

The following seven pages contain two excerpts from the manual. The first covers the Targeting Weapons and the second, Firing Weapons.

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**PHASE II: TARGET PHASE**

During the Targeting Phase, the Console Bar shows the current unit and its weaponry.

**CHOOSING AND TARGETING WEAPONS**



Each force can have up to six weapons that are placed in up to six groups. A force can fire any and all weapons in *one group* per turn. A typical troop will have a gun in Group 1 and grenades in Group 2. This means that the troop can either fire the gun or throw the grenade, but not both. A troop can also have 2 pistols in Group 1 and a shotgun in Group 2, meaning the troop can fire one or both pistols or the shotgun each turn.

You can determine which weapons are grouped together by the color frame around the picture. If weapon pictures have the same color around them, they are in the same group. You can also find this information in the unit description box.

Targeting is straightforward. Choose the weapon you want to fire by left-clicking the weapon in the box. The box will be highlighted with a white frame. To then target the weapon, left-click the desired location on the battlefield. A red targeting graphic will display. If this is the last or only weapon a unit has, the next closest unit with a weapon to fire will automatically become active. You can get detailed information about a weapon by right-clicking its picture.



If the selected unit has already picked a target for a weapon, a "Found Target" marker will appear over the appropriate weapon. You can see where the weapon is targeted by left-clicking the weapon to highlight it. A red dotted line will appear on the field. At the same time, general information about the weapon will appear on the Console Bar. To clear the targeting for this weapon, left-click it again.

In order to target friendly units (with healing weapons, for example), you must hold down the Shift key while left-clicking. Otherwise, the unit will be simply be selected as normal.

## **TARGETING TIPS**

When aiming your weapons it's important to keep the weapon's firing arc and maximum range in mind. The firing arc is displayed as a red arc under the unit's icon on the Console Bar. It increments/decrements in 45-degree steps.

Notice that when the mouse cursor is over an enemy unit, aiming information is displayed. The information will show the chance of hitting the unit, or let you know if the target is blocked, out of range, or out of the firing arc. You can still target outside of the weapons range and arc - the game will automatically correct the shot to keep it inside the weapons envelope.

Sometimes the targeting information will be inconsistent, giving different results each time the cursor passes over the enemy unit. This is because friendly units are in the way and the weapon can't draw a proper bead.

You don't need to fire only at enemy units; you can also target terrain - even if it isn't visible. This allows you to knock down walls or place an area effect weapon in a better position.

## **MORE TARGETING TIPS**

It is useful to know how targeting works. The chance of your force actually hitting what it aims at is quite slim. Instead, when targeting, you're declaring a general area that your force is firing at. This general area grows in size the further away you aim your weapon. If your force is right up close to where it's aiming, then the "general area" will be the one square you aimed at. If your shot is inaccurate, then it will pick one of the units (in either army) - or an empty square - within the general area and hit it.

This mimics the general feel of spraying an area with fire as opposed to picking out one piece in the middle of the battle and firing only at it. It also keeps the enemy from picking out your strong pieces and winking them out in the midst of weaker guys, allowing screens to be established. Of course, if your guy is standing all by himself, then he's the only target.

## **EVEN MORE TARGETING TIPS**

A target square isn't chosen until the weapon fires. Then the deviation, if any, is worked out and a line of sight is traced from the weapon square to the target square. If anything or anyone gets in the way, then that becomes the new target square (except in the case of weapons that ignore terrain). So one may consider aiming repeating weapons well past a squad in order to spread out the deviation area and allow the enemy to "get in the way" of the shots.

One last consideration: Forces bigger than troops have weapons that shoot from different parts of their body. See the unit description for the placement. This can make a big difference when your Comstruk is half behind a building and decides to shoot all its guns.

More details on how attacks are carried out are contained in the Calculating Hits and Damage section.

## **FRIENDLY FIRE**

Friendly Fire is a fact of war and The War Engine is no different...

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## PHASE III: FIRING THE WEAPONS



At this point, all friendly units have already moved and aimed their weapons, leaving you with very little control during the rest of the turn. The information bar is the same as Phase II: the active force along with its weapons is shown. The active weapon is highlighted. However the "Found Target" markers over the weapons have been replaced with "Ready to Fire" markers.

To fire a weapon, simply click on its picture and watch the attack happen. There is no particular order you have to follow - you can highlight any unit and fire any of its weapons.

### **CALCULATING HITS AND DAMAGE**

When determining if a unit or piece of terrain takes damage, three tests take place: 1) Seeing if the unit is hit, 2) checking if the unit took damage, 3) determining whether the unit saves against damage.

### **FINDING THE TARGET SQUARE**

The algorithm for hitting a unit was touched on briefly in the Phase 2 description. The full algorithm is much more involved.

The algorithm starts with the unit's Weapon Skill. Aiming, panic, courage, and range modifiers are then added. Each weapon has its own statistics for adjusting accuracy when used for short-, medium-, and long-ranged targeting. Lastly, the terrain modifier is added. This terrain modifier is determined by tracing the line from the weapon square to the target square, adding up all the DIMINISHES VISIBILITY BY values (not including the square the weapon is in) and dividing it by two. This new number gives the basic chance to hit. (Let's call it ChanceToHit).

To find the square hit (the square in which the weapon lands), the initial step is counting first how many squares up or down from the weapon the target is and then how many squares to the left or right it is. The larger of these two numbers is taken. For example, if a marine takes a shot at an enemy 14 squares up and 9 squares to the left, a value of 14 will be used during the next step.

This number is divided by five and then capped at five, giving a number between 0 and 5. This value is the maximum distance the original square might have been missed by (or MaxDistanceMissedBy.) An area is defined that is +/- MaxDistanceMissedBy squares in all directions, centered on the original target square. So if MaxDistanceMissedBy = 2, it defines a 5x5 area of squares (a 2 square radius area around the original target square) and includes all 25 squares.

A random number between 1 and 100 is then chosen and compared with ChanceToHit. If this random number is less than or equal to ChanceToHit, then one unit-occupied square within the defined area will randomly be hit. If the random number is greater than ChanceToHit, then one empty square within the defined area will be hit. If a unit or empty square can't be found, then a random square will simply be picked as the target square. If you targeted a square holding an enemy unit and passed the ChanceToHit, that square has twice the chance of being hit as any other square containing a unit.

This whole process usually just happens once. However, if a unit is not aiming and is firing a repeating weapon, then the process is repeated 3 times in order to find the final square. For the second iteration, the target determined during the first iteration is used as the new starting square. The third iteration begins with the square picked through the second iteration. This means the deviation from the original target square can be 3 x MaxDistanceMissedBy squares away! This represents the difficulty in controlling these more powerful weapons and also the more general spraying of an area associated with repeating weapons.

Once the final target square is determined, a line is once again drawn between the weapon and the target square. If any forces or solid pieces of terrain (DIMINISHED FIREPOWER BY 100%) appear in the line and the weapon doesn't ignore terrain, that square becomes the new - and final - target square.

Example: Sgt Billy Bob Murphy of the 32<sup>nd</sup> Trencher Division has a Weapon Skill of 40%. He doesn't move during Phase 1 and so is considered to be Aiming, increasing his Weapon Skill to 60%. His morale is zero and so has no effect. Sgt Murphy is firing at a group of 3 enemy forces 22 squares away. The forces consist of a Size 3 ATV Transport with one trooper on either side. Sgt Murphy decides his best target area is the center of the transport.

Halfway between Murphy and his target is a thin row of bushes that will reduce his visibility by 10%. This gives him a ChanceToHit of 55%. (His base 40% + 20% for Aiming - 5% from the bushes.)

Since the target is 22 squares away, MaxDistanceMissedBy = 4 (22/5 rounded down). This means that the area Sgt Murphy will hit in is 9x9 in size - 4 squares to the left, 4 squares to the right, 4 squares short and 4 square too far (in addition to the targeted square). His chance of hitting any square with a unit in it is ChanceToHit = 55%. He fails this roll and an empty square is randomly chosen. The chosen square ends up on the other side of the transport. An LOS is drawn and since Sgt Billy Bob Murphy is firing a direct fire weapon (his trusty HMG Model 50), the transport "gets in his way" of fire and ends up becoming his target.

Let's say Sgt Murphy *had* passed his ChanceToHit and there were 4 squares holding units in the 9x9 area. The squares the Sergeant didn't target would have a 20% chance of being hit while the original would have a 40% change of hit (twice any other). This is calculated by adding 1 to the number of possible squares and dividing it into 100 (100/5 = 20%). Double this for the targeted square.

## CHECKING FOR DAMAGE

First off, if the Damage Strength of the weapon is zero, the weapon cannot possibly do any damage and this part is skipped. This would be the case if you wanted a weapon to only stun and not kill.

The following steps are used to determine the shot's Chance to Damage:

- 1) First, the firing unit's Morale is checked. If it is -50 or below, the unit gets a 10% modifier for their courage. If, however, the unit is Badly Shaken or Panicked, the modifier is -10%.
- 2) If the firing unit is aiming and the target is within the required range (that's 10 squares for a Size 1 unit, 20 for a Size 2 unit, or 30 for a Size 3 unit) then there is another modifier of 10%.

- 3) Many weapons have bonuses or penalties to their Strength if their target is within a certain range.
- 4) The three possible modifiers generated above are added together. The resulting percentage is applied to the weapon's Damage Strength.
- 5) If the weapon is Strength-Based, its adjusted Damage Strength is then raised or lowered by the firing unit's Strength Modifier. For example: A sword's Strength at this point is 50 and the unit wielding it has a Strength Modifier of +20%. The final Weapon Strength would be 60 (50+(50x20%)).
- 6) An Obstacle Modifier is then applied to the Damage Strength, representing intervening terrain that might weaken the incoming shot. Note, however, that this modifier is not applied if the weapon ignores terrain (i.e. is going over any intervening obstacles) or causes an explosion (a grenade doesn't create a smaller boom just because it was slowed down on the way). See the paragraph below for more details on how this modifier is generated.
- 7) The final adjusted Damage Strength is added to the Base Damage Roll. The default rules define the Base Damage Roll as 50%.
- 8) Subtract the appropriate Toughness of the target from the resulting number. The target's Toughness will vary depending on the ammo used by the weapon and the direction from which the attack is coming. Note that Toughness is subtracted from the adjusted Damage Roll rather than reducing it by a percentage. In other words, if the target has a Toughness of 20% and the Damage Roll up to this point is 50, the result is a Damage Roll of 30% (50-20), not 40% (50-(50x20%)).
- 9) Finally, subtract the target's Cover Modifier. This modifier is handled the same way as Toughness in terms of how it is applied. Details on how it is computed are given below.

A random number 1-100 is then compared to the totaled number. If it is greater than the Chance to Damage, then the target escapes damage. Otherwise, the number of hits the target will take is chosen: a number between and including the minimum and maximum damage values for the weapon.

**OBSTACLE MODIFIER** - If firing a weapon that Ignores Terrain or causes an explosion, this is 0. Otherwise, a line is drawn from the source to the target square. If the line of fire passes through terrain that has a DIMINISHES VISIBILITY BY of 100%, then the DIMINISHES FIREPOWER BY value of that terrain is tallied up. This represents loss of firepower from firing through solid objects. For example, let's say you're firing through office cubicles (just thought of a scenario...) The walls block visibility entirely (they're tall) but only Diminish Firepower by 20%. This means your shotgun strength would drop from 50 to 40, as the wall absorbs some of the pellets/shock.

**COVER MODIFIER** - If firing at a unit and the weapon does not ignore terrain or cause an explosion, the Cover Modifier equals the DIMINISHES FIREPOWER BY value of the terrain square immediately in front of the targeted unit. This allows the unit to hide behind walls and other obstacles. Note that the rules can be adjusted to have the Cover Modifier be based on the terrain square the unit actually occupies instead of the square in front of it. The use of the Cover Modifier can also be turned off completely. Also note that a single piece of terrain can be used both in the Cover Modifier and the Obstacle Modifier if it

has the appropriate DIMINISHES VISIBILITY BY to be considered for the OM.

An example: Two soldiers are exchanging fire. Between them are a single tree (DIMINISHES FIREPOWER BY 30% and DIMINISHED VISIBILITY BY of 50%) and two patches of brush (each with DIMINISHES FIREPOWER BY 10% and a DIMINISHED VISIBILITY BY of 30%). One soldier stands immediately behind the tree while the other is out in the open. They are 8 squares apart.

The unlucky fellow in the open has potentially saved himself by hitting his target. He is using a Bolter, which has a Damage Strength of 40. Neither unit is having any Morale problems (yet) so there is no modification there. He's aiming (having remaining still during Phase 1) and is within the range needed for the 10% bonus. A Bolter is defined as having a short range of 10 squares, so its short-range damage bonus of 10% is used. These two bonuses are added together and then applied to the Bolter's basic Strength for a result of 48% ( $40 + (40 \times 20\%)$ ).

A Bolter is not a strength-based weapon so there is no modifier for that.

The Bolter doesn't cause an explosion or ignore terrain, so there is a possibility of an Obstacle Modifier. None of the intervening terrain, however, has a DIMINISHES VISIBILITY BY stat of 100%. The Obstacle Modifier is 0.

The default rules are being used and so the Base Damage Roll is 50. Adding the 48 we've got so far to this gives us a new Chance to Damage of 98.

The targeted soldier has body armor giving him a frontal Toughness of 50 versus the Bolter's ammo type. This is subtracted from the 98 to give a 48. The soldier is located right behind the tree, so there is an additional Cover Modifier of 30 (the tree's DIMINISHES FIREPOWER BY value). This drops the final Chance to Damage to 18% ( $48 - 30$ ). With only an 18% chance of wounding his opponent, perhaps the soldier would have been better off diving for cover during Phase 1 instead of holding his ground and aiming!

## SAVING AGAINST DAMAGE

Before the hits are subtracted from the target, the target has a chance to "save." This represents extra armor in place, the ability of the target to react, or just plain luck. To figure the chance to save, take the Save value of the unit or terrain (0-100 range) and add the Save Modifier of the weapon (-100 to +100). If a random number 1-100 is less than or equal to this number, the target escapes all damage. Otherwise, the hits are applied.

Note that a particularly weak weapon (say, a board with a nail in it) would have a positive save - giving a unit without a save a chance to avoid damage. However, a tremendously powerful weapon - such as a super heated, plasma attack - may have a very low, negative save modifier, effectively wiping out any Save value a target may have.

## TOUGHNESS VERSUS DAMAGE SAVE

Although they may seem redundant at first glance, both Toughness and Damage Save have their own specific uses. Toughness represents the

ability of a unit to be struck and still evade harm. Damage Save represents its potential to dodge or otherwise deflect the incoming attack through something other than pure physical durability.

Consider two units, one a tank and the other an agile scout. The tank is covered in thick armor but isn't nimble enough to dodge. The scout is the exact opposite. He is wearing only light, unrestrictive body armor. The tank should be given a high Toughness score and a low Damage Save score. The scout has a low Toughness but his quick reflexes give him a high Damage Save.

Now let's say somebody unleashes a missile at the tank. This missile has a powerful warhead (high Damage Strength) but gives no adjustment to Damage Save. Its Damage Strength is probably high enough to blow through even the tank's high toughness and deal some damage. The tank's low Damage Save isn't likely to save it. If this same weapon were used against the scout, certainly the Damage Strength will easily puncture his light armor. His high Damage Save, however, will give him an excellent chance to dive out of the way or otherwise avoid actually getting struck. The rocket would make an excellent weapon against the tank but a rather poor one against the scout.

The fellow with the missile launcher gives way to his buddy with a flame-thrower. The overall Damage Strength of the flame-thrower is not all that high. Since it spreads its napalm over a large area, however, it is harder to dodge than most weaponry. This translates into a penalty to the Damage Save of this weapon's targets. If the flame-thrower sprays the tank, its low Damage Strength isn't very likely to penetrate the tank's armor (Toughness) and so it doesn't have much of a chance to do any damage. When the scout is sprayed instead, his low Toughness may or may not stop the flame from hurting him. If it doesn't, he has little chance to dodge, as the flame-thrower's Damage Save Penalty will reduce his normal Damage Save to almost nothing. This makes the flame-thrower the better choice against the scout but less useful against the tank.

This system allows different weapons to be more or less suitable for different targets, something that is a key issue in real combat. By using the various rules for Toughness, Ammo Types, Damage Save, and Damage Save Penalties, combat in The War Engine can be modeled with much greater sophistication than in other simpler systems..