

## AUTO-MITRAILLEUSE MINERVA

David R. Haugh

The Minerva armored car has the strange distinction of being *almost* the first of its kind. The "almost" being the qualifier.

Introduced in 1914, at the outbreak of the First World War (WWI), the Minerva was one of the first armored cars of that period to have a more or less standard armor design for its chassis.

The Russian's had introduced a British designed armored car, the Armstrong-Whitworth in 1913, but these machines disappeared into obscurity.

The Minerva was a powerful, reliable, touring car. A machine which proved suitable to being adapted to carrying armor, but so was the Rolls-Royce.

The Minerva mounted machineguns, or even small cannons, but so did many other contemporary machines.

What the Minerva did do, was to combine all of these attributes into one machine. A machine available in sufficient numbers to have an immediate effect that caught the attention of the public. The Minerva earned the title *First!*

### DEVELOPMENT

During WWI, the Belgians were among the first to make extensive use of automobiles to strike back at the German horse mounted Uhlan's. At first unarmored touring cars such as SAVAs, Mors, and Minervas were pressed into service. Operating singly or in groups, these unarmored cars carried sharpshooters on raids against the advancing Germans.

After the first few actions the advantage of armor protection for the crew was realized, and temporary armor of boiler plate was fashioned. These first efforts were simple, consisting of little more than a quick screen around the passenger compartment.

Meanwhile a standard pattern of armor was designed for the Minerva chassis, with new special built cars being delivered from the Antwerp factory by the end of August 1914.

Development of the basic design continued quickly until the Battle of Aïnse, which saw the start of trench warfare in Europe. Belgian armored cars were still valuable, but they now were most often used as mobile anti-aircraft guns, or

...continued on Page 3

Top: An artist's rendition of a Minerva, during the battle of Verdun, 1916. Note the extensions on the front wheels to decrease ground pressure.

Right: A standard Minerva catches German mounted troops in the open 1914. This type of rapid raid, soon came to an end.





Editorial

WHY ARMORED CAR ? OR YOUR EDITOR INTRODUCES HIMSELF

It's kind of considered mandatory when you start a new publication, to take a few lines and let the readers know who you are, and what it is you hope to accomplish with a new publication.

Taking the steps one at a time, here's my introduction.

For those of you that don't already know me, my name is Dave Haugh, and I live here in the glorious (if you don't mind a little rain) state of Oregon. I also served in the military as an armored crewman for years, spending time on the M48, M48A1, M48A5, M60, M60A1, and last the M60A3, before I finished. I never did get a chance to serve on the Commando.

If you happen to have a long memory, you may remember that, I was the Assistant Editor of AFV-G2 for several years, and the Editor of the military history magazine Fusilier for all of one issue.

I haven't been completely gone from the scene since then, contributing to Conflict, AFV News, Military Journal, Panzer, and lately, The Review International.

But in all of those publications, armored cars took a back seat to tanks. Not that I have anything against tanks, just that I'm more interested in wheeled fighting vehicles. Perhaps it's because armored cars and wheeled fighting vehicles are more accessible in size. That is, you can picture having an M3 scout car, or a Panhard AML 90 sitting in your driveway, a Leopard, or T-80 just wouldn't fit.

So looking around, I decided to present a format where the armored car and other wheeled fighting vehicles would get center stage.

When I went to design Armored Car, I purposely borrowed ideas from two very successful publications

First of course was George Bradford's perennial AFV News. George has found a format and maintained a reliable publishing schedule for over twenty years. But again George's main focus has been, and seems to remain tanks.

Second was small air forces observer, now in its fourteenth year. In an era of slick paper, high priced aircraft and modelling magazines, SAFO, has carved out a place by providing unique information.

Both publications have two things in common. First, they are small publications that respond to the interests of their readers. Second, their readers participate in the

issues. Whether it be letters, post cards, or contributions of photos or articles. It's one member of the group, talking to another member of the group.

While I can generate material and articles for the issues, I would much rather have this an open forum for the sharing of a hobby/interest that we have in common. Material can be on either the actual machines themselves, the countries, armies, police, etc., that use them. Or any of the scale models, or modelling related areas.

This is also my way to reach you, the many friends I've made around the world, on a regular basis. Well, I don't want to take up any more space from our first issue, until #2, Keep modelling!

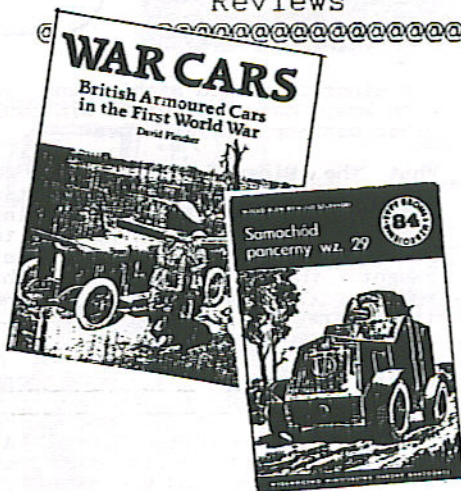
...David R. Haugh

Samochod pancerny wz. 29, by W. Jelen & R. Szubanski, publisher, Wydawnictwo Ministerstwa Obrony Narodowej, Poland.

This is #84 in the Polish Profile series, and covers a vehicle not all that well known outside of Poland.

The profile sports color four view drawings, plus a cutaway of the interior, nineteen photos, and a schematic showing a typical wz. 29 armored car squadron. These cars sported some really nice color schemes during the between war years, and the vehicle doesn't look like it would be that hard to scratch build. This is a nice to have profile for the completist. I don't have any source for the booklet other than trade with someone in Poland.

Reviews



War Cars, by David Fletcher, publisher, Her Majesty's Stationery Office (HMSO) London, price \$14.95. ISBN 0 11 290439 4

After two years I finally got ahold of this book, and it's well worth the wait. A large paperback, approximately 8 1/2 by 11", it's chock full of clear, beautiful, photographs. Written by David Fletcher (the Librarian for the Tank Museum at Bovington), he has done a great job of covering British armored cars and wheeled fighting vehicles from the First World War.

The majority of the book covers the period 1914-1919, with cars, armored lorries, and motorcycles all getting their fair share of attention. Royal Naval Air Service, Army and Commonwealth units are covered, with an appendix giving a quick summary of units, their designations, area of operation and vehicles used. There are only a couple of drawings, but the text and information more than make up for that. This is a must have book for armored car fans.

If you can't order the book through your local book store try Portrayal Press, P.O. Box 1913, Bloomfield, N.J. 07003. A catalog is available for \$3. (Please mention Armored Car when you write)

News

In December 1989, the Army's 3rd Battalion, 73rd Armor Regiment, 82d Airborne Division, Fort Bragg, received 16 LAVs from the Marine Corps. The 73rd is testing the vehicles for two years to help decide whether the Army should adopt them for scouting duties. -Ordnance Magazine, August 1990



Letters

This spot reserved for you!

Next Issue

Our backcover shows one of the subjects for our next issue #2, the Italian AUTOBLINDA AB40 /41, we'll also have material on the DAF YP-408, plus more..



# MINERVA

...continued

mobile strong points, or simply as armored troop carriers. This situation continued until late 1917 when the situation in Europe began to allow more mobility in operations.

During this same period Belgium, along with Britain, sent a contingent of armored cars to help strengthen the Russians on the Eastern Front. Arriving in 1916 these Minervas saw most of their action in Poland, finally being withdrawn in 1917.

1917 also saw the rebuilding of the Belgian army. Those earlier cars that were still serviceable were kept, some being refitted with dome shaped shields. These shields were open at the back at first, but after the war most were closed to form true turrets.

These same cars were also fitted with new spaced armor (there was now a 1/4" gap between layers of 5mm plate. After refitting, these early Minerva's, along with later versions continued in service until 1937-38. Finally being replaced by new series of armored cars just prior to the start of World War II.

## DESCRIPTION

The Minerva touring car formed the basis for a more or less standard pattern of armored car. The only major change to the chassis being the fitting of dual rear wheels to help take up the extra weight of armor and equipment.

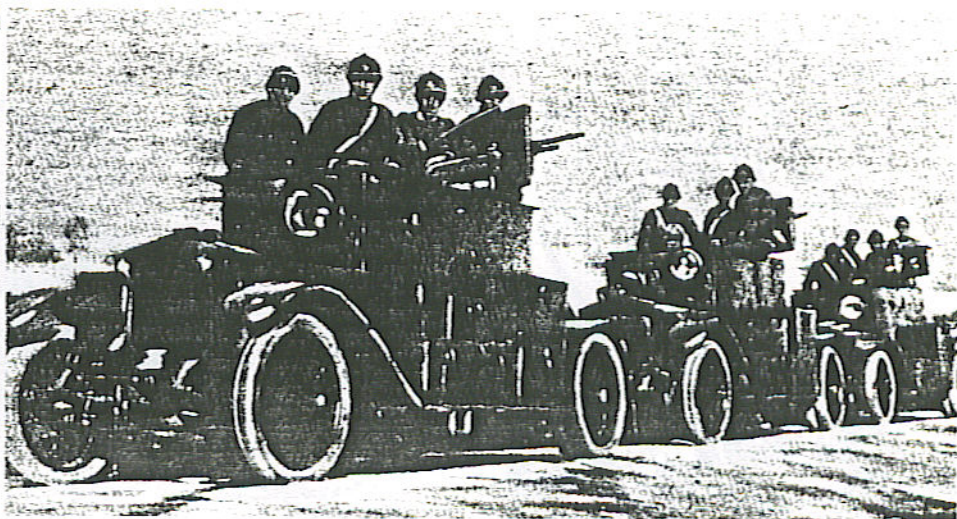
The armor itself consisted of 5mm plate framing a simple open-top crew compartment with vertical sides and front, along with a rounded rear end. On later models there was also separate protection provided for the engine and radiator. Two small armored doors were fitted to aid in cooling.

A 4-cylinder, 40 horsepower, gasoline engine was standard. Using what was for the time state of the art engine design, this seems to have been a fairly reliable powerplant. In addition, dual wheels were fitted at the rear in an attempt to deal with the extra weight.

Extra boxes for storage were carried at the rear, along with the spare tires. These tires were carried flat in a curved well at the rear of the vehicle.

## VARIANTS

The basic Minerva was introduced in 1914. This vehicle had an armored, open top box hull, with a pedestal mounted Lewis gun, and single rear wheels. There was no protection provided for the engine.



Minervas at Houthem, between Ypres and Comines, September 1917. These are refitted cars with the addition of overhead cover for the driver and co-driver.

The second version was introduced within just a few months, and consisted of an open top crew compartment, with two straight plates on either side, and a curved plate at the rear. The front of the vehicle now included a flat plate with vision slots for the driver and co-driver, as well as armor protection for the engine. A single Hotchkiss machinegun with/without a shield was fitted. Dual rear wheels were also added to help carry the extra weight. This version became the basic Minerva on which all others were based.

A slight modification to the 1914 model Minerva was the round hull version. Armor at the front and rear now being curved. Some vehicles were also armed with a shield protected 37mm Puteaux cannon.

A further improvement of the basic Minerva, was the addition of overhead armor for the driver and co-driver. At times the rear of the hull was built up into cupolas.

The final wartime Minerva was the so-called "streamlined" version. This later model had a more streamlined appearance, with curved plate over the driver and co-driver, plus a half-dome turret at the rear and covers over the rear wheels. Some late production versions had full turrets.

The post-war Minerva was introduced in 1919, and consisted of a refit of existing machines to the final standard. Those machines still in serviceable condition were refitted with armored tops and a large cylindrical turret. These last machines soldiered on for almost another twenty years.

## MODELING NOTES

Minicraft released a reissue of four early touring cars called *Highway Pioneers*, Kit #1504. This particular set includes a 1911 Rolls-Royce, 1915 Ford Model T, 1914 Stutz, and a 1913 Mercedes.

While these kits are in 1/32d scale, the Stutz or Rolls-Royce could act as the base for building a Minerva. I haven't as yet found a decent wirespoked wheel in 1/35 - or 1/32d. Perhaps someone who has found a source can write in and share with the rest of us.

The basic color for a Minerva seems to have been either green, or grey with white markings.

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*Encyclopedia of Armoured Cars*, Duncan Crow & Robert J. Icks, 1976

*Illustrated Encyclopedia of Military Vehicles*, Ian V. Hogg & John Weeks, 1980

*Illustrated History of Military Vehicles*, Ian V. Hogg & John Weeks, 1980

*A Photo History of Armoured Cars in Two World Wars*, George Forty, 1984

*Tanks and Other Armored Fighting Vehicles 1910-1918*, B.T. White, 1970

*War Cars*, David Fletcher, 1987

## SPECIFICATIONS

Crew: 3

Armament: (1) 8mm Hotchkiss MG or  
(1) 37mm Puteaux Cannon

Length: 4.4 m (14.5')

Width: 1.7 m (5.7')

Height: 2.05m (6.7')

Weight: 3500 Kg (7,714 lbs)

Engine: Minerva, Gasoline, 40hp,

4-cyl

Max Road Speed: 48 km/hr (30 mph)

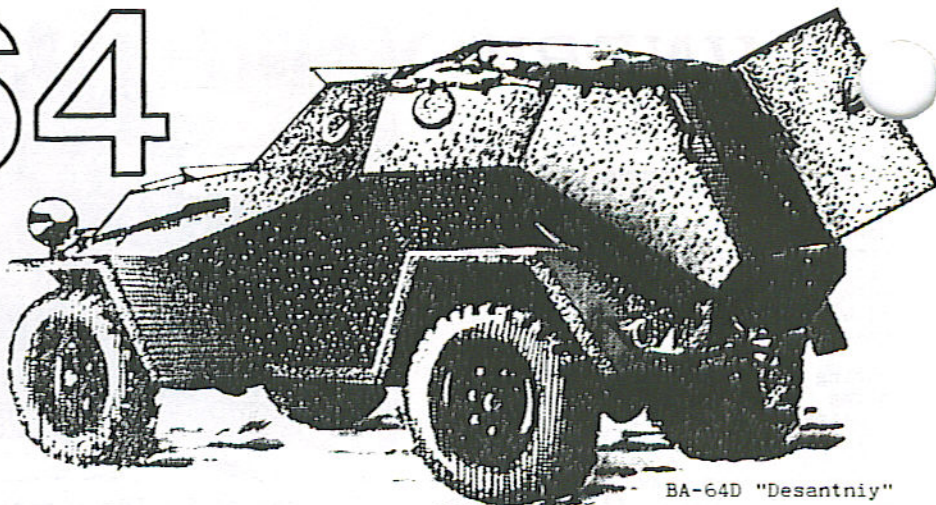
Range: 240 Km (150 miles)

Armor: 5mm (.2")

Maker: Minerva Motors SA



# BA-64



BA-64D "Desantniy"

## DEVELOPMENT

In 1942, World War Two (WW2) for Russia had reached a critical point. All production of armored vehicles had been turned to tanks and assault guns, with trucks, jeeps, and other armor coming in Lend-lease from the U.S. and Britain. Those armored cars that were available, were those that had survived the initial years of the war.

It was during this period that the little BA-64 was put into production. Based on the GAZ-64 light cross country car, the BA-64 carried a light machinegun in a built up open top.

Strongly influenced by contemporary German vehicles, the BA-64 was ment as a reconnaissance, liaison and command car.

## DESCRIPTION

The most numerous version was the BA-64B, which used a wider chassis based on the GAZ-67B field car. This version introduced a fully rotating open top turret. With well sloped armor, and good cross country ability, these cars were popular vehicles with their crews.

BA-64Bs were seen nearly everywhere with Russian armored units as well as Polish and Bulgarian from 1944 on.

Production ceased in 1945, but the BA-64B continued on into the '50s in the Soviet Union and into the late '70s and early '80s with the smaller third world countries.

## VARIANTS

The command version did away with the turret, but had extra radios and map boards. Other versions were fitted as halftracks, or mounted 20mm cannon, antitank rifles, or the heavy 12.7mm DShK 1938 HMG.

A turretless personnel carrier for airborne units was also developed, the BA-64D. This vehicle had a door at the rear as well as the two on either side. Only a prototype was built.

## BIBLIOGRAPHY

*The Eastern Front, Armor Camouflage and Markings, 1941 to 1945*, Stephen J. Zaloga & James Grandsen, 1983.

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*Russian Tanks 1900-1970*, John Milsom, 1970.

*Wozy Bojowe LWP 1943-1983*, Janusz Magnuski, Poland, 1985.

*Beogradska Operacija 1944-1984*, Ljumovic, Yugoslavia, 1984.

## MODELING NOTES

There are at least two versions of the BA-64B out in vacuform. The TondaVac (from Czechoslovakia) and from Schmidt Vacuform (Germany).

The TondaVac is a complete kit, and while it does take some time to build (you even have to put together the leaf springs one leaf at a time), it makes a really good looking model when your finished. The BA-64B drawings are from the TondaVac instructions.

The Schmidt version is a conversion kit and requires a Tamiya GAZ67B Field Car, a kit that is not all that available here in the states. It also runs up the price of building a version. I would recommend trying to trade with a Czech or Polish modeler. It may take some patience as TondaVacs aren't all that numerous in Eastern Europe either.

## SPECIFICATIONS

Crew: 2  
 Armament: (1) 7.62mm MG  
 Length: 3.65m (12')  
 Width: 1.52m (5')  
 Height: 1.9m (6' 3")  
 Weight: 2,400 kg (5,290 lb)  
 Engine: GAZ Model MM, 4-cyl, gas, 54 hp  
 Speed: 80 km/hr (50 mph)  
 Range: 600 Km (375 miles)  
 Armor: 6-10mm  
 Maker: GAZ Motor Factory, Moscow

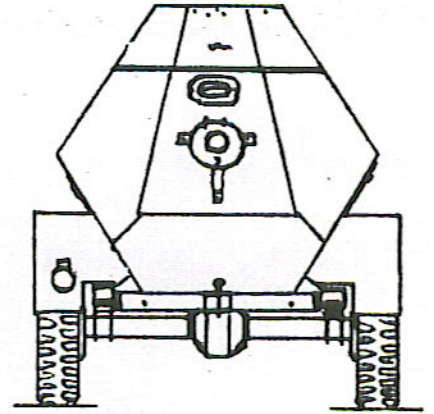
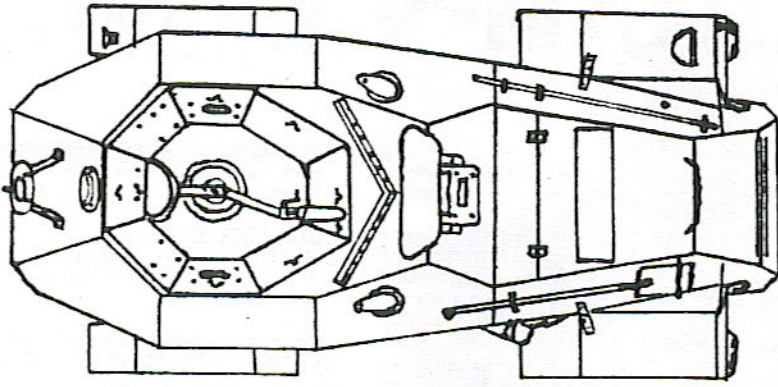


Above and below: BA-64Bs lead a column in the liberation of Belgrade 20 October 1944.





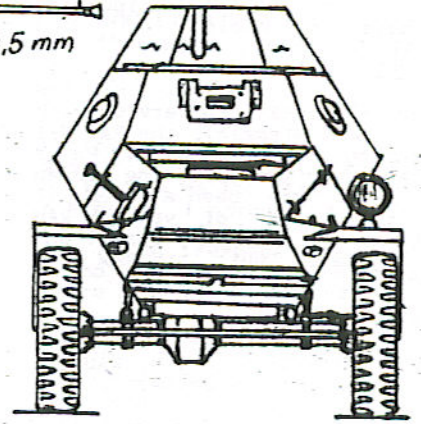
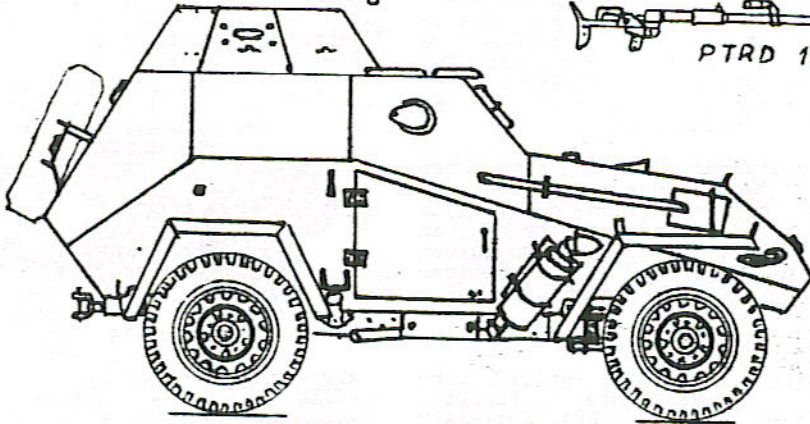
ARMORED CAR



DT vz.1929 7,62 mm



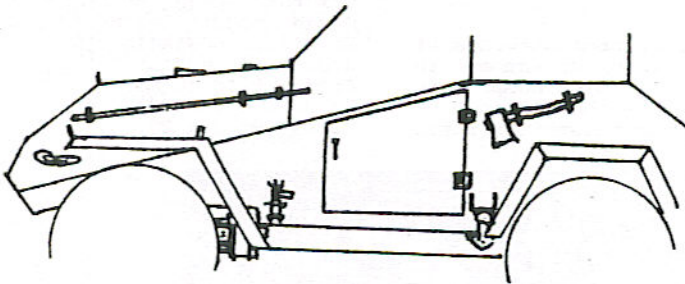
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**BA-64B**

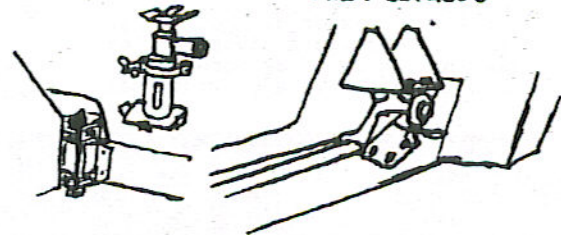
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LEVÝ BOK AUTOMOBILU

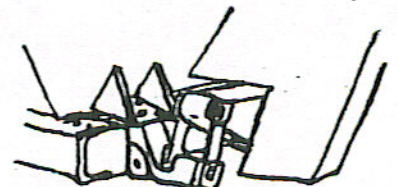
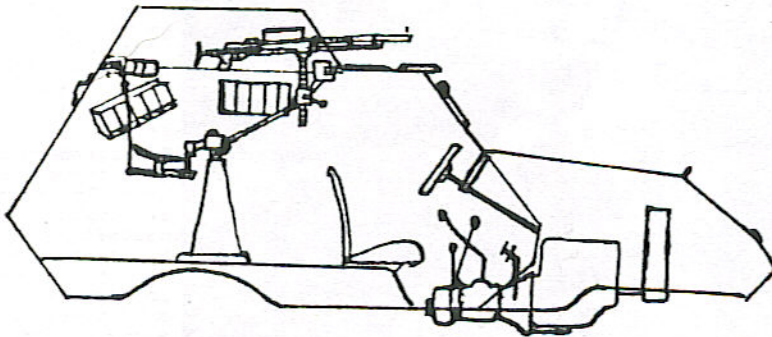
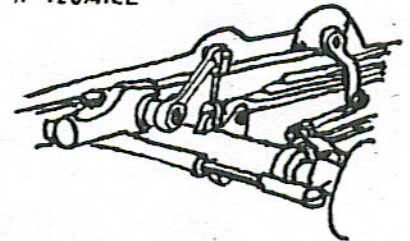


UCHYCENÍ ZVEDÁKU

UCHYCENÍ ZADNÍ PRŮŽNIVY A PANCÉŘOVÉ KORBÝ SHŘEŠK ZBPŘEDU



UCHYCENÍ PŘEDNÍ NÁPRAVY, ŘÍZENÍ A TLUMIČE



UCHYCENÍ ZADNÍ PRŮŽNIVY A KORBÝ POHLED ZBZADU

INTERIÉR AUTOMOBILU

NA BOČÍCH KORBÝ SCHRÁNKA NA ZÁSOBNÍKY  
PRO KULONET (celkem 1070 nábojů)

From TONDA VAC BA-64 Instruction sheet



# RAM-V1

As almost any scout in a mechanised army will tell you, armor protection is secondary to ease of movement and stealth when it comes to survival. And stealth requires a low silhouette, low noise, agility, and quick bursts of speed. Firepower is nice, but really only needed as a last resort. If it comes to a shoot out, you've been spotted. Israel Aircraft Industries' Ramta Structures and Systems division seems to have come up with a modern, effective, simple design for a multipurpose reconnaissance vehicle.

## DEVELOPMENT

A logical development of the earlier RBY Mk1 (in service with Israel and Guatemala), the RAM V-1 was introduced at the 1979 Paris airshow. Over the following eleven years there has been a steady if slow production of various RAM versions. So far only Israel and Morocco have put the RAM into service.

The RAM series consists of two basic groups, broken down into subtypes. First are the RAM V1, with a short wheelbase of 3.4 meters (118"). And the RAM V1L (or long) with a 3.8 meter (141") wheelbase. The second series, the V2 has the same short and long wheelbase, with the addition of a closed and armored troop compartment.

## DESCRIPTION

The RAM V1 has an air-cooled six cylinder 5560cc Deutz diesel engine delivering some 132 horsepower. This is coupled with a conventional

leaf spring and hydraulic shock absorber straight axle design.

The straight axle was chosen over the more conventional independent suspension because of improved cross country handling in sand. This suspension is tied to an Allison automatic transmission with four forward and 1 reverse gear (along with a manual select override), and power steering and brakes to reduce driver fatigue.

Armor plates from 8 to 10 millimeters (.32") surround the fighting compartment and floor. The fenders are made of fiberglass and are designed to tear away in the event of a mine blast.

On the standard RAM V1, up to three 7.62mm machineguns along with 5000 rounds of ammunition and various small arms are carried. The V2L can be fitted with a commander's turret carrying either a .50 caliber machinegun, or a 40mm automatic grenade launcher.

## VARIANTS

Infantry Fighting Vehicle, Long Range Surveillance (Scout), Anti-tank (106mm RR), Anti-tank (TOW), Anti-aircraft (TCM-20 twin 20mm AA system), C<sup>2</sup> (Command and Control), Rocket Launcher, Armored Fighting Vehicle (V2L with overhead cover), and Medical Evacuation.

## MODELING NOTES

The general arrangement drawings of a RAM V1 are from IAI and are in 1/35th scale. A quick comparison showed that while the body can be made from plastic sheet, the frame

and wheels can be used from the Testors/Italeri 1-1/2 Ton Truck.

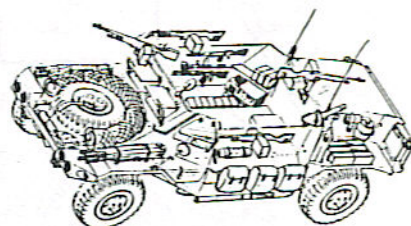
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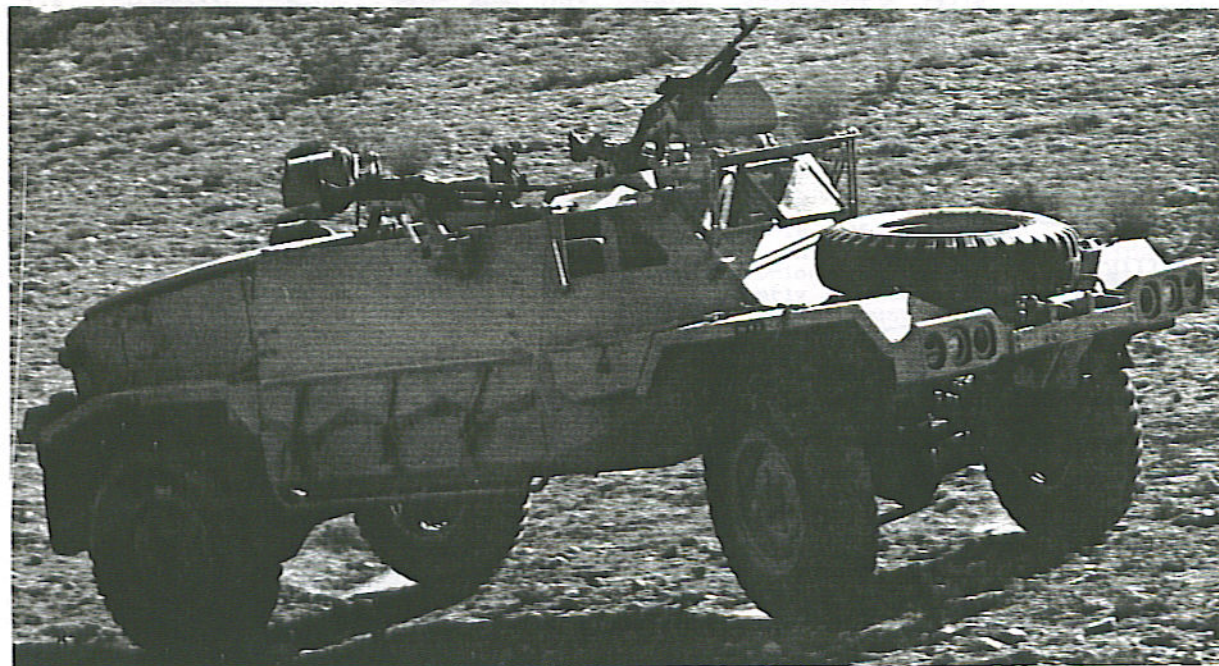
*Jane's Armour and Artillery 1981-82* Second Edition, Christopher Foss, 1982.

*Defense Update International* #53, RAM-V1, T. Eshel



## SPECIFICATIONS RAM-V1

Crew: 2+4 (Cdr, driver, 4 mm)  
 Armament: 3 x 7.62mm LMG  
 Length: 5.02 m (16.48')  
 Width: 2.03 m (6.66')  
 Height: w/o arm: 1.72 m (5.64')  
 Weight combat: 5400 Kg (11907 lbs)  
 Engine: Deutz diesel 132 hp  
 Max road speed: 96 km/hr (59.6 mph)  
 Range road: 800 Km (496.8 miles)  
 Vertical obstacle: 0.8 m (2.62')  
 Grade: 70 percent  
 Armor: 8 to 10 mm  
 Ford: 1 m (3.28')  
 Tires: 9:00 x 20

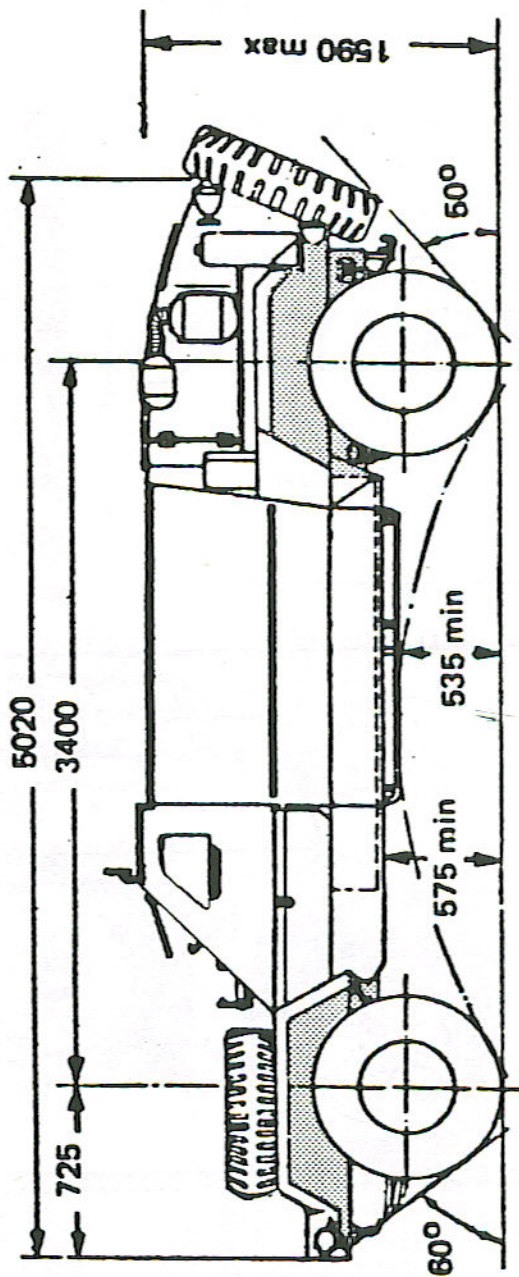
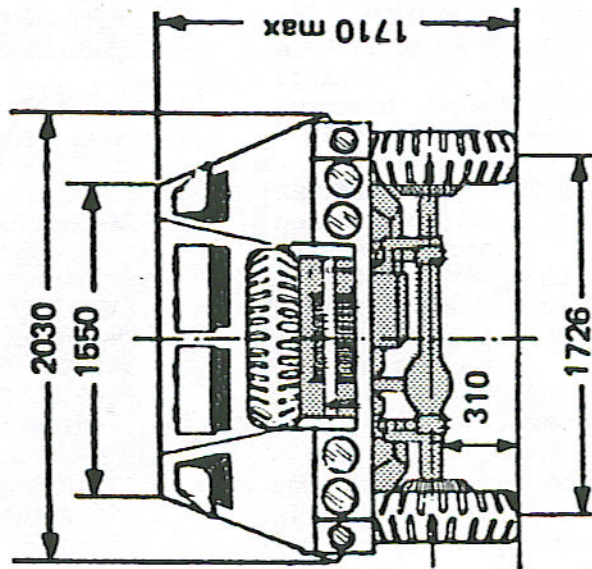
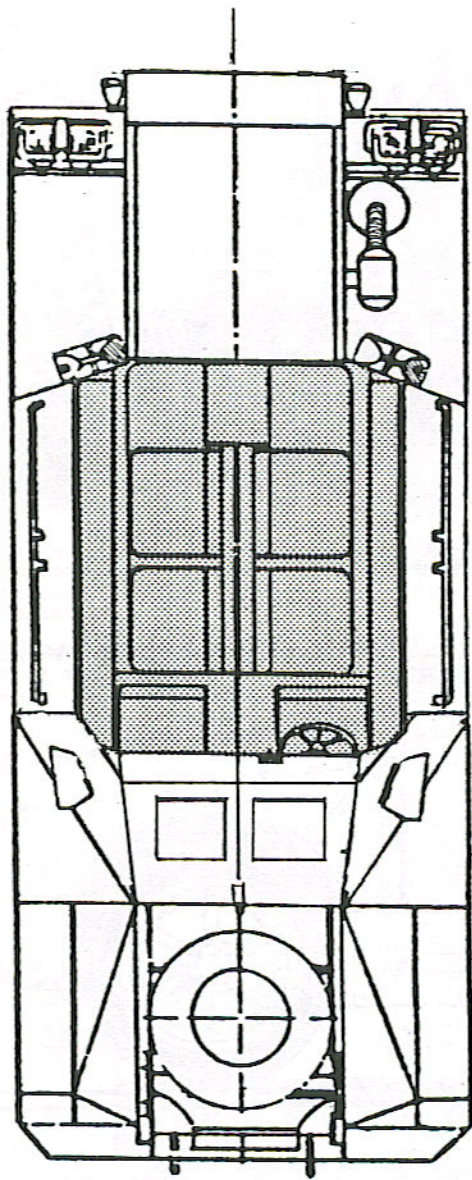


The standard RAM-V1 with three 7.62mm LMGs. The fenders, and engine compartment roof and access panels are of fiberglass, designed to separate in a mine blast. This, along with sloped angles at the bottom of the crew compartment are meant to reduce concussion injuries to the crew.

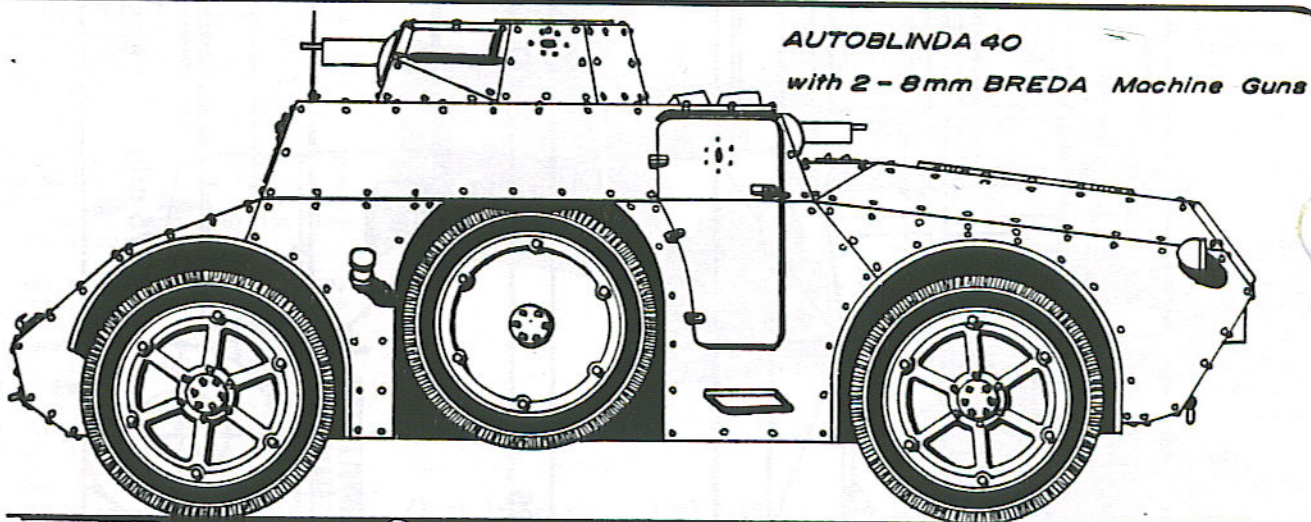
IAI photo



RAM-VI







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