The Book of Tanks
A Wargamer’s Portable Guide to Tanks, Self-Propelled Guns, Armoured Cars, and Personnel Carriers from World War I to the 1990’s

By David L. Ferris
ArmourSoft
The Book of Tanks

Introduction

This book is designed to be a handy, portable, comprehensive, concise guide covering tanks and other fighting vehicles used from the First World War to around the end of the 20th Century. Wargamers (people who play recreational games using metal or plastic miniatures, cardboard counters and paper maps, or computers to simulate historical situations) are the intended audience of this book so the information is laid out with them in mind. The data is presented in "real world" format rather than in game terms, and so should be useful as a reference for any set of wargame rules, from any publisher or manufacturer, as well as for non-gamers.

The format allows the reader to print out as many hardcopies of the book as required and place them in binders, to be easily carried to local game club sessions or game conventions. Updates may be downloaded and printed out as soon as they appear, at no extra expense to the reader aside from the time spent downloading and the cost of making a hardcopy.

Like many projects of this nature, The Book of Tanks was written for one important reason: I needed something like it for my own personal use. Gamers and other hobbyists had expressed an interest in owning a copy, so the choice to place it online for free downloading was an obvious one.

Originally The Book of Tanks (TBOT) was intended to be the data book to be included with the Tankbase computer-assist wargaming project, analogous to The Book of Ships included with Shipbase III. By 1995, Tankbase was put on indefinite hold and I considered publishing TBOT as a stand-alone title, probably through a mainstream publisher. By 1999 I was saying nuts to that, and just decided to give the thing away for free over the Net. No deadlines, far fewer headaches, and I didn’t have to worry about some unknown editor screwing up the captions. If anyone is going to screw up the captions, it’s going to be me!

My intention was not to list every single sub-type, variation, or experimental prototype vehicle ever produced or dreamed of; such a volume would be interesting, but not portable. My goal in TBOT was to list all the vehicles likely to be encountered in a wargame, plus a number of the more interesting designs. Astute readers will note that there are currently no wargaming miniatures available for several of the vehicle types listed in this book. These vehicles are listed here because there may one day be miniature models made of them, and for those who wish to create their own conversions.

Note that the coverage in this book is concentrated mostly on WWII and earlier. Many vehicles after 1945 are included, but coverage thins out rapidly after the mid-1980’s. This is because not as much information is available on the newer vehicles (note that the bibliography lists mostly sources from the 1960’s through the mid-1980’s) and even if I could get my hands on the data, most of it is classified, so I wouldn’t share it anyway. The armour data for many of the post-1945 vehicles presented here are my best guesses, and this is noted in the vehicle entries.

Most of the research used in the production of this book took place between 1989 and 1995. The sources used often disagree with each other on major and minor points of information. In these situations, I went with the information I felt was more reliable, tempered with my own measurements taken from the genuine vehicles at tank museums whose photos grace the pages of this book. Because of all these disparate references, I cannot claim that the information provided in The Book of Tanks is absolutely and definitively accurate. I will only claim that this information is the best I have available, in my own opinion, as of this writing.

If you have comments, suggestions, corrections, or just want to chat about tank stuff, I am generally available online. There are now far too many game-related discussion areas on the Internet for me to visit on a regular basis, but I can be reached via e-mail and through the ArmourSoft web site. The web site, as of April 2002, is at http://www.irvania.com and my e-mail address is comments@irvania.com. I am happy to discuss the validity of any of this data, but please be prepared to cite sources and references. Old episodes
of *Combat*, Sergeant Rock comic books, or anything written by Sven Hassel are not considered acceptable research materials.

**Credits:**
Research, text, compilation, and layout by: David L. Ferris
Additional research and technical advice: Jim O’Neil

All photography by the author. Most of the photos were taken at the museums at Aberdeen Proving Grounds in Maryland and Fort Knox in Kentucky. Some photos were taken at memorials, monuments, small museums and National Guard armouries scattered throughout the USA, and some of the photos were taken at the Duxford Air Museum in Cambridge, UK.

Photo retouching was done using Paint Shop Pro 5.0 and Adobe Photoshop 3.0 on Windows 3.11 and Windows 95 machines.

*The Book of Tanks* was originally written and laid out in Ami Pro 3.0 in 1996. This edition was compiled and laid out in Microsoft Word 97.

**Example of tank entry:**
The top line lists the name of the vehicle, its nation of origin, and the year it was introduced into service. In the case of prototype vehicles that were never accepted into service, the year of manufacture is listed.

**Gun:** The vehicle’s cannon armament. This is generally known by a number followed by “mm”, which is the width of the projectile in millimeters. British WWII guns were classified by the weight of the projectile in pounds, e.g., “2-Pounder”. The letter “L” followed by a number indicates the gun’s calibre, which is its length divided by the diameter of the projectile. The longer a gun is (the higher the “L” number is), the higher its muzzle velocity, which increases its range, accuracy, and hitting power.

**Weight:** The weight of the vehicle in US tons.

**MG:** The number and type of machineguns carried. This number often varied in practice as the crews would tend to mount whatever extra weapons they could scrounge, using whatever means were available.

**Speed:** The maximum road speed of the vehicle, in miles per hour. In practice this would vary from vehicle to vehicle, as one tank in a platoon would inevitably be a bit faster or slower than the others.

**Crew:** The number of men it normally took to operate the vehicle.

**Armour Thickness and Angle:** The armour characteristics are listed as the thickness of the plate in millimeters, followed by a slash, followed by the angle of the plate in degrees. Note that in this book, 0° is straight up and down, perpendicular to the ground, and 90° is laying flat, parallel to the ground.

**Notes:** Brief comments about the vehicle’s configuration, manufacture, or service history.

**Variants:** Common and/or interesting sub-types are listed.

<table>
<thead>
<tr>
<th>P26/40</th>
<th>Italy</th>
<th>1943</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gun: 75mm L34</td>
<td>Weight: 26 tons</td>
<td></td>
</tr>
<tr>
<td>MG: 1 or 2 x 8mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed: 22 mph</td>
<td>Crew: 4</td>
<td></td>
</tr>
<tr>
<td>UpHullFr: 50/45°</td>
<td>TurFr: 50/15°</td>
<td></td>
</tr>
<tr>
<td>LowHullFr: 50/45°</td>
<td>GunMant: 50/30°</td>
<td></td>
</tr>
<tr>
<td>HullSide: 45/25°</td>
<td>TurSide: 45/15°</td>
<td></td>
</tr>
<tr>
<td>LowHull: 40/0°</td>
<td>TurRear: 45/15°</td>
<td></td>
</tr>
<tr>
<td>HullRoof: 20/85°</td>
<td>TurRoof: 20/90°</td>
<td></td>
</tr>
<tr>
<td>HullRear: 40/45°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes: Italy’s only heavy tank design of WWII. Only about 21 built.</td>
<td></td>
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</tr>
</tbody>
</table>

Nose-on view of the British A12 Matilda Infantry Tank Mark II parked at Aberdeen. Note the many angles making up the front of the tank. In the entries in this book, I used the armour thicknesses and angles I felt provided an aggregate value for the surface area noted.
Bibliography

Part 1: The “Must Have” List: These books should be on the shelves of every gamer interested in tank warfare. These are all good single-volume sources, so if you only have room for a few books on tanks, this is a good list to start with.

Part 1a: Recently published, recently reprinted, other otherwise generally easy to find

Peter Chamberlain, Chris Ellis. *Pictorial History of Tanks of the World 1915-45*, Fakenham Press Limited, 1972. This is usually the first book I pick up when looking up a tank type. Not a lot of specific information on any given vehicle, but a good overall view of everything.

Peter Chamberlain, Chris Ellis. *British and American Tanks of World War II*, Arco Publishing Company, 1969. Still the definitive work on the subject. I often wish that there were books like this one covering all the other nations.


Tim Bean, Will Fowler. *Russian Tanks of World War II, Stalin’s Armored Might*, MBI Publishing Company, 2002. Lots of photos and drawings of inter-war designs and light tanks that are seldom covered in other books on Russian armour. The title is a bit misleading as the coverage actually extends from the 1917 Renault FT through WWII and a short section up to the T-90.

One of my early attempts at computer graphics. This illustration is from the original *Treads & Turrets* documentation from 1983. I drew this “freehand” on a TRS-80 Color Computer I with a whopping 32K of memory. That’s 32 kilobytes, not 32 megabytes. I don’t remember the name of the graphics application, but it was one of the early paint programs. This was drawn using a joystick, as this was before it was common for computers to have mice.
Part 1b: Rare, out of print, or otherwise not so easy to find

Duncan Crow, Robert J. Icks. *Encyclopedia of Tanks*, Barrie & Jenkins, 1975. A rare volume, but invaluable. Only short entries for each tank type, but it does a good job of listing the sub-types and variants.


John Milsom. *Russian Tanks 1900-1970*, Galahad Books, 1970. This is a fairly rare book but it covers the subject matter well and is well worth hunting down.

Aberdeen Proving Grounds staff. *Tank Data Proving Ground Series*, WE Publishing Inc. Photos of the vehicles at the museum, back when they were in much better condition. Measurements and data taken directly from the real thing, plus some good archive photos and some very interesting period drawings.

*Tank Data*, no date, author, or editor listed.

*Tank Data 2*, 1969. Edited by E.J. Hoffschmidt and W.H. Tantum IV.

*Tank Data 3*, 1972. By Harold E. Johnson.

F. Heigl. *Taschenbuch der Tanks*, J. F. Lehmanns Verlag, 1935. This three-volume set is rare and expensive, but well worth it for the information contained therein. I don’t know if an English translation exists. My copy is a 1971 reprint of the 1935 edition, but the original 1921 edition can be found on the used book market. Ich habe Teil I und II, nicht habe Teil III.

Part 2: The “Overview” Books: I call this type of source “overview books” because they cover a big swath of tanky subject matter, either the entire history of tanks (up to the date of publication), a particular war, or a particular nation.


Christopher F. Foss, general editor. *The Encyclopedia of Tanks and Armored Fighting Vehicles*, Thunder Bay Press, 2002. Very good coverage. Short capsule entries for each vehicle, good photos and some familiar artwork. A bit more expensive than the other books in this section but well worth it. Some annoying technical errors, like the photo of the Aberdeen Type 97 Shinhoto Chi-Ha medium tank in the entry for the Type 97 Te-Ke light tank.

Ian V. Hogg. *The Greenhill Armoured Fighting Vehicles Data Book*, Greenhill Books, 2000. Also very good coverage with short capsule entries for each vehicle, but not very many pictures. Data is displayed in worldwide alphabetical order, rather than the usual sorting-by-date and/or sorted by nation.


F.M. von Senger und Etterlin. *The World’s Armoured Fighting Vehicles*, Doubleday and Company Inc., 1962. A bit out-of-date information on many important vehicles that were being developed in the late 1950’s and early 1960’s (Chieftain, M60, M113) but still a very useful book for post-WWII designs. Photos, illustrations, and data on many prototypes that never entered service, many of which are rarely mentioned in later books.

Peter Gudgin. *Armoured Firepower, the Development of Tank Armament 1939-45*, Sutton Publishing Ltd., 1997. This book contains some factual errors but describes a number of systems not generally covered by other sources, e.g., target acquisition doctrine and the design of gun mountings.


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Liliane and Fred Funcken. *Arms and Uniforms: The Second World War, Volumes 1-4*, English Edition: Ward Lock Ltd., 1976. The vehicle data in this four-volume set is not as reliable as most of the other sources listed in this bibliography, but the color plates are very useful as painting guides and the uniform information is invaluable. These books are rare and expensive, but well worth the investment if you are a scale modeller or miniature painter.


Nicola Pignato. *I Mezzi Corazzati Italiani 1939-1945*, Storia Militare, 1996. The edition I have is entirely in Italian, but the information is well laid-out and easy to read.


Dr. Matthew Hudges & Dr. Chris Mann. *The T-34 Russian Battle Tank*, MBI Publishing Co., 1999. This is more of an “overview” type book than a “nitty-gritty” type. Lots of good internal and external photos and line drawings.


Wolfgang Fleischer. *An Illustrated Guide to German Panzers, 1935-1945*, Schiffer Publishing Ltd., 2002. Contains a lot of photos I hadn’t seen before. Interesting information on the German maintenance system and how few tanks were usually available at any given time. Quotes from German unit commanders will shock many gamers as to actual division strength versus “paper” Order of Battle strength.

Michael Green, Thomas Anderson, and Frank Schulz. *German Tanks of World War II in Color*, MBI Publishing Company, 2000. Great color photos of museum displays and vehicles restored to their original condition. Some sad photos of tanks that have not been properly cared for and have deteriorated over the decades.


**Part 3: The “Nitty-Gritty” Books:** The following sources are more in-depth than the overview books, so probably won’t be of interest unless you’re really interested in the specific subject matter. Many of these are pretty expensive as well.

**The R. P. Hunnicutt Series** from Feist Publications, Inc.: These volumes tell you just about everything you need to know about the vehicles described. I would have included this series on the “Must Have” list above, were they not so expensive and hard to find. It took me several years to collect the entire set.

**The Thomas L. Jentz Series** from Schiffer Publishing Ltd.: Jentz has authored an extensive series of excellent books concentrating mostly on German WWII armour.
*Panzer Truppen, Volumes 1 and 2*, 1996.
*Germany’s Tiger Tanks Series: VK45.05 to Tiger II*, 1997. Co-authored with Hilary L. Doyle.

**The Spielberger German Armor & Military Vehicles Series** from Schiffer Publishing Ltd.: Not as much detail as the Hunnicutt series, but plenty of excellent photos, drawings, and data.

David Fletcher. Mr. Churchill’s Tank, the British Infantry Tank Mark IV, Schiffer Publishing Ltd., 1999. Very good volume covering the entire history of the Churchill, plus a bit on the earlier British infantry tanks.

Part 4: Monograph Series, Magazines, and Similar “Booklet” Format Sources

The Profile Series, Profile Publications Ltd.: Two excellent sets of pamphlets on individual vehicle types and series of vehicles. Perhaps more useful to scale modellers than to wargamers, but well worth the price. Published between 1967 and 1974. There were 24 issues in the first series, sometimes known as the “red cover editions”. The second series was much more widespread, at least 64 issues having been published. The following were used in researching The Book of Tanks:

B.T. White. AFV 1, Churchill, B.T. Mk IV.
Chris Ellis and Peter Chamberlain. AFV 4, Light Tanks M1-M5.
B.T. White. AFV 6, Valentine Mk III.
Chris Ellis and Peter Chamberlain. AFV 7, Medium Tanks Marks A-D.
Major James Bingham. AFV 8, Crusader – Cruiser Mark VI.
Major-General N.W. Duncan. AFV 9, Early Armoured Cars.
Chris Ellis and Peter Chamberlain. AFV 10, Panzerkampfwagen V Panther.
Chris Ellis and Peter Chamberlain. AFV 11, M3 Medium (Lee/Grant).
Major-General N.W. Duncan. AFV 12, Mediums Marks I-III.
Chris Ellis and Peter Chamberlain. AFV 13, Ram and Sexton.
Peter Chamberlain and Duncan Crow. AFV 14, Carriers.
Major-General N.W. Duncan. AFV 15, Panzerkampfwagen I & II.
Major Michael Norman. AFV 17, Russian KV and IS.
Peter Chamberlain and Chris Ellis. AFV 20, Churchill and Sherman Specials.
R.M. Ogorkiewicz. AFV 44, Ferrets and Fox, 1972.

Some of the Profile volumes were collected in hardcover or softcover compilations:

The “Ospreys”, Osprey Publishing Ltd.: There are so many volumes in these two series, the “Old” Vanguard and the New Vanguard Series, that the thought of collecting them all overwhelmed me. They’re excellent books but for some reason I only bought one until just recently. I’m now slowly picking them up, one or two here and there. At this rate I’ll own the entire series in about forty-five years.
 Steven J. Zaloga, James Grandsen. Soviet Heavy Tanks, Vanguard 24, 1981.  

The Arco “WW2 Fact File” Series, Arco Publishing Company: A handy and inexpensive series, although the entries are often incomplete and the data sometimes contradicts more reliable sources.  

The Bellona Print Series, Bellona Publications, Ltd.: Another outstanding series of pamphlets, somewhat more rare than the Profiles. Excellent multi-view drawings and armour layout information.  

Series 1 through 19, 1964 to 1969.  
 Series 20, 1970.  
 Series 21, 1967.  
 Series 22, 1970.  
 Series 24, 1970.  
 Series 34, 1972.  


P. Chamberlain and H.L. Doyle. *German Army Semi-Tracks 1939-45, Part 1. Prime Movers and Self Propelled Carriages*, Bellona Publications Ltd., 1971. Very good "capsule" coverage of German halftrack artillery tractors and gun carriages, including a number of types that are usually left out of other sources.


**The Squadron/Signal Series**, from Squadron/Signal Publishing Co.: Intended more for scale modellers than for wargamers, these books nevertheless contain lots of useful information and good photographs.


**The Aero Armor Series**, Aero Publishing Inc.:


**Purnell’s History of the World Wars Series:**


**The War Data Series**, Eshel Dramit Ltd., edited by Lt. Col. D. Eshel: This series, along with the *Born in Battle* magazines from the same publisher, contain a lot of interesting photographs and illustrations. The data however should be taken with a grain or two of salt, particularly when it involves the then-new equipment.

*War Data Number 10, Israel’s New Merkava*, 1981.
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Main Section: July 24, 2003

War Data Number 12, Soviet A.P.C. BTR40, 50, 60, 152, BRDM, BMP, BMD, 1981.  
War Data Number 14, Main Battle Tanks Chieftain, T-62, M-60, AMX-30, 1981.  

AFV-G2 Magazine, many issues.

Tankette, the Miniature Armoured Fighting Vehicle Association (MAFVA) Magazine, many issues.


This is from a series of Polish-language booklets similar to the Profiles in format.


Part 5: “Pocket”/“Recognition Guide” Books: Small-format booklets with capsule entries for each vehicle.  
Inevitably they don't have an entry for the specific vehicle you're looking for if it isn't one of the main types, but if you work with a stack of four or five of these books you'll usually find at least one entry.


Part 6: Recommended Autobiographies and Histories


Ralph Zumbro. Tank Aces, Pocket Books, 1997. Collected experiences of tank crewmen and cavalrymen from WWII through Desert Storm. The combat recollections are pretty good, the editorialized political sections in between are not so good.


Dmitriy Loza, translated and by James F. Gebhardt. *Commanding the Red Army’s Sherman Tanks*, University of Nebraska Press, 1996.


**Part 7: Web Pages**

There are some outstanding web pages out there covering all sorts of tank-related stuff. These sites sometimes come and go faster than I can keep track of them, so I will not attempt to list them here. I try to maintain a fairly up-to-date list of armour-related links at my web site (www.irvania.com).
The Book of Judges 1:19. Mention the word “tank” and most people think of an awe-somely powerful, seemingly unstoppable weapon. Tanks (often referred to loosely as “armor”) may be defined as tracked, armored fighting vehicles armed with a high-velocity, flat-trajectory main gun designed for direct-fire engagement. This distinguishes them from artillery, which primarily employs indirect fire. The section that lists the major tanks is an important part of this book. It includes statistical information and illustrations of major tank designs from World War I to the present. It lists such vital information as weight, speed, armor, armament, crew size, battle characteristics, and performance, and if known the number manufactured.