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Introduction

MoBHackMBT is a data file editor for WinSPMBT wargame developed by The Camo Workshop, based on the Steel Panthers 2 - Modern Battles source code released to us by SSI.

Each file is used for a specific nation, e.g. obat44 is West Germany, obat12 the US Army etc. And each one holds the basic game data for the Units, Weapons and Formations used in the game.

Do not edit The Camo Workshop order of battle files in any editor **other than** the one released with each product. The SPWW2 and WinSPMBT file formats differ!.

This program is designed for experienced users only, or those who wish to learn by experimentation, therefore the **only** help available will be this file, and no support calls will be taken for this product other than proper bug reports. The 'hack' part of the product name points to the intended user audience - hackers, people willing to dig around and teach themselves. However, you may be able to get help by asking a question at the Camo Workshop, WinSPMBT TO&E subforum at [Shrapnel Games](#).

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Basics

<< ***Before editing your OB files, first back the original file set up in a zip file or similar archive, in case of errors!*** >>

Remember that any edits you do will possibly trash any scenarios provided with the game, or from third parties - you may need to re load the default OB files in order to play scenarios, or to play another player in PBEM, as in PBEM your oba files must be exactly the same throughout the entire game - changing or modifying an OB file while you have a PBEM game in progress will almost assuredly invalidate the game due to OB checking errors (anti cheat tests). Additionally - changing an OB in the middle of an ongoing campaign will possibly produce unexpected results, as will re loading any saved game where the underlying OB data was modified. In other words - if you are not using the default OB files as issued by Camo Workshop, caveat emptor - any problems are of your own making.

One way to get round this is to install a default version of the game, and only use the issued OB files here - use this copy for playing scenarios, and to PBEM any users who do not want to install your modified OB. You may need to install a completely new copy of the game into a further directory, for example to play Joe, who only uses his OB mods - only use this copy of the game to play Joe, after installing his OB files.

Scenarios are particularly sensitive to any OB file changes, especially to the weapons data.

If you are a scenario or user campaign designer, then you should stick to The Camo Workshop Issued OB files, making desired changes in the scenario editor in-game if you want to distribute your scenario to other users. Otherwise - even if you issue the scenario with your home made OB - a lot of the end users will not install your OB, and complain about your broken scenario, or will install your OB over the default Camo Workshop ones, and then complain that the in game scenarios etc are broken. Any problems such as these are your support calls, not ours at The Camo Workshop!. If you issue your OOBs or any scenarios or user campaigns (which are packages of scenario files) using your modified OOBs to the general public - provide a contact email address for users to get support from you.

The Moral is, back up your files, and be very careful about randomly issuing or installing OB files not issued by The Camo Workshop themselves. Keep an official copy of the game for playing scenarios, and PBEM and so on - drop your mods into a second copy of the game and use for hack work.

Large Fonts

Some folk run Windows with 'large fonts' - MoBHackMBT is meant to be run with the normal Windows font. If you cannot see the Open, Save etc buttons on the right - resize the window by dragging in the normal windows manner as necessary, but changing back to normal windows font size is the best thing to do, prior to a session with MoBHackMBT.

Running MoBHackMBT

Once you have backed up your original OB files, run the programme - you will find this in the WinSPMBT\MOBHack folder under the main game folder.

Open the ini file in a text editor (such as notepad) - **never** a WP programme such as Word, which does not operate in plain ASCII text!! You will see something like:

```
[MoBHackMBT]
```

```
TransparentColour=256  
Hints=1 [When new to MoBHackMBT - set hints to 1 for ON - to aid you with pop up messages]  
HintDelay=5
```

Hints is 1 or 0 (on or off) and the hint delay can be increased to give more time for the hint pop up to appear if desired - do not alter any other line in the INI file. (Changing "Medium Tank" to say "My Tank" in the MoBHackMBT INI file will do nothing other than change the string shown in MoBHackMBT - it will not change the Game data, which will still show "Medium Tank" !).

MoBHackMBT is set up to be run from the pre-set WinSPMBT and it automatically loads the shape (shp) files from the WinSPMBT\Game Data\Graphics directory and the unit picture files (LBM) from WinSPMBT\Game Data\Pictures. MoBHackMBT therefore is not stand alone, it needs these support files to work.

The first thing you need to do is to load up an OB file - double click from the list shown, or select an OOB then press OPEN.

Transparent Colour

The code to display the shape files does not seem to like some graphics modes. It runs fine in 32 bit True colour, and in 256, but 16 bit High colour can cause problems with the transparency but this is **very** rarely a problem any longer - this allows you to try one of the 256 colours in the SP Palette - 0 to 256 - try 255 or 254 if you require to work in 16 bit colour for some reason.

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Tool Bar Buttons & Menu Items



These are common across most all edit tabs.

Toolbar Buttons

 **Erase Button** - this blanks out the data for the current edit item. It does **NOT** delete it!.

 **Copy Button** - You can copy the currently selected item (Unit, Weapon or Formation) to a set of paste buffers here, or select 'all' to copy all the current data.

 **Paste Button** - Select a copied item from the buffer and paste to the currently selected item, this does NOT save the data. Selecting 'all' will copy all the buffers currently pasted to, and **will** save the changes to memory.

 **Move To Button** - Moves this item to another slot, overwriting the target if filled, this does save to memory.

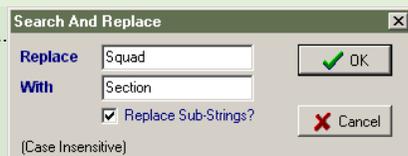
 **Move forward and move back VCR buttons** - one click moves you forward or back 1 item in the list, a right click moves you in increments of 10.

 **Cancel button** - Undoes any changes made since the last save event. **[F9]**

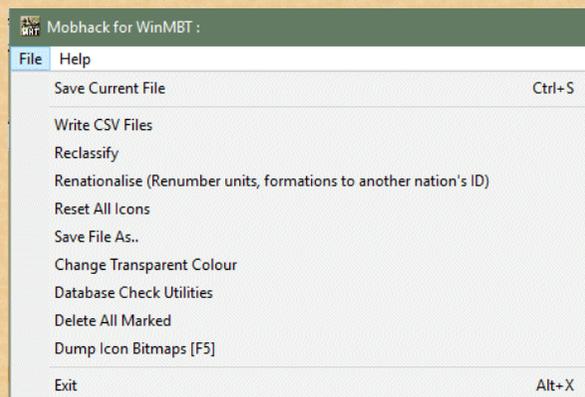
 **Save Button** - saves the current item's data to memory. Note that this is the **ONLY** way to save your changes to memory - moving off the current item has the same effect as a cancel (all changes not saved are lost). **[F12]** note that this will only save your changes to the OB data held in memory - you require to save to file to put your changes into effect!. (see Save button above, or the save file menu item below)

Find:  **Find Edit Box and Button** - Enter a partial string to search on and hit enter (while still in the edit box) or **[F3]** or **[F11]** to find the first item containing that sub string. All searches go forwards, and wrap. Use **[F3]** or **[F11]** as a search again function. (Example - "62" will find T-62, T 62A etc.)

 **Search and replace names Button**- brings up this sub screen...



This allows MOBHackers to change an entire series of names. For example, you may want to change all units named "Rifle Squad" to "Infantry Section" and now you can. This function works with unit's , weapons and formations so be careful what you change. The "Replace Sub-Strings" function allows you to replace , for example, all Squads with the word "Section". In this case you may have rifle squads and infantry squads in your OOB and you want to rename all of them sections. If the "Replace Sub-Strings" box is checked it will replace all instances of the word in the Replace window no matter what other words may also be on that line. If the "Replace Sub-Strings" box is **not** checked it will look for any whole phrase of the word "Squad" so unless you have a unit just named "Squad" nothing will be changed



Menu Items

File/Save Current File - saves from memory overwriting the current OB data file. **[Ctrl-S]**

File/Write CSV files - same as **Dump CSV** button above

File/Reclassify - Allows you to change all things of 1 class to another (Say MBT to Medium Tank) - useful if you have just imported a bunch of say tanks classed as MBT from another OOB, but your OOB uses medium Tank as its basic tank category.

File/Renationalise - Allows you to Renationalise all units and formations of 1 nation code to another - useful again if you have imported a batch of things from another OOB.

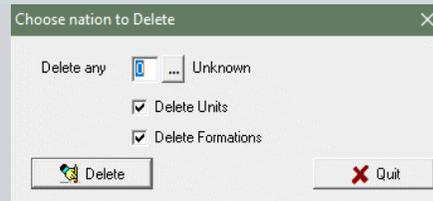
Reset All Icons - Resets all Icons to the "Summer" versions

File/Save File As - same as Save As button above.

File/Change Transparent Colour - See transparent Colour above.

Database Check Utilities - Allows OOB designers to check their work. For a full explanation of these functions click [HERE](#)

Delete All Marked - Allows mass deleting of units of formations. A submenu



will pop up and ask you to enter the nation you wish to delete units or formations of...of use mainly to Camo

Workshop

Dump Icon Bitmaps. This will save copies of the Icon used by the unit you have open on the screen by the season you are viewing so if you are viewing the winter Icon and press F5 a copy of the hull and the turret (if it's a two part vehicle) will be placed it in the OOB folder named hullimage.bmp and TurretImage.bmp....be aware that any subsequent pressing of F5 will produce new copies of hullimage.bmp and TurretImage.bmp **that will overwrite** any previous ones and anything like an aircraft that only has one part will be named BigImage.bmp.

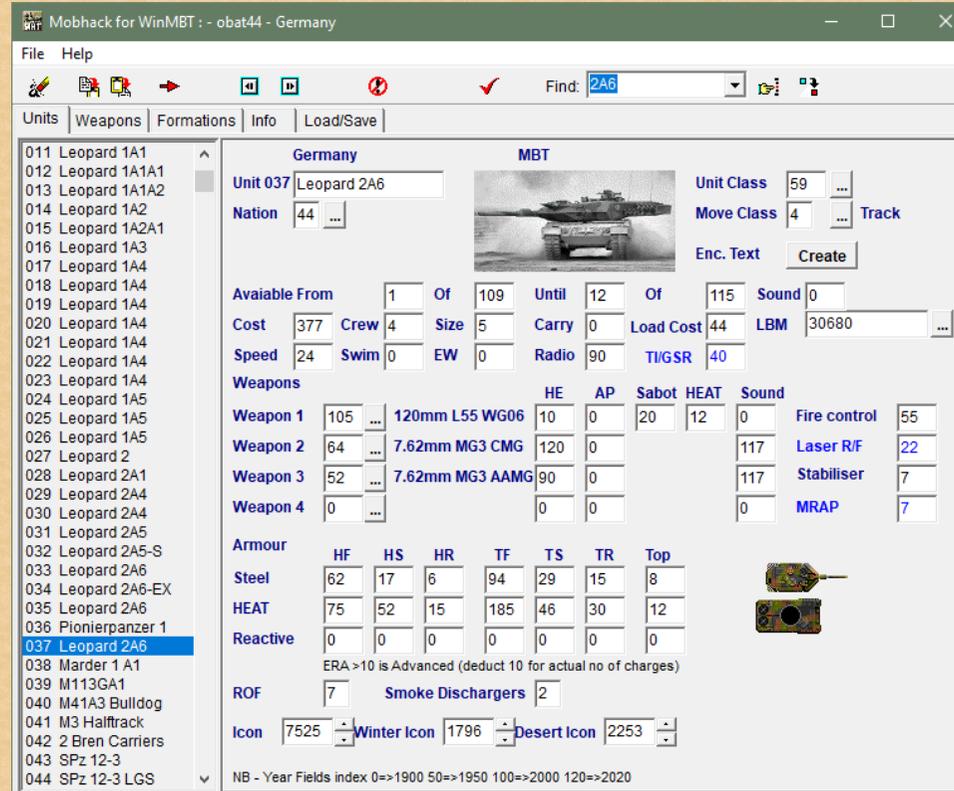


Help/Help - Brings this file up.

Help/About - Has version number, and links to the Wargamer and the Yahoo SP discussion site (for questions etc.)

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Units Tab



These games are based on *units*, 1 per vehicle (generally - some may represent say 2 jeeps), Section (USA='Squad') of infantry, support weapons and so on.

There is a list of the units on the left - go directly to a unit and click on it, or use the VCR controls on the toolbar to navigate (right click to jump several)

When a unit is selected on the LHS, the data fields are shown on the RHS.

Name - the unit name, 15 characters max. **(All text in the game must be USA ASCII !! - cedillas, umlauts etc. may display in MoBHack, but will do strange things and possibly crash the game).** do NOT 'pad' the right hand side of the name with spaces as that screws up in-game displays - this version of MoBHackMBT now automatically trims trailing spaces in any case in names. Do not use characters or character sequences that are significant inside the 'C' programming language ("n" may cause unexpected screen corruption - "&" needs to be "&&" etc).

If the **Unit Name** is underlined as in the example above it indicates that specific unit is used as a template unit in a formation

Nation - the integer number of that nation - name is reported at the top, above unit name. If you want to temporarily remove something from the game but not delete its data - Renationalise this to a nation other than the main OB. Any unit slot that is actually unused **must be set to nation 0 (unused)** or the slot may appear in the game as a fortification with (usually) a blank name - these will show up as blank bars in the purchase screen or encyclopaedia, and **will crash the game** if chosen (the AI will happily do so!) - so you have been warned - if you do not use a slot, set its nation to 0 and type to 0. The pick list of nations is available from the ellipsis button to the right of this field, you do not need to enter the number directly, unless you so desire.

Unit Class - This number represents the unit class. Some unit classes are meant to be set up as of map units (e.g. aircraft and artillery units). Unit classes are set out in the Game Guide. Remember that some unit classes will exhibit strange behaviour if incorrectly used or edited (e.g. armouring some soft classes). It is up to you to figure what works and what does not.

Move Class - each unit class has a **default** movement class in built into the game code, which you can override here. For example, trucks use wheeled movement - you may want an 8 wheeled higher mobility carrier - so change to AT-Wheel (Which seems to be All Terrain Wheel - use this for any 4WD or greater). The only way to find out what the default is for yo to drive a unit of this type set to default around the battlefield, there is no public list of the defaults. For infantry type classes and air units - leave 0. For vehicles, it is best to override with the desired movement class type. Note that it is perfectly acceptable to have say, an 'APC-Halftrack' class with move class 'wheeled' - you may for example have formations which mainly use a half track APC, but is available with a secondary wheeled APC (say M3 half tracks with a few in Walids).

winSPMBTv12 ENC.Text (Encyclopaedia text) This allows direct editing of unit encyclopaedia text that will be saved in the Game Data/ Text folder and eliminates the need to create these files in a separate text editor and manually placed in the Game Data/ Text folder. For more information click [HERE](#)

Availability fields - Month and year the unit is first available from, and last month and year that unit can be purchased. Do not reverse these!. Set outside the game period of 1/1946 to 12/120 for unused unit slots. NB - the year 2000 is year 100 in our date scheme, therefore year 120=2020. Do not leave gaps between units if the formation used inside covers the gap date!.

Sound - use this to override the in game sound used for this unit, though - be aware that the code will ignore this in some circumstances, so you will need to check this in game. Also note - one of these overrides is some truck classes with speed of 6 points or less - this was the original horse drawn fix, and was left in as some OB designers wanted to have both trucks and horse wagons available for purchase in the same formations.

Cost - The cost to buy one of these items, at 70 experience points. It is up to you to determine this - look at other unit relates in capability, for that date range as well.

Crew - the number of men in a rifle section, or vehicle crewmen etc. Acts as a form of 'hit point' system - 8 man rifle sections last longer than 5 men, a soft skinned vehicle with 4 crew will tend to take more rifle hits than an equivalent with 1. Vehicle 'damage points' in the game (* messages) - usually mean 1 crewman disabled, as well as sometimes removing weapons etc.

Size - between 0 and 6 usually. Smaller is more difficult to spot, to hit and so on. A size 1 infantry section is not the same size as a size 1 vehicle. Size 0 is for snipers and similar types only.

Carry - numbers less than 100 is the number of men. 100 series numbers carry things with 1 '*' beside their names (guns), 200 series 2 '*s (vehicles). look at various APC, truck, barge classes for guidance. In general - APC classes protect their crew - unprotected classes which get hit, the passengers will dismount, possibly taking damage. '6' means 6 men weight can be carried - 106 means a small support weapon with about 6 crew can be carried (small mortar or AT gun etc). SP games make no differentiation between 'towed' and 'carried'.

Load Cost - this is an arbitrary code number which if not 0, means this thing will add extra on top of the crew number to the carry cost. An MMG unit with 6 men and weight code of 1 - takes rather more than 6 carry to lift!. Mostly used for guns, vehicles etc., most mobile infantry support weapons will tend to be 0.

LBM - SP uses an old Atari file format for pictures of units. It is only supported by some paint packages, and it is palletised - you will need to apply the correct palette if making your own, or the pictures will appear as 'mush' in the game (even if appearing OK in MoBHackMBT - remember the game is the final arbiter of 'rightness' - not MoBHackMBT!). This palette is especially limited with respect to colour pictures. **Colour pictures must NOT be used for normal unit pix** - there are a few Colour LBM in designated LBM numbers, but these are used on special in game pages which know about colour - use of coloured LBM elsewhere can cause crashes or weird effects!. All LBM **require** to be **160 by 80 pixels**, or crashes or weird effects can occur!. You can type in the LBM number here directly, or use the ellipses button to bring up the LBM picker. Centre picture is the current one - select one of the other 9 to make it current, type in the number, or use the list box at the side to pick.

Speed - The number of movement points this unit has for normal movement (flying for helos for example). ! MP is 1 hex on roads, but of road, this varies on terrain and move class. Off map planes use a speed number - where 9 is the start of jet noises.

Swim - Used for the number of hexes a unit can move over water.

EW - Electronic Warfare value. Mainly used for AA vs aircraft capability. For non flak on map units which are vehicles, the field is used for special countermeasures devices. A value of 1 in this case is 1 shot of Arena active anti ATGM countermeasures, 2 is 2. 3 is 1 shot of Visual and Infrared Screening Smoke (VIRSS) which ejects anti TI smoke, possibly linked to an IR Jammer as well. 4 is 2 VIRSS shots. This field changes colour and displays a note when VIRSS or Arena are valid.

Radio Code - the tens part of the number is the chance of the unit being given a radio (for forts, assume 'radio' can cover field telephone). The digits will be 0, 1, 2 or 3 *never* anything else (no "75" for example). A figure of say 2 could be used here - for example for an infantry unit which will never have a radio issued by the code (no tens part in its radio code) but is commonly picked by the AI (a 2 in the digits part of its radio code).

The digits part is used by the AI in picking units as a rarity code. In particular - never use an X3 radio code if you do not understand AI unit and formation picks fully. 0 is normal chance of picking, 1 is *rare* (AI will tent to skip over this unit), 2 is *common* (AI will tend to stick on this unit as it runs through the list upwards).

NOTE

"Rarity" in game terms does **NOT** necessarily mean the unit was historically "Rare". When the AI picks units for it's formations it starts at the bottom of the list and works up and it tends to favour the first thing it finds. It is sometimes necessary to make high numbered units "rare" just so the AI will not pick them repeatedly

3 - is explained in formations, but is not recommended unless you are an expert as odd things may happen with this code. It is however useful to **exclude** units from the AI pick, provided that you do not use this unit as the template unit in any formation!. (for example - tank X is available 1950 through 1970, but beyond 1960, you do not want the AI to pick it. Make 2 tank X units exactly the same. Run 1 from 1950 to 1960, with say an X0 radio code. Copy to paste buffer, paste in a successive slot. Change dates from 1961 to 1970, and change radio code to X3. Now, the AI as it trundles through the unit list, will be able to choose tank X in the early time frame, but will not choose it in the second time frame - but the human player can if he so desires. You could have the second tank X as a different class (say Obsolete MBT) - but that means the creation of another set of formations based on Obsolete MBT, and the human having to go off and pick such.

Never use a unit with an X3 radio code as the template unit in a formation unless you absolutely know what you are doing (see formations tab for more on template units and the X3 radio code effects).

Vision/TI/GSR - numbers over 0 are night fighting vision devices. Approximately 20 for most vehicle IR searchlights, 30 for Image Intensifiers or LLTV systems, Infantry systems tend to be in the 10 to 15 range. Values of 40 or more have the special ability to look through smoke - units with 40 plus vision have Thermal Imaging (TI) sights, ranges of 50 or so on represent Ground Surveillance Radars (GSR). Label changes and colour changes if TI vision is granted.

Icon - The actual game icon used for this unit. An icon list can be found in WinSPMBT\Game Data\Design. Game icons are stored in shape files (SHP), and the turret and hull associations are stored internally to the game code. The only recommended utilitie for editing SHP files is SHPEdit which is located in the WinSPMBT\Game Data\Graphics\ShpEdit folder. (as a point of reference SP2 code had 391 icons, there are **9069** icon slots in WinSPWW2). There is a spin button - but going outside the allowed ranges *may* crash the game as there is no shape file relating to that number. Currently the maximum recomended number is 9069. Mobhack does its best to show the unit icon in the bottom right of the form - but the game itself is the final arbiter as to actual colour etc.

Weapons

Each unit is allowed up to 4 weapons each in its own **slot**.

Slot 1 is the **primary** weapon and is likely to be available more often. Slot 1 is the **only** one which can be assigned HEAT or sabot rounds as well. (But for HEAT there is a work around - see 222 HEAT code later in weapon data).

In SP - weapons further down the list of 4 become less available as the unit gets damaged or is suppressed. Weapons down the list are less likely to fire (depending on skill etc.) - just because a 'shot' is detailed for a weapon, does not in SP men that it is guaranteed to fire on the 'F' key being pressed, if it is not weapon slot 1. Therefore - placement of weapons in slot order is important in unit design, more primary

In infantry teams - weapon slot 1 is for the **primary** infantry weapon. (Weapon class 1). In the code, class 1 weapons in slot number 1 get their fire strength and to-hit adjusted upwards as more men are added to the section. a unit with rifle only in slot 1 has several shots (internally in the code) - a section with rifles in slot 2 to 4 has but 1 shot. A rifle section with rifle in slot 1 and another slot therefore does not have 2 'rifle shots' - it has slot 1 times multiplier + 1 unmultiplied rifle shot.

It is perfectly OK for a support weapon infantry team to have another weapon type in slot 1 - say an LMG team of 4 men with LMG, rifle, others - in this case they would only get 1 unmultiplied rifle shot, which is OK as their prime task is servicing the gun. The LMG would tend to get more shot opportunities in a move as it is in the prime slot, or if the unit is suppressed or damaged etc.

NB - a 'shot' is not 1 round - think of each as an engagement - therefore a sniper can kill >1 man with 1 so-called 'shot' - in reality he may have expended several rounds.

Weapon number - relates to the weapon number on the weapons tab. Enter directly, or better, use the ellipses button to select the weapon directly.

HE - number of HE engagement opportunities this weapon has.

AP - Number of AP engagement opportunities for this weapon.

Sabot - Weapon Slot 1 only - Number of AP round number 2 (called sabot) engagement opportunities for this weapon

HEAT - Weapon Slot 1 only - Number of HEAT engagement opportunities this weapon has.

Sound - enter a sound byte code to override the default weapon class. Note also that weapon or unit class can override this sound, as can fire type (e.g. Indirect as opposed to direct).

Fire Control - This affects accuracy, especially against moving targets. Values over 99 are fire control radars, with 101 being better than 100. Field changes colour if AAA radar is issued. AAA radar is only worthwhile for AA units, obviously - SP SAM, AA guns, SP AA guns. SEAD aircraft seek out units with active AAA radar - there is no EMCON in SP. Anti-radar missiles may destroy the radar, if not the firer. (As a reference point, 5 was used as a maximum in WW2 data - e.g. King Tiger)

Range Finder - This makes hitting targets easier, especially for firers who did not move. 20 is the level for laser range finders, use 6 for the ranging coaxial rifle calibre MG as used in UK tanks, or 8 for a ranging .50 MG as used in Chieftains. Use around 6 to 10 for optical range finders as in the M48/M60/Leo 1. values under 5 tend to be used for WW2 type tank sights. For reference - 4 was generally the max value in SP 1 (e.g. panthers) barring some specials (e.g. 8 for the Nashorn, which used a stereo optical range finder of artillery observer type).

Stabiliser - this allows the unit to move and still keep a fire control solution (target lock) on its current target (if any) - and reduces the effects of own firer movement. Larger is better. Units with high FC and RF can engage slow moving helos with AP shot. (Almost anyone in range can shoot at hovering helos).

Armour

this is split into 3 types.

Steel armour is the basic armour (if any). For planes, the front steel armour value is the 'durability' of the airframe, and the side hull armour value is used for armoured planes like Sturmoviks and the A-10 etc.

Anti HEAT armour is either spaced or special armours which have extra resistance to shaped charge (HEAT). if ANY field is filled in here - then all fields must be so, even if these remain the same as the steel armour. The values must also be greater than the steel, or equal - never lower!. The top HEAT armour value is sometimes used for a strafing number for off map attack planes with rifle calibre mg - see above.

ERA - Explosive Reactive Armour, or active armour. Blocks of high explosives strewn over the vehicle which explode when a HEAT jet passes through them, hopefully disrupting the shaped charge jet. Comes in ordinary and Advanced forms - advanced ERA can defeat incoming AP rounds as well. Vehicles with ERA must not be given a carry capacity - distinctly unhealthy for troops to be sat on such a vehicle!. Higher numbers mean a greater chance to disrupt a HEAT round. Numbers from 1 to 10 on a facing are ordinary ERA. Numbers from 11 to 20 are Advanced ERA such as Soviet Kontakt. The field changes colour if advanced ERA is issued. Each ERA explosion, whether or not it defeats the incoming round, reduces the ERA number for that face. Once 0 is reached, or if the ERA fails, then the AP round will attack the underlying anti-HEAT or steel armour as normal. Multi charge ATGM have a higher chance of defeating ERA than plain vanilla HEAT. Note that cluster bomblets are considered HEAT rounds for ERA.

Each digit, other than for ERA, is very approximately 1 centimetre of thickness at normal. (SP adds to this value for glancing shots - a side shot impacting at 30 degrees off 0 degrees will have to penetrate more than the number entered for that side armour).

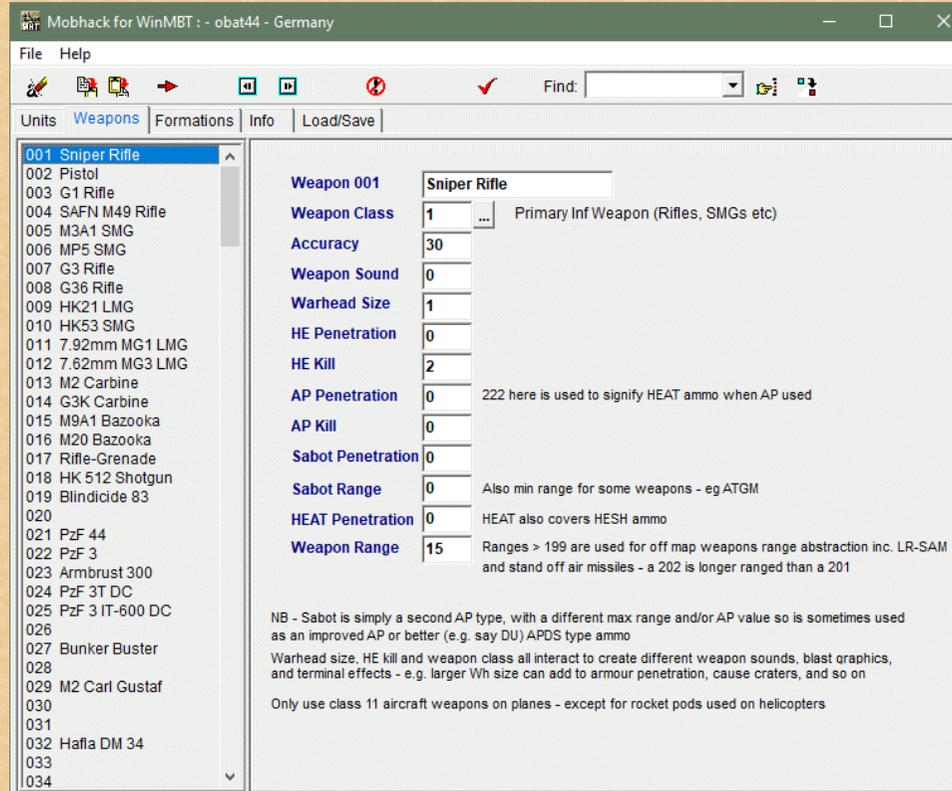
ROF - rate Of Fire - this affects weapons larger than size 2 (infantry weapons) in the main. Usually in the 6 to 9 value - can be say 40 for an off map Multiple Launch Rocket.

Smoke Dischargers - the number of smoke discharger salvos this unit has.

Oft asked question - 'How do I add N smoke rounds to my unit, like I can in the Scenario Editor?' - the answer is that the number of smoke rounds given out to a unit is determined in the unit creation code in the game code, based on the unit class and warhead, as well as battle type (more smoke ammo tends to be given to the assaulter). There is no data field for smoke rounds - the field you edit in the Scenario Editor is in *game* data (like the leader name), *not OB data*.

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Weapons Tab



Each OB has its own set of up to 255 weapons - there is no central database of weapons, so keeping all these in synch across up to 99 OB files is a complete pain, especially if the name of the weapon changes!

If you need a weapon, it is best to copy it from an existing Camo Workshop OB item, before trying any editing.

Weapon Name - 15 character maximum, no non-ASCII codes such as umlauts etc. or the game will crash.

Weapon class - An absolutely vital field, which is the basic weapon behaviours. Flame weapons make flame effects, SAMS fire at aircraft, and missiles use missile launch sequences etc. Some notes.

Class 1 - This is the infantry primary weapon class. This covers Rifles, SMG and so forth. **Infantry units with a class 1 weapon in weapon slot 1 will have their fire effect adjusted for the number of men in the unit and range in hexes**, less bonus at long range. This reflects the number of riflemen in the section. Inf Prime weapons not in slot 1 do not get this bonus.

Class 4 - FLAK - if under size 2, is assumed to be external AAMG - so if the vehicle is closed down (Or 'buttoned') then these weapons will not be able to fire. Size 2 (20mm etc) and above are assumed to be on AA mounts and do not have this problem.

Class 5 - Light Gun /Auto Cannon CMG, BMG- this class is for autocannons etc that **do not** engage aircraft. As with Class 19 this reflects the mounting, rather than the weapon - it is possible to have say 2 14.5mm or 20mm cannon with the same stats, but one will be class 19, the other typically class 5. The difference here is that the class 19 version represents a high angle high traverse rate type mounting, but the class 5 version would be in a low elevation, low traverse turret mainly intended for anti APC work.

NOTE: WC 5 SHOULD NOT BE USED BY HELICOPTERS IF THEY ARE EXPECTED TO SHOOT AT OTHER HELICOPTERS. USE WC19 ONLY FOR THOSE .

Class 10 - use only for naval artillery which only the assaulter in a beach game will be allowed for naval gunfire support. Class 10 weapons will only be seen by the player who has to do the beach landing assault. (This is how the code splits naval guns from normal off map artillery).

Class 11 - this is used for off map aircraft weapons. (Not helicopter MG or so on). These can be cannon or rockets, or if range is 1 hex, bombs.

Class 11 Aircraft weapons must only be allocated to strike, bomber or wild weasel planes, not to on map units.

Class 11 air weapons if auto cannon or MG will use the HE ammo number for number of engagement opportunities, and the AP byte is then used to represent the *number of cannons/MGs* for this type of class 11 weapon. Helicopters use normal on-map MG or cannon classes, not class 11. You may therefore need a copy of say a 12.7 gatling - one off map for fixed wing planes and one on map, with normal AP ammo and possibly sabot for your helicopters to use.

Class 11 air cannon can only use HE ammo as the AP round number is used as the number of cannon, so if they have an armour piercing capability then this is reflected in an HE AP rating, not an AP round rating. Class 11 air cannon are fired at 2 standard ranges - about 8-10 and 2 or 3 hexes, so max range is not very relevant - leave at about 20 hexes should do. (As they use HE AP values there is no pull down for range between firer and target in any case).

Other class 11 weapons - bombs, missiles etc - use the HE rounds as number of bombs. Do not allocate them an AP rounds number as they are not air cannon, so not multiplied by the AP 'number of cannon' multiplier.

Spotter, glider and transport planes do not use weapons.

Bombers can only drop bombs - weapons with range of 1 hex, therefore cannot use cannon, stand off weapons or guns/cannons.

Aircraft passes are determined by remaining 20mm plus cannon ammo if no other weapons are left - size 2 and above. Therefore - for WW2 in the main - where strafing planes with 0.50 or rifle calibre mg were needed - these are controlled by the **strafe number** - this is entered in the HEAT Top Armour byte, for fighter bomber or SEAD planes only. If entered an S:NN is displayed beside the plane's name on the buy screen. It can be used on planes with a 20mm plus cannon to reduce passes, but in this case - better to reduce the number of actual shots, if you do not want the plane to linger for strafing runs after offloading its heavier ordnance.

Class 14 - only use for HE ammo, for MRL or air dropped cluster bombs. Can have AP value, but only issue HE rounds of this type to your units whether strike plane or on map MRL. Usually named as "weapon name - CM" for Cluster Munition as a reminder to players.

Class 15 - Off map minelet batteries should only be used for this type, of the 2 dedicated types (rocket or tube) - minelets should never be issued to on map units or aircraft. (I may have safety code implemented in the game code if not in V1, certainly by V2, to restrict minelets to the 2 dedicated off map battery types). Minelet units should only have 4 to 6 rounds and all ammo must be of type 'HE' - this ensures the cluster button is used on the bombard screen. Minelet units can only throw minelets, they cannot have say HE shells and some mine rounds like arty can have some normal HE as well as bomblets. Note that In American military speak, minelets are called FASCAM.

Class 16 - ARM will automatically target any active enemy AAA radar on map. If none or all have been damaged by ARM - these are unable to fire.

Class 17 - these are for large air missiles, and as all aircraft weapons must be HE types, need a large **HE** AP value - if there is an off map air version of say an ATGM - you must make a class 17 version with large HE kill for the off map planes, as you cannot hang the on map version under a plane's wings.

Class 18 - Napalm - is used for air napalm bombs (range 1) - but are also used as ranged flame weapons for on map units (FAE weapons for example like the buratino or RPO launcher).

Class 19 - Auto Cannon - this operates exactly like any other auto cannon, but it has limited AAA capabilities against lower flying planes and helicopters. Thus, this reflects the mounting, rather than the weapon - it is possible to have say 2 14.5mm or 20mm cannon with the same stats, but one will be class 19, the other typically class 5. The difference here is that the class 19 version represents a high angle high traverse rate type mounting, but the class 5 version would be in a low elevation, low traverse turret mainly intended for anti APC work.

Class 20 - Top Attack ATGM - is exactly the same as class 13, but it generates many more top attack hits due to its flyover trajectory. It also is considered a class 21 missile for anti ERA purposes.

Class 21 - Multi Charge ATGM - Modern missile with 2 or more sub charges designed to strip away ERA, or a 'dibber' or similar device. Performs better against ERA protected units than class 13.

Class 22 - Multi Charge HEAT - Is similar to Class 21 above but used for infantry AT weapons and other projectiles that are **not** guided missiles such as the RPG-7VR, RPG-29 , PzF 3T DC and PzF 3 IT-600 DC as well as the Russian 125mm Tandem HEAT ammo and ammo for any other nation that develops this type of munition

Class 23 -Top attack HEAT - Is similar to Class 20 above but used for infantry AT weapons and other projectiles that are not guided missiles and NOT used by infantry squads only infantry AT teams that can be given a RF and FC rating.

Class 24 - A new weapon class for Top attack HEAT (Inertial Guidance) and is treated as having some range finder and fire control for that weapon so it can be used by infantry squads otherwise it's a top attack LAW. If it moves these bonuses are reduced as the operator needs to track moving targets).

Class 25 - Explosives- A weapon class for bobby traps and IED type weapons

Class 26 - HESH Gun - High-explosive squash head known in the US as HEP, (high explosive plastic) for any gun that used this type of ammo. **HESH/HEP** rounds are thin metal shells filled with plastic explosive and a delayed-action base fuze. The plastic explosive is "squashed" against the surface of the target on impact and spreads out to form a disc of explosive. The base fuze detonates the explosive milliseconds later, creating a shock wave

Class 27 - NLOS ATGM used for ATGM like the Israeli Spike NLOS that can be fired indirectly without direct LOS to the target

Accuracy - this number increases the ability of the weapon to hit compared with the same stats used but with a lower Accuracy number. look at existing weapons to see how this number is used. (See the sniper rifle for example and contrast with say a normal bolt action rifle).

Weapon Sound - this variable sets the weapon sound for all units that use that weapon in that OOB if a special sound is desired

Warhead Size - this is a very important variable. Larger WH size represents larger shells and is used when reloading from ammo dumps etc, with larger numbers loading more slowly. WH over a certain value will cause crater damage, drop bridges (higher yet to drop stone ones) and cause larger explosion graphics and noises etc. None, some or all of Warhead Size can be added to all kill and penetration values, so if all stats are identical - an AP shell with a larger WH will tend to penetrate more armour at a given range than the exact same stats, bar WH size. An HE weapon with larger WH size will kill a few more men on average than a weapon with identical HE characteristics, bar WH size. Size 0 could be allowable for militarily useless weapons like pistols, for example, to reduce their effect dramatically from other HE kill 1 weapons - but not recommended.

HE Penetration - This is used when an HE round hits or explodes in the same hex as an armoured target. It does not degrade with range, unlike solid shot AP. Since it has an effect on all targets in a hex, it is not useful to make a proper HESH (American 'HEP') type shell by assigning a large HE AP value to a normal HE round. Otherwise, you get a super shell which wipes out 2 or 3 BMP in a single hex!.

HE Kill - the value of the round at killing soft targets. Bigger is better!.

AP Penetration - The value of armour the normal AP shot can penetrate at the muzzle.

<Special code 222> - **the 'HEAT code'** - can be used here for weapons which have HEAT ammo, never ever have AP ammo, but require to be deployable in weapon slots other than slot 1. Therefore - 222 code will be seen in recoilless rifles, ATGM, and infantry AT type weapons. If the code finds 222 as an AP value - it uses the HEAT value instead.

PLEASE NOTE:

"AP ammo" can also represent earlier or alternate versions of SABOT ammo in much the same way that "Sabot" ammo can sometimes represent AP ammo when used by on map artillery.

AP Kill - this value is used for cluster type munitions as an HE kill value.

Sabot Penetration - The AP value at the muzzle for the second AP type round, if issued. 'Sabot' is just a name - the normal AP round can of course be an APDS or APFSDS round, with the sabot round perhaps representing a

more advanced round - e.g. a DU APFSDS. Sabot is also used for Armour Piercing Composite Rigid (APCR) - Known in the USA as HVAP - or 'arrow' shot, of late WW2 vintage. These are basically similar to sabot rounds, but do not discard the sabot at the muzzle, so suffer from increased drag, somewhat like a ping pong ball with a steel core - they lose velocity and hence AP value rather quickly, but at close ranges are better than the plain AP shot.

Sabot Range - This range is used for the second AP round, and hence can differ. (All other ammo uses the Weapon range). An APCR round will tend to have a higher AP value than the plain AP round, but a shorter Sabot range than Weapon range. This shows the high penetration at the muzzle, but the shorter max range draws down the AP value quicker as range increases so its AP value will fall below the AP round at not too great a range. Where the second AP round is being used for an actual APDS type round (where the sabot is discarded at the muzzle, thus the only drag is from the sub calibre penetrator, not the penetrator plus the light metal shroud as in APCR), then the sabot range will be longer than the Weapon Range, or the AP value greater, or both. (If the sabot round has the same AP value as the AP shot, but longer range, the draw down for range will be less for that round at any range X as opposed to the shorter ranged AP shot, so the longer ranged sabot round will penetrate more armour at any given range X). (The draw down decrement for range is roughly linear.)

HEAT penetration - The armour value the HEAT shaped charge can cut through at any range, at normal impact. HEAT only weapons should use the 222 AP code outlined above, so the AP ammo becomes HEAT in weapon slots 2 through 4.

Weapon Range - The maximum range in hexes the weapon can fire all rounds to except for the 'sabot' round, if the range is in the 1 to 199 range. Ranges of 200 and greater are used as an abstraction for range for off map artillery and stand off missiles, and for on map long range SAM firing at off map planes. In this case, 200 means 'indirect' and 201 can shoot further than a 200. A range 203 gun can counterbattery guns of ranges 200 to 202, and sometimes an enemy battery with range 203, but not an enemy battery with range 204. Do not assign off map batteries weapons with ranges less than 200 hexes, or you will find some areas of the map (not necessarily on the side your opponent is on) are out of range.

Some weapons editing points:

Weapon effect, fire graphic, impact graphic, sound played, causation of shell holes, effects on bridges and so forth is a complex interaction of weapon class, HE Kill, and Warhead Size. Adding 1 HE kill point may make a weapon fire MG tracer, or make a different sound, or use the cannon explosion graphic etc. Experiment if necessary. Unit Class can also override weapon sounds (LCS are only to be armed with rockets so make a rocket swoosh in indirect fires, built in), as can mode of fire - indirect and direct can differ. There is no 'table' for me to give you even though I have the source code - even I need to experiment sometimes when unexpected side effects happen.

Artillery Bomblets

Artillery bomblets in SP2 (which WinSPMBT is based on) are AP rounds. Therefore - on map howitzers and so forth cannot be issued with an AP round, as that is the bomblet munition type. Look at existing bomblet artillery weapons for guidance - they have AP kill, and .AP penetration. Some MRL use class 14 with HE ammo rather than AP - so the rounds appear on the HE menu, not using the cluster button on the bombardment screen - in this case adding 'CM' to the name of the weapon is a good idea.

Artillery minelets

These are powerful items in this game. In real life, a battalion of howitzers (c. 18 guns) require to shoot for at least a half hour to provide a useful minefield about 500 metres wide with minelet ammunition. SP allows remote minefields to be laid rather too quickly, so the amount of such ammunition should be severely restricted, to about 4 or 5 shots. Minelet ammo must also always be AP type. Only the 2 off map artillery minelet classes should be used to allow minelet delivery.

Weapons data and scenarios

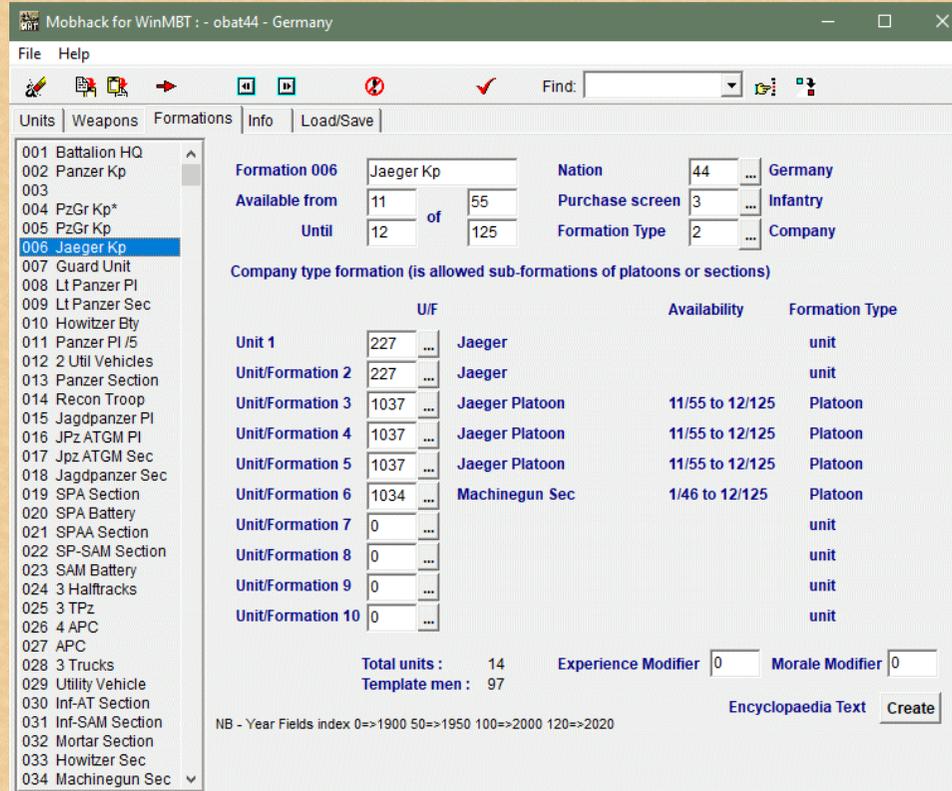
Changing weapons slot data can completely trash existing saved games and especially scenarios. Scenarios store weapons ID numbers, not the raw data at the point of scenario manufacture. Therefore, changing weapon 123 to 5.5 inch field gun, from say 7.62mm CMG - will result in co axial 5.5 inch guns on many tanks in scenarios which had used weapon slot 123 (including user campaigns, which are a set of scenarios). The scenarios will also keep the ammunition issued by the designer - so removing say sabot ammo from a weapon will probably result in units in the scenarios with useless sabot ammo. Basically - never change a weapon slot's type, use a blank weapons slot. At a pinch - use a weapon slot not utilised in any unit in the units list for this nation (check every unit before doing so - you may just find some unexpected unit in say the UK OOB using say USA M1 rifles!).

Indirect Capability

Indirect capability in SP comes from *unit class*, not the weapon class. Thus to fire indirect, you require to be an on or off map artillery or mortar class unit.

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Formations Tab



Formation editing causes the most problems in OOB editing.

A formation is a list of 1 to 10 unit templates or formation pointers.

A **unit template** is one of the things on the units page, funny enough!. A unit's number from the units page is entered as the **template** unit for that slot in the formation. The first slot in any formation *must* be a unit, slots 2 to 9 *may* be formation pointers in company type formations.

It is important to realise that the unit placed in a formation is a template, not necessarily a representation of that specific unit. The formation pick code will use the **Unit Class** of the unit placed as a template as its **search key** when replacing that template with possible units of the exact same class available at that specific battle date. More specifics about template units will be mentioned later.

A **formation pointer** is a special code pointing to a subordinate platoon entered instead of a unit number. It is made up of 1000 plus the formation's ID number on this formations tab. So formation 123 would be entered as 1123. On purchase, this will be expanded to include the units from a formation of that type inside the company, under a separate leader.

There are 2 types of formation in SP - **companies** and **platoons**.

Platoons

A platoon is a formation whose organisation is **flat** - i.e. there are no sub formations (formation pointers) contained within its list, just single template units.

There are 2 platoon type formations - Type code 1 is the normal platoon, and tends to get a Lt or occasionally a 2 Lt assigned as its commander (air sections will tend to have a 2 Lt), with any other units being assigned sergeant as leaders. Type code 0 is also a platoon, but is retitled as **'section'** in the formation editor. A class 0 section type platoon will get a sergeant in command - it is meant for sections of 1 to 3 support weapons, trucks or what have you not requiring an officer, conscript rifle platoons and so forth. Remember that as far as the game code is concerned - both these are platoons, and will show 'P' in the HQ menu, and they can be cross attached under the command of company HQ units. Off map naval artillery batteries are a rarely seen third platoon type.

Companies

A company is the same as a platoon, with the difference that instead of being a flat organisation, it can contain **nested** sub formations - which must be platoon types (section or platoon, 0 or 1 command level). When the purchasing code finds a formation pointer inside a company, it buys a new formation based on that platoon template, and places it under command of the company commander. Nesting is only allowed to 1 level (platoon types under a company type). There are several company types.

Command level 2 is the normal SP company - it is commanded by a captain, occasionally a major.

Command level 3 is new for WinSPMBT. It is called an independent platoon for now. It will be commanded by a Lt rather than a captain, and that is the only difference between it and a class 2 company. Despite the name - as far as game code is concerned it is a company. Therefore it cannot be placed under command of any other company type. Its main use is for conscript rifle companies and for use for some larger recce companies such as perhaps USA

Armor cavalry which may not fit into the 10 unit max of a normal platoon, or which by training will operate with its various sections widely separated over the battlefield.

Command level 5 is the Battle Group HQ. Only one of these is allowed in an OOB, and it must be the **first** formation in the formations list and only containing one unit, which **must** be a headquarters unit class. The Battle Group HQ is led by a Lt Colonel, no matter the force size under his command..

Unit Commander

The unit in slot 1 of a formation will be assigned as the commander - in campaign games, if he is killed, this may change.

The LBM shown for the formation on the purchase page will be the LBM of this first unit - So a mortar platoon should be all mortars, not a rifle section and then some mortars, or the user will see a rifle section picture, not the expected picture of a mortar. Stick any such at the end of the list!

The listing order for formations on each buy page is based on the unit class of the first unit in the formation. Therefore if you have 1 mortar platoon with a rifle section as number 1, as well as showing the wrong type of picture - it will be sorted with any other items having a unit of that class as unit 1 on the listing, and probably not with the other mortar units, assuming you have another mortar class with say mortars in slot 1.

When the AI deploys units on the map, it determines the entire unit type from the unit in slot 1. So if you have an MBT platoon with a scout section in slot 1 for some weird reason - the AI placement will be as for an infantry type.

So - unless you have any special reason for not doing so, the first unit in the formation must be of the main formation type - an MBT for an MBT platoon, a rifle section for a rifle platoon, an ATGM for an ATGM formation etc.

Fields
Formation Name - 15 characters maximum, USA ASCII only .
Nation - This OOB's nation, unless this is an unused or AI only formation
Available From - First month and year this formation can be bought
Available to - Last month and year this formation can be bought.
Purchase Screen - The particular purchase page in the game that this formation will be made available to purchase on. 0 - Default - Game code determines which page from whatever is in unit slot 1. 1 - Armour through 4 Misc - your formation will appear on that selected page, overriding code default - best to override default really to avoid unexpected things!. 10 - Only used for the BGHQ. It is auto bought. 5 - Air Transport+Troops. A special 'page' for mixed units of troops with air transport bought for them as part of the formation - transport helos, para transport planes or gliders. This code ensures that these formations are only offered if the user has 1 or more air strikes remaining, and do not appear if no strikes allocated or left. All mixed air transport and passenger type formations must be of this purchase screen type.
Formation Type - The formation type code as outlined above - 0 for a section etc.
Unit 1 - The first slot must be a unit, never a formation. It is the commander of the formation.
Unit/Formation N - Slots 2 to 9 may be units or formations as outlined above. The ellipses button if clicked will bring up the unit picker, if left clicked and legal (this is a company type formation and not a platoon type) - it will bring up the formations picker. Note that for MoBHackMBT - the formations picker will mark illegal formations. Illegal formations would be assigning another company type formation under a company - and recall that a type 3 company (independent platoon) is in game terms a company so it cannot be assigned under another company formation . Type 3 company independent platoons are stand alone formations, just like any other company type.
Experience and Morale modifiers - leave at 0 and the formation (and any sub formation) units when bought will use the default experience and morale and hence costs (depending on whether national characteristics is on or off in the game preferences). Otherwise - positive numbers increase experience (training) levels and cost, while negative numbers will reduce these, and purchase cost.
Encyclopaedia text - Allows a text discription of the formation to be entered and saved to the Text folder if there is anything special to say about the formation. For more information click HERE

Template Units

As stated above - the unit you place in a formation slot is a **template unit**. It stands for any legal unit in the unit list of that unit class, available at the date the formation is purchased. Thus - place a light infantry unit here, and all the light infantry types in the OOB for that date and time are made available to the human player to select on purchase. Place an MBT - all the current MBT are made selectable.

The first rule of formation design is that there shall be no 'gaps' in formations. Say you have an armoured car section available from 1946 to 2020, but in the OOB you have 2 armoured cars - A is available from 46 to 80, B is available from 85 to 2020. From 1981 to 84 - you have a gap which will confuse end users! - above all, it may confuse the AI pick (see later for AI pick notes). If this formation is human only - then either close the gap by extending one of the units dates, or create 2 formations, 1 for the first period, the second for the second.

Be especially careful when editing companies to ensure their platoons are available throughout the entire period of the company formation. However - if arranged in a crafty manner - you can get away with having platoons under companies that exist only at the end of the company time frame - by ensuring that the part time platoons are at the end of the list, and in last start date order.

So - you have a rifle co with 3 rifle platoons, available 1946 to 2020 say, but it has a mortar section from 1966 to 2020, and an ATGM section added from 1980. Lay the company out as CHQ units, 3 rifle platoon pointers, then the mortar platoon pointer and finally as it appears last - the ATGM section pointer. Test thoroughly by buying at various dates, as this is not 100% guaranteed.

This layout does apply to platoons though. If a unit cannot be found at a particular date, sometimes strange things will happen (especially if the unit had an X3 radio code!). The usual thing that happens, barring X3 - is a gap in the platoon - this will cause a break in the formation, and a new platoon is created with the units after the gap especially if buying the platoon as part of a company formation. Therefore - say you have a mech inf platoon of 3 rifle units, 3 APC and an infantry SAM, but the SAM is only available at the start of that formations 'era'. Place the SAM at the end of the list (after the APC) and its disappearance in early part of the formation's era will not cause a hiccup. Note that this does not always work in reverse - if something is only available for the first part of the formation era - you will probably need 2 formations. As with all such exploits - test your formation by buying it at all dates through its era, and also - test buying it as part of a company formation at all dates through its era.

The above are advanced techniques for experienced OOB designers. If you are a novice, or want to be 100% sure, make separate formations for each (Rifle co A with no mortars, then Rifle Co B with them, and finally Rifle Co C

with mortars and ATGM).

With the new MBT platoon cross attachment code, mixed formations are at first blush less useful to OOB designers - however, they are most useful for the AI pick, and also for human end users as they can buy a ready-rolled Company combat team without having to mess about in turn 1 attaching things about.

It is normal as well to use the first unit of a particular class as the template, and to lay out your OOB units of a class in a linear date oriented fashion. This is because when the code starts a pick, it will start its search from the unit you specifies offset in the OOB, and then move forwards testing each such unit it finds, as and until it actually finds one it likes and stops there. If the pick code reaches the end of the OOB file - it does not always loop round and go from the OOB start to the initial pick position. It tends to like the unit you use as the template, if it is in period at the pick, but units before the one you point at in the OOB will tend to be picked less often as it is not guaranteed to loop around on reaching OOB end. Intelligent picking of the correct unit as a template can have a drastic effect on the AI force buy, as can say, jumbling units up by date - if say you have your OOB laid out - most early tank, 2020 wonder monster tank, then the in betweenies and use most early tank as the template - because the AI pick code tends to move on, when the 2020 wonder monster is current, it will often whiz by it, and pick some other intermediate dated tank from the in betweeny dates that is still current. For most OOBs - lay units of a class out in increasing date (and perhaps cost) order in the OOB.

At the bottom of the screen the total number of units in that formation is given. as well as the total number of men for all the **template** units is given as well.

The X3 Radio Code.

And why not to use it (much)!

The early SSI SP code only allowed a limited number of unit classes - about 40 of these. There was one scout car and one armoured car class for example. The X3 radio code seems to have been designed to ensure that certain things were the only ones picked in a particular formation

For Example, say one wanted a formation of 4 light tanks, a UK one with always 2 Scorpion and 2 scimitar - both light tanks in the old style OOB. The solution was to give both these light tanks an X3 radio code. The X3 radio code means "buy this specific unit if used as a template unit in a formation", but it is subject to severe limitations. If the formation the unit is used as the template exists beyond the dates the X3 template unit actually exists, strange things happen, especially when the AI buys such a formation. Usually - the formation will appear with an outdated or future unit at the wrong date. When presented to the human for purchase, often the out of era unit with the X3 radio code is presented on the buy screen on initial load of the formation but is not shown as a choice. The other problem with this method is that selecting one of the light tanks offered as choices in the purchase screen would replace all 4 units, as they were all light tank class.

The expanded class types of SPWW2, and now WinSPMBT were designed to get OOB designers round the problems of such mixed formations and the limitations of the X3 radio code when you want specific units in specific formations. Now as an OOB designer, all you need do is define your scorpions as 1 unit class and the scimitars as another, so you now have a formation of 2 light tanks of class A, and 2 of class B therefore the formation will now always be 2 of one and 2 of the other class of vehicle.

You may need to duplicate some of your units but with differing unit classes - for example if you have a mixed troop (2 scorpion 2 scimitar) and want a pure troop as well (4 scorpion or 4 scimitar). Either copy one of them and only change its unit class - or build a mixed formation, a pure scorpion formation and a pure scimitar formation. Which way you go (duplicates with different class or several formations) - is up to you, and perhaps determined by other considerations such as parent formations and AI pick list.

Use classes to split mixed formations now - so the X3 radio code is obsolete. Or is it?.

There is one legitimate use for the X3 radio code, as its corollary effect is - if a unit has an X3 radio code and it is **not** used as a template unit then it will **not** be picked by the AI for a formation using that unit class, **ever**. The X3 radio code is therefore useful for restricting some units to human only purchase - obsolete tanks say - without having to move them into a separate formation with another Unit Class. So - make tank A, and use if from dates X to Y - with normal radio code, and then copy it, paste it and extend the dates from Y to Z - but with an X3 radio code. AI pick will not now buy it, but those humans who want to, can.

Restricting AI access to certain units by making those units radio code x3 is **the main use** for x3 radio codes today. It is rarely, if ever , used to build specific formations any longer

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Info Tab

Units	Weapons	Formations	Info	Load/Save
OB file Comments - use for copyright and version info etc.				
<input type="text" value="Version 19/March/2005 (C) 2004 A. Gailey & SP Camo Workshop"/>				
(This string appears at the foot of the Encyclopaedia page for the ob)				

This tab allows you to input version number information to the OB data.

The string appears at the foot of the Encyclopaedia page as an indicator to the end user as to which data set is in use.

If you change the data in a Camo Workshop OB - you **must change this string**, in order to avoid confusing either yourself, or anybody you may distribute your changed OOB to. Especially as when playing a PBEM game, the save game includes a **checksum** validation of both OB files in use when the PBEM game commences - if you get a save game load failure because somebody has changed an OB file in the middle of the PBEM game's progress, this

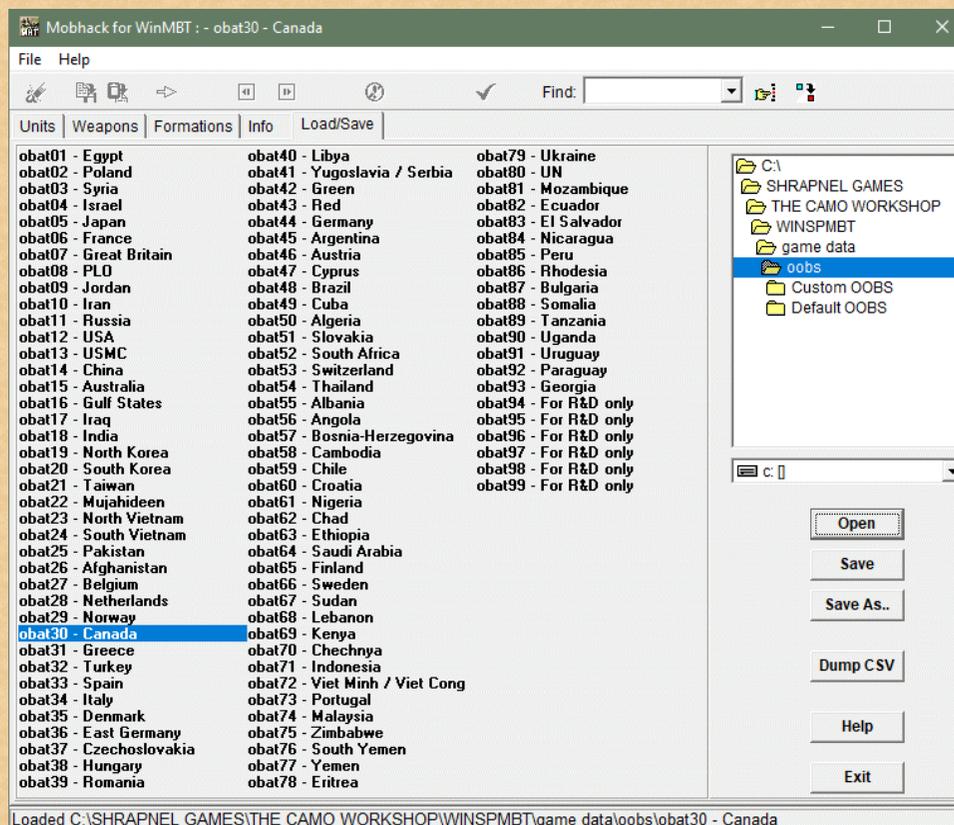
string gives you a quick way to check the version ID OB file loaded, assuming you remembered to change the version string for your own changes or on any subsequent change. Put the date in, and since SP players are world wide - do not use the DD/MM/YY format - use 'April' or 'Apr' - as different countries use different orders - USA used MM/DD/YY for example, so 03/04/2002 parses different ways in different parts of the globe. Minor point, but this date format thing has caused hiccups to me in several projects where different countries were involved.

Always use a **letter** format for the month for **clarity** world-wide - 03/April/2002 (the previous example) would then be properly parsed by an American, while a Brit getting April/03/2002 from an American would get that right, but would parse 04/03/2002 as 4th March 2002.

A trivial little point perhaps, but it has had unintended effects in several cross Atlantic projects I have worked on, when discussing say delivery dates and other contractual items!.

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Load/Save tab



Open button - for those who like to select from the list, then hit a button. Double clicking the nation name in the list is faster.

Save button - to save the changes you make and overwrite the original file on disk. **Important point!** - the editor changes you do are **held in RAM**, and are only archived to disk from this button - many new users make changes in the program, then exit without pressing this button, and wonder why these changes do not appear in the game. (The earlier versions of this editor did not have the reminder nag screen on exit, this was introduced to provide the hint to such).

Save As button - lets you save the OB in question as another file (any name you like) - advanced users could use this to say, overwrite another OB in another directory. No safety check or sanity check - save it as fred.dat, and you will of course not be able to load it in again till renamed properly!.

Dump CSV button - This dumps 3 Comma Separated Value (CSV) files for the currently loaded OB file - these can be read by such spreadsheet programs as Excel or database programs like Access. This is for internal Camo Workshop team usage, and is meant to provide a data dump for comparisons, data checking and so on. There are no guarantees that all the data fields are in there, this facility is an unsupported extra to an unsupported product!. (To answer an oft asked question - there is deliberately no CSV import, as the only method used in early versions of the editor had zero error checking. Adding Error checking would have taken too much effort. Too many folk used a spreadsheet or similar and then uploaded duff data, so this was removed, and the facility is only included for output now). It is very useful for checking consistency,

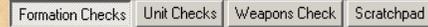
Help button - Calls this file up.

Exit Button - Gets you out of the program. **NB** - there is a size grip in the bottom right corner - you can increase the form size, if desired - e.g. if using windows large fonts setting.

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Database Check Utilities

This page allows OOB editors the opportunity to check their work for errors. There are three main tabs along the top



1. **Formation Checks**
2. **Unit Checks**
3. **Weapons Check**
4. **Scratchpad**

Each of those tabs, when clicked on, will show secondary tabs below it

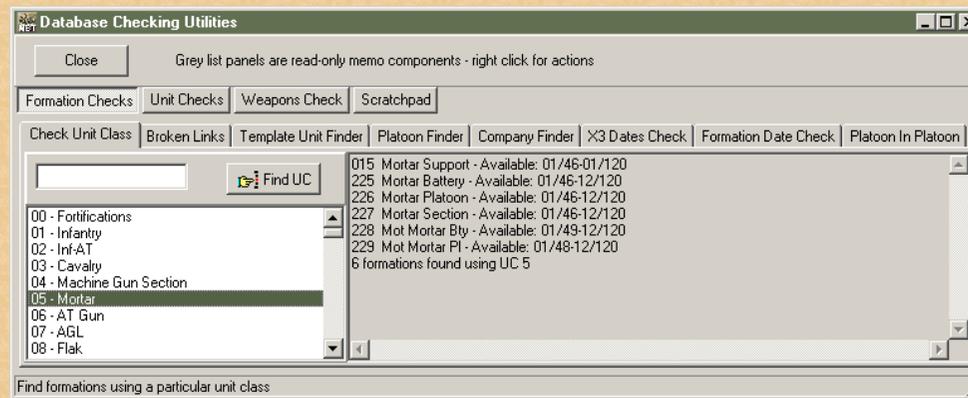
Formation Checks

Clicking on **Formation Checks** will display 8 secondary tabs

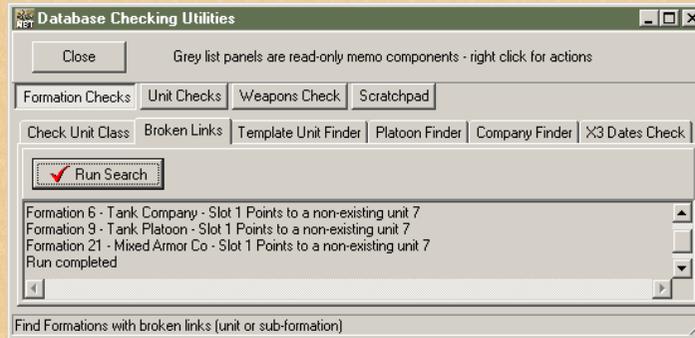
1. **Check Unit Class**
2. **Broken links**
3. **Template unit Finder**
4. **Platoon Finder**
5. **Company finder**
6. **X3 Dates Check**
7. **Formation Date Check**
8. **Platoons in Platoons**

Formation Checks-Check Unit Class - Choose a unit class from the left hand window and in the right hand window all the formations that use that unit class will be displayed as the formation number and Formation name. At the end of the list will be displayed how many formations were found using that particular Unit Class (UC).

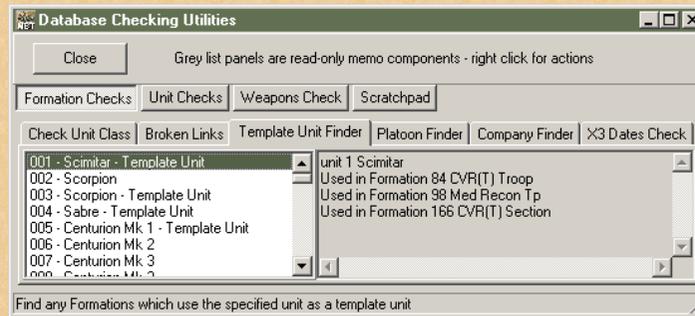
FIND UC allows players to enter the name of the unit class to find all that may be similar. For example typing in "Mortar" will allow you to check all the various mortar classes.



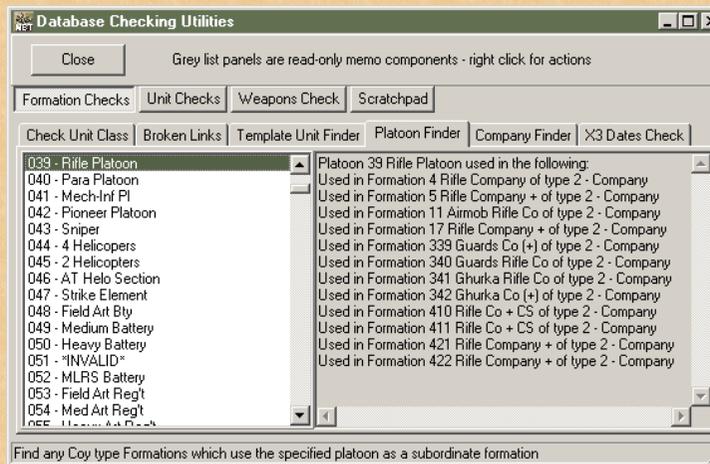
Formation Checks- Broken Links - After clicking on this tab you'll need to click on 'Run Search'. If there are any formations that have problems they will be listed here and you can then investigate. In the example below three formations are using a unit that does not exist in the unit list. There are any number of reason why this would be ranging from a simple typing error (7 was entered instead of 6 for example) or the unit was removed from the unit data base for some reason.



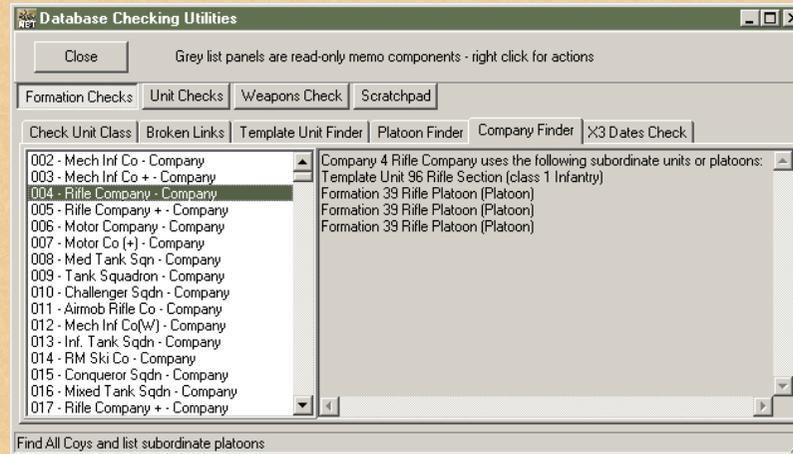
Formation Checks- Template Unit Finder - Finds any Formations which use a specified unit as a Template unit (these are the units that are underlined in the main MOBHack screen).
 Template units are units which act as placeholders that may define the start of a unit class in a formation. i.e the earliest example of (for example) a Main Battle tank in a Tank company



Formation Checks- Platoon Finder- This finds any company type formation that uses a specified platoon as a subordinate formation and lists them on the right hand side

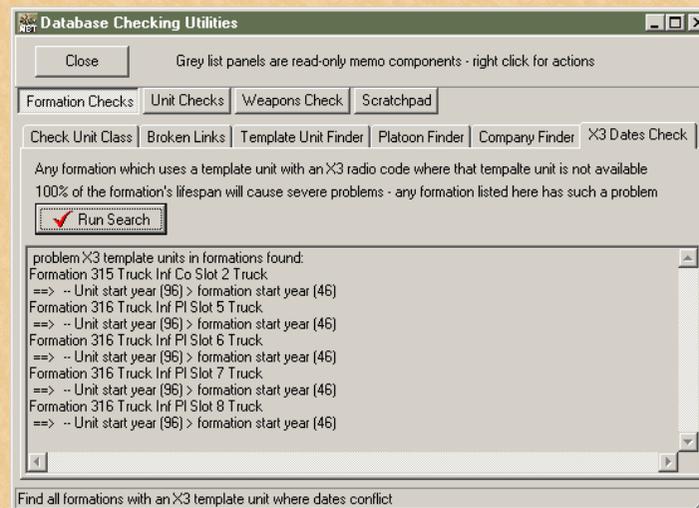


Formation Checks- Company Finder - This allows you to pick a particular company and all subordinate platoons used by that company are listed on the right



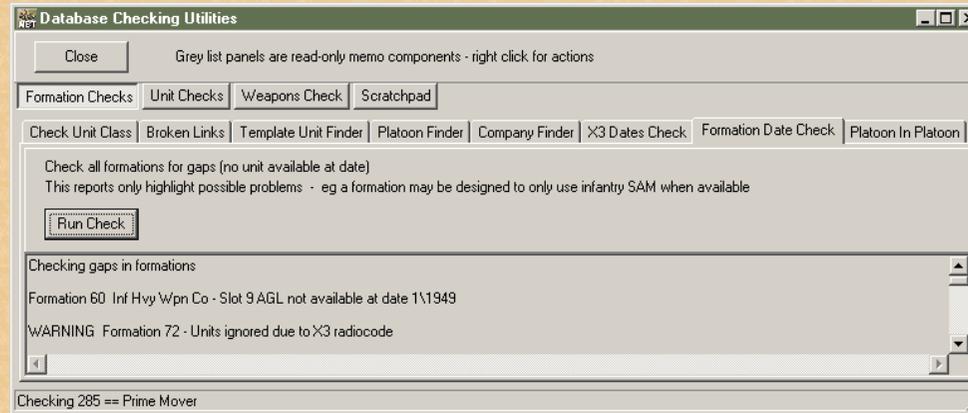
Formation Checks- X3 Dates Check - Finds all formations with an X3 template unit date conflicts as shown below. What can happen is although you may indeed have a unit for those dates it will not show up in the game.

In the message box, the formations are identified so they can be located easily and the problem they can cause is listed. Click [HERE](#) for information on the X3 Radio Code

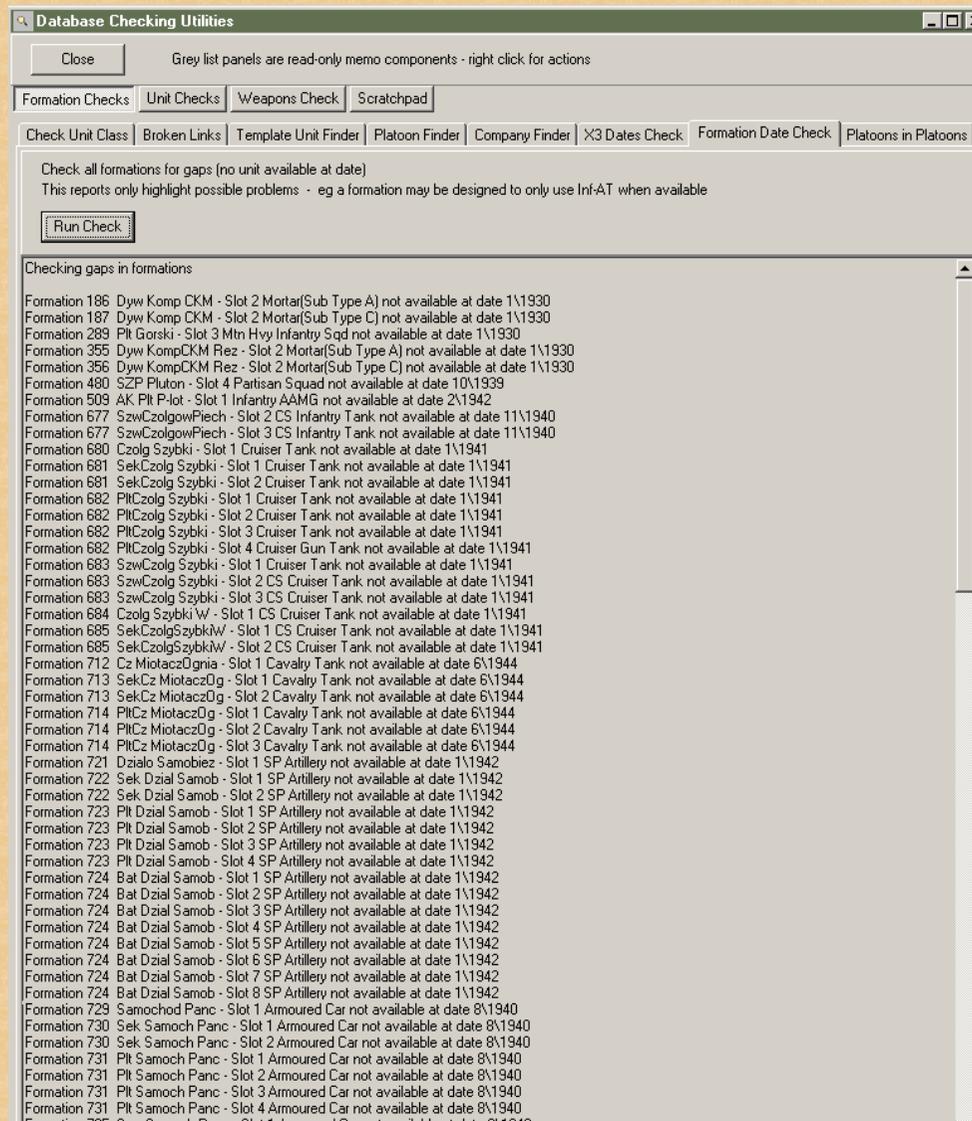


Formation Checks- Formation Date Check. This test checks for three things. First it looks for all formations that have gaps caused by missing units. For example a tank class that is used from 1950-1969 then not again until 1983. Anyone trying to use this formation in the game from 1970-1983 will be shortchanged. It then looks for units that may start AFTER the formation ends or ends before the formation starts and finally it checks that the OOB designer has not put companies within companies.

Note that the gaps in formations test ignores any units it finds that have an X3 radio code. For example a formation may be the only user of that unit class and this unit is available for all the dates of the formation, BUT the template unit has an X3 radio code - this will be shown as an error. (In this case there is only the one unit of that class used for the one formation - the X3 code is therefore superfluous since there are no other unit choices for that formation anyway.



Here is an example from a third party SPWW2 OOB of just about all the things that can go wrong during OOB construction!



```

Formation 735 Szw Samoch Panc - Slot 1 Armoured Car not available at date 8\1940
Formation 735 Szw Samoch Panc - Slot 2 Armoured Car not available at date 8\1940
Formation 751 CieDzialoP-panc - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 752 Cie PIt p-panc - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 752 Cie PIt p-panc - Slot 2 Heavy AT Gun not available at date 9\1943
Formation 753 Cie Bat p-panc - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 753 Cie Bat p-panc - Slot 2 Heavy AT Gun not available at date 9\1943
Formation 753 Cie Bat p-panc - Slot 3 Heavy AT Gun not available at date 9\1943
Formation 753 Cie Bat p-panc - Slot 4 Heavy AT Gun not available at date 9\1943
Formation 754 CieDzPpancZmech - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 755 CiPIIPpancZmech - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 755 CiPIIPpancZmech - Slot 2 Heavy AT Gun not available at date 9\1943
Formation 756 CiBatPpancZmech - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 756 CiBatPpancZmech - Slot 2 Heavy AT Gun not available at date 9\1943
Formation 756 CiBatPpancZmech - Slot 3 Heavy AT Gun not available at date 9\1943
Formation 756 CiBatPpancZmech - Slot 4 Heavy AT Gun not available at date 9\1943
Formation 757 CieDzPpancZmot - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 758 CiePIIPpancZmot - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 758 CiePIIPpancZmot - Slot 2 Heavy AT Gun not available at date 9\1943
Formation 759 CieBatPpancZmot - Slot 1 Heavy AT Gun not available at date 9\1943
Formation 759 CieBatPpancZmot - Slot 2 Heavy AT Gun not available at date 9\1943
Formation 759 CieBatPpancZmot - Slot 3 Heavy AT Gun not available at date 9\1943
Formation 759 CieBatPpancZmot - Slot 4 Heavy AT Gun not available at date 9\1943
Formation 792 Heavy Mortars - Slot 1 Heavy Mortar not available at date 6\1941
Formation 792 Heavy Mortars - Slot 2 Heavy Mortar not available at date 6\1941
Formation 793 Heavy Mortar Pl - Slot 1 Heavy Mortar not available at date 6\1941
Formation 793 Heavy Mortar Pl - Slot 2 Heavy Mortar not available at date 6\1941

===== checking formations =====

301 - Komp Gorska - Sub Formation Slot 4 => 293 PIt Gorski Finishes Before Company End Date
663 - Szw Centurio 45 - Sub Formation Slot 4 => 664 PIt Centurio 45 Starts AFTER Formation END Date - ERROR!
663 - Szw Centurio 45 - Sub Formation Slot 4 => 664 PIt Centurio 45 Ends BEFORE Company START Date - ERROR!
663 - Szw Centurio 45 - Sub Formation Slot 5 => 664 PIt Centurio 45 Starts AFTER Formation END Date - ERROR!
663 - Szw Centurio 45 - Sub Formation Slot 5 => 664 PIt Centurio 45 Ends BEFORE Company START Date - ERROR!
663 - Szw Centurio 45 - Sub Formation Slot 6 => 664 PIt Centurio 45 Starts AFTER Formation END Date - ERROR!
663 - Szw Centurio 45 - Sub Formation Slot 6 => 664 PIt Centurio 45 Ends BEFORE Company START Date - ERROR!
663 - Szw Centurio 45 - Sub Formation Slot 7 => 664 PIt Centurio 45 Starts AFTER Formation END Date - ERROR!
735 - Szw Samoch Panc - Sub Formation Slot 9 => 734 PIt CieSam Panc Starts after Company Start Date
735 - Szw Samoch Panc - Sub Formation Slot 9 => 734 PIt CieSam Panc Finishes Before Company End Date

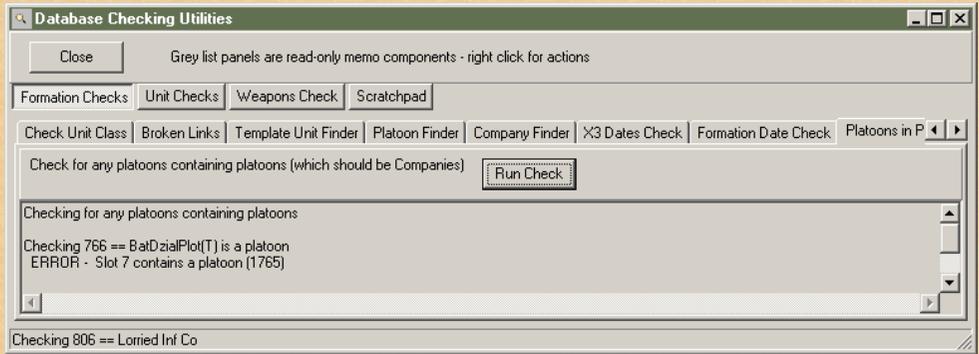
===== companies containing companies check =====

Checking 517 == KWP Kompania Sub Formation Slot 2 => 517 KWP Kompania is a COMPANY inside a COMPANY type formation!
Checking 517 == KWP Kompania Sub Formation Slot 3 => 517 KWP Kompania is a COMPANY inside a COMPANY type formation!
Checking 517 == KWP Kompania Sub Formation Slot 4 => 517 KWP Kompania is a COMPANY inside a COMPANY type formation!

===== run complete =====

```

Formation Checks- Platoon in Platoon - This checks for platoons that have been put into platoons



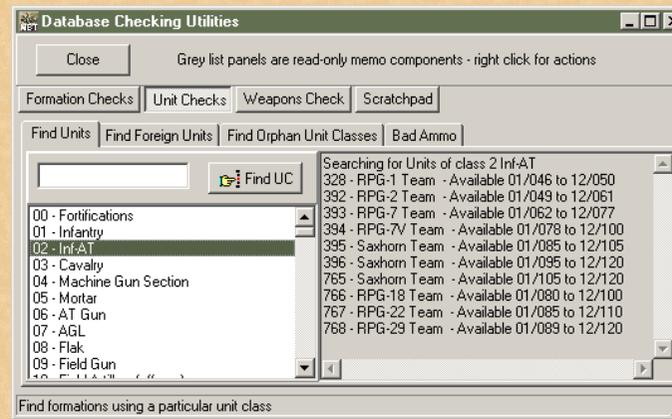
Unit Checks

Clicking on **Unit Checks** will display 4 secondary tabs

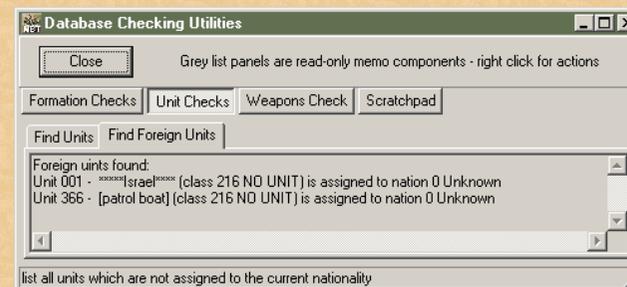
- Find Units
- Find Foreign Units
- Find Orphan Unit Classes
- Bad Ammo

Unit Checks- Find Units - Finds the formations that use a particular unit class. The the example below we are looking for all formations that use Unit Class- 96 - Paratroops. In the Russian OOB. The formations that use this class are listed on the right with the OOB unit number, then the Unit name then the dates of availability.

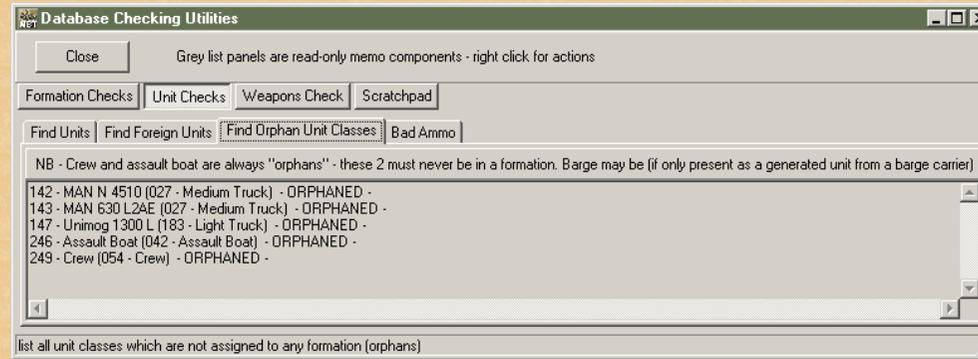
FIND UC allows players to enter the name of the unit class to find all that may be similar. For example typing in "Mortar" will allow you to check all the various mortar classes.



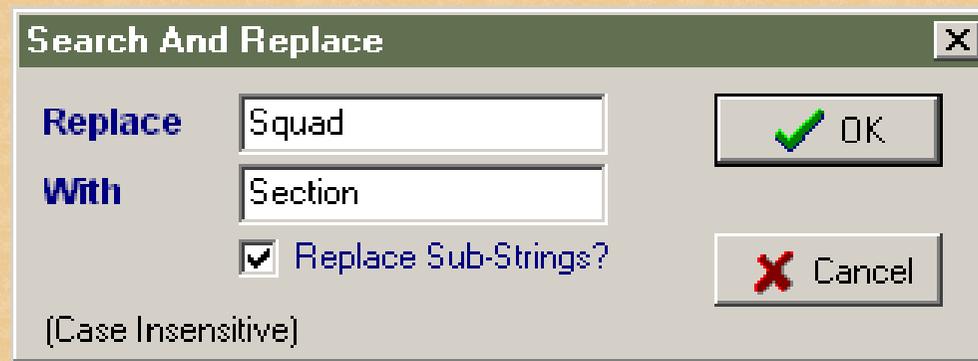
Unit Checks- Find Foreign Units - Lists all units which are not assigned to the current nationality. The example below shows two reasons this can happen. Unit 001 - *****Israel**** (class 216 NO UNIT) is assigned to nation 0 Unknownhas been assigned to Nation 0 so the lead "unit" on the unit list *****Israel****, which has been placed there as information only, will not show up in the game. The second example is there for much the same reason. It allowed the OOB designer to place an information marker in the OOB that will not show up in the game. The **MAIN** reason for this check is to ensure that a unit that as been copied and pasted into an OOB from another nation has been correctly assigned to the NEW nation it's been pasted into. A prime example of that would be a T-34/85 or T-55. There are dozens of nations that use them and it's much easier to copy from one nation then paste into the new rather than writing everything in from scratch. The problem in the past was sometimes people forgot to change the nationality to the new nation after pasting it in. This check was implemented to find those problems



Find Orphan Unit Classes - Lists units assigned to unit unit classes that are not being used by formations in that OOB. Crew and Assault boats which must be **NEVER** used in formations will always appear here but any other unit that appears need to be assigned to formations as in the example below



Bad Ammo- This check finds units that may be assigned ammo it is not set up to use (for example a tank may be assigned HEAT ammo when there is no HEAT listed for that weapon) **OR** assigned ammo to a weapon slot that is not being used

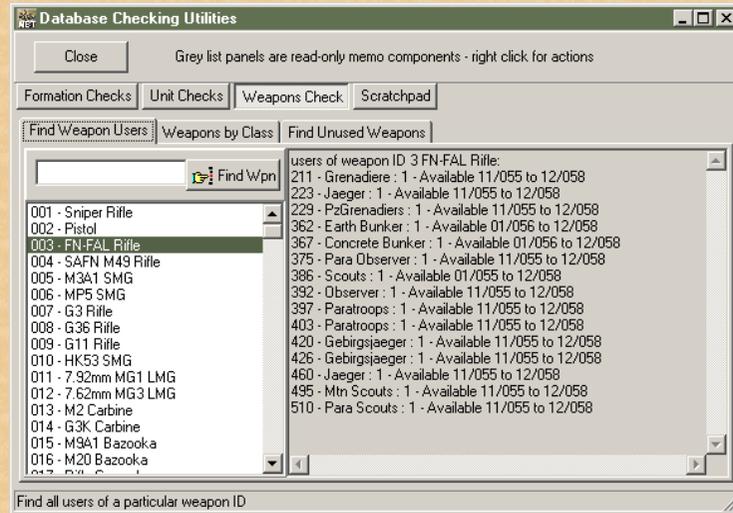


Weapons Check

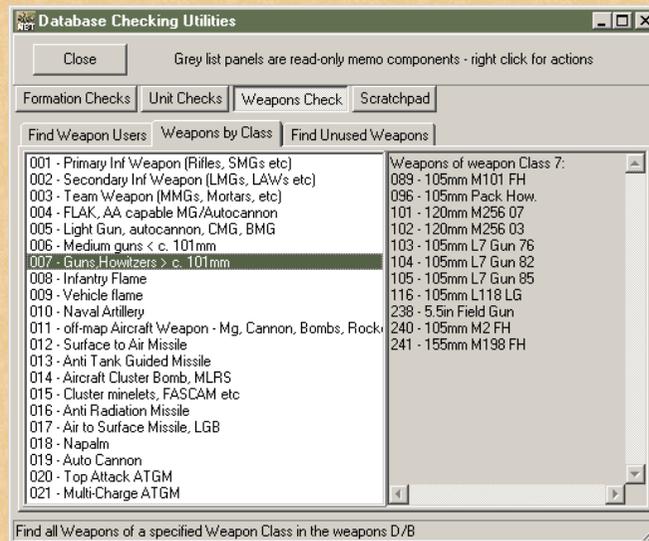
Clicking on **Weapons Check** will display 3 secondary tabs

- **Find Weapon Users**
- **Weapons by Class**
- **Find Unused Weapons**

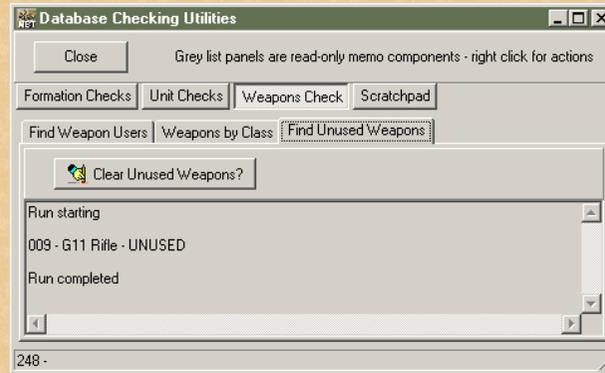
Find Weapon Users - This finds all the **units** that use a specific weapon in that nations OOB. The listing on the right shows the unit number first then the name of the unit and finally which of the four slots you can find that weapon in



Weapons Check- Weapons by Class - This list shows you all the **weapons** from the weapons database that use one of the 21 different weapons classes used by the game



Find Unused Weapons - This lists any weapon in that OOB that is not used in that OOB. The option exists to clear them. We do not recommend it unless you are 100% sure they have not been used in the past as this could possibly cause issues with older scenarios.



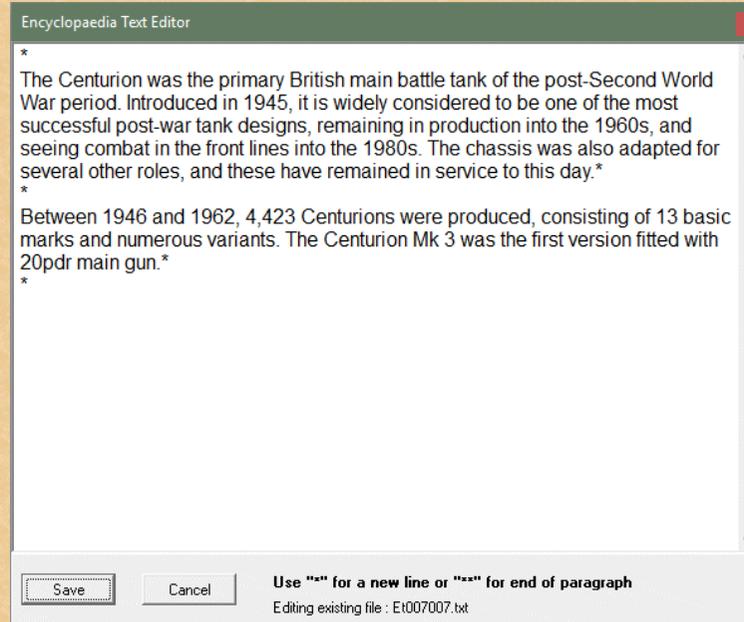
Scratchpad



Scratchpad has two uses. It allows OOB editors to make notes while working. You can load old notes you may have made about a unit or formation or save new notes or print them out. You can also use **Scratchpad** to edit the unit and formation text files that appear in the game. These can be found in **WinSPMBT\Game Data\Text** but that function has now been streamlined ..**see next item**

ENC.Text / Encyclopaedia text --Create / Edit

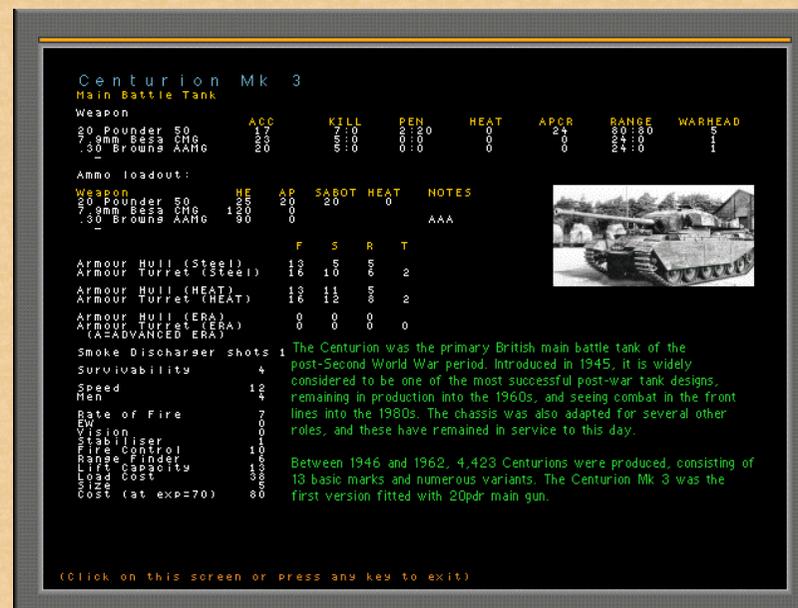
When this button is pressed a screen like this will appear.



If the unit or formation already has text the button will show as "Edit" if there is none there now it will show as "Create" and this screen will be blank

Editing can be done manually or cut-and-paste from another source. The ONLY thing special to this game is that you need to add a ' * ', at the end of a complete line and ' ** ', for the end of a paragraph. This creates spacing between paragraphs. Otherwise it will be displayed in the game as a continuous block of text. The unit page has a button for this as does the formations page but they are in different spots. The weapons screen does not have a text button. When adding text a good rule of thumb for length would be 2-3 paragraphs maximum.

This is how the text above fits into the game.. use that as your guide.



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General Editing Notes & Rules

Special rules for Aircraft and helos etc:

Do NOT mix strike aircraft, attack helos or bombers or spotters into any other formation. These units must be in pure formations of platoon type which only contain the one type. Additionally - the game code deducts one strike point for each such formation bought. In SP an air strike is 2 or *rarely* 3 strike planes or wild weasels or attack helos. Bombers may be in flights of 4. Spotters are in 1 or 2 packs. (UAV flights may be say 4).

SP deducts 1 strike point from the total allocated per such formation bought. It is OK to make formations with 1 plane or attack helo - end users sometimes find these useful where they may want to buy 1 plane at the end of purchase, but leave some points still unused for some other things like maybe a sniper or scout team etc.

You may think it is cool to make a strike with 10 planes - do **not** do this as the game balance (setting up of number of strikes for both sides) will be totally destroyed - if you PBEM somebody and allocate 2 strikes each, you expect him to have maybe 4 or 6 attack planes or so. You would be somewhat annoyed if he turned out to have 20 strike planes because you broke the design of the game's air strike allocation method.

Again - the code makes the decision on the unit in slot 1 being an aircraft of the requisite type. Therefore - say you want to make a USA mixed helo platoon type - say 2 attack helos and a scout light helo - put the 2 attack helos first, and the scout after, and the game will then correctly deduct 1 strike point for the attack helo part of this mixed element. Don't do it the other way round, or you grant the opponent *infinite* attack helos if he is granted any air strikes at all.

Singletons

if building a company type formation, placing single units after a formation pointer will cause these to be attached to the formation pointed to. Thus a company with mortar,mortar,truck,truck,mortar section,truck,truck (assuming the mortar section is 2 mortars with no transport) - would result in a bought company of CHQ - 2 mortars with trucks, and a subordinate mortar section of 2 tubes (from the platoon type pointed to) with 2 trucks added to that - the 2 singleton trucks listed immediately after the pointer go under the platoon, not under CHQ. Such singletons can cause problems though if the formation pointer they are placed under does not exist for some point in the formation era, but the singleton unit does (in this case trucks) - here it is better to make a new mortar section/T with 2 mortars and 2 trucks. Use of singletons can be a useful technique for experienced OOB designers, but maybe not the novice. **Experimentation and Experience are the keys to mastering OOB design.**

"Bunkeritis"

If you have a formation with a unit number that points at a blank unit slot (usually caused by reorganising your units) - in the original SP2 game a formation with that error would, when bought, buy a bunker (usually) for the blank slot. This phenomenon was called "bunkeritis" for this reason - for MBT, we have a new coloured MBT graphic that should show up in this case. The same often happens if you move a platoon - check all the companies for a formation pointing at thin air!. (moving a company type formation is not usually a problem).

Crew type

Do not move certain critical units - the crew is one such. Crew should only ever have pistols and maybe a grenade, they are meant to be spawned from disabled vehicles. There will be only 1 crew, exactly the same from 1946 to 2025. Bunkers spit the same crew - no excuse to have extra crew with rifles say - as tanks will generate these. Crews always have point cost 0 - you get the VP for killing their bunker or vehicle, killing the crew is only useful for an extra kill marker, and making the cost non zero can result in strange arithmetic on the end game results - essentially if you made a crew with 10 points and they bailed out of a 200 point vehicle (paid for out of points) and you then killed them - you get credited with 210 points killed, when your opponent only spent 200. You could then wipe out the enemy force, and end up with more kill VP than that force cost!

Do not move the barges or barge carrier. Do not move the rubber raft. These get assigned internally in the code (barge to carrier, raft to riflemen) in river or beach assault battles by direct ID number.

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The AI Pick List

A common thing for new OOB designers is to produce an OOB that looks wonderful when a **human** uses it to buy his forces.

Then, somebody assigns this nation as the AI opponent in a game, and the designer suddenly gets complaints of facing hordes of barge carriers, trucks or the AI force is completely made up of off map batteries some other weirdness.

The AI uses an internal list of formation numbers which it buys depending on Nationality, Date, available points, number of air strikes allocated, number of buy points currently remaining, random dice rolls, and sometimes who the enemy opponent is, plus whether or not the end user has set up the tank heavy flag etc. This is called the **AI Pick List**. The pick list information is **not** publicly published information.

Note that the AI pick code works on absolute formation numbers, and not formation 'types' - it does not look for a 'leg rifle company' - it looks for formation number 6.

The pick list is different for most OOBs - some minors use a generic pick. It is subject to change when the MBT exe changes as well.

The only way to figure out the pick list for a nation (without access to the source code) is to start up several hundred games at various points levels and of all battle types (Beach assault and defence, river assault and defence etc etc) with the computer buys forces button set, and examine what was bought in each case, noting patterns. Fight various different opponents as well - for example the Soviet buy versus say Chechnya is rather different than against a NATO country. Repeat this process at about 5 year differences from 1946 to 2020 (if your OOB lasts the entire period).

Why bother with the pick list? - well, if your OOB is only ever to be used by you, fine - but should you actually want to release it for others to use, it has to be AI buy compatible, because even if you specify human only usage - somebody **will** try to use it as an AI opponent!.

The easy way to ensure you have no AI pick problems is to follow the following rules.

1) Never remove an existing formation as the AI may well use it

2) Never alter the core dates of an existing Camo Workshop OOB formation - by all means, extend it back or forward, but never shrink the time band it is available for.

3) If you are going to alter a formation - ensure it remains exactly the same type. If it is a leg rifle platoon - it must remain a leg rifle platoon sort of formation, do not overwrite it with say a light tank platoon. Or it may be that the AI (as it does when points are low) - will be set up to buy that particular leg rifle platoon as a filler in that case. So - alter the configuration of the leg rifle platoon (you are convinced the Omnians had 4 rifle squads and a sniper in the leg platoon, not the 3 rifle squads the original designer used - fine, do that - but now look for any company formations using that leg rifle platoon - maybe a truck co with a 3 truck section per such platoon - ah, need a 4 truck section now!). If the formation is a company - rearrange its structure if desired, but keep it the same type. Do not replace the standard leg rifle company with your Omnian elite flamethrower guards company, unless you want to see rather a lot of flamethrower users when playing the AI!

4) never change the formation type of an existing formation - if it is a platoon type, leave it as a platoon type, if a company - leave as a company. The AI pick is set up to buy companies when remaining buy points are high, platoons when it gets to the small change, for infantry and tanks. Reversing that is not a good idea.

5) Certain key formations - forts, leg engineer platoon, strike and attack helos, transport helos (sometimes the AI will air assault), barge carriers, artillery (especially naval arty which has peculiar layout rules for its formations) should never be messed with. (By all means - say you think the Omnians should have a few extra engineers in a river crossing - add a couple of such to the default barge carrier formation, and then make a pure barge carrier for human consumption using another formation slot). These ones must always be platoons, or results can be undefined.

6) You may find some AI formations in the OOB - often these have // added to the name, and they usually have the 'wrong' nationality - treat exactly like an existing Camo Workshop formation, however - you now know that yo have an AI only formation the human will not be able to buy. (Such formations can be useful for the designer - for example WW2 USA mechanised infantry companies were a mix of all sort so of things the AI would not properly handle - it would leave the AT guns on the start line and charge the jeeps forwards, the mortars and so on. Simplified AI only formations were needed).

7) Be careful with any existing Camo Workshop formation. Adjust a bit within reason, but not greatly. The best thing to do, especially if the OOB you are designing is aimed at other human players, is to utilise **only** empty formation slots for your supplementary new stuff. Use only free unit slots for your new units, and use only empty weapon slots for your new weapons (remember that existing scenarios and campaigns are very sensitive to careless weapon database edits).

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Design information, standards and guidelines for OOB database designers

INTRODUCTION: This section is intended to provide potential OOB designers with the design information, standards and guidelines that we used to create the 93 WinSPMBT OOB's. These are the standards we tried to use, whenever possible, when the OOB databases were designed.

Using standardised information is crucial in order to assure that every nation's database is created using the same assumptions or else **SERIOUS** imbalances may occur that can ruin game play. We ask that anyone who may MOBHack these OOB's to please follow the spirit of these guidelines and this should ensure that your OOB will harmonise with the existing game database.

Subject INDEX:

- Accuracy
- Aircraft - Fighter-Bombers and Level Bombers
- Aircraft - Helicopters
- Aircraft - Spotters / UAV
- [Ammo Loads](#)
- Ammo Supply
- Anti-Material Rifles
- Armour Rating System
- [Artillery - Warning!!](#)
- Artillery - General
- Artillery - Minelet/FASCAM
- Artillery - Mortars
- [Artillery - Range](#)
- Artillery - Rocket Launchers
- ATGMs
- [Crews](#)
- Electronic Warfare (EW Rating)
- Engineer Vehicles
- Experience & Morale - Units
- Fire Control
- [Formations - General](#)
- Formations - Immovable Units, Weapons & Formations
- Formations - Naval Guns
- Formations - Slots Orders
- Fortifications
- [HEK Ratings](#)

- Horse-based Unit Defaults
 - Hull Down
 - Images
 - Map Text
 - Movement - Move Class
 - [Movement - Speed of Units](#)
 - [Naming Limitations](#)
 - Name List Files
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 - Radios
 - [Radio Codes](#)
 - Reaction Turns
 - Rocket Launchers
 - [Scale](#)
 - Sizes of Units
 - Snipers
 - Soft Vehicles
 - Sounds
 - Survivability
 - [Tripod Weapons](#)
 - Units - Arms Exports
 - [Warhead size chart](#)
 - Weapons - ATGMs
 - Weapons - Classes
 - Weapons - Flamethrowers
 - Weapons - Recoilless Weapons
 - Weapons - Thermobaric/Napalm
 - Weapon Slots
 - Vision
 - [Way-Points](#)
 - [Load Cost \("Weight"\) & Carry Capacity Ratings](#)
-

APPENDICES:

- Self-Load Semi-Auto Rifle List
 - [Warhead Size Chart](#)
-

ACCURACY:

MORTARS:

- Regular mortars ACC=3
- Breechloading mortars ACC=5
- Commando mortars ACC=0 ACC

GUNS:

Formula for Guns: Calibre Length, (the effective length of the barrel (from breech to muzzle) divided by the barrel diameter is the Calibre Length value) is then divided by 4 to give the game accuracy rating with a minimum of 6 (6 is also the default for howitzers if calibre length is unknown). This is the game standard that applies to 99% of the guns in the game but there MAY be a manual adjustment made to accuracy after the calculation is completed if the gun / ammo is known to be more or less accurate than others of its type

As an example a Bushmaster II 30 mm autocannon has a Barrel length of 3,405 mm with a barrel diameter of 30mm .

3,405 mm divided by 30mm = 113.5 divided by 4 = 28.3 rounded down to 28 for the game accuracy rating

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AIRCRAFT - FIGHTER-BOMBERS AND LEVEL BOMBERS WEAPONS:

AIRCRAFT WEAPONS: Planes always use Weapon Class 11 weapons.

ARMOUR: Side armour is the armour factor, and so this applies 360 degrees

AIRCRAFT DURABILITY: Steel Hull Front Armour sets Durability for aircraft

LEVEL BOMBERS: They do not need to locate a target on the ground to attack, so need no vision. They do not aim at anything, so FC and RF is superfluous.

RETURNING AIRCRAFT: Where desired, fighter-bombers can be made to return until their ammo is expended by placing the number of maximum times it can return in the slot for HEAT TOP ARMOUR. Used mainly for A/C with rifle calibre MG (and nothing else), to allow them > 1 pass, but also useful for other strafers, as once the cannon ammo runs out they go home even if they have MG ammo left over.

Bombers will automatically be available for return missions if they still have bombs available. Generally no more than 8 bombs a slot will be dropped.

Sorties is really only required if the aircraft has rifle calibre MG, if it has 50 cal (or 20mm ?) and above then it has as many as the cannon ammo allows.

SEAD: The AAA must have AA FC RADAR (FC>=100) - as that is what SEAD planes are going for as the primary target indicator, for the SEAD plane to attack it with ARM weapons.

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AIRCRAFT - HELICOPTERS

HELO WEAPONS:

Helo Autocannons should be all set to Class 19. This allows helo vs helo opportunity fire.

Wpn class 19 will opfire on helos if both the helos and the class 19 have moved only a little.

Wpn Class 4 will opfire against all helos and aircraft regardless.

Wpn Class 5 will not opfire against helos or aircraft. May not be able to direct fire vs helos either unless helos are stationary.

Heavy Helicopters class 205 are hard coded to be more vulnerable to SAMS than other helos due to their size.

HELO ARMOUR RATINGS:

Helo front armour rating is a general damage ability before it goes BOOM. More points confers more ability to take damage and continue functioning. Side armour, like for planes, is the armour factor, and so this applies 360 degrees

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AIRCRAFT - SPOTTERS

There will be NO spotter helos or spotter jets, etc. Only spotter prop planes and UAVs. The code allows only for the prop sound and the dynamics of tree-top flying.

A generic 1 spd spotter plane is probably best as a place holder if no actual models are known.

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AMMO LOADOUTS

Vehicle AAMGs get 90 rounds, while Vehicle TMGs, CMGs & BMGs get 120 rounds.

Towed or Static AA Guns

- 14.5mm -----60 shots
- 20mm -----45 shots
- 23mm to 59mm -40 shots

Fort type AA gun 120 shots

Howitzer & mortar loads are 5xROF for on-map pieces, and 10xROF for off-map items.

Infantry Small Arms generally get 80 rounds for a full squad (7+ crew), but can go up to 90, and down to 70 depending on country factors. Half squads (less than 7 crew) generally get 60 rounds max, 40 rds for smaller squads (4 & less). Snipers get 50 rounds. Anti-Material (tank/helicopter) rifles get 50 rounds.

Infantry Squad grenade launchers such as the M79, M203, BG-15, etc. (non auto grenade launchers): shot allocation is four per man in a squad.

Leg Infantry based Automatic Grenade Launchers have an allowance of 20 rounds per weapon slot containing an AGL.

Infantry Squad direct-fire mortars generally 2 rds per crew. Handheld "Commando" mortars generally 1 or 2 rds per Crew.

Helos get 20 rds MG/CG/GG fire.

Planes get anywhere from 6 to 20 rds of MG/Cannon fire.

Where possible always give a vehicle it's actual real-world number of rounds for non-MG guns, if the information is available.

Recoilless weapons will have HEAT or HE ammo ONLY, and will have a 222 code in the AP pen for when used in slots 2 through 4 with AP ammo (=HEAT). No RCL weapon fires Sabot in SP.

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AMMO RE-SUPPLY

Ammo trucks do not run out of ammo - but firer firing, or movement of either will seriously affect reloading ability, as does suppression state of either.

Resupply is based on **WARHEAD SIZE**.

Amount of ammo resupplied depends on type of ammo supplier: cannister, dump, or other.

Once the ammo unit has used its resupply points (40) that turn - nobody else gets anymore.

Resupply points = 40/Warhead Size per turn, to a minimum of 1 shot per round.

First slot gets resupplied fully before the next slot gets any ammo.

AMMO CANNISTER - crew is 1 and speed must be 0. Usually transportable, supplies small ammo only (to WH size 4), low supply points per move (20 ammo points).

AMMO DUMP - 6 or more men, speed must be 0, loadcost>49. An ammo dump supplies at lower rate (~1/2 rate) at 2 hexes range, full rate at 1 or less, has more supply per move (60 ammo points).

AMMO TRUCK (normal supply of 40 ammo points).

Helicopters must land to be resupplied (Mainly MBT affected) - no more loading in the hover.

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ANTI-MATERIAL RIFLES

The AP ammo will draw down very quickly with range - the HE is superior, so effectively the unit has 40 decent AP ammo (which it will fire at infantry as well) and a few poor quality AP rounds it may never fire at all. The anti material sniper does not really need the AP shot.

HMG will penetrate their max pen (as they have HE pen)at range 0 as at range max as there is **no range reduction**. AP ammo for these, unless drastically better than the HE pen value, is really superfluous, ditto with sniper anti-material rifles.

The problems with low value AT ammo can be seen with WW2 ATR, and the fiddling with sabot we had to do get something useful in AP terms from the French 37 short tank gun.

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ARMOUR RATINGS

HEAT:

HEAT Armour ratings equal the basic Armour rating PLUS HEAT protection, if any.

EG: A tank with 2 point side skirts, but no other HEAT protection, will have a Side Hull rating 2 points greater than the normal ARMOUR rating, and all other HEAT ratings will be the same as the normal ARMOUR ratings.

ERA:

REACTIVE Armour ratings equal the number of **EXTRA** points of Reactive Armour.

EG: A tank with 5 pts ERA armour on it's front hull, but none elsewhere, would have a 5 REACTIVE Armour levels at the Front Hull, and a zero REACTIVE armour level everywhere else. The normal ARMOUR ratings will stay as they are normally.

Additionally, Reactive is now split into plain ERA and KONTAKT ERA. Plain ERA is 1 through 9, and Kontakt is 11 (=1 Kontakt ERA point) to 19 (=9 pts Kontakt), and Kontakt is better than plain ERA vs enhanced warheads, and can also deflect AP shot.

It is REQUIRED for the attacker to defeat any ERA before attacking the Steel or HEAT armour behind it. ERA (normal and KONTAKT) will also defend against indirect arty firing bomblet ammo.

The "level" of the ERA determines how MANY chances the protection has of defeating HEAT. It ALSO reflects how "tough" the protection is, so that ERA 2 has about 20% chance of defeating a projectile, while 9 is about 90%.

EG: Level 8 ERA has 8 chances in X of defeating HEAT (+ AP for KONTAKT). Each time it goes off (ie. defeats HEAT), it reduces, so the 8 has 8 possible chances to go BANG before you are down to bare metal on that facing.

Ship Armour:

A note on boat "armour" . . . if you do not give them top armour -- no mortar what size they are a single 50mm mortar can sink them. At least a 1 top armour for small rivercraft, and 2 or more for larger craft. Same for the side armour -- if you want an MG to sink a 60-ton ship with a single burst . . . give it 1 side armour. 2 is the playable minimum for rivercraft, more for larger craft.

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ARTILLERY - WARNING!!

Indirect fire classes **CANNOT** have hand grenades issued to them or they will not be able to fire smoke. This is one of the quirks of the code. The smoke missions will appear available on the artillery menu but they will never actually fire the smoke rounds. In any event, there is absolutely **NO** reason for an OOB designer to give **OFF MAP** artillery units hand grenades

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ARTILLERY - GENERAL

Unit Classes:

infantry gun: **Cannot** fire indirect (is AGL in MBT)

infantry howitzer: **Can** fire indirect

All on and off map indirect firing artillery has been set up using the following formula

Gun Size	ROF	OFF MAP	ON MAP
		AMMO	AMMO
< 65mm	<7	100	50
65mm-94mm	7	90	45
98mm- 107mm	6	80	40
114mm -130mm	6	70	35
140mm - 155mm	5	60	30
>170mm - 185mm	4	50	////////////////////
> 200 mm	3	40	////////////////////
> 220 mm	3	30	////////////////////
> 250 mm	<2	20	////////////////////

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ARTILLERY - MINELET/FASCAM

All minelet (FASCAM) type ammo is designed to be fired by OFF-MAP minelet arty classes # 210 & #211 **ONLY**. The off map units are the **ONLY** ones that fire at the correct rate of fire for their type (tube or rocket) - deliberately low ROF as it takes an entire battalion of 155mm arty a half hour of steady firing to seed a 500 metre patch of minelets to a useful level in 'real life'. **DO NOT** give on map troops minelet ammo . This can result in unexpected mine patches being sown by reaction fire.

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ARTILLERY - MORTARS

Note that mortars increased their ranges over time, but as a consequence became less mobile.

Remember also that long range mortars lose movement ability -- longer range, heavier unit, less mobility. Research the weight.

An example:

- 107mm M2 Mortar, range 88, weight 150kg, move=3
- 107mm M30 Mortar, range 119, weight 289 kg, move=2
- 107mm M107 Mortar, range 126, weight 340 kg, move=2

(slight differences in range and weight will be expected from different national models of the above types)

Generally speaking, the following movement allowances will apply:

- 40mm - 59mm = 6
- 60mm - 69mm = 5
- 70mm - 79mm = 4
- 80mm - 90mm = 3
- 91mm - 110mm = 2
- 111mm - 125mm = 1
- 126mm+ = 0

The ammo loads and movement rates are based on standardised crew sizes, as follows:

- 60mm mortar = 3 man crew per mortar
- 3inch/81mm mortar = 4 man crew per mortar
- 90mm/107mm mortar = 4 man crew per mortar
- 120mm mortar = 6 man crew per mortar
- 160mm mortar = 8 man crew per mortar
- 240mm mortar = 12 man crew per mortar (should be only 1 mortar)

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ARTILLERY - RANGE

All artillery with a range over 10km qualifies for off-board. All guns under 10km must stay on-board only, no exceptions.

Each kilometre over 10km adds "1" to the range.

- 9.5 km - 10.4km = 200
- 10.5 - 11.4 = 201
- 11.5 - 12.4 = 202
- 12.5 - 13.4 = 203
- 13.5 - 14.4 = 204
- 14.5 - 15.4 = 205
- 15.5 - 16.4 = 206
- 16.5 - 17.4 = 207
- 17.5 - 18.4 = 208
- 18.5 - 19.4 = 209
- 19.5 - 20.4 = 210
- 20.5 - 21.4 = 211
- 21.5 - 22.4 = 212
- 22.5 - 23.4 = 213
- 23.5 - 24.4 = 214
- 24.5 - 25.4 = 215
- 25.5 - 26.4 = 216
- 26.5 - 27.4 = 217
- 27.5 - 28.4 = 218
- 28.5 - 29.4 = 219
- 29.5 - 30.4 = 220
- 30.5 - 31.4 = 221
- 31.5 - 32.4 = 222
- 32.5 - 33.4 = 223
- 33.5 - 34.4 = 224
- 34.5 - 35.4 = 225
- 35.5 - 36.4 = 226
- 36.5 - 37.4 = 227
- 37.5 - 38.4 = 228
- 38.5 - 39.4 = 229
- 39.5 - 40.4 = 230
- 40.5 - 41.4 = 231
- 41.5 - 42.4 = 232
- 42.5 - 43.4 = 233
- 43.5 - 44.4 = 234
- 44.5 - 45.4 = 235
- 45.5 - 46.4 = 236
- 46.5 - 47.4 = 237
- 47.5 - 48.4 = 239

- 48.5 - 49.4 = 240
- 49.5 - 50.4 = 241
- 50.5 - 51.4 = 242
- 51.5 - 52.4 = 243
- 52.5 - 53.4 = 244
- 53.5 - 54.4 = 245
- 54.5 - 55.4 = 246
- 55.5 - 56.4 = 247
- 56.5 - 57.4 = 248
- 57.5 - 58.4 = 249
- 58.5 - 59.4 = 250
- 59.5 - 60.4 = 251
- 60.5 - 61.4 = 252
- 61.5 - 62.4 = 253
- 62.5 - 63.4 = 254
- 63.5 - 64.4 = **255** (maximum value allowed)

This range formula is vital to the counter-battery process.

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ARTILLERY - ROCKET LAUNCHERS

Multiple Rocket Launchers, self-propelled and stationary, are setup thusly:

Whatever they actually fire at one time, divided by two, IS their Rate of Fire.

In each unit set up 2 slots of launchers, each with 1 "salvo" (i.e. half the ROF).

So if a Rocket Launcher could fire 24 rockets at once, the Rate of Fire would be 12 (24/2), and it would have two launch slots of 12 rockets each. It would fire 12 rockets from each slot in a single turn, giving it a RoF of 24.

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CREWS

All crews will be pistol and 1 or 2 hand grenades. **NO EXCEPTIONS!**

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ELECTRONIC WARFARE (EW)

- EW = 1 or 2 -> ARENA type active defence systems 1 or 2 shots
- EW = 3 or 4 -> VIRSS/SCHTORA type passive defence 1 or 2 shots

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ENGINEER VEHICLES

Dozer Blades: Dozer blades, as a game convention, constitute 100 points of HEAT armour. So a Sherman Dozer, for example, with 13 pts of front hull armour, gets 113 pts of HEAT front hull armour. Additionally, the dozer blade will add 2 points of normal armour.

Mine Rollers/Flails: Full-size rollers and flails will be treated the same as blades for game purposes. Small-size rollers will give a bonus HEAT armor of 20 instead of 100, and a bonus ARMOR of 1 instead of 2.

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EXPERIENCE & MORALE - UNITS

Scouts: Scout formations generally get a bonus of +3 experience and morale over and above their normal numbers because it is assumed that some of the best troops are chosen for recon missions.

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FIRE CONTROL

- Fire Control of 100+ is radar
- Note that FC101 is FC 1 with Radar, but can track planes through smoke and darkness.

- Only AA systems with radar get targeted by anti-radiation missiles, and they seek these out automatically . There is no need to point an ARM equipped plane at anything specific on the map.
- Radar equipped AA weapons WITHOUT Thermal Imaging sights should NOT see ground targets through smoke, only helos and other planes.

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FORMATIONS - GENERAL RULES

Off-board and On-board units should never be put in the same formation. if necessary, use informational text files to explain to the Player that certain off-board and on-board formations should be bought in tandem.

The First Unit of every formation needs to be of the type equivalent to the Purchase Screen where the formation is found. Artillery formations need an artillery unit in the first slot. Armour units need an armour unit in the first slot. Infantry units need an infantry unit in the first slot. Etc. Any attached units, such as Forward Observers, transport, "HQ" or whatever, cannot be in the first slot.

Smaller formations have better C&C results during game play -- C&C breaks down quicker in larger formations. This can be used for design purposes. Militia and reserve-type formations can be designed with larger platoons, or with a larger HQ platoon (make the first platoon single units under the HQ Unit) so as to put stress on the C&C structure. This can't be done in every circumstance, but sometimes the opportunity presents itself for this kind of design to help simulate poor quality troops.

Elite formations can be designed with smaller platoons, or with no units attached to the HQ Unit. Elite support platoons can be put into separate formations to further alleviate stress on the C&C structure.

Example:

<single large formation stresses C&C>

- Militia HQ
- Militia Squad
- Militia Squad
- Militia Squad
- Militia Platoon
- Militia Platoon
- Militia Platoon
- Militia Support

<small double formations eases C&C>

- Elite HQ
- Elite Platoon
- Elite Platoon
- Elite Platoon
- Elite Support HQ
- Elite Support Platoon
- Formation Availability:

Be careful when crafting formations that the availability of the sub-formations are presented in chronological order -- or at least do not present a period where some sub-formation in the middle is not available but sub-formations further down the list are available. this situation causes the formation to "break" in the game, making two or more separate formations, or even causing parts of the formations to disappear.

Formation Nesting:

Be careful when crafting formations that you do not nest formations within formations. We have "Company," "Platoon," and "Section" building blocks available for common use (some others for specialized use only). Companies can have either/or/both platoons & sections as sub-formations, but companies cannot have sub-formations that themselves include subformations. That is, you cannot put a platoon containing sub-formation Sections into a company formation. Please note that I am not talking about "Units" here, just "Formations." Unit Sections and Unit Platoons are simply Units and have no bearing on this.

In MBT there are " **Combat Group** " formations that have the same commanding officer level as a platoon, and can accept only Sections within it. These can be used as "2nd rate" companies for militia, guerillas, etc. They can also be used to portray smaller-than-company-sized formations with elite C&C.

Be careful in splitting the infantry portion of a mech platoon into 2 "platoons" in a company (1 as an APC platoon and 1 as the dismounts in a platoon of thier own). The CD game has an advanced load facility, but it ONLY applies to mech inf platoons where all are members of the same platoon (SP series default). In this case, the end user will lose out on this useful feature!. If your mech platoon is too large (or you are splitting it into 2 elements for C&C purposes) - make a partA (some of the APC and some of the dismounts) and a Part B (The remaining APC and dismounts), then each of part a and part b can group mount and dismount in the CD extended game.

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FORMATIONS - IMMOVEABLE UNITS, WEAPONS & FORMATIONS

The "immoveable" units, weapons and formations are ones the AI uses for special circumstances: the HQ (unit=245), the Assault Boat (unit=246), the Barge (unit=247), the Barge Carrier (unit=248), the Crew (unit=249). You can have other units that are modifications of these located anywhere, but these must stay exactly where they are in the unit list of an OOB.

The formation that should not be moved is: The Battalion HQ (ft=1).

The Weapon that should not be moved is the 1000lb Bomb (Wpn=198) -- the game uses it to simulate the Ammo Carrier explosion.

Additionally, all Naval Gun formations should appear in one group in ascending order of guns and size (least first, most last). The AI Picklist needs to be always pointed at the first unit in the group, and it will then move up and down the group as necessary for its picks.

A thought on AI Picklists: every country needs a picklist done for it if any formation was moved from the original. Since we are cleaning up the formations and moving them around, that means a new AI Picklist.

If you want to change an OOB without making an AI Picklist you must not move any formation.

Keeping an OOB compatible with previous version scenarios means not moving any units because the scenarios refer to the unit slot for information -- and if something different, or nothing, is there . . . strange things can happen. This is why some OOBs have many units re-nationalized to "0" (zero), these units are no longer used, but they are present for compatibility issues.

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FORMATIONS - NAVAL GUNS

This applies only to naval gun formations that the AI will be picking from.

Some OOBs have WW2 cruisers - these should be at 1 end or the other of a contiguous list of naval formations

All naval battery formations must be contiguous as the code does $X + \text{Random}(\text{NrNavalBtys})$ to decide picks

If all the earlies (or later) are at 1 end or the other, you can write a pick list which starts higher (ignoring WW2 8 inch cruisers say) and only goes far enough to avoid the later things.

Units with X3 radio codes can cause problems, if the AI chooses a unit with an X3 which is not available that year.

Therefore all those 'cruisers' set up to buy a '6 inch gun' with x3 radio code can be problematical

Probably best to have 2 NG, 3 NG, 4 NG formations (in a row), and leave all naval guns with X0 radio codes - AI will then choose number of 'guns' and then randomly pick that number of units in the formation, which could be single guns or a whole 4 pack etc . . .

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FORMATION - SLOTS ORDERS

The formations need the "correct" unit in slot 1. "Correct" means that an Artillery formation must have a Artillery class unit as the first unit, not an observer or transport, for example. (Exceptions can be made, but this is the general rule)

- 1) It determines the LBM picture displayed in the purchase screen (so a medium arty unit platoon with an infantry section in formation slot 1 immediately gives a "weird" photo of a rifle section).
- 2) The sorting of formations in the purchase screen pages is by slot 1 unit's unit class so again, your only medium arty formation with a rifleman in slot 1 as commander suddenly breaks away from all other medium arty formations in the listing.
- 3) The AI placement code determines what sort of formation it has to place by the slot 1 unit, so adding an infantryman in slot 1 means it will tend to be deployed as a rifle platoon, and not in back like arty should be. (It may well affect reaction to victory hexes and so forth - and in any case the infantry element will blunder off forwards if it is an advance, while the guns/mortars stay put - giving them C&C and/or rally hiccups).

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FORTIFICATIONS

Forts can have a Carry Capacity, and will provide protection to those "loaded" inside.

Forts get a Survival rating related to their construction in a general way (i.e. sandbags have less survival rating than steel-reinforced concrete . . .). Be consistent. Be conservative. See below for *suggested* generic Survival ratings.

Forts get a Size rating tied directly to the icon used to represent them (as a visual aid to the Player as well as keeping continuity throughout the OOBs)

Some Generic Ratings:

- Icon=417, Size=0, Survival=6, Carry=40 Sewer Grate
- Icon=416, Size=0, Survival=6, Carry=40 Shelter Bunker
- Icon=412, Size=0, Survival=6, Carry=18 Hiding pit
- Icon=410, Size=7, Survival=4, Carry=14 Small Double Gun
- Icon=409, Size=7, Survival=4, Carry=14 Small Single Gun
- Icon=408, Size=7, Survival=6, Carry=27 Large Twin Gun
- Icon=407, Size=7, Survival=6, Carry=30 Naval Fortress
- Icon=406, Size=6, Survival=2, Carry=20 House
- Icon=405, Size=5, Survival=6, Carry=20 Steel & Bushes
- Icon=404, Size=0, Survival=6, Carry=15 Cave

- Icon=403, Size=1, Survival=3, Carry=12 Sandbags
- Icon=402, Size=2, Survival=3, Carry=12 Small Steel & Dirt
- Icon=401, Size=3, Survival=3, Carry=18 Large Wood
- Icon=400, Size=4, Survival=5, Carry=18 Large Steel & Dirt
- Icon 421. Twin gun concrete fort
- Icon 422. Dug in tank turret ---JsIII turret
- Icon 423. Dug in tank turret ---T-55 turret
- Icon 424. Dug in tank turret ---T-34/85 turret
- Icon 425. Panzerturm Turret (Pz-IV)
- Icon 426. 120mm Gun Emplacement
- Icon 427. 127mm TWIN Gun Emplacement
- Icon 428. 150mm Gun Emplacement
- Icon 429. Dug in tank turret ---Desert M50 turret
- Icon 430. Coastal Gun Turret (Finland)
- Icon 431. Dug in tank turret ---Centurion turret
- Icon 432. Sandbag Foxhole, infantry
- Icon 433. Sandbag Foxhole, machinegun

For Tank Turret armour ratings use use normal turret armour ratings, and then determine how much should be added to the hull armour ratings all around. One example would be to add 40pts all around to represent tanks dug-in to the ground.

NOTES:

Bunker Design Trick:

The AI fires only the first weapon slot at targets over 10 hex range (usually), so if you have a long range weapon in the first slot, it will fire that at long range, but not any of the others. If you put a 10 hex weapon in the first slot, the AI will then open up all it's weapons at the same time. That will also cause it to wait for the enemy to come closer, thus giving it a better chance to hit with it's long range weapons.

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HEK (High Explosive-Kill) Ratings

Rifle Ratings:

- HEK=1 bolt-action rifles/carbines
- HEK=2 self-loading, semi-automatic rifles/carbines,
- HEK=3 Fully automatic assault rifles/carbines

Mortars:

All Mortars/Rockets use HE Kill two levels up from their calibre size.

Multiple Weapons:

Single slots that are meant to represent more than one multiple of a weapon use the following multipliers:

- 2x is 1.5x HEK
- 3x is 1.75x HEK
- 4x is 1.875x HEK

So when a weapon has an HEK value of 10, and you want to convert it to a twin weapon (for example a single and a twin AA gun) you would multiply the HEK by 1.5 to have a total HEK of 15.

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HORSE-BASED UNIT DEFAULTS

ALL horse-based units with a speed greater than 6 need their SOUND variable set to 222.

Pack Animals:

- Crew:3, Size:2, Carry:109,
- Weight:10, Speed:7 Move Class:Default
- Radio: 3x
- Unit Class: Pack Animals class
- Weapon: None

Cavalry (Light) Transport:

- Crew:4, Size:2, Carry:10,
- Weight:10, Speed:12, Move Class:Default
- Radio: 3x
- Unit Class: One of the unused Cavalry classes
- Weapon: None

Field (Gun) Carriage (Limber)

- Crew:2, Size:3, Carry:120,
- Weight:15, Speed:7, Move Class: A/T Wheel
- Radio: 3x
- Unit Class: Prime Mover or Wagon class
- Weapon: None

Cavalry Field (Gun) Carriage (Limber)

- Crew:2, Size:3, Carry:112,
- Weight:15, Speed:8, Move Class: A/T Wheel
- Radio: 6x
- Unit Class: Prime Mover or Wagon class
- Weapon: None

Wagon:

- Crew:2, Size:3, Carry:118,
- Weight:20, Speed:7, Move Class: A/T Wheel
- Radio: 1x
- Unit Class: Wagon or Prime Mover class
- Weapon: None

Ammo Wagon:

- Crew:2, Size:3, Carry:0,
- Weight:20, Speed:7, Move Class: A/T Wheel
- Radio: 3x
- Unit Class: Ammo Carrier class
- Weapon: None

Supply (Ammo) Horses:

- Crew:3, Size:2, Carry:0,
- Weight:15, Speed:7 Move Class:Default
- Radio: 3x
- Unit Class: Ammo Carrier class
- Weapon: None

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HULL DOWN

Basically, if you are higher than the unit firing at you and not moving or dug-in, then you are considered hull down.

Hull Down Conditions:

Target is considered hull down if :

- - the target is not a fortification, and
- - firer is not adjacent, and
- - target is dug-in OR not moving and Higher than Target

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PHOTOGRAPHIC LBM IMAGES (PICS)

A few important LBM-related items to be aware of:

1) when putting your own LBMs into the game do not **EVER** over-write an existing LBM that is not yours to begin with. **PM22000.lbm to PM22999.lbm has been set aside by Camo Workshop for modder use**

2) The **O N L Y** palette that should be used when creating a game LBM PIC is located in the WinSPMBT\Game Data\Design\Palettes folder and is named JASC_WINSP_PICPAL.pal. That is used for the standard B&W photos that go into the game. The special colour photos that appear in groups of three and six on some screens use the JASC_WINSP_COLOUR_PICPAL.pal

3) The encyclopaedia pictures **MUST** be the correct (Black and White) palette, colour ones will cause problems in the game due to colour cycling (which the BW palette is designed to avoid).

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MAP TEXT

The maximum that can be placed on a map are 100 text strings, each a max of 64 characters.

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MOVEMENT - MOVE CLASS

Special Move Class units, like Snow Vehicle Unit Class and Amphibian Unit Class, should be given the DEFAULT Move Class. In order to get the appropriate Sound for the unit use you may need to apply a specific sound variable rating.

Bicycles and Motorcycles are vehicle based in terms of movement behaviour

Heavy Bicycle and Motorcycle units are infantry based in terms of movement behaviour.

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MOVEMENT - SPEED OF UNITS

Fighter-bomber and level bomber Aircraft Speed: 1 pt of Speed for every 100 km/h (round up past 50)

Helicopter speed: 1/3 of actual maximum speed in km/h

Spotter Plane/UAV/Gunships speed is equal to their normal air speed as calculated for fighter-bombers and bombers. The higher the number the wider the circle the Spotter Plane will fly.

Ground Speed equation is: max km/h speed divided by 3 = SPEED in hexes.

AA guns 25mm or less have 1 movement point. Larger weapons have 0.

AAMGs have a move of 2.

Certain types of terrain are likely to cause breakdowns to vehicles entering them. This is based on distance/speed travelled (faster is worse), movement class (2WD is worse than track) and experience and vehicle weight.

Piston attack aircraft need to be 8 or under for speed to get the default propeller sound effect. Jet sound effects start at speed 9.

One can over-ride the sound by specifying the SOUND variable. We do have some slow jets, and some fast propellers, that cross the line above and below the default. The AT-33 Shooting Star, for example, is a slow jet -- but we can give it SOUND 84 and it will sound like a jet instead of a propeller. The reverse can be had by using SOUND 5 for propeller aircraft diving.

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NAMING LIMITATIONS

1) Unit names **cannot** exceed 15 characters in length.

2) Use abbreviations that are consistent with abbreviations in other databases.

3) when naming your units and formations **do not** put in extra spaces before/after the unit/formation name.

4) be careful, ensure no weird national language text is put in (umlauts, cidillas etc). This will crash the game..

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NAME LIST FILES

There need to be 100 names (ie lines) in those text files. Pressing <enter> after the last name formats another spot. Please check that when you go to the bottom of the list that the last thing on the list is the last letter of the 100th name

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OBSTACLES

Ordinary infantry will clear mines but only if in the same hex as the mines, and at a lower rate than engineers.

Engineers clear mines by facing the hex the mines are in

Suppressed troops will clear at lower rates.

Ordinary infantry will not remove Dragon's Teeth.

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RADIOS

Previously, the game gives a radio to all formation command units. Although this is unrealistic in the 1930s for example, it was built in. In WinSPMBTv4 all units in the game were given radios based on their radio code. If the radio code indicates a unit could not have a radio then it won't get a radio even if it is the command unit.

All mortar and howitzer units need to have radios. The game will allow them to indirect fire at the command of an FO whether they have a radio or not, so to forestall any Player questions on the subject, all mortars and howitzers for all countries should have a 9x Radio code. (This can be assumed to represent field telephones in the 1930s and 40s). Forward observers (and FO vehicles) are the command unit in FO formations so will have radios, but should have a 90 radio code in any case as with artillery. Again - in the 1930s you can abstract this as carrying field telephones.

Generally Soft Transport (trucks, jeeps) should have low (or nil) radio codes, while most 1960s+ armoured vehicles of Western manufacture would be 80-90. Soviet tanks even in the 1970s only had 2-way radios in the platoon command vehicle, with subordinates having a receive only set, so a value of 50-60 would suffice.

Before 1939, vehicle radios outside the platoon commander should be rare, and restricted to the technically advanced nations. Russia did not issue individual vehicle radios before the 1960s or so and then often these were simple receive only sets. Japan did not have many, and France issued radios to the platoon command vehicles only. Before 1939, the only nations that should have much use of vehicle radios would be Germany, British Empire, and the USA, and this advantage will be held throughout WW2. Suggest 10 radio code for Soviet vehicles after 41 or so, with Commonwealth in the 60-70 (and rising), US vehicles with a slight edge (10 points). By 1945, all western Allied AFV would be in the 80-90 region, APC perhaps a bit lower.

Squad/section level infantry radios were very rare until the 80s outside of elite units. Post 2000 or so, these can be reasonably common in modern NATO or similar western armies. In WW2, man portable radios were extremely rare outside of the UK and USA in 1943 plus, "man portable" here usually meant a 40 or 50 pound unit!. The USA "walkie talkie" was an exception, but also it was still somewhat rare until perhaps Korea. In the 1930s and before - there were not any sensibly man portable items. pre 1939 infantry squads should really have 0 radio codes, but this USA advantage in availability of squad-level radio would be held till the late 70s or so.

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RADIO CODES

The ten's digit in the Radio code (multiplied by 10) is the percentage chance of having a radio.

The One's digit can only be "0" "1" "2" or "3" -- each deals with the availability of a unit and its selection by the AI and its selection in the Purchase Screen as the default unit.

- **x0= barring any other commands the most current "0" unit will be picked**
- **x1= rare, this unit will not be chosen very often**
- **x2= common, this unit will appear very often**
- **x3= DO NOT USE THIS CODE UNLESS THERE IS NO OTHER DESIGN METHOD TO USE**

if an x3 unit is the default unit in a formation it will always be picked -- therefore it MUST ALWAYS be available for selection during the entire life of the formation. If it is not available, no other units will be selected -- and the formation will be a false ghost formation.

if an x3 unit is not the default unit in a formation, there MUST ALWAYS be a non-x3 unit available through the entire life of the formation or no unit will be selected -- and the formation will be a false ghost formation.

Always seek to design a method to NOT use the x3 code.

What also has an effect on AI Purchases is how you compose the formation. For example, an APC Platoon:

Platoon #1

- Unit 250
- Unit 250
- Unit 250
- Unit 250

Platoon #2

- Unit 250
- Unit 251
- Unit 252
- Unit 253

Platoon #3

- Unit 250
- Unit 250
- Unit 251
- Unit 251

Platoon #1 will buy four APCs of the same type in a block.

Platoon #2 will buy four APCs, and make a determination of which APC to buy at each slot -- may be four different APCs, may be four the same, all depends on radio codes.

Platoon #3 will buy two blocks of 2 APCs, determining which APC to buy for each block of 2.

Variations on this theme are possible.

So, if you have 4 units at x0, and 1 unit at x2 . . . the x2 unit will show up almost all the time, and the newest x0 unit will show up once in a while.

If you have 4 units at x1, and 1 unit at x2 . . . the x2 unit will show up a lot, and the remaining times the other 4 units will show up in equal chances.

If you have 5 x1 units, or 5 x2 units, they act the same -- they split time.

One more factor, the units actually in the formation slots seem to get their chance to appear calculated first -- as they appear a little more often than other units with the same code.

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REACTION TURNS

1) Reaction turns do not work for a side designated to assault or advance or for meeting engagements. (In fact, you will notice that attacking units have reaction turns of 99 -- which they ignore). If you want attacking units to delay movement, you have two options: A) have them enter as reinforcements; or B) give them a circuitous route with waypoints (but these will need to be out of LOS of the enemy);

2) Reaction turns work for units designated to delay or defend so long as they do not spot enemy units. Once an enemy unit is spotted, reaction turns -- like waypoints -- go out the window;

3) If a unit is given no reaction turn, the AI appears to move (or not move) the unit at random. If you want a unit in delay or defend stance to begin moving immediately, you should assign them a reaction turn of 1.

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SCALE (Vehicle Icons)

One icon pixel equals six inches **for vehicles only**..Aircraft and watercraft do not follow that convention

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SIZES OF UNITS

INFANTRY:

- Size 0: Snipers, FOOs, Scouts, Inf-AT, Inf-SAM (all 5-men or less), MMG & HMG (see section on machineguns)
- Size 1: all others

Note the ATGM teams are specifically made easier to spot in the game code because of the large flash and smoke emitted by these weapons.

ARTILLERY - GUN SIZES

*Howitzers (on-board ONLY *)*

- up to 49mm = 0
- 50mm to 110mm = 1
- 111 to 150mm = 2
- 151mm to 215mm =3
- 216mm to 250mm = 4
- 250mm to 299mm = 5
- 300mm + = 6

* Counter battery fire does not use size as a factor for potential damage to off board artillery units. Any size number these units may have is ignored by the game

- up to 70mm = 0
- 71 to 120mm = 1
- 121mm to 180mm = 2
- 181mm + = 3

AA Guns

- up to 40mm = 2
- 41mm to 90mm = 3
- 91mm + = 4

Howitzers and AA Guns classed as Inf-Guns or ATGs for various reasons retain their Howitzer sizing.

Naval Guns use the formula: 1 Gun Size per 10mm caliber.

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SNIPERS

Decade availability is for general guidelines. Superpowers will have earlier availability, poor 3rd world may never have more than sniper #3 or 4 (generally available), maybe only #0-2.

Every OOB will have #0, #1 & #2. In every OOB #0, #1 & #2 should have x2 (common) radio code. Whether or not any others are rated as "common" (x2) depends on the country, but very few if any will be so designated other than special snipers (e.g. commandos, para, mountain, etc).

#3 thru #8 might be best implemented in most OOBs that have them as special sniper classes and formations (for example, Commando Sniper, Para Sniper, etc).

- Sniper #0 = Sniper Rifle, FC=0, RF=0, Vision=0, Cost=3, Any Decade (aka Marksman)
- Sniper #1 = Sniper Rifle, FC=5, RF=5, Vision=0, Cost=4, Any Decade (aka Marksman)
- Sniper #2 = Sniper Rifle, FC=10, RF=10, Vision=0, Cost=5, Any Decade
- Sniper #3 = Sniper Rifle, FC=10, RF=10, Vision=5, Cost=6, 1960+
- Sniper #4 = Sniper Rifle, FC=10, RF=10, Vision=10, Cost=7, 1970+
- Sniper #5 = Sniper Rifle, FC=10, RF=10, Vision=15, Cost=8, 1980+
- Sniper #6 = Sniper Rifle, FC=10, RF=10, Vision=20, Cost=9, 1990+
- Sniper #7 = Sniper Rifle, FC=10, RF=10, Vision=30, Cost=10, 2000+
- Sniper #8 = Sniper Rifle, FC=10, RF=10, Vision=40, Cost=11, 2010+

The Sniper unit class is intended to be a special forces, commando-trained insertion specialist, not the company or platoon marksman.

Snipers are considered battalion-level assets.

Sniper-class units should only be found in "Sniper" formations, in Battalion Support formations, and in Special Forces/Commando/Para/Ranger/etc support formations.

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SOFT VEHICLES

Soft vehicles like trucks and jeeps should **NEVER** have armour in front of 1. Doing that causes problems with the ammo selection routine in the game. Also, they should not have any armament. **No trucks with pistols!** The same applies to pack animals.

PLEASE NOTE - certain scout or patrol vehicles may be allowed an RPG type weapon, and additionally, third world "technicals" which have a few militia as semi-permanent crew may well be allowed an AK-47, for "flavour". However these are exceptions, and 99.9% of plain ordinary soft motor transport (not scout vehicles) **Should have NO weapons**. Some specific soft scout vehicles may have some added armour (and perhaps improvised sandbag armoured APC) but be soft in certain aspects. **No** vehicles with pistols, **ever**.

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SOUNDS

Due to the way the original code was written, default sounds are based on weapon stats. We can over-ride the default sound in most cases.

For example, an MG with a HEK of 14 or above will have the default sound of a tank gun. Therefore, all MGs must have HEKs of 13 or less, or have their sound variable manually set to that of a MG.

Piston attack aircraft need to be 8 or under for speed to get the default propeller sound effect. Jet sound effects start at speed 9.

Certain Sounds are mandatory and standardised:

- 16 Motorcycles
- 17 Cavalry and other horse units

- 56 BAR
- 111 Soviet .50 cal MGs
- 208 US .50 Cal MGs
- 222 Wagons, pack animals if speed >6

Others are optional:

- 36 Marching Fotsoldiers
- 55 MG42 and other ultra-high ROF MGs
- 210 .30 cal MGs

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SURVIVABILITY

Survivability (aka "S") ratings range from 0-7. At the low end are fragile units, while at the upper end are a few units with a reputation for taking a lot of serious punishment with 7= a MRAP protected vehicle with added armour that protects the crew from mine . IED explosions. Survivability is directly tied into other factors such as armour rating -- as it doesn't come into play unless the armour has been penetrated.

The S rating is very powerful, but it's weak link is the armour rating of the unit. High armour ratings and high S makes for a very powerful unit. Very low armour ratings and high S only makes the unit tough against large caliber MGs and small caliber AA. Catastrophic penetration bypasses the S rating. Catastrophic penetration is 10pts pen greater than was needed for penetration.

The following ratings are generalized, and indicate the "normal" median point for such units. You can go up or down depending on actual circumstances, but generally it is much easier to get a lower rating than a higher rating. The addition of reactive and composite armour to a basic model will increase S by 1 -- so here is another place where we factor in the properties of modern armour.

On the other hand, Flamethrower vehicles and ammo carriers will have their S reduced by at 1 & 2 respectively.

General Examples:

- 0= Armoured Jeeps
- 1= Makeshift APC
- 2= Makeshift Armoured Cars
- 3= Light Tanks, Low-end APCs & Armoured Cars
- 4= Medium Tanks, Rivercraft, High-end APCs & Armoured Cars
- 5= Heavy Tanks, Monitors/armoured boats
- 6= Ultra-Modern Tanks, Ships
- 7= Mine Resistant vehicles

No use for Helos or Aircraft

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TRIPOD WEAPONS

All tripod mounted weapons will get a RF & FC of 1. This will include all standalone MG and AGL units, but not any such weapon incorporated as a secondary weapon into a regular squad. In other words, it has to be the primary weapon of the unit -- occupying Slot 1. It will also receive the penalty of slower movement (-1) and the bonus of smaller size (-1) to indicate its primary use in concealed and/or protected setups.

Note that this bonus is not applied to tripod weapons, pintle weapons, etc on vehicles.

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UNITS - ARMS EXPORTS

Remember that when the major exporting countries sell arms, they usually do not sell the top secret high tech goodies that their own country uses with those same items. Only in very special cases will a major exporter sell the latest high tech gadgetry to any country -- and almost never outside a very small circle of allies.

So when importing units from the major exporters, remember to decrease the Vision and EW ratings at the very least. Try to find out if they got the same fire control system, or the previous model system. Did they get a special model of the unit made for export? If so, it usually contains old technology.

Now, the minor exporters are a slightly different story. They want to increase their business, and so will sell the best they have -- the only problem is, that the best they have is not usually as good as what the major exporters have.

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VISION

- Vision up to 39 is any Passive or Active IR system short of Thermal Imaging.
- 40 is Thermal Imaging (see through smoke).

50 and up is radar systems (Ground Surveillance Radar).

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WAY-POINTS

- 1) A unit will use only TWO WP's per turn and (assuming you have the MP's to get there) it will stop the hex before entering the third WP. This holds true in 98% of the cases (SP still throws some variables in there to keep things interesting).
- 2) When you initially place a series of waypoints the line begins to be drawn in the hex in front of your unit. The game considers this a WP.
- 3) Waypoints disappear one per turn so if a unit does not reach the next waypoint it will not continue trying to go to it but hear for the next available one.

Example of Way-point use: Let's assume you have a unit that can move 20 hexes along a road. You place WP1 10 hexes away and you place WP2 5 hexes beyond WP1. Then you go on to place WP3 8 hexes beyond WP2 and WP4 10 hexes beyond that. (so 10+5+8+10)...start the game and the tank will move to just behind WP 2 (remember.....at the start the very first hex the tank enters is classed as a WP). So your tank passed the "start" WP, WP1 then stopped just before entering WP2. On the next turn it will enter WP2 then drive the 8 hexes to WP3 (1+8 used so far) then drive 9 more hexes and stop just before WP4.

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WEAPONS - ATGMs

Heavy ATGM Class:

The AI uses heavy ATGM, if placed in its own formation a bit differently, e.g. they are bought in the defence mainly (slow movement). They will not be advanced like other infantry units or regular leg ATGMs, but will be held back.

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WEAPONS - CLASSES

CLASS 2 & 3 WEAPONS - MORTARS/GLs

Indirect fire mortars should be class 3 (team weapons) - direct fire mortars/big Grenade launcher thingys - should be class 2 weapons. (e.g. UK 2 inch, JA 50mm GL).

CLASS 4, 5 & 19 WEAPONS

- 4 - Flak/AA-Capable MG/Autocannon
- 5 - Light Gun/Autocannon/CMG/BMG
- 19 - Autocannon
- Class 4 - any AA weapon, good against any aircraft
- Class 5 - no AA capability.
- Class 19 - only AA against helos.

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WEAPONS - FLAMETHROWERS

Vehicle flamethrowers will use 15 gallons of FT fuel for one "shot." A "shot" can be many small bursts or a long stream -- but that is abstracted into the game combat system and is not a consideration for number of "rounds."

If you cannot find the FT fuel allotment, look to similar vehicles and make a conservative determination. You can look to WinSPWW2 USMC for guidance, as they have a lot of FT vehicles there.

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WEAPONS - RECOILLESS

Recoilless weapons will have HEAT or HE ammo ONLY, and will have a 222 code in the AP pen for when used in slots 2 through 4 with AP ammo (=HEAT). No RCL weapon fires Sabot in SP.

Recoilless Rifles as vehicle main guns and as anti-tank guns (ATG Unit Class w/large amount of ammo) will have ratings of "2" for FC & RF. Infantry-based RR units (Inf-RR, Inf-AT, Para Inf-RR, etc) will be treated as Inf-AT units (e.g. bazookas) and will have no FC/RF rating, will have a movement of 6, and the generic ammo loadout of 8 - 12 rounds (usually 4-HE & 8 AP but it varies. Some are set up to just use HE).

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WEAPON SLOTS

Vehicles: (secondary weapons by priority order)

- Slot 1: main gun or weapon

- Slot 2: tube ATGM, AAMG, CMG
- Slot 3: CMG if there is an AAMG or a tube ATGM
- Slot 4: BMG (mandatory), AAMG if there is a tube ATGM

Notes:

- 1) An AAMG will be unusable if the vehicle is closed down as it is assumed to be external. (Class 4 weapon with warhead less than 2 is the split). Larger AAA (class 4) are no longer considered to be unusable if pinned.
- 2) Autocannon have limited anti air (esp low fliers and so helos, in MBT mainly) - and CAN fire AA if suppressed (autocannon presumed to be under armour or remote controlled).
- 3) TMGs always get Slot 1 -- they are the primary weapon of the vehicle **IF** this is the main gun type weapon. If there are 2 different calibres (say 14.5 and 7.62mm), the larger calibre one is placed in slot 1, smaller in slot 2.
- 4) BMGs always get Slot 4. Slot 4 gives only the frontal arc for a firing radius (see AAMG below)
- 5) CMGs should get Slot 2 whenever possible, Slot 3 if a missile is in Slot 2. They can have Slot 1 if another CMG is in Slot 2. They never get Slot 4.
- 6) AAMGs get whatever is left over. When all other Slots are full, put them in Slot 4. They always get lowest priority for a Slot.

Infantry sections:

- Slot 1: main weapon, this will be fired by every man in the section (i.e. more dmg): rifle, smg, etc.
- Slot 2: lmg, saw, smg/rifle, light mortars (for support sections), grenade
- Slot 3: LAW/LAD/MAW/MAD, rifle-grenade, GL, smg/rifle, grenade, flamethrower, satchel charge, molotov
- Slot 4: Grenade, sniper rifle, light mortar (if there is an lmg/saw), satchel charge/bunker buster

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WEIGHT & CARRY CAPACITY RATINGS

WEIGHT: (**LOAD COST**)

Inf-SAMs, Inf-ATGM and L/MMGs should not have weight.

The game **does not** use "weight" anyplace in the code. Weight was a conveniently short word that fit the space available when MOBHack was first assembled that generally described what this represented and it's been misleading people ever since. Vehicles are *generally* given their weight in tons, but this is **NOT** what it represents and Loading Cost (what it actually IS in code) is really only used in the game for loading vehicles into Landing Craft and Helicopters and the majority of landing craft are set up to carry both guns and vehicles and therefore have a 55 point limit because 255 is the highest number we can use there with '1' indicating a landing craft or vehicle can carry guns and '2' indicating it can carry a vehicle or a gun so only one tank with a weight over 27 is allowed on a landing craft and it really means nothing for an early version of a tank to be set to a weight of 29 for example and a later model set to 32. The oddball units come in where the weight would be below 10, and then they need to be given a "10" rating as a minimum because "10" and over tells the game the unit is a vehicle. Anything you do not ever want loaded onto any type of unit (e.g. landing craft) should get a "99" Weight rating. A "99" rating is hard-coded to be uncarryable.

Because the Initial Indicator reflects vehicles, towed guns or personnel, it will sometimes be necessary to have the same unit with two different weight capacities in order to allow one unit to carry vehicles, and the other to carry the maximum allowable personnel. This is because the highest numerical possible is "**255**".

The Initial Indicator can be 0 (not shown), 1 or 2. Zero indicates personnel-only can be transported -- i.e. nothing with a Weight rating above zero can be carried. A "1" indicates personnel and guns can be carried -- i.e. anything with a Weight rating of 0-9. "2" indicates personnel, guns and vehicles (everything) can be carried up the weight restriction of the other indicators.

For example, one unit with a capacity of "255" can carry vehicles, towed guns or personnel up to 55 "weight" (LOAD COST!). While the otherwise identical unit with a "199" capacity can carry towed guns and personnel up to 99 "weight" (LOAD COST!).

CARRY CAPACITY RATINGS:

- 2xx (can carry vehicles up to xx weight)
- 1xx (can carry towed guns/mortars/etc up to xx weight)
- 0xx (can carry personnel up to xx weight)(the leading zero is left off)

The following unit types should never have a Carry Capacity rating >0 UNLESS IT IS CLEAR they were designed to carry passengers internally:

- Self Propelled Artillery,
- Self Propelled Anti-aircraft,
- Self Propelled SAM,
- Self Propelled Recoilless Rifle,
- Self Propelled ATGM,
- Self Propelled Mortar,
- Flame Tanks,
- 3rd Gen Tanks (EW or ERA),
- Armoured Cars,
- Mine Plows,
- Engineer Tanks.

- SPGs,
- AGs,
- Light Tanks and Tankettes, any of which are of Size 1 & 2 should not have any Carry Capacity.

Please note that none of the above types are referring to unit classes, but what the real-life vehicle would be. The following unit types should never have a Carry Capacity rating >0 unless it is clear they were designed to carry passengers internally:

Notes:

1) 255 is the maximum number (for anything) -- therefore we have some basic coding restrictions on carrying capacity in regards to that, and the above numbers and their interpretations by the code (ie. it is impossible to carry 100 troops, as 100 is interpreted as towed guns of 0 weight . . . IOW, nothing).

2) Hybrid Vehicles: When making a hybrid vehicle -- such as making a SP-Flak vehicle out of an APC, we reduce the rating of the CARRY CAPACITY by the number of new crew, and ALSO by how much room the weapon system and ammo load will take up. For many hybrid vehicles, that will mean negating any CARRY CAPACITY, or at least severely restricting it. If one has real transport figures for a vehicle, use those instead.

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APPENDICES

Self-Load Semi-Auto Rifle List

The following should be rated HEK=2

- 7.62mm SLR
- Beretta M.37
- BM-59
- Brondby SLR of 1939 (Norway)
- Cristobal M2
- FG 42
- Hakim Rifle
- Ishopore
- MAS 49 & 49/56
- M1 Garand
- M59/66 (Yugoslavia)
- SAFN 49
- SKS Carbine
- Stgw 57
- SVT 38/40
- Tokarev ST 38/40

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Warhead Size Chart

GUNS

ADJUSTMENTS

Gun Size	WH	Mortar Adjusted WH	Rocket Adjusted WH
1mm- 19mm	1	1	1
20mm- 39mm	2	2	2
40mm- 59mm	3	3	2
60mm- 79mm	4	4	3
80mm-109mm	5	4	3
110mm-119mm	6	5	4
120mm-139mm	7	5	5
140mm-159mm	8	6	6
160mm-179mm	9	7	6
180mm-199mm	10	8	7
200mm-219mm	11	8	8

220mm-239mm	12	9	9
240mm-259mm	13	10	9
260mm-279mm	14	11	10
280mm-299mm	15	12	11
300mm-319mm	16	13	12
320mm-339mm	17	14	13
340mm-359mm	18	15	14
360mm-379mm	19	16	15

As the formulas-

- 1mm- 19mm = 1 Mortar+0/Rocket +0
- 20mm- 39mm = 2 Mortar+0/Rocket +0
- 40mm- 59mm = 3 Mortar+0/Rocket -1
- 60mm- 79mm = 4 Mortar+0/Rocket -1
- 80mm-109mm = 5 Mortar-1/Rocket -2
- 110mm-119mm = 6 Mortar-1/Rocket -2
- 120mm-139mm = 7 Mortar-2/Rocket -2
- 140mm-159mm = 8 Mortar-2/Rocket -2
- 160mm-179mm = 9 Mortar-2/Rocket -3
- 180mm-199mm = 10 Mortar-2/Rocket -3
- 200mm-219mm = 11 Mortar-3/Rocket -3
- 220mm-239mm = 12 Mortar-3/Rocket -3
- 240mm-259mm = 13 Mortar-3/Rocket -4
- 260mm-279mm = 14 Mortar-3/Rocket -4
- 280mm-299mm = 15 Mortar-3/Rocket -4
- 300mm-319mm = 16 Mortar-3/Rocket -4
- 320mm-339mm = 17 Mortar-3/Rocket -4
- 340mm-359mm = 18 Mortar-3/Rocket -4
- 360mm-379mm = 19 Mortar-3/Rocket -4

every 20mm +1 Warhead Size, continue Mortar-3/Rocket-4

Additional Notes:

- Napalm & FAE minimum warhead size = 3
- Rifle/Pistol Bullets should be the only weapons with warhead size = 1
- Grenades should have warhead size 3
- Warhead Size 6 makes craters
- SAM warhead size is not adjusted downward like ground to ground rockets. A SAM with a diameter of 130mm would be WH 7

Naval guns

(Naval Guns +1 Warhead Size above land based guns) with their WARHEAD / HEKILL AND , PENETRATION rating

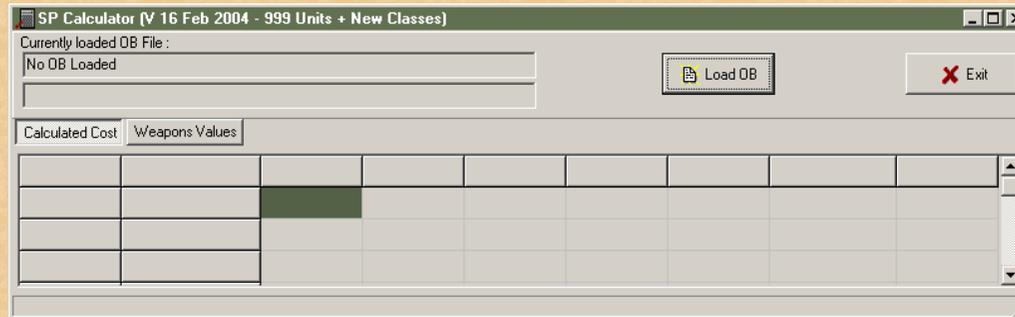
GUN SIZE	WARHEAD	HE KILL	HE PEN
3 inch (76mm)	5	5	2
4 inch (101mm)	6	11	3
4.7 inch (119mm)	7	13	3
5 inch (127mm)	8	15	3
5.5 inch (139mm)	8	18	3
6 inch (152mm)	9	21	4
7 inch (177mm)	10	26	4
8 inch (203mm)	12	31	5
9 inch (228mm)	13	36	5

10 inch (254mm)	14	41	6
11 inch (279 mm)	15	46	6
12 inch (305mm)	17	51	7
13 inch (330mm)	18	57	7
14 inch (355mm)	19	61	8
15 inch (381mm)	21	67	9
16 inch (406mm)	22	71	10
17inch (431 mm)	23	76	10
18 inch (457mm)	24	81	11

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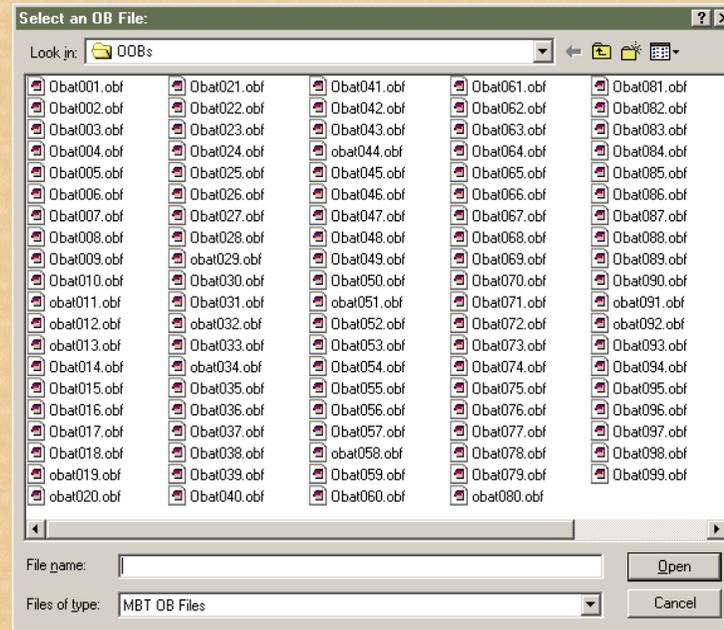
Running the Cost Calculator

After editing or making additions to the OOB's it is required that the cost calculator be run to ensure that all unit costs in all OOB's are calculated fairly. The cost calculator is now located as a sub-directory of MOBHack. When you first load the cost calculator you will see a screen like this:



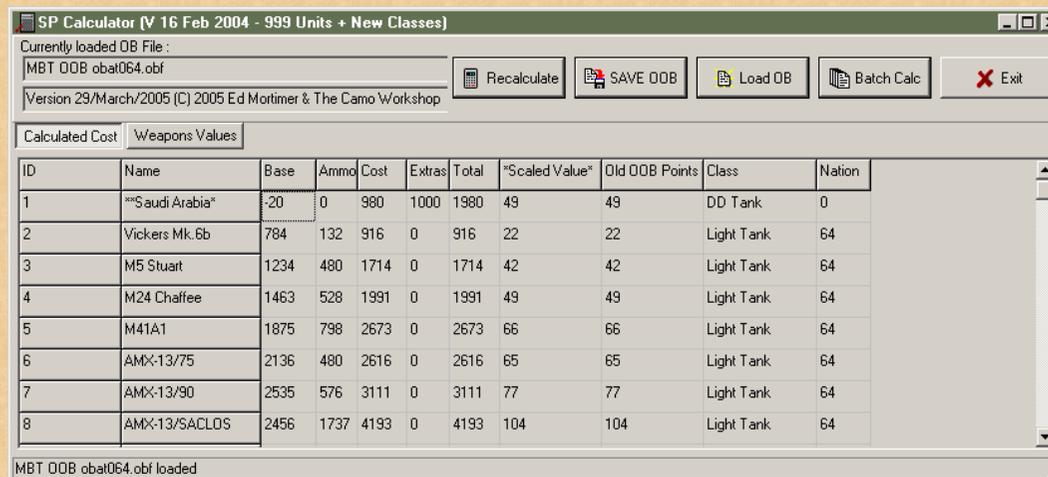
Press the 'Load OB' button and a directory navigator screen will appear.

The OOB's are located in WinSPMBT\Game Data\OOBs



Please ensure that the "Files of type" is set to MBT OB files when using this calculator with WinSPMBT.

Select the nation you just edited and the screen will change to something like this



There now five buttons along the top

- **Recalculate** - Pressing this will recalculate every unit in the OOB. If none of a units values were altered since the last time it was recalculated you will not see a change but any unit you made changes to most likely will see a change. The new values are NOT fixed until you press "Save OOB"
- **Save OOB** - This saves the OOB after you recalculate. It's a safety feature for designers. If the value of the new unit makes a dramatic change now would be a good time to open MOBHack again and check for errors BEFORE you press "Save". For example, you may have entered 55 instead of 25 for fire control and this can make a BIG difference to the cost
- **Load OB** - Loads a new OOB
- **Batch Calc** - This recalculates **ALL** the values in **ALL** the OOB's. Don't play with this unless you are sure you really want to do this!!
- **Exit** - Exits the Cost calculator

Below those buttons you will see this when "**Calculated Cost**" is depressed

Calculated Cost		Weapons Values								
ID	Name	Base	Ammo	Cost	Extras	Total	"Scaled Value"	Old OOB Points	Class	Nation
33	Leopard 2A6	10993	8661	19654	0	19654	491	491	Main Battle Tank	44

- **ID** - The slot number in MOBHack this unit is located
- **Name** - The units name
- **Base** - The unscaled cost of the hull, armour, radio, etc. without the weapons cost
- **Ammo** - Cost for the weapons expressed as ammunition cost (by shell times the ammo cost per weapon, available on the weapons values tab). See below for details on the weapons values tab
- **Cost** - The Base+Ammo costs totaled before the extras are factored in.
- **Extras** - Additional costs get added here. Engineering costs, commando cost, ammo truck cost, paratrooper cost etc. Look at engineer tanks or commandos/Special Forces troops etc. These are the added costs that make these units special above the "Plain Jane" versions
- **Total** - The total of Cost + Extras.
- **"Scaled Value"** - This is the value the game uses and is the TOTAL cost divided by the Scaling value (See below for details on the Scaling value.)
- **Old OOB Points** - This is the previous cost calculator total. If you have not made any change to a unit that cost will not change. If, however, you HAVE made a change since the last calculation you will be able to see just how much the unit costs have changed with the changes you have made
- **Class** - The unit class
- **Nation** - The nationality of the unit. This is a final check to ensure the nationality of the unit is set correctly

You will see this when "**Weapons Value**" is depressed

Calculated Cost		Weapons Values						
ID	Name	On map HE	Off map HE	AP Value	Sabot Value	HEAT Value	Special	SCode
12	.303in Bren LMG	0.09	0.072	0	0	0	LMG	1
13	7.62mm LMG	0.108	0.0864	0	0	0	LMG	1
14	7.62mm GPMG	0.144	0.1152	0	0	0	LMG	1

- **ID** - The weapon number in MOBHack
- **Name** - The Weapons name
- **On Map HE** - cost for HE if it is on-map
- **Off Map HE** - cost for each HE shell if an off-map unit (artillery etc)
- **AP Value** - cost per AP shell
- **Sabot Value** - cost per sabot shell
- **Heat Value** - cost per HEAT shell
- **Special** - Shows the name of the special weapons code that assigns points under the SCode value tab.
- **SCode** - These are added costs assigned to things like LMG's and flame weapons to properly reflect their added value

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