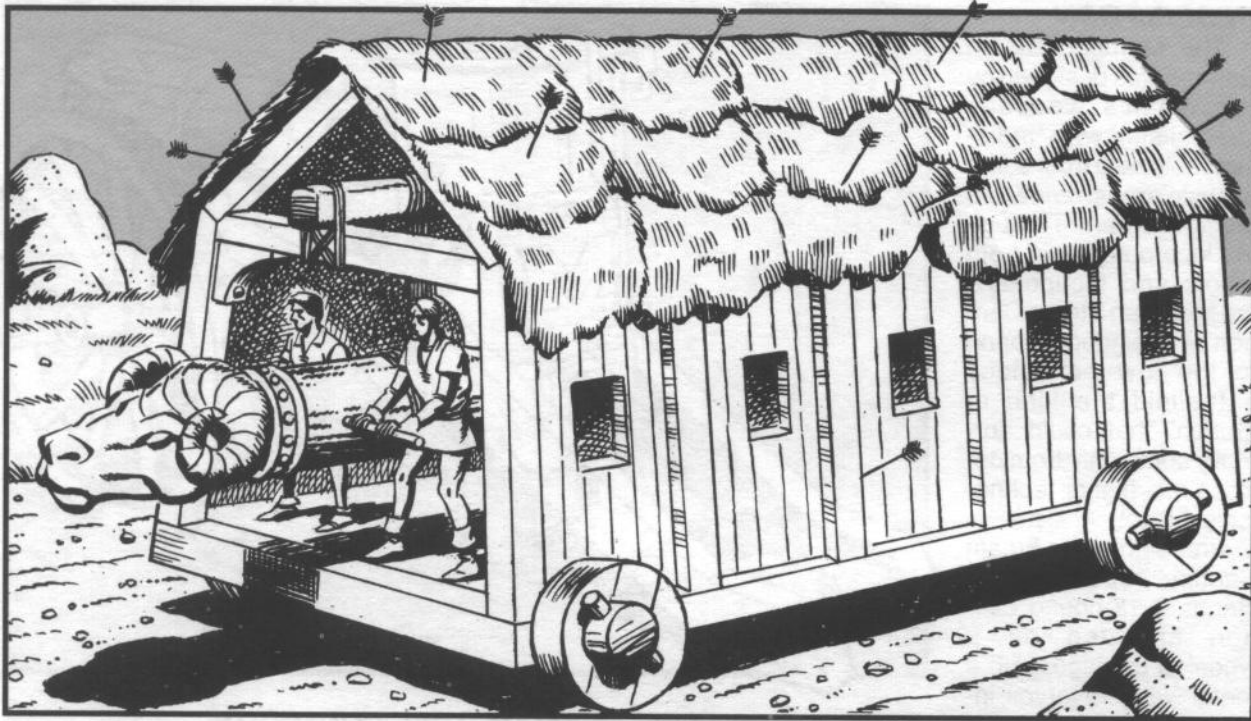


Illustration by C. Hunter

BATTERING RAM



DESCRIPTION

The Hachiman Battering Ram siege engine is 25 meters in overall length, and 3 meters in width. In structure, it consists of a wheeled "gallery" (a roofed structure mounted on wheels) with an interior clearance of 2 meters. Suspended by chains beneath this gallery is a stout log approximately 0.8 meters in diameter. This log is capped on one end with a heavy, blunt brass cap. Along the length of the log, metal bars have been driven into the wood to provide handholds for the troops swinging the ram. The ram is designed to be used by 30 troops.

The log is suspended, freeing the troops to concentrate all their efforts on swinging it against the target. Secondly, the gallery protects them from the defending troops on the battlements above. [This gallery has a *Toughness* of 15.]

HISTORICAL BACKGROUND

The basic concept of the ram, a way for multiple troops to concentrate their strength on a small target, has been understood for many centuries.

EVALUATOR'S COMMENTS

It must be said at the outset that the battering ram is not a "stylish" weapon. There are many who would disdain its use, preferring to use cannon to reduce a fortification. However, there are many cases where

cannon are simply less effective than more primitive methods. On a purely monetary basis, a single battering ram can be as effective as a battery of cannon costing easily ten times as much.

It is very difficult to move this device across rough ground. In addition, while its roof will protect the troops beneath from dropped objects and from missile fire, a single pan of burning embers could conceivably set the entire structure aflame.

Hamish MacDonald
Master at Arms, MacDonald Clan, Scotland

BATTERING RAM

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
8	22*	1**	***	N/A	N/A	50K (24)	

* This damage usually will be applied only to part of a building. The gamemaster must decide the *Toughness* of the structure against which the ram is being used.

** The ram can be swung once per round, so long as there are troops to operate it, and so long as it is within 1 meter of the target.

*** The ram must be within 1 meter of its target to be effective.



MORRIGAN STEAM CANNON

DESCRIPTION

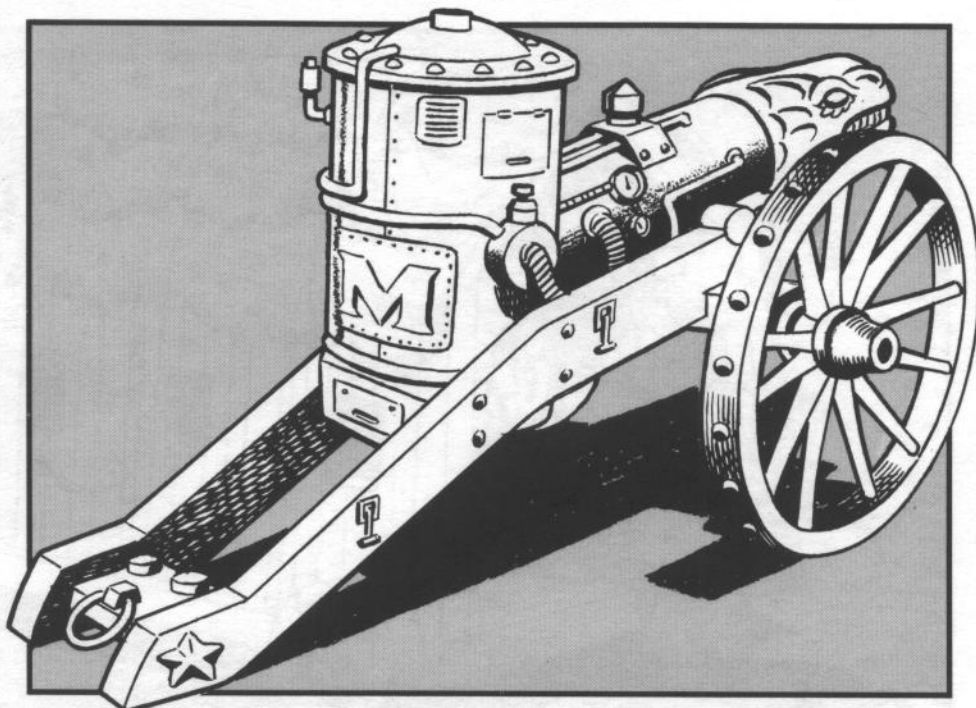
The Morrigan Steam Cannon was designed by Hachiman's weapons specialists, with indispensable help from some of Aysle's most renowned magic-wielders. Through the incorporation of both magic and technology, the Morrigan Steam Cannon is designed to bring to the low-technology battlefield the kind of "punch" that could normally come only from devices of a higher technological level.

In structure, the Steam Cannon appears like a standard 12-pound cannon mounted on a wheeled carriage, with a metal water reservoir installed behind and above the butt of the cannon. This open-topped reservoir will hold 1,200 liters (317 gallons) of water. The weapon is prepared for use by filling the reservoir with water, and then loading an iron "roundshot" — massing about 5.5 kg, with a diameter of about 12 cm — down the bore of the weapon. The weapon is fired by pulling a small lever on the carriage.

The lever causes a volume of water to be admitted to a small chamber behind the loaded shot. This water is then magically heated to such a degree that it instantly flashes into steam, propelling the shot from the barrel with a muzzle velocity equal to or greater than that of many higher-technology gunpowder field guns. In addition, since the sole propellant is water, the Morrigan is much cheaper to operate than standard field pieces. The fully-filled reservoir contains enough water for 60 shots. The steam cannon has a Magic axiom level of 18.

HISTORICAL BACKGROUND

Although the structure of the barrel is similar to those of cannons dating from the late 15th Century, the combination of techniques seen in the Morrigan is absolutely unique on the face of the earth.



EVALUATOR'S COMMENTS

When I visited Dublin recently, I got to see and to fire this beauty. My first reaction was, "Bull****, this ain't gonna work!" Then I had the chance to try it myself.

I want one. I want one to play with. I can imagine upgrading the projectile, maybe with a discarding sabot. Or maybe mounting the sucker on a tank and loading it with HEAP rounds.

Practically speaking, the thing is very quiet, and there seems to be almost no recoil (must be something magical that plays merry hell with Newton's Laws). With good people laying it, it's easily as accurate as an 1857-vintage "Napoleon" 12-pounder ... and that's saying a lot for a muzzle-loader. Range is exceptional: at 5° barrel elevation, it'll toss a roundshot out to over 1500 meters.

Sgt. Ted "Boomer" Nakamura
USMC Weapons Instructor, Fort Bragg

MORRIGAN STEAM CANNON

DAMAGE	TECH	VALUE	AMMO	RANGE			PRICE (VALUE)
				S	M	L	
12	24	1	3-200	600	1.5K	200K (27)	

WEAPONS OF ORRORSH

This section details selected weapons that will find their greatest applicability in the "realm" known as Orrorsh. Orrorsh is a place of agony and despair, where monsters stalk the night while men huddle in terror, waiting for the day. In many ways — most importantly, in terms of technology — it is similar to Victorian Europe. Hachiman has taken this into account when presenting the following weapons for your perusal.

Most of these weapons, or their analogous counterparts, were brought over to Core Earth by the Victorians from Gaea. However, certain weapons, such as the Maxim Heavy Machine Gun, are not native to Gaea but function perfectly well within the realm. Whether the Victorians themselves will use them is a different matter entirely.

Gamemaster Note: Most Gaeans believe wholeheartedly that they are the best and brightest at *everything*. This extends to all walks of life, including the design, manufacture, and sale of arms. They are suspicious of any equipment manufactured by non-Gaeans (or by workers not employed and supervised by Gaeans) and will generally sneer at such items — whether they are inferior or not.

While this can be infuriating, especially for

Hachiman Arms' Sales Department, it is a prejudice that most have learned to work around. Experience has shown that proving to a Gaeon that your weapon is better or more effective will only waste your time and annoy the Gaeon. Most foreigners distribute their goods under a Gaeon company logo, or arrange for "special discounts" for their Gaeon customers.

HACHIMAN ANNOTATION:

It has come to our attention at Hachiman Arms that, though these weapons are excellently suited to the technological limitations of Orrorsh, certain creatures and even people have proven remarkably resistant to conventional firepower. While we at Development and Testing still believe that, if you blow a large enough hole in something, it will at least be incapacitated enough for you to get away, we are working on the problem.

Currently, tests are being performed on a variety of creatures imported from "the realm of horror," and, as the creatures' weaknesses, strengths and limitations are determined, we at Hachiman will customize new weapons to suit these situations and make them available to you, the consumer.



12-POUNDER "NAPOLEON" FIELD GUN

DESCRIPTION

The design of Hachiman's "Napoleon" is based on the last and best smoothbore muzzle-loading guns. The cast barrel is 198cm in length, massing 796kg. The gun is mounted on a two-wheeled carriage, which masses 532kg, and can quickly be "limbered" for transportation. The gun is equally effective when loaded with iron roundshot, canister, case or grape shot, or explosive shot.

HISTORICAL BACKGROUND

The "Napoleon," which was named after Napoleon III, was based on a French design and appeared on the scene in 1857. It was widely used in the American Civil War (1861-65).

EVALUATOR'S COMMENTS

A very effective field piece, the Napoleon is the culmination of a design that has been in action for centuries. Loaded with 12-pound iron roundshot, the piece has an effective range of 2,000 yards (1,828 meters). While grape and other spreading shot is effective against targets at minimum range, roundshot is definitely the load of choice against

distant massed troops. This is particularly the case since roundshot will bounce when it is fired parallel with the ground. Even when the ball is moving slowly enough to be seen, it is heavy enough to do significant injury. It must be added, however, that this colonial design is in many ways inferior to our own 15-pounders, which are both breech-loading and rifled.

Col. John Dansworthy
Her Majesty's Light Fusiliers, Singapore

NAPOLEON FIELD GUN

TECH	DAMAGE		RANGE			PRICE (VALUE)
	VALUE	AMMO	S	M	L	
17	24*	1	3-150	600	1.5K	4000 (18)

*For roundshot only. For canister or grape shot, ranges are as follows: S 3-350, M 400, L 450; damage is increased to 25. For explosive shells, L range is decreased to 1.3k; damage is 24, with range of shrapnel 4/6/10 from impact point.

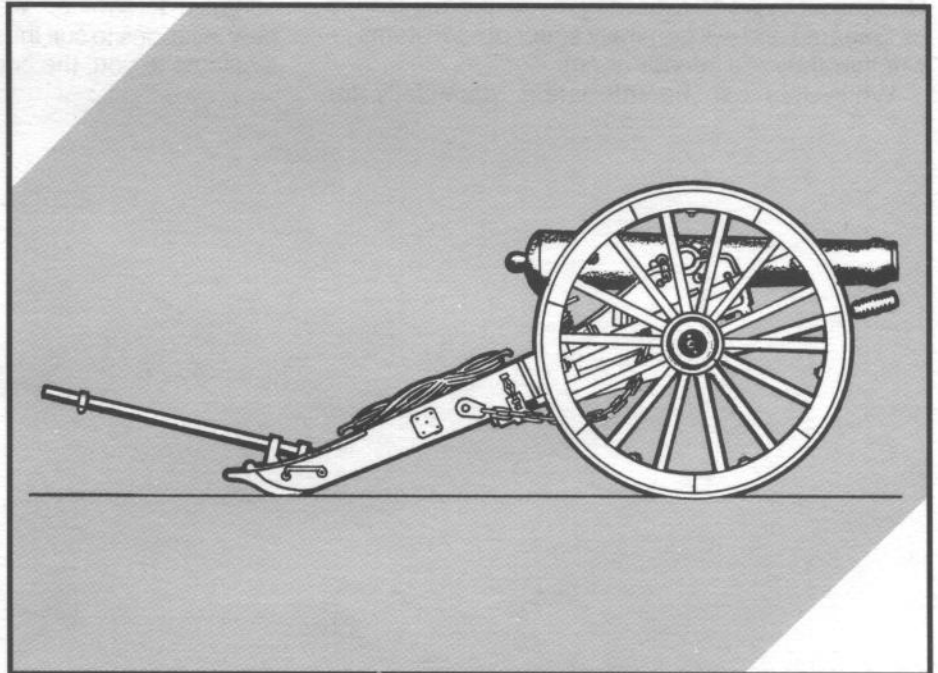


Illustration by A. McClellan

CAT. NO. 74-310521

24-POUNDER FIELD HOWITZER

DESCRIPTION

Compared to a standard field gun, the howitzer has a short and squat barrel. (For comparison, the howitzer has a barrel length of 1.34 meters, compared to 1.98 meters for a comparable field gun.) The barrel and carriage are thus considerably lighter. The howitzer fires an explosive shell with a diameter of 16.5cm. This piece, based on the Gribeauval system, shows many significant improvements over earlier artillery pieces. Most noticeable is its screw-adjusted elevating wedge, making laying of the gun much faster and more accurate. These enhancements, combined with Hachiman's attention to reliability, make this an exceptional choice for indirect fire missions.

HISTORICAL BACKGROUND

This piece is based on a French design dating from around 1765.

EVALUATOR'S COMMENTS

I must admit to a preconceived bias against howitzers based, I suppose, on my preference for direct as opposed to indirect fire. Having evaluated this piece, however, I must change my mind. The weapon is much lighter than a comparable direct-fire field gun. The range is considerably lower, and the flight of the shell slower (this latter effect is insignificant

when the weapon is loaded with explosive shot). The weapon requires considerably less propellant — in fact, less than half as much as a comparable field gun — which applies less firing shock to the shell. This means that the shell's walls can be thinner, which in turn implies it can hold more powder, making it more effective than a heavier shell.

The sole disadvantage of this weapon is that it is a muzzle-loader, requiring the crew to present their backs to the enemy when loading.

Capt. Randolph Penobscott
Queen's Own Light Horse, Jakarta

24-POUND HOWITZER

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
17	25		1	50-150*	500	1000	3500 (18)
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-4	10	30			

* The howitzer cannot be used against targets at a range of less than 50 meters.

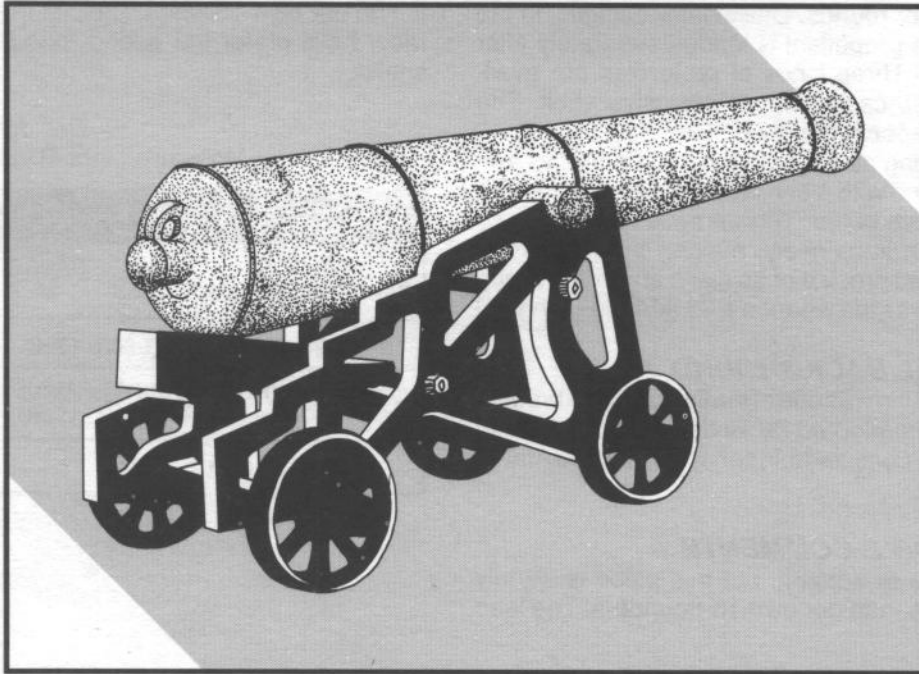


Illustration by C. Hunter

CAT. NO. 74-311521



MAXIM HEAVY MACHINE GUN

DESCRIPTION

The Maxim is a belt-fed water-cooled crew-served heavy machine gun. It masses approximately 32kg. The weapon fires 7.92mm rounds. Cyclical fire is rated at an exceptional 450 rounds per minute, and the weapon can deliver a sustained 10,000 rounds per hour, assuming that the supply of ammunition and cooling water is maintained. This high rate of fire makes the Maxim a murderous weapon under any circumstance. The weapon's barrel is cooled by water which flows through a "sleeve" surrounding the barrel. In the Hachiman model, steam is removed from the sleeve and condensed for re-use.

HISTORICAL BACKGROUND

The Hachiman Maxim HMG is based on the German Maxim design of 1908. This weapon was heavily used in the First World War, and was particularly lethal at the battle of the Sommes on July 1, 1916.

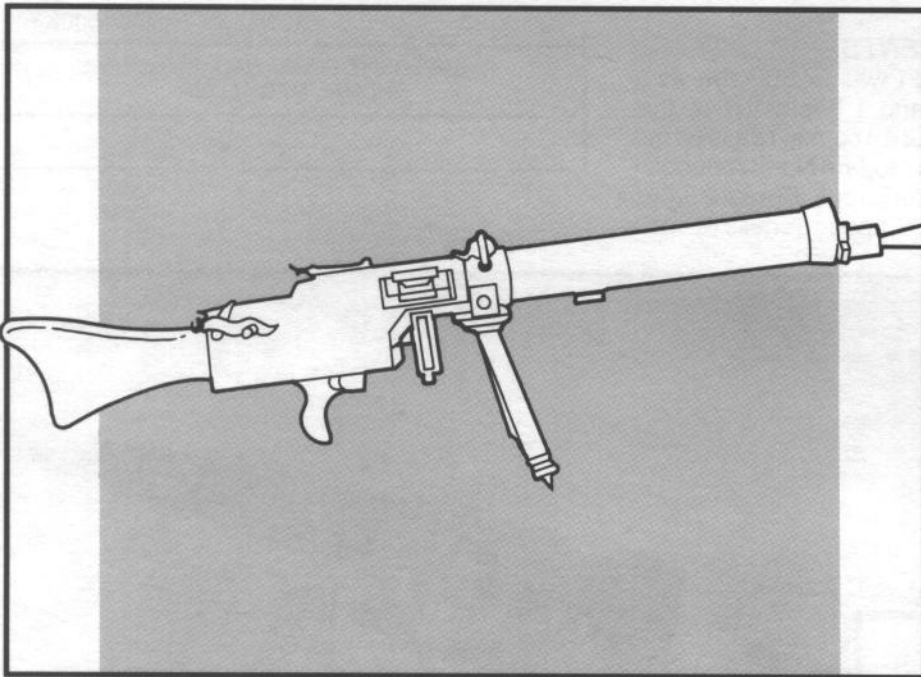
EVALUATOR'S COMMENTS

A hideous weapon, unworthy of a gentleman. The profligacy with which this satanic device spews lead must be seen to be believed. I hope I never live to see the day when the battlefield is dominated by such engines of mass destruction. Where is the honor of spraying lead on the enemy as if from a fire hose? No, even though I can see the effectiveness of this manner of war, I for one will never support it.

Col. James Duncan Patterson
Her Majesty's First Highland Guard, Jakarta

MAXIM MACHINE GUN

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
19	23	25	3-50	500	1K	2500 (17)	



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111 TON NAVAL GUN

DESCRIPTION

This massive breech-loader is designed to be mounted in an open-topped barbette on the deck of a dreadnought. It fires a 412mm armor-piercing shell massing approximately 28.5kg. The recoil of this enormous piece is such that it must be mounted on a slide, which is then mounted on an elevating ram. In our test-firings, we have found that a run back of approximately 70cm is optimal. The hitting power of this weapon must be seen to be believed. A single hit will sink virtually any vessel. In addition, the weapon is ideally suited for bombardment of coastal fortifications. Its range is greater than that of most coastal batteries; hence it can rain destruction on an enemy without risk of counterbattery fire.

other? With missiles and air power, it's a ludicrous concept. But when you don't have missiles, and air power is rudimentary at best... A 60-pound shell packs a lot of kinetic energy, and can hold a lot of high explosive. One hit is going to sink virtually anything smaller than a destroyer, and will give even a battleship something to think about. Accuracy is an issue, as is rate of fire [the weapon suffers a -1 penalty at all ranges, and reloading takes 8 rounds]. But to tell you the truth, if somebody took away my Tomahawk missiles and laser-guided munitions, I'd be quite happy to have one of these things aboard.

Lt. Cmdr. Josh Wallace
Fire Control Officer, USS Reuben James
(Detached Duty)

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HISTORICAL BACKGROUND

The 111 ton gun was mounted on the dreadnought HMS Benbow in the 1880s. In this installation, the barbette was faced with 14-inch (35.6cm) armor, illustrating why such weapons were required.

EVALUATOR'S COMMENTS

A little background first: I was in Sumatra as a "Naval Military Advisor," and I heard tell of this monster. When I heard about it, I couldn't pass up the opportunity to see it. From a modern North American perspective, the weapon is ludicrous. Dreadnoughts with 2 feet of armor, lobbing 60-pound shells at each

111 TON NAVAL GUN

TECH	DAMAGE		S	RANGE			PRICE (VALUE)
	VALUE	AMMO		M	L		
19	30	1	100-1K	3K	5K	500K (29)	
EXPLOSIVE BURST RADIUS (METERS)							
			SHORT	MED.	LONG		
			0-5	15	40		

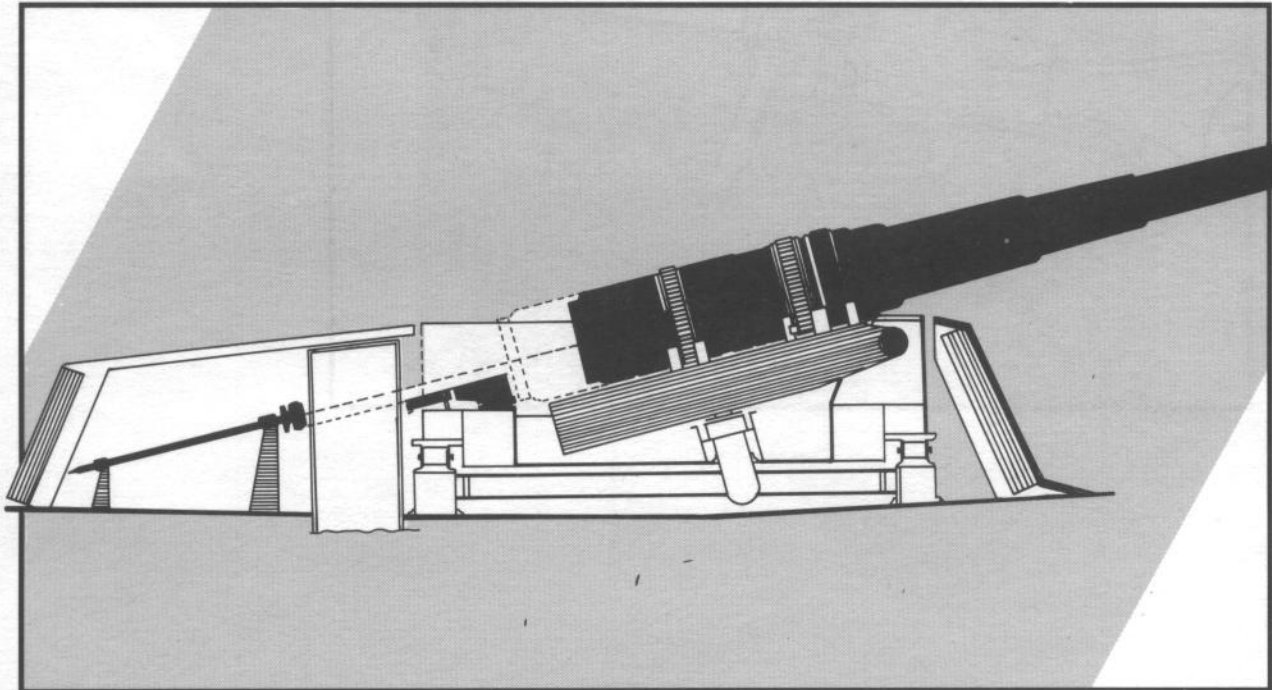
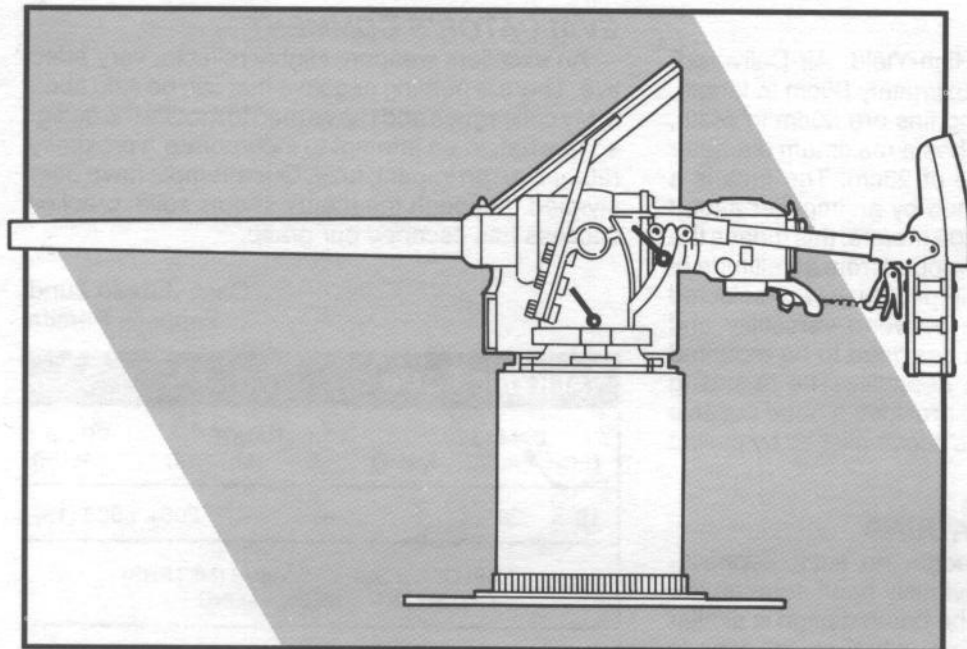


Illustration by C. Hunter

PEDESTAL-MOUNTED QUICK-FIRING (QF) GUN



HISTORICAL BACKGROUND

In the 1880s, it became apparent that small, fast torpedo boats were capable of sinking even a battleship. A battleship's main armament, on the other hand, proved much too unwieldy to engage such a small, maneuverable opponent. The QF, which appeared in the 1890's, was built to fill this gap.

EVALUATOR'S COMMENTS

This weapon is an admirable supplement to a dreadnought's primary armament. I can image several of these being

DESCRIPTION

The QF is a light, simple and rapid-firing gun designed to counter the threat of small, fast torpedo boats. The weapon is aimed and fired by one man. The gunner presses his shoulders against the padded rest at the rear; this shoulder piece is attached to the carriage and not the gun, isolating the gunner from recoil. Other crew members load the fixed cartridges. A falling-block breech is used to maximize rate of fire. With trained crew, the weapon is capable of firing 25 shots per minute. The entire weapon is mounted on a revolving bracket attached to a deck-mounted pedestal. This versatile and eminently reliable weapon has an overall length of about 3 meters, and a calibre of 7cm.

mounted on the open deck, or even atop the ship's primary turrets. Range is far from exceptional, but considering its purpose this is not a significant issue. The accuracy of the piece's open sights is also questionable, but again rate of fire can make up for this weakness.

Capt. Gordon Klew
HMS Illustrious

PEDESTAL-MOUNTED QF GUN

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
19	23*		1	3-300	1K	1.5K	100K (25)

*This assumes the weapon has a full, trained crew of 4. With a partial or untrained crew, this weapon inflicts a damage value of 20, but has Ammo for 3 rounds.



"VALKYRIE" BHA-15 ZEPPELIN BOMB

DESCRIPTION

The BHA-15 (Bomb, High-Yield, Air-Delivered) masses 50kg and is approximately 80cm in length. Its broad, stubby stabilizing fins are 50cm in width, and its bulbous body reaches a maximum diameter — just behind the fuze — of 23cm. The fuze is a simple impact variety, armed by an impeller after it has fallen free for at least 200 meters; this means the bomb will not detonate if dropped from an altitude of less than 200 meters (an impact fuze was selected as a perfect compromise between versatility and reliability). The Valkyrie is designed to be mounted beneath the gondola of a Zeppelin. The mounting rack is easy to attach, and provides a good positive fit for the bomb. Release is accomplished by pulling a lanyard.

EVALUATOR'S COMMENT

An excellent weapon. Highly reliable, very effective. There is nothing negative that can be said about it. My colleagues and I have tried to modify the design somewhat, in an attempt to incorporate a proximity, rather than an impact, fuze. Our attempts have been stymied. Although the theory seems solid, practical success has escaped our grasp.

Capt. Jurgen Zundt
Zeppelin Parsifal

VALKYRIE BOMB

TECH	DAMAGE		S	RANGE			PRICE (VALUE)
	VALUE	AMMO		M	L		
19	29	1	—	—	200+	6000	(19)
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-5	20	35			

HISTORICAL BACKGROUND

To Hachiman's knowledge, no such Zeppelin-mounted weapon has previously been seen on the battlefields of the world. The bomb design is similar to British 112lb aerial bomb, although the fuze is more similar to the German APR, dating from 1912.

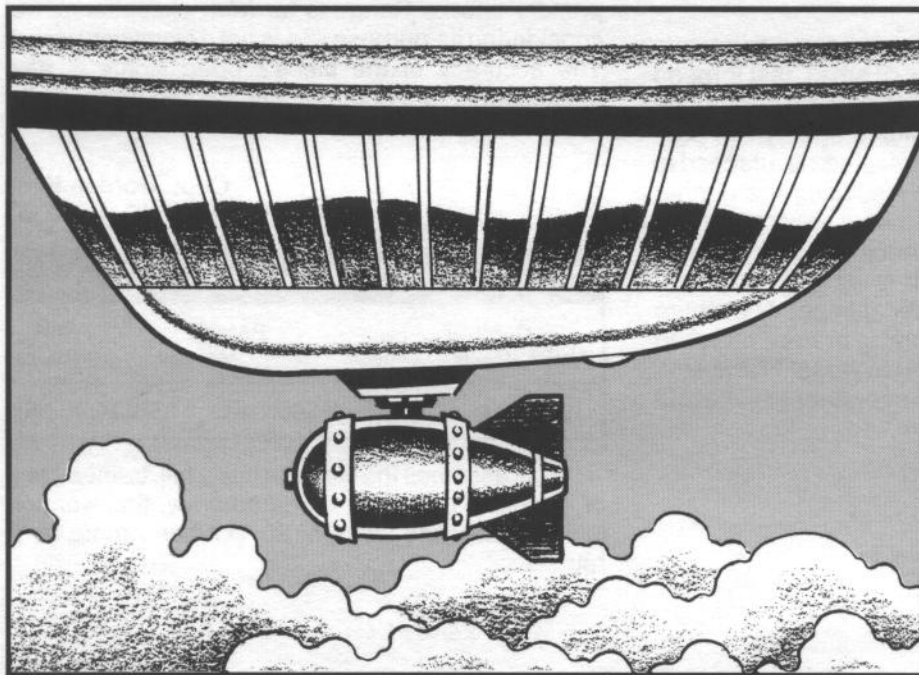
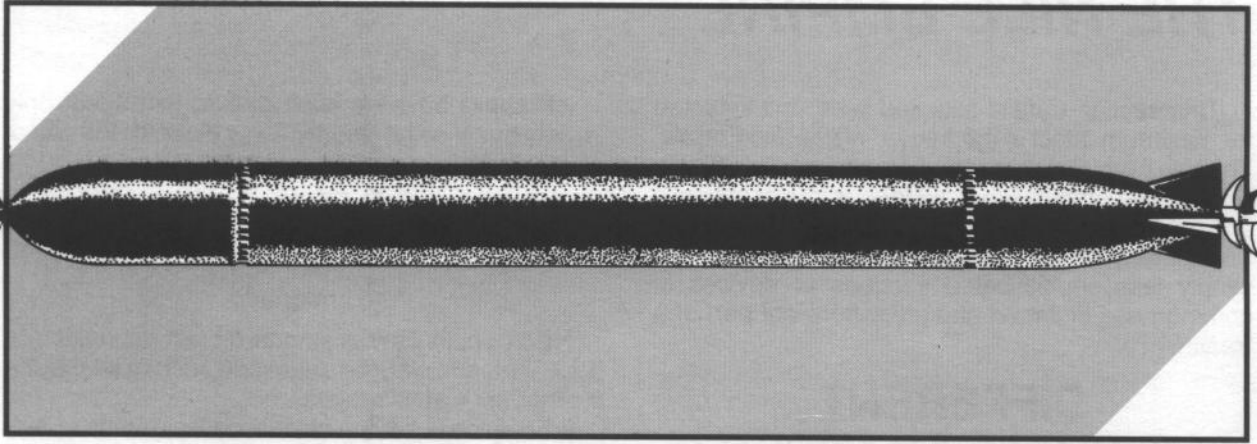


Illustration by A. McClellan

G7 TORPEDO



DESCRIPTION

The G7 is a simple but effective torpedo, approximately 6 meters long, with a diameter of 50cm. It masses 1130kg overall, with a high-yield warhead massing 200kg. It is driven by two contra-rotating propellers. The weapon is equipped with a gyroscope and the associated equipment required to keep it on a straight heading. The weapon is designed to be launched from a tube mounted in the side of a surface vessel, although it could — with modifications — be launched from a submarine's torpedo tube.

HISTORICAL BACKGROUND

The G7 is a modification of the first torpedo design, the British "Whitehead," invented in 1886. The torpedo revolutionized naval warfare, in that it allowed small craft to attack — and often sink — capital ships such as battleships.

EVALUATOR'S COMMENTS

I think Hachiman kind of blew it when they asked me to eval their fish. On my command back home, we use Mk48 fish: lethal little buggers not much over 2 meters long, that can cruise 40 nautical miles at 52+ knots, pack a 287kg warhead, and have the computing power of a small mainframe computer in their

guidance suite. I can't get excited over a 6-meter behemoth that has a maximum range of maybe 6 clicks — about 3.5 nautical miles — and can't get out of its own way. To make it worse, I'm a naval historian and I know about how the original G7 made out in WWI: over 5,000 fired, of which *at least* 3,000 missed.

I'll be very surprised if Hachiman prints this.

Capt. Bartholomew (Bart) Glenn
USS Dallas (688-class attack sub)

G7 TORPEDO

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
19	30		1	—	—	500- 6K	100K (25)
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-5	15	40			

(UNDERWATER ONLY)

This weapon suffers an additional penalty of -3 to hit when fired at a moving target.

17

WEAPONS OF THE NILE EMPIRE

This section details selected weapons selected for maximum effect in the "realm" of the Nile Empire. The Nile Empire — known to its leaders as the "Tenth Empire" — combines the mysterious lore of majestic ancient Egypt with the technology of the late 1930s. Thus, many of the weapons presented herein are simply less sophisticated versions of devices in common use in Japan and elsewhere not part of a "realm."



18

DIFFERENT SHELL LOADS

This section includes a number of field guns that can fire different types of shells. High Explosive (HE) shells are ideally suited for "soft" targets, such as infantry in the open or behind soft cover. Armor Piercing (AP) shells are generally solid, non-explosive rounds. AP shells exchange effectiveness against soft targets for improved armor-defeating characteristics. High Explosive Anti-Tank (HEAT) shells are explosive rounds designed to detonate only after they have partially penetrated armor. High Explosive Squash Head (HESH) shells are specialized anti-tank round that deform on impact and then detonate, causing fragments to spall off from the inside of the armor and fly around the interior of the vehicle at high velocity.

If a weapon is capable of firing different loads, this is stated in the text. The damage and blast radius statistics are for HE shells. Different loads have the following effects.

AP shells have no blast radius, and affect only targets that they hit directly. They diminish the add of armor, the effect varying by range:

Range	Effect
S	-5 to armor add
M	-2 to armor add
L	-1 to armor add.

HEAT shells have a standard blast radius of 0-3/5/12. They diminish the armor add, for targets they hit directly, by 4 at all ranges.

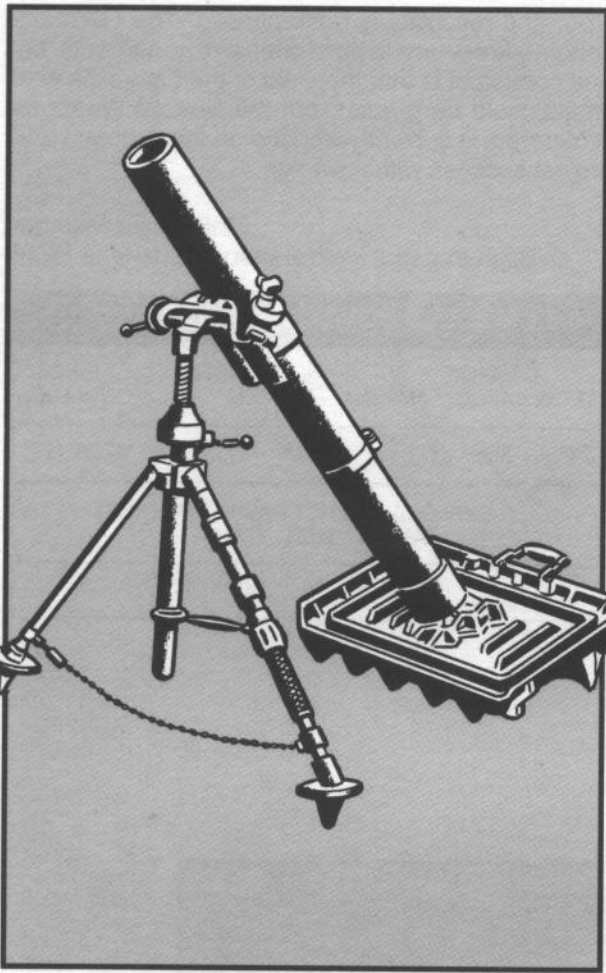
HESH shells have a standard blast radius of 0-5/8/12. They diminish the armor add, for targets they hit directly, by 4 at all ranges.)

HACHIMAN ANNOTATION:

It has come to our attention that certain weapons and devices created in the "Nile Empire" have, their inventors claim, astounding and bizarre abilities. Many people have taken to calling these pieces of equipment products of "weird science."

At Hachiman Arms, we know a scam when we see it. These "weird science" weapons are just embellished versions of our own advanced technology prototypes, stolen through industrial espionage. Consumer beware! These "embellishments" might make the item appear mysterious or incredible, but we at Development and Testing find that these "gizmos" fail often and have even been known to melt down or explode. We urge you to stick to tried-and-true products from legitimate corporations and not resort to "back alley scientists" when it comes to you and your family's protection.

81MM MODEL 1933 MORTAR



DESCRIPTION

This Swiss exceptional weapon is based on the classic "Stokes-Brandt" design. Like most mortars, it is a man-portable, smoothbore weapon that fires fin-stabilized projectiles at a very high angle (i.e., indirect fire). It consists of three main elements: the barrel, the bipod (which supports the barrel and allows for aiming), and the baseplate (which prevents the weapon from sinking into the ground under

the effects of recoil).

The Model 1933 is drop-fired; that is, the projectile is slid, tail first, down the muzzle, and the propellant charge is triggered as soon as it strikes the bottom of the tube. This versatile weapon can fire either high explosive or smoke bombs.

HISTORICAL BACKGROUND

Mortars changed the face of the modern battlefield in that now infantry could carry their own "mini-artillery." Mortars first made their appearance on the battlefield in the 14th Century, but the weapon's present form dates back only to World War I. As its name implies, this model dates from 1933. Interestingly enough, the mortar is the only significant muzzle-loading artillery still widely-used.

EVALUATOR'S COMMENTS

I like mortars. I can pack 'em around easily, set 'em up in a couple of minutes, deliver some outgoing mail, and then tear 'em down and make myself scarce before things get too hot. The Model 1933 is a good, solid performer. Nothing fancy, but nothing to go wrong either. Somebody once told me they'd seen a mortar firing star shells, but I've never been able to get that to work.

Dirk Montrose
Soldier of Fortune, No Fixed Address

1933 MORTAR						
TECH	DAMAGE VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
	20	18	1	100-400*	750	1K 8000 (20)
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
			0-4	10	20	

* Cannot be used at ranges less than 100 meters.



Illustration by A. McClellan

10.5CM LEFH18 FIELD HOWITZER

DESCRIPTION

The leFH18 is an outstanding example of standard design for field howitzers, having a horizontal sliding breech and a split trail. As its name implies, its caliber is 105mm, and is capable of firing a 15kg shell more than 11 kilometers. The weapon will fire high explosive, armor-piercing shot, HEAT (High Explosive Anti-Tank), smoke and incendiary shells. During World War II, a propaganda shell was designed for this weapon that ejected leaflets over the target area. (Hachiman offers an improved version of this special-purpose load.) The ammunition is "semi-fixed": in other words, the primer and propellant charge are in a metal case, but the shell is loaded separately first.

type, and reliability is unsurpassed. The Germans certainly knew how to build offensive armaments. My one complaint is that the yield of the high explosive shells could be greater, but the Special Weapons Directorate is currently working on this problem and project success within weeks.

Field Major Memnet
Sixth Imperial Field Battery, Sudanese Front

10.5 CM FIELD HOWITZER

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
21	30		1	400-1K	4K	12K	400K (28)
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-5	15	40			

HISTORICAL BACKGROUND

The weapon on which the Hachiman design is based was the standard German field howitzer from 1935 to 1945.

EVALUATOR'S COMMENTS

A very fine addition to the armory of the Tenth Empire. Accuracy is exceptional for a weapon of its

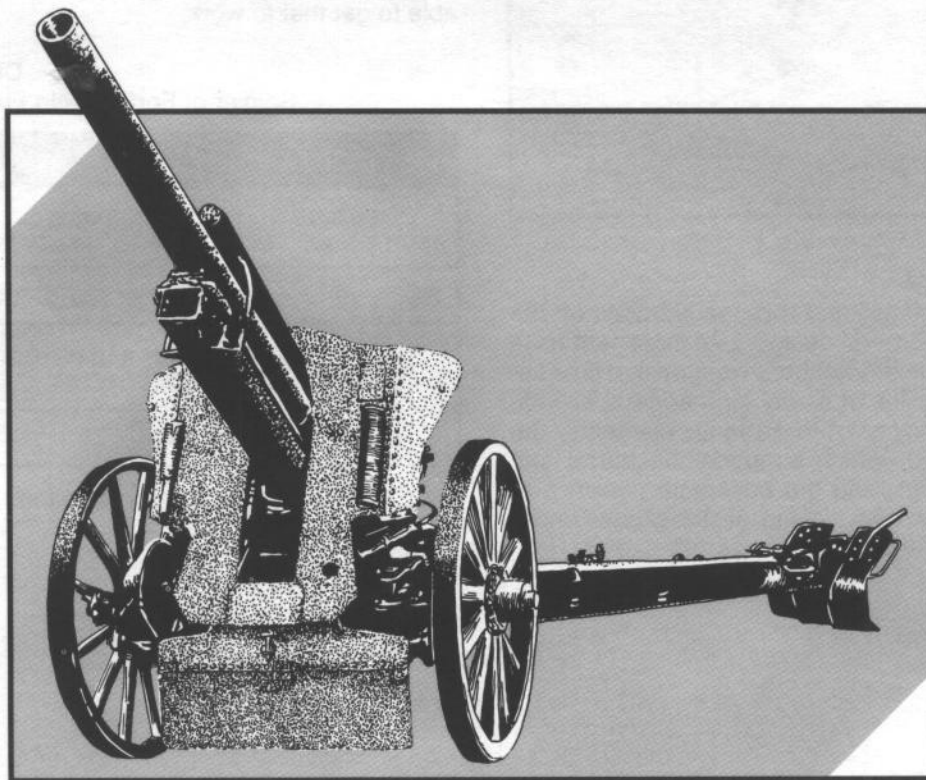


Illustration by C. Hunter

CAT. NO. 74-320521

155MM M2 GUN ("LONG TOM")

DESCRIPTION

The M2 is often referred to by its nickname, "Long Tom," because of its long barrel and exceptional range. The weapon is mounted on a four-wheel carriage with a split trail. The Long Tom can fire a 43kg HE shell some 22 kilometers with incredible accuracy. In addition to HE, the weapon can also fire armor-piercing and smoke rounds. These rounds are fully separate, in that the projectile, charge — contained in a cloth bag — and primer are each loaded separately. The advantage of this system is that the charge load can be varied to adjust range and trajectory. It is for this reason — flexibility of fire missions — that Hachiman continues to offer this loading system.

HISTORICAL BACKGROUND

The American-designed M2, and its predecessor the M1, found much favor in several allied armies for precision long-range bombardment. The weapon was used in World War II and after. Although no longer used by the US military, the Long Tom is still in use elsewhere in the world.

EVALUATOR'S COMMENTS

As a military historian, I consider myself lucky to have had the chance to test a famous weapon that was decommissioned before I joined the forces. The Long Tom has a somewhat illustrious reputation among artilleryists, and deserves it. While the separate charge does allow you to alter the range and trajectory, this system isn't as efficient as I would have expected. Accuracy seems to be at a maximum with a full charge, and to drop off rapidly if you change the charge.

A historical note: the name "Long Tom" seems to have been applied to at least two weapons, the M2 and the M59 155mm.

Capt. Tony Wallinger
USMC, Detached Duty

155 MM M2 GUN						
TECH	DAMAGE		S	RANGE		PRICE (VALUE)
	VALUE	AMMO		M	L	
21	30	1	—	1K-6K	25K	200K (27)
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT	MED.	LONG		
		0-5	15	40		

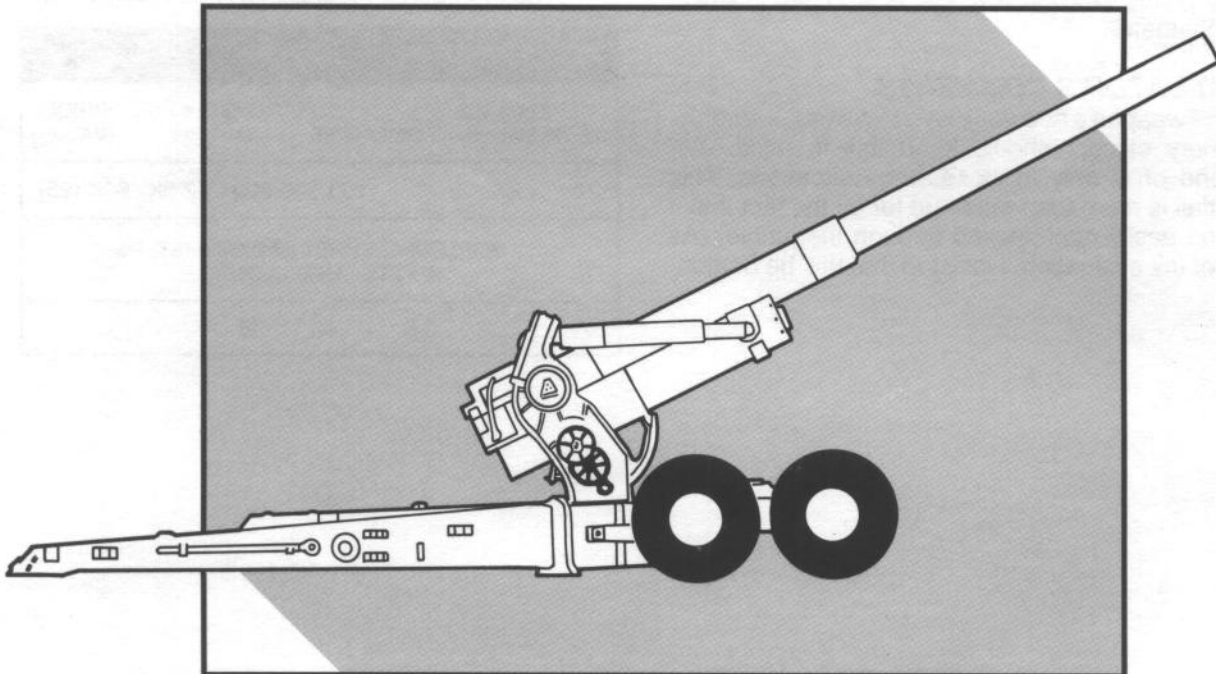


Illustration by C. Hunter

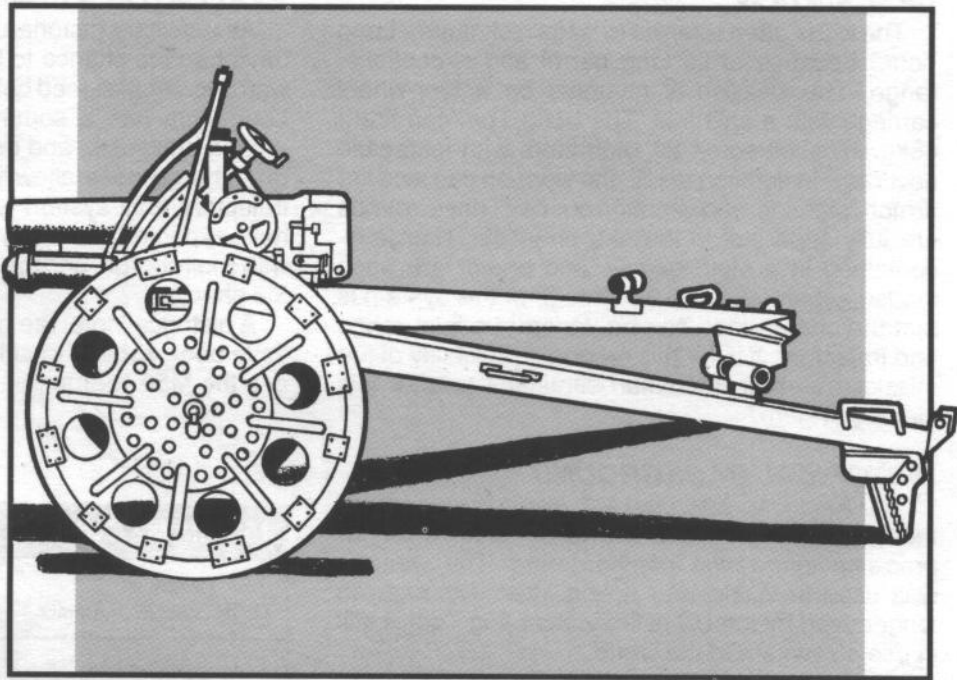


70MM TYPE 92 INFANTRY GUN

DESCRIPTION

This Japanese weapon was designed to provide support for infantry. Its barrel is only 58cm long, minimizing the gun's accuracy. Since it is intended for close-range engagements — at which it excels — this is not an issue.

The Type 92 is an incredibly portable weapon. It can be man-packed through the roughest terrain and set up quickly. When fitted with sheet steel wheels, the height of one or both wheels can be adjusted to suit the ground contours. The weapon fires semi-fixed ammunition, and HE, smoke, and armor-piercing rounds are available. For comparison purposes, the HE shell masses 3.8kg.



strated. The weapon was broken down, packed through 15 miles of African jungle, then reassembled. I am convinced.)

Field Major Memnet

Sixth Imperial Field Battery, Sudanese Front

HISTORICAL BACKGROUND

The Type 92 was widely used by the Japanese Army during World War II, and is still used in China and Vietnam.

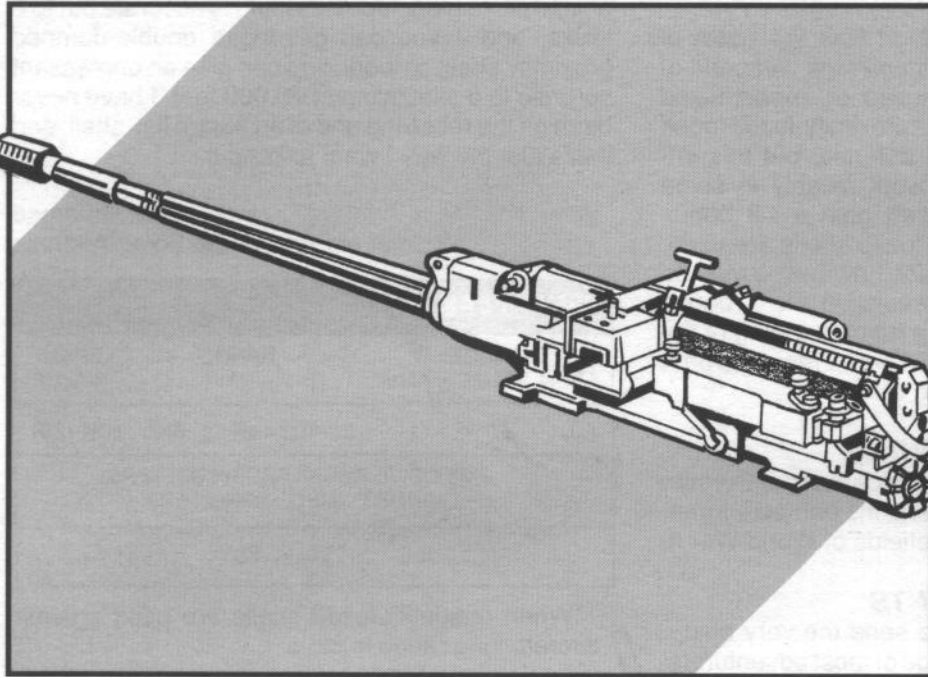
EVALUATOR'S COMMENTS

The weapon's accuracy is — in a word — terrible. Gunnery officers should keep this in mind, and depend on it only in close-range situations. This shortfall is more than made up for by the fact that it can be easily man-packed through the jungle. (As part of my evaluation, I insisted that this be demon-

70 MM INFANTRY GUN

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
21	27		1	100-300	500	2.5K	90K (25)
EXPLOSIVE BURST RADIUS (METERS)							
SHORT MED. LONG							
0-5 10 25							

KAA 20MM AUTOMATIC CANNON



Hispano-Suiza. Incremental enhancements of this design are still in use around the world.

EVALUATOR'S COMMENTS

Theory states that 20mm is to be considered the minimum caliber for an automatic cannon. Sure you can get 15mm weapons, but they're not worth the effort. The KAA is a typical Oerlikon design: well-thought-out and reliable as all hell. My one kick: Why doesn't anybody come up with an international standard for 20mm rounds? At Fort Bragg we have about two dozen different types of 20mm

cannon, and no two weapons use interchangeable rounds. Pain in the butt.

Sgt. Ted "Boomer" Nakamura
USMC Weapons Instructor, Fort Bragg

DESCRIPTION

The KAA 20mm cannon is a highly-refined example of the "blowback" design. Its mechanism is very similar to an enlarged machine gun, and thus is highly reliable. The KAA can accept two kinds of loads: a standard solid projectile, and a high-explosive incendiary shell. This second load is based on the US M50 series, designed for aircraft cannon. Caution: This more sophisticated round may not function reliably in the Nile Empire.

Both types of ammunition are belt-fed. The cannon can be mounted in an aircraft, either fixed-wing or rotary, or on a pintle mount on a vehicle or fortification.

HISTORICAL BACKGROUND

The Hachiman KAA is based primarily on a famous Oerlikon design, although some modifications have been borrowed from another Swiss firm,

KAA 20MM CANNON

TECH	DAMAGE		AMMO	S	RANGE			PRICE (VALUE)
	VALUE				M	L		
21	27/28*		8	3-400	2.5K	4K	75K (25)	

*The number before the slash refers to standard solid rounds. The number after the slash refers to the enhanced explosive rounds. These rounds are Tech Level 22, however. If the explosive rounds do not function because of a contradiction, the damage rating of the weapon drops to 26.

Illustration by A. McClellan



88MM FLUGABWEHRKANONE 36 (FLAK36)

DESCRIPTION

This famous German design was the basis of several anti-aircraft (AA) and anti-tank weapons of World War II. It fires time-fuzed or impact-fuzed rounds. Hachiman also offers a proximity-fuzed round specifically designed for air defense, but this improved technology will not work reliably in some realms. (Shots against aircraft gain a +2 bonus number modifier if proximity-fuzed shells are used. These shells are Tech Level 22, however. If they do not function because of a contradiction, the +2 bonus becomes a -2 penalty and the damage rating of the weapon drops to 21.) The Hachiman model is on a mobile mount with removable wheels.

advise picking one up. This thing is accurate out to 6 klicks, and if you can get those double-damned proximity shells to work, you can give an unpleasant surprise to a pilot flying at 26,000 feet. I have never been on the receiving end of an 88mm flak shell, and that's just the way I want to keep it.

Dirk Montrose
Soldier of Fortune, No Fixed Address

88MM FLAK 36

DAMAGE TECH	VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
20	27	1	50-600	4K	6K*	90K (25)
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
			0-5	15	35	

HISTORICAL BACKGROUND

The FLAK36 first entered service with the German military in 1936. Enhanced versions earned a formidable reputation on the battlefields of World War II.

EVALUATOR'S COMMENTS

When you care enough to send the very best... Probably well beyond the range of most adventurers' pocketbooks, but if you have the finances I strongly

*When proximity-fuzed shells are used against aircraft, long range is 8k.

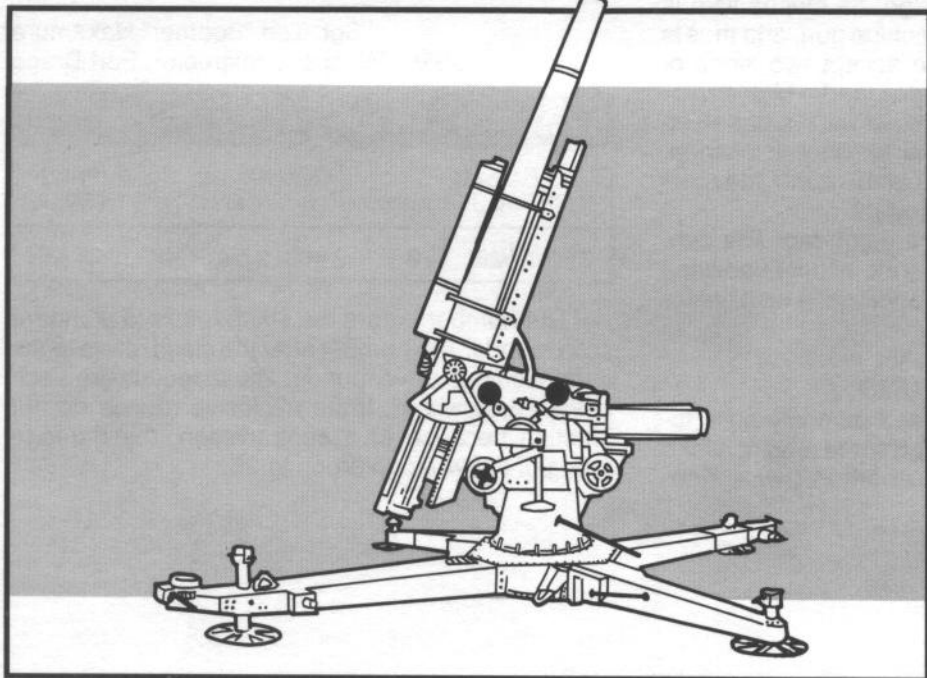


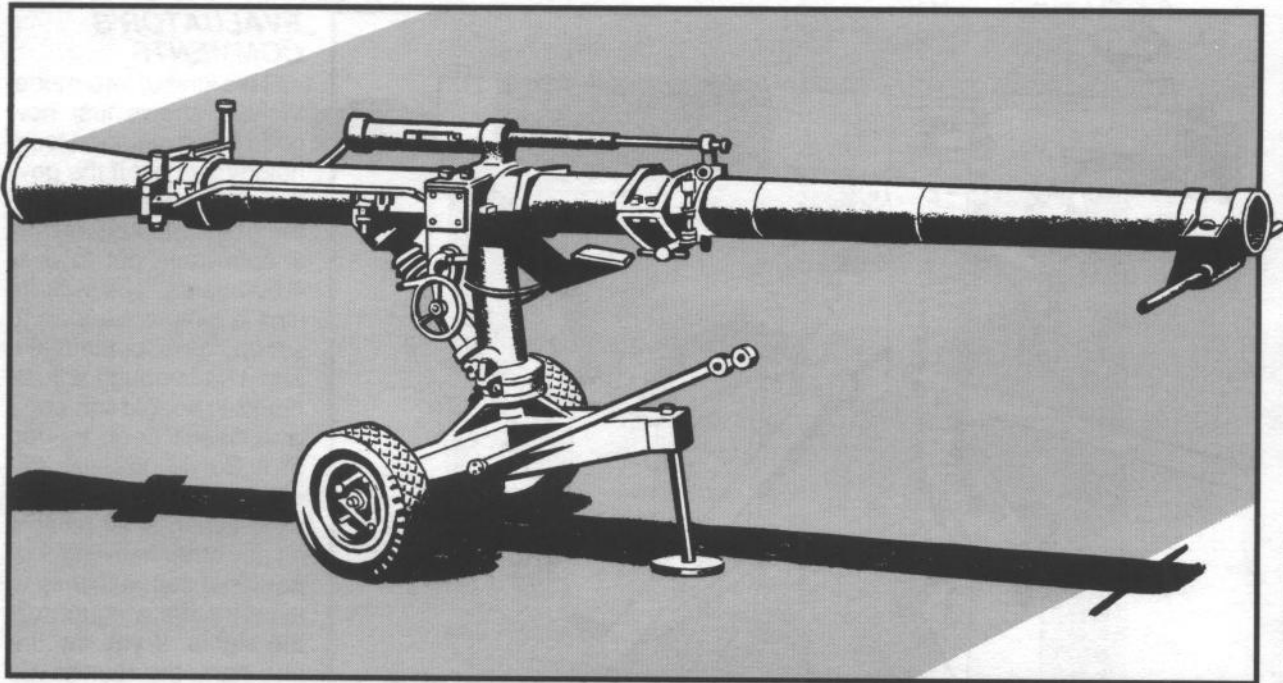
Illustration by C. Hunter



24



L6 WOMBAT ANTI-TANK GUN



DESCRIPTION

The British WOMBAT (Weapon Of Magnesium, Battalion Anti-Tank) is the premier choice among lightweight recoilless anti-tank guns. Through the use of alloys, the weight of the weapon is kept to a bare minimum (295kg). Its light carriage is not intended for towing; the weapon must be carried into action on a jeep. The weapon is 3.7 meters in overall length.

The WOMBAT fires a relatively high caliber projectile: specifically, 120mm. It is a recoilless weapon, based on the frangible base system. The WOMBAT can fire HE and HESH (High-Explosive, Squash Head) anti-tank rounds.

HISTORICAL BACKGROUND

Although the WOMBAT did not see service until after World War II, the various technologies involved could have been integrated in the late 1930s. The WOMBAT is currently being replaced by a guided missile system.

EVALUATOR'S COMMENTS

The HESH round will do nasty things to anything less than Chobham armor — which you're not going to get at this tech level — and the canister load is extremely nasty. Those are the good points. The bad point: backblast!! If you're directly behind the WOMBAT and within 14 meters of it, you're dead; sorry,

thanks for playing.* Oh yeah. Do not — repeat, do not — try firing this thing out through the window of a building or vehicle. You can figure out why.**

Dirk Montrose
Soldier of Fortune, No Fixed Address

WOMBAT ANTI-TANK GUN

TECH	DAMAGE VALUE	AMMO	RANGE		PRICE	
			S	M	L	(VALUE)
21	25	1	3-200	600	1K	25K (22)
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
			0-5	10	15	

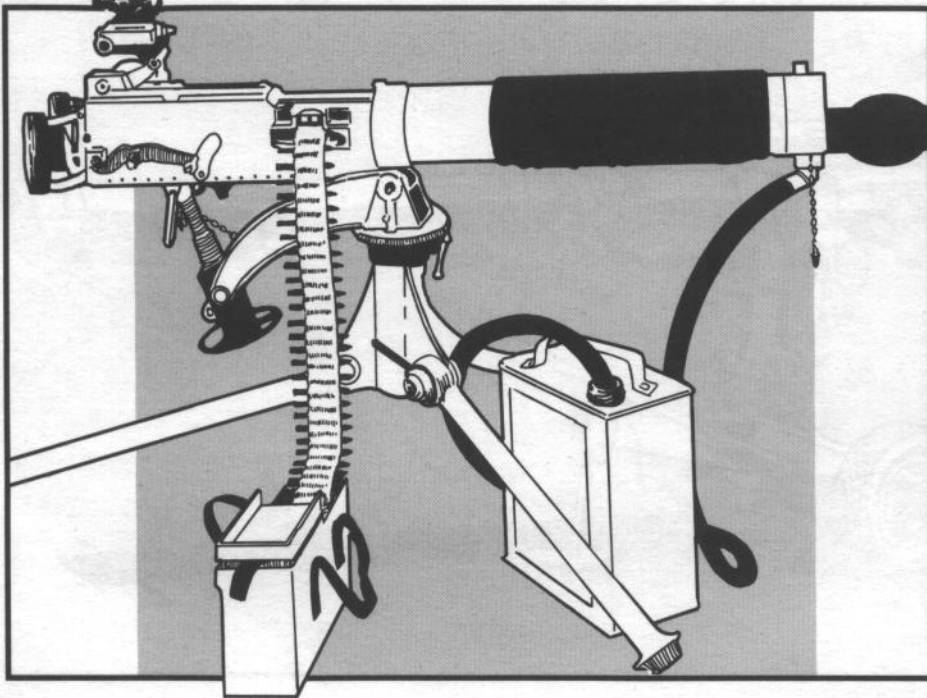
*Anyone within a 10°-wide cone extending 100 meters from the rear of a WOMBAT suffers an attack with the following damage rating:

0-14 meters	17
15-32 meters	11
33-100 meters	8

**If the backblast is contained within a room of less than 10,000 cubic meters — which equates to a cubic room about 21.5 meters on a side — it will inflict overpressure damage on anyone within that room, regardless of whether the victim is within the actual cone of the backblast. Anyone within the room will suffer an attack with damage value 16. Within the room and within the backblast cone of the weapon, apply damage value 24.



VICKERS MK 1 HEAVY MG



EVALUATOR'S COMMENTS

This kind of late-model Vickers shows just how good British weapon technology can get if the government keeps its nose out of things. Accuracy is unbelievable out to over 4,000 yards. The Vickers isn't a simple weapon to set up, "tune" or maintain, and it has enough adjustments to boggle someone who hasn't been trained on it. But its impressively-engineered recoil-principle action is as reliable as any other heavy MG. A personal suggestion is to avoid tracers, and just trust the sights. If you lay the gun right, the rounds will end up just where you in-

tend them to, and nobody will see where the fire's coming from.

Lance Cpl. Billy Morris
BAOR (Detached Duty)

DESCRIPTION

The epitome of World War II technology, the Vickers Mk 1 is an exceptional water-cooled belt-fed crew-served heavy machine gun. The cooling sleeve is equipped with a steam recycler and condenser, minimizing the requirement for continued water supply. Without its tripod mount, the 1.2-meter-long weapon masses 40.2kg. Firing Mk8z-class .303 caliber ammunition, the Vickers clocks an impressive 500 rounds per minute. The Hachiman Vickers includes an advanced feature found only on some post-War models: a dial sight, allowing the gunner to fire by compass bearing.

HISTORICAL BACKGROUND

This British weapon appeared on the battlefield in 1912, but underwent steady improvement until its retirement from the British Army in 1965.

VICKERS MK 1

DAMAGE		RANGE			PRICE	
TECH	VALUE	AMMO	S	M	L	(VALUE)
21*	24*	20	3-100	1K	4.5K*	5000(19)*

*These values are different from those in the *Torg Rulebook*. This is because the *Rulebook* refers to the early (1912-vintage) Vickers; these statistics refer to the improved version.





27

BROWNING M2 .50IN AIRCRAFT MG

DESCRIPTION

The Hachiman version of the venerable Browning M2 is an exceptional aircraft machine gun, designed for easy mounting in turret or wing. Massing only 29.5kg, and 1.2 meters in length, it requires virtually no modification to any aircraft design. The Browning is air-cooled, minimizing "support" engineering, but is still capable of a punishing 800 rounds per minute rate of fire. When used against aircraft of a similar technological level, the .50 inch (12.7mm) rounds are highly effective.

HISTORICAL BACKGROUND

The Browning M2 was perhaps the most widely-used aircraft machine gun of World War Two, and earned an impressive reputation as a "plane killer."

EVALUATOR'S COMMENTS

I laughed when I saw this thing. Compared to the M61-A1 Vulcan 20mm cannon I've got in my F-16 Falcon back home, this thing was a frecking toy... I

thought. Then they let me take up their weapons trainer — a modified Supermarine Spitfire with quad Brownings — and it wasn't funny any more. Sure, my M61 has a rate of fire of 100 rounds per second, as opposed to 800 per minute, but the requirements of low-speed maneuvering and more fragile airframes removes the difference. The quad Brownings could reduce the training drones to toothpicks, and they were equally useful for Air-to-Ground strafing. I'm not going to trade in my M61, but if you can't use high-tech toys, the Browning is one hell of a good weapon.

Lt. Thomas "No Fun" Bainbridge
USAF

BROWNING AIRCRAFT MG							
TECH	DAMAGE		S	RANGE			PRICE (VALUE)
	VALUE	AMMO		M	L		
21	25	11	3-250	1K	2K	1500 (16)	



Illustration by A. McClellan

TELLERMINE 35 ANTI-TANK MINE

DESCRIPTION

The Tellermine 35 is a particularly lethal anti-vehicular weapon. Only 32cm in diameter and 5cm thick, this disk-shaped mine still contains 5.4kg of TNT. The mine's primary igniter requires a pressure of 113kg, ensuring that it will detonate only when a vehicle passes above it. In the Hachiman model, a secondary igniter incorporating an anti-lifting device will detonate the mine if an enemy attempts to dig it up.

HISTORICAL BACKGROUND

The Tellermine 35 was the standard German anti-tank mine of World War II. This successful design has been widely copied by other manufacturers, and these "offspring" of the Tellermine 35 are still used in many parts of the world.

EVALUATOR'S COMMENTS

Good punch: enough to blow the track off a Nile Aperehen tank, and to turn a jeep into scrap metal. It's made of steel, unfortunately, which means your

enemy can find it easily using an electro-magnetic detector. (Of course, the anti-tamper stuff makes disarming it a dicey proposition.) Oh, and don't be too sure it's only go boom under a vehicle. Remember, 113kg is only 250 pounds. A fat shocktrooper in full pack can weigh more than 250 pounds easy.

Dirk Montrose
Soldier of Fortune, No Fixed Address

TELLERMINE MINE

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
21	27		1	—	—	—	300 (13)
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-6	8	10			

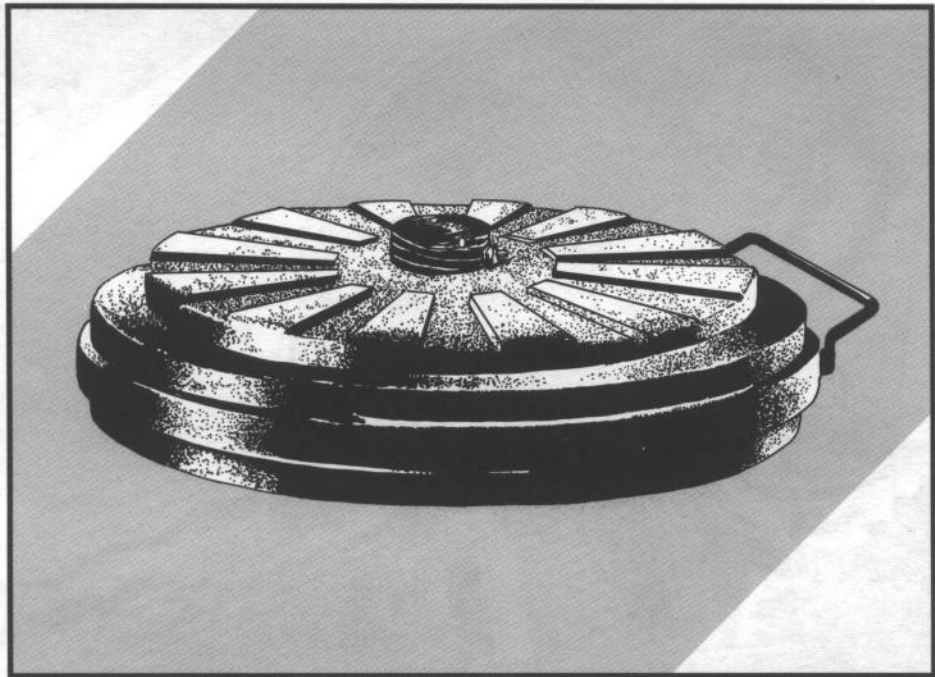


Illustration by C. Hunter

11 785364 22 28

CAT. NO. 74-328521

ELIA MINE

DESCRIPTION

The highly effective Elia mine is a moored type designed to be laid by being dropped from the deck of a ship. Using an ingenious "sinker" mechanism, the mine automatically moors itself at the desired depth below the surface. The process is as follows: The mine itself, which incorporates a buoyancy chamber containing air, floats on the surface while its sinker mechanism sinks to the bottom, unreeling a cable as it does so. When the sinker mechanism reaches the bottom, a pre-set length of the cable is automatically reeled in, pulling the mine itself underwater, and fixing it at the prescribed depth. The Hachiman Elia mine contains 100kg of TNT, and is detonated by an impact fuze when struck by a surface vessel or submarine.

HISTORICAL BACKGROUND

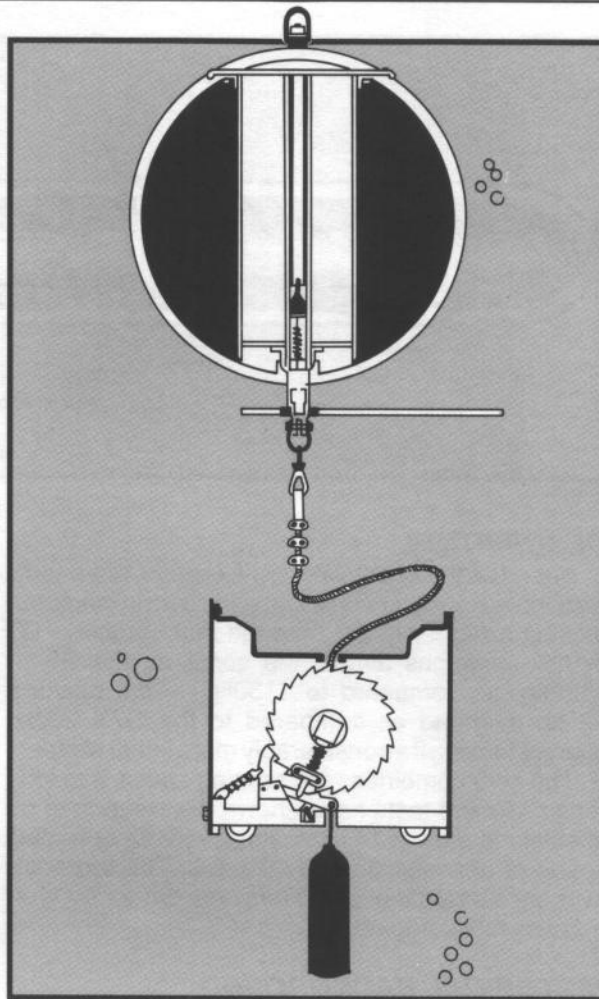
The Elia mine is a British design, used widely in World War II. Like other moored mines, it is considered a strategic — rather than a tactical — weapon, and is an essential part of any blockade.

EVALUATOR'S COMMENTS

The Elia combines good and bad features. It's a moored mine, which means it can be cleared by physical "sweeping." It's impact fuzed, so it can't be cleared by "influence sweeping." It's metallic, so it can be detected electromagnetically. It's just as deadly against non-magnetic (i.e., wooden-hulled) ships as against metal "cans." The automatic sinker mechanism is a stroke of genius, and seems to work reliably. The charge is powerful enough to do significant damage to any vessel unfortunate enough to hit it.

On the whole, this is one hell of a good mine.

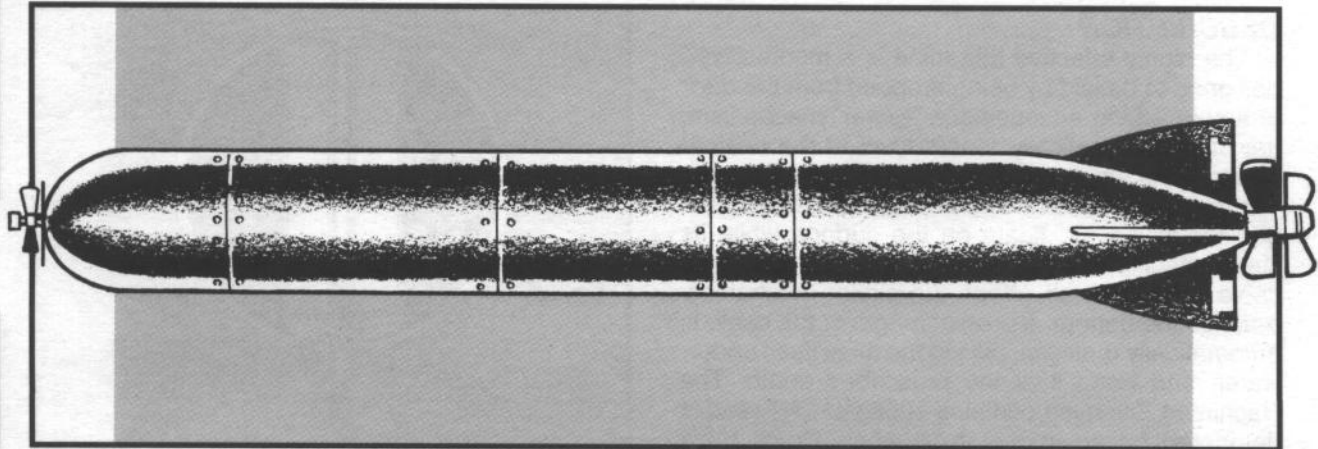
Lt. Cmdr. Roderick Blair
Canadian Armed Forces
HMCS Discovery Naval Training Base



ELIA MINE

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
20	30		1	—	—	—	4000 (18)
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT		MED.		LONG	
		0-3		10		40	

MK9 MOD TORPEDO



30

DESCRIPTION

Based on the British Mk9 Mod torpedo, this deadly weapon is 6.2 meters in length and 70cm in diameter, making it slightly larger than the more primitive G7 model. It weighs almost the same as the G7 — 1132kg, as compared to 1130kg — but packs a 527kg warhead as compared to the G7's 200kg charge, making it a considerably more lethal weapon.

The Mk9 combines high running speed with long range. Recent tests have shown the weapon to be effective at almost 14 kilometers, with an operating speed of between 35 and 40 knots. The torpedo's twin contra-rotating propellers are driven by a 4-cylinder radial engine.

HISTORICAL BACKGROUND

The Mk9 Mod saw service in World War II, and was equally effective when launched from shipboard or from a submarine.

EVALUATOR'S COMMENTS

This thing's one hell of a lot better than the barbaric G7, but it's still not the most reliable of weapons. A range of 8 nautical miles and speed of 35

knots (do not believe the 40 knot figure) makes it a more useful weapon, but remember it still doesn't have any guidance. Its 500kg warhead is more than twice the size of our Mk48 warhead, but the yield is much lower simply because of the explosive used.

Capt. Bartholomew (Bart) Glenn
USS Dallas (688-class attack sub)

MK9 TORPEDO

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
21	31		1	—	500-1K	13.5K	200K (27)
EXPLOSIVE BURST RADIUS (METERS)							
SHORT MED. LONG							
0-15 50 100							

(UNDERWATER ONLY)

The weapon suffers a -1 penalty to hit at all ranges if used against a moving target.

WEAPONS OF CORE EARTH

This section describes weapons that will function in the environment of "Core Earth" — that is, those areas of the world that are not part of another "realm." The weapons listed here are all fully tested and in standard production. (In comparison, the more advanced weapons described in the next chapter are generally experimental or prototype products. For this reason, there is some chance that they will not work reliably on some battlefields.) Since Hachiman Arms is a division of the larger Kanawa Corporation, they are able to mass produce these weapons much more ably than their competitors.

While many "Core Earth" nations may seem to be lower in technological development than other Core Earth nations, Hachiman Arms wishes to keep its products on the "cutting edge" of local technology. Therefore, most of the weapons printed in this section are the most advanced of Core Earth's development. If you wish to acquire weapons that are not quite as developed, or have older equipment in need of repair and maintenance, Hachiman Arms will be more than happy to provide such equipment.

AUTONOMOUS SELF-GUIDED AND "SMART" WEAPONRY

Despite some wide-spread confusion on this point, there is a significant difference between autonomous self-guided and "smart" (precision-guided) munitions. A truly self-guided weapon has some autonomous target acquisition and tracking capability. In essence, the gunner or operator fires the weapon in the general direction of the target, and the weapon then handles at least some of the guidance — generally the terminal phase — by itself. With an autonomous self-guided weapon, as long as the operator fulfills some minimal requirements — such as keeping the fire control radar "lit off," as in the case of a Phoenix air-to-air missile — the weapon will continue to home on the target. The performance of the gunner or operator obviously has some significance. If the weapon is aimed directly at its target when it is fired, obviously the "intercept solution" is simpler, and the weapon has a better chance of hitting. But the weapon can make up for certain levels of sloppiness by the gunner.

In contrast, a "smart" weapon or precision-guided munition (PGM) generally requires considerably more participation either by the gunner or by a forward

observer. Generally, a PGM will home in on a target that is being "painted" by a laser designator. To be precise, the PGM does not home in on the target; it homes in on the reflected spot of laser light. If the forward observer "paints" a tank, the PGM will hit the tank; if the FO paints a tree next to the tank, the weapon will hit the tree. This implies that the accuracy of a PGM is considerably more dependent on the actions of the forward observer or the gunner than is an autonomous self-guided weapon. This is reflected in *Torg* by the following mechanics.

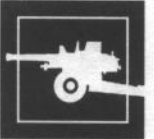
AUTONOMOUS SELF-GUIDED WEAPONS

These weapons have a guidance value that is equivalent to a character's *heavy weapons* value. When a character fires an autonomous self-guided weapon, the player rolls the die twice. Once, he generates a bonus and adds it to his character's heavy weapons value. The other time, he generates a bonus and adds it to the weapon's guidance value. The player then uses the better of the two results.

This reflects the facts discussed above. By aiming carefully, the character can aid the weapon (which is the case if the character's total is greater). Alternatively, even if the character is sloppy, the weapon can "pick up the slack" (which is the case if the weapon's total is greater). In general, this will make autonomous self-guided weapons inhumanly accurate... which is just what they are. These weapons are identified by the designation ASG.

PRECISION-GUIDED MUNITIONS

These weapons have no autonomous "intelligence" of their own. Their accuracy depends entirely on the forward observer or the gunner — whoever is responsible for "painting" the target. It makes no difference how accurately the gunner aimed if the FO "paints" the tree rather than the tank. Conversely, even the sloppiest gunner will get the weapon close enough to the target for the weapon to pick up the laser signature. PGMs are more accurate than "dumb" weapons, however, and this is reflected by a "precision bonus" these weapons receive. This bonus — ranging from +4 to +10, depending on how easy it is to designate the target — is added to the total generated by the FO or gunner. In addition, PGMs



are ideal for "vital blow" attacks — such as sending a laser-guided bomb down an air shaft. To reflect the precision of these weapons, when a "vital blow" attack is selected, the acting value for the hit is decreased by 5 (not the usual 8), while the damage value is increased by 4.

The individual weapon description will state whether it is the FO or the gunner who is responsible for the guidance. If a FO is required, this character must possess the heavy weapons skill. These weapons are identified by the designation PGM.

MISSILE SPEED

For regular firearms and artillery pieces, range is generally so short compared to projectile speed that the weapons are close to "real-time." In other words, the delay between firing the weapon and projectile impact is negligible. This is not the case for many missiles. While these weapons are fast, their range is so great that the time lag between firing and impact is considerable. There are some situations where the operator must keep this time lag in mind when devising a tactical or operational plan for using such weapons. To provide the prospective buyer with relevant information, entries on missiles and similar weapons include projectile speed.

In most cases, flight time will not be an issue. Sometimes it does become important, however — for example, if a bad guy hoses off a missile at the plane containing the Storm Knights, and you as gamemaster have to figure out how many rounds the PCs have in which to evade the missile or eject. Divide the range in meters by the speed in meters per second, to get the flight time in seconds, then divide by 10 to determine the flight time in rounds.

OTHER WEAPONS SYSTEMS

If there are other weapons systems in use in the world today that are not described in this section, the gamemaster and the players should use this section as a guideline for determining mutually satisfactory rules systems. As new weapons are brought to our attention, they will be added to the world of the "Near Now."

HACHIMAN ANNOTATION:

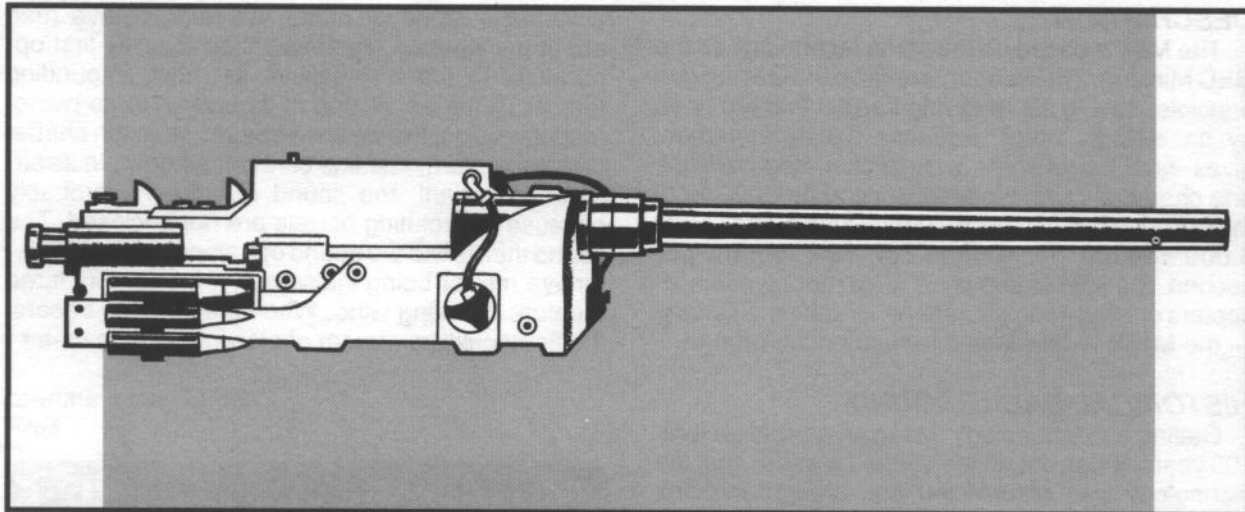
When you are considering updating or expanding your arsenal for defense, be sure to take all the factors into consideration. While many of these weapons are available from smaller companies around the world, the intelligent consumer must realize that these companies have undergone serious upheaval since the Invasion. Of all the mass-market weapons manufactures, virtually all but Kanawa's Hachiman Arms Division has experienced — first hand — the devastations caused by the invaders.

While Hachiman Arms looks forward to a time when these companies can undergo restructure and reorganization, and thus reenter the field of arms sales, it is not now time to risk your investments — and your lives — on companies that may not be able to fill your defense needs. Ask yourself this question: will they be around tomorrow, or next week, when you need replacement parts, ammunition or on-the-spot servicing? Be smart. Be safe. Stick with Hachiman Arms, a division of the Kanawa Corporation.



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ADEN 30MM CANNON



DESCRIPTION

The Aden aircraft cannon uses a revolutionary design — a belt-fed five-chambered revolver, operated by recoil and a gas piston — to deliver an astonishing rate of fire of 1200 to 1400 rounds per minute. The weapon is compact — only 1.6 meters long — and masses only 87kg.

HISTORICAL BACKGROUND

The British Aden first appeared on the scene in the 1950s, and is still in use in many planes, including the Hawker Harrier. The Aden is a development of a German design.

EVALUATOR'S COMMENTS

Okay I'll admit it, I always liked a high rate of fire like with the M61 used in lots of American planes. Throw a lot of lead, you'll score some kills. But now

I've flown a Hachiman T-38 trainer equipped with twin Adens, and I'm not so sure. The Aden has a lower rate of fire — 20 rounds per second compared to 100 — but it's got a longer accurate range. Plus, a 30mm slug hits a lot harder than a 20mm. I'm not totally convinced, and I still love the way my old M61 howls when it cuts loose.

But the Aden is one hell of an effective cannon.

Lt. Barry ("Widowmaker") Jacks
USAF

ADEN 30MM CANNON

DAMAGE	TECH	VALUE	AMMO	RANGE			PRICE (VALUE)
				S	M	L	
22	30	10	3-400	2.5K	4K	100K (25)	

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M61 A1 20MM CANNON

DESCRIPTION

The M61 is based on the same technology as the GEC Minigun. The weapon works on the Gatling gun principle, having six revolving barrels that are spun by an electric motor. Because this arrangement gives each barrel some time to cool, and because one chamber can be loaded while another is firing, the M61 develops a literally unbelievable rate of fire: 6,000 rounds per minute, or 100 rounds per second. The M61 is designed to be mounted in helicopters or fixed-wing aircraft. An air-defense version — the M168 — is adapted for use on the ground.

HISTORICAL BACKGROUND

Gatling gun technology has been around for over 100 years. It was only in the 1960s, however, that the technology was resurrected and brought into the high-tech age.

EVALUATOR'S COMMENT

This weapon, often called the Vulcan cannon, literally fills the air with bullets, inundating its target in

a veritable storm of metal. Although I have read about the weapon, this evaluation was my first opportunity to fire it. I believe its most astounding feature to the uninitiated is its sound. In its plane-mount version, the weapon doesn't so much chatter (like a standard machine cannon) as howl. In its air-defense variant, the sound is different, probably because the rotating barrels are not enclosed. The sound then is like the sound of a zipper opening or — forgive me for being indiscreet — some very large creature breaking wind. When loaded with tracers, the fire looks like stream of glowing, molten metal.

Capt. Gerald Harkness
RAF

M61 A1 CANNON

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
22	29		6	3-400	2K	3K	80K (25)

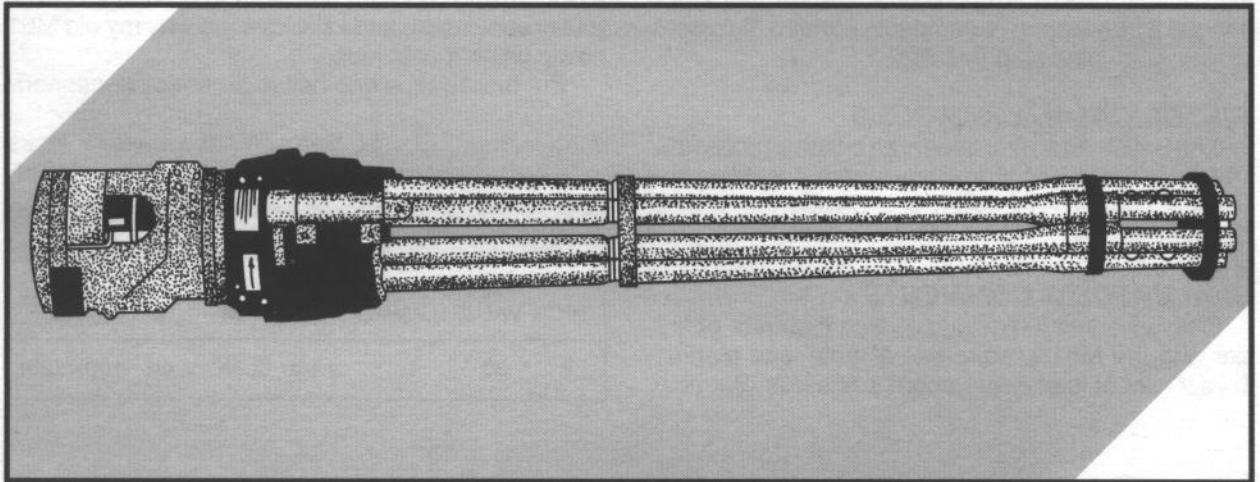
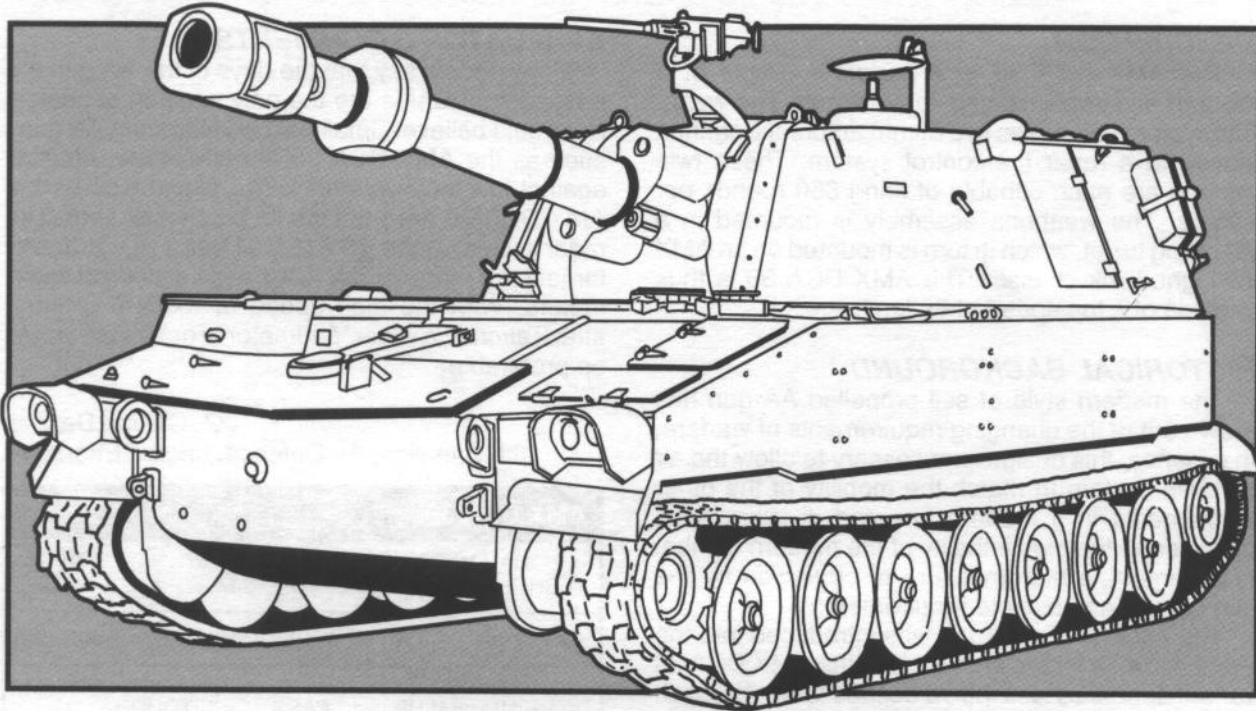


Illustration by C. Hunter

CAT. NO. 74-334521

150MM M109A1 SELF-PROPELLED MEDIUM HOWITZER



35



DESCRIPTION

The 150mm M109A1 is a highly effective self-propelled gun (SPG). In fact, it has become the most important of America's SPGs. The howitzer itself is mounted on a tracked armored chassis powered by a turbocharged diesel engine. With a total mass of about 23 tons, the weapon is capable of a top speed of 55 km/h. The enclosed turret is capable of 360° traverse, and protects the crew against chemical and light conventional weapons, and even against some nuclear weapon effects.

The 150mm howitzer uses separate-loading rounds, and can fire HE, chemical and canister shells. The M109 is also capable of firing special-mission shells, such as the Copperhead CLGP, and even tactical nuclear rounds. The weapon can fire a 43kg shell to a maximum range of 18 kilometers.

HISTORICAL BACKGROUND

The M109 was introduced into the US armed forces in 1962. Since then, over 3,000 units have been built, and many have been exported worldwide. In Vietnam, the M109 was widely used by both the US Army and Marine Corps. A later variant, the M109A1 — on which the Hachiman model is based — extended the maximum range of the weapon from about 14,600 meters to 18,000 meters.

EVALUATOR'S COMMENTS

People inexperienced with actual battery doctrine

seem to think separate shell and propellant is a dumb, inconvenient way to go. Just the opposite: it's real smart, and adds to the versatility of the weapon. If you plan ahead, you can use the good ol' M109 to plant two shells on the same target simultaneously. How? Use a small charge to fire the first shell on a high, slow trajectory. Then use a full charge to fire another shell on a fast, flat trajectory. If you've figured it out right, both shells arrive at the same time.

Lt. Col. James Whittaker
USMC (Ret.)

150MM HOWITZER						
TECH	VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
22	33	1	400-1K	8K	18K	500K (29)
SPEED		PASS.	TOUGH			
KMH/MPH/VALUE						
55 / 35 / 11		4	25			
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT	MED.	LONG		
		0-5	15	40		

The weapon can land two shells simultaneously on any target at a range between 8k and 16k meters. The two attacks are resolved separately.

Illustration by C. Hunter

AMX DCA 30 ANTI-AIRCRAFT GUN

DESCRIPTION

The AMX DCA 30 is a perfect example of a modern and sophisticated light AA gun. The weapons system comprises two 30mm automatic cannon slaved to a radar fire-control system. These twin cannons are each capable of firing 650 rounds per minute. The weapons assembly is mounted in a revolving turret, which in turn is mounted on an AMX 13 Light Tank chassis. The AMX DCA 30 is thus capable of a top speed of 69 km/h.

HISTORICAL BACKGROUND

The modern style of self-propelled AA gun has grown out of the changing requirements of warfare. In essence, this design is necessary to allow the air defense system to match the mobility of the other components in a modern armored division. Also, considering the high lethality of the modern combat environment, a high measure of protection for the gun crew is an absolute requirement.

The AMX 13 Light Tank was introduced into the French armed forces in 1952, and the AMX DCA 30 variant appeared less than a decade later. Although considerably older than some comparable systems, the AMX DCA 30 continues to enjoy acceptance worldwide.

EVALUATOR'S COMMENTS

Many people say that the days of the AA gun are passed, that SAMs are the only weapon of choice. Not true, I believe. Small-caliber, fast-firing AA guns such as the AMX DCA 30 are still highly effective against low-level air attack. The electronics on the AMX DCA 30 are perhaps its only weak spot. The radar system — the RD 515 Oeil Noir 1 — can detect targets to a range of only 12km at an altitude of 3,000 meters. With the high speed of modern ground-attack aircraft, a wider "perimeter of detection" would be preferable.

Lt. Claude Devries
6th Battalion, Air Defense, Legion Étrangere

AMX DCA 30

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
22	30	10	3-400	2K	3K	500K (29)	
SPEED KMH/MPH/VALUE			PASS.	TOUGH			
60 / 37 / 11			4	25			

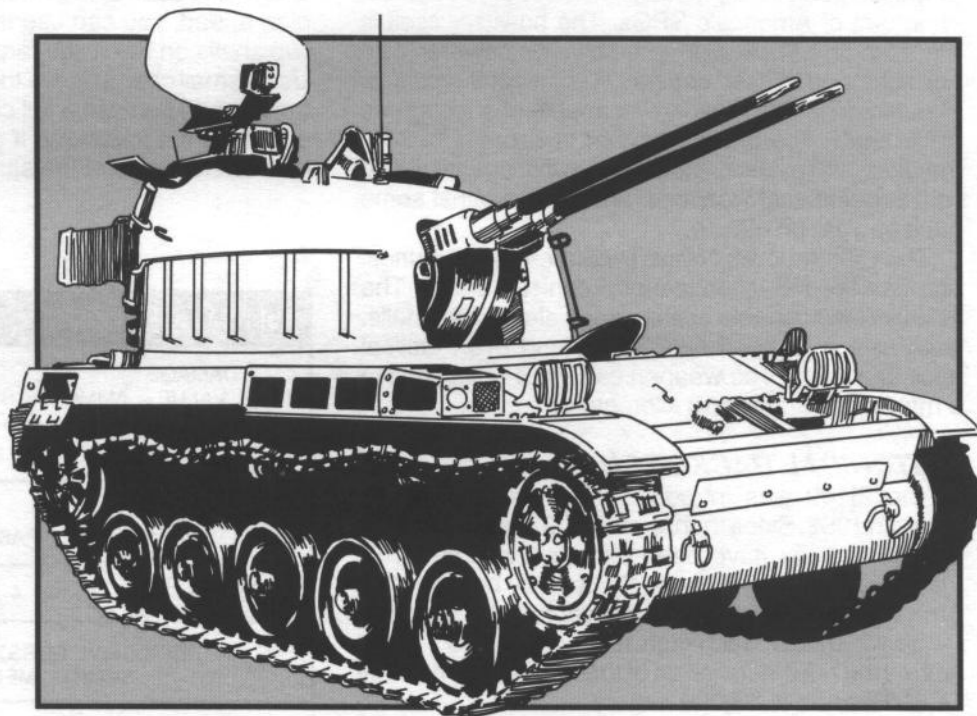
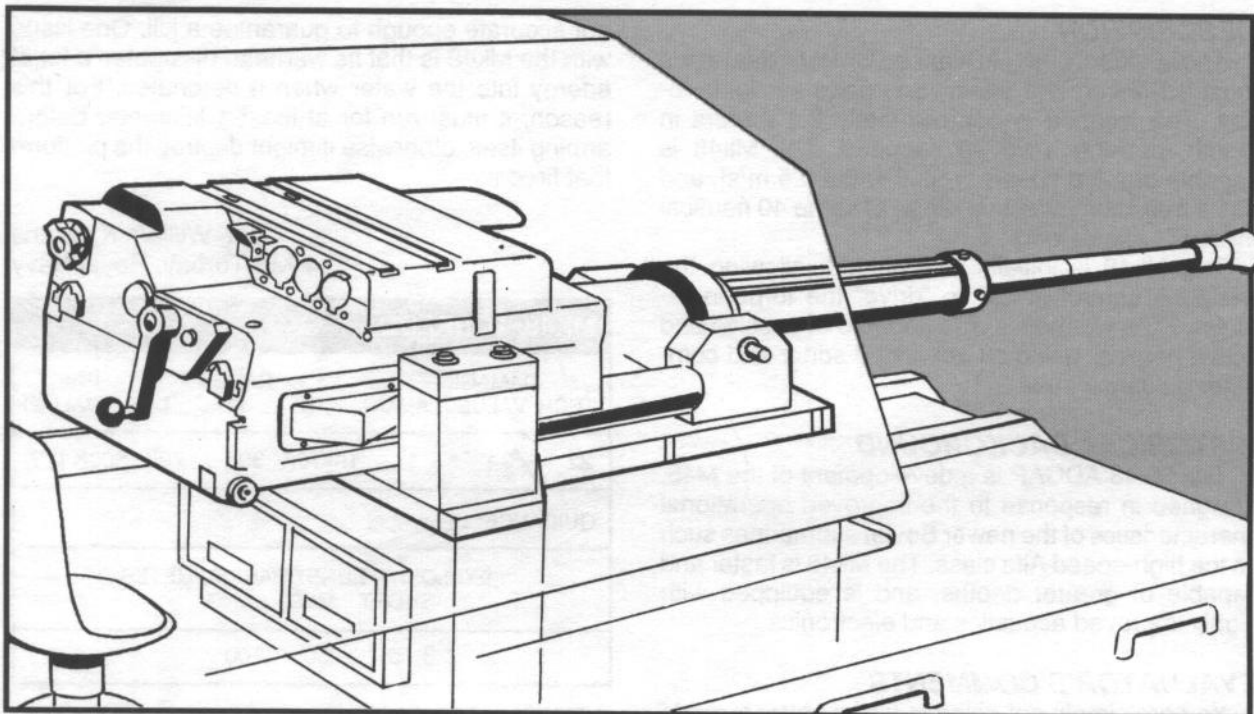


Illustration by C. Hunter

CAT. NO. 74-336521



RARDEN 30MM LIGHT AFV CANNON



DESCRIPTION

The Rarden 30mm cannon is an ideal weapon for mounting on a light tank, armored car or APC (Armored Personnel Carrier). It emphasizes accuracy over rate of fire; in fact, its ROF is a comparatively slow 90 rounds per minute. The weapon is powerful enough to penetrate the armor of APCs, and even the side armor of main battle tanks (MBTs). The gun accepts "clips" of three rounds, which are loaded from the rear. Hachiman selected the Rarden design because of its compactness. The weapon intrudes much less into the crew's fighting compartment than does any other comparable design.

HISTORICAL BACKGROUND

The Rarden 30mm cannon is the British Army's choice as the automatic cannon for light Armored Fighting Vehicles (AFVs). It entered service in 1974.

EVALUATOR'S COMMENTS

I'm a tanker. I command an M1 Abrams MBT. And would it terrify me to be in some tin can of a light AFV and have anything smaller than my trusty 105mm

main gun available to me. A 30mm cannon? Give me a break.

Now that's out of the way, the Rarden is one heck of a nice design. It's small and doesn't get in the way, and it's very reliable. Accuracy isn't as good as the M1's 105mm, but that's to be expected: the Rarden just doesn't have the same electronics. A 30mm shell will penetrate an APC's armor, but this bunk about penetrating an MBT's side armor is dangerously misleading. Unless the enemy tank commander has done something seriously wrong, you won't get that side shot. If you do get it, make sure it counts. You won't get a second one.

Sgt. Chris Lambett
11th Armored Cavalry Regiment, US Army

RARDEN 30MM LIGHT CANNON

DAMAGE	TECH VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
22	27	3	3-400	2K	3.5K	100K (25)

MK48 ADCAP TORPEDO (ASG)

DESCRIPTION

The Mk48 ADCAP (ADvanced CAPabilities) is the most advanced and effective torpedo available today. The weapon is approximately 2.1 meters in length, packing a 267kg warhead. The Mk48 is capable of a top speed of 52.5 knots [25 m/s], and has a maximum effective range of some 40 nautical miles (71 kilometers).

The Mk48 is initially wire-guided, allowing the weapons control officer to "drive" the torpedo remotely. The weapon is also capable of passive and active homing, using an advanced sonar and computer guidance suite.

HISTORICAL BACKGROUND

The Mk48 ADCAP is a development of the M46, designed in response to the improved operational characteristics of the newer Soviet submarines such as the high-speed Alfa class. The Mk48 is faster and capable of greater depths, and is equipped with highly improved acoustics and electronics.

EVALUATOR'S COMMENTS

You are simply not going to find a better torpedo in the world today. Our own Spearfish is a faster weapon, topping out at over 60 knots, but its directed energy warhead is smaller and its guidance system

not accurate enough to guarantee a kill. One issue with the Mk48 is that its warhead dissipates a lot of energy into the water when it detonates. For this reason, it must run for at least 1 kilometer before arming itself; otherwise it might destroy the platform that fired it.

Capt. William K. Morris
HMS Torbay, Royal Navy

MK48 TORPEDO

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
22	34		1	1K-10K*	30K	70K	500K (29)
GUIDANCE: 14							
EXPLOSIVE BURST RADIUS (METERS)							
SHORT MED. LONG							
		0-15	50	100			

(UNDERWATER ONLY)

*The Mk48 cannot be used against a target less than 1k from the firing platform.

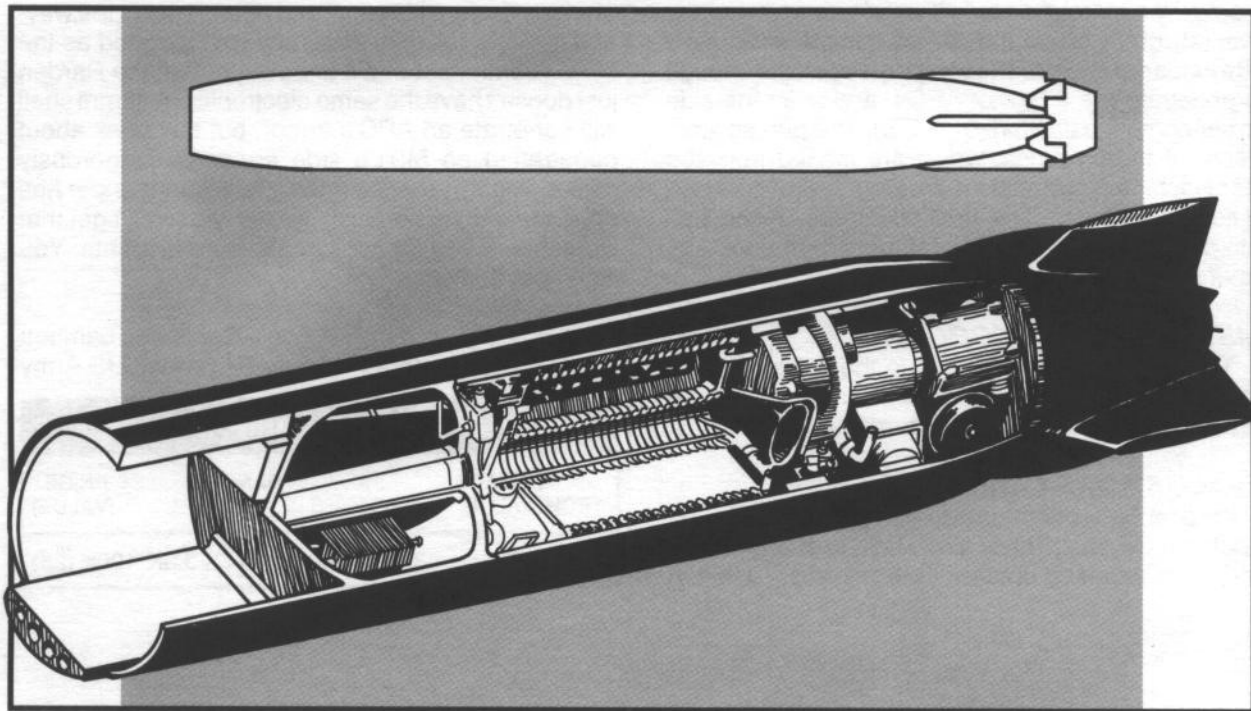
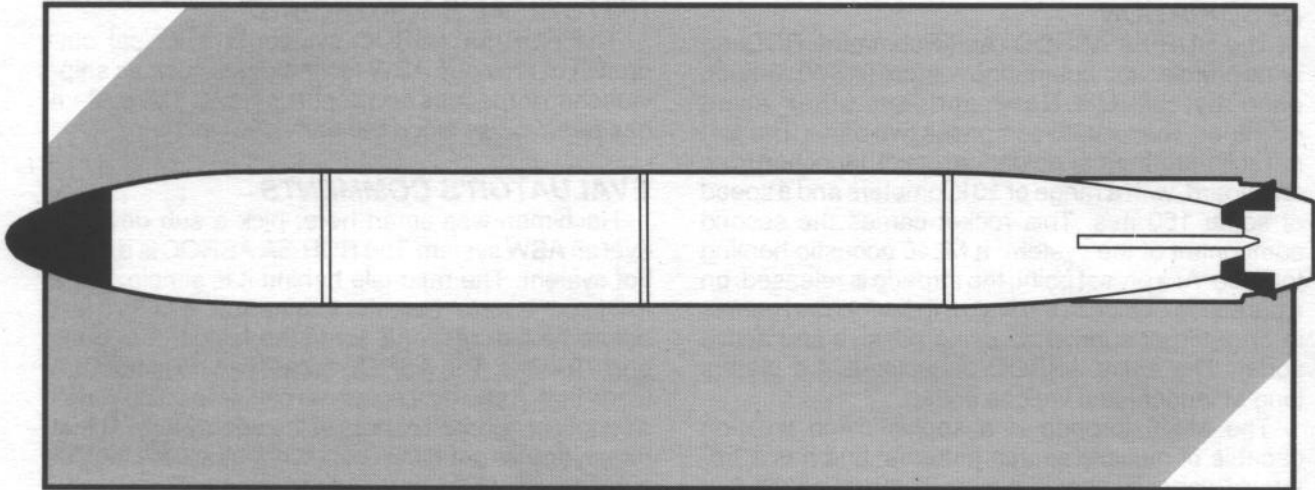


Illustration by C. Hunter



38

SPEARFISH TORPEDO (ASG)



39

DESCRIPTION

The British Spearfish torpedo is an example of a new philosophy in anti-ship and anti-submarine design. Unlike the standard type of torpedo, such as the Mk48, the Spearfish carries only a small warhead, massing only 45kg. This warhead is, in essence, a shaped charge, or "directed energy" charge, however. Instead of dissipating energy equally in all directions, it focuses the energy of its detonation in a narrow path so as to "punch through" the hull of a target vessel. Partially as a result of this much smaller warhead, the Spearfish is capable of speeds in excess of 60 knots (106 km/h; 30 m/s).

HISTORICAL BACKGROUND

Like the Mk48, the Spearfish was developed in response to the introduction of high-speed and high-maneuverability Soviet submarines such as the Alfa. The directed energy warhead is designed to defeat the very strong titanium hull of the Alfa.

EVALUATOR'S COMMENTS

Like our Mk48, the Spearfish is a multiple-speed torpedo: cruising speed of about 40 knots, high speed of 60 knots, and capable of short "sprints" at about 70 knots. There is nothing in the sea that can outrun a well-planned Spearfish attack. The directed energy warhead is very effective, but there's a problem — one that we're seeing with our own directed energy fish, the Mk50 ALWT (Advanced Lightweight Torpedo). The guidance system must be incredibly precise, so the fish hits the enemy hull close to

perpendicular. Otherwise the directed blast will just glance off the hull. The Spearfish doesn't quite have the electronics necessary to do this.

One further advantage of the directed energy warhead is that the fish doesn't have to run so far before it can be safely armed. You can be within 300 meters of the detonation and not be damaged.

Capt. Bartholomew Glenn
USS Dallas

SPEARFISH TORPEDO

TECH	DAMAGE VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
23	34	1	300K-10K*	30K	70K	500K (29)
GUIDANCE: 12						
EXPLOSIVE BURST RADIUS (METERS)						
SHORT MED. LONG						
			0-3	20	25	

(UNDERWATER ONLY)

*The Spearfish cannot be used against a target less than 300 meters from the firing platform. To reflect the nature of the Spearfish's directed-energy warhead, the weapon suffers a -1 penalty to hit at all ranges. If it does hit, however, it decreases the armor adds of the target by 5.



RUR-5A ASROC (ASG)

DESCRIPTION

The RUR-5A ASROC (Anti-Submarine ROcket) is the premier anti-submarine warfare (ASW) weapon used by the US Navy and ten other allied countries. The system comprises two parts. The first is a solid-fuel inertial-guidance rocket, launched from shipboard, with a range of 10 kilometers and a speed of some 150 m/s. This rocket carries the second component of the system: a Mk46 acoustic-homing torpedo. At a preset point, the torpedo is released, on a parachute. Once in the water, it detects and homes in on a target submarine using passive and active sonar. The entire ASROC projectile is 4.4 meters long at launch, and weighs 458kg.

The Mk46 torpedo is a sophisticated weapon capable of multiple search patterns, and has a "re-attack" capacity should it miss its target on the first pass. Top speed is about 40 knots, and maximum range is approximately 40 kilometers [20 m/s]. The weapon is equipped with a 44kg warhead.

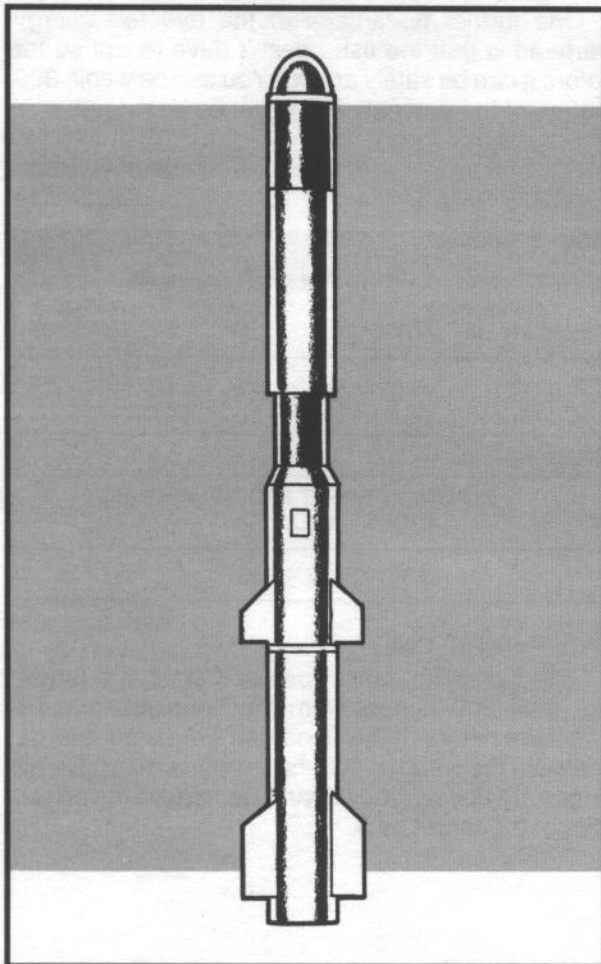


Illustration by A. McClellan

CAT. NO. 74-340521

HISTORICAL BACKGROUND

The RUR-5A ASROC system is a logical outgrowth of previous ASW technologies such as ship-launched torpedoes and depth charges. The system has been in use since the early 1980s.

EVALUATOR'S COMMENTS

Hachiman was smart here: pick a sub driver to eval an ASW system. The RUR-5A ASROC is a really hot system. The rationale behind it is simple: get a fish into the water near the enemy sub, and do it fast before he can respond. Even the fastest torp does only 70 knots. The ASROC rocket can do almost ten times that. If you do it right, you can drop a fish within a couple of hundred meters of the enemy sub. At that range, you've got him. There's not much the fastest sub and wiliest driver can do to evade.

Hachiman doesn't mention it, but the ASROC rocket has an alternate load. If you're feeling particularly militant, you can replace the Mk46 fish with a nuclear depth charge, and god help any sub within a couple of clicks of the detonation point.

Capt. Bartholomew Glenn
USS Dallas

RUR-5A ASROC

TECH	DAMAGE		RANGE			PRICE (VALUE)
	VALUE	AMMO	S	M	L	
23	32	1	1K-10K*	30K	70K	600K (29)
GUIDANCE: 12						
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT	MED.	LONG		
		0-15	30	80		

(UNDERWATER ONLY)

* "Range" here refers to the distance between the torpedo release point and the submarine target. The torpedo release point can be anywhere between 2k meters and 10k meters distant from the launching vessel.

VALMARA 69 MINE

DESCRIPTION

The Valmara 69 is a specialized anti-personnel mine of unequalled lethality. When the mine is triggered — either by a pressure plate or by an optional tripwire — a propellant charge detonates, firing the mine into the air. When it reaches approximately waist height, and anchor wire attached to the base still in the ground triggers the main charge. Because of this highly controlled air burst, the Valmara 69 can throw shrapnel up to 100 meters.

HISTORICAL BACKGROUND

The original "jumping mine" was the Sprengmine 44, a German anti-personnel mine of World War II. The Valmara 69 is an Italian design that keeps to the same concept as the Sprengmine, but incorporates several enhancements. The most important of these is that the explosive used is considerably more advanced, and thus generates a greater yield. The Valmara 69 was widely used by Iraq in the 1991 Persian Gulf conflict.

EVALUATOR'S COMMENTS

My first experience with the Valmara 69 was when I had to clear thousands of the pestilential things from the beaches of Kuwait in 1991. Then they were a risk

to life and limb. Now, however, evaluating them from the standpoint of one who would use them, I must appreciate the design. The mine is very reliable, and is definitely lethal. The true killing zone is about 10 meters in radius, however, not the 100 meters mentioned above. Certainly, fragments may fly that far, but not many, and the concussion and overpressure are reduced to virtually nothing at such a range.

Capt. Henri Guillaume
17th Parachute Engineering Regiment
French Army

VALMARA MINE						
TECH	DAMAGE		RANGE			PRICE (VALUE)
	VALUE	AMMO	S	M	L	
22	24	1	—	—	—	800 (15)
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
			0-10	15	40	

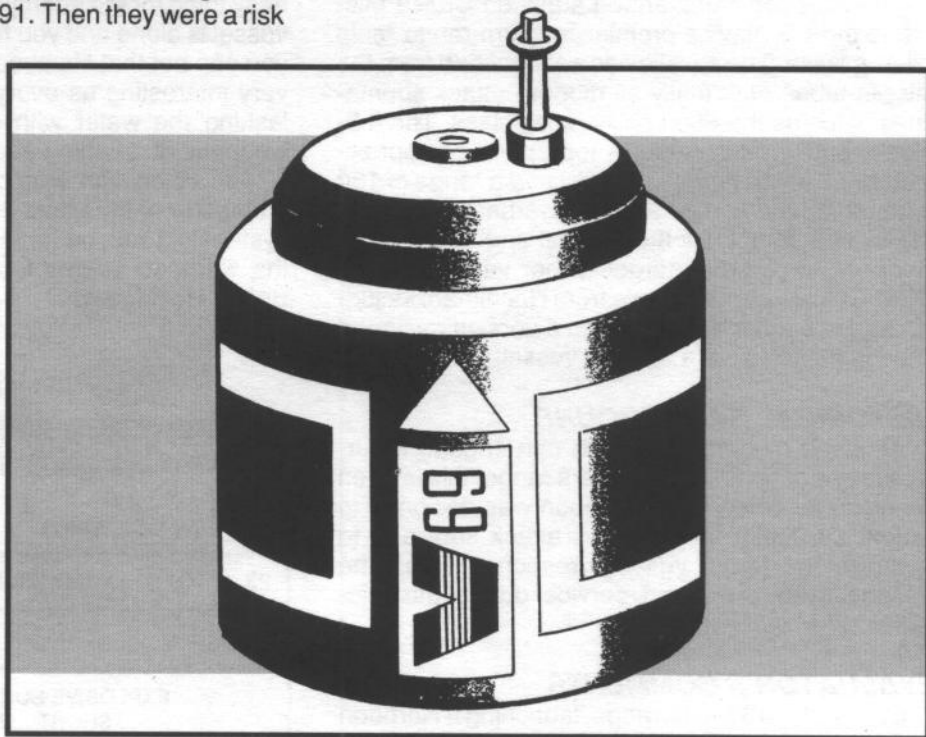


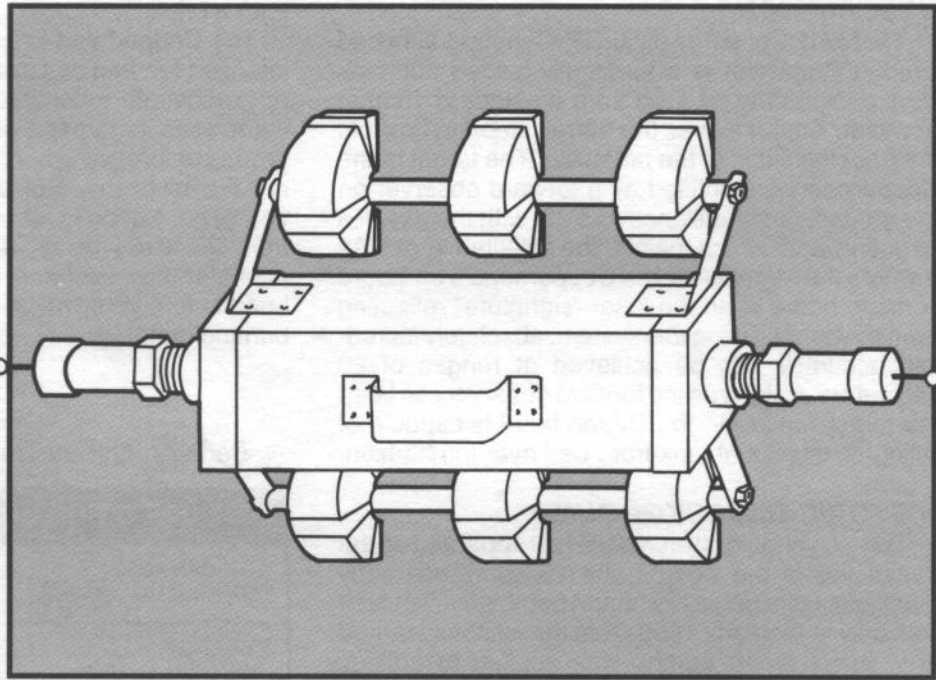
Illustration by A. McClellan

CAT. NO. 74-342521

HACHIMAN "VAMPIRE" LIMPET MINE

DESCRIPTION

This tactical weapon is designed expressly for sinking enemy vessels, and is highly effective at this mission. The device is a small and difficult to detect plastic-encased charge of Torpex HE, detonated by two redundant delay fuzes. The Vampire is intended to be attached to the hull of an enemy vessel, below the waterline, by divers or by commandos or agents in small boats. For this purpose, the mine is equipped with six small but powerful magnets. These magnets are able to resist the drag of water flow up to 100 km/h. The Vampire uses directed energy, or shaped charge, technology to maximize its chances of penetrating even an armored hull. Although the total charge is only 4.5kg, it is as effective as a standard (i.e., non-directed) charge of almost 20kg.



HISTORICAL BACKGROUND

The Hachiman Vampire incorporates the best features of many limpet mines, predominantly US designs dating from the Korean and Vietnam conflicts.

EVALUATOR'S COMMENTS

The marketing boys at Hachiman go out of their way to point out the mine has a plastic case. Presumably you're supposed to conclude the mine is thus harder to detect. Don't forget that it's attached to the hull by six "small but powerful" magnets. Kinda makes the plastic case irrelevant, huh?

In my own unofficial tests, the mine won't hang on if the water flow exceeds about 80 km/h, or about 45 knots. That's not bad, but falls a lot short of the 100 km/h Hachiman claims. On the good side, the shaped charge is just great. It'll cut through a destroyer's hull like a hot scalpel through cheese, and doesn't dissipate any punch into the water. The hole it makes is only small, though, so I strongly suggest you use

enough to make sure you open several watertight compartments. Otherwise the ship might not go down.

Jack Vance
"Expediter," No Fixed Address

LIMPET MINE							
TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
22	27*	—	—	—	—	550 (14)	
EXPLOSIVE BURST RADIUS (METERS)							
SHORT MED. LONG							
— — 0-4**							

*If the mine is in direct contact with the hull but above the waterline, the damage rating is reduced to 24 (water helps concentrate the blast). If the mine is not in physical contact with the hull — even if the separation is only 1 cm — the damage rating is reduced to 20.

**This refers to characters or objects other than the vessel to which the mine is attached.



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M712 COPPERHEAD CLGP (PGM)

DESCRIPTION

The M712 Copperhead CLGP (Cannon-Launched Guided Projectile) is a terminally-guided anti-tank shell designed to be fired from a standard 155mm howitzer. After it leaves the barrel, steering fins fold out from the sides of the projectile. The target of the Copperhead is identified by a forward observer on the ground, or surveillance aircraft, with the use of a targeting laser which "paints" the selected target. As it enters the target area, the Copperhead's on-board sensors home in on the laser "signature" reflecting from the target. Using this system, absolutely incredible accuracy can be achieved at ranges of 20 kilometers. As long as the forward observer can keep the target "painted," the Copperhead is capable of killing an individual tank from well over the horizon.

than a brick.

The Copperhead is a tank-killer. That's what it's intended for, and that's about all it's good for. It's set up to penetrate armor before detonating, which means if it misses its target it generally buries itself in the ground before going boom. Not good for anti-personnel fire missions. But against tanks it's lethal. If you've got a good FOO, you can fire the Copperhead from 20 clicks away, and have it hit a 1-meter-diameter target zone. And it's got enough of a warhead to turn your typical tank into a twisted mass of burning metal.

Lt. Zeke Baleski
Forward Observation Officer
Battalion Artillery Training Center, Fort Benning

HISTORICAL BACKGROUND

Terminally-guided munitions first appeared on the battlefields of the world in the 1970s. These early munitions were generally "smart bombs," however. It was only in the early 1980s that the lessons learned from these smart bombs was applied to artillery shells. The M712 Copperhead was the first US precision-guided artillery round to see widespread use. It is still widely used, and considered very effective.

EVALUATOR'S COMMENTS

The job of FOO (Forward Observation Officer) has got to be one of the most overlooked in the modern military. Without us, rounds like the Copperhead are just artillery shells, with no more guidance

M712 COPPERHEAD

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
22	29		1	100-500	2K	4K	8000 (20)
PRECISION BONUS: +6							
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-4	10	15			

The weapon diminishes the armor add, for a target it hits directly, by 4 at all ranges.

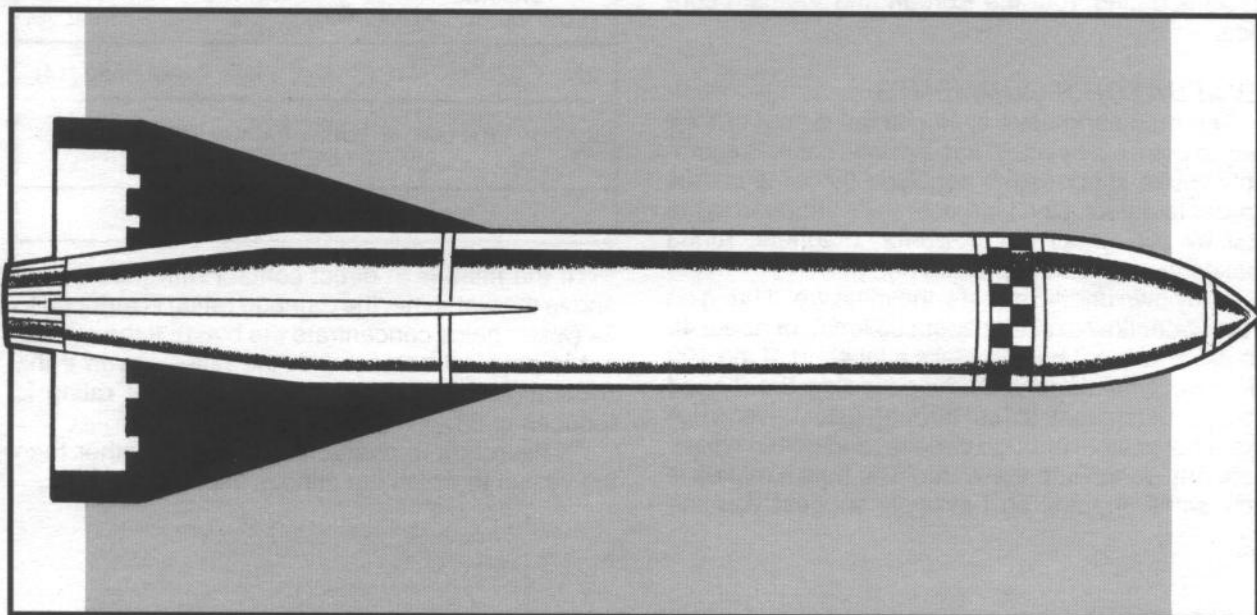


Illustration by A. McClellan



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VIGILANT ANTI-TANK MISSILE SYSTEM (PGM)

DESCRIPTION

A Vigilant launcher is a man-portable rectangular unit approximately 1 meter wide by 1.5 meters long by 0.4 meters thick. One end of this unit folds down, exposing the two missiles within, and also providing support for the unit. The missiles are a little more than one meter long, massing about 10kg each, with an effective range of 2 kilometers.

The "gunner" and the missile launcher unit can be separated by distances up to 100 meters. In the Hachiman implementation, the gunner carries a rifle-like laser designator equipped with a sighting scope. This designator is connected to the launch unit by a cable, but this cable is important only for the actual launch of the missile, performed by pulling the designator's trigger.

After launching, the gunner must keep the laser designator's beam trained on the target. The missile tracks the laser signature. Accuracy is exceptional right out to the system's maximum operational range. (The missile's speed is approximately 150 m/s.)

HISTORICAL BACKGROUND

The original Vigilant was deployed in the early 1980s, and used "command to line-of-sight guidance"; in other words, the operator used a joy-stick to actually "fly" the missile into its target. The Hachiman variant adds cutting-edge technology, including the warhead, unavailable before 1990.

EVALUATOR'S COMMENTS

Most infantry anti-tank missile systems get the operator killed. With a TOW, you fire your missile

from the shoulder tube, and have to keep your sight on the target until the missile impacts. The problem is, the bad guy sees the launch and starts shooting at you. The missile's heading out at 500 feet per second or thereabouts; the bad guy's high-velocity rounds are coming in at about 3,000 fps: boom! The Vigilant lessens this problem by separating gunner and launcher. Once the missile's shot, who cares what the bad guy does to the launching unit. The gunner is up to 100 meters away.

Sgt. Ted "Boomer" Nakamura
USMC Weapons Instructor, Fort Bragg

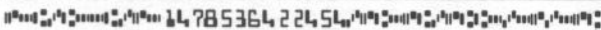
VIGILANT MISSILE SYSTEM

DAMAGE		AMMO	S	RANGE		PRICE (VALUE)
TECH	VALUE			M	L	
23	27	2*	—	0-1K	2K	36K (23)
PRECISION BONUS: +6						
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT		MED.		LONG
		0-5		10		15

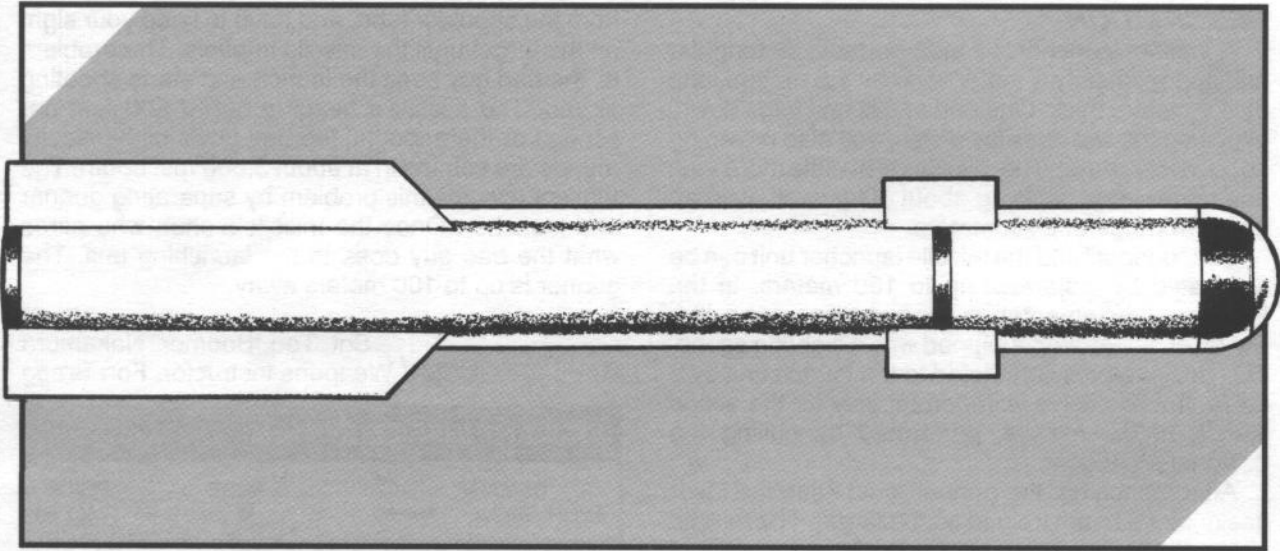
*Up to 5 launcher units, 2 missiles each, can be slaved to one designator. The 10 missiles can be fired simultaneously, or sequentially. All Vigilant missiles in flight home on the single target that the designator is currently targeting. The weapon diminishes the armor add of its target by 3 at all ranges.



Illustration by A. McClellan



HELLFIRE ATGW (PGM)



DESCRIPTION

The Hellfire Anti-Tank Guided Weapon is the United States' premier tank-killer, designed expressly to be fired from the AH-64 Apache anti-tank helicopter. The solid-fuelled missile is 1.9 meters long, massing 43kg, with a maximum effective range of 5 kilometers. The Hellfire is a laser-guided missile, homing in on the target "painted" by the AH-64's laser designator. This designator is slaved to the helmet-mounted optical unit of the gunner.

The Hachiman implementation of the Hellfire design allows the weapon to be mounted on any aircraft that incorporates its own laser designator. Due to a design decision, the Hachiman Hellfire cannot be guided by a forward observer or a separate reconnaissance aircraft, but only by the aircraft that fired it. [The missile's speed is about 200 m/s.]

HISTORICAL BACKGROUND

The programs that developed the original Hellfire and the AH-64 proceeded in parallel, and came to fruition in the mid-1980s. Currently, only US units are equipped with the original Hellfire.

EVALUATOR'S COMMENTS

If you can keep it properly painted until missile impact, there isn't a Main Battle Tank in the world that can stand up to a single Hellfire hit. The missile's

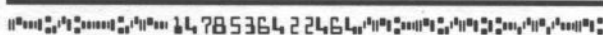
HEAT (High Explosive Anti-Tank) warhead spells certain death for anything it hits. I know how effective the Hellfire is when fired from an Apache. I have my doubts as to whether it's going to be as effective fired from something else. The Apache laser designator was designed with the Hellfire in mind, and vice versa. Unless you're using something as sophisticated, you're probably going to see glitches.

Lt. Harvey ("Black Flag") Black
7th Cavalry (Air), US Army

HELLFIRE ATGW						
DAMAGE TECH	VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
22	29	1	50-2K	5K	—	100K (25)
PRECISION BONUS: +8						
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
		0-5	15	20		

The weapon diminishes the armor add, for a target it hits directly, by 5 at all ranges.

Illustration by A. McClellan



TOW ANTI-TANK MISSILE SYSTEM (PGM)

DESCRIPTION

The TOW (Tube-launched Optically-tracked Wire-guided) missile is a second-generation ATGW (Anti-Tank Guided Weapon). It is a two-stage solid-fuelled missile, 1.2 meters long and massing 18kg, with an operational range of 3,000 meters. Unlike the M72 A2 LAW (Light Antitank Weapon), the TOW's launching tube is too heavy to be shoulder-fired. It must be mounted on a vehicle, either ground (such as a jeep or APC) or air (such as a helicopter). [The weapon's speed is about 200 m/s.] After firing, the operator must keep an optical sight aligned on the target until missile impact.

HISTORICAL BACKGROUND

The first generation of ATGWs, such as the original Vigilant system, required that the operator use a joystick or similar control to "fly" the missile into the target. The second generation, of which the American TOW is typical, simplifies the operator's function. All that this system requires of the operator is to keep the optical sight on the target while the missile covers the distance.

EVALUATOR'S COMMENTS

"All" the operator has to do is keep the sight on target? It's tougher than it sounds. Review my comments on the Vigilant — about how you've got to keep from getting killed or otherwise distracted between launch and impact — and keep in mind that a

TOW missile takes fifteen seconds and up to fly 3 clicks. Fifteen seconds is an eternity when you're taking fire. For this reason, if you're going to be shooting missiles from a chopper, go with a third-generation system like the Hellfire. Or, if you can afford it and get it to work, one of the full-on fire-and-forget systems, like the ACAVM, coming out of Japan. Like the Vigilant, the TOW is downright lousy at short range.

Sgt. Ted "Boomer" Nakamura
USMC Weapons Instructor, Fort Bragg

TOW MISSILE SYSTEM						
DAMAGE	TECH VALUE	AMMO	S	RANGE	M	PRICE (VALUE)
22	28	1	100-400	1K	4K	36K + 7K (23/20)
PRECISION BONUS: +7						
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
			0-5	15	20	

The weapon diminishes the armor add, for a target it hits directly, by 4 at all ranges.

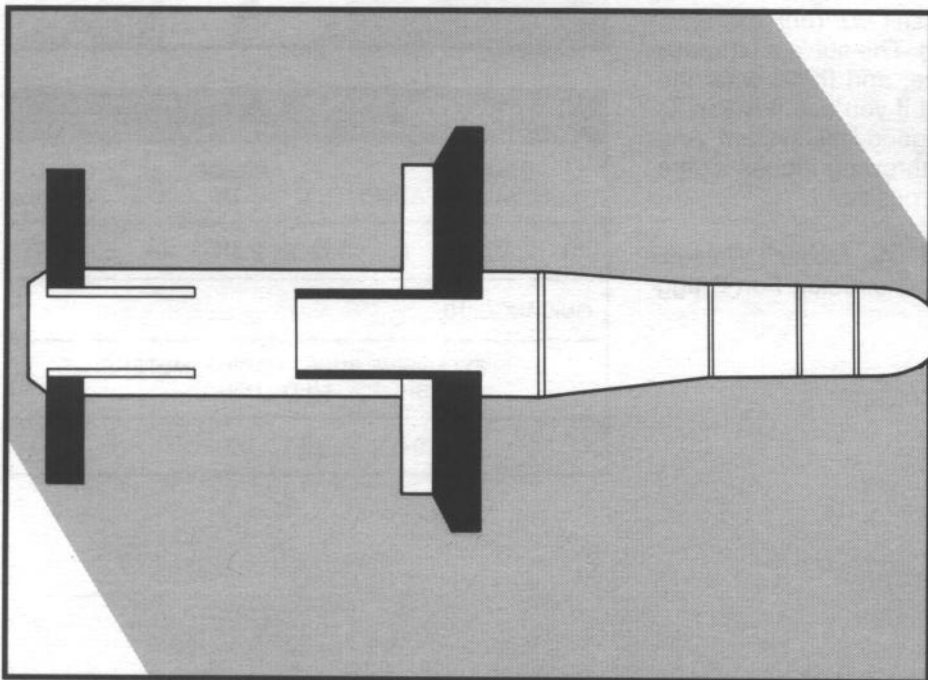


Illustration by C. Hunter



STINGER SAM (ASG)

DESCRIPTION

The Stinger gives infantry an unparalleled ability to defend against low-level air attacks. The Stinger shoulder-launched system comprises two parts. The first is the launcher tube, which contains the 1.5 meter, 13.4kg missile itself. The second is the launching unit — basically the sight and control system that allows the soldier to fire the missile. The tube is disposable once the missile is fired; the control unit is reusable.

The system is used as follows. The soldier attaches the control unit to the missile tube and powers up the system. Using the sight, he targets the enemy aircraft to be attacked and uncages the missile's seeker head. When the missile has a lock, the control unit emits a tone, and the soldier fires the weapon. The missile uses passive infrared or ultraviolet homing to track the target. Thus the soldier can immediately change positions, or prepare another missile. [The missile's speed is about 200 m/s.]

HISTORICAL BACKGROUND

The Stinger entered service in the late 1970s, replacing the obsolete Redeye missile system. Its effectiveness and low cost have made it a success on the international arms market, as well as within the US armed forces.

EVALUATOR'S COMMENTS

Range isn't that great, and neither is hitting power. And you've got to have some training to know just what the system can and can't do. (For example, don't fire into or near the sun. The sun's a better IR and UV source than a plane, and that's what the missile's going to track.) But if you use it within its operating parameters, it's a good little system. And it's a whole lot better than throwing stones at the planes that are strafing your position.

Sgt. Tim ("The Archer") Walsetti
USMC Weapons Instructor, Fort Bragg



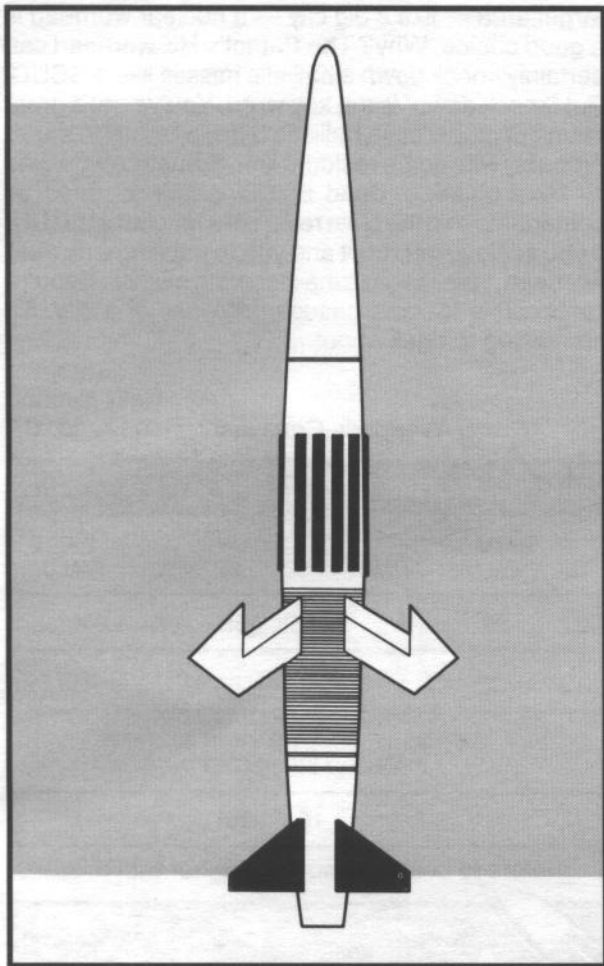
STINGER SAM

TECH	DAMAGE VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
23	27	1	100-1K	2.5K	4K	50K (24)
GUIDANCE: 10						
EXPLOSIVE BURST RADIUS (METERS)						
SHORT MED. LONG						
0-5 15 20						

Illustration by A. McClellan



RBS 70 SAM (PGM)



DESCRIPTION

The Swedish RBS 70 air defense weapon system is a unique offering in the area of man-portable surface-to-air missiles. The RBS 70 missile itself is 1.5 meters in length, massing 20kg, with a speed of about 200 m/s. The launching unit is mounted on a tripod, and contains the gyro-stabilized optical tracking system that makes the system unique.

Unlike most other short-range man-portable SAM systems, the RBS 70 missile uses "beam-riding" guidance. In other words, the gunner keeps an

optical sight on the target. A laser beam is slaved to this sight, and the missile rides this beam to its target. The RBS 70's unique gyro stabilization removes much of the instability and "wobble" that has plagued other beam-riding prototypes.

HISTORICAL BACKGROUND

The RBS 70 is a result of cooperation between the Swedish and Swiss military, and has been in use since the early 1980s.

EVALUATOR'S COMMENTS

I've got to give the beam-riding guidance mixed reviews. On the positive side, you don't have to worry about getting infrared lock, target aspect isn't even an issue, you don't have to worry about countermeasures, and you can even change targets while the missile's in flight (with some restrictions). On the negative side, you've got to eyeball the missile all the way in. All the way in. If you're busy dodging munitions and your concentration slips, the missile misses. Overall, it's more accurate than the Stinger, and packs a slightly larger warhead. If you're in a secure position where you can concentrate all your attention on guiding the missile, the RBS 70 is a good system.

Sgt. Tim ("The Archer") Walsetti
USMC Weapons Instructor, Fort Bragg

RBS 70 SAM						
DAMAGE		AMMO	RANGE			PRICE (VALUE)
TECH	VALUE		S	M	L	
22	28	1	100-1K	3K	5K	36K + 7K (23/20)
PRECISION BONUS: +7						
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
		0-5	15	20		

Illustration by C. Hunter



MIM-104 PATRIOT AIR DEFENSE MISSILE (ASG)

DESCRIPTION

Rightfully famous after its stellar performance in the 1991 Gulf War, the Patriot is Hachiman's versatile answer to the low- to medium-altitude air defense problems of modern warfare. Fired from a four-round mobile launcher, the 5 meter, 998kg missile can successfully knock down targets ranging from incoming ballistic missiles to enemy bombers or fighters. The weapon combines semi-active radar guidance with a command terminal mode. Its range is 60 kilometers, and it can knock down targets to an operational ceiling of 24,000 meters, using a high explosive or an optional nuclear warhead. Its high speed (Mach 3.0, about 1,000 m/s) makes it viable as an anti-missile system.

A Patriot battery comprises the radar system, control unit, five four-round mobile launchers and a powerplant, plus several support vehicles.

HISTORICAL BACKGROUND

The MIM-104 Patriot emerged from a 1965 specification for system to replace both the HAWK and Nike Hercules. The MIM-104 entered service with the US Army during 1983.

EVALUATOR'S COMMENTS

Everybody who watched CNN has an idea what the Patriot can do, so I won't rehash that. If the political allows it, and you've got a very sensitive

target area — like a big city — a nuclear warhead is a good choice. Why? The Patriot's HE warhead can certainly knock down a ballistic missile like a SCUD. But "knock down" is the key word. You've got a great chunk of inoperative ballistic missile falling to earth, probably with some residual fuel. Someone who gets hit by a chunk o' dead SCUD is just as dead as someone within the blast radius of a functional SCUD. If you achieve intercept and you're packing a nuclear warhead, you vaporize the incoming missile. If you're responsible for zero-casualty defense of a city, it's something to think about.

Sally Kirchoff
Weapons Consultant, San Diego, CA

MIM-104 PATRIOT							
TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
23	29		1*	500-5K	25K	60K	1.8M (32)*
GUIDANCE: 14							
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT		MED.		LONG	
		0-5		15		25	

*Refers to one four-round launcher with missiles.

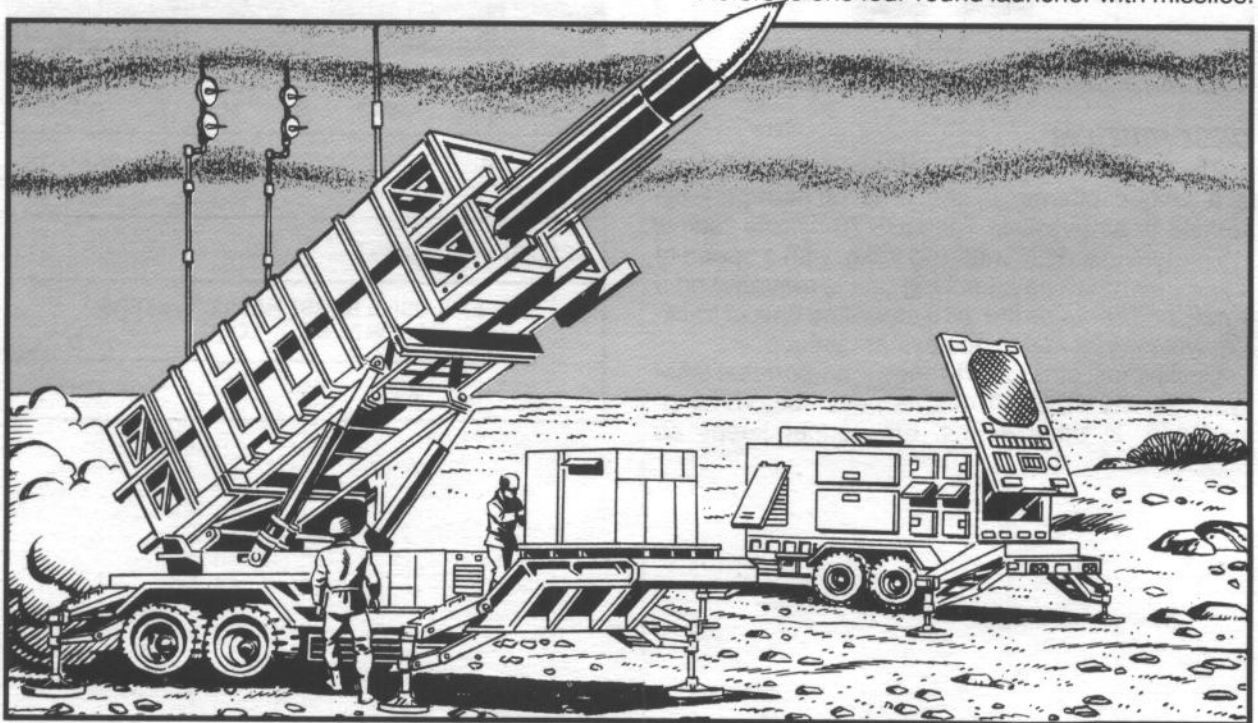


Illustration by A. McClellan

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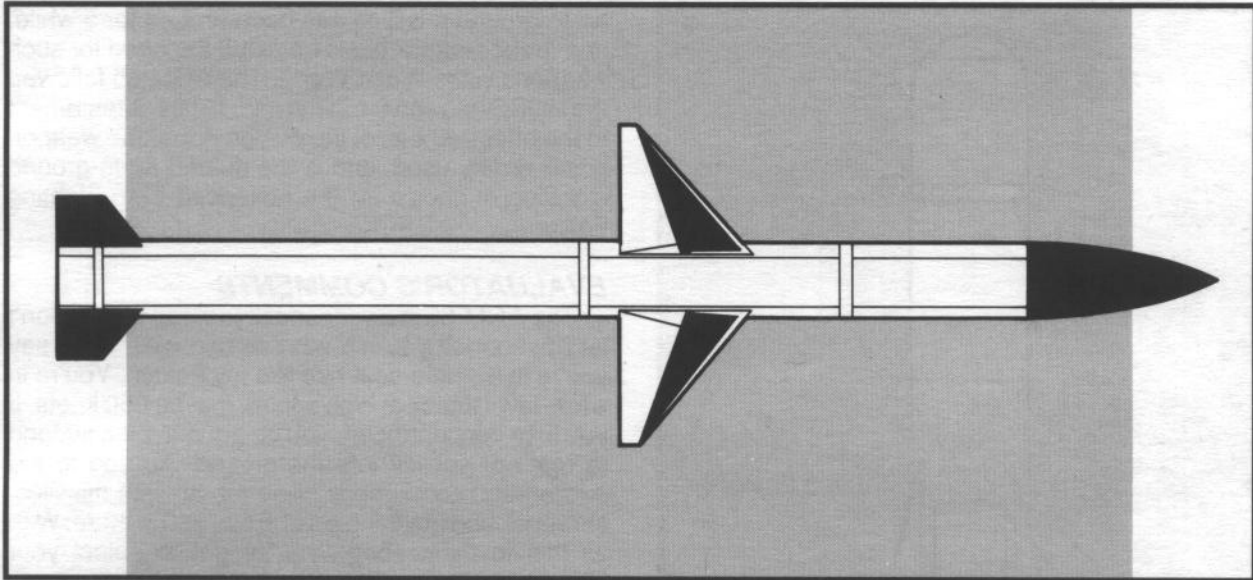
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HARM ASM (ASG)



DESCRIPTION

The HARM air-to-surface missile is the ideal weapon system for taking out radar-guided anti-aircraft guns and SAM batteries. The missile is 4.3 meters in length, massing 354kg. It is the ideal "fire-and-forget" missile: once launched, it homes in on the most intense source of electromagnetic radiation within its tracking cone. Typically this will be the radar emitter of an air defense system. Since the HARM's guidance system is totally passive, it is difficult to detect prior to impact. The HARM can be launched from virtually any aircraft. [The missile's speed is about 200 m/s.]

HISTORICAL BACKGROUND

The first anti-radiation missiles (ARMs) were introduced during the late 1960s and early 1970s, and were used in Vietnam. These missiles were the perfect answer to the new generations of radar-guided anti-aircraft artillery (AAA) and surface-to-air missiles (SAMs). The HARM is a contemporary US design, building on the foundation of these early missiles.

EVALUATOR'S COMMENTS

It should be easy to spook an incoming HARM, right? Once it's in the air, just turn off your radar, and the missile loses lock, right? Wrong! The guidance system is smarter than that. It remains locked onto the physical position of the strongest EM radiation source before that source went off the air. So if you turn off your radar system, the HARM's still coming

down your throat. The HARM is the best friend of ground-attack pilots like me and my A-10 buddies, who think they'll be facing AAA or SAMs. When you make your attack, you come blazing in behind a swarm of HARMs, which gives the guys on the ground a tough choice. Keep their radars on and try and track you... which means the HARMs will have lots of juicy targets.

Or turn off their radars and fire blind... and hope that the HARMs didn't have target acquisition before they pulled the plug. Tough choice. Glad I'll never have to make it.

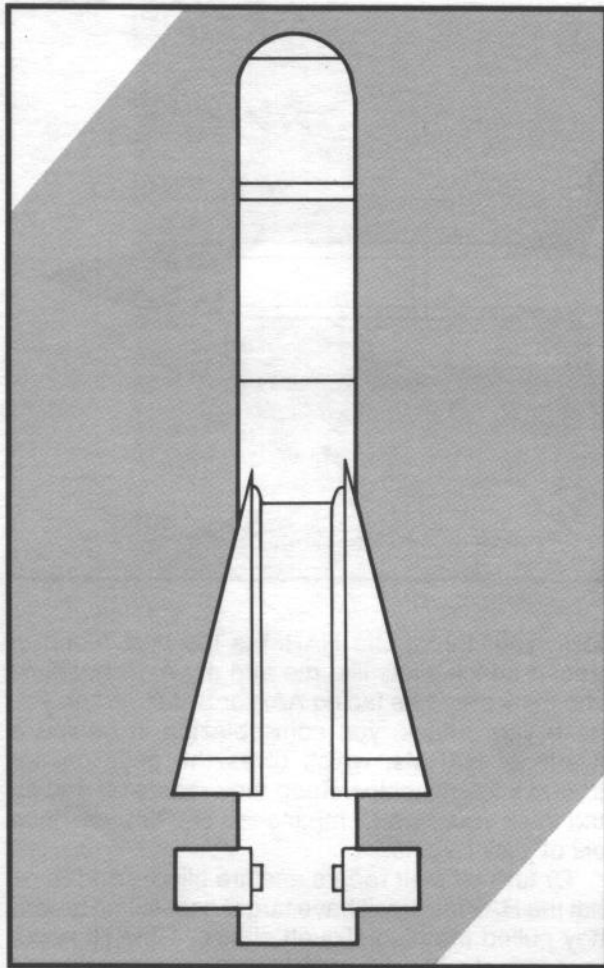
Lt. Tony ("Weasel") Hughes
USMC

HARM ASM

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
22	28		1	50-2K	12K	16K	75K (25)
GUIDANCE: 15							
EXPLOSIVE BURST RADIUS (METERS)							
SHORT MED. LONG							
0-5 15 20							

The HARM can only be fired at ground targets that have radar systems, and the systems must be on at the time the missile is fired. If the radar is turned off after the HARM is launched, the weapon is considered to have a guidance value of 12.

AGM-65 "MAVERICK" (ASG)



air-to-ground missiles has been around for a while, and ground-attack pilots have felt the need for such weapons since World War II. The AGM-65 followed the HOB0 into service in the mid-1970s. A testament to the effectiveness of the design is that the weapon is still widely used, and is the guided air-to-ground munition of choice for the advanced F-16 Fighting Falcon.

EVALUATOR'S COMMENTS

The AGM-65 is a very effective weapon, but don't let anyone tell you it's easy to use well. Let's say you're in a single-seat bird like my Falcon. You're in a low-level attack at high speed, maybe 650 knots. If you lose concentration, you've got maybe a second to react or you fly into the ground. To add to the excitement, someone is filling the air with missiles, shrapnel, and anything else he can get up there. With all this to think about, you've got to select your Maverick's target. This involves moving a cursor around on a TV screen, using a little "tit" on your control stick. This is like playing a video game while driving a car in the Indy 500. To make it even more interesting, you've got to make sure the AGM-65 has a good lock. If the aiming cross looks kind of jittery on screen, there's a chance the missile will shift lock — say from the enemy tank you want to kill to the politically neutral tree it's parked next to.

But hey, nothing's perfect. Apart from that, the Maverick is a good weapon. The catalog doesn't mention it, but you can switch the missile's tracking mode, too. The other option is laser (i.e., beam-riding). This requires a forward observer to "paint" the target.

Lt. Pete Brosnan
Eighth Tactical Fighter Wing

DESCRIPTION

The AGM-65 Maverick is a self-guided "fire and forget" air-to-ground missile. Because the firing aircraft does not have to remain in the area to guide the missile to its target, it is the ideal choice for high-threat environments. Its self-guiding features also make it perfect for use against tanks and other moving targets, since the missile can compensate for target movement.

The AGM-65 is a 209kg missile, 2.65 meters in length. The Hachiman version uses a TV homing system: the pilot selects the target using a display screen in the cockpit that shows what the missile "sees," and locks the missile on by moving a cursor. Once the missile is launched, it tracks the selected target until impact. [The missile's speed is about 180 m/s.]

HISTORICAL BACKGROUND

The idea of "fire-and-forget" (or "launch-and-leave")

MAVERICK

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
22	29	1	250-5K	15K	45K	120K (26)	
GUIDANCE: 12							
EXPLOSIVE BURST RADIUS (METERS)							
SHORT MED. LONG							
			0-5	15	20		

The weapon can optionally be set for laser-guided mode. This must be done before the plane leaves the ground. The weapon is guided to the target by a forward observer, and has a Precision Bonus of +5.

Illustration by C. Hunter

MM40 EXOCET (ASG)

DESCRIPTION

The Exocet has been called the "premier ship-killing missile of the late 20th Century;" Hachiman humbly agrees. The Exocet is a versatile anti-ship weapon with two major launching modes: air-launched, or surface-launched (primarily from another ship). The sleek 5 meter, 825kg missile combines inertial and active radar guidance to provide exceptional accuracy at ranges up to 70km. The primary inertial guidance is used simply to get the missile into the target area. After that, terminal active radar takes over.

For most of its flight path, the Exocet maintains an altitude of less than 10 meters above the surface of the sea, making it difficult to detect and even more difficult to intercept. At a range of about 1km, it climbs into a "pop up" terminal maneuver, then tips over and dives into its target. As was demonstrated in the Falklands conflict, a single Exocet hit is sufficient to sink a large vessel. [The weapon's speed is about 160 m/s.]

HISTORICAL BACKGROUND

The French Exocet entered service in the late 1970s, and continues to see extensive use around the globe.

EVALUATOR'S COMMENTS

The Exocet's reputation is deserved. It is a highly accurate weapon, and packs a lethal punch. It is a fast-flying missile, which makes the job of interception even more difficult. The weapon can be launched from below the horizon, so there is frequently no launch detection. The first warning the target vessel receives is often when a crewman sees the missile "pop up," and then it's usually too late.

Cmdr. Jerome Beasely
Executive Officer, USS Nimitz

EXOCET						
TECH	DAMAGE VALUE	AMMO	S	RANGE M	L	PRICE (VALUE)
23	30	1	1K-6K	40K	70K	150K (26)
GUIDANCE: 15						
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT	MED.	LONG		
		0-5	15	25		



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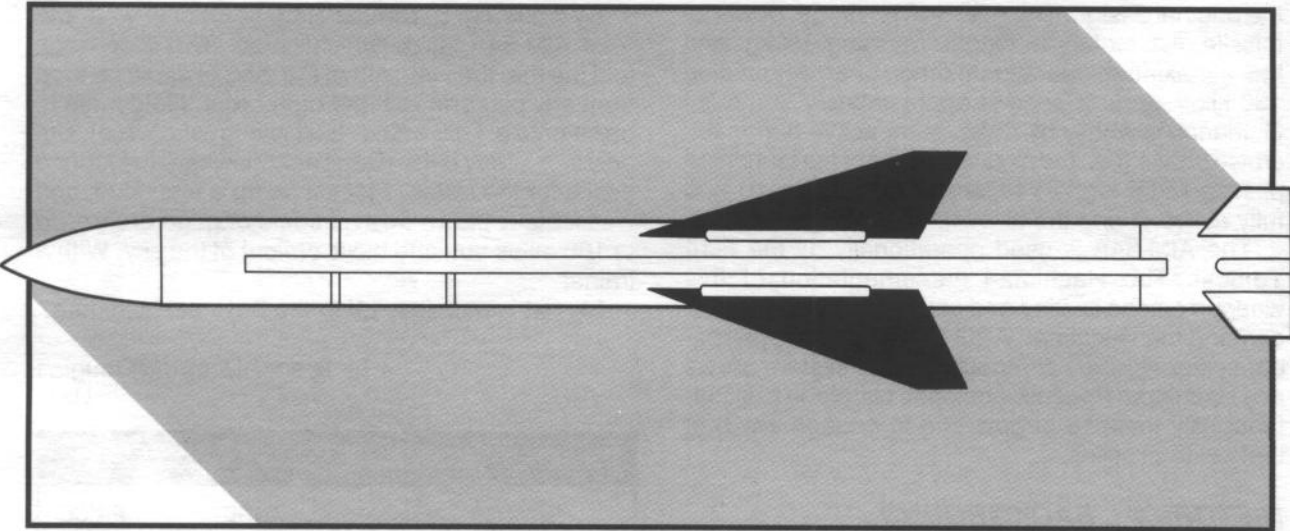
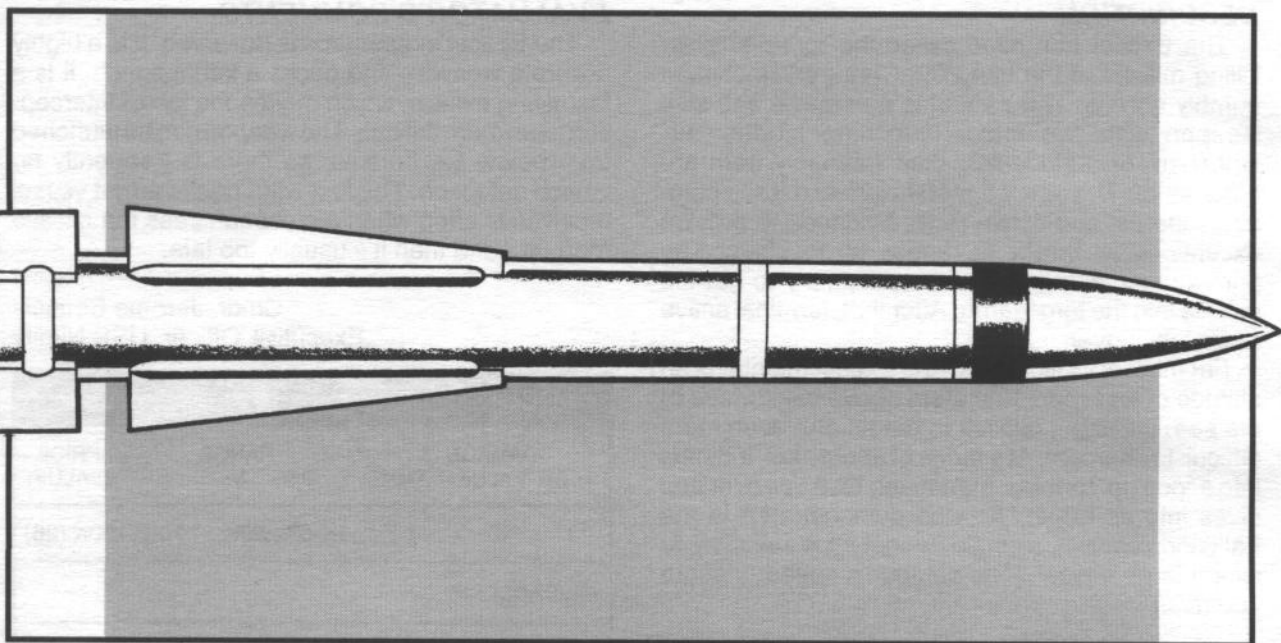


Illustration by C. Hunter



AIM-54A PHOENIX AIR-TO-AIR MISSILE (ASG)



DESCRIPTION

The AIM-54A Phoenix is undeniably one of the most sophisticated air-to-air missiles in the world, and Hachiman has done nothing if not improved on the original design. The AIM-54A is a large, powerful missile, 4.1 meters in length, massing 380kg, and has a maximum operational range of an astounding 160 kilometers. [Speed is approximately 300 m/s.] Guidance is wholly by radar: semi-active during the cruise phase (i.e., the missile homes on the launching plane's radar signals reflecting off the target) and fully active during the terminal phase.

The AIM-54A is used operationally by the F-14 Tomcat. The Hachiman implementation of this weapon can be carried and utilized by any warplane carrying the Hachiman APG-69H pulse-Doppler radar system (or true compatible). This system allows any Hachiman Phoenix-equipped warplane to simultaneously track 16 targets and to engage any 6 of them with missiles.

HISTORICAL BACKGROUND

Before the introduction of the Phoenix, the premier American long-range air-to-air missile was the radar-guided Sparrow, which was first carried into combat by the venerable F-4 Phantom. While highly effective for its time, advances in aircraft performance and tactics necessitated the introduction of a

longer-range radar-guided missile. This role was filled by the AIM-54A Phoenix.

EVALUATOR'S COMMENTS

By trade I'm a Tomcat RIO, so I know what the "real" AIM-54A can do (which is a lot). When Hachiman told me that their version of the missile could be fired from any platform with the right radar, I told them to bolt it onto a T-38 trainer (just joking, of course). But holy s___, they did it. (Don't ask me where they found space for the radar.) I took it up for a test drive, and was literally blown away. I could engage drones up to 100 miles out, and blow 'em out of the sky. With a trainer.

My hat is definitely off to the boys at Hachiman.

Lt. Brent ("Doogie") Douglas
USN

PHOENIX MISSILE

TECH	DAMAGE		RANGE			PRICE (VALUE)
	VALUE	AMMO	S	M	L	
23	29	1	100-20K	75K	160K	1M (30)
GUIDANCE: 14						
EXPLOSIVE BURST RADIUS (METERS)						
SHORT MED. LONG						
			0-5	15	20	

Illustration by A. McClellan



MK78 MOD2 750LB FIRE BOMB

DESCRIPTION

The Mk78 Mod2 from Hachiman is an advanced successor to the napalm bombs used by US forces in Vietnam. This bomb uses the newly-developed Napalm-B, which is a liquid consisting of polystyrene thickener, benzene and gasoline. Napalm-B burns at about 850° C for two to three times as long as "first-generation" napalm. The bomb is little more than a 2.5-meter-long canister containing 416 liters of Napalm-B. The Hachiman model incorporates two redundant detonators that ignite the Napalm and spread it over more than 3,000 square meters. The Hachiman Mk78 Mod2 is designed to be dropped from virtually any type of fixed-wing aircraft capable of ground attack.

HISTORICAL BACKGROUND

Invented in 1943, the original form of Napalm derived its name from aluminum naphthenate and aluminum palmate, substances which were used to thicken petroleum into a gel. The Mk78 Mod2 bomb was widely used by US Naval aviators in the 1960s and 1970s.

EVALUATOR'S COMMENTS

Anyone who's seen the famous news footage from Vietnam will know just how deadly a weapon napalm is. (Or, if you haven't seen the real thing, check out the movie Apocalypse Now.) When this bomb bursts, it spreads a carpet of fire 30 meters in

radius, and splatters gobs of burning liquid even further. Liquid Napalm-B doesn't stick to things (and people) like Napalm gel did, but this doesn't diminish its effectiveness. From a weapon designer's perspective, this is almost the perfect weapon. There's virtually nothing to go wrong. Even if the redundant detonators both fail, the energy of impact will probably ignite the Napalm.

Sally Kirchoff
Weapons Consultant, San Diego, CA

MK78 FIRE BOMB						
DAMAGE	TECH	VALUE	AMMO	S	RANGE	PRICE
					M	(VALUE)
22	27	1	—	—	—	4000 (18)
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT	MED.	LONG		
		0-30*	35	40		

*This bomb creates a carpet of flame, 30 meters in diameter. The flame continues to burn for a number of rounds equal to the effect total. Any creature or vehicle that enters this burning region suffers full damage from the fire.

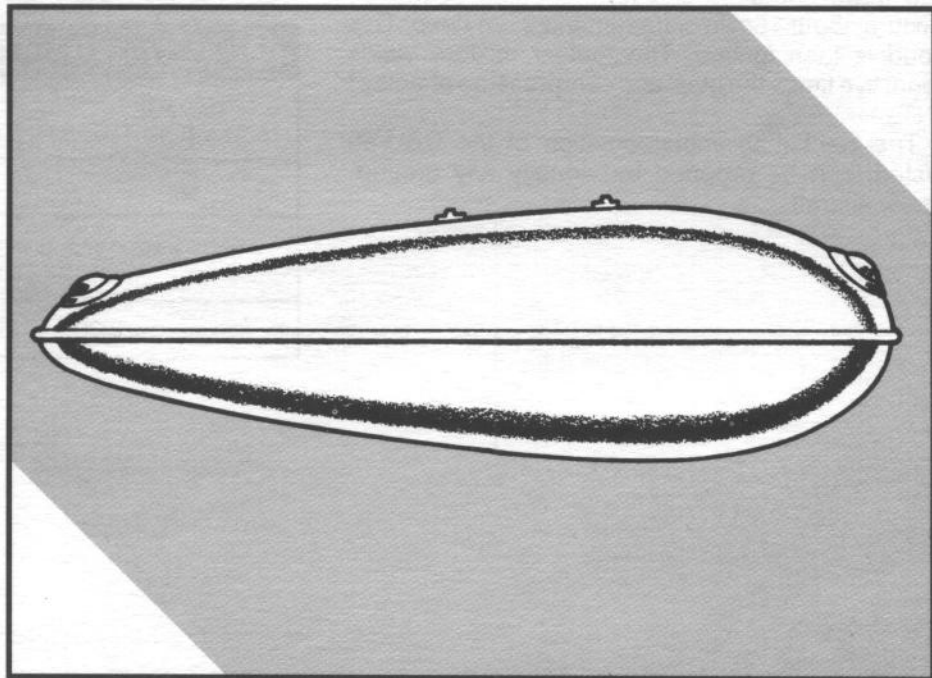


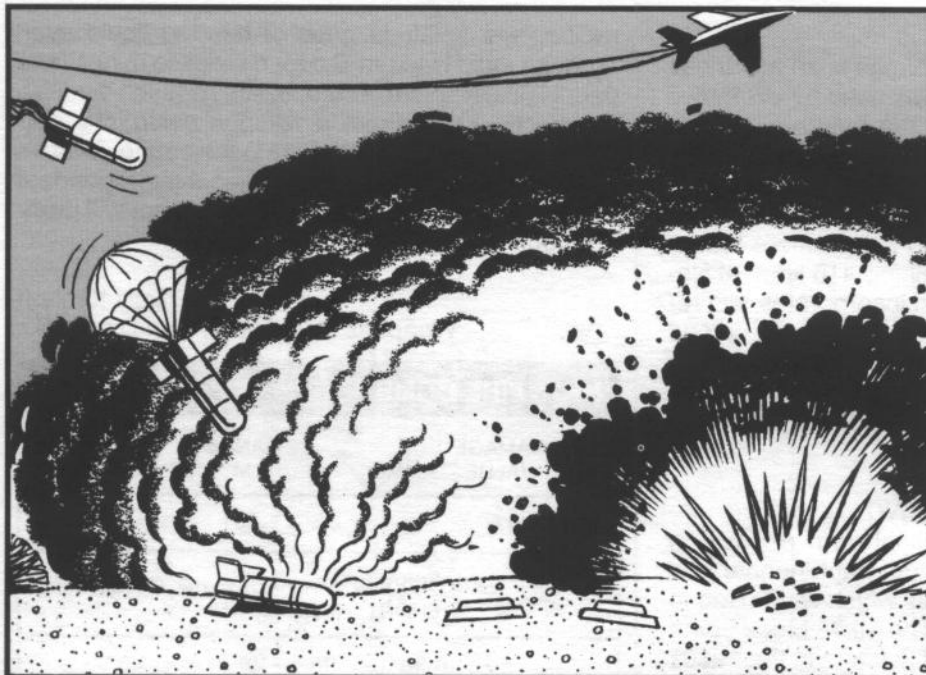
Illustration by A. McClellan



55



CBU-55 FAE WEAPON SYSTEM



HISTORICAL BACKGROUND

The FAE was originally intended as a method for clearing minefields. Its incredible overpressure effects, and the fact that it literally "drains" the oxygen from the atmosphere over a large area, have proven highly lethal against enemy troop concentrations, however. The CBU-55 system entered service in the late 1980s.

EVALUATOR'S COMMENTS

Like most weapons suppliers, Hachiman loves numbers: 32.6kg of ethylene oxide, 15m by 2.5m cloud, 5 times the kick of TNT. What does

this really mean? It means the CBU-55 FAE system packs the same punch as some battlefield nukes. Without the fallout (radioactive and political) of using a nuke. What more can I say? To believe the power of this weapon, you've just got to see it.

Sally Kirchoff

Weapons Consultant, San Diego, CA

DESCRIPTION

The Fuel-Air Explosive, or FAE, is a new and very effective weapon system. In the CBU-55 system, three parachute-retarded bomblets, each about 1 meter in length, are dropped into the target area. Each bomblet releases 32.6kg of ethylene oxide, a highly volatile hydrocarbon gas, which mixes with air. The three bomblets can form a cloud of fuel-air mixture about 15m in diameter and 2.5m deep. This cloud is then ignited. The fuel-air mixture yields about five times the blast and overpressure effects of TNT.

The Hachiman implementation of the CBU-55 system can be dropped by virtually any ground-attack aircraft.

CBU-55 SYSTEM

TECH	DAMAGE		S	RANGE			PRICE (VALUE)
	VALUE	AMMO		M	L		
23	50	1	—	—	—	100K (25)	
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-30	70	125			

Illustration by A. McClellan

785364 2256

CAT. NO. 74-356521

WEAPONS OF ADVANCED TECHNOLOGY

This section describes beta-test, prototype or experimental weapons — including energy weapons — using advanced or extended technology. These weapons “push the envelope” of weapon design, but at a cost: reliability can be problematic in many parts of the world. The designations PGM and ASG are used in the same manner as in the previous chapter, with all associated rules.

ENERGY WEAPON AMMUNITION

Several of the weapons described herein are laser or other energy weapons. To minimize confusion, this section uses the same statistics and abbreviations as the preceding chapters. While most correlate directly, the major difference concerns “ammo.” With energy weapons, this refers to the efficiency of the weapon’s energy source: the number of shots before the battery or capacitor pack must be replaced.

Certain weapons allow for multiple power packs to be connected to the weapon, either in series or in parallel. Connecting multiple packs in series increases the damage done by a single shot; connecting packs in parallel increases the number of shots that can be taken before replacing the packs. This capability is noted in the text for individual weapons.

In game terms, the damage value for a weapon is increased by 1 for each additional power pack connected in series. The “ammo” value for a weapon is

multiplied by the number of power packs connected in parallel (thus a laser cannon with three power packs connected in parallel will have 3 times its normal “ammo”).

HACHIMAN ANNOTATION:

Advanced technology is Hachiman Arms’ way of keeping ahead of the competition — and your way to keep ahead of your enemies. At great risk to themselves, determined scientists and engineers of the Hachiman Arms’ Development and Testing Department have made it their goal to be first in the breakthroughs that will help you win the “Possibility Wars.”

Because Hachiman Arms takes these chances to bring the newest developments to you, the consumer, the prices do somewhat reflect that additional risk. Believe us when we say “to keep ahead of your enemies is worth *any* price.” Likewise, some people have had difficulty operating our equipment in certain areas of the world. We at Hachiman Arms stress the importance of *careful maintenance by experts* — especially regarding this equipment. While we supply detailed manuals and instructions on basic maintenance and upkeep of all our weapons, we at Hachiman Arms claim no responsibility for malfunctions due to haphazard maintenance. If you have a problem operating one of our weapons, please contact our representative nearest you; if he cannot make the weapon work, we will refund your money *in full*.

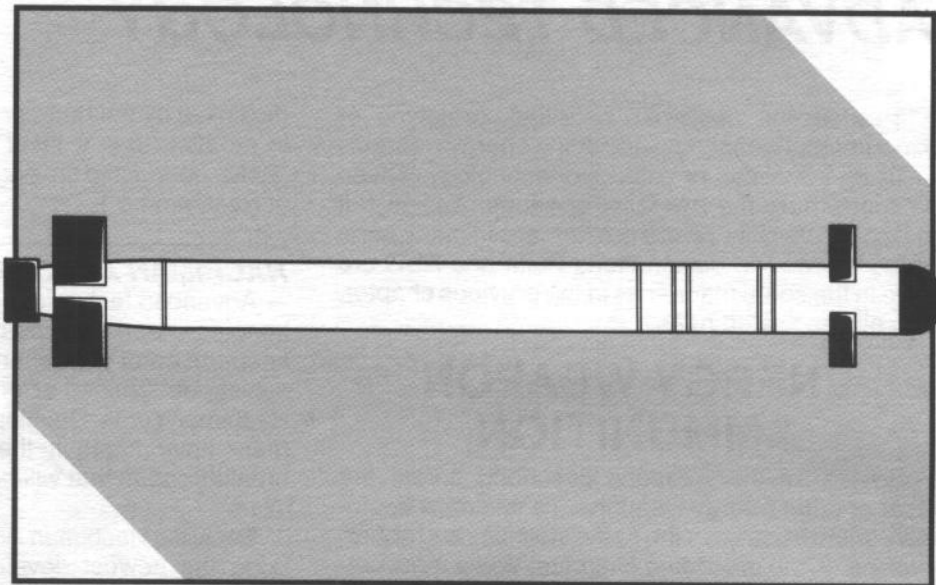


TORONAGA CORP. "ARCHER" SAM (ASG)

DESCRIPTION

The Archer surface-to-air system from the world-renowned Toronaga Corporation is the latest development in man-pack weaponry. The Archer is similar in concept to the Stinger system, comprising a disposable launching tube and re-usable control units which attach to the tube. The missile is 1.2m in length, and masses 15kg, with a speed of 250 m/s.

Apart from these superficial similarities, the Archer is decades in advance of the Stinger. The Archer is a true fire-and-forget weapon. The target is identified using an optical sight, and the missile locks onto the "signature" of that target. Once launched, the missile homes in on that target with no further attention required from the operator. Although the warhead is small, its directed energy design makes it highly effective against any warplane up to and including a bomber.



only, even if it changes its geometry ("swing-wing" planes, for example). This change might well be enough to confuse the missile and make it lose lock.

If you've got to have one-shot kill, go with a more sophisticated system like the ACAVM. If cost is an issue, the Archer is a good choice.

Sgt. Bill "Bingo" Bingham
USMC Weapons Instructor, Fort Bragg

HISTORICAL BACKGROUND

Much of the technology involved in the Archer system is drawn from earlier, "second-generation" man-pack SAMs. Toronaga's major innovation is in the targeting and homing technology.

EVALUATOR'S COMMENTS

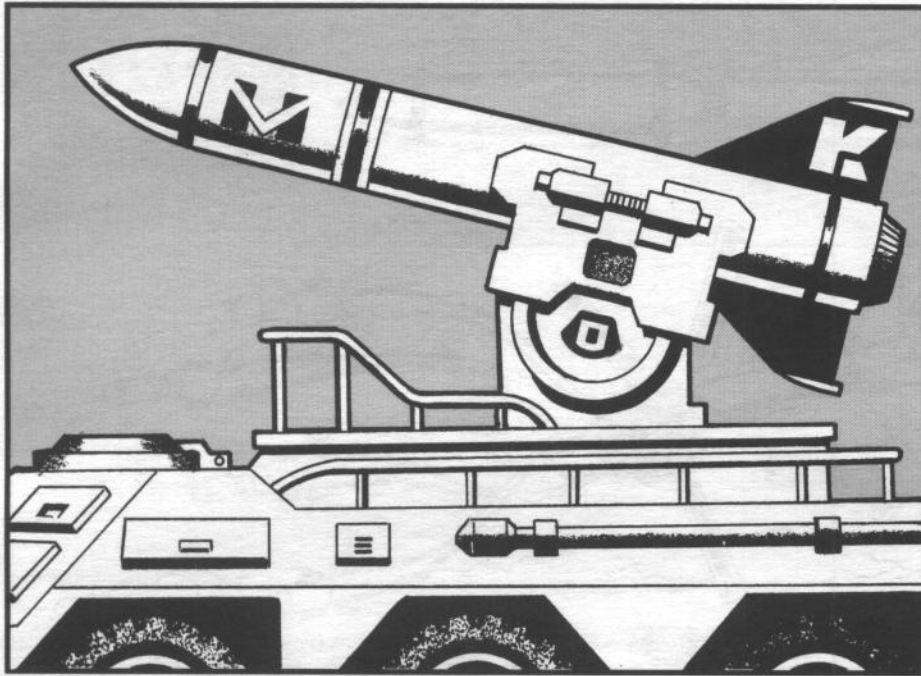
Range of the Archer is much better than the Stinger, and it hits harder. Accuracy isn't the best, however. The "signature" the Archer locks in on is a combination of IR, UV and visible light. This signature will change if the target plane changes its throttle setting, drops flares, takes damage from other weap-

ARCHER SAM						
TECH	DAMAGE		RANGE			PRICE (VALUE)
	VALUE	AMMO	S	M	L	
24	28	1	300-1.5K	2K	5K	65K (25)
GUIDANCE: 13						
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT	MED.	LONG		
		0-5	8	15		

Illustration by C. Hunter



MIKRONIKA ACAVM MISSILE SYSTEM (ASG)



HISTORICAL BACKGROUND

The ACAVM is the next logical development of infantry missile systems such as the TOW and HOT currently in wide use.

EVALUATOR'S COMMENTS

I have one thing to say about this system, and that's "Wow!" This is fire-and-forget from heaven. The operator still has to have some level of skill. The target designator sighting reticle is very small, and apparently the chance of the missile maintaining lock depends on exactly where on the target you place the reticle when you pull the trigger.

DESCRIPTION

The ACAVM (Advanced Capabilities Anti-Vehicular Missile) is the next logical development of infantry missile technology. The 1.5 meter, 30kg missile is a two-staged solid-fuel projectile, that flies at supersonic speed [about 450 m/s]. The launching tube can be mounted in virtually any ground vehicle. Currently, an air-launched variant is not available.

The ACAVM can be used as a LAW (Light Anti-tank Weapon), or against low-flying aircraft as a SAM. This versatility is unprecedented. The ACAVM is entirely fire-and-forget. The operator designates a target. The missile's on-board image recognition system then builds a mathematical "model" of the target's "signature," using a combination of IR, UV and visible light. The missile then tracks this image visually. The missile will retain lock despite changes in target aspect, and will even compensate for "actual" changes such as that presented by variable-geometry ("swing-wing") aircraft.

As an important added feature, the ACAVM control unit includes an IFF (Identification Friend or Foe) system that interrogates the transponder of any vehicle designated as a target. Only if the control system does not receive the correct IFF code can the missile be fired at that target.

It's more of an issue with aircraft, too, since you might "miss" with the reticle.

The IFF system is good, but don't give up on eyeball enemy identification. If you're into combined-arms or (ugh!) multi-national operations, not everybody might have the right transponder setting, and blowing up the tank containing the commander of an allied force isn't cool.

Sgt. Bill "Bingo" Bingham
USMC Weapons Instructor, Fort Bragg

MIKRONIKA MISSILE SYSTEM						
TECH	DAMAGE		S	RANGE		PRICE (VALUE)
	VALUE	AMMO		M	L	
24	30	1	500-2K	4K	5K	100K + 70K (25/25)
GUIDANCE: 15						
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
		0-5	15	20		

The weapon diminishes the armor add, for a target it hits directly, by 4 at all ranges.

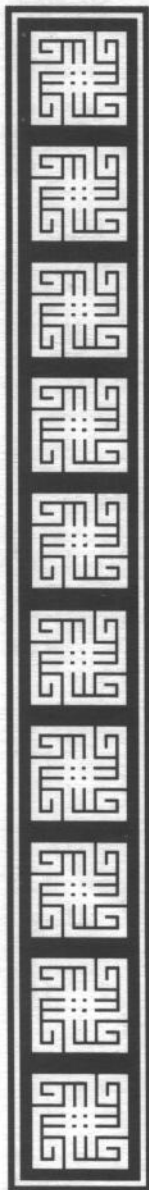
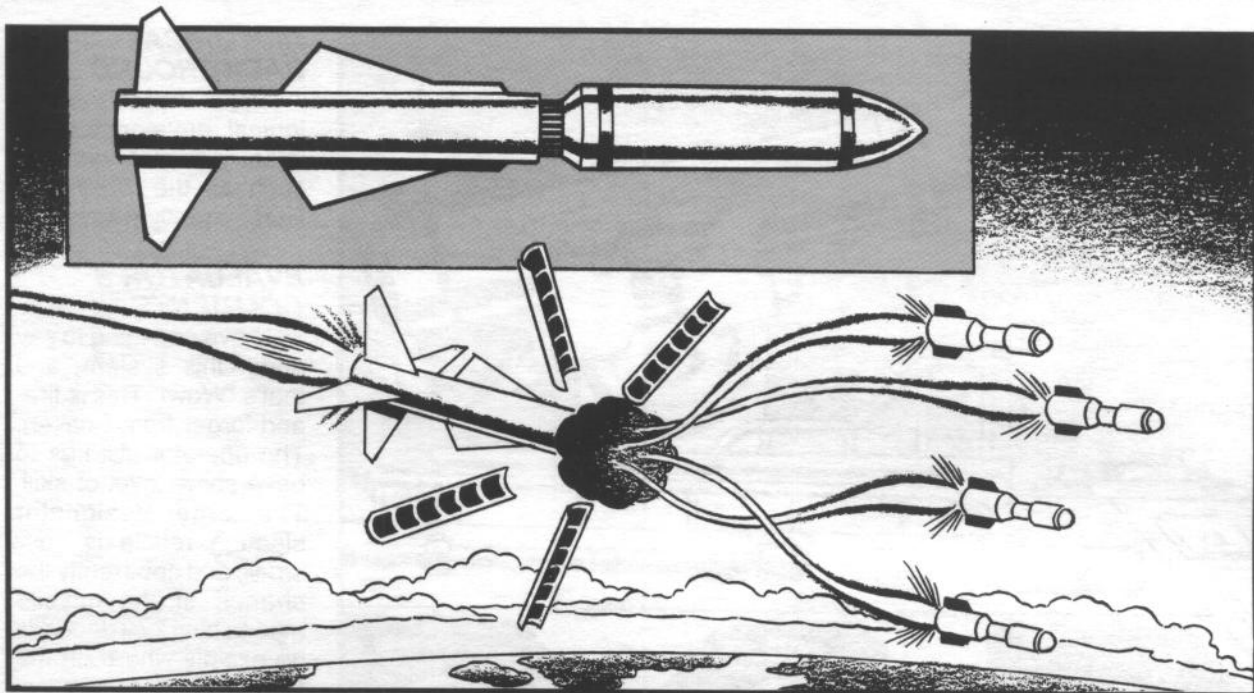


Illustration by A. McClellan

SARINAN MIST-50 CLUSTER MUNITIONS (ASG)



60

DESCRIPTION

The MIST-50 from Sarinan Industries is the latest development in multiple independent self-targeting munitions. The MIST-50 is two-stage solid-fuel inertially-guided missile launched from a vehicle-mounted guide rail system. The missile is 2.5 meters in length, massing 135kg, with a speed of 250 m/s.

At the target, MIST-50 releases four sub-munitions, each massing 17kg and carrying a directed-energy warhead. Each sub-munition's "brain" has the "profile" and energy signature of up to five types of enemy armored vehicle; these are programmed before launch. Each sub-munition searches the area for a vehicle profile, and then homes in on that target. The four sub-munitions from a single MIST-50 communicate among themselves, ensuring that each munition targets a different vehicle.

If no vehicle profile is detected, the sub-munitions fall free. They detonate only if disturbed, acting like land mines. The computer system accompanying each MIST-50 launching unit contains the profiles of over 500 different armored vehicles from around the world.

HISTORICAL BACKGROUND

Sarinan Industries has combined technology from various sources, and added its own expertise in the area of data storage and computer programming.

EVALUATOR'S COMMENTS

It's not perfect; the sub-munitions aren't as "smart" as Hachiman would like to think. They can get confused by smoke, by strange target aspects, even by things like gear — or personnel — slung on the outer hull of a vehicle. (You can imagine the munition thinking, "Well I thought it was a T-72, but T-72s don't have that human-shaped bulge on the back.")

Dennis Moriarty
Weapons Designer
US Army Advanced Weapons Design Facility
("The Shop"), Dallas

SARINAN MIST-50

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
24	27		1	500-1K*	2K	3K	200K+50K (27/24)
GUIDANCE: 12							
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT		MED.		LONG	
		0-4		10		20	

*The MIST-50 cannot be used on targets at a range of less than 500 meters. The weapon diminishes the armor add, for a target it hits directly, by 4 at all ranges. Each of the four sub-munitions operates independently.

Illustration by A. McClellan

CAT. NO. 74-360521

TORONAGA "SCORPION" ATGW (ASG)

DESCRIPTION

The Scorpion is a special-purpose variant of the Archer SAM system described above. As such, it pushes the technology and effectiveness of man-pack anti-tank guided weapons to new heights. In appearance and use, the Scorpion is identical to the Archer. The sole differences are in the configuration of the warhead and in the targeting and homing algorithms. As with the Archer, the Scorpion offers true fire-and-forget performance. [The speed of the weapon is 250 m/s.]

HISTORICAL BACKGROUND

Both Toronaga systems arose out of the same development work. Although the Scorpion was released two months after the Archer, it was actually developed before the SAM system.

EVALUATOR'S COMMENTS

Of course the Scorpion was developed first. It was Toronaga's first attempt at a man-pack SAM, but it couldn't hit anything going faster than about 150 klicks. So the back-room boys tweaked the targeting and homing software and hardware, and got the kind of performance they needed for SAM work. They put that on the market as the Archer.

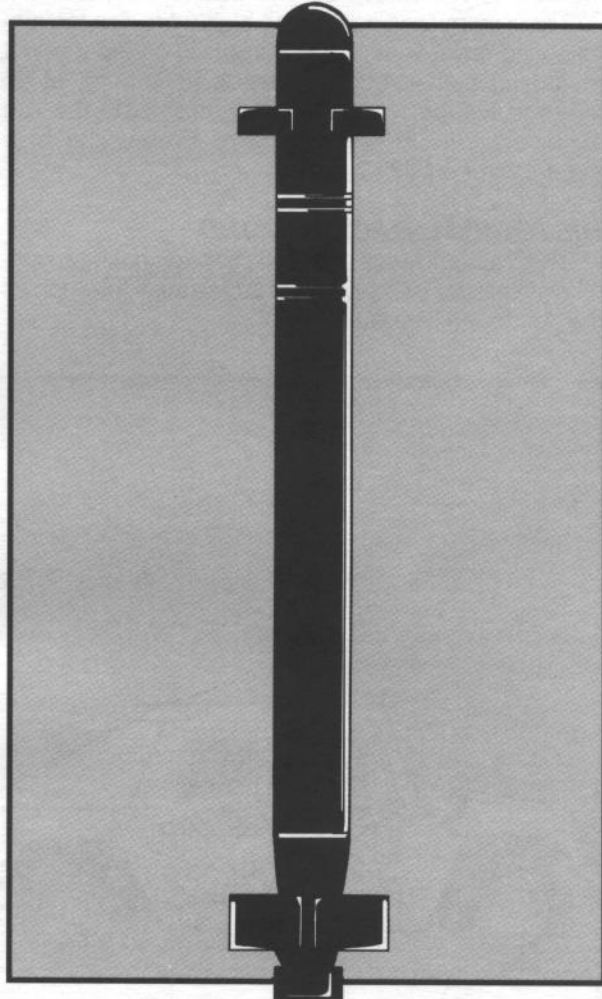
Then the marketing gurus at Toronaga wondered if they could make some money from the old technology. Can't hit anything faster than 150 klicks, huh? How about... tanks? Yeah, that's the ticket... So they bolted on a different warhead, and released it as the Scorpion.

Cynicism aside, the Scorpion is much better against tanks than the Archer is against aircraft. The Scorpion is a fast missile, and even the fastest tank isn't going to change its signature much in the time it takes the missile to get there. This means there's much less chance of losing lock. The warhead isn't bad, but it could pack more punch.

Jack "Dude" Mitchel
 Weapons Designer
 US Army Advanced Weapons Design Facility
 ("The Shop"), Dallas

SCORPION ATGW							
TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
24	28		1	1K-2.5K	4K	5K	65K (25)
GUIDANCE: 13							
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-5	10	25			

The weapon diminishes the armor add for a target it hits directly by 4 at all ranges.



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TORONAGA "YARI" SURFACE-TO-SURFACE MISSILE

DESCRIPTION

The Yari is a mid-range surface-to-surface missile — strictly speaking, a vehicle-launched cruise missile — that can carry a large HE or small nuclear warhead to targets up to 500 kilometers from its launcher.

The Yari mobile launcher is small enough to be towed behind a jeep. The launch tube is 3.5 meters long, 0.25 meters longer than the missile itself, and is self-erecting. The computer control console is a portable unit, massing only 25kg. Using this console, the operator downloads target and course information to the missile, and sets the firing time. After this information is transferred, the operator can disconnect the console and leave the area. The launcher will automatically position itself appropriately, and the missile will launch on schedule.

The Yari missile itself uses highly precise terrain-following radar to reach its target. In cruise mode it maintains high subsonic speeds (310 m/s), at an average altitude of 100m. In Hachiman tests, the Yari achieved a CEP (Circular Error Probability) of 9 meters over a 500km course.

HISTORICAL BACKGROUND

The Yari guidance system is based on the terrain-following radar used in earlier cruise missiles such as the American Tomahawk.

EVALUATOR'S COMMENTS

What we're talking about here is a nuclear-capable jeep-portable cruise missile. Scary. The programming console is a joy to work with. It's about as user-friendly as anything you'll ever see, and will walk a virtual novice through the process of setting up the missile. (If the novice can get past the very sophisticated password security system, of course.)

Hachiman claims a CEP of 9m, which is garbage. CEP is closer to 30 meters — not bad, considering the burst radius of the HE warhead is almost 50 meters. Overall, this is one very effective weapon system.

Sgt. Bill "Bingo" Bingham
USMC Weapons Instructor, Fort Bragg

YARI MISSILE

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
24	31		1	2K -150K	250K	500K	750K + 1M (30/30)
EXPLOSIVE BURST RADIUS (METERS)							
SHORT MED. LONG							
0-15 30 45							

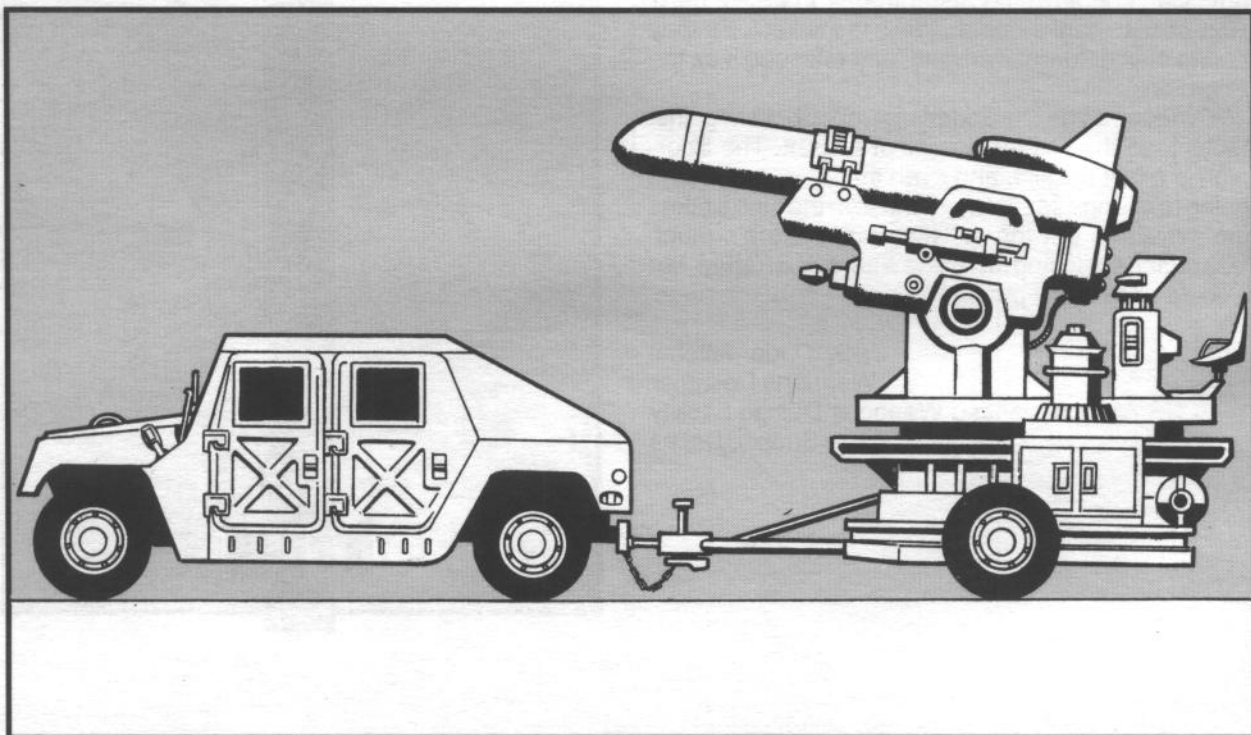
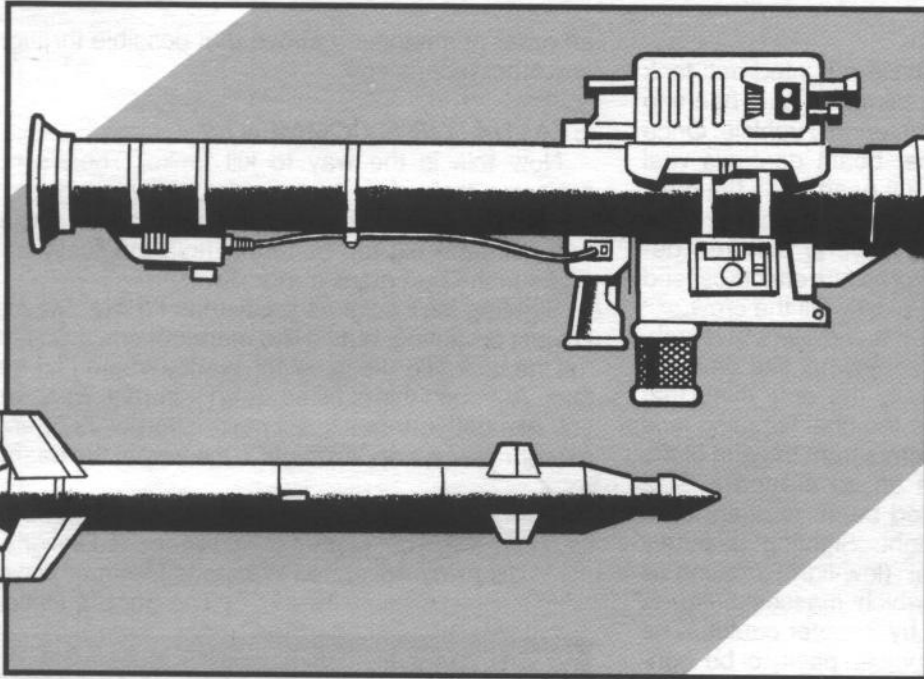


Illustration by A. McClellan



SARINAN SWARM MAN-PACK SYSTEM (ASG)



and increased the sensitivity of the detector to make the SWARM the premier system for killing radar sources on the battlefield.

EVALUATOR'S COMMENTS

"Direct development" is a euphemism for "reverse-engineered from" the HARM. The missile is effective for taking out small radar systems, like the guidance system for battlefield SAMs and the like. One problem is that the warhead is very small to make room for the guidance system. This leads to a limited punch.

Sally Kirchoff
Weapons Consultant, San Diego, CA

DESCRIPTION

The SWARM system from Sarinan Industries brings the radar-killing capabilities of anti-radiation missiles such as the HARM to the individual infantryman. The SWARM is a tube-launched fire-and-forget missile similar in size and design to the American Stinger, using high-energy solid fuel based on a Sarinan patent. The launching tube is light and very simple, since no control functions are necessary; all guidance "intelligence" resides in the missile. [The speed of the weapon is 250 m/s.]

On firing, the missile homes in on the most powerful source of electromagnetic radiation within its forward tracking cone. As does the HARM, it continues to home in on the last radiation source if the emitter should go off-line.

HISTORICAL BACKGROUND

The guidance system used in the SWARM is, in fact, a direct development of that used in the HARM. Sarinan Industries has miniaturized the electronics,

SARINAN SWARM SYSTEM

DAMAGE TECH	VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
24	24	1	100-1.5K	2.5K	3K	80K (25)
GUIDANCE: 13						
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
			0-3	8	15	

The SWARM can only be fired at ground targets that have radar systems, and the systems must be on at the time the missile is fired. If the radar is turned off after the SWARM is launched, the weapon is considered to have a guidance value of 10.

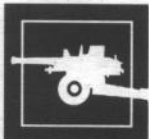


Illustration by A. McClellan

KOMATSU "WARHAMMER" ANTI-TANK LASER SYSTEM

DESCRIPTION

The Warhammer is a vehicle-mounted anti-tank weapon that uses a highly-collimated laser beam to punch through the armor of an enemy vehicle. Once through the armor, the laser beam destroys vital systems within the vehicle. If it penetrates the crew compartment, it will typically increase the air temperature instantaneously by several hundred degrees. This, coupled with overpressure effects caused by sudden expansion, will typically kill the crew.

The Warhammer unit itself is 2 meters in length, massing 300kg, and looks somewhat like an oversized TOW launcher. Virtually the only thing that gives its true nature away is the final focusing lens which extends a few centimeters from the end of the barrel. The Warhammer is based around a CO2 laser, so its tightly-collimated beam appears as a pencil-thin shaft of ruby light. Sighting is purely optical, with IR and "starlight" (low-light) imaging as options. The power pack, which masses 50kg, is connected to the laser unit by 3-meter cables. The weapon allows a second power pack to be connected, either in serial or parallel.

HISTORICAL BACKGROUND

The Warhammer is based on various breakthroughs made by Komatsu's High-Energy Physics lab in Osaka — the same breakthroughs, in fact, that made possible Komatsu's Highbeam laser rifle. The method of "pumping" the CO2 laser is protected by patent and trade secret, and delivers an energy level

an order of magnitude above that possible through any other technology.

EVALUATOR'S COMMENTS

Now this is the way to kill tanks. There's no projectile flight time to consider, no windage, no projectile drop. Put the sighting reticle on the target and push the big red button. A hole magically appears in the bad guy's armor. Swift.

Sighting isn't quite as precise as I'd like. Maybe I'm just dreaming, but I'd like more options than just "hit the tank." I'd like to select exactly where I hit the tank. Although this is billed as an anti-tank weapon, you can bet your butt it will make short work of any personnel who happen to get in the way of the beam.

Dennis Moriarty
Weapons Designer
US Army Advanced Weapons Design Facility
("The Shop"), Dallas

WARHAMMER LASER

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
24	28		4	500-1K	2K	3K	1M (30)

The weapon diminishes the armor add of its target by 4 at all ranges.

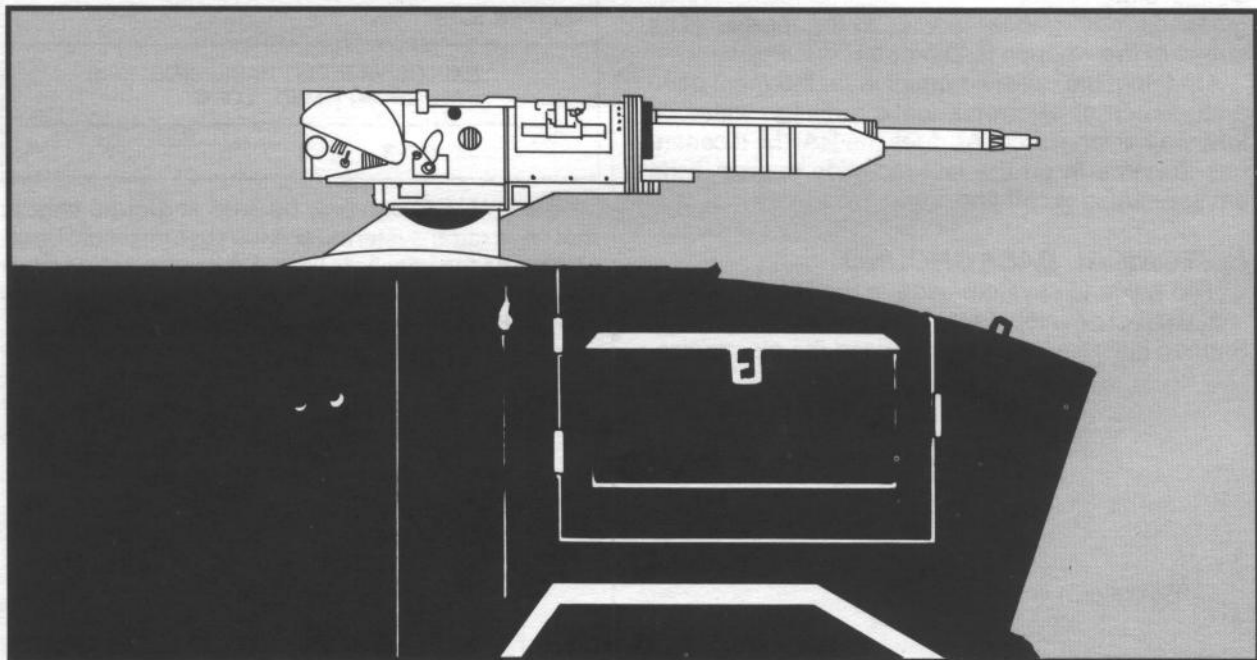


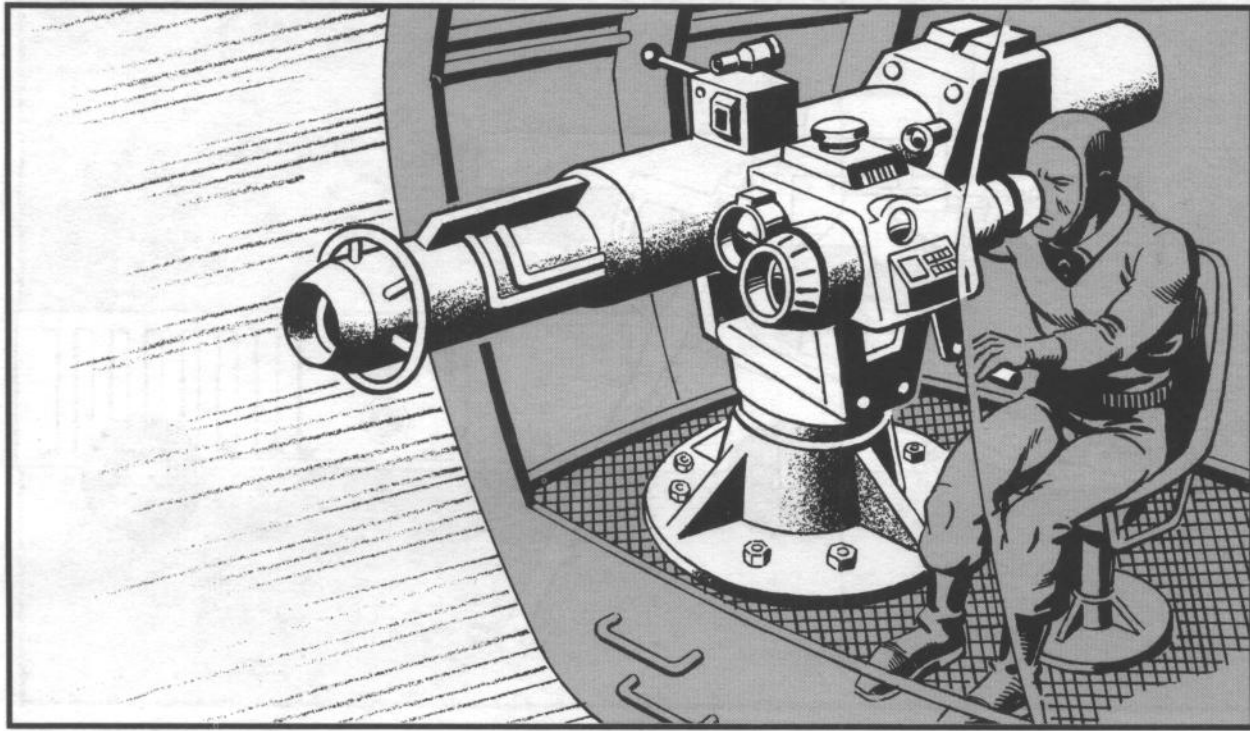
Illustration by C. Hunter



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KOMATSU "SPARROWHAWK" AIR-TO-AIR LASER



65



DESCRIPTION

Similar in basic design to the Warhammer anti-tank system, the Sparrowhawk includes several significant enhancements. First is a more versatile mounting system, with power-assist movements around both axes of motion, to allow the operator to engage high-speed targets. The second modification is a decrease in the collimation of the beam (in other words, the beam is broader and "cooler"). With a wider beam, it is easier to hit a fast-moving target. Even though the damage potential of the beam is decreased, this is incidental since warplanes by necessity carry much lighter armor than Main Battle Tanks.

The Sparrowhawk uses the same power packs as the Warhammer. Up to two additional power packs can be connected, either in serial or parallel. Important Note: If two additional packs are used, they must both be connected in the same way — either serial or parallel. Connecting one in serial and one in parallel will seriously damage the weapon. [In fact, it will cause the weapon to explode when fired. This explosion has a damage rating of 25, with the following burst radius in meters: Short 0-5, Medium 8, Long 12.]

The current prototype of the Sparrowhawk is too large to be used as a wing- or fuselage-mounted

weapon for fighters or fighter-bombers. So far, the only viable mounting option is in the tail-gunner position of a strategic bomber.

HISTORICAL BACKGROUND

Apart from the modifications listed above, the Sparrowhawk is basically the same weapon as the Warhammer.

EVALUATOR'S COMMENTS

In a missile-heavy environment, everybody seems to forget about the lowly tailgunner.

With the standard tail armaments, which are usually high-speed cannon, hitting anything is a cast iron bitch because of the speeds and weird geometries involved. With this "death ray," it's a piece of cake: see the bandit, kill the bandit.

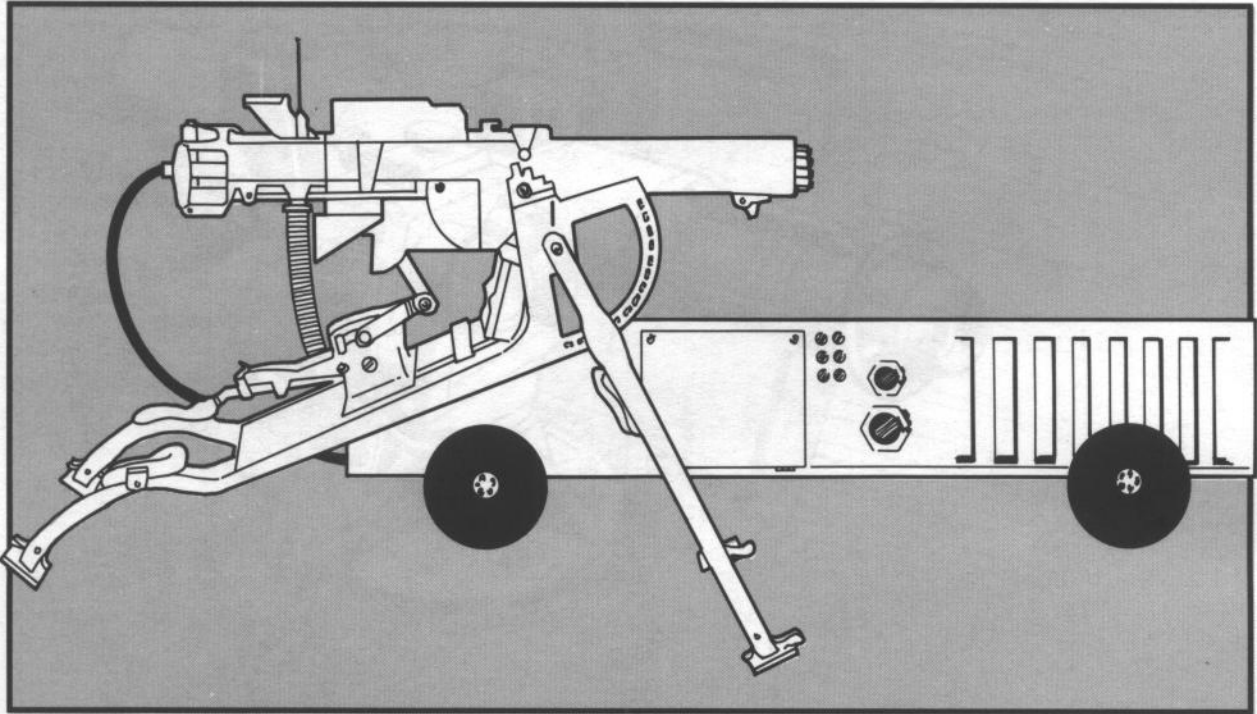
Where can I buy one?

Lt. Geoffrey ("Lowlife") McHugh
Fifth Strategic Bomber Wing, USAF

SPARROWHAWK LASER						
TECH	DAMAGE VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
24	27	4	500-1.5K	2.5K	3K	1M (30)

Illustration by A. McClellan

SARINAN "BAKEMONO" MULTI-LASER



DESCRIPTION

The Bakemono is Sarinan's successful attempt to produce a rapid-fire laser. The weapon is based on modified Gatling gun technology. It has six "barrels," each consisting of a CO2 laser, each with its own "pumping" and support circuitry. The barrels rotate, bringing each laser in turn into line with the aiming line. This technology minimizes a problem with many earlier laser systems: the relatively long recycling time for a single laser. Since the Bakemono incorporates six lasers, each individual laser has time to recycle while the other five are firing.

The Bakemono system is large — 2 meters in length — and bulky, even without its power packs. While this makes it difficult to transport in lighter vehicles such as jeeps, it is not a problem when the weapon is mounted in a light tank, or positioned in a fixed emplacement.

Power drain is obviously a problem. The Bakemono's power pack is 1.75m long by 1m wide by 0.8m deep, massing 230kg. A second power pack can be connected to the weapon, in either series or parallel.

HISTORICAL BACKGROUND

The six individual lasers making up the Bakemono system are based on mature technology. The major

breakthrough made by Sarinan Industries is the Gatling gun arrangement.

EVALUATOR'S COMMENTS

Oh boy, oh boy, a Star Wars rapid-fire laser... or so I thought. Yes, this is a rapid-fire laser. And yes, when it hits something it chews it up but good. But its effectiveness is greatly limited by its power supply. The thing fires about 3 shots per second... which is incredible for a laser. But a single battery pack, which is the size of a coffin, only has the juice for 12 shots. That means you're out of batteries after 4 seconds.

All that aside, this is one cool weapon. It sounds like something out of Star Wars, and watching this thing fire at night is something you'll never forget.

Sgt. Bill "Bingo" Bingham
USMC Weapons Instructor, Fort Bragg

BAKEMONO MULTI-LASER

TECH	DAMAGE		AMMO	S	RANGE			PRICE (VALUE)
	VALUE				M	L		
24	30		1	50-500	1K	2K	2M (32)	

Illustration by C. Hunter

CAT. NO. 74-366521

KOSA MEA-50 "CRYSTAL" BOMB

DESCRIPTION

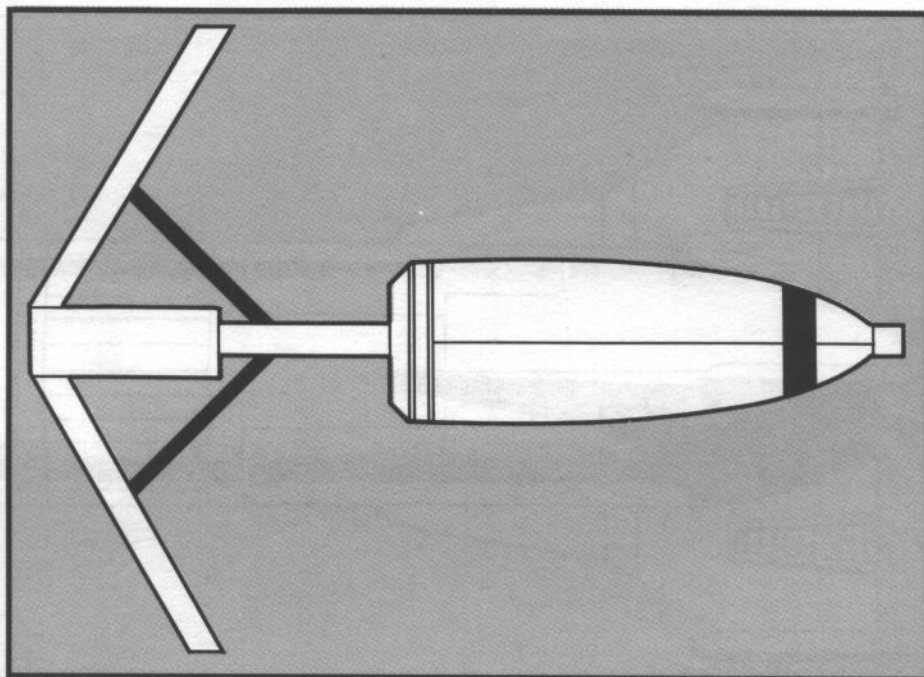
The MEA-50 is a unique weapon offered by Kosa Corporation of Kyoto. It is an air-delivered bomb, similar in appearance to a standard Mk81 250lb GP bomb, except somewhat lighter (98kg). It can be delivered by any aircraft capable of carrying "dumb" general-purpose ordnance.

The MEA-50 falls until it reaches an altitude of 200m, then detonates, releasing a spray of liquid Metal Embrittlement Agent (MEA). (The bomb is equipped with retarders, which slow its fall and give the delivering aircraft time to clear the area.) Metal Embrittlement

Agent is a chemical which greatly speeds up the process of metal fatigue in all metals, ferrous and non-ferrous. This accelerated metal fatigue leads to premature failure of parts, and significantly diminishes the effectiveness of metal armor. The MEA-50 bomb spreads this chemical agent over a circular area 150 meters in radius, centered on its detonation point. This metal embrittlement agent has the effect of diminishing the TOU of any metal object with which it comes in contact. If the object has its own *Toughness*, as with a vehicle, decrease the object's TOU by 5. (Thus, the *Toughness* of an M113A2 APC affected by MEA would be reduced from 24 to 19.) In the case of metal armor, decrease the add of the armor by 4. (Thus, the armor add of plate mail affected by MEA would be reduced from +5 to +1.) The effect of the agent is permanent.

HISTORICAL BACKGROUND

The research labs of various espionage services were reportedly trying to develop an effective metal embrittlement agent throughout the 1980s. It took the masterminds at Kosa's Chemical Research Facility to succeed. Kosa had no prior experience in the arms industry before announcing the MEA-50. This triumph shall change that.



EVALUATOR'S COMMENTS

We've got a big guy on staff that the boys call T-Bone. As a test, we gave T-Bone a 12-pound sledge, and told him to whale on an M48 tank we've got on the test range. Predictably, the experience hurt T-Bone more than it did the tank. Then we hit the tank with Kosa's MEA, and sent T-Bone out to try it again. It took him a while, but good ol' T-bone managed to smash a hole through the M48's side armor. That is scary.

Modern tanks are surprisingly immune to MEA, though. The Abrams uses ceramic-composite armor, which is unaffected.

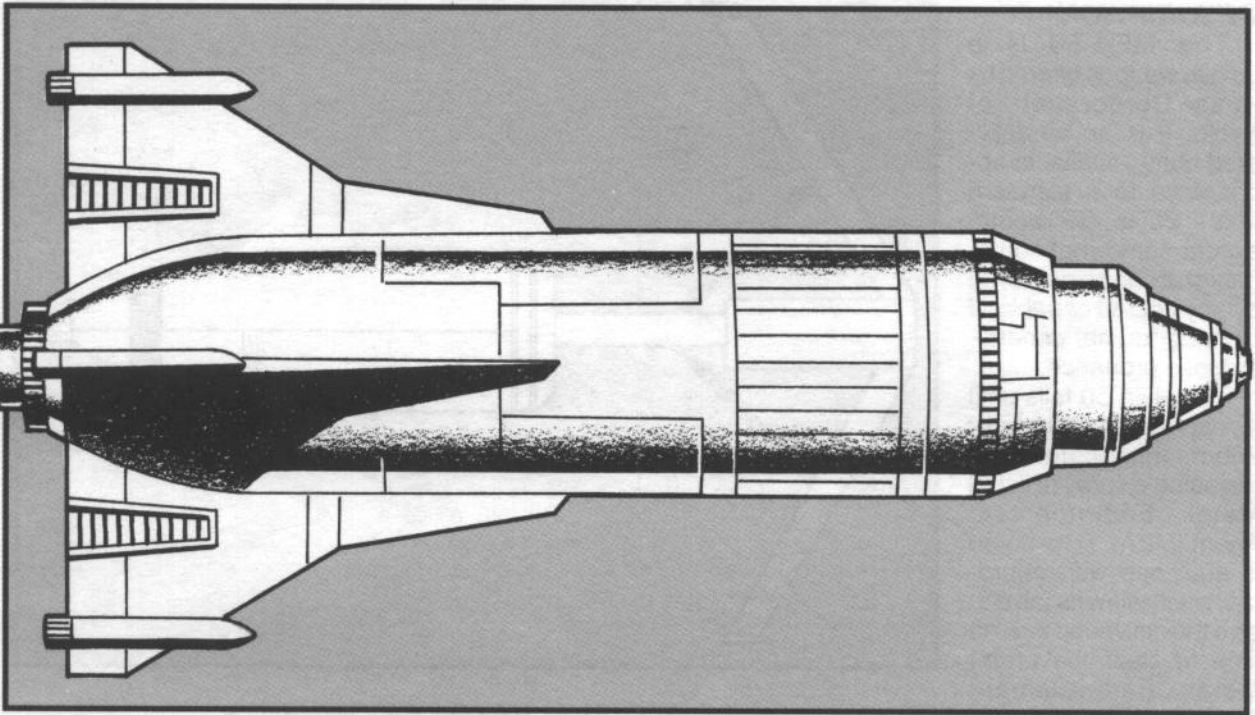
Jack "Dude" Mitchel
Weapons Designer
US Army Advanced Weapons Design Facility
("The Shop"), Dallas

KOSA CRYSTAL BOMB

TECH	DAMAGE		S	RANGE		PRICE (VALUE)
	VALUE	AMMO		M	L	
24	—	1	—	—	—	500K (29)



YAMAGUCHI ERW BOMB



DESCRIPTION

The ERW (Enhanced Radiation Weapon), or neutron bomb, is a small tactical nuclear weapon that kills with a massive dose of enhanced neutron and gamma radiation. This radiation can penetrate armor plate, and even a meter or more of earth, and is highly damaging to living tissue.

The Yamaguchi weapon is mounted in an air-delivered bomb. The weapon masses 230kg, and can be delivered by virtually any warplane. The bomb is equipped with retarders to give the plane time to get out of range. While the actual explosive effect is quite limited, the enhanced radiation effect extends outward in all directions to a range of 1,000 meters.

Twenty-four hours after the initial attack, the residual effects start. The character suffers another attack with a damage value two less than the initial attack's. Twenty-four hours after that, the character suffers another attack with a damage value four less than the initial attack's.

HISTORICAL BACKGROUND

During the mid-1970s, the US military was working on their own "neutron bomb." For reasons that were mainly political, the US indefinitely postponed the project in 1978. Yamaguchi has continued the research program. The result is this ERW Bomb.

EVALUATOR'S COMMENTS

If you believe that the difference between nuclear and conventional weapons is a political fiction, then the ERW is the weapon for you. Theoretically, you could kill the crews of an entire armored column and the next day walk in and repaint the tanks in your own colors.

Sgt. Bill "Bingo" Bingham
USMC Weapons Instructor, Fort Bragg

ERW BOMB

TECH	DAMAGE VALUE	AMMO	RANGE			PRICE (VALUE)
			S	M	L	
24	32/40*	1	—	—	—	20M (37)
EXPLOSIVE BURST RADIUS (METERS)						
SHORT MED. LONG						
		0-40	60	75 (BLAST)		
		0-300	750	1K (ERW EFFECTS)		

*The figure before the slash refers to damage caused by blast effects; the figure after the slash refers to damage caused by ERW effects. As the bomb is typically detonated at 200m altitude, nothing on the ground will suffer blast effects.

Illustration by A. McClellan

CAT. NO. 74-368521

EIJI "PORCUPINE" ACTIVE ANTI-TANK MINE SYSTEM (SPECIAL ASG)

DESCRIPTION

A single Porcupine unit is an air-delivered 2.5-meter-long, 350kg bomb similar in shape and design to the French Durandel Anti-Runway Bomb. It can be delivered by virtually any warplane. After release, a parachute deploys from the tail of the Porcupine, ensuring a correct nose-down attitude. When a proximity radar in the nose of the weapon confirms the Porcupine is at the correct altitude, a rocket motor in the tail accelerates the bomb straight downward. No longer powered, the Porcupine drives several meters deep into the ground, leaving a very small crater. When its sensors detect the approach of heavy armored vehicles, it "goes active" and fires four small guided sub-munitions out of the ground and into the air. Each sub-munition searches the immediate area for a vehicle that matches the profile of a tank or other heavy armored vehicle, and then homes in on that target. The four sub-munitions from a single Porcupine communicate among themselves, ensuring that each munition targets a different vehicle. If no vehicle matching the profile is detected, the sub-munitions fall free and detonate on impact.

HISTORICAL BACKGROUND

The Porcupine is a development of the Eiji Corporation's earlier "Spika" anti-tank system.

EVALUATOR'S COMMENTS

Weird, but interesting. The operational rationale assumes that enemy tanks are going to be close together — say in column. If not, then this very expensive device is going to toast just one (1) vehicle.

Sgt. Ted "Boomer" Nakamura
USMC Weapons Instructor, Fort Bragg

EIJI PORCUPINE MINE SYSTEM						
DAMAGE	TECH	VALUE	AMMO	RANGE	PRICE	(VALUE)
				S	M	L
24	26	1	10-30*	75	100	90K (25)
GUIDANCE: 11**						
EXPLOSIVE BURST RADIUS (METERS)						
		SHORT		MED.		LONG
		0-4		10		20

*This range refers to the distance between the buried Porcupine and the target tank.

**The gamemaster rolls only once for each munition (not twice) using the munition's guidance value. Each of the four sub-munitions operates independently. The weapon diminishes the armor add, for a target it hits directly by 4 at all ranges.

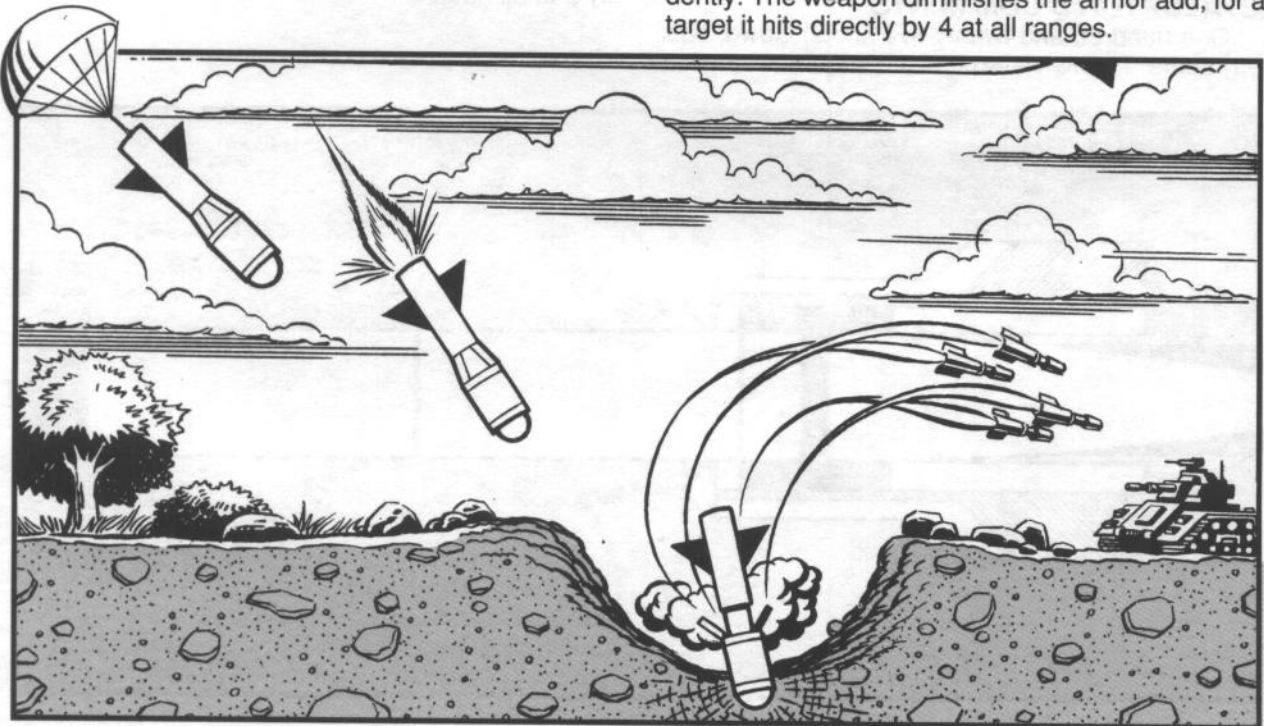


Illustration by A. McClellan



KOBAYASHI "STINGRAY" HIGH-SPEED TORPEDO (ASG)

DESCRIPTION

The Stingray from Kobayashi Corp. of Tokyo is the perfect answer to the improving performance of enemy submarines. The Stingray is, quite simply, the fastest torpedo in the world. Driven by a patented underwater rocket engine, the Stingray can achieve a top speed of over 125 knots [61 m/s] with a maximum range of 40 kilometers. The Stingray is entirely self-guided, using a combination of passive and active sonar. The small warhead is of the directed energy type, maximizing the chance of hull penetration. The Stingray can target submarines or surface ships.

The weapon is 2 meters in length. It is designed to be fired from a submarine torpedo tube, although a surface-vessel variant can be launched using the Hachiman ASROC system.

HISTORICAL BACKGROUND

When Kobayashi Corp. evaluated the performance of Britain's high-speed Spearfish torpedo, its engineers realized that this was the way of the future. High torpedo speed removes much of the guesswork from an engagement, since it reduces the enemy commander's options down to nothing; it also simplifies intercept geometry to a startling degree. The rocket-driven Stingray is expected to change the face of torpedo warfare.

EVALUATOR'S COMMENTS

One hundred and twenty-five knots! Gawd, let's buy some. This fish is exceptionally loud on sonar; it

sounds like there's a 747 with a lousy muffler after you. But what does that matter? Once the fish has got acquisition, odds are it's going to hit you whether you hear it and try to evade or not. There is one disadvantage of the mega-high speed. If the fish does miss, its turning radius when it comes around for a re-attack is huge. This gives a canny sub driver a chance to evade. Maybe.

Capt. Bartholomew Glenn
USS Dallas

STINGRAY TORPEDO

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
24	30	1	300- 20K*	40K	—	700K (30)	
GUIDANCE: 14							
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-3	20	25			

(UNDERWATER ONLY)

*The Stingray cannot be used against a target less than 300 meters from the firing platform. The weapon diminishes the armor add, for a target it hits directly by 2 at all ranges.

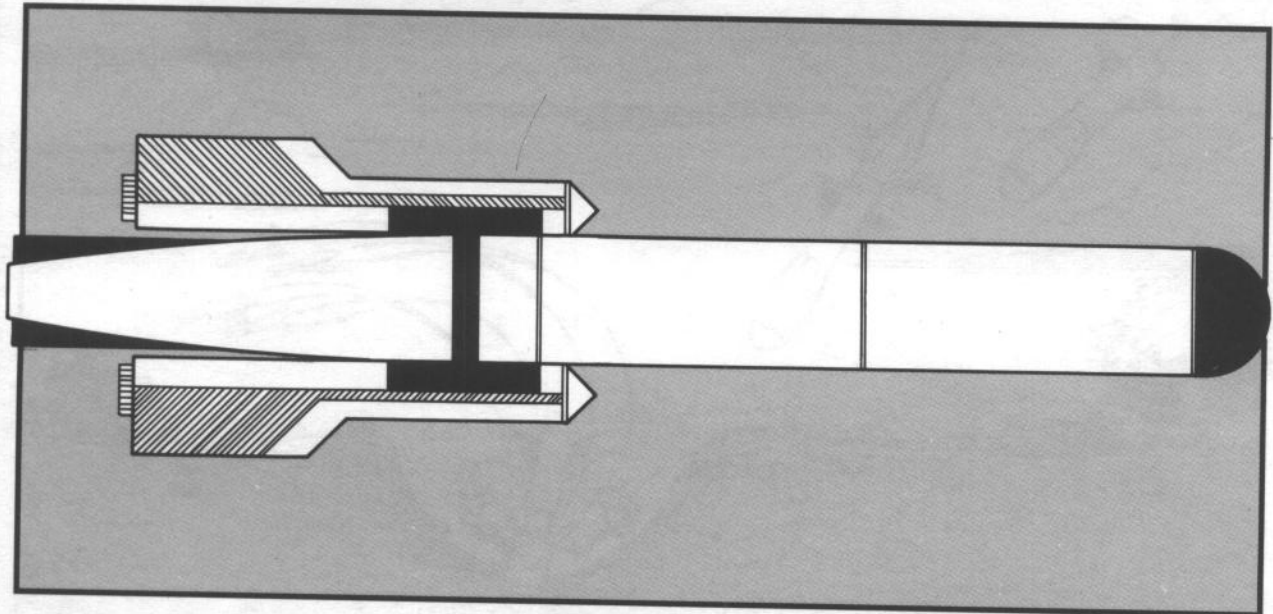
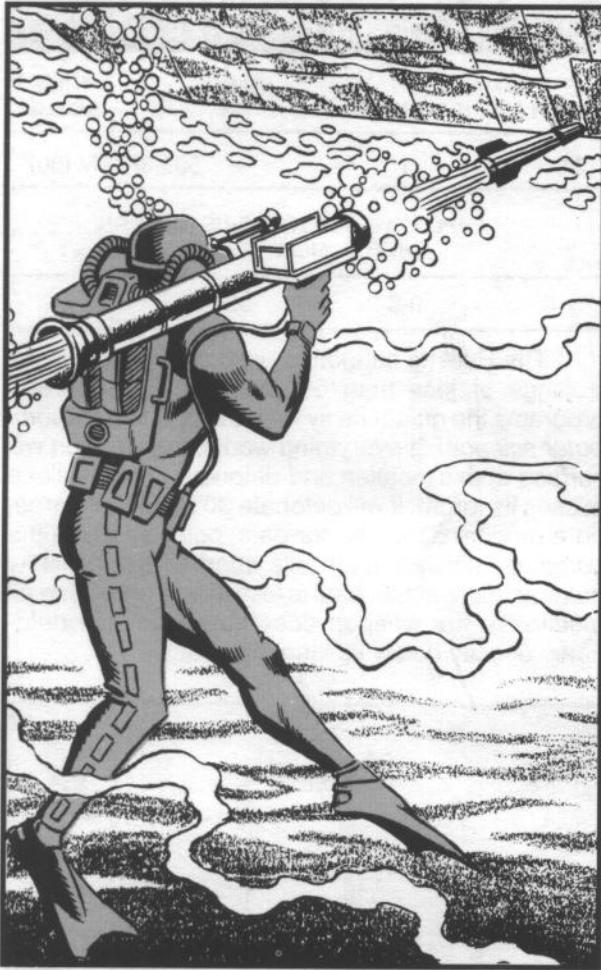


Illustration by C. Hunter

CAT. NO. 74-370521

KOBAYASHI "CUTTLEFISH" MAN-PACK TORPEDO (PGM)



a surface vessel. In this latter case, the "fish" runs at a standard 0.5 meters below the surface.

HISTORICAL BACKGROUND

Tube-launched man-pack weapons have long been a reality in surface combat. It has only been recently that the marine warfare experts at Kobayashi realized that this versatility could also be applied to naval actions. Much of the guidance technology was borrowed directly from LAW systems. The major breakthrough made by Kobayashi was in incorporating a powerful enough drive system in such a small form factor.

EVALUATOR'S COMMENTS

A shoulder-fired torpedo. What will they think of next? Great idea, but not so hot in implementation. First off, the Cuttlefish is one slow torpedo. Top speed is only 30 knots (about 53 km/h [15 m/s] for you metric types), which means there are lots of targets out there that can plain outrun your fish. Second, you're going to be keeping your sight on target for a while: max range is 1km, so transit time is about 68 seconds. In combat conditions, that's forever. Thirdly, the thing packs a warhead not much bigger than a hand grenade. Sure it's shaped-charged which helps, but it's still not going to even scratch the paint on a capital ship. (It's great for dealing with the rowboat that took your slip at the marina, though...)

Jack "Dude" Mitchel
Weapons Designer
US Army Advanced Weapons Design Facility
("The Shop"), Dallas

DESCRIPTION

In appearance, this weapon is very similar to a Stinger. It is a tube-launched optically-tracked wire-guided torpedo launched from a shoulder-fired disposable tube. The tube is 1.5 meters long, and the torpedo is 1.2 meters in length. The weapon can be fired underwater by a diver, or above the surface by a crewman on a ship's deck. The torpedo is ejected from the tube by a charge of compressed air; once clear of the tube (and in the water, if launched from above the surface), the torpedo's electric motor drives its contra-rotating propellers. The torpedo trails a control wire which remains connected to the firing tube. To guarantee a hit, all the operator must do is keep the launcher's optical sight centered on the target.

If fired underwater, the Cuttlefish can target either submarine or surface vessels. If fired from above the surface, however, the small torpedo can target only

CUTTLEFISH TORPEDO

TECH	DAMAGE		S	RANGE			PRICE (VALUE)
	VALUE	AMMO		M	L		
24	25	1	75-250*	500	1K	36K (23)	
PRECISION BONUS: +5							
EXPLOSIVE BURST RADIUS (METERS)							
		SHORT	MED.	LONG			
		0-3	10	15			

(UNDERWATER ONLY)

*The Cuttlefish cannot be used against a target less than 75 meters from the firer. The weapon diminishes the armor add, for a target it hits directly, by 1 at all ranges.



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YAMAGUCHI "BULLETTE" LAND TORPEDO

DESCRIPTION

The Bullette is a smooth cylinder 3.5 meters long, tipped with a rounded nose-cone. Around the base of the nose-cone are grinding elements similar to the three toothed elements making up an oil-drilling bit. Within the nose-cone itself is a hydrogen-burning "torch" which raises the temperature of the ceramic-composite nose to several thousand degrees Centigrade — hot enough to melt earth and rock.

The Bullette is "launched" into the earth from a downward-angled rack. It burrows into the ground to a depth of between 5 and 15 meters. Then, guided by inertial navigation, it begins to burrow towards its target. On reaching the target area, it "climbs" to within 1 meter of the surface. Then its warhead — plus any unexpended hydrogen — explodes, destroying the enemy emplacement from below. The Bullette is, of necessity, a slow-speed weapon. In soil or soft rock, it can achieve a top speed of 5 meters per minute. In hard igneous rock (such as basalt), it slows to 2 meters per minute. Maximum range for the weapon is 3 kilometers.

HISTORICAL BACKGROUND

There is no precedent whatsoever for this trend-setting weapon by the innovative Yamaguchi Corporation.

EVALUATOR'S COMMENTS

Yeah, it's a real ground-breaking invention. (Gaharf ga-harf.)

Say you've got a target 3 klicks away. That's 3,000 meters. At the torp's top speed of 5 meters/minute, it takes ten hours to get there. Another problem is that the inertial navigation gets screwed up regularly. In one test the pesky thing just decided it wasn't going anywhere. After ten hours, it reemerged next to its launcher... and detonated there. Embarrassing.

There seems to be a real trick in picking the thing's course; your chances are better if you look at a geological map and chart the little darling a course that minimizes transitions between hard and soft rock. These transitions seem to play merry hell with its guidance. On the positive side, when/if it reaches its target, it blows up real good.

Jack "Dude" Mitchel
Weapons Designer
US Army Advanced Weapons Design Facility
("The Shop"), Dallas

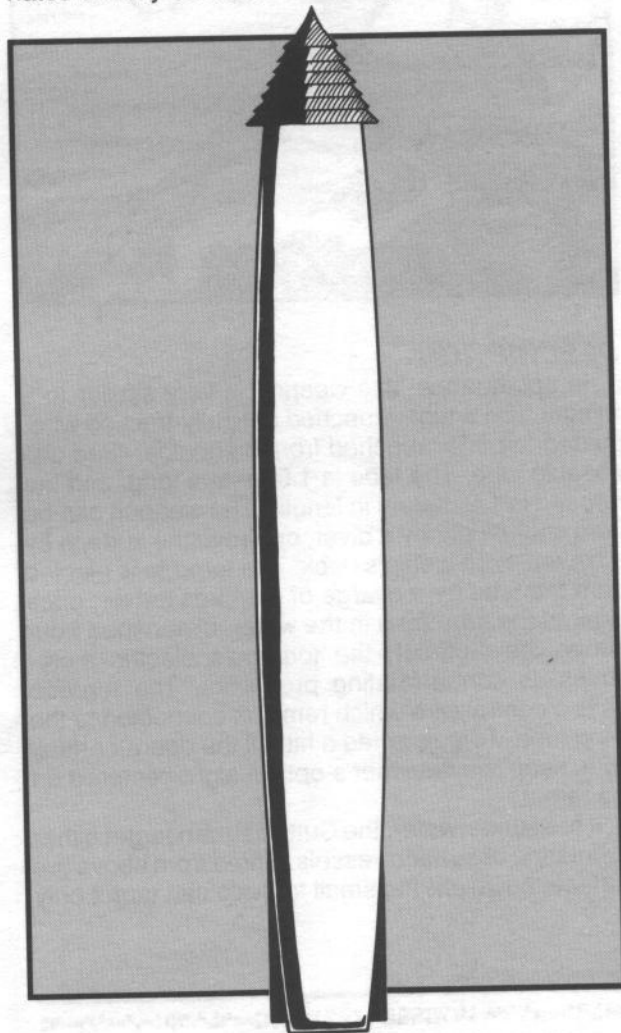
Illustration by C. Hunter

CAT. NO. 74-372521

BULLETTE TORPEDO

TECH	DAMAGE		RANGE			PRICE (VALUE)
	VALUE	AMMO	S	M	L	
24	33	1	—	—	500-3K* 1M (30)	
EXPLOSIVE BURST RADIUS (METERS)						
SHORT MED. LONG						
0-5 15 35						

* The Bullette cannot be used against targets at a range of less than 500 meters. The operator programs the guidance system using *Science (computer science)*. If everything works, the weapon will surface at this location and detonate. If the Bullette misses its target, it will detonate 30 meters off target (in a random direction) for each point by which the *computer science* total falls short of the difficulty number. If the action total is less than 2 (including all modifiers), the weapon does not move, but detonates directly below its launching rack.



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YAMAGUCHI "SHIROKINUKATSUKAMI" EMP GENERATOR

DESCRIPTION

The Shirokinukatsukami is a large, truck-transported unit, 18m long by 2.5 meters high by 2.1 meters wide. It generates an instantaneous EMP "burst" which is focused outward from a large inverted cone. The EMP is collimated into a beam which is approximately 1.5m in diameter at its source, but which spreads rapidly.

The Shirokinukatsukami must be accompanied by a support vehicle, containing a generator, or must be connected directly to the civilian electric grid at a substation. The large capacitors that power the Shirokinukatsukami take 45 minutes to recharge, and the weapon cannot be used again within this time period.

The device creates a cone-shaped EMP effect that subtends an angle of 5° and extends out to a range of 2k. Anything within this cone is struck by the EMP. Because of this, the weapon will always hit a stationary target within its maximum range, no die roll required. [If the operator is trying to hit a moving target, the weapon gains a +5 bonus to hit at all ranges, as its field of effect is so wide.]

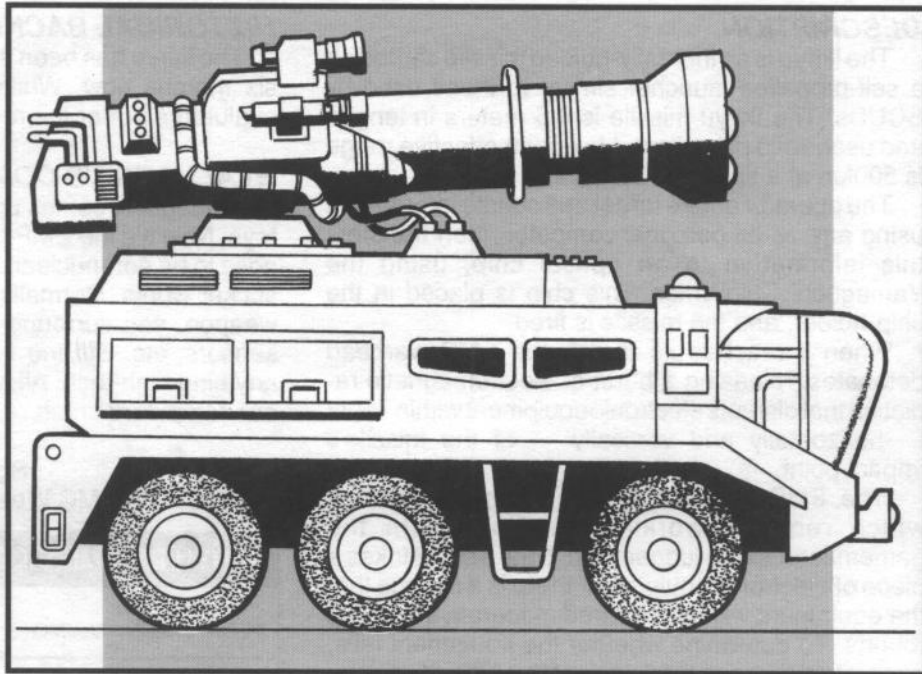
[The EMP is effective only against equipment which requires working electronics (in the gamemaster's sole judgement). If the beam strikes a piece of electronic equipment, there is a chance that the equipment will be rendered inoperative for 1-20 rounds. To determine whether the equipment fails, generate a damage total against the difficulty below. If the equipment is damaged, roll again to determine the number of rounds it is inoperative.]

EMP DAMAGE

Tech Level	Difficulty
20	15
23	14
24	12
26	10

HISTORICAL BACKGROUND

The technology used in Yamaguchi's Shirokinukatsukami is protected by patent and trade



secret. It can only be assumed that the technology is similar to the corporation's portable Mk.3 Microwaver, which has somewhat similar effects.

EVALUATOR'S COMMENTS

Who cares about patent and trade secret? Not us, boyo...

Let me tell you what really protects Yamaguchi's technology. It's the big radiation-warning trefoils stuck all over the outside of this nasty great device. Even our keenest technologists, the people who'll rip anything apart to see what makes it go, don't want to muck with this thing.

The Shirowhatever is big, you need a semi- to move it, a generator truck to power it, and five guys in white coats to make sure it works. But one EMP generator can crash all of that neat-as-all-get-out military hardware, leaving the enemy with nothing more sophisticated than a knife and some rocks. Sounds like it's real useful to me.

Jack "Dude" Mitchel
Weapons Designer
US Army Advanced Weapons Design Facility
("The Shop"), Dallas

SHIROKINUKATSUKAMI

TECH	DAMAGE		S	RANGE			PRICE (VALUE)
	VALUE	AMMO		M	L		
24	19	1	0-2K	—	—	20M (37)	

Illustration by A. McClellan



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YAMAGUCHI "IKIRYU" EMP MISSILE

DESCRIPTION

The Ikiryu is an inertially-guided missile carried on a self-propelled launcher similar to those used by SCUDs. The Ikiryu missile is 4.5 meters in length, and uses solid propellant. Maximum effective range is 500km at a speed of 280 m/s.

The operator enters target and course information using any 16-bit personal computer, then transfers this information to an optical chip, using the Yamaguchi ChipWriter. This chip is placed in the chip-holder, and the missile is fired.

When it reaches its target, the EMP warhead detonates, releasing a burst of electromagnetic radiation that disrupts electronic equipment within 750m — horizontally and vertically — of the missile's impact point.

[The EMP is effective only against equipment which requires working electronics (in the gamemaster's sole judgement). If the beam strikes a piece of electronic equipment, there is a chance that the equipment will be rendered inoperative for 1-20 rounds. To determine whether the equipment fails, generate a damage total against the difficulty below. If the equipment is damaged, roll again to determine the number of rounds it is inoperative.]

EMP DAMAGE

Tech Level	Difficulty
20	15
23	14
24	12
26	10

HISTORICAL BACKGROUND

The Ikiryu has been available in beta-test form for six months now. While extremely effective, most evaluators prefer the re-usable EMP generator.

EVALUATOR'S COMMENTS

Yamaguchi comes up with all kinds of other neat toys. Now it's the EMP bomb which somehow manages to be non-nuclear. We can't figure out how this sucker works. Normally, to analyze the action of a weapon, you surround it by all kinds of high-tech sensors, etc. But the Ikiryu is designed to disable anything high-tech. All we know is it goes boom and our computers crash.

Sgt. Ted "Boomer" Nakamura
USMC Weapons Instructor, Fort Bragg

IKIRYU EMP MISSILE

TECH	DAMAGE		RANGE			PRICE (VALUE)
	VALUE	AMMO	S	M	L	
24	20*	1	1K- 100K	250K	500K	3M (33)
EXPLOSIVE BURST RADIUS (METERS)						
			SHORT	MED.	LONG	
			0-5	20	30*	

*These figures — damage and burst radius — refer to the actual explosive detonation of the EMP warhead. The EMP effect extends 750 meters from the point of detonation, with a damage value of 21.

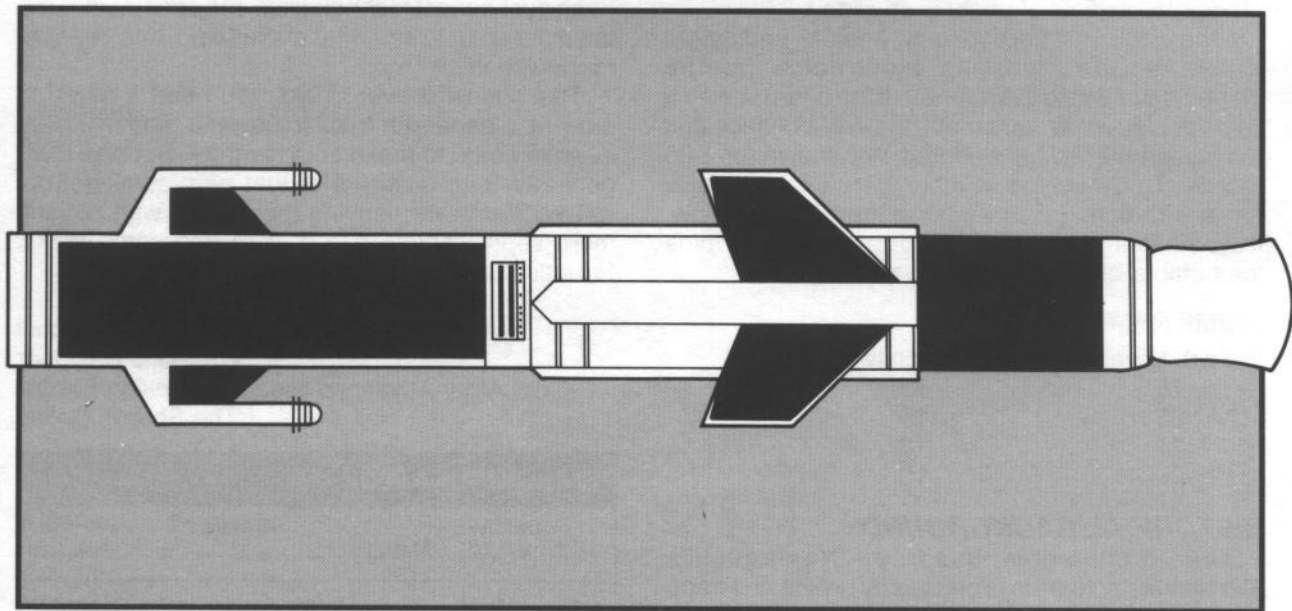
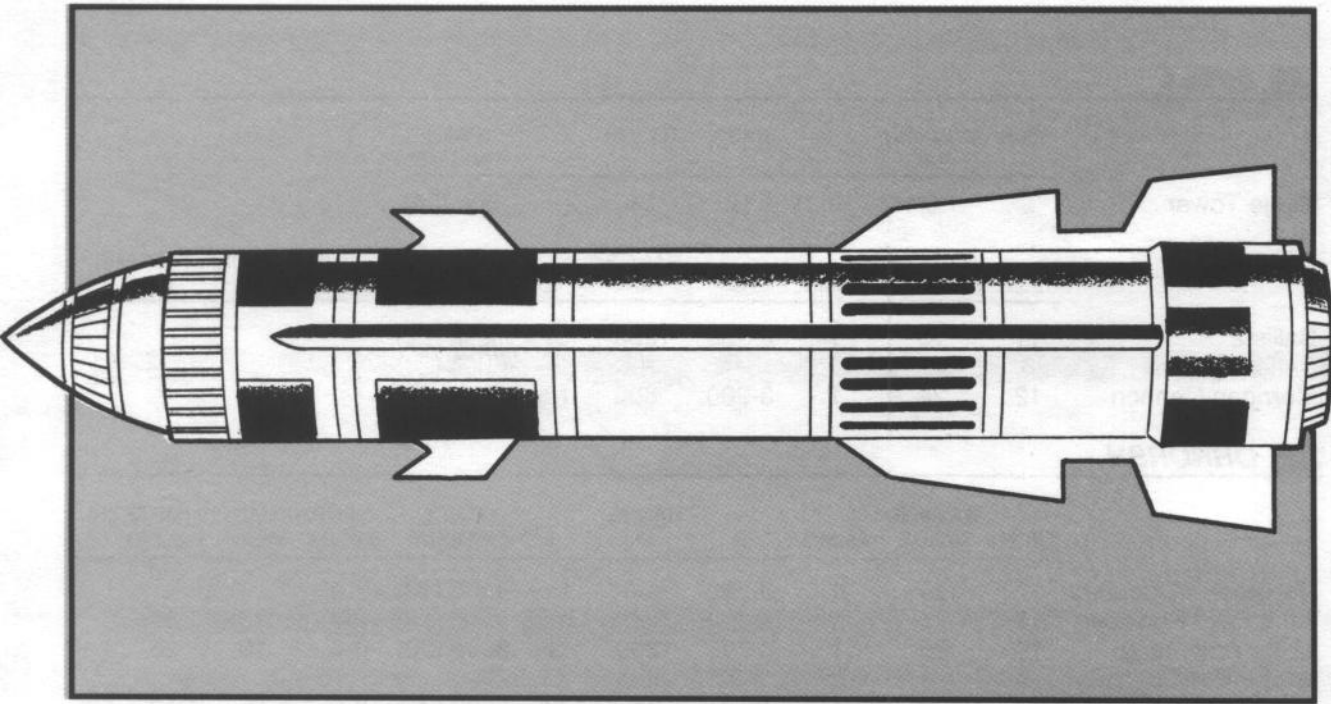


Illustration by C. Hunter

SARINAN NOW ENHANCED ASAT (ASG)



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DESCRIPTION

The NOW (Near-Orbital Weapon) is a 3-meter-long missile that can be launched from any missile-capable warplane that has an operational ceiling of 14,000 meters or more. Information on its target — which must be at an altitude of between 120km and 425km — is fed to the missile directly from any radar ground station compatible with the near-standard Sarinan ATC/AP telemetry protocol. [The speed of the weapon is 2,000 m/s for calculating flight time.]

On launching, the missile drops free from the plane, and then accelerates upward, out of the atmosphere. The missile uses full independent active radar guidance. The warhead is small, but sufficient to destroy even a militarily-hardened surveillance satellite.

HISTORICAL BACKGROUND

The NOW is a significant advancement from the American ASAT weapons tested in the late 1980s. These primitive weapons had to be launched from a high-speed fighter in an extreme zoom climb at an altitude of almost 29,000 meters (95,000 feet), and relied solely on kinetic energy to eliminate its target.

The NOW can be launched at an altitude of only 14,500 meters, and the launching plane can be in virtually any attitude by directly nose-down. In addition, the warhead gives the weapon considerably more "punch."

EVALUATOR'S COMMENTS

The NOW is an amazing weapon. The fact that you can launch from 14,500 meters is great. Even better is the fact that you can feed the missile with the target data it needs while the bird carrying it is in the air. It is very accurate.

But I have some objections. First off, in a well-planned attack, with the right intercept geometry — and you can always set up the right intercept geometry on a satellite — the kinetic energy involved in a collision can hardly be referred to as "solely."

Sally Kirchoff
Weapons Consultant, San Diego, CA

NOW ASAT						
DAMAGE	TECH	VALUE	AMMO	RANGE	PRICE	
				S	M	L
24	35	1	200K*	300K	425K	10M (35)
GUIDANCE: 15						
EXPLOSIVE BURST RADIUS (METERS)						
SHORT MED. LONG						
0-10 12 15						

* Range refers to altitude of the target above the earth's surface. The NOW cannot be used on any target at an altitude of less than 125k meters.

Illustration by A. McClellan

WEAPONS LIST

AYSLE

	TECH	KMH/MPH/ VAL		PASS.	TOUGH		PRICE (VALUE)	BURST RADIUS (METERS)		
	TECH	DAMAGE VALUE	AMMO	S	RANGE M	L	PRICE (VALUE)	SHORT	MED.	LONG
Siege Tower	8	1.6/1/2		12	14		60k (24)			
Ballista	11	18	1	3-150	250	375	25k (22)			
Battering Ram	8	22	1	—	—	—	50k (24)			
Morrigan Cannon	12	24	1	3-200	600	1.5k	200k (27)			

ORRORSH

	TECH	DAMAGE VALUE	AMMO	S	RANGE M	L	PRICE (VALUE)	BURST RADIUS (METERS)		
	TECH	DAMAGE VALUE	AMMO	S	RANGE M	L	PRICE (VALUE)	SHORT	MED.	LONG
Napoleon 12-pounder	17	24	1	3-150	600	1.5k	4000 (18)			
24-lb Field Howitzer	17	25	1	50-150	500	1000	3500 (18)	0-4	10	30
12-lbr Armstrong	19	25	1	3-300	1200	3k	8000 (20)	0-4	10	25
Maxim HMG	19	23	25	3-50	500	1k	2500 (17)			
111-Ton Naval Gun	19	30	1	100-1K	3K	5K	500k (29)	0-5	15	40
QF Pedestal Gun	19	23	1	3-300	1k	1.5k	100k (25)			
Valkyrie BHA-15	19	29	1	—	—	200+	6000 (19)	0-5	20	35
G7 Torpedo	19	30	1	—	—	500-6k	100k (25)	0-15	50	100

NILE EMPIRE

81mm mortar	20	18	1	100-400	750	1k	8000 (20)	0-4	10	20
10.5cm leFH18	21	30	1	400-1k	4k	12k	400k (28)	0-5	15	40
Long Tom	21	30	1	—	1k-6k	25k	200k (27)	0-5	15	40
70mm Type 92	21	27	1	100-300	500	2.5k	90k (25)	0-5	10	25
KAAs 20mm Cannon	21	27/28	8	3-400	2.5k	4k	75k (25)			
88mm FLAK36	20	27	1	50-600	4k	6k	90k (25)	0-5	15	35
L6 Wombat	21	25	1	3-200	600	1k	25k (22)	0-5	10	15
Vicker MK 1	21	24	20	3-100	1k	4.5k	5000 (19)			
Browning M2 .50 in	21	25	11	3-250	1k	2k	1500 (16)			
Tellermine 35	21	27	1	—	—	—	300 (13)	0-6	8	10
Elia Mine	20	30	1	—	—	—	4000 (18)	0-3	10	40
Mk 9 Mod Torpedo	21	31	1	—	500-1k	13.5k	200k (27)	0-15	50	100

CORE EARTH

Aden 30 mm cannon	22	30	10	3-400	2.5k	4k	100k (25)			
M61 A1 cannon	22	29	6	3-400	2k	3k	80k (25)			
150 mm 109A1	22	33	1	400-1k	8k	18k	500k (29)	0-5	15	40
		Speed kmh/mph/val.	Pass.	Tough						
		55 / 35 / 11	4	25						
AMX DCA 30	22	30	10	3-400	2k	3k	500k (29)			
		Speed kmh/mph/val.	Pass.	Tough						
		60 / 37 / 11	4	25						
Rarden cannon	22	27	3	3-400	2k	3.5k	100k (25)			



	TECH	DAMAGE		S	RANGE		PRICE (VALUE)	BURST RADIUS (METERS)		
		VALUE	AMMO		M	L		SHORT	MED.	LONG
Mk 48 Torpedo Guidance: 14	22	34	1	1k-10k	30k	70k	500k (29)	0-15	50	100
Spearfish Torpedo Guidance: 12	23	34	1	300-10k	30k	70k	500k (29)	0-3	20	25
RUR-5A ASROC Guidance: 12	23	32	1	1k-10k	30k	70k	600k (29)	0-15	30	80
RGM-84A Harpoon Guidance: 11	23	31	1	2k-20k	80k	30k	750k (30)	0-5	15	40
Valmara-69 Mine	22	24	1	—	—	—	800 (15)	0-10	15	40
Vampire Limpet Mine	22	27	1	—	—	—	550 (14)	—	—	0-4**
M712 Copperhead Precision Bonus: +6	22	29	1	100-500	2k	4k	8000 (20)	0-4	10	15
Vigilant Anti-Tank Precision bonus: +6	23	27	2	—	0-1k	2k	36k (23)	0-5	10	15
Hellfire ATGW Precision Bonus: +8	22	29	1	50-2k	5k	—	100k (25)	0-5	15	20
TOW missile Precision bonus: +7	22	28	1	100-400	1k	4k	36k +7k (23/20)	0-5	15	20
Stinger SAM Guidance: 10	23	27	1	100-1k	2.5k	4k	50k (24)	0-5	15	20
RBS 70 SAM Precision Bonus: +7	22	28	1	100-1k	3k	5k	36k +7k (23/20)	0-5	15	20
MIM-104 Patriot Guidance: 14	23	29	1	500-5k	25k	60k	1.8m (32)	0-5	15	25
HARM ASM Guidance: 15	22	28	1	50-2k	12k	16k	75k (25)	0-5	15	20
AGM-65 Maverick Guidance: 12	22	29	1	250-5k	15k	45k	120k (26)	0-5	15	20
MM40 Exocet Guidance: 15	23	30	1	1k-6k	40k	70k	150k (26)	0-5	15	25
AIM-54A Phoenix Guidance: 14	23	29	1	100-20k	75k	160k	1m (30)	0-5	15	20
Mk78 Mod2 Firebomb	22	27	1	—	—	—	4000 (18)	0-30	35	40
CBU-55 FAE	23	50	1	—	—	—	100k (25)	0-30	70	125

ADVANCED TECHNOLOGY

Archer SAM Guidance: 13	24	28	1	300-1.5k	2k	5k	65k (25)	0-5	8	15
ACAVM Missile Guidance: 15	24	30	1	500-2k	4k	5k	100k + 70k (25/25)	0-5	15	20
MIST-50 Guidance: 12	24	27	1	500-1k	2k	3k	200k + 50k (27/24)	0-4	10	20
Scorpion ATGM Guidance: 13	24	28	1	1k-2.5k	4k	5k	65k (25)	0-5	10	25
Yari Missile	24	31	1	2k-150k	250k	500k	750k+	0-15	30	45
SWARM Man-Pack Guidance: 13	24	24	1	100-1.5k	2.5k	3k	1m (30/30) 80k (25)	0-3	8	15
Warhammer AT Laser	24	28	4	500-1k	2k	3k	1m (30)			
Sparrowhawk	24	27	4	500-1.5k	2.5k	3k	1m (30)			
Bakemono Laser	24	30	1	50-500	1k	2k	2m (32)			
Crystal Bomb	24	—	1	—	—	—	500k (29)			



ADVANCED TECHNOLOGY CONTINUED

	TECH	DAMAGE		S	RANGE			PRICE (VALUE)	BURST RADIUS (METERS)		
		VALUE	AMMO		M	L	SHORT		MED.	LONG	
ERW Bomb (blast) (ERW effects)	24	32/40	1	—	—	—	20m (37)	0-40	60	75	
Porcupine Mine Guidance: 11	24	26	1	0-300	75	100	90k (25)	0-4	10	20	
Stingray Torpedo Guidance: 14	24	30	1	300-20k	40k	—	700k (30)	0-3	20	25	
Cuttlefish Torpedo Precision Bonus: +5	24	25	1	75-250	500	1k	36k (23)	0-3	10	15	
Bullette Torpedo	24	33	1	—	—	500-3k	1m (30)	0-5	15	35	
Shirokinukatsukami	24	19	1	0-2k	—	—	20m (37)				
Ikiryu EMP Missile	24	20	1	1k-100k	250k	500k	3m (33)	0-5	20	30	
NOW ASAT Guidance: 15	24	35	1	200k	300k	425k	10m (35)	0-10	12	15	



SNEAK PREVIEW!!! SNEAK PREVIEW!!!



DESCRIPTION

The Hachiman Arms "Pulse Cannon" is a hand-held heavy weapon of devastating power. Its meter-long barrel fires pulses of plasma energy that, when fired over long distances, use their own kinetic energy to increase the damage of the pulse. This increase in pulse energy also causes the breakdown of the bolt soon after the energy passes the weapon's effective range, thus lowering the chances of "stray bolt" damage.

Currently, pulse cannons are powered by detachable energy packs capable of firing twenty-five such shots, but Hachiman is considering vehicle mounting and turret weapons with greater ammunition capacity.

HISTORICAL BACKGROUND

A product of years of development, the Pulse Cannon developed by the Hachiman Arms South American Development Organization is a major breakthrough in man-portable heavy weaponry. Large enough to cut through the heaviest armor, the Pulse Cannon's ammunition capacity and effectiveness at range herald a new frontier in arms manufacture.

EVALUATOR'S COMMENTS

"A new frontier in arms manufacture ..." that's what I was told the day I showed up in Sacramento for a "sneak preview" at Hachiman's new toy. *Three days* before the *Heavy Weapons Catalog* was due for release, the company rep calls me up and says I've got to fly to Sacramento *now*, to see this "incredible breakthrough." Normally, companies that want favorable reviews give their experts a little more time.

Normally, weapons like this don't exist.

While I'm not sure I believe what Hachiman says about their "South American Development Company," I'll believe anything anybody says while they're holding this weapon. This thing is *scary*. The woman chosen to fire the weapon at the demonstration I knew — she's my secretary. After brief, preliminary instructions, she fired the "pulse cannon" at an APC at about forty meters. Amazingly, she hit. Not so amazingly, the APC grew a large hole in its side — I've seen energy weapons before and know what they can do.

Or so I thought.

For the next shot, they backed Maggie up about 600 meters and fitted the cannon with a scope. After sighting in, she pulled the trigger.

The APC exploded.

Jack "Dude" Mitchel
Weapons Designer
US Army Advanced Weapons Design Facility
("The Shop"), Dallas

PULSE CANNON

TECH	DAMAGE		AMMO	RANGE			PRICE (VALUE)
	VALUE			S	M	L	
27	23*		25	3-200	500	1K	400K(28)

* The damage value of the pulse cannon increases with range. At medium range, add +2 to the damage value; at long range, add +4.

KANAWA HEAVY WEAPONS

By Nigel Findley

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We at Hachiman Arms Division know you would never start trouble. Sadly, the world is full of trouble willing to start with you. For those extreme circumstances, we proudly offer the finest selection in heavy weapons. We have made painstaking efforts to procure weapons from a wide spectrum of technological sophistication, from an Aylish steam cannon to our ultra-modern gatling laser. In keeping with tradition, each offering comes with a technical description, historical background, and commentary from our expert evaluators. Financing to qualified buyers is available through our UpGun™ program. So call your Hachiman representative today!



A Supplement for



Roleplaying the Possibility Wars™

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Fantasy/Games

This supplement is designed as a companion to *Torg: Roleplaying the Possibility Wars*. It introduces players and gamemasters to the second in a series of weapons catalogs provided by Hachiman Arms, a weapons-manufacturing megacorporation in the realm of Nippon.

For ages 12 and up.



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