

\$3.00

May 1996

# *Museum Ordnance*

*The Magazine for the  
U.S. Army Ordnance Museum*

*Promoting the preservation and collection of information and artifacts of military ordnance from around the world.*



# NOTE FROM *Museum Ordnance* THE PUBLISHER

Since September of 1991, *Museum Ordnance* has been published on a regular basis to an ever-growing base of readers. The magazine has successfully filled a need for coverage of land-based military equipment, methods, and actions of the 20th century and beyond. In January of 1995, to meet a demand for more information, *MO* increased in page count to a total of 32 while still maintaining a balance of content.

Effective with the next issue will be the another step in the evolution of the magazine. When I started *Museum Ordnance*, I wanted a close relationship with the US Army Ordnance Museum. This would serve to promote the tremendous resource that they hold in the collection and also share some of the information on those artifacts with those that do not have the capability of visiting the museum. Over the years, the relationship has benefitted both the museum and the magazine. However, the time has shown that the title, for all of its worth, has not reflected the actual editorial content of the magazine. While we have always included articles on the museum's collection, a greater part of the material has dealt with other armor and artillery subjects. In some cases the inclusion of the word "Museum" has denoted old, and historic and has made the research of more modern, or

(Continued on Page 30)

## On The Cover

*After spending 57 minutes in the field during operational testing, Mark VIII 67986 ran out of fuel and had to be towed off.*

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*Two rockets are on their way. This photo was taken by the US Army 329 Infantry Regiment as it tested a captured rocket projector new Dusseldorf, Germany.*

# The Short Life of the 15 Volksworfer Brigade

In September of 1944 the 15 Werfer Brigade (Rocket Projector Brigade) was activated in the area around Hildesheim, Germany. Although the unit spent the next several months in training, only the officers and about 10% of the personnel were actually trained on the rocket projectors. The

unit was redesignated the 15 Volksworfer Brigade sometime in November.

In early December, the 15th were part of the GHQ reserve for the German assault into Luxembourg and Belgium. While positioned around the town of Marienbaum, the unit enjoyed a fully



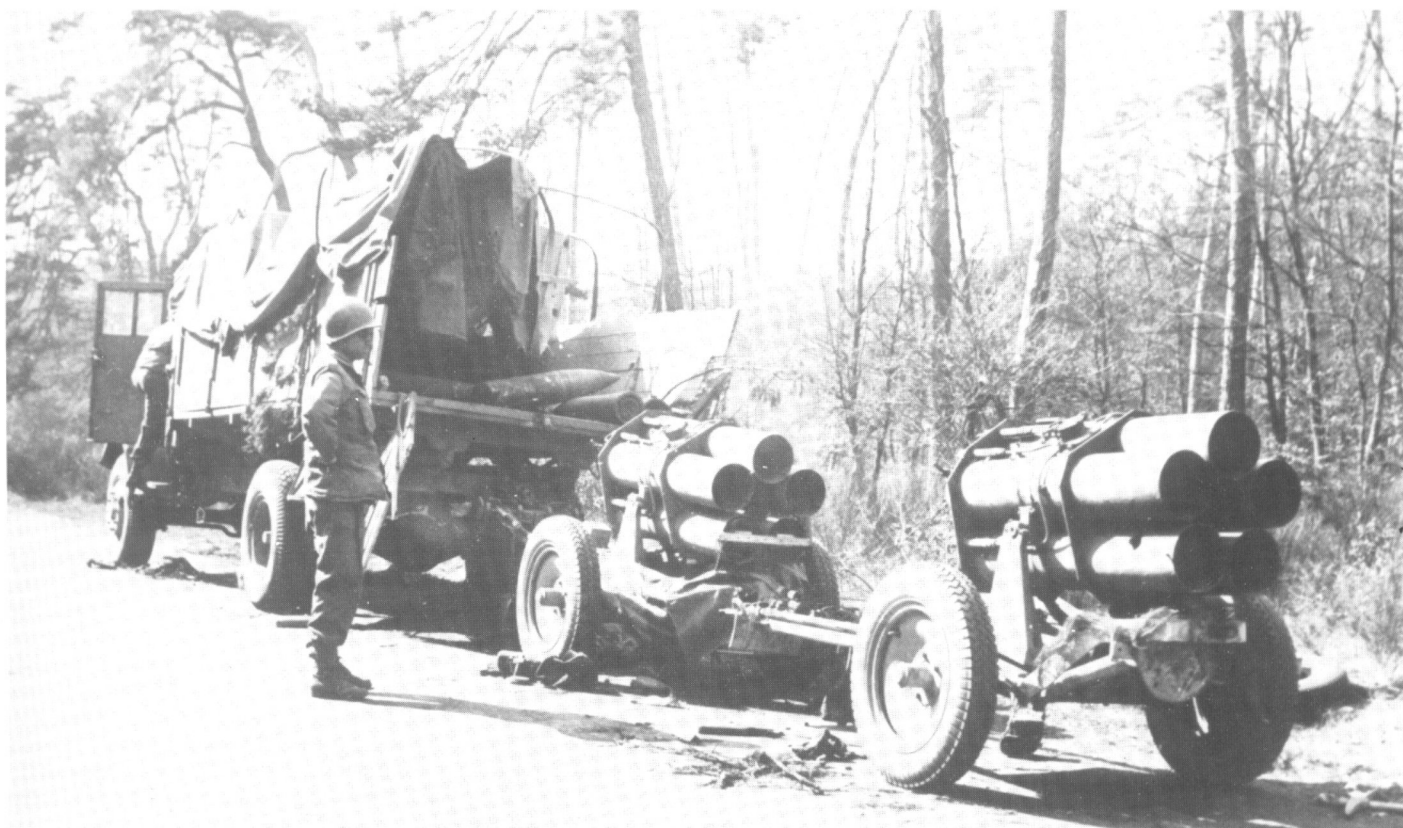
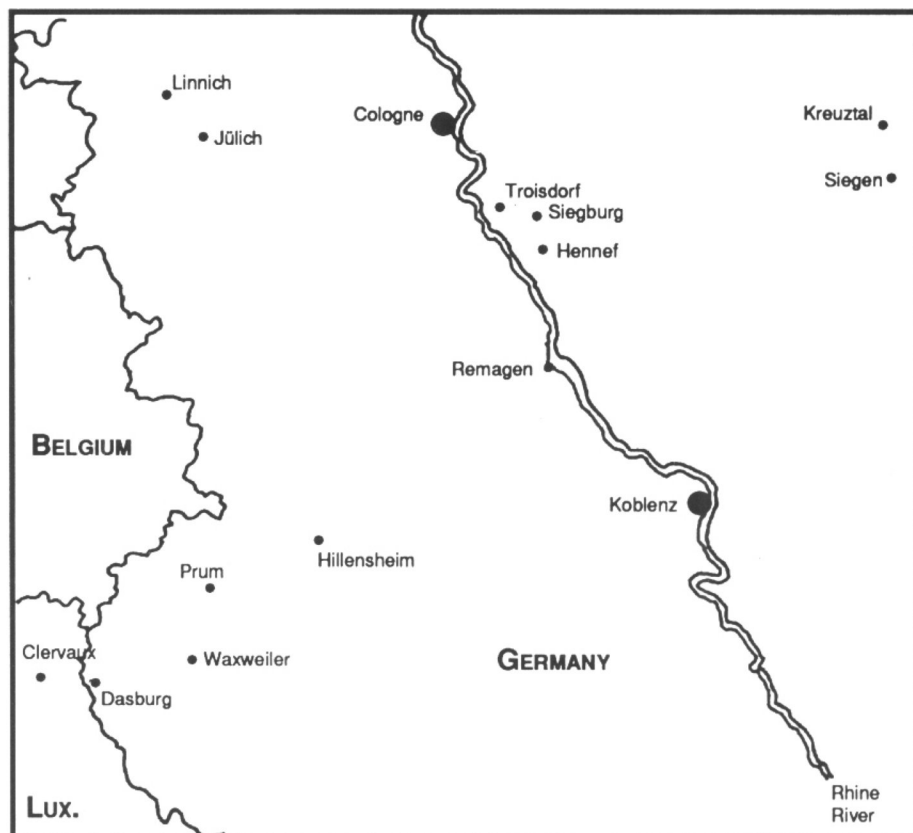
*In an unidentified location sits this 15 cm Nebelwerfer 41, with a worse-for-wear prime mover.*

Jeffrey D. McKaughan

staffed and equipped situation. There was, besides the Brigade staff, a signal/communication platoon, a maintenance platoon; the brigade consisted of two regiments, the 85th and 55th. Each regiment had three battalions (I, II, and III). The I and II battalions of each regiment were equipped with 15 cm projectors while the III Bn/85 had 30 cm and the III Bn/55 had 21 cm projectors. Each rocket projector battalion had three batteries each, with each battery equipped with six projectors. During the time prior to the assault, the 15th was subordinated to the XXXVII Armored Corps under General von Luettwitz. The final assembly area, before shifting to the actual firing locations was around the town of Waxweiler.

The unit's mission was to relocate to firing positions around Dasburg (almost due east of Clervaux) and lay down preparatory and support barrages on December 15. After the initial phases, II Bn/55 was to be piecemealed to the attacking divisions for support. The other two battalions were to await movement orders.

On orders, the brigade fired six salvos into the American positions and then waited for instructions. Placed into army reserve, the brigade was ordered to detach all of its transport to aid in the movement of bridging equipment to the Meuse. The majority of the



*Shown here being pulled by a light truck in tandem are two 21 cm Nebelwerfer 42s.*



*Ruined and abandoned, these 30 cm nebelwerfer 42 projectors have been pushed off the road by advancing U.S. troops.*

vehicles returned to the brigade by December 31.

On January 1, 1945, Regiment 55 was ordered to the Bastogne area and reunited with the II Bn/55 which had detached earlier. The Brigade Staff and Regiment 85 were unable to move forward in support due to fuel shortages. Despite the distance, as the HQ staff was still located around Arzfeld, communications did not present a large problem as the brigade was equipped with 100 watt transmitters, and forward observers had ultra short wave radio sets.

Ultimately, as the offensive became a defensive operations, the 15th again found itself in positions around Waxweiler. The I Bn and II Bn/55 were still operating under subordinated commands and did not move with the bulk of the brigade. Losses during the offensive were relatively light, roughly ten percent of the troop figure and this included losses due to illness (which was the major cause). Vehicle losses, however, were more significant totaling about fifty percent of the starting number. Battle losses, accidents, and maintenance problems were major contributing factors.

Between February 15 and 22, the brigade moved north to the area around Jülich. Fuel shortage prevented the III Bn/55 from moving with the brigade, not completing the move until Febru-

ary 26. While I Bn/55 was moving to rejoin the brigade from the fighting around Prüm was attacked by an American column and forced to destroy its vehicles and rocket projectors. This loss, combine with others in all units resulted in the brigade having no trucks for munition supplies. All projectors were towed in couples or behind light trucks or cars.

The brigade was now under the command of LXXXI Corps and was assigned fire support duties along the defensive line from Jülich to Linnich. Curiously enough, the brigade command post was very far to the rear in Troisdorf, just north of Bonn. On the 23rd, while changing positions, the III Bn/85 was attacked by American tanks and lost the bulk of its vehicles and projectors. On the same day, a similar fate befell the II Bn/55 at Boslar where its personnel now took up infantry roles in the town's defense.

Slowly the front lines fell back, creeping closer and closer to Cologne. On March 2, II Bn/85 suffered heavy losses when it was surprised by American tanks east of Sinnersdorf. On the same day, the entire staff of 55 Werfer regiment was captured at Geyen.

By the 5th of March, with its ammunition expended, the brigade withdrew across the Rhine, except for the I Bn/85. On the evening of the 7th, the I Bn/85 crossed to the east side of the

Rhine in boats while their vehicles fought their way south through the city towards Bonn. The rocket projectors were destroyed somewhere around the Cologne Zoo as travel with them in the current conditions was too difficult and slowed down the movement.

Once the units reorganized, and with the arrival of sixteen new projectors, the 15 Werfer Brigade was established as Werfer Regiment 85 (I Bn and II Bn (both with 15 cm projectors)) and Werfer Regiment 55 (II Bn (with 15 cm) and III Bn (with 28 cm projectors)). Battalions were now made up of two batteries, each with six projectors. The unit was given a period of rest that lasted about two weeks in the area near Altenberg. Each regiment also had four trucks for munitions supply and carriage. When the unit was originally formed in September 1994, each regiment had twelve trucks for the same purpose.

Once placed back into combat service on March 23, the 15th was assigned to support the defensive line between Siegler and Hennef from positions northwest of Siegburg. The Brigade HQ was located near Breidt. On that very day, the units bombarded American positions on the southern bank of the Sieg River with some effect. For the next several days, the units spent much of their time moving from position to position based on the American advance.

Movement stabilized and the units stayed in positions near the Siegen-Kreustal road for a little over a week. On April 4, III Bn/55 was detached and sent northeast towards the Ruhr Pocket. The next day, the regimental staff of 55 along with II Bn/55 were transferred to the 59th Division for use as infantry as they were no longer capable of rocket projector operations. On April 15, the bulk of Regiment 55 was destroyed in an armored attack on the town of Remscheid where the regiment, now acting as infantry, were deployed.

The remainder of the brigade steadily fought a losing battle of movement, fire, and retreat until finally on April 17 a large portion of the Brigade HQ staff was captured and the Brigade fundamentally ceased to exist.

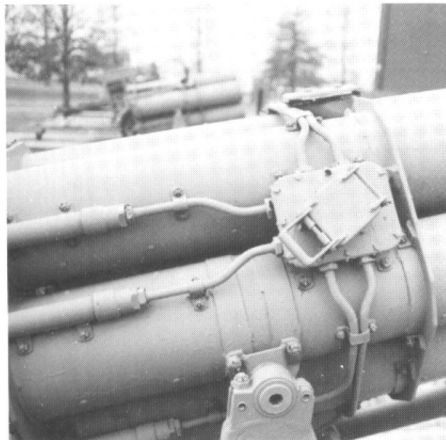
Thus ended the short history of the unit. After being given a promising amount of time to equip and train itself, it was utilized en mass at first, then as some parts were piece-mealed to other units, the 15 Volkes Werfer Brigade began to suffer from the problems of transport and overwhelming attacks by American forces. A specialized artillery unit ended the war, for the most part, as foot soldiers.



# 15cm Nebelwerfer 41



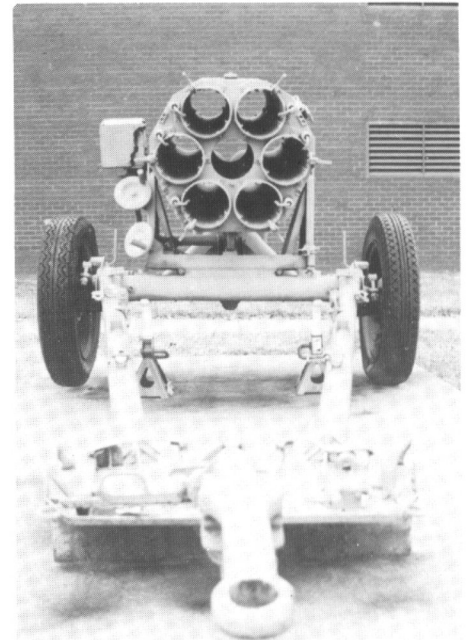
The 15 cm Nebelwerfer was the smallest rocket projector that equipped the artillery units. Distinguishable with its six barrels, it was capable of firing gas and smoke rounds as well as high-explosive projectiles.



The barrels are not rifled, the three small rails in each barrel are for support only. Notice the small rivet heads on the outside of each barrel along the length of the rails. This photo also shows the front support plate in the raised position.

The firing order of the rockets was fixed to reduce the chance that the projector would overturn while firing. The fire control junction box was operated electrically by remote control and permitted one "ripple" of six rounds to be fired in ninety seconds.

Each barrel measured fifty-one inches long and the entire projector, minus rockets, weighed about 1,195 pounds.

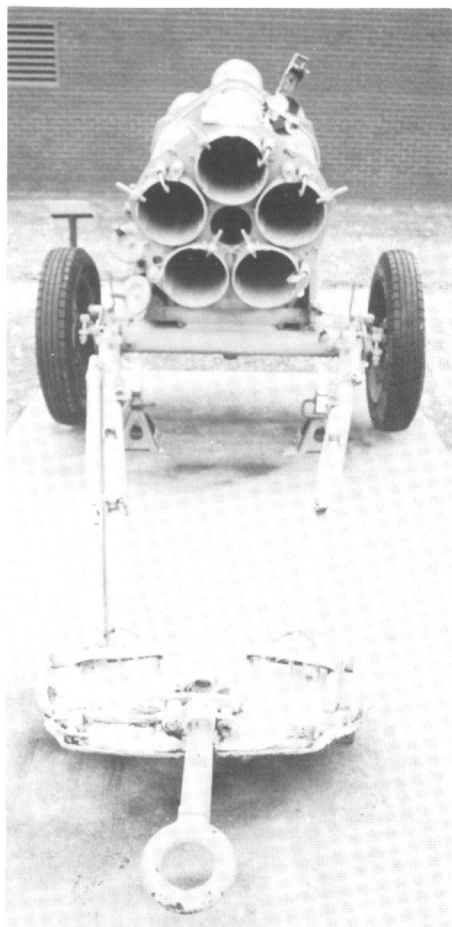


Elevation and traverse wheels are to the left. Maximum elevation is 44 degrees (range of 7,700+ yards).



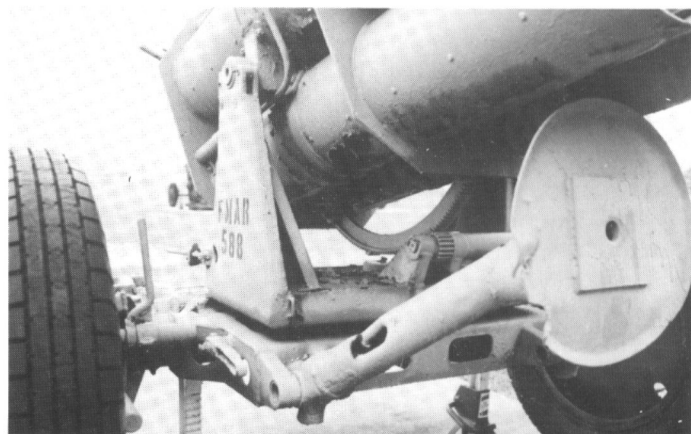


# 21cm Nebelwerfer 42



*Easily distinguishable from the 15 cm launcher by the number of barrels, five instead of six on the smaller projector. The barrels are also larger in diameter (9.25 inches) and longer (4 feet, 3.25 inches).*

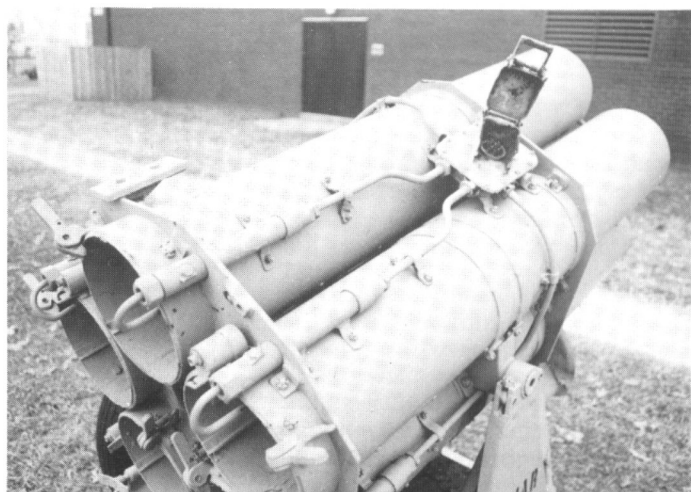
*From the rear of the projector, notice the split trail, trail locking arm, and the towing eye.*



*A look at the elevating gear.*

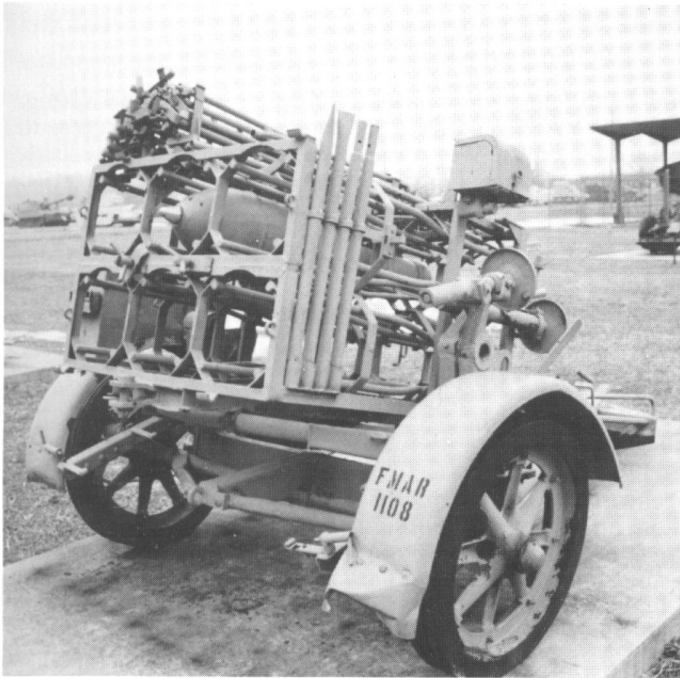


*Maximum range at an elevation of 45 degrees was about 9,734 yards. Firing mechanism and sights were similar to that of the 15 cm.*

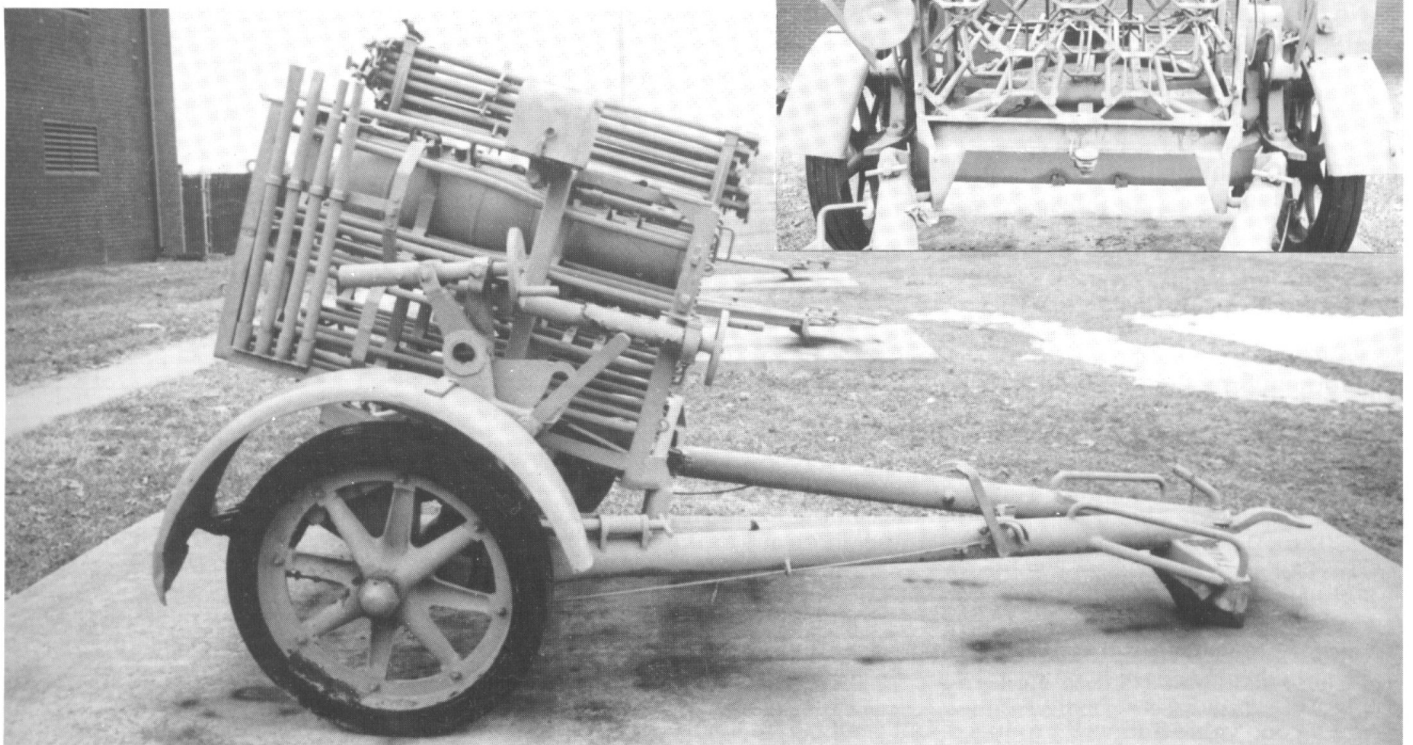
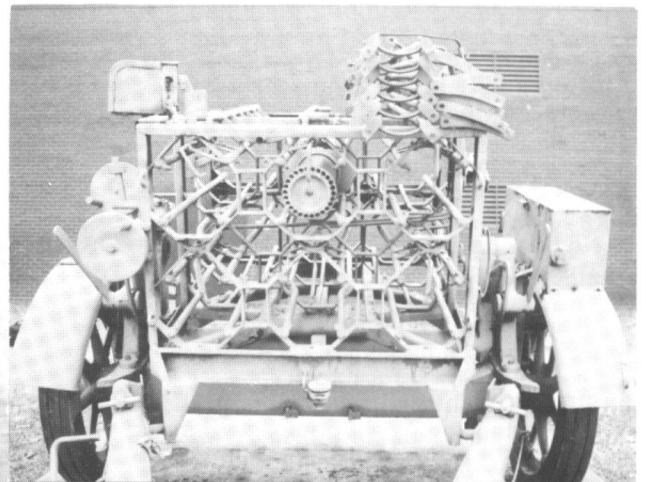


*Inside each barrel are angle pieces to support the rocket. Note the electrical junction for firing controls.*

# 30cm Nebelwerfer 42



*Differing in construction with the use of steel frames as opposed to tubes for the rockets, this projector could fire rockets up to 4,976 yards. The frame members are round steel bars that are shaped to the contour of the rockets. Note that this example at the U.S. Army Ordnance Museum has a rocket in one of the racks.*



# Museum Ordnance Bookshelf G-2

## news and notes about AFV resources

by

Tom Laemlein

A large number of autumn releases of AFV-related books has been followed by a relatively quiet winter and spring. But that doesn't mean that there aren't interesting and exciting new AFV resources to turn to. If you have access to a computer, and can get onto the Internet, there are numerous sites on the World Wide Web that provide downloadable images and information for the AFV enthusiast. Here's a listing of some sites of interest, with a short description of what you can expect to find. Note: most of these sites contain a large graphical content. Be patient and give them time to download.

The Tankers Homepage (<http://webpace.com/~tanker/>)

Possibly the best collection of links to military history sites on the Internet. A good starting point.

CanTankerous Page (<http://acs.appstate.edu/~pk7703>)

A loose collection of modern and vintage AFV photos.

Heavy Metal (<http://cyberspace.com/mbrunk/tanks.html>)

Multiple detailed shots of vehicles on display at the Patton Museum.

PanzerLehr (<http://clark.net/pub/mrhicks1/panzer.html>)

A home page dedicated to WWII German armor fans, using material from the National Archives. Under construction.

Matti Yrjola's Home Page (<http://hkkl.fi/~yrjola/my.html>)

A Finnish fellow interested in things military. Some AFV images. Outstanding shots of Finnish military aircraft museum.

Tankman's Tank Gallery ([http://compulink.co.uk/~mollusca/tank\\_gall.html](http://compulink.co.uk/~mollusca/tank_gall.html))

A loose collection of AFV photos, some from the famous Budge collection in England.

George Bradford's AFV News Page (<http://golden.org/~momoney/>)

The granddaddy of AFV magazines, offering details about back issues, "Question of the Month," and sample AFV multi-view drawings.

Desert Storm Pictures (<http://www.uoknor.edu/isc/dstor.html>)

Multiple photos of destroyed vehicles on the road from Kuwait City and a Iraqi hardware graveyard at Daharan.

No title (<http://bronze.ucs.indiana.edu/~cwhagen/tracks.html>)

The personal page of a AFV enthusiast. Numerous period shots of WWII German AFVs.

Gray's AFV Page (<http://www.scruznet.com~gcreager/hello6a.htm>)

Detail photos of most of the German vehicles at Aberdeen.

WW2 Pics (<http://ac.acusd.edu/History/index/allpicindex.html>)

A large index of WWII photos with descriptions. Includes some interesting period drawings and cut-aways of AFVs. Also WWII posters and ads from the US home front.

Track Link (<http://www.islandnet.com/~paulie/index.html>)

Resources for the armor modeler.

WWII Reenactor Page (<http://www.reenactor.net/us/ww2/>)

Group information on the many US and foreign reenactor units.

WW.I Bibliography (<http://www.sonic.net/~bstone/booktgh.html>)

Brian Stone's ambitious attempt to catalog every known book about WWII. A work in progress.

Look for these books to be released in the coming weeks/months. Concord's excellent Armor At War series will offer US Tank Destroyers In Combat, and Panther (both at \$13.95). Squadron-Signal has released M3 Lee/Grant In Action, and will soon re-release Leichte Panzer In Action and the much-sought-after Afrikakorps In Action (all at \$9.95). Schiffer will offer the first in a two-volume series called Panzer Truppen (\$45.00), culled from original German documentation and reports, and edited by Thomas Jentz. Also look for Schiffer's The Tiger I & Tiger II Profile (\$12.95), and Armored Trains of the Soviet Union (\$9.95).

Finally, there are two new releases in the Osprey/Automotive series on military vehicles: World War II Armored Fighting Vehicles and An Illustrated History of Military Motorcycles (both at \$29.95). These hardbound Osprey books are a good value and well produced, but really don't make a serious effort to break any new ground.



# Museum Ordnance's Bookshelf Book Reviews

## TIGER WITHOUT A HOME

### The United States Army Ordnance Museum's Panzerkampfwagen VI, Ausführung H1

By Richard Cox

103 pages, 72 photos, 1 map

1996 ISBN 0-9644359-1-8

The Ordnance Museum Foundation, Inc

Available from

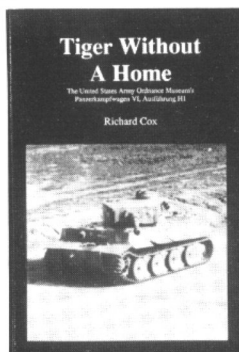
The Ordnance Corps Association

P.O. Box 377

Aberdeen Proving Ground, MD 21005

\$12.95 (\$2.00 US postage)

(Foreign - \$3.50 surface, \$5.50 air)



Reviewed by Peter Brown

While much has been written about Tigers over the years, this book is different. It is the story of one specific vehicle, covering the history of the Tiger captured in North Africa in 1943 and shipped to the USA for technical evaluation. As full a history of the tank is told from leaving the factory, through shipment to Tunisia, its actions there and subsequent abandonment, in as much detail as possible using surviving records. There is also an extensive bibliography on Tigers, listings of official photos of the tank, notes on which shots of the vehicle appear in other books, and even ideas of where to see the tank on video! The development of vehicles as affected by the Tiger is also mentioned, and a table compares it to

its contemporary opponents.

The vehicle itself is a very early example, thus when built it had some unique features. More were added in service, and still more while it was being tested as parts were taken from other captured tanks to keep it running. Even its markings were changed regularly, the different turret numbers are listed as part of the study of its modifications. After the tank had been tested it became a museum exhibit, it is perhaps best known as displayed at the Ordnance Museum at Aberdeen, Maryland, where it was on show for many years. Parts of the armor were cut away to reveal its interior, and for several years it was on outside display resulting in weather damage and still more damage from souvenir hunters. Even with the cut-outs covered over it continued to deteriorate and sink into the

ground. It was finally decided to try to have the vehicle restored, and a deal was struck whereby it would be returned to Germany for ten years in return for a complete restoration. At present it is in Germany where some work has been done although much still needs doing. It is now at least under cover from the elements.

While the story of the tank is interesting in itself, and details of one of the handful of remaining examples will make this a worthwhile book in itself for tank and Tiger fans, the other main thread of the story is just as important. While there is much interest in old AFVs and several survive in collections around the world where they can be studied by enthusiasts and professionals, many are in poor condition, usually due to lack of funds to care for them in official establishments. Cash shortages are not new, nor will they go away. Aberdeen's Tiger is a case in point, it stood totally exposed to the elements for many years, while the most many could do was to steal parts from it. Yet, when it was revealed that it was to be restored, there was an outcry about it being removed from display. Some amazing and unfounded accusations began to fly around, although few of those complaining would have been prepared to help either practically or financially. They would be far happier to spend their money on kits, books and other related items.

So, if this book does nothing else, it will show that tanks will not be preserved or restored for future generations by leaving them alone. During the period the Tiger was at Aberdeen, many other vehicles were scrapped, 235 in the early 1950s alone, and many more were destroyed in the early WW2 scrap drive. While such excess are (hopefully!) unlikely to happen again, practical action, and above all money, is needed. Profits from the sale of this book will help APG, but they are not enough. Maybe instead of just sitting back and eventually throwing your hands up in horror when a vehicle finally subsides into scrap, you might like to consider making some donation towards keeping them in existence at APG or another collection?

Donations to, or membership of, the Ordnance Museum Foundation, PO Box 688, Aberdeen Proving Ground, Maryland 21005 would help save other vehicles. The alternative is shown very well on the back cover of this book, with a photo of the empty concrete plinth where a piece of AFV history used to stand.

## FIGHTING VEHICLES

### APCs and IFVs

By T.J. O'Malley

Greenhill Books

144 pages, 140 photos and drawings

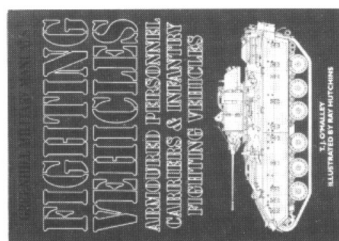
1996 ISBN 1-85367-211-4

Available from Stackpole Books

5067 Ritter Road

Mechanicsburg, PA 17055

\$19.95



the basic facts and information about each vehicle in a rather useful manner.

Finally, each vehicle is supported with a specification table giving the basic, height, weight, etc., in eighteen different areas.

Although it is rather easy to find more indepth information on any of the particular vehicles covered, it is not easy, and this affordable to find the broad information in a single source.

This book makes a great first reference book or for a general reference manual for basic information.

A hardback book measuring 8.25 by 6.25 inches, it covers 63 wheeled and tracked armor personnel carriers and infantry fighting vehicles. Each vehicle is shown with a black and white photo along with a side view line drawing.

Accompanying the illustrations is a well-rounded, if not in tremendous quantity, text. The author is well-respected and known within the military trade circles. He has summarized



# C<sup>3</sup>I

James W. Loop co-author of several books on tanks including *Soviet Tanks and Combat Vehicles 1956-Present*, and *Modern American Armor*, died on January 25, 1996 at the age of 63 after a long bout with cancer.

He was an avid armor enthusiast, and had been one of the original backers of the AFV Association. He and his brother John were the financial backers of the now-defunct *AFV-G2*.

Jim was a retired lieutenant colonel of the US Army, having served as an air defense officer. He was a wounded veteran of the Vietnam war, serving as an air advisor to the ARVN before being hit by sniper fire.

Jim was a generous supporter of other authors, with his photos and other material often appearing in books by Steve Zaloga, Dick Hunnicutt, Mike Green, and others and he was a regular contributor to the annual *Jane's Armor and Artillery* yearbook.

He is survived by his wife and daughters, as well as his brother John, also an armor enthusiast.

In the July, 1995 issue of *Museum Ordnance* there was an article on the competition for an Armored Security Vehicle for the US Army Military Police. The Tank Automotive and Armaments Command awarded a \$3.2 million contract to Textron Marine & Land Systems (Cadillac Gage Combat Vehicles) for their ASV 150. Phase One of the contract calls for four prototypes to be delivered for testing and evaluation.

After satisfactory completion of Phase One,



Phase Two calls for the delivery of 95 vehicles in a contract worth about \$56 million.

With the Army's 'Force XXI' concept still in an evolutionary state, there is the potential for the contract to expand to more than 1,000 ASVs to equip a lightly armored peacekeeping requirement of four brigades.

The Army version will mount an automatic 40mm grenade launcher and a .50 caliber machine gun in a small turret.

The USAF could also participate in the program with a contingent for the delivery of two prototypes to them for \$1.5 million. The USAF variant will be fitted with a high-energy laser to destroy unexploded munitions.

The Royal Military College of Science in England will hold a military vehicle display on May 19, 1996. Normally this high security area is off limits to the public and this event marks the first time they have opened their doors.

Besides the variety of military vehicles in the collection, both historic and modern, there seems to be a "method to their madness." In 1995, the staff at the college cosmetically restored their Tiger Ausf B (Tiger II) and they have recently decided to restore it to running

condition. They hope to raise interest and funds for that project starting with this open house.

The college can be contacted at 01973 785504 for more information.

Thanks to Peter Brown for the letter that was edited down for this column.

I would like to thank the numerous readers for letting me know that the vehicle shown in the bottom photo of page 6 in the January issue of *Museum Ordnance* was a Czech Praga Vollkettenschlepper, most likely a type T IX. I am told that there is a series of photos showing the vehicle in the Spielberger 35/38(t) book.

It was also noted by a few readers that the Biafran AFV in David Spencer's article, "Armored Combat of the Nigerian Civil War, 1967-1970," was not a British Universal Carrier but a T-16. Distinguishable by the four road wheels.

Thanks to everyone who responded and as always, please feel free to write regarding any article we publish.

*War Studies Journal* is a new bi-annual publications of the Department of War Studies of the King's College in London. The 89-page, soft-cover book has a variety of articles ranging from WWII historical pieces on American efforts to rearm the French and the British 21st Army Group Operations in the Autumn 1944 to contemporary articles on Croatia, Abkhazia, Hungary, and India. There is also a selection of book reviews.

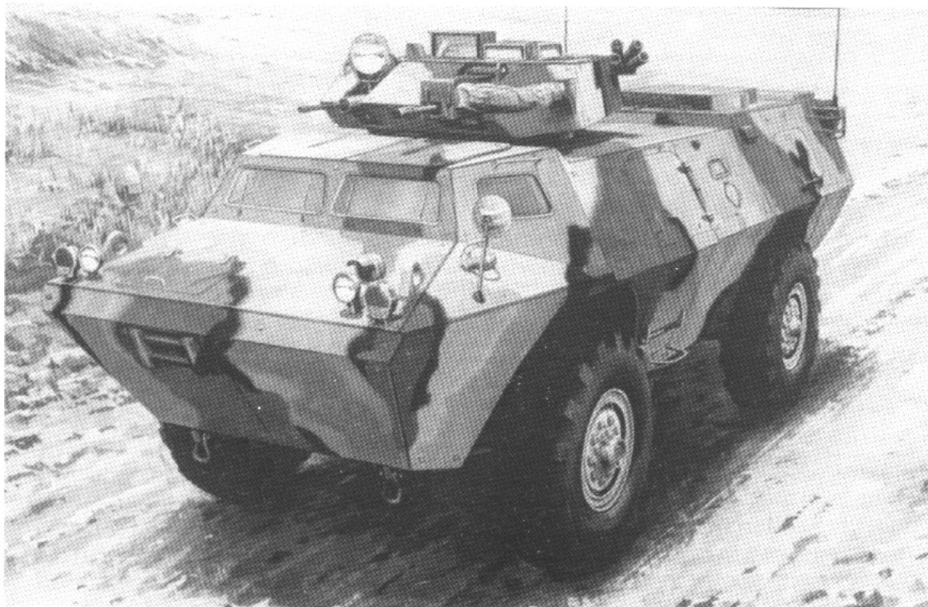
Nicely done and informative. For more information the *War Studies Journal* can be reached at P.O. Box 40951, Mesa, AZ 85274 in the US, or at King's College London, The Strand, London WC2R 2LS, England. Cost for a sample issue send \$9.00 or one-year at \$18.00.

The U.S. Army recently announced the cancellation of the development of the Regenerative Liquid-Propellant Gun (RLPG), which Dr. Asher Sharoni described as the key feature of the Crusader SPG in his January, 1996 *Museum Ordnance* article. The new self-propelled gun system has been a \$200 million and decade long process and is still at least two years from a point where the technology could be proven.

The Crusader will now be designed to fire the Modular Artillery Charge System (MACS) which is a solid propellant offering greater range (by about ten kilometers) than capable by the M109A6 Paladin currently.

The need to move forward and the failure to provide solutions to key features of the RLPG led to the move to cancel as the new system is due in place by 2005.

Lockheed Martin, prime contractor for the RLPG is still hopeful that development will continue, even if not for the Crusader program.



# 1995 Royal Navy and British Army Equipment

By PETER BROWN

## Exhibition Report

Every other year this event is held, not to display equipment currently in service with Britain's army and navy, but as a trade fair where British defense manufacturers can show their latest designs. It was originally an army only show, but the inclusion of naval items is not as strange an idea as might first be thought as many UK companies produce products for both services. As the event takes place near Aldershot, 'Home of the British Army' and some distance from the sea, it has a strong land-based flavor anyway, and apart from a mock frigate and some specialist electronics would easily pass for a single service showcase.

Anyone attending over a number of

years will spot a series of trends. One is the apparent smaller numbers of exhibitors, brought about in some cases by mergers within the industry. Most obvious is the change of emphasis on what is displayed, previous shows had more new heavy armor items while this time around these were thin on the ground. No new Main Battle Tanks or large caliber heavy artillery items were there, although both the British Army's newest items in these categories were displayed.

Vickers Defence Systems had a Challenger 2 on static exhibition. This again was in contrast to previous years, when several Vickers vehicles were paraded in the daily Mobility Displays.

One inside view stated that lack of participation was due to the relatively small market for new, heavy MBTs worldwide. Anyone seriously interested, and with sufficient funds and the necessary government clearance could easily be given a private viewing, either in the UK or their own country.

The vehicle on show was in the almost obligatory desert sand scheme, leaving no doubt as to the manufacturer's idea of their best potential market. The design has been adopted, in a modified form with special emphasis on engine cooling, by the Royal Omani Army, and Challenger 2 is now entering service with the British Army, and differs in a number of ways from the existing Challenger used in the Gulf. The turret is all new, and even that has changed over the vehicle's development cycle with more armor being fitted to the roof.

Externally, new tracks and track sprocket are obvious changes, as are the non-armored side skirts which would be replaced in wartime by metal armor bazooka plates or the Chobham armored skirts developed for the Gulf. Large road wheels and hydrogas suspension are used, engine is a Perkins Condor CV12 1200hp powering a David Brown TN54 gearbox with six forward and two reverse speeds. Basic armament is a new generation 120mm rifled gun aimed using a Canadian CDC fire control system, and the armor is the proven Chobham type.

Still new and with parts of its design classed as secret, this was the only vehicle on show with its own guard as two policemen were on hand to prevent anyone taking a look into the open commander's hatch. As is often said, "aren't British policemen wonderful?"

Despite all its sophistication, the display tank carried one of the show's oldest items, a Browning .50" heavy



*The Vickers Challenger 2, along with the ever-stalwart British police guarding the steps to the left.*



Above, left is the Alvis Sabre. A conversion utilizing turrets from Fox armored cars with turret-less Scorpion tanks. To the right is the British configuration of the Multiple Rocket Launching System (MLRS).

machine gun. Still in production almost 75 years after it was first introduced, the Fifty Cal seems to have a long life ahead of it still. Those guns seen on many vehicles are built in the UK by Manroy Engineering. Oddly, British Challengers will not carry them, but will use a 7.62mm GPMG in front of the loaders hatch, while the coaxial gun will be a chain gun of the same caliber.

The other heavy armor item was the VSEL AS90 155mm self-propelled gun. Vickers Shipbuilding and Engineering — not the same organization as Vickers Defence Systems - have designed and are building this system for the British Army and it has been trialed in a number of Middle East nations, in both complete vehicle form and also as a drop-in turret module which has been successfully fitted to the T-72 MBT. True international cooperation there!

Looking for more tanks, there was one other design on show, the newest version of Alvis's Combat Vehicle Reconnaissance Tracked series, the Sabre. This is not totally new however, being a conversion of the older Scorpion 76mm armed tank which is no longer needed by the British Army. As there is seen to be no operational role for a small fire support AFV, surplus hulls are being fitted with the turrets from the Fox armored car which is also being phased out of service. As part of the conversion, a large adapter is used to allow the Fox turret to fit to the Scorpion's larger turret ring aperture, and the coaxial machine gun is replaced by a chain gun while the Fox's 30mm RARDEN cannon is retained. Many other small detail changes are

also made, including a larger turret hatch and new stowage bins.

As well as home produced equipment, Britain also uses some designs from other nations. One which has had great success, both operationally in the Gulf War and commercially, is the Multiple Launch Rocket System or MLRS. An American design, British vehicles are produced by a European consortium which includes British companies. As is so often the case with widely used designs, small changes are made when they are taken into service in each country. British launcher units have banks of smoke dischargers on the cab front, and have recently been fitted with a large stowage rack as well.

British companies also sell arms

abroad, and one recent success was the sale of the Warrior infantry combat vehicle to Kuwait. The makers, GKN, had the sixth unit built for Kuwait on static display, and another similar vehicle made an impressive entry on the Mobility Display. Unlike British standard vehicles, Kuwaiti Army ones have a different turret, based on the American AC Delco design used on the USMC's LAV-25. While the 25mm Bushmaster cannon is retained, Desert Warrior uses an uparmored variant which also carries TOW missile launchers on each side of the turret.

Another variation in the basic design is the uparmoring of the hull. This is similar to that fitted to British vehicles serving in the Gulf, but is not



GKN Desert Warrior. This particular vehicle is the sixth production vehicle destined for Kuwait.





*The Royal Ordnance/GIAT Cased Telescopic Weapon System.*

identical. Designed to protect the crew, it is asymmetrical as it does not extend to the side of the engine compartment. Rumored to be made of Chobham armor, it raises the level of protection to MBT standards. In fact, one Warrior was hit in error in the Gulf by a 120mm HESH round with no serious injury to the crew. Fitting the extra armor has meant that the vehicle does not have provision for firing ports at the sides of the crew compartment, unlike the earlier version seen at RN/BAEE'93.

International cooperation is another feature of the modern defense industry. On the British Aerospace stand was a the 45M911, a 45mm weapon designed to arm and take on light AFVs. This has been developed by CTA International, a company jointly owned by BAE subsidiary Royal Ordnance and France's GIAT. Based around the Cased Telescoped Weapon System or CTWS, it uses a tubular "round" which takes up less precious space inside a vehicle, and which is readily adaptable to an auto loader. Rounds are fed into the chamber at 90 degrees to the barrel, the chamber is



*The MR, or Medium Range, version of TRIGAT.*



*Mounted on a stretched M113A2 chassis and body is this Royal Ordnance 120mm mortar.*

rotated and the gun fired. Once the chamber has been rotated back, the next round pushes the case out and the cycle repeats. The actual form of loader can be tailored for individual vehicle applications. Various types of ammunition have been developed including APFSDS and HE, as well as a reduced range series for training in restricted areas.

BAE also had on show the latest version of the TRIGAT anti armor missile system. This is designed to replace a number of existing designs, the MR or Medium Range version being designed for infantry use in the same manner as MILAN or Dragon. Still under evaluation, it could well be in service by the end of the century. Able to be fired from within an enclosed space, it homes onto its target using a laser beam where its tandem warhead can defeat MBT armor as well as fortifications, while it is agile and accurate enough to take on attack helicopters. Indeed, LR TRIGAT, its long range variant, is designed to be vehicle launched and was also part of the armament proposed for the Eurocopter Tiger attack helicopter offered to the British Army Air Corps. Despite the Tiger being passed over in favor of Longbow Apache, LR TRIGAT continues in development.

Another commercial venture looking for adoption is the 120mm Armored Mortar System. Developed over a number of years by Royal Ordnance, it is a breech-loading weapon mounted in a fully enclosed turret which can be fitted

to a number of different carrier chassis. At this show it was displayed on a stretched version of the M113 series armored personnel carrier, and it has also been tested on the standard M113 and was shown in 1993 fitted to the Mowag Piranha. The complete package can fire conventional and guided rounds out to 8.5 kilometers or in direct mode against bunkers and other armored vehicles. Rates of fire from four to eight rounds a minute can be achieved, and the turret gives a full 360 degree rotation while operating under NBC conditions.

Other adapted weapons were also on show. Two were based in the Chieftain MBT which is being phased out of British service. Some are being converted to engineer vehicles, the turrets are removed and a new top hamper fitted to carry a variety of engineer stores which can be loaded by the vehicles own crane. In service as the Chieftain Armoured Vehicle Royal Engineers or AVRE, it can also be fitted with mine plows or dozer blades.

Another Chieftain variation is the fitting of the Marconi Marksman turret, which converts this or a number of other MBT chassis into a potent anti aircraft vehicle. The armored turret is self-contained and is thus easily integrated with its carrier, Marconi claim suitable vehicles can be converted in two hours! Once finished, the on board radar and optical sights can engage aircraft or ground targets day or night with two 35mm Oerlikon KBA can-





*A side view of the Aardvark JSFU Mk 3. This vehicle can be seen in a variety of guises around the world, including at least three with the U.S. Air Force.*

nons. This vehicle was very spectacular when shown in the Mobility Display, alas it always fired just as your reporter was about to photograph it and spoilt his day at least. The turret has also been integrated with the chassis of the South African G6 self-propelled gun.

The threat of mines is one which all armies take very seriously. Cheap to produce and easy to put in place, they kill men and disable machines very effectively and take a great deal of effort to remove even under peacetime conditions. In combat they can literally stop an attack in its tracks, so it is no surprise that means to dispose of them are eagerly sought. While they can be removed by hand, this is a slow and very dangerous operation, so faster means have been developed.

One such is to use explosive hoses, carried on vehicles or trailers and laid across a mined area using a rocket motor. This is fine once the mines have

been located, and the latest Giant Viper system used in the British Army is effective and both noisy and spectacular. The carrier trailer is towed to the edge of the minefield and the rocket fired to lay the hose which is then detonated. Mines close to the hose are either destroyed by the blast itself, detonated by the pressure on the explosion or initiated by sympathetic detonation.

Also spectacular is the use of flails. Very effective against both pressure actuated and tilt-rod fused mines, a flail unit like Aardvark's Joint Service Flail Unit can quickly clear a vehicle width path during an assault, or on its own or with other units can clear a mined area. Its use is not limited to the conventional front line of the battlefield however, in fact the Mk 3 version of the JSFU is designed to be used on airfields to clear munitions dropped to prevent the field being used for takeoff and

landing, or sown around demolitions to prevent repair. As such it is a wheeled vehicle, the basic design is similar to earlier half-track units with the protected cab at the rear for flailing, as far from the mine detonation as possible. Rotating flails set off the mines, the resulting blast and fragments are deflected by a shield just behind their operating arc. The large tires are filled with a special compound which gives them a good run flat capability should any fragments or offensive fire hit them.

Other means to at least remove mines on display included two designs from Pearson Engineering, who supply a range of dozer blades and plows for use with AFVs. Their Surface Mine Plow sweeps mines on the top of the ground to one side for later disposal, and was show fitted to the Alvis Spartan personnel carrier.

A wider path, and also a greater range of mines, can be dealt with by the Area Clearance Plow demonstrated on an FV432 APC. Its hanging chains actuate tilt rod mines and trip wires.

While no new heavy AFVs were introduced at RN/BAEE'95, some new wheeled items were. Short Brothers have long been well known for their Shorland series of armored patrol cars and APCs based on the widely distributed Land Rover chassis. Current model is the S500 series based on the 110 chassis, which has been exported widely.

Their latest venture in the S600 series, based on a Mercedes Benz Unimog chassis. Much bigger than earlier vehicles, it is offered for use in a variety of roles. Military needs are met by the IMV or Infantry Mobility Vehicle which can be configured as troop carrier, command vehicle, ambulance or



*On the left is the Pearson Engineering Surface Mine Plough mounted on an Alvis Spartan. To the right is the Area Clearance Plough, from the same company, mounted on an FV432 armored personnel carrier.*



Based on the sturdy Unimog chassis, is this Shorts Shorland S600 Infantry Mobility Vehicle (IMV).

weapons carrier. It is already under consideration as a contender for the Australian Army's Bushranger Phase 2 project. There, it is marketed by British Aerospace Australia as Foxhound with features including self recovery winch and GPMG machine gun armament. It is also offered for the police and para military market as the Internal Security Vehicle or ISV, with options including folding side screens, surveillance cameras, riot control equipment and various communications fits.

Also Unimog based are two series marketed by Alvis. Based on South African technology, the smaller range consists of the Scarab which is enclosed and the open backed Acorn.



A rear three quarters view of the Alvis 4, another South African design.

Small and light enough to be air portable and air droppable, they fill the role of weapons carrier, attack and patrol vehicle for rapid reaction forces. Larger and more conventional are the Alvis 4 and its longer partner the Alvis 8. This is a pure patrol vehicle, ideal for peacekeeping forces. It offers good pro-

tection all round against small arms fire and fragments, the large windows being as resistant as the steel hull. Both series have excellent mine protection features, as befits their origins.

Another series of wheeled patrol vehicles was seen on the GKN stand. Designed and produced by their Glover Webb subsidiary, the Tactica comes in normal control and cabover forms, and can be configured as a personnel carrier, command vehicle, ambulance or light armored car depending on its intended role. The normal control vehicle on show carried a GKN light turret fitted with the ubiquitous fifty cal but other weapons can be carried. A wide range of engines can be fitted to this design to fit in with a user's existing vehicle fleet.

Almost a fleet in itself is the GKN Simba. While a dedicated police riot control vehicle was shown, other configurations include military personnel carrier and patrol vehicles, while turrets mounting guns up to 90mm can be fitted as well as anti tank and anti aircraft missiles. This versatile vehicle is currently being built in the Philippines under license and has attracted wide interest all over the world. Cheaper and easier to operate than tracked vehicles, wheeled armor is also less aggressive in appearance for use in limited war and peace keeping operations. Widely used commercial components can be incorporated which greatly eases maintenance, especially in less developed areas.

GKN are also license holders for the production of the Mowag Piranha



The Scarab, one of two versions of the same basic vehicle, is based on a South African design.





*This is the mortar carrier version of the GKN Piranha. Originally a Swiss design, the all-wheeled armored car has become well-known around the world.*

series of wheeled armored vehicles. This Swiss designed product is also built in Canada for the Canadian Army, and is widely used by the US Marine Corps in a variety of roles. The GKN vehicle exhibited was the mortar carrier. Two large hatches in the roof allow the 81mm mortar to be trained in any direction. A similar vehicle is used by the USMC, with a similar mortar. The one on display was the Royal Ordnance type, used in the British and other armed forces, and also adopted by US forces. GKN also offer the Piranha in a full range of roles, including fire support vehicles with 90mm and 105mm guns.

In addition to the above, RN/BAEE'95 also saw a wide range of small arms, artillery and other weapons on display, a wide range of logistic vehicles, radios and other electronic hardware, as well as uniforms and personal equipment. Overall, it was as usual a unique chance to see what British industry has to offer the world's armies, in the form of its own designs, cooperative projects and license built designs. It will no doubt help to keep British manufacturers among the leaders in the international arms market.



*The Glover Webb Tactica, from the family of wheeled patrol vehicles.*



*Fitted for internal security or police duty, this is the GKN Simba.*

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# Mark VIII Heavy

## The 'Liberty

## Tank'

by Glen Broman

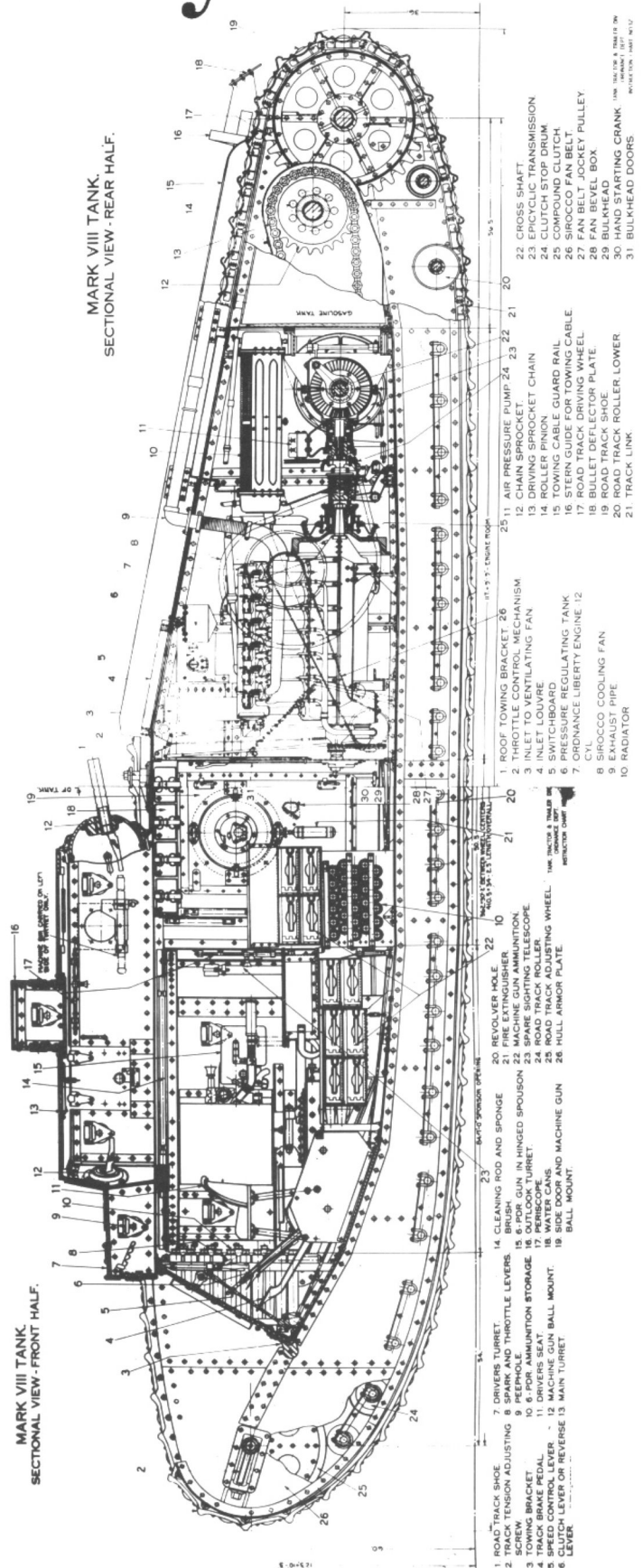
The Mark VIII Heavy tank is historically significant because it was the first example of a joint international tank development program. It is also significant in that it was also the last reasonably successful one. The Mark VIII was also known as the International and Allied tank, but it's more common name was the Liberty tank. The name was derived from the modified Liberty aircraft engine used to power it.

With the advent of American involvement in the First World War, the United States Army started a hard look at the use of tanks. As a part of this effort, Major James Drain and Major Herbert Alden were sent on a fact-finding mission in the Fall of 1917. The purpose of their mission was to determine the suitability of current tank designs for use with the American Army. They recommended the use of the Renault FT-17 light tank but found none of the current heavy tank designs satisfactory. Their report recommended that the British and Americans jointly develop a new heavy tank that would combine British experience and American production. In November 1917, the Joint Inter-Allied Tank Committee was created to develop the recommendation for a new heavy tank. Lieutenant Colonel Albert Stern, who was then Secretary of the Royal Naval Air Service Landships Committee, and Major James Drain, were appointed as the Co-Chairman of the Inter-Allied Tank Committee. The French provided support to the project but made a decision to pursue their own designs.

Work on the new design started immediately. At the direction of the Tank Committee, Lieutenant G.J. Rackham developed the detailed drawings. The tank reflected British experience with the classic rhomboid shape and was in fact



A Mark VIII being tested on a 39 degree incline at Aberdeen Proving Ground. Tank No. 67986 is producing a heavy amount of smoke created by a leaky oil system.



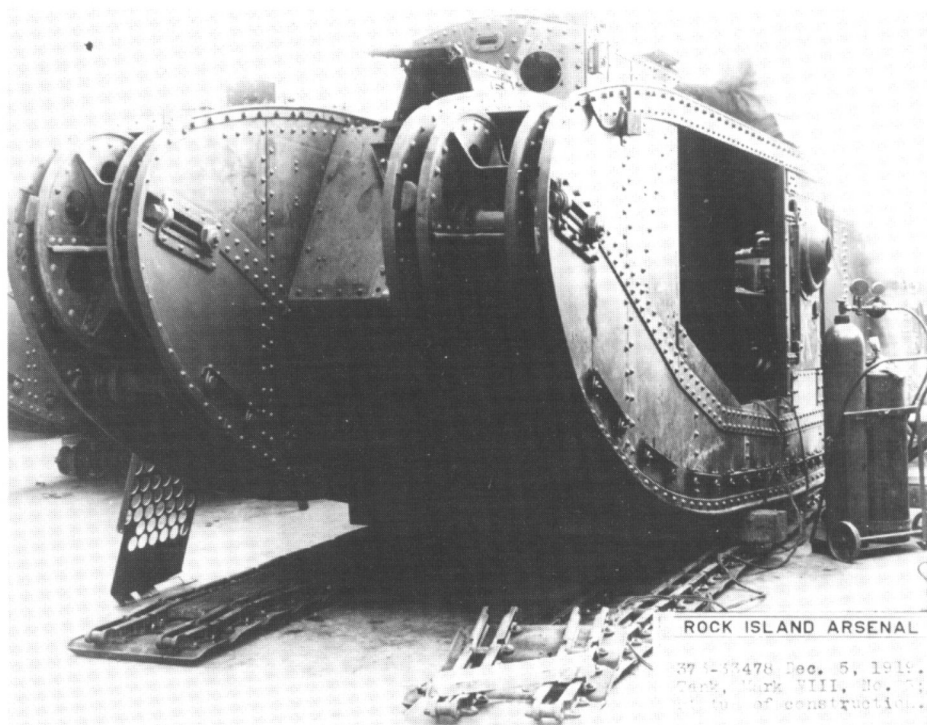


Taken on August 39, 1922, this Mark VIII's hull was built in England and shipped to the United States and fitted with a Liberty engine. Photo taken at the Savannah Proving Grounds, north of Rock Island Arsenal. This prototype is made of mild steel and has no armament fitted.

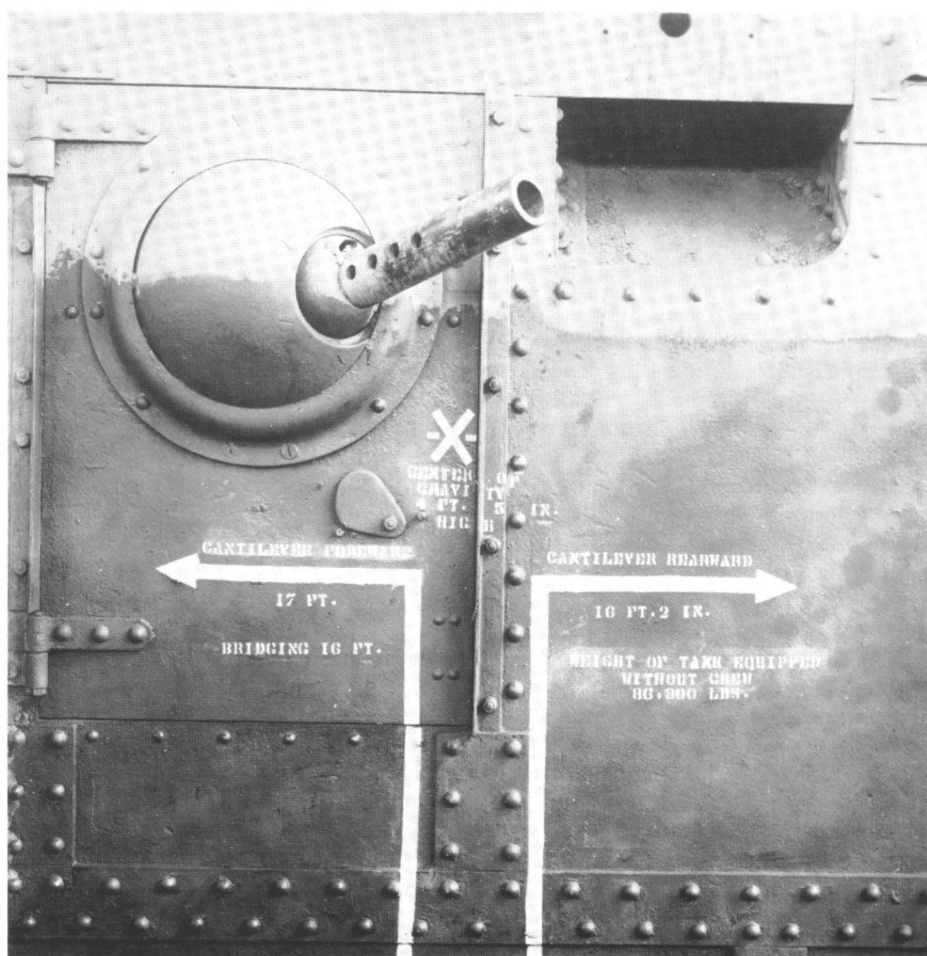
a natural progression in British tank design. The tank was designated the Mark VIII. The Liberty 12 cylinder aero engine was selected as the power plant for the Mark VIII. This engine was considered to be the best of its type in the world at that time and the tank took its name from the engine, becoming the Mark VIII Liberty Tank. It seems certain that the connotation was not lost on members of the committee. The tank incorporated some new innovations, the engine compartment was separated from the fighting compartment by a steel bulkhead with hatches to provide access and an overpressure system to reduce the amount of engine fumes in the fighting compartment. The sponsons for the main armament were of a new American design and the tank incorporated a fixed turret that had first been tried on the unsuccessful Mark VII tank. The armor for the Mark VIII was to be proof against small arms, shrapnel, and armor-piercing bullets.

On the 26th of December, 1917, the plans and a full scale wooden mock-up were completed and approved. The British would supply armor plate, the structural members, weapons, ammunition, and track shoes. The United States would provide the engine, brakes, suspension, and other automotive parts.

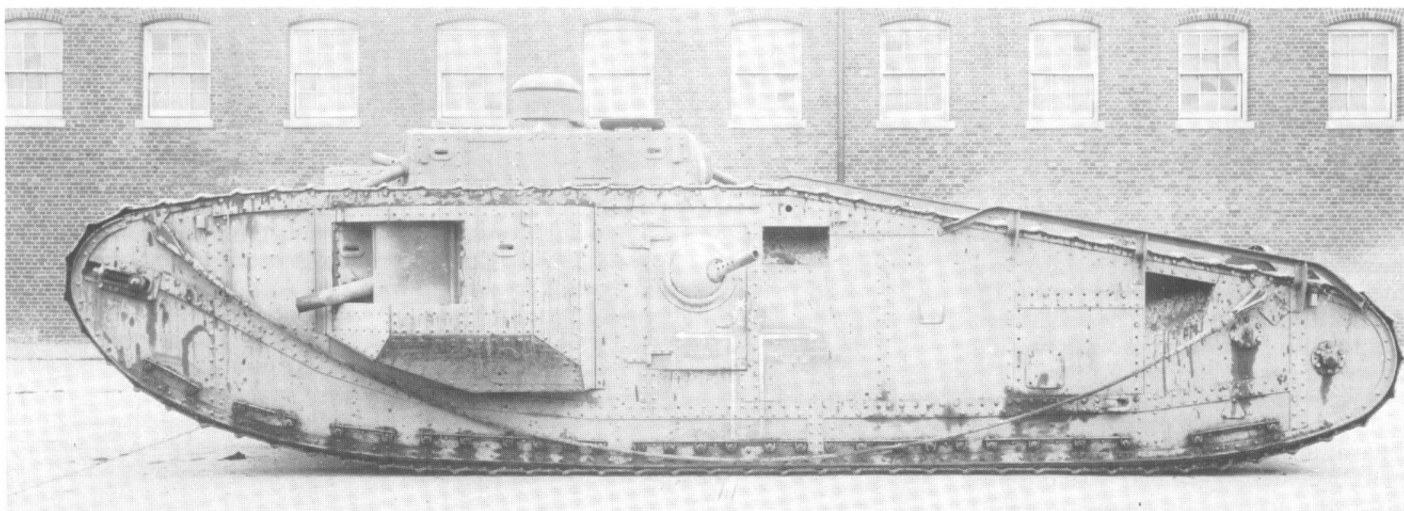
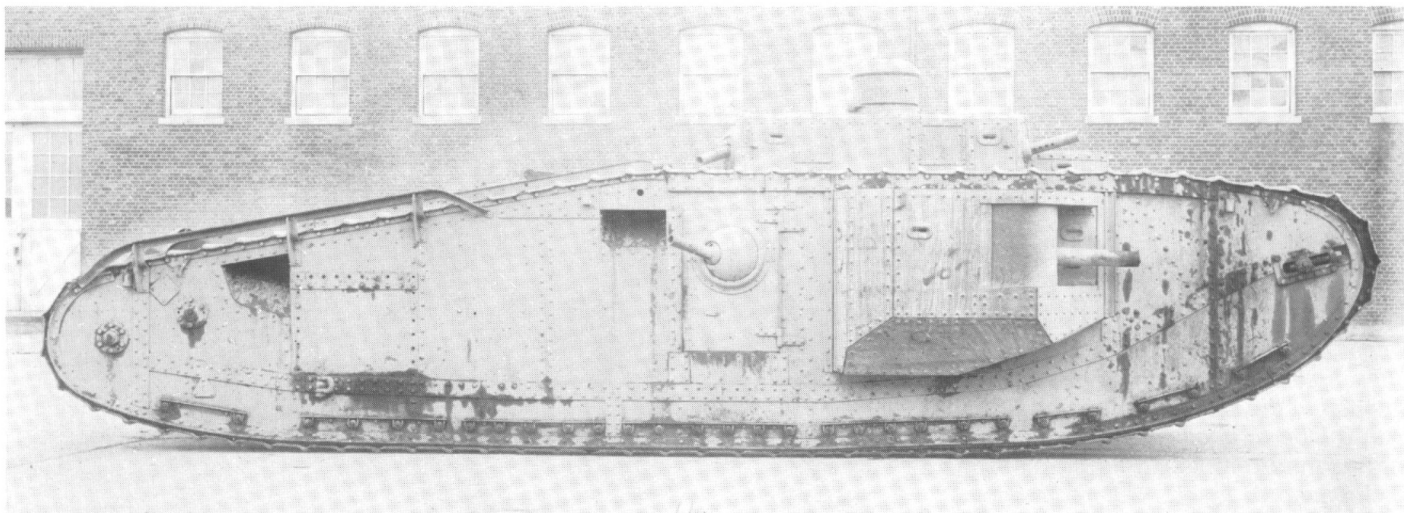
The tanks would be built in France with Chinese labor to reduce the amount of shipping space required to the continent. Initial production goals were set at 300 tanks per month with a total of 1,500 tanks projected. These plans began to unravel immediately. The Liberty engine required numerous small changes before it was ready to enter full scale production. Once it was in pro-



This photo was taken at Rock Island Arsenal on December 5, 1919. During peak building periods, as many as 28 Mark VIII's were under construction at one time.



Gravity and balance information, illustrating the centerline of the Mark VIII.



*Left and right side views of the Mark VIII.*

duction, the fledgling U.S. Air Service took nearly all of the engines. Engine deliveries were scaled back forcing revisions in the production schedule which were further revised when engine deliveries were again postponed.

Neuvy-Pailloux, France, was selected as the site of the factory and construction began and proceeded slowly for the remainder of 1918. The factory had not been completed when work was stopped after the Armistice. In July, 1918, a mild steel prototype was completed in England and was shipped to the United States where the engine and transmission were added. To further complicate matters, in 1918 the French reentered the program and demanded a share of the production. By November, 1918, parts for 100 tanks had been completed in England. The Armistice was signed on the 11th of November and the British and French withdrew from the project on the 27th of November.

The Americans purchased the parts for the first 100 tanks and shipped them to the United States. In January of 1919, the parts were shipped to Rock Island Arsenal, Illinois and Colonel Jordan, the Arsenal Commander, was directed to manufacture 100 tanks. During February, the mild steel prototype arrived at Rock Island and was immediately sent to the Proving Grounds at Savannah, about fifty miles north of Rock Island. Several problems were found during testing with the exhaust system and the cooling system. The exhaust system was changed but the cooling problems were never completely corrected, despite redesign efforts as late as 1929. The machine gun mountings on the side of the non-rotating turret were also deleted on the U.S. models. Manufacturing started at Rock Island Arsenal on the 1st of July 1919 and the first tank was completed on the 5th of January, 1920. The last tank was completed on the 5th of June,

1920.

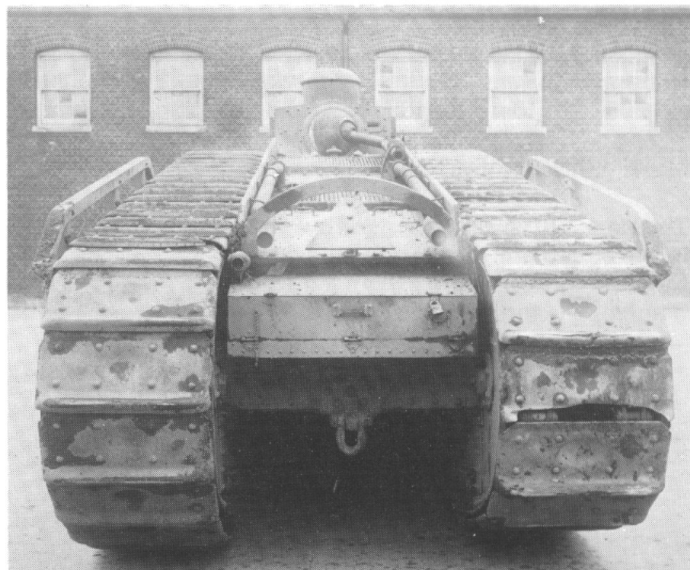
Only seven Mark VIII tanks were built in England. They were manufactured by the North British Locomotive Company in Glasgow, Scotland. The first tank was initially powered by a Rolls-Royce aircraft engine but all subsequent vehicles were powered by 300 h.p. Ricardo twelve cylinder engines and the prototype also later received a Ricardo engine. One source also lists the powerplant as two 150 h.p. Ricardo engines.

In the United States the tanks were in service from 1920 to 1932. The tanks equipped several units to include the 67th Infantry (tanks) which later became the 67th Armored Regiment. Between 1928 and 1932, experiments were carried out with an air cooled liberty engine. This modification is identified by a large ventilator assembly on the left side of the tank. In 1932 the Mark VIII tanks were withdrawn from service and stored at Aberdeen



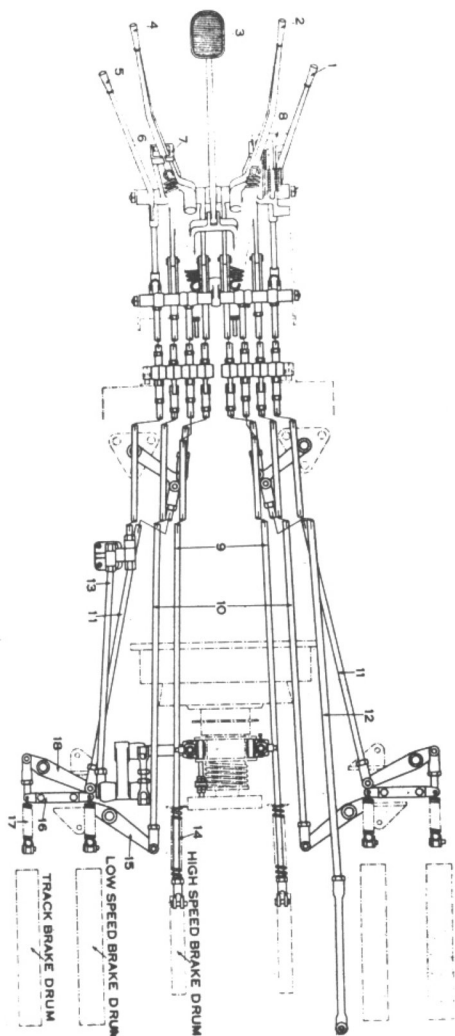
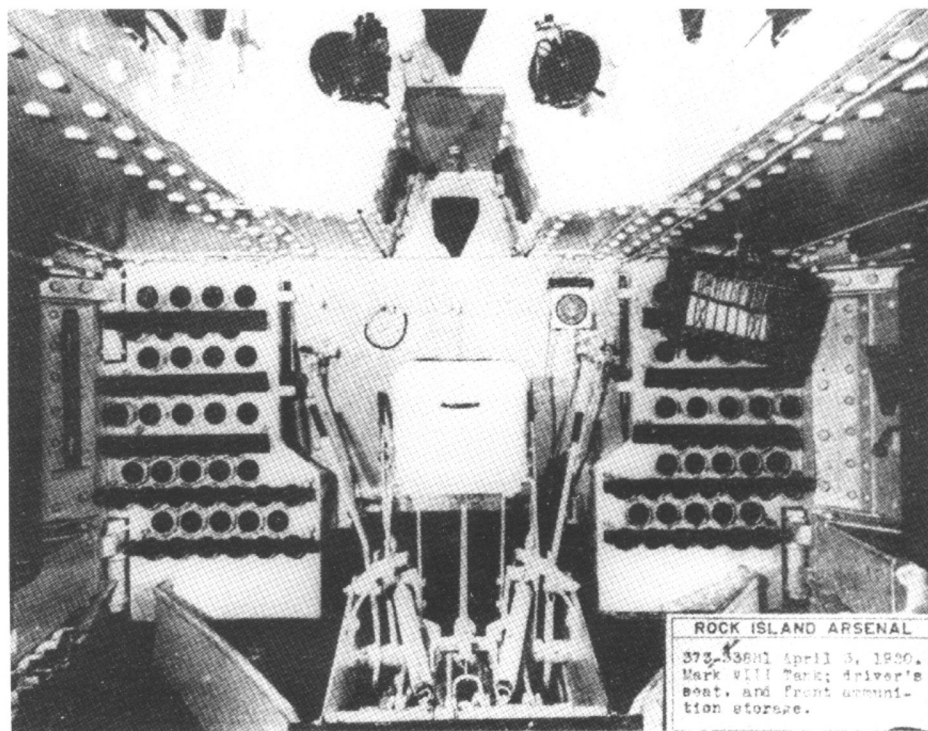


Mark VIII photo taken on July 8, 1925 at Aberdeen Proving Ground.



Rear view of the same vehicle shown on the left. Note the damaged track plate on the right.

Driver's seat and ammunition stowage. The commander would stand on a box with his head in the turret. The tank had two speeds forward and one reverse.



1. Reverse lever
2. Speed control lever, right
3. Track brake pedal
4. Speed control lever, left
5. Clutch lever
6. High speed selector lever, left
7. Low speed selector lever, left
8. Control gate
9. High speed brake rod
10. Low speed brake rod
11. Foot brake rod
12. Reverse rod
13. Clutch rod
14. High speed brake rod spring
15. Horizontal lever for low speed brake
16. Foot and low speed brake rod spring bracket
17. Foot and low speed brake rod spring
18. Horizontal lever for foot brake
19. Control lever spring
20. Fulcrum shaft
21. Swing link shaft
22. Swing link
23. Intermediate shaft
24. Rocking lever for brakes
25. Fulcrum bracket for clutch levers

Proving Grounds. In 1940, 90 Mark VIII's and a quantity of six-ton tanks were shipped to Canada for use as training vehicles.

#### Mark VIII Technical Information.

The Mark VIII was constructed by riveting armor plate to an iron and steel frame. Armor thickness ranged from 6mm on the top to 16mm on the front and sides. The engine was a liquid-cooled, low compression version of the 12 cylinder Liberty aero engine and delivered 338 h.p. at 1400 r.p.m. The transmission was a Wilson epicyclic with a chain drive to the sprockets.

On American and British production models the lower exhaust was removed and the mufflers were relocated to the top on the British version and the exhaust pipes were extended to the rear of the hull with no mufflers on the American version. Weight was 37.5 tons with a road speed of five to seven miles per hour, however, cooling problems restricted the amount of time the tank could travel at it's top speed.

The Mark VIII carried 240 gallons of fuel in three tanks which gave it a range of 50 miles. The Mark VIII was 10 feet, 3 inches high, 12 feet 4 inches wide, 34 feet and 2 1/2 inches long and could cross a trench 16 feet wide. The armament consisted of two six pound-



*This photo was taken during a demonstration of the Mark VIII to West Point Cadets. Note the difference in size between the Six-Ton light tank and the Mark VIII.*

ers (57mm) mounted in sponsons that could be swung inboard for rail travel, and seven Hotchkiss .303 machine guns on the British version and five M1919 .30 caliber machine guns with protective barrel sleeves on the American version. Basic load was 208 rounds for the six pounders and 13,484 rounds of machine gun ammunition.

The crew consisted of 8-11 men, a driver, tank commander, two six pounder gunners, three machine gunners and a mechanic. The three additional crewmen were two six pounder loaders and another machine gunner. The tank commander stood in the tur-

ret and communicated with the rest of the crew by means of an intra-tank communications system called a laryngaphone.

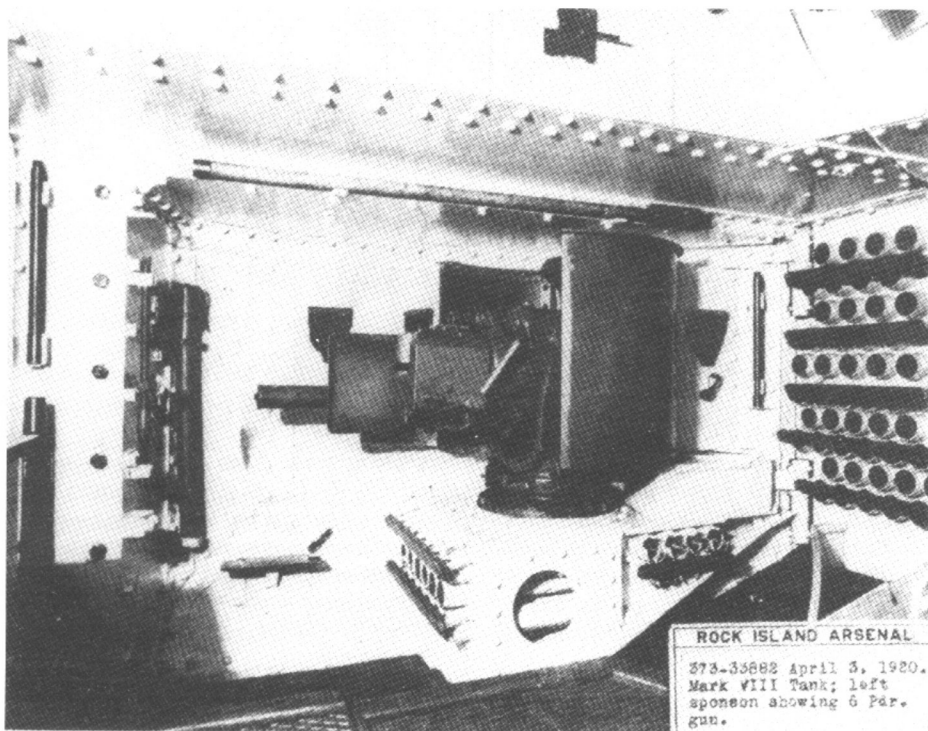
#### References:

Tanks and Other Armored Fighting Vehicles, 1900-1918, B.T. White, Macmillan Company, 1970

Treat'em Rough, the Birth of American Armor 1917-1920, Dale Wilson, Presidio Press, 1990

Firepower, a History of the American Heavy Tank, R.P. Hunnicutt, Presidio Press, 1988

Mark VIII Technical Manual, Museum Archives, Rock Island Arsenal



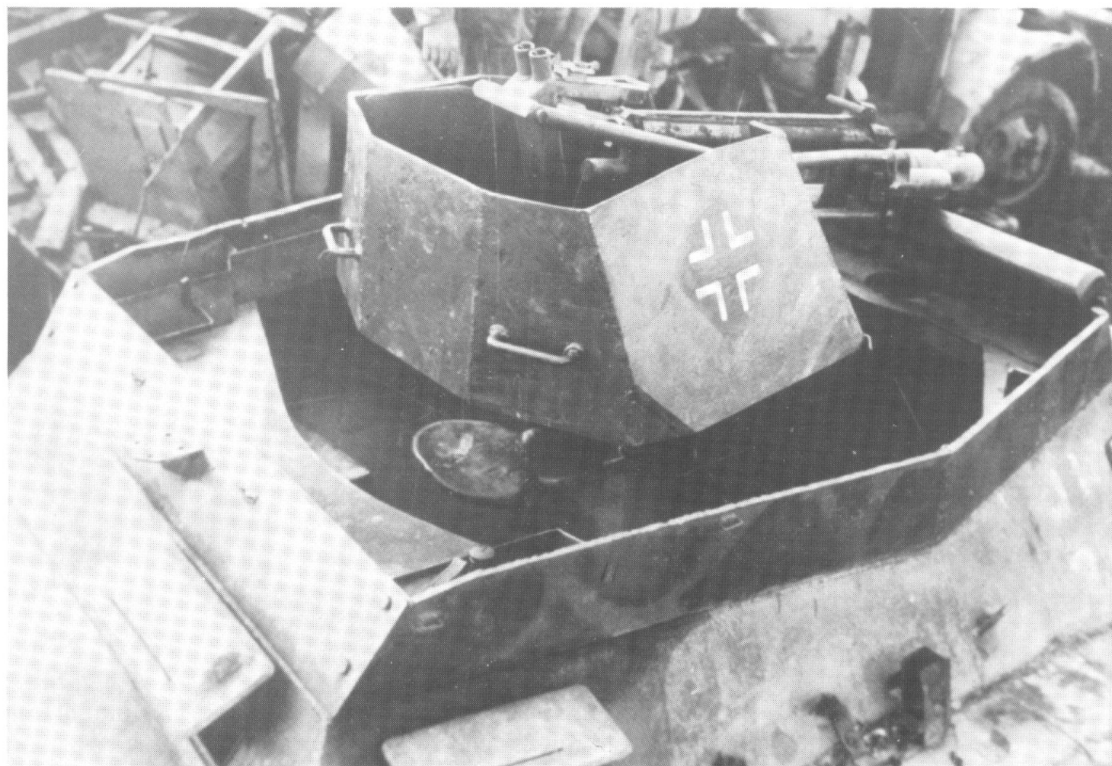
*Interior photo showing the left sponson. The breech of the six-pounder is clearly visible. The tubes to the right are for stowing rounds.*



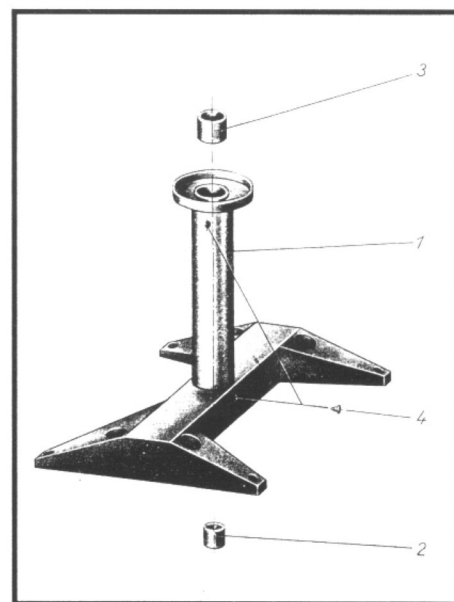
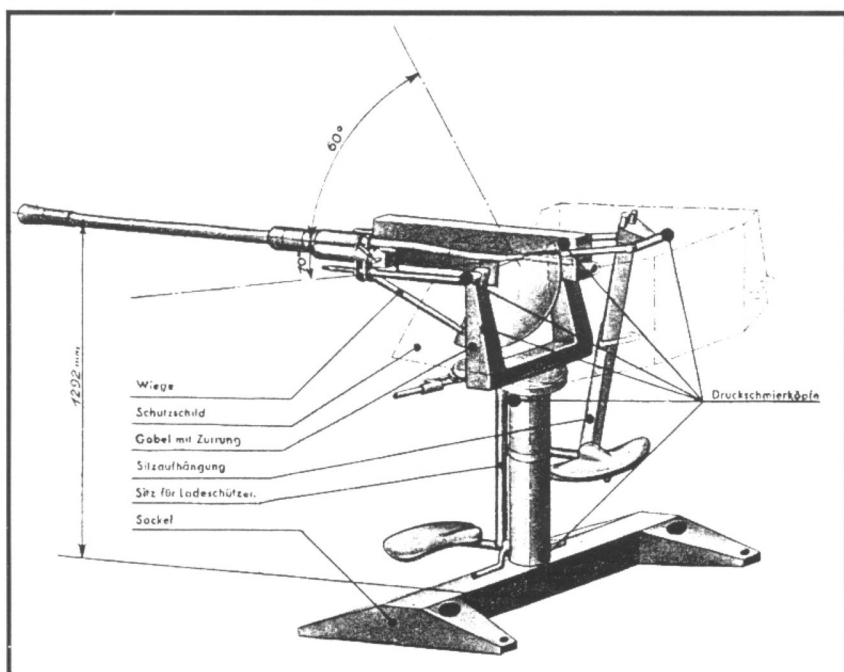
# Sd.Kfz 234 with 2 cm Schwebelafette 38

By Jeffrey McKaughan

The shape of the turret and the extra armor added around the top of the superstructure are clearly visible. Also note that on top of the front strip (right in the photo) a piece of wood has been added to act as a gun rest.

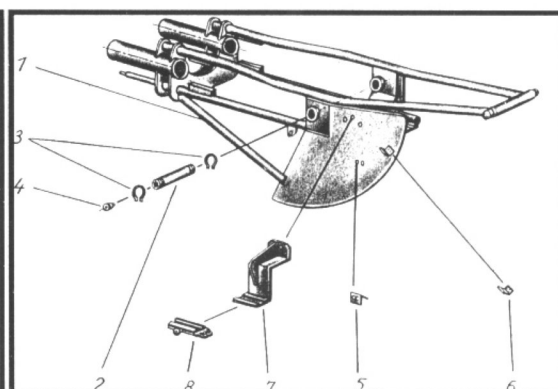
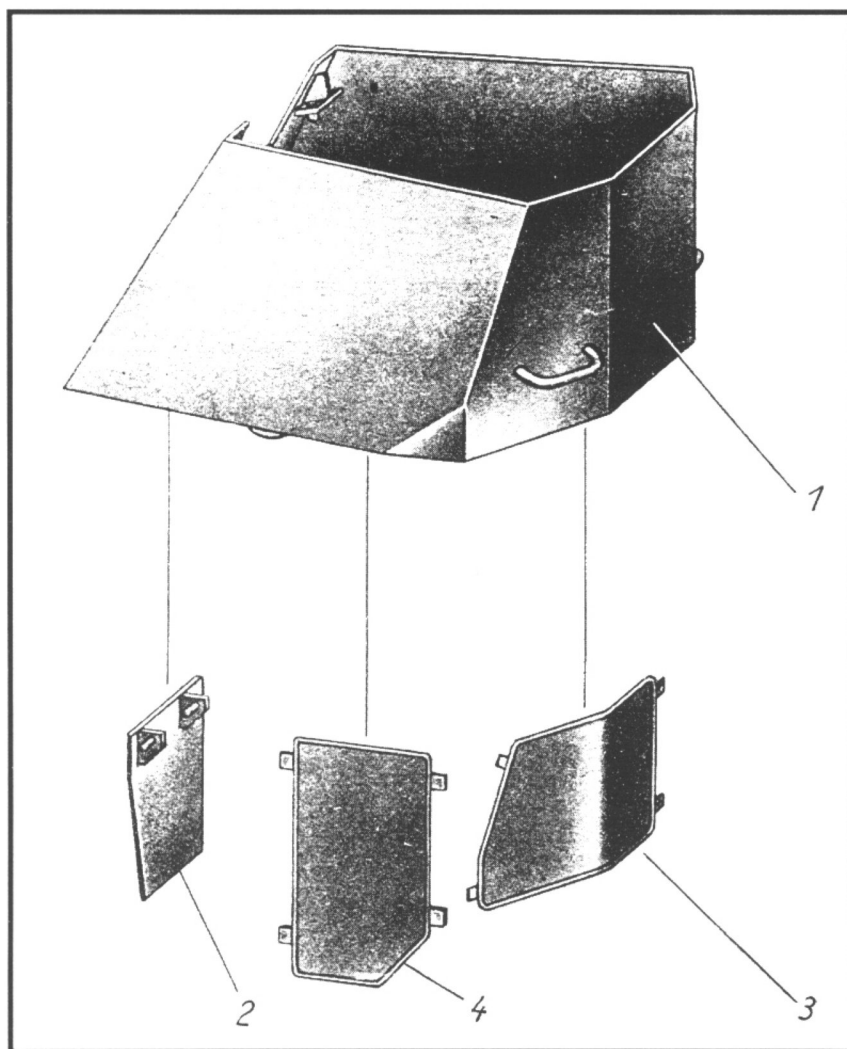


A rather non-descript, but overall drawing of the gun mount showing the gun in place and the seats for the gunner and loader.

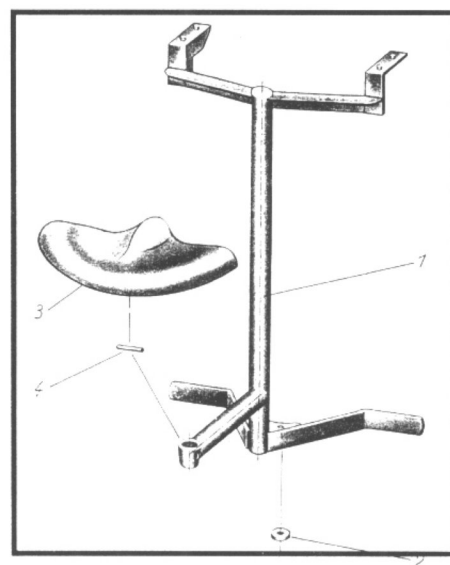


The baseplate for the gun mount was H-shaped and was bolted directly into the floor.





*The open-topped turret plating.*



## Armor Modeling and Preservation Society...

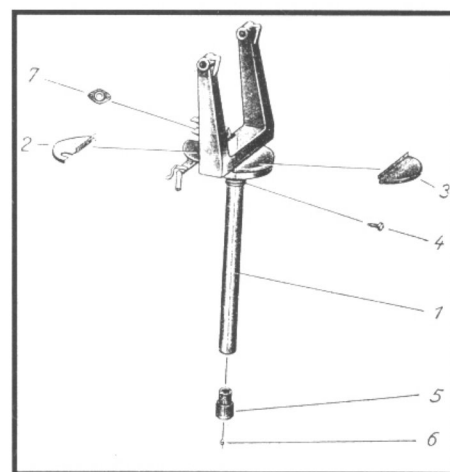
... or AMPS, is a non-profit organization whose purpose is to "associate interested individuals and organizations in both sharing an interest in the history of armored vehicles and in cultivating interest in armored vehicles and related subjects via the hobby of modeling..."

Boresight the Society's publication, is issued six-times per year and is full of articles, reviews, and other information useful to the military modeler.

A one-year membership is \$20.00 (U.S.), Canada \$25.00, All Others: \$25.00 surface and \$35 airmail. All payments must be in U.S. funds, no credit cards.

AMPS, P.O. Box 331, Darlington, MD 21034

**Plan on attending AMPS 96, the 2nd Annual National Convention of the Armor Modeling and Preservation Society on April 19 & 20, 1996 at the Aberdeen, Maryland, Sheraton Four Points.**



*The gun cradle and extension tube.*

# The Ordnance Museum Foundation

## Executive Director's Corner

P.O. Box 688  
Aberdeen Proving Ground, MD 21005

Fellow Members:

The annual meeting was held March 9, 1996 at the Museum and the following summarizes the highlights of the meeting:

### 1) STATUS OF THE FOUNDATION: (AS OF 31-DEC-95)

205 ACTIVE MEMBERS

NET BALANCE (CHECKING AND SAVINGS): \$ 23,363.23

BOARD OF TRUSTEES: RICH CARNEGIE, CHAIRMAN & ACTING TREASURER  
ELLIOT DEUTSCH, CO-CHAIRMAN  
RON LEHMAN, SECRETARY  
BROADNAX CAMERON  
ARMANDO FRAMARINI  
DAVID CLARK

Ron and Broadnax were re-elected to the board (3 year terms)

### 2) STATUS OF CURRENT FUND RAISING

The sale of posters and the book Tiger Without a Home are progressing at a satisfactory level. Elliot Deutsch is putting together an initiative for the Foundation to reprint some "public domain" manuals that can provide revenue. Our major source of income for 1995 was membership renewals. We need to build up our membership and are looking for ideas to increase our membership. Any thoughts?

### 3) ORDNANCE MUSEUM ARTIFACT RESTORATION PROGRAM

Cathy Stevens presented the program for the cosmetic restoration of the artifacts that Dr. Atwater discussed in his column in a previous edition of *Museum Ordnance*. As you will recall, The Foundation pledged financial support to provide the paint and associated consumables for the artifacts. The majority (90%+) of the total cost is from Federal Environmental Accounts. The program should get underway in September '96. Cathy has joined our Board of Advisors and we expect to have a good, long term relationship with her and this important program.

### 4) FUND RAISING INITIATIVE - HELEN BENTLEY & ASSOCIATES INC.

The Foundation has entered into an agreement with Helen Bentley & Associates Inc. to solicit and acquire donations for the Foundation. Helen Bentley is a former Congresswoman who has developed a highly effective fund raising organization. We are very excited about this initiative. Frankly, as you can see from our current fund status, we need a significant boost in donations to realize our objectives in the near future. The use of a professional fund raising organization with an genuine interest in our objectives is a significant step in the right direction. I'll keep you informed of the progress in future issues of the magazine.

If you would like a set of the overheads from the Annual meeting, let me know.

Rich Carnegie  
Chairman

### Join The Ordnance Museum Foundation, Inc.

Regular Membership  
\$25.00

Ordnance Company Commander Membership  
\$100.00

Ordnance Battalion Commander Membership  
\$250.00

# BIR HAKIM 75'

## DES Resin's 75mm M1897

By  
Adam Geibel

DES Resin has produced two 1:35th scale versions of the famous 'French 75' used by L'Armee Francaise, circa 1939; with spoked 'wagon' wheels and high-speed roller carriage (350401) or pneumatic wheels (350161). Both were simple solutions allowing WWI ordnance to be towed by faster 'modern' transport. DES' also offers matching caissons for both guns.

Since my WWII modeling efforts lean towards North Africa, circa 1939-42, I decided to modify DES' pneumatic wheeled kit to one used by the Free French Brigade at Bir Hakim, specifically a piece belonging to the 1st Artillery Regiment\*.

Apparently the majority of these Foreign Legion pieces were not

equipped with the French pneumatic tires, as I have seen only photos of 'Burquor Adaptors' made by Martin York, as well as obvious field lash-ups of standard truck wheels bolted to the axles.

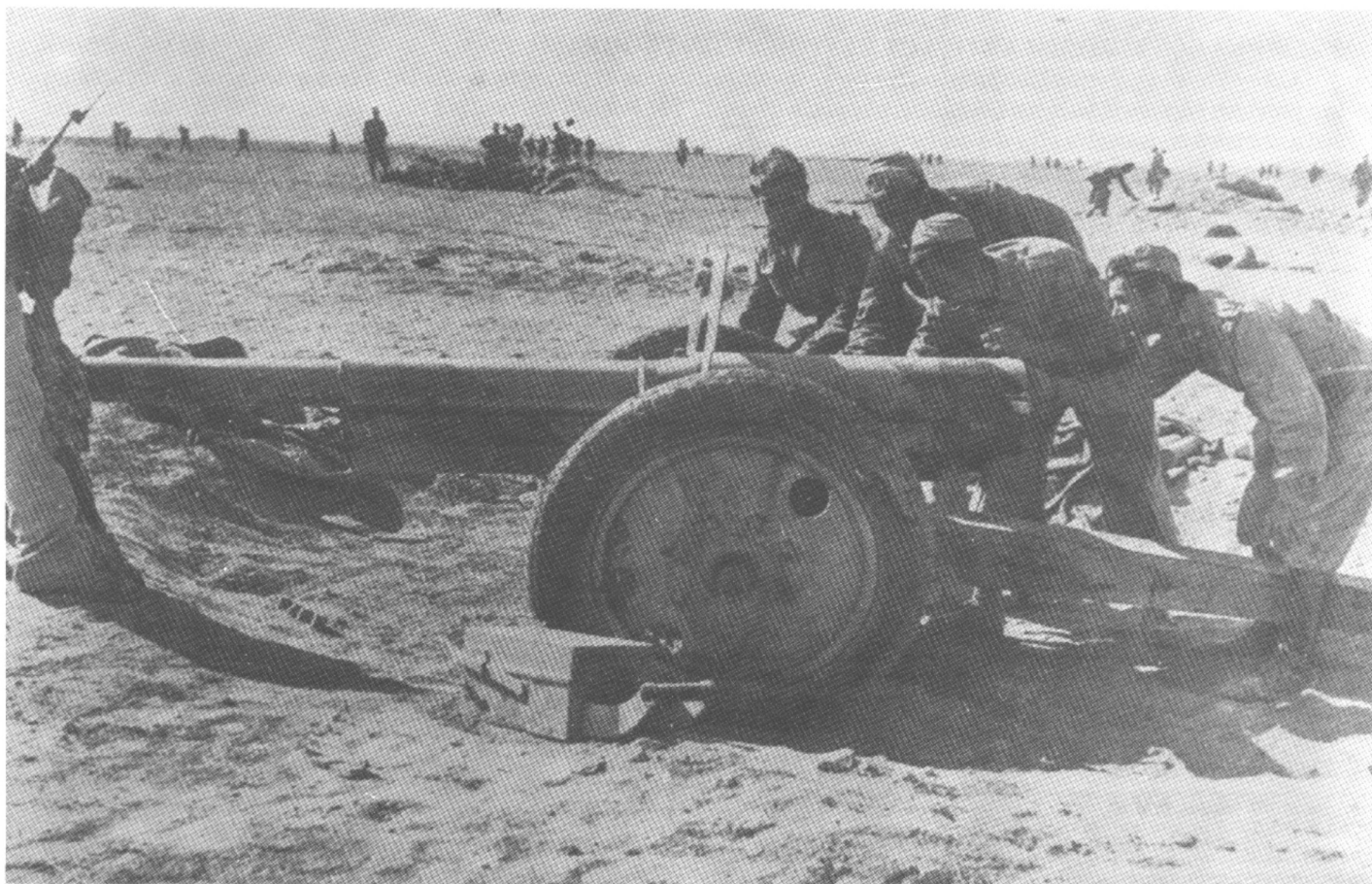
The Free French deployed up to sixteen of 75's, as a dual field artillery and anti-tank piece, in batteries of up to six guns. The large battery, along with its high rate of fire (twelve rpm), made for a formidable wall of steel. Depending upon the round, the 75' could reach a range of 8.5 (at 624 m/s) to 11.1 (575 m/s for a 6.2 kg shell) to 12.7 km (610 m/s for 6.6 kg). Antitank ammunition was concocted from German AP projectiles mated to cases of WWI-era US surplus rounds captured from the Italians in Eritria. The age of all stocks of ammunition accounted for an estimated 30% dud rate.

DES' Resin's 75' is an absolutely gorgeous kit, crisply molded in light sand resin, with less than a score of parts. Instructions are in French, but well illustrated — save for the location of the elbow sight. It should be affixed to the recoil cradle, opposite Part 12.

My only complaint about components is the wire supplied to create the grab handles — a technique which requires patience. I want pre-formed handles! Simple staples sufficed as replacements. Assembly of the rest of the gun was straightforward.

Since the majority of North African M1897's had the 'Burquor Adaptor' wheels, I reproduced them from Italeri's Katyusha hubs assemblies fitted with Tamiya Chevy LRDG truck tires. 1:72nd scale Airfix Scorpion roadwheels were glued to the inside center of the hubs and four of the six lightening holes were filled in with putty. The tires came from the Tamiya LRDG Chevy truck. In retrospective, the tires should be narrower — only as wide as standard truck

\*Alternately, these pieces have been attributed to the 2nd Anti-Tank Company.





tires. The wheels of the Italeri 122mm howitzer appear to be another reasonable source.

The gun was primed flat grey, then given an initial wash of Testor's MODELMASTER Desert Sand (FS 33637). A second coat of Desert Sand mixed with Weber's White Acrylic Oil Paint was drybrushed on, then a dusting of desert sand mixed with flat white. The tires were painted Euro I Grey (FS36081), then given a wash of flat black.

As of 1974, the French 75' was still in use by Cameroon, Cambodia, Bulgaria, Greece, Laos, Mexico, Morocco, and Upper Volta.

#### Sources

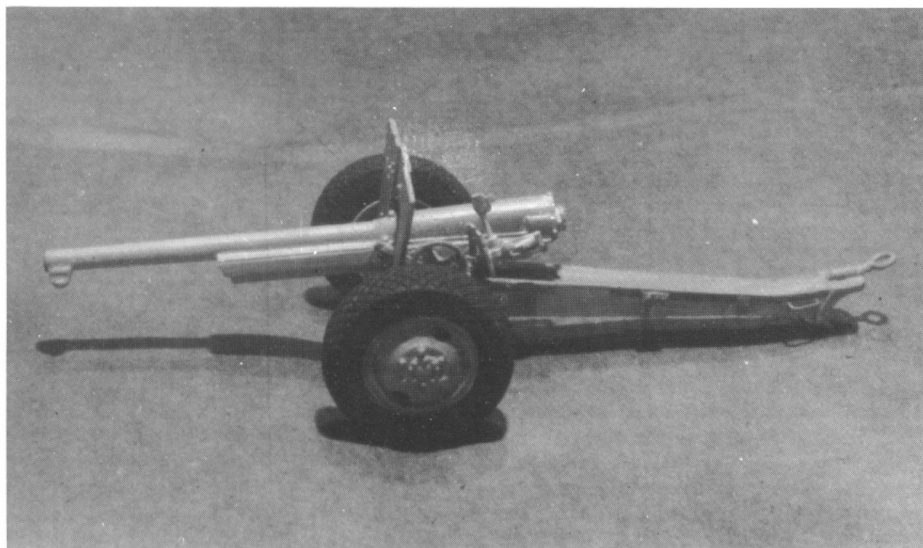
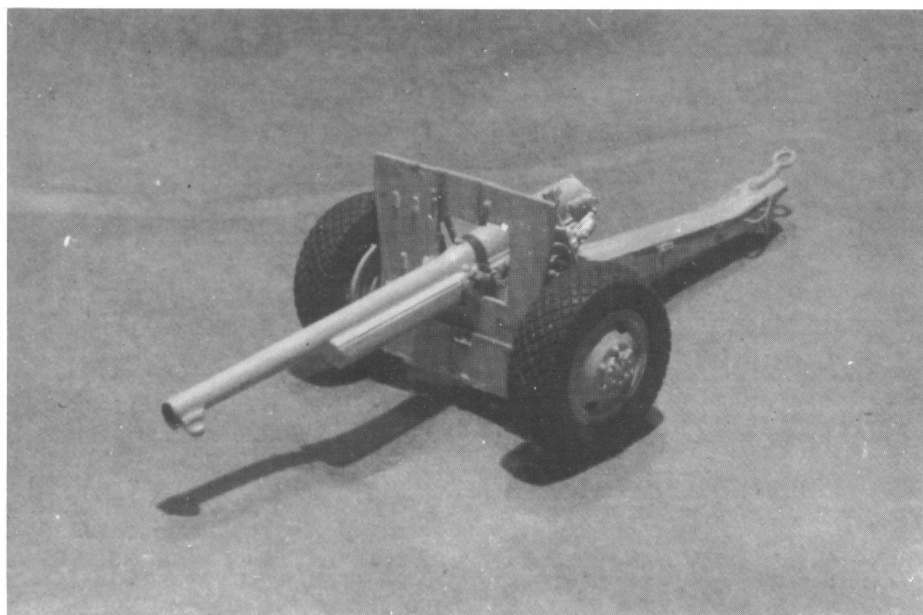
Rommel's North African Campaign, Greene & Massigliani, Combined books, 1994

MARE NOSTRUM The War In The Mediterranean (2nd Edition), J. Greene, Typesetting, Etc., 1990

'Tobruk', Avalon Hill Game Company, 1975

Light and Medium Field Artillery, Chamberlain and Gander, 1975

Artillery of the World (2nd Edition), Chris Foss, 1975



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Now in its sixth year, AC covers the history and development of wheeled fighting vehicles. Photos, scale drawings, vehicle and unit histories, book reviews, and more. Sub: \$18 a year (six issues). Sample copies \$3. **ARMORED CAR**, 4520 DRAKE CT NE, SALEM OR 97301-3058

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<del>November 92</del> SO	<del>March 1995</del> SO
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March 1993	<del>July 1995</del> SO
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<del>July 1993</del> SO	November 1995
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SO- indicates this issue is sold out

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\$3.00 each U.S. (50¢ postage. MD residents add 5% sales tax), foreign \$4.25. U.S. funds only.

Museum Ordnance, POB 5884, Darlington, MD 21034

# NOTE FROM THE PUBLISHER

(continued from Page 3)

even future, vehicles and systems more difficult. For these reasons, the title of the magazine will be changed with the July, 1996 issue.

Journal of Military Ordnance will carry the magazine on in the same tradition as every issue before. We do not plan any change in the scope or nature of the magazine, just the title.

The magazine's relationship with the US Army Ordnance Museum remains as it always has been. Dr. Atwater will continue to have space for news and information pertaining to the museum and the Ordnance Museum Foundation will continue to use the magazine as their communication tool with their membership for the foreseeable future.

Museum Ordnance, as Journal of

Military Ordnance will be, has always been privately owned and published by Darlington Productions. Our efforts to support the museum and the Foundation are purely voluntary and done because there is a need to support the historic efforts of these two organizations. Your continued support of both is encouraged.

There will be several other changes to affect the magazine before the end of 1996. Most will not be noticed by the readers and are done solely to improve the quality and appearance of the publication. Any comments or suggestions would be appreciated and welcomed.

I hope that you will continue to enjoy the Journal of Military Ordnance and that we can continue to offer the range of articles that you wish.

Thank you.

Jeffrey D. McKaughan  
(410) 457-5400  
(410) 457-5480 (fax)  
DPI14@aol.com

## Looking for a Publisher?

Darlington Productions is seeking manuscripts for publication and would like to hear from you.

We are rapidly expanding our Museum Ordnance Special series with ten to fifteen new titles planned for the next 12 months. If you have an idea or concept for a Special, give us a call. The Special is a heavily illustrated magazine-format publication focusing on a particular vehicle, series of vehicles, or an engagement, conflict, or war.

We are also seeking manuscripts on 20th century military history subjects. These can include battles, wars, equipment, etc., from WWI through to the present. Minimum word count is approximately 45,000 and must include photos and/or other illustrations. The books in this range would be published with a soft-cover.

Finally, we are seeking manuscripts that are longer and more comprehensive, however, otherwise similar to the above description for soft-covers. These books would be published with a hard cover.

See page three for the address and phone number to contact Darlington Productions.

## Classified Ads

A free service to subscribers of *Museum Ordnance*. All subscribers are entitled to one free, thirty word classified ad per issue. Copy should be typed or neatly printed. The Publisher reserves the right to approve and edit all classified ads prior to publication. All ads must include the date the ad is to be removed, or they will be run for two consecutive issues. For ads with more than thirty words or ads for non-subscribers, the rate is fifty cents (50¢) per word. All payments must be made in advance and in U.S. funds. Send to Museum Ordnance, P.O. Box 5884, Darlington, MD 21034.

### SALE/OFFERS

**Modeler Research:** Modeler is researching for project on the VT-34 and any SU-100-based armored recovery tanks. Contact Tim Roberts, 25 Kamps Ave., Bellevue, Shrewsbury, SY3 7QW, England 5/96

**Artillery Plans:** Reprinted early 20th century American artillery plans and manual. For list send two first class stamps to: Peter Frandsen, 9900 Georgia Avenue #302, Silver Spring, MD 20902-5242. 2/96

**Sale:** Thinning military book collection. Send LSASE for 8-page list of books I am disposing of. Peter Hudik, 3525 Julep Dr., Colonial Heights, VA 23834 5/96

**Study U.S. Coast Artillery Corps,** artillery, harbor defense, and fortifications! Trips and publications. Write: Coast Defense Study Group, 731 Baltimore Pike, Bel Air, MD 21014. 6/96

**Technical Manuals for sale.** Photocopies of over 7500 titles of AFV's and military vehicles technical manuals. Languages mainly in English, plus some others. Send specific enquiry to Tank Museum, 3 Parc Cinquantenaire, 1040 Brussels, Belgium.

**Sale:** Odd ball/miscellaneous magazines/books, etc. Over 40 years of buying military books. Send three (\$3) dollars for list (SPECIFY ODDBALL). Mostly WWII to present. Bill Whitley, 311 Bundy Ave., Endicott, NY 13760. (607) 748-7922. 6/96

**Dominican Crisis, 1965-66!** Over 300 action photos in 64 pages, from the US Army's Caribbean adventure thirty years before Operation 'Restore Hope.' Plenty of modeling ideas! \$3 pp from AG, 225 Brown St., Philadelphia, PA 19123

**Fighting Vehicles & Weapons of Rhodesia '965-80,** Mint \$37US. Also Eastern European AFV publications available. D. Frost, 4335-115th St., Edmonton, Alberta T6J 1P5 Canada 3/96

### WANTED

**Wanted:** Photos of WWI British Heavy Tank V\* at Fort Knox, KY, US Mk VIII and Renault light tank at Fort Meade, MD. Colin Knapp, 35 Meadow Field, Stokesley North Yorkshire, 759 5EL, England. 6/96

**U.S. 75mm Pack Howitzer** optics, tools, recoil system repair equipment, etc., Wanted. Please call collect. Weekdays (505) 437-0220; Evenings & Weekends (505) 437-3599 5/96

**Modeler Research:** Modeler is researching for project on the VT-34 and any SU-100-based armored recovery tanks. Any assistance would be gratefully appreciated. Contact Tim Roberts, 25 Kamps Ave., Bellevue, Shrewsbury, SY3 7QW, England 5/96

**Researcher seeks** Demilitarization manuals from Dept. of Defense, from 1940 through 1975. Call collect days (505) 437-0220. Evenings and weekends (505) 437-3599. 2/96

**Wanted:** Photos of rear of Indian Army T-72, early models with Gill armor. Need to know if they have unditching beams, extra fuel tanks, and markings. Photocopies ok as long as they show these features. Peter Brown, 8 Saddle Close, Colehill, Wimborne, Dorset BH21 2UN England 6/96

**Hetzer:** Researching for book on Hetzer family. Looking for photos, information, & material. If interested in contributing contact L. Archer, Ty Bach, 59 Rugby Pl., Brighton Sussex BN2 5JB England. 5/96

**Wanted:** Am looking for 1/35 Centurion kit. If interested in selling, please contact Olaf Kievit, 303 Mansfield Street, Apt E, New Haven, CT 06511. (203) 787-9587, olaf.kievit@yale.edu 4/96

# Museum Ordnance Specials

Museum Ordnance announces a series of publications using the 24-page magazine format. Each publication in the series will feature either a particular vehicle, a series of vehicles, or a conflict/engagement.

## #1 M88A1 Armored Recovery Vehicle

An indepth photo study of the U.S. Army's primary ARV. More than 80 photos and line drawings detail the exterior and interior.

## #2 Iron Coffins: Italian Medium Tanks - M13 and M14

More than 60 photos, illustrations, and drawings depict these WWII tanks.

## #3 M26 Pershing

The interior and exterior of this U.S. tank is detailed with more than 90 photos and line drawings detailing the exterior and interior.

## #4 German Elephant Panzerjäger Tiger (P)

Approximately 90+ illustrations show the inside and outside of this German Tank Destroyer. Although this example is not in restored condition from the APG museum, it clearly shows off the features and details of this vehicle.

## #5 "FUCHS" Transportpanzer (TPz1) and Variants

This modern Bundeswehr vehicle serves not only as an APC, but also as an engineer vehicles, ambulance, command post, and other roles. The U.S. Army (designated as the FOX) used these vehicles in an NBC role during the Gulf War. See it inside and out!

## #6 Post-War T-34/85

Looks at the life and evolution of the T-34/85 after WWII. Photos show external changes as well as internal details.

Postage:

U.S.: \$1.00 for the first, +70¢ for each after.

Foreign: \$2.00 for first, +70¢ for each after. (surface)  
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U.S. funds only.  
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## #7 Armored Fighting Vehicles of El Salvador

El Salvador fought their internal guerrilla war with a variety of armored vehicles, some purchased, most, however, were designed and built within the country. Tracked and wheeled vehicles alike are shown in this Special filled with action photos and detail shots.

## #8 The Battle for Namibia, South Africa's Longest War

This Special takes the reader into a rarely studied war fought by the South African military against SWAPO insurgents based mainly in Angola. With 57 photos, 2 drawings, and 3 maps.

## #9 The M1A1 and M1A2

A detailed look at *THE* world's premium MBT. Inside and out using photos and line drawings from the U.S. Army TM's, you can see the differences between the two vehicles.

## #10 Valentine Infantry Tank

Using photos from two different vehicles as well as illustrations from the operator's manual, see this tank up close.

## #11 Sd.Kfz 231 (8-Wheel)

Detail photos of both the interior and exterior, plus a few wartime photos clearly describe the German armored car.

## #12 Merkava II and III

This look at the exterior of this Israeli MBT. Shows the differences between the two variants AND the differences between the production runs within the variant.

For readers who are outside of the U.S. interested in the Museum Ordnance Specials, below is a list of dealers that carry some or all of the products of Darlington Productions. Try contacting them for your order, or as always you can contact us directly.

Darlington Productions

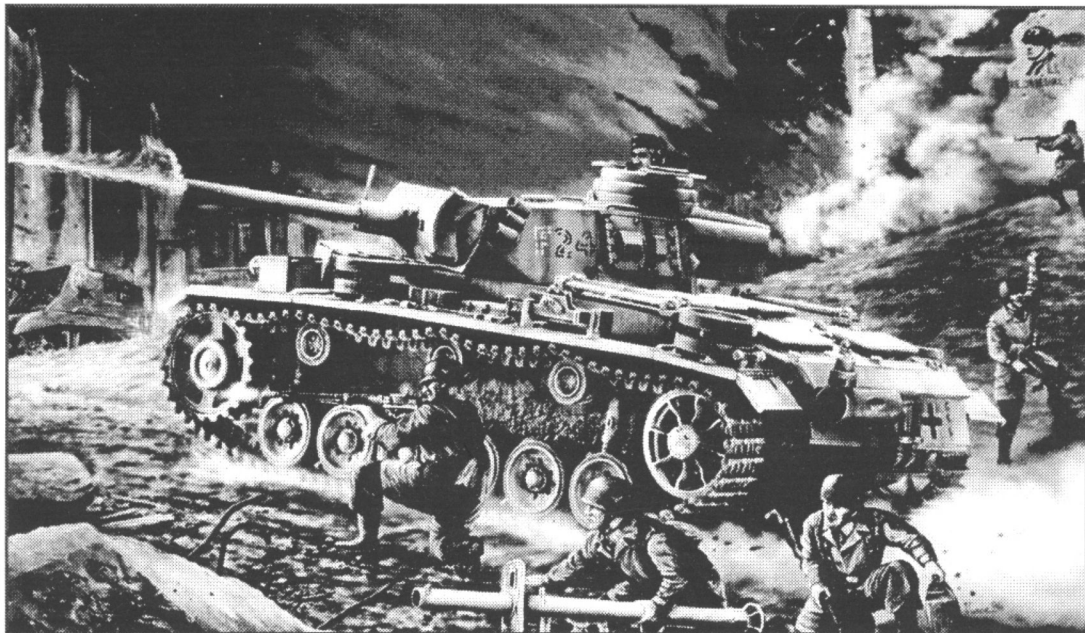
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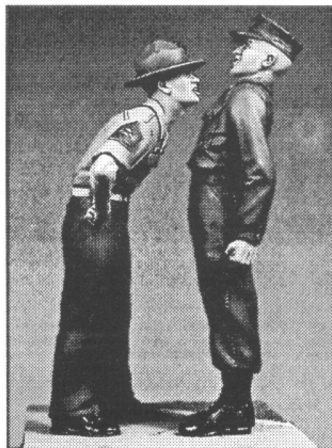
AFV CLUB

1/35 FV-107 SCIMITAR



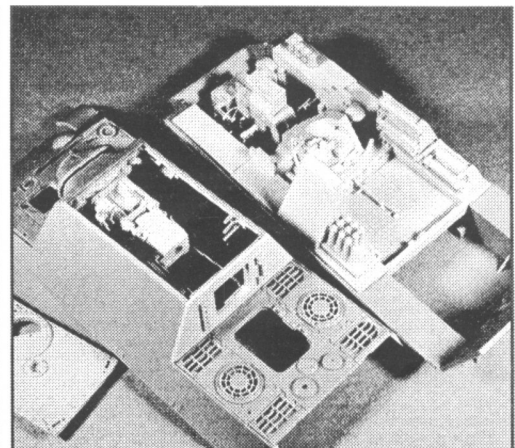
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KIRIN

1/16 D.I. & RECRUIT



JAGUAR

1/35 JAGDTIGER INTERIOR



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