New Simplified Rules for WW2 Naval Combat

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# Introduction

These rules have been designed to provide a very simple and quick game whilst still retaining the armour penetration aspects that were so important to Naval Warfare in that period.

**Optional**: Note, the system does not allow for catastrophic failures (eg magazine explosions), or steering failures or Radar breakdown or destruction (see 4 below for rules for this). It would be possible to make the rules slightly more complex by adding an extra throw of a single dice every time that a new damage block (apart from the first) is entered. If a 0 is thrown then roll again, an 8 or 9 indicates a possible stuck steering (roll randomly for left, right or straight on) and a 0 indicates a catastrophic magazine explosion destroying the entire ship in seconds.

# Scales

The distances used in these rules assume a model scale of 1:6,000 and a ground scale of 1:10,200. This gives a maximum range of 252 cm – beyond that distance it is not possible to see whether a shell fell in front of the target (Short) or beyond it (Long) it is equivalent to 28,000 yards or 14 nautical miles approximately. Feel free to adjust these for different scaled models or play areas.

Speed Scales are based on 1cm = 1 Knot, where the actual speed of the vessel is rounded to the nearest 3 Knots, hence a vessel capable of 23.5 Knots would move 24cm per move. Note an accurate figure for a vessel traveling at that speed with the specified ground scale would be 1.5cm per knot which would mean that if two vessels were closing at 30 knots it would travel over a third of the extreeme range distance assuming they started at the maximum distance only allowing a vessel to fire twice on the target before they were right on top of each other giving too much of a benefit to torpedo attacks. Note though that a ship couldn’t fire its secondary/tertiary armament at a destroyer that often as the range of those guns is considerably less than 28000 yards. Umpires are free to reduce this speed (1cm=1kn) if they wish but it will adversely affect destroyers on a torpedo attack.

The maximum distance that each vessel can move is recorded on the Vessel Record. It is not necessary to move this maximum distance every move.

The maximum distance that a vessel can travel is reduced when a vessel takes damage as per the Vessel Record.

Battlewagons, Carriers and Merchantmen may accelerate at 3 Knots per move and decelerate by 6 Knots per move. Cruisers and Destroyers may accelerate by 6 Knots per move and decelerate by 9 Knots.

If it matters, assume a move is 5 minutes. Vessels carry enough ammunition to fire all of their guns for a maximum of 1 hour and fifteen minutes (15 moves) continuously, but may fire, take a break then fire again, etc.

If using 1:6000 scale models, fix these to a base that is 60 mm long to represent the distance that the ship occupies. Ideally cut a point at the bow and stern that is at 45 degrees and use the point at the bow for measurement purposes. When laying the models out the bases can be placed adjacent to each other, point to point, and when the ships turn they can be pivoted from the bow before moving. The angle will allow bases to be placed adjacent to each other when two of them are at 45 degrees to each other and possible help the angle change when one turns. Destroyers and smaller could possibly be placed on 30 mm bases as they are more manoueverable than larger ships and less likely to collide, but I don’t think that was common practice. Generally ships would have 2000 yards between them (I believe, it might be 2000 feet) but this base allows for that distance from bow to bow rather than stern to bow. The otherwise empty rear of the base could be used to record details of the ship, eg a code (B05), speed (27kt), guns (8SM) and more if room. If there is insufficient space of course the info could be recorded on the underside of the base but at least the code should be added so that the owner and opponent know which ship they are talking about.

# Sequence of Play

* Launch Torpedo Attacks as per Section 12.
* Move vessels, aircraft and torpedoes XXXX up to their current maximum move distance. Note, divisions and squadrons should keep in formation unless changing formation, ie Line Ahead, Line Abreast or En Echelon. The lead vessel of a formation may turn according to *Table 1 - Turning Rates* at any point in the move. All the following ships in the formation will either turn simultaneously when changing formation, or they will move to the point where the lead ship turned and there turn exactly as the lead ship did. When changing formation such as to turn from Line Ahead to En Echelon, all ships turn 45 degrees, to turn from Line Ahead to Line Abreast, all ships turn 90 degrees (possible as two lots of 45 degrees over two moves), etc. Note, turns require a vessel to move a certain distance in a straight line before they turn again. The lead ship may turn before moving in the first move, the other ships in the formation will turn as ordered. Mark the point where the lead ship turned so that other ships may follow at the same point.
* Fire guns from all ships that are in range according to sections 7 to 11.

As an example of turning, a Dreadnought sized ship (HZ) would have to move forward 15cm before it could turn a second time. A 30 knot BC could turn at the start of a move, travel 15cm and then turn again at the end of the move before firing at the very end of the move. They could then turn again at the beginning of the next move (a vessel must have at least one cm of movement left after it turns) XXXX check these distances.

# Dice Types Used

All dice used in this game are D10’s, ie ten sided dice. If you have only D20’s then only use the unit’s digit on the dice and ignore the leading 10 if appropriate. For all dice rolls, if a 0 (or 10) is rolled then count this as a value of 10 and roll the dice again (or roll another dice) – this technique is called “Exploding 10’s”, shortened to epd10 XXXX or exp? in these rules. If a further 10 is rolled then roll the dice again until a number other than 10 is rolled, keeping all ten’s rolled. All dice values are added together, including all the 10’s rolled.

For example, if three dice are rolled and result in 10, 5, 3 and the re-roll of the 10 gave 2, then the total value is 20.

Dice are rolled to equal or beat a Target Number assigned from various situations. Target Number is abbreviated to TN throughout this document. For example the TN to hit a Battleship travelling at 27 knots (the equivalent of 27 cm per move) at extreme range is 25 (from *Table 4 - Base Target Number* *depending on Range and Speed*). Note however, that if this is the first time that the vessel has fired on that target then they will have to add 5 to the TN (from *Table 5 –TN Mods* *caused by Increasing Accuracy over Time*), making 30 in total. See section 7 – Calculating TNs. Note *Table 6 - Adjustments for Size* shows no adjustment for the target being the size for a battleship.

Note, if the firer has Radar Fire Control, then use *Table 11 - TN Mods caused by Increasing Accuracy over Time RADAR FIRE CONTROL only* instead of Table 5and note that there are no TN mods associated with this for Smoke. The player will have to determine what type the Radar is based on their knowledge of the vessel and time period. The early radars will be Type 1 for example, those used at the Battle of North Cape might be considered to be Type 2 and very late 1945 allied radars might be Type 3 – the Japanese had deployed Type 1 Radar Fire Control by early 1945 and may have improved on that later. You could assume the deployment date to be Mid 1943 for Type 1, Mid 1944 for Type 2 and Mid 1945 for Type 3 if you didn’t have any other information.

**Optional**: Whenever a vessel carrying Radar receives their first damage into any damage block other than the first then roll to see if the Radar breaks down or is destroyed, looking at the last three columns in Table 11.

Note also that the Germans appear to have employed a very accurate Sound Ranging system on Prinz Eugen at the time she accompanied Bismarck, she was allegedly able to detect a KGV class ship with Hood long before they came into sight but didn’t recognise the propeller characteristics – they were not aware that PoW was commissioned.

It is possible that this system could have been used to track the fall of shot as well, if you feel that this is so, then treat it as a Type 1 Radar with a 1 in 10 Breakdown chance. I do not believe that Bismarck was fitted with the same equipment. It is possible that this equipment formed the basis for the more modern SONAR post war once the data for the design had been captured.

# Number of Dice Rolled

The number of dice rolled for each attack is determined by the number of guns or torpedoes bearing on the target. See *Table 2 - Number of Guns*. The number of guns bearing is on the Vessel Record, the first number is the number of guns that can fire at a target forward of a line drawn 45 degrees from the bow of the vessel. The second number is for those guns that can only bear between this line and one drawn 45 degrees from the stern, and the third number is for those guns that can only bear aft of the last line. For example Bretagne would be 4/10/4, and Leipzig would be 3/9/6.

All vessels of Cruiser size and larger have two director control positions and can split each type of weapon against two targets. Smaller vessels only have one unless there is evidence for more. Some Battleships for example may have carried 3 or even 4. For example a vessel with a standard four twin turret layout could fire 4 guns at a target that was forward of the ship and 4 at a target that was aft of the ship (or on any other bearing other than forward). A vessel that has a fifth centre positioned turret such as Bretagne, cannot use a director to fire that turret at a third target to one side or the other, however 6 guns could be fired at one target to the side and 4 to a target forward (or aft).

Gun Types that are only side mounted (eg secondary armament and Anti-Air) may fire at **two** targets to **each** side, but if firing at a target to the front, or rear, of the vessel, then reduce this pro-rata. For example a vessel carrying 10 anti air guns could fire at an air group attacking 45 degrees off the port bow, one to the port beam, one to the starboard beam and one astern, but only two of those groups could benefit from the controllers. Note this is not entirely true, some AAA had a built in local director that controlled only that one mount but I have ignored this because it is very difficult to find which ones had that facility.

In the last case described, this would be resolved by rolling one dice against the forward (or aft) target and 2 dice against the targets to the side. If all 10 guns were instead fired at a single target to the side of the vessel, then 4 dice would be rolled.

If firing both the main and secondary guns in the same move they can only target a maximum of two ships unless the ship has more than two low angle directors. If firing at attacking aircraft, most ships of Cruiser size and larger also had two High Angle Controllers (HACs), smaller ships only had one. Hence only two groups of aircraft can be engaged as well with controllers.

Note, if there are more than 19 guns of a particular type firing at a target (this can only really happen with AA guns firing at an air group), then for every group of 5 XXXX extra guns, add one dice to the roll. For example, if 30 guns are firing at one air group, roll 8 dice. This can probably only happen with Semi-Automatic or Automatic DP guns which have a rate of fire of 3 and 6 times respectively of the normal DP gun of the same calibre.

Guns and Torpedoes fired from a single vessel or air group cannot be split to fire at the same target. For example if three Swordfish were to attack a single target, they would have to roll as a group (ie 1 dice for all three aircraft). They cannot individually attack and each roll 1 dice.

**Optional:** To give a little more variation when firing guns not exactly divisible by 3, then subtract 2 from the lowest dice rolled if there are 2 guns in the last group of “3” (eg 5, 8, 14), and 4 if there is only 1 gun in the last group of “3” (eg 4, 7, 10). Note if the lowest dice is less than the amount to be subtracted then set that dice to zero – do not reduce any of the other dice. For example if there are 10 guns then subtract 4 from the lowest dice, if there are 8 guns then subtract 2. Examples: Ten guns rolls 10, 8, 7, 5 and 4 = 30 (4-4=0), eight guns rolls 9, 7, 4 (the 4 becomes a 2) = 20.

# Types of Guns

Guns are split into three types, Main, Secondary and Anti-Air, they are abbreviated with either an M, an S or an A respectively as their second letter. Note that guns that can fire in both the Anti-Air and Anti-Ship role are designated with a D for Dual Purpose, such guns can only be fired once per move, either at a vessel or at an air group but not at both.

These types do not imply the designations of the guns on the ship. For example, the Main guns on a cruiser are no larger than GS, the light cruisers having XS or in some cases HS (eg the British and American AA cruisers). Belfast for example has Main guns of type XS (6”) and Secondary guns of type MS (4”).

Each type is generally split into at most five sizes, Extra, Heavy, Standard, Medium and Light (respectively X, H, S, M and L). There are also very light Anti-Air guns (less than 3”) which are designated as AAA guns. To cover really large guns there are three higher (larger) levels, Collosal, Gigantic, and the largest Immense (respectively CM, GM, and IM).

Hence a gun marked as an XM is an Extra heavy Main gun, MS is a Medium Secondary gun, etc.

Torpedoes also fall into similar naming conventions, with the letter T, hence XT, HT, etc. Note the XT and HT torpedoes are the same size (24” diameter), the difference is in the range, the XT are the Japanese Long Lance torpedoes which have considerably longer range than the other types, and greater speed, HT are on HMS Nelson and possibly a few others. There are no ST torpedoes. XXXX 15” TT?

# Calculating TNs

The TN (or Target Number), is calculated from several sources and can be recorded each move so that if firing at the same target next move, little recalculation is necessary.

Start with *Table 3 – Ranges per Weapon Type*. Check the range from the bow of the firer to the bow of the target and compare with the type of gun firing on this table. Read off the range band from the left column of the table for the number that is exactly equal to or higher than the actual range. For example, a MM gun firing at 157 cm would be considered to be at LONG range. XXXX check this is still true

Use the Range Band found from Table 3 on Table 4 – ask opponent for current speed of target and compare this with the range band to select the relevant TN. In the example above of a MM gun firing at 157 cm against a XXXX cm per move target, the TN would be 21. XXXX

Add to this TN any factors that apply from *Table 5 – TN Mods* caused by Increasing Accuracy over Time. For example if a vessel starts to fire at a target within a new formation (usually a line of ships) when it had not fired at any target in the previous move, then apply the +5 TN modifier applicable to that situation. If a ship has fired at a formation in one move, then cannot fire at it again during the next move, for example because its line of sight has been blocked, then this +5 TN modification must be re-applied once the fire is returned on the formation. XXXX why not step back one column for each move it can’t fire?

XXXX change paragraph below so that the largest TN applies not all of them, firing at the lead ship on turn 1 then switching to the second in line on turn two would otherwise give a greater benefit.

If two or more lines apply on Table 5 because the firer has changed target, then all positive TN mods will always apply which might be from several lines on the same move. If HMS Hood fires on the lead ship of a new formation then the TN Mod will be +5 for first move of firing on a new formation. On the second move, destroyers have laid smoke so she can’t see the first two ships so switches to the third, she now has +4 for first move against a non-adjacent target but she also has +3 (for a total of +7) for the second move against the formation. XXXX not right On the third move smoke covers the third ship too so she switches to the 4th for +1 (3rd move against the formation) +2 (2nd move against a non-adjacent target) and +2 (1st move against an adjacent target) for a total of +5. On the fourth move the first two TN mods are now zero so no longer apply so only the +1 for the 2nd move against an adjacent target applies unless she has to switch fire again.

Take as an example one column lead by HMS Hood heading straight at an enemy column at 27 knots (still speeding up to max), she reaches extreeme range and opens fire, the enemy is already traveling at maximum speed of 21 knots. Hood’s TN is 22 for firing at a XXXXcm target at extreme range + 5 for firing at a new formation – 5 for being across the enemies T = 22 which with only 4 guns (2 dice) this is going to be hard. Having said that Hood is not under fire on the first move – she probably will be on the second move but will not have her T crossed as she is at 45 degrees to the firer, so should have a further 5 subtracted giving 17 as the TN for that first move. On the second move Hood turns to Port to open up the A arcs, speeds up to 30 knots and switches fire to the second ship in line as HMS Nelson is within range of the first ship. The TN for the second move is 22 + 3 (2nd move) + 2 (firing at adjacent vessel) – 5 across T = 22 but now 8 guns firing, and Nelson has 22 on her first move of firing with 6 guns firing, though again will probably not be under fire. On the third move Hood has 22 + 1 (third move of firing at the formation) +0 (2nd move against 2nd ship) – 5 (T) = 18 now much more likely to hit with 3 dice, the average dice roll in my system is just over 6. On the fourth move, Hood moves into Long Range and has a TN of 18, the + 0 (fourth move against formation no longer applies) –1 (3rd move against 2nd ship) – 5 (T) = 12, now likely to get many hits with Nelson having 22 + 1 (3rd move) – 5 (T) = 18 with 6 guns as she has not reached the point where Hood turned yet as her maximum speed is 24 knots.

If fire is switched to a target adjacent to the last target in the same formation, apply the +2 TN modifier for the first move of firing on that vessel. If fire is switched to another target in the same formation that is not adjacent to the last target, then apply the +4 TN modifier for the first fire on that vessel, but note the comments in the above paragraphs on Table 5.

On the following moves, if fire is continued against the same target, then apply the TN from *Table 5 – TN Mods* caused by Increasing Accuracy over Time that is appropriate for the move in question. Note there is a column on the Firing Sheet (see Section 15) to record which the current move of fire is, if two or more lines are appropriate then record all with a slash between them. The values given for the 9th Move are the best TN mod that applies, do not continue to subtract 1 from these figures for further moves, although you may continue to apply the –5 TN for all subsequent firings against the same target.

If the Firer has been damaged, then apply the TN modifier according to the Damage Block in *Table 13 – Affect Of Damage Blocks* that has some damage marked off in it (but not for the first damage block). See Section 14 – Vessel Records.

If multiple ships are firing at the same target in the same move, then for each ship that is firing add 2 to the TN to all the ships that are firing at that same target if their Gun Sizes are less than 2 bands from each other and add 1 if they are exactly 2 bands from each other. For example one ship firing LM and another ship firing CS at the same target would add a TN of 1 for both ships firing. If a third ship fired XS guns at it, then this would add an additional 2 to the ship firing CS but would not affect the ship firing LM, and would add 2 to the ship firing XS. Note for the purposes of Bands, XS and HS are considered to be the same band – the only difference between them is that HS guns may only fire HE shells and not AP shells.

In the latter example, the LM ship would have a TN of +1 and CS ship would have a TN of +3, and the XS ship would have a TN of +2 as it would be affected by the CS ship only.

**Optional:** If only two battlewagons are firing at a single target then the second can time their firings halfway between those of the first ship – Battlewagons generally fire every 30 seconds, by pausing for 15 seconds after the first ship fires it should be easier to determine which shells are from which ship. Note if this Option is used the second ship fires half its guns in the first round only of firing at the enemy (rounded down) and both ships suffer a +1 TN if the range is Long or greater. If more than two Battlewagons are firing at a single target then this option cannot be used. Guns of 10” or less generally fire every 12 seconds or faster so cannot use this option. Guns of 10” to 7.5” average about 4 rounds a minute, guns down to 4.5” around 6 a minute and smaller about 8 rounds a minute. These rules take this rate of fire into account by giving the shells a greater damage number rather than increasing the number of guns firing, resulting in less hits doing more damage. The five minute move gives around 10 of these super heavy shells being fired per move.

Add the appropriate modifies from *Table 6 - Adjustments for Size*, depending on the size of the target and whether inappropriate guns are being fired at smaller targets, or if the target is making smoke or is within it or is beyond it. There is also a TN modifier if the target is end on to the firer (the firer is within 15 degrees either side of the targets bow or stern), and if the firer is not under fire this move.

All Battleships, Battlecruisers, Large Carriers and Liners have no adjustment. Smaller ships have an adjustment. For example a mid to large sized Destroyer has an adjustment of +4 making them particularly difficult to hit, especially at high speed and long range. A 36 Knot (36 cm movement XXXX) DD at Extreme Range would have a TN of 39 on the first move, 37 on the second move and 35 on the third move, etc, unless they had crossed range bands in the meantime. This is an extremely difficult TN to make with only 3 dice, almost impossible with only 2 dice. However, a couple of hits with HS guns will not do it a lot of good.

In addition if the target is end-on (within 15 degrees on either side of the bow or stern) then subtract the “Crossing the T” modifier (subtract 5 from the TN) because shells are far less accurate in a side to side direction than they are in a longitudinal direction. Hence a long thin target is a lot easier to hit than a short wide one.

# Determining Hits

Roll the specified number of dice according to Section 3 - Number of Dice Rolled, and compare with the TN to hit. If this TN is equalled or exceeded then at least one hit has occurred. For every 5 by which the TN is exceeded then an additional hit occurs. In the example above, where the Destroyer would be hit on a 37 on the second move, if 42 is rolled on the dice, then two hits would occur. If the dice thrown is below the TN but within 5 (32 to 36 in the example in the previous sentence) then a Straddle occurs. If a ship obtaining a Straddle fires at the same ship on the next contiguous following move they reduce the TN by 5 points for that move only. If they achieve a Straddle on the following move they can again subtract 5 points on the following move. Note a hit counts as a Straddle for these purposes as well. A straddle means some shells in the salvo fall beyond and some fall short of the target whether any actually hit or not.

# Determining if the Belt or Deck has been Hit

For each hit on an armoured target, roll one dice and compare the result with the last column on the *Table 4 - Base Target Number* *depending on Range and Speed* cross indexed by range. If this TN (in the table) has been equalled or exceeded then the Belt has been hit. Otherwise the Deck has been hit.

# Determining if the Hits Penetrate

For each hit on an armoured target, compare the Firing Weapon Type against the Range and the part of the Armour that has been hit on *Table 7 - Penetration by Gun Type against Belt or Deck Armour.* This will tell you the largest size of Armour than can be penetrated at that range by the shell against that type of armour. Compare it with the appropriate Armour Value from the Vessel Record. If the Armour that can be penetrated (from table 7) is greater than or equal to the actual armour for that location on the target, then some damage has been done.

# Determining the Damage Caused

Perform this step for all hits that have penetrated the appropriate armour.

If the target is unarmoured (ie has a value of 0) for the location hit, then apply the damage from the “Unarmoured” row of the *Table 8 - Damage by Weapon and Armour Type* according to the weapon type.

For hits on the Belt, if the target is armoured and the thickness that could be penetrated is equal to or greater than twice the actual armour + 1, then the shell has passed completely through the target. Although this will cause some damage to the target, this is not as much as it would if the armour caused the warhead to explode within the vessel. See the effect of the 11” shells hitting Exeter at the Battle of the River Plate for example. In this case use the Medium Armour row of Table 8.

Otherwise, use the Armoured row of Table 8, but note, only for those shells that have penetrated the armour.

If the shell didn’t penetrate the armour then apply the Non-Penetrating value.

Note also the difference between Armour Piercing (AP) and High Explosive (HE) shell values – ensure the correct value is used.

Add the value of all hits on each target vessel and notify the owner of that vessel who will mark off the damage on the Vessel Record.

# Handling Torpedoes

Torpedoes are fired at the beginning of a move before all movement, this appears to be different from most rules, but in reality there is no difference between the end of one move and the start of the next.

Torpedoes are fired as a spread with up to the maximum number that can bear on the target. If a spread of 4 torpedoes were launched then 2 dice would be rolled (possibly subtracting 4 from the lowest die).

Inform the owner of the target vessel or formation (see below) that they are under Torpedo Attack and ask them what their general intentions are for that force, that is what is there approximate direction and speed for the next however many moves. You will need this information to compute the running time of the torpedoes.

Torpedo attacks are handled differently depending on the range. At Point Blank range, a torpedo spread may be targeted on a specific vessel, handle the attack as you would any gun firing. Note, there is no need to worry about penetration, and there is a new table depending on the bearing that the torpedo was fired from relative to the target.

At ranges greater than point blank, the torpedoes are targeted on the whole enemy formation. Each ship must determine a selected target in the enemy formation before dice are rolled. If the selected target vessel in the formation is missed, then an attack may be made against the two adjacent vessels at +2 TN mod and then the other vessels in the formation at a +4 TN mod, until one vessel is hit. If the first successful target that is hit would have received more than one hit, then only one torpedo will actually hit it – add any extra torpedoes back into the number that still have to be diced for. For example, if the second torpedo out of a batch of six to attack rolled high enough for three hits, then there are still six more torpedoes to dice for. If there are still torpedoes left to dice for then continue to attack other vessels in the formation that have not yet been attacked until all of the hits have been taken up or there are no more vessels to attack. In this case at least two of those remaining 6 must hit a target – continue dicing until at least three hits have occurred. Once all vessels in the division/squadron have been attacked, if there are still torpedoes left to fire then start with the original target again with no TN adjustment and continue in the same order.

Example

A formation containing four battleships is attacked by a destroyer with eight 21” torpedoes. The destroyer commander selects the second in line to be the first vessel targeted. This is missed, so the destroyer commander then tries to hit the first vessel in the line at +2 TN mod because it is adjacent to the original target. This too is missed so the third in line is targeted, again at +2 because it is adjacent to the original target. This time three hits are obtained, one hits this vessel. At most one of the remaining two hits might hit the fourth in line. This is targeted at +2 TN because it is adjacent to the vessel that was actually hit. If this attack is successful then another hit occurs, it doesn’t matter how well the attack succeeded by, only that it has been hit. There are still six more torpedoes to fire (including the extra 2 hits on the 3rd ship) and at least two of them must hit something. XXXX

XXXX why can’t a ship take more than 1 hit, surely it is more sensible to have the “extra torpedoes” should hit the same ship.

So the final result is that the third and fourth vessel will have received a hit of 12 points each XXXX, enough to fill one damage block and half fill the next. This is assuming that they do not manage to outrun the torpedoes if they turned away. The torpedoes need to hit within the next six moves or they will have avoided them, but doing so may put them in a bad tactical position. Of course there are still at least two more hits to take into account.

For all torpedoes, whether fired at an individual vessel or a whole formation, the target is considered to be Armoured for the purposes of Table 8, if it has 9” or more armour. One with less than this but more than 0” is considered to have Medium Armour. Any vessels with 0” armour are considered to be unarmoured.

The other major difference between torpedoes and guns is that a torpedo takes a finite amount of time to reach the target. All Long Lance (XT) torpedoes travel at 11 cm XXXX per move, all others travel at 8cm XXXX per move. Compute the running time of the torpedo to reach the target. Most commanders either turn their vessels towards or away from a torpedo attack. If they turn towards then add the target’s speed to the torpedo’s speed and divide it into the current distance.

If they turn away then subtract the target’s speed from the torpedo’s and divide the result into the distance, note this means that if you fire the torpedoes from behind the target you need to be very close to be able to hit them. If they do not turn towards or away then just count the torpedo’s speed and divide that into the distance. This will tell you how many moves are left before the torpedo will strike. If this number of moves is greater than the total running time of the torpedo, then they will never reach and damage the target. If they can reach the target then apply the damage at the start of the move computed (before any movement takes place).

Note the commander of a formation under torpedo attack may not change its direction from that specified when the attack was initiated until the torpedoes have reached the formation. So if the formation was turned towards the launching vessel then they must continue to move towards the point from which the torpedoes were fired until the start of the move on which they were due to hit whether any hits have taken place or not.

Example

At the start of move number 12 a destroyer fires a spread of 8x21” torpedoes at a Battlecruiser (Repulse with a 6” belt) from the fore quarter (the ideal point from which to fire). Repulse is travelling at XXXX 5cm per move at a range of 5cm when the torpedoes are launched, ie within Point Blank range. The commander of the Repulse opts to turn away, the torpedoes are only going to be catching up at XXXX 3 cm per move – the torpedoes will arrive some time during the second move from now, ie at the start of move 14.

The base TN to hit Repulse is 10. The destroyer has been peppering the Repulse for the last three moves with her HS guns to gauge the range, hence the TN Mod from Table 5 is 0 (this is the 4th move), there is no TN for Target Size or initial angle of attack. Therefore the total TN is 10. The destroyer commander opts to launch only one spread of 4 torpedoes and rolls two dice for the attack. His roll is 10, 2 and rolls 4 with the re-roll of the 10, giving 16 in total for 2 hits. If using the option to reduce the lowest dice if the last group of 3 is not 3 then this would only be 14 for one hit.

If the commander of the destroyer had not been peppering the Repulse with the MS fire, then the TN would have been 15, only 1 hit, although the destroyer commander may have opted to fire all eight torpedoes and roll 3 dice. If the same dice as above were used plus a 7 for the third dice, then this would be a total of 23 for two hits.

As it is, Repulse will be hit by two 21” torpedoes at the start of move 14, for a total of 90 points XXXX of damage – she is considered to be Medium Armour because of her 6” belt. This will be enough to disable her even if she is undamaged, as it will cause 5 full damage blocks at 18 points per damage block, reducing her speed to 1 cm XXXX per move and adding 8 to her TN to hit. However the destroyer would have to get very close (5 cm in this case) without taking any damage to dish out this much punishment.

# Leadership Dice

All ships receive one Leadership Dice at the start of a battle, all Division or Squadron Leaders receive an extra one and an overall Fleet Commander receives a third. These can be used at any point in the game for one of the following purposes, but once it has been used for one of them it is gone and can’t be used again. Use it wisely.

A Division or Squadron commander can give one (and only one) of his Leadership Dice to a vessel under his direct command, the second is for the use of his vessel only. A Fleet commander can give away up to two of his Leadership Dice to any vessel under his command but must keep the third for his own vessel. Other than this no Leadership Dice can be passed to another vessel.

This dice can be used at any point for one, and only one of the following, but must be announced before the throw is made:

* Roll an extra dice for all firing from the owner’s vessel in a particular move. This extra dice must be added before the roll is made, you cannot wait to see what the result of the roll will be before deciding to use the extra dice.
* Add 7 to the TN for your vessel to be hit for one move only from all sources. Alternatively roll one dice (10’s explode as normal) and add the result as a TN to be hit for that move.
* Ignore the effects of one partially full damage band for the number of rounds equal to the roll of a single dice (10’s explode as normal). Note however that this effect is terminated if the damage band becomes full at a later point in time and at least one point of damage is put into the next band. XXXX this doesn’t seem right – there is no effect for a partially full block?

# Vessel Records

An example of a Vessel Record table is shown below:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vessel Record | | | | | Captain | | | | |
| *Type* | BB | Name | | Duke of York | | | *Leadership Dice* **1 2 3** | | |
| Main | MM | | | | 6/10/4 | | | | |
| Secondary | MS | | | | 8/8/8 | | | | |
| *AA* | LS | | | |  | | | | |
| *AAA* | AAA | | | |  | | | | |
| *Belt* | 14” | | | | Deck | | | ???” | |
| *Speed* | 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 | | | | *(Cross out as damage is taken)* | | | | |
| XXXX check speed and add AA and deck details | | | | | | | | | |
| Damage Blocks | | | | | | | | | |
| *Number* | *Size* | | *Accumulated Damage* | | | *Add to TN to hit* | | | *Subtract from Speed* |
| *1* | 24 | |  | | | *0* | | | *0* |
| *2* | 24 | |  | | | *2* | | | *1* |
| *3* | 24 | |  | | | *4* | | | *2* |
| *4* | 24 | |  | | | *6* | | | *3* |
| *5* | 24 | |  | | | *8* | | | *4* |
| *6* | 24 | |  | | | *10* | | | *5* |
| *7* | 24 | |  | | | *12* | | | *6* |
| *Listing* | 24 | |  | | | *14* | | | *DIW* |
| *Sunk* | 24 | |  | | | *n/a* | | | *n/a* |

Note DIW in the Speed Column means Dead in the Water, ie the vessel can’t move at all. In the Sunk row, the n/a is because the vessel is underwater, it cannot fire anything and its only movement is in a downwardly vertical direction (or an upwardly vertical direction in many pieces).

The Size column in the Damage Blocks section is the amount of damage that the vessel can take in that Damage Block before it is full and further damage is taken on the next Damage Block. If the vessel in the example above already has 21 points of damage in its Block Number 1 and takes a further 28 points in one move then the first 3 will go into Block 1, 24 will go into Block 2 and the last one will go into Block Number 3. This will cause it to add 4 points to the TN of any Target it fires at, and to reduce its maximum speed by 2 cm. XXXX check speed

# Firing Sheet

The firing sheet is used to track vessel movement and firing, an example is shown filled out below. Note not all these columns will be necessary to record what happens, some have been added to allow the reader to better understand how a battle may progress.

XXXX redo this completely

Note in columns where more than one value can be recorded, such as the Dice Rolls, Belt/Deck, Arm Pen, , Success, Damage, then record each item with a slash or some other punctuation mark between them.

Note also that 171 cm is the maximum range at which a vessel can see enough of a target that they can spot the fall of shot without Radar or an Observation Aircraft to assist.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Firing Sheet for:* **Duke of York XXXX redo this table it is totally wrong** | | | | | | | | | | | | | | | | | | | | |
| Move # | Movement | Target | Wpn | # | Range | Band | Spd | Base TN | Time Mod | Dmg Mod | Size Mod | Total TN | Dice | Total Dice | Hits | Belt Deck | Actual Arm | Arm Pen | Success | Damage |
| 8 | 5 | Bismark | MM | 10 | 168 | Long | 6 | 23 | 5 | 0 | 0 | 28 | 10/8/2/1/3/5 | 29 | 1 | 6D | 3.5 | 4.5 | Y | 4 |
| 9 | 5 | 2nd | MM | 10 | 165 | Long | 6 | 23 | 3 | 0 | 0 | 26 | 3/4/9/7 | 23 | 0 |  |  |  |  |  |
| 10 | 30P/5 | 3rd | MM | 10 | 160 | Long | 6 | 23 | 1 | 0 | 0 | 24 | 9/3/7/5 | 24 | 1 | 7D | 3.5 | 4.5 | Y | 4 Note 3 |
| 11 | 5 | 4th | MM | 10 | 155 | Long | 6 | 23 | 0 | 0 | 0 | 23 | 4/3/5/2 | 14 | 0 |  |  |  |  |  |
| 12 | 5 | 5th | MM | 10 | 150 | Long | 6 | 23 | -1 | 0 | 0 | 22 | 4/10/9/1/5 | 29 | 2 | 1D/9B | 3.5/12.6 | 4.5/6 | Y/N | 4 Note 4 |
| 13 | 5 | 6th | MM | 10 | 145 | Long | 5 | 21 | -2 | 0 | 0 | 19 | 7/6/8/8 | 29 | 3 | 1D/8B/2D | 3.5/12.6/3.5 | 4.5/6 | Y/N/Y | 8 Note 5 |
| 14 | 5 | 7th | MM | 10 | 140 | Long | 4 | 18 | -3 | 0 | 0 | 15 | 4/2/3/1 | 10 | 0 |  |  |  |  |  |
| 15 | 5 | 8th | MM | 10 | 135 | Long | 4 | 18 | -4 | 0 | 0 | 14 | 2/3/7/1 | 13 | 0 |  |  |  |  |  |
| 16 | 5 | 9th | MM | 10 | 130 | Long | 4 | 18 | -5 | 0 | 0 | 13 | 4/2/3/3 | 12 | 0 |  |  |  |  |  |
| 17 | 5 | 10th | MM | 10 | 125 | Mid | 4 | 14 | -5 | 0 | 0 | 9 | 7/9/6/5 | 27 | 3 | 6B/9B/8B | 12.5/12.6/12.6 | 11.5 | N/N/N |  |
| 18 | 5 | 11th | MM | 10 | 120 | Mid | 4 | 14 | -5 | 0 | 0 | 9 | 3/9/6/7 | 25 | 3 | 5D/6B/7B | 3.5/12.6/12.6 | 3.5/12 | Y/N/N | 4 |
| 19 | 5 | 12th | MM | 10 | 115 | Mid | 4 | 14 | -5 | 0 | 0 | 9 | 8/10/4/3/5 | 30 | 4 | 1D/6B/9B/8B | 3.5/12.6… | 3.5/12 | Y/N/N/N | 4 Note 6 |
| 20 | 5 | 13th | MM | 10 | 110 | Mid | 3 | 11 | -5 | 0 | 0 | 6 | 7/9/5/7 | 28 | 4 | 2D/5D/6B/9B | 3.5/3.5/12.6/12.6 | 3/13 | N/N/Y/Y | 8 Note 7 |
| 21 | 45S/5 | 14th | MM | 10 | 110 | Mid | 2 | 9 | -5 | 0 | 0 | 4 | 1/2/10/5/5 | 23 | 3 | 1D/0B/9B | 3.5/12.6/12.6 | 3/13 | N/Y/Y | 8 Note 8 |
| 21 | n/a | Z1 | MS | 8 | 102 | Ext | 7 | 30 | 5 | 0 | 6 | 41 | 9/2/5 | 16 | 0 |  |  |  |  |  |
| 22 | 5/10S | 15th | MM | 10 | 112 | Mid | 1 | 9 | -5 | 0 | 0 | 4 | 4/9/3/7 | 23 | 3 | 2D/6B/7B | 3.5/12.6/12.6 | 3.5/13 | Y/Y/Y | 12 Note 9 |
| 22 | n/a | Z1-2nd | MS | 8 | 96 | Ext | 7 | 30 | 3 | 0 | 6 | 39 | 4/5/9 | 18 | 0 |  |  |  |  |  |
| 23 | 30S/5 | Tirpitz | MM | 10 | 113 | Mid | 4 | 14 | 5 | 0 | 0 | 19 | 3/8/2/6 | 19 | 1 | 3D | 3.5 | 3.5 | Y | 4 Note 10 |
| 23 | n/a | Z1- 3rd | MS | 8 | 90 | Long | 7 | 26 | 1 | 0 | 6 | 33 | 9/10/7/1 | 27 | 0 |  |  |  |  |  |
| 24 | 5 | Tir – 2nd | MM | 10 | 113 | Mid | 3 | 11 | 3 | 0 | 0 | 14 | 5/3/2/8 | 18 | 1 | 9B | 12.6 | 13 | Y | 4 |
| 24 | n/a | Z1 – 4th | MS | 8 | 83 | Long | 7 | 26 | 0 | 0 | 6 | 32 | 10/9/8/8 | 35 | 1 | No Armour |  |  | Y | 3 Note 11 |
| 25 | 5 | Z1 – 5th | MS | 8 | 77 | Long | 6 | 23 | -1 | 0 | 6 | 28 | 8/10/9/4 | 31 | 1 | No Armour |  |  | Y | 3 Note 12 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Note 1: Movement, turns are shown as angle turned (in degrees), then P for Port or S for Starboard. Straight movement is just a number of cms moved.

Note 2: Target, if the fire is against the same target then record the number of moves against that target.

Note 3: Bismark’s first Damage Block is now full unless she has taken damage from another vessel, but no effect is taken until at least one point of damage is marked off in the next Damage Block.

Note 4: Bismark has now taken 12 points of damage from Duke of York and is well into the second Damage Block, reducing her speed to 5, and adding 3 to the TN for Bismark to hit anything.

Note 5: Bismark is now within her 3rd Damage Block and is down by 2 cm speed and adds 5 to the TN for her to hit anything.

Note 6: Bismark is now within her 4th Damage Block and is down by 3 cm speed and adds 8 to the TN for her to hit anything. In real trouble.

Note 7: Bismark is now within her 5th Damage Block and is down by 4 cm speed and adds 10 to the TN for her to hit anything.

Note 8: Bismark is now within her 6th Damage Block and is down by 5 cm speed, almost stationary and adds 13 to the TN for her to hit anything.

Note 9: Bismark is now DIW and adds 15 to the TN for her to hit anything. 1 more point of damage and she will be listing. At this point DoY shifts fire to Tirpitz who has already taken some damage, the adjacent vessel in the formation. However Bismark has fallen so far back from the rest of her formation that she is considered to be in a different formation, as she is beyond 4 ship lengths from any other vessel in the formation. Note also that DoY turned slightly away from Bismark to open the range so that she was in the overlap of the zones of immunity (Bismark’s Deck can be penetrated beyond 110 cms and the Belt can be penetrated below 114), so there is a small overlap where shells will penetrate both belt and deck.

Note 10: I haven’t worked out how badly damaged Tirpitz is, so I will ignore any damage effects that slow her.

Note 11: First hit on the DD. With a Damage Block only 2 wide, she is already 1 into her 2nd Block so is slowed to 6 and will have 3 added to her TN for any firing, including Torpedoes. I will ignore all attacks on Tirpitz from now on to simplify the table.

Note 12: The DD has now 3 Damage Blocks full (6 points of Damage, when the blocks are 2 wide). This slows the vessel to 5 knots and adds a TN of 5. She is getting easier to hit, but still capable of causing some considerable damage if she gets closer. Note also that the two hits on her were remarkably lucky. There were two 10’s rolled in 8 dice – I set the dice rolls for purposes of illustration and so as not to enlarge the table too much. It is likely that she would get much closer before taking this level of damage in a real game.

At this point I shan’t continue with the example. It might also be easier to have separate firing sheets for each target fired on, that way it is obvious which each line is meant to be dealing with. It would not be necessary for separate sheets for Bismark and Tirpitz as they are not fired on at the same time.

# Anti-Air Combat

Vessels fire at a group of aircraft in a similar manner to firing Torpedoes at a formation. At Point Blank Range a single aircraft in the formation can be targeted, at greater ranges a random aircraft in the air group will be hit for every hit obtained on the air group. Note if multiple hits are obtained on the same air group, then a single aircraft may be hit by more than one of these hits.

Select any accompanying fighter for the first hit before assigning hits to their escorted bombers. The fighter must be hit before any damage will be taken by the escorted bombers. One hit is sufficient to destroy any single engined aircraft. Hits from guns below 37mm or 2 pdr will require 2 hits to down a twin engined bomber and 3 for a 3 engined bomber and 4 for a 4 engined bomber. Halve this number (round up, ie 1, 2, 2 respectively) for 37/40mm or 2 or 3 pdr. Double the number of hits if the gun is of 0.5” or 13.2mm and triple the number of hits for smaller guns. If the gun is a 57mm or 6pdr then it will destroy any aircraft with one hit unless it is a four engined aircraft which will require two hits. Guns of 9pdr and larger, eg 3”, will destroy any aircraft with a single hit.

XXXX adjust the above to require more hits and convert to multiples eg 3x25mm=2x37/40/2pdr, 2x20mm=1x40mm, 2x.5”=1x20mm, 2xsmaller=1x.5”

Require 2 hits per engine or 1 on pilot?

Because even the slowest of aircraft will travel at least one mile a minute and the move is 5 minutes long then allow all AA guns of 3" or above to fire twice at each air formation (don't double the number of guns firing, perform the firing twice with the actual number of guns bearing), and all guns of smaller size could potentially fire once (not if the aircraft are at high level for example) before the air attack is made.

The first firing of 3" or larger guns fired from the target will take place at long range. The second firing will be at point blank range. TN Improvements due to Time can be taken into account for the second firing, as can the bonus due to not being under fire. Strafing fighters do not count against 3" or larger guns as they are generally in closed turrets or shields. If they are in unarmoured mounts (like most 3.4” mounts) then strafing fighters will put them under fire.

For guns of less than 3", the single firing from the target is performed at point blank range and any accompanying fighters will put the ship’s AAA under fire.

If other vessels in the formation fire on the aircraft then they will do so once at the point of closest approach to the other firing vessel (and before the aircraft attack the target). Vessels beyond the target may fire once at the aircraft after they have carried out their attack unless they are able to fire at the aircraft before the attack (presumably over the target).

Torpedo attacks by aircraft are covered by the following rules. Single engined aircraft will carry one 18” torpedo and twin engined aircraft will carry one 21” or 2x18” torpedoes, unless data for a specific aircraft type is known to be different from this.

To reduce accidents, only a small number of aircraft can attack simultaneously from a particular angle. The limit is 3 aircraft, but they may be accompanied by 1 fighter to strafe the vessel being attacked. The eight angles that a vessel can be attacked from are (if there are enough aircraft available they could in theory all attack in the same move, though it would be more appropriate if only one or two attacks per move was made):

* Directly Ahead
* 45 degrees off either side of the bow
* Abeam on either side
* 45 degrees off either side of the stern
* Directly Astern

It was not uncommon for two flights of Torpedo Bombers to attack from both fore quarters at the same time.

Torpedo Bombers drop torpedoes in exactly the same way that vessels fire torpedoes. The whole formation drops their torpedoes at point blank range to attack a single vessel as a single spread if they survive AA and AAA fire at the beginning of their move. At longer ranges they may target the whole formation in the same way that vessels launch torpedoes.

Bombers can also attack ships in the following manner. Note Skip bombers ideally attack from abeam and all other bombers ideally attack from ahead or astern. If they are not on this ideal line then add 4 to the TN for each extra direction that they are out. Hence skip bombers will have a +8 TN if attacking from ahead or astern and other bombers will have the same TN if attacking from abeam.

Skip Bombing – this is a technique developed by the Americans late in the war and to the best of my knowledge was not used by any other nation. A single aircraft attacks from low level abeam the target and drop the bomb(s) so that it skips like a Barnes Wallace’s bouncing bomb – it has a very good chance of success (-2 TN to hit) but is best used against un-armoured targets. This is generally used by single aircraft, usually without accompanying fighters which would get in the way (+5 TN to hit if fighters are used to strafe or other aircraft attack from the same bearing in the same move).

Dive Bombing – the aircraft start at High Level and dive on to the target, AAA cannot fire at the aircraft until the final move just before bombs are released (and will fire at Point Blank range). Fighters cannot accompany the dive bombers to strafe because they can’t perform the same diving manoeuvre. This is another very accurate method of attacking (-2 TN to hit if each aircraft drops 1 bomb, -3 if they drop 2 or more). The number of dice rolled is based on the number of aircraft attacking. British 4.7” Semi-DP guns cannot engage Dive Bombers as they cannot elevate the guns sufficiently (55 degrees maximum elevation), though they could engage Dive Bombers attacking a different target.

Mid Level Bombing – usually carried out by Fighter Bombers or Medium Bombers, or Fighters armed as bombers, it is not very accurate, +4 TN to hit, but +2 instead if 2 bombs are dropped per aircraft and +0 if 4 or more bombs are dropped per aircraft. The number of dice rolled is based on the number of aircraft attacking. The only AAA guns that can engage a Mid Level Bomber are 37mm or larger (excluding 2pdr).

High Level Bombing – carried out by Heavy Bombers (eg Wellington) or Extra Heavy Bombers (eg Lancaster). This form of attack is very inaccurate - +8 TN to hit, but +7 if 6 or 7 bombs are dropped from each aircraft and +6 if 8 or more bombs are dropped by each aircraft. The number of dice rolled is based on the number of aircraft attacking. Accompanying fighters cannot strafe the target and AAA guns cannot fire at the high level bombers (only A or D equivalent dual guns). For High Level Bombing a complete Squadron may attack in sequence rather than attacking as three separate flights.

If a bomb hits a ship then compare the penetration in *Table 7 - Penetration by Gun or Bomb Type against Belt or Deck Armour* with the deck (belt for Skip Bombing) of the target. Apply the damage depending on the appropriate row – note a bomb will cause some damage even if it doesn’t penetrate, the amount of explosive in a bomb is considerably higher than in a shell of the same type but most bombs are not armour piercing. The only exception that I can think of is one of the attacks on Tirpitz’s covering concrete shelter.

Fighters accompanying the Bombers may fire their machine guns at the vessel, this puts the AA/AAA guns under fire if they are unarmoured. Accompanying Fighters may damage AAA guns or unarmoured AA guns if they would hit the vessel with a +20 TN added, destroying two guns for every hit caused. Note they are actually killing and injuring the crew, the guns can be re-manned 2 moves later but the new crew will have a +4 TN to hit due to not being used to firing the guns.

See also Submarine Combat (Chapter XXXX) for Air to Submarine Combat.

For Carrier Operations, count the distance moved at the relevant air speed for both the journey to and from the target. Subtract 5 minutes from the range for every aircraft being launched from the same catapult on the same carrier for the same mission to allow the aircraft to launch, climb, group up and land on return. XXXX check launch rate.

It takes half an hour for all bombers (including torpedo bombers) to be re-armed for another mission. For Ground Based aircraft, these can be rearmed in half this time. Fighters can be refuelled and re-armed in 15 minutes. XXXX double check against New Campaign rules

Example, a Carrier launches a torpedo strike on a formation from a range of 90 miles at 0900 hours. The aircraft are Swordfish escorted by Sea Gladiators. They reach the target at 1030 hours, attack it and return (if they survive) at approximately 1200 hours (based on a 60 knot speed). They will be ready to re-launch at 1230 hours and would be over the target at 1400 hours. In the meantime, the Sea Gladiators would be ready for another mission at 1215, such as CAP.

# Submarine Combat

The Mk 1 ASDIC system only works if the ship is travelling at 12knots or less.

XXXX add to the TN if travelling faster than this – see notebook in the bedroom

If a submarine or torpedo is in the 90 degree forward arc (45 degrees either side of the centreline) of a ship with an active ASDIC system and within 1500 yards of the ship, then the referee rolls one exploding d10. Add one to the dice if the submarine/torpedo is within the outer 15 degrees of this arc on either side or the outer 500 yards of the range (add 2 if both are true), subtract 1 if it is within the inner 15 degrees either side of the centreline or within 500 yards of the targeting ship (2 if both are true). If the submarine is within 500 yards but in the outer 15 degrees then there is no change to the dice (add 1 and subtract 1). Note if the ASDIC is active the submarine commander knows the bearing to the ship and its approximate range – give or take d10\*20 yards. On a result of less than 4 the object has been spotted – if there is both a submarine and a torpedo within the arc and range then the torpedo is the target that is reported. No other information is given other than that a submerged target has been spotted.

The Mk2 works in the same way but has a range of 2000 yards and may be used up to a speed of 15 knots. If a torpedo or a submarine is spotted, tell the ship commander which 1000 yard segment the object is in – there are only 2 of them (it’s an arc of 90 degrees and 1000 yards wide), but don’t tell them what the object is.

Mk3, only works if the ship is travelling at 18 knots or less, otherwise as above but the maximum range is 3000 yards, if within the outer 1000 yards or the outer 15 degrees then add 1 to the dice (2 if both are true), if within the inner 1000 yards or the inner 15 degrees then subtract 1 as before (2 if both are true). On a result of less than 5 the object has been spotted – if multiple objects eg a torpedo and a submarine then roll for each and give the information for all that are spotted if applicable. Report the 45 degree side of the centreline that the objects are in, and also the real depth and one other adjacent depth determined by a 50/50 roll if it is not obvious. If it’s at shallow then it can only be shallow/medium, if it’s at deep then it can only be medium/deep, if it’s at medium then roll for shallow or deep. If the submarine is running awash or at periscope level then it is considered to be at shallow depth. Tell the ship commander which 500 yard and 45 degree segment the object is in (but not what the object is), there are 12 possible segments.

Mk 4, only works if the ship is travelling at 21 knots or less, on a result of less than 6 the object has been spotted, otherwise treat it as a Mk 3. Report the correct depth that all of the objects are in if they are spotted. Tell the ship commander which 250 yard and 15 degree segment the objects are in – there are 72 possible segments.

On a second move if an object was spotted the previous move then subtract 2 from the dice. If the submarine sinks to the bottom and stops all movement then add 4 to the dice. After being DC’d, the submarine may stop all movement and release some oil and debris and add a further 2 to the dice – it can combine this with sitting on the bottom. It can only release debris twice a day and loses a half day’s worth of cruising range each time it does this. If the ship fails to spot the target on the move after it releases debris then it will believe that it has sunk the submarine and not search for it again unless it is spotted again by a different ship.

Once the ship commander is confident that they have localised the submarine they select the aim point where they want to drop the DCs. The referee marks this on a sheet of graph paper and also the actual location of the submarine. The ship commander selects the depth or depths to set the DCs, runs over the aim point and drop the DCs.

DCs which are two depths from the submarine (deep when the submarine is at shallow, or vice versa) have no effect (the referee might still want to roll dice so that the ship commander doesn’t get extra information from the dice not being rolled). The same is true for DCs dropped 200 yards or more from the submarine. If dropped at the same level or one level away from the submarine then there is a chance to damage it. If dropped below the submarine then it may force the submarine to the surface though it can dive again one move later if it is still watertight.

For patterns that are at the same level as the submarine, roll one non-exploding dice for each group of 5 DCs to give the distance from the aim point that the DCs explode, multiply it by 10 to give a number ranging from 10 to 100 yards. Roll a d8 to give a compass bearing (N/NE/E/SE/S/SW/W/NW). Plot the actual point of impact the number of yards from the aim point in the direction given by the d8. Measure the actual distance from the impact point to the real location of the submarine. If this range is less than 40 then fill two Damage Blocks on the submarine, if it is less than 80 then fill one, less than 120 fill half a Block and if less than 160 fill a quarter of a block.

If the pattern is one level away from the submarine, then perform the above calculations but add 50 yards to the final figure. If dropped at the level below the submarine and damage is actually caused then the submarine is forced up one level. If this happens at shallow depth then they are forced to the surface and must spend at least one move on the surface. They can dive again after spending one whole move on the surface as long as there is no damage in their second damage block.

Depth Charge Attacks – aircraft carrying depth charges can attack submarines according to the following rules. A submarines base TN to be hit depends on its speed, add 8 to this for size (a near miss will still do enough damage to force the submarine to the surface). If the submarine is on the surface or awash it may engage the aircraft with AA fire, if it shoots down the aircraft the aircraft cannot drop depth charges. For single engined aircraft roll 2 dice to try and beat the TN (they only get one attack with depth charges), larger specialised aircraft such as the Sunderland roll 4 dice and may make up to three attacks before returning to base to rearm. They can stay over the target of course to mark it for another aircraft or ship to attack. If the submarine chooses to dive then add 5 to the TN to hit it on the move that it dived, 15 the following move, 30 the move after that, and 45 for the last move that it can be attacked. This combat takes place at point blank range for all other purposes. An exception to these rules is that a Swordfish armed as an anti-submarine aircraft carries two 5 DC patterns so can attack twice. Float Plane Scouts (FPS) or Float Plane Torpedo (FPT) that can carry 21” or larger torpedoes can also carry two patterns. Other TB that carry 21” torpedoes are generally too quick to successfully attack a submarine.

Aircraft Firing Guns at Submarines – aircraft may choose to fire their guns at a surfaced or awash submarine too – roll 1 dice for single engined aircraft or 2 for larger aircraft such as the Sunderland vs the TN based on the submarines speed and size (on the surface or awash only, you cannot fire at diving submarines). 1 point of damage is done for each successful hit. Note this can be performed at the same time as the depth charge attack, but larger aircraft only get 1 dice in that case unless they survive the AA fire (in which case they get a second single dice after they drop the depth charges). There were some specialised aircraft built as submarine busters with very large cannon (up to 75mm) eg Beaufigher or Beaufort (I can’t remember which) and I believe the Stuka which could also be used for this purpose. Roll 2 dice for such aircraft attacking a submarine with guns and treat the gun as a LS (ie doing 2 points of damage XXXX per hit and guaranteeing that the submarine cannot dive). This type of aircraft can still fire at a submarine on the move that it dived as they can see the shadow under water and the cannon is powerful enough to penetrate the water. This type of aircraft always treats the submarine as if it was on the surface (not awash) so will roll against a TN of speed + 8 if the submarine is on the surface or awash and speed +13 if it is in the process of diving. It cannot fire at a submarine on the move after it has dived.

If a submarine receives damage that completely fills its first damage block and has at least one point in the second then it is no longer watertight. It must either do an emergency surface to either continue the fight on the surface or surrender, or it will sink at the end of the following move. During that following move (before it sinks) it can make any applicable turn, change depth or fire torpedoes (or guns if awash or surfaced), but first must roll a 7+ morale check on a d10 – the captain is effectively committing suicide. A surfaced submarine with at least one point of damage in its second Damage Block cannot dive but may continue fighting if it passes a 7+ morale check and will not sink. A surfaced submarine that is fighting on can be boarded (one move to lower a boat, two moves to load the boarding party into it, then the travel time to the submarine, one move to exit the boat on to the submarine deck. If the hatches are battened down then they may lay charges – these go off 2 moves later sinking the submarine at the end of that move. If the hatches are not battened down and the submarine crew are fighting the guns then the boat will have to survive the AAA fire but can fire back at the crew. If the boat reaches the submarine they can force it to surrender 3 moves after they get on the deck. Of course the ship can continue firing on the submarine until the boat is one move away from reaching it.

Before or after firing (but not both), submarines can perform any or all of the following: turn up to 45 degrees, increase speed XXXX by 3 knot, reduce speed by up to 6 knots, change depth by 1 level (shallow to periscope or awash or surfaced is considered to be one level of change), perform an emergency surface. If performing an emergency surface they can reach the surface in one move if they are medium depth or two moves if they are deep. They must remain on the surface for five moves after an emergency surface before they can dive again, if that is possible (they may be too badly damaged). To change depth (other than an emergency surface) or turn they must be moving at 3 knots or more.

If a submarine is at periscope depth or higher (awash or surfaced), then any escort can attempt to ram it. The escort must pass through the location where the submarine is – split the move into phases depending on the speed of the submarine and allow the escort to move after the submarine. The escort may turn twice by up to 45 degrees each time, once in the final phase and once in the middle phase (the previous one if there is an even number of phases eg phase 2 out of 4). If the submarine and the escort are within 50 yards of each other at the end of any phase then the escort has successfully rammed the submarine, however if the ram occurs on the last phase then the submarine may fire guns or torpedoes as it is rammed. Fill two Damage Blocks on the submarine and 1/4 of a damage block for every 6 knots (or part of six knots) that the escort was travelling at on the escort. If that damage fills the current Damage Block with at least one in the next Damage Block then add another Damage Block’s worth of damage. If the same escort later rams a second submarine before it is repaired, then add two Damage Block’s worth of damage if this occurs again.

Example, an undamaged destroyer rams a submarine at 27 knots and fills the first Damage Block and ¼ of the next, therefore adds another Damage Block to make 2 and ¼ full. Later it rams another submarine but at 15 knots adding a further ¾ of a Damage Block for a total of 3 Damage Blocks full (but none in the fourth). It therefore does not get the extra two Damage Blocks that it would have done if it received 1 more point of damage. Had either submarine done one point of damage with guns as they were rammed then the extra two Damage Blocks would have been added and the ship would have 5 Damage Blocks full and at least 1 point in the 6th, so would be in serious problems.

When submarines fire torpedoes at an enemy, add one to the dice roll for every move (except the move that they fired) that they have observed the target through the periscope. Add 2 for every move (except the move that they fired) that they have observed the target while awash or surfaced.

SONAR, initially available to Prinz Eugen only, can be added to other cruisers and destroyers later as described in the Campaign Rules XXXX.

SONAR cannot be used on a ship with an active ASDIC system, or within 2000 yards from a ship with an active ASDIC.

When using a SONAR, if an enemy ship or submarine enters the range of the system, at the end of the move, roll one non-exploding d10. If the result is greater than 3 then the vessel has been spotted. Role another non-exploding d10, if the result less than 6 then multiply the result by 2.5 to give the number of degrees that the vessel is reported to the left of its real position. If the result is greater than 5, then subtract 5 from the dice and multiply by 2.5 to give the number of degrees that the vessel is reported to the right of its real position. If the Class of the ship is recorded then report the Class and the calculated direction, if the actual ship is known then report that as well.

Every move after that, roll another non-exploding d10, on a result of 3 to 9, improve the accuracy of the estimate by 2.5 degrees, on a 10 improve it by 5 degrees (1 or 2 is no improvement). Note the error can never be better than 2.5 degrees unless a 10 is rolled when the error is 5 degrees.

No information will ever be given about the depth of a submarine spotted by SONAR.

# Sighting targets

In some cases in a campaign it is vital to determine if one force sights another.

If the observer is flying at medium or high level then halve the actual range to the target of the sighting if they are on the surface. The maximum range that an aircraft can spot an enemy force is 100 miles not 120.

No observer halves the range against a flying target.

Make one sighting role when the TN changes, from beyond to extreme, extreme to long, etc.

XXXX Add sighting rules for army and note in AA rules that aircraft sighting is in this document.

When two forces get within 60 nautical miles of each other check if each spots the other. Note, the spotting band for one force may be greater than for the other (see *TABLE 14 – Spotting Ranges*). Each side is given a Spotting Type as per *TABLE 16 – Spotting Types*, the best spotter in the force specifies what this value is. The Spotting Type specifies the number of dice to roll, one for each level of type so a Spotting Type 3 will roll 3 dice and a Spotting Type 1 will only roll 1, etc.

The Target of a spotting attempt is based upon the largest target in that force. The target sizes are specified in *TABLE 6 - Adjustments for Size.* Take the Base TN from *TABLE 15 – Base Spotting TNs* and add or subtract the relevant modifiers from *TABLE 17 – Spotting Modifiers*. Note, some of these modifiers are counted more than once depending on the number of targets in the force of that size. Do not include the largest target in this sum – these modifiers only relate to extra targets beyond the first.

Note also for the purposes of my campaign, all merchantmen including Liners and Auxiliaries but not including Oilers are Coal Fired. All Naval vessels (except for submarines which are considered to have diesels and any vessels known to have diesels, eg Deutschland) are considered to be Oil Fired unless they are very old (approximately pre-Orion class). The intention is for only one fuelling type modifier (the worst one) to be included in the calculation but there is an argument to say that this should be applied to each target in the force.

It would be possible to add another modifier if the target force was engaged in combat at the time but I feel that this is unlikely as their location should be known by then.

When the Base value and all the modifiers have been added or subtracted into a single TN then roll the appropriate number of dice (decided above) to see if the TN can be equalled or beaten.

Each spotter can roll the appropriate number of dice against the target’s TN (2 dice for the DDs in Example 2 and 3 for all the other spotters), or if there are a large number of spotters then you can roll one additional dice for each group of 5 spotters that can see in the relevant direction beyond the first.

Example 1- A carrier and 3 BB/BC (4xXZ, only count 3 of them = 6), a cruiser and an oiler (2xHZ, count both = 2), and four destroyers (4xLZ, count all of them = 2). Therefore subtract from the base value, 6+2+2=10 for size.

All are oil fired moving at Cruising Speed (0) (cumulative modifier = -10), they are potentially spotted by an ordinary two seat floatplane reconnaissance aircraft (-3) (cumulative modifier = -13). At extreme range the TN is = 45-13 = 32 to spot with two dice which would require at least two 10s and an average of 6 for the other two rolls. At Long Range the TN becomes = 30-13 = 17 to spot with two dice which is much more likely.

Example 2 – The force described above which is laid out with only 5 vessels per side (2 destroyers ahead, the other 2 on the forward quarters, with the cruiser following and the carrier and oiler behind that and a BB/BC to either side and behind the formation to provide AA cover to the carrier and oiler – I have assumed that the carrier and oiler will have their spotting arcs obscured by the BB/BC on either side) are trying to spot the aircraft. Note the force cannot spot the single engineed aircraft until it reaches 8 nautical miles which is well inside the Point Blank spotting range for the aircraft to spot the force. The largest target size is LZ (+6) and the target is an aircraft (+2) so the chance to spot it even at 8 nautical miles is 45+8 or 53 which is extremely unlikely for even 4 dice (1 extra for 5 per side), it would require 3x10, 2x8 and 1x7 or some such combination.

Example 3 – 1xSurfaced SS (MZ) = +4, +1 for diesel power, -6 for Specialist recce aircraft, = -1 all together. At Extreme Range = 45-1=44 with 3 dice, which is very unlikely, it would require two 10s to be rolled and 24 for the other 3 dice. At Long Range=30-1=29 which still requires nearly 8 per dice. At Medium Range=21-1=20 which should be possible on average.

If an aircraft sights a surface force it can usually get off a report even if it is spotted by any CAP and shot down. The biggest issue is “will the radio work” – the Japanese aircraft that spotted the main American carrier force at Midway had a radio failure and couldn’t get the message off for two hours by which time it was all over for the Japanese. Roll one d10, on a 1 the radio is permanently broken until the aircraft gets back to base – an hour later the radio is fixed. On a 2, multiply an exploding d10 by 5 and that is the number of minutes that the radio is out of action. Any other value and the report goes out – but may not be accurate see below.

# Reporting Sighted targets

Once a target has been sighted a report of its strength is likely to be radioed (the aircraft in Example 3 above would probably attack the submarine if it still had any depth charges left). Use these rules to randomly add errors to the report of the number of targets and their sizes.

Take the number of “hits” obtained from section 18, add one extra hit if the formation was spotted at Long Range, two if the formation is spotted at Mid Range, and three if it was spotted at Close Range.

Roll a single die and select the appropriate column depending on this “hit” value on *TABLE 18 – Error in Numbers of targets*. Look up the result according to the die and number of “hits” and modify the number of targets in the formation appropriately. For example if you roll a 2 and you only had 2 hits you would remove 2 HZ (or appropriate) targets from the formation (you would report the correct number if you had 3 or more hits). In the Example 1 above this would be the Cruiser and Oiler. If it were a 100-bomber formation then you would just remove 2 of the bombers.

Having determined the number of targets to report for the sighting, for each target roll one dice and compare it against *TABLE 19 – Size Change for Each Reported Target*. Again use the number of “hits” obtained in the sighting to determine the column to use and select the row depending on the dice rolled to modify the size of the target.

In Example 1 above with 2 “hits” to spot it then if the dice rolled were 2 to 9 respectively for the 4xDD, Carrier, BB, 2xBC, then you would report them as LZ, 3xMZ, 3xXZ and HZ. If you feel that it is inappropriate to report a potential SS in a formation (though it could be a floatplane that has landed or is about to take off) then you could increase the size of that vessel to MZ instead.

# APPENDIX A - Tables

|  |  |
| --- | --- |
| **TABLE 1 – Turning Rates** vessels may turn after moving: | |
| LZ objects | 3cm forward |
| MZ object (DF and smaller) | 5cm forward |
| SZ object (approx Cruiser Sized) | 7cm forward |
| HZ object (carriers and battlewagons) | 8cm forward |
| XZ object (larger carriers and Battlewagons) | 10cm forward |
| Habbakuk | 16cm forward |

Note, add 1cm to the above for every 3 knots above 21 knots up to 42 knots

If the object is travelling faster than 42 knots add 1cm for every knot above 42 but Fighters and Fighter bombers not carrying any bombs, DC or torpedoes add 1cm for every 3 knots.

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| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 2 - Number of Guns** | 1 to 3 | 4 to 6 | 7 to 9 | 10 to 12 | 13 to 15 | For each +5 |
| Number of Dice to Roll | 1 | 2 | 3 | 4 | 5 | +1 |

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| **TABLE 3a – Ranges per Gun Type (in cms)** | | | | | | | | | | | | | | |
| Weapon Type | IM | GM | CM | XM | HM | SM | MM | LM | GS | CS | XSHS | SS | MSLS | AAA |
| Point Blank | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 31 | 31 | 31 | 21 | 10 | 1 |
| Close | 109 | 104 | 99 | 94 | 89 | 84 | 84 | 84 | 63 | 63 | 63 | 42 | 31 | 3 |
| Mid | 208 | 198 | 188 | 178 | 167 | 157 | 125 | 117 | 116 | 105 | 94 | 73 | 63 | 4 |
| Long | 251 | 249 | 239 | 229 | 219 | 209 | 179 | 169 | 147 | 136 | 125 | 94 | 73 | 6 |
| Extreme | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 199 | 170 | 141 | 112 | 85 | 8 |

The distance, 252 cms, is equivalent to 28,000 yards which is the maximum distance that somebody in a spotting top can see whether a shell fell beyond or in front of their target. All of these guns are actually capable of firing much further but with a very poor chance of hitting unless a spotting plane or radar is used. An IM gun will actually be at Long Range when it can first fire on a target rather than extreme. XXXX see rules on opening fire at shorter ranges. I may add an extra row for Radar (which will also include spotting aircraft) once I have developed the Radar rules.

Note the German 8.2”, 11" (from Von Der Tann onwards) and 12” (from Kaiser onwards) guns have a faster shell with a flatter trajectory than other shells of the same size. In some of my rules I have designated these as Long guns (eg 11Lo) and also added 14Lo, 15Lo and so on. When calculating ranges and penetration against the belt treat them as one weapon type higher and one type lower against the deck, treat then as the correct band for damage whether they penetrate or not. For example, the 11” is treated as an MM against belt armour, and GS against deck armour and a LM for damage. If the German 12” gun is re-bored to 12.7” in the Early Inter Treaty (EIT 1921 to 1928 approx) era then it loses this special ability-see my campaign rules.

Note also that AA versions (and DP versions firing in AA mode) of the S type guns have half the range (rounded up) of the S type guns, eg an XD XXXX (a 5.25" DP gun for example) has a Point Blank range of 16 when firing at aircraft.

There are no AA or DP guns greater than 5.5" and only the Japanese mounted that calibre, Britain had the 5.25" DP and Italy had a 5.3" DP XXXX for example. XXXX not true – France had a 6” Triple DP before the war!!! And America had a Tw6DP during it.

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| **TABLE 3b – Ranges per Torpedo Type** **(in cms)** | | | | | |
| Weapon Type | XT | HT | ST | MT | LT |
| Point Blank | 8 | 6 | 6 | 4 | 3 |
| Close | 20 | 12 | 12 | 8 | 6 |
| Mid | 36 | 20 | 18 | 12 | 8 |
| Long | 56 | 32 | 30 | 18 | 14 |
| Extreme | 84 | 48 | 44 | 26 | 20 |

The XT torpedoes are the Japanese Long Lance, hence the much longer range, HT are the British 24” on HMS Nelson, and any other Nations that used it. ST are 21” or equivalent (eg 19.7”), MT are 18” or equivalent (eg 17.7”) and LT are modern 15” or similar, eg used on Surcouf.

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| **TABLE 4 - Base Target Number depending on Range and Speed** | | | | | | | | | | | | | | | | Chance to hit Belt (1 dice) | |
| Speed (Kn) | 0 | 6 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 45 + |  | |
| Range Band |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Point Blank | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 15 | 2 | |
| Close | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 20 | 4 | |
| Mid | 5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 24 | 6 | |
| Long | 9 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 28 | 8 | |
| Extreme | 14 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 33 | 10 | |

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| **TABLE 5 – TN Mods caused by Increasing Accuracy over Time** | | | | | | | | | |
| (add 5 if NO Directors see Table 6)  **No Radar** (see Table 11 for Radars) | 1st Move | 2nd Move | 3rd Move | 4th Move | 5th Move | 6th Move | 7th Move | 8th Move | 9th Move |
| Firing at a New Formation | +5 | +3 | +1 | 0 | -1 | -2 | -3 | -4 | -5 |

Note if changing fire to an adjacent target to previous target shift the fire one column to the left until a Straddle occurs. Regardless of this adjustment, the total TN will eventually reach -5 even if no Straddle occurs. If fire is changed to a non adjacent target the firer may either classify this as a new formation or move two columns to the left, depending on which would be more advantageous to them. If no fire occurs from this firer for a number of moves and then resumes against the same target then move one column left for each move on which they didn’t fire.

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| **TABLE 6 - Adjustments for Size and other points** | | |
| Size | Type | Adjustment |
| GZ | HMS Habbakuk, BW over 1200 feet long | Subtract 9 from TN |
| CZ | VC, VG, BW over 1000 feet long | Subtract 4 from TN |
| XZ | Battlewagons (BB/BC), Fleet Carriers (VF/VA), Liners (LL/LS) | No Adjustment |
| HZ | Heavy Cruisers (CA), Light Carriers (CVL), Merchantmen (MM), PB | Add 2 to TN |
| HZ | Light Cruisers (CL), Escort Carriers (CVE), Oilers (OI), Auxilary(AUX) | Add 2 to TN |
| MZ | Fleet Destroyers (DF or DD) and Heavy SS of all types on suface | Add 4 to TN |
| MZ | Escorts (DE) and lighter Submarines on the surface and OGT | Add 6 to TN |
| LZ | 4 Engined Aircraft, or large 2/3 Engined Aircraft, eg Wellington, TW | Add 11 to TN |
| LZ | Other 2 or 3 Engined Aircraft and Submarines awash. | Add 14 to TN |
| LZ | Single Engined Aircraft | Add 18 to TN |
| LZ | Swordfish (notoriously hard to hit) instead of +18 | Add 20 to TN |
|  | Crossing the “T” for shell or bomb hits (not skip bombing) | Subtract 5 from TN |
|  | GS or CS type guns firing at MZ sized ships | Add 4 to TN |
|  | M type guns firing at HZ sized ships | Add 4 to TN |
|  | M type guns firing at MZ sized ships | Add 8 to TN |
|  | All guns firing at ship making smoke | Add 2 to TN |
|  | All guns firing at other ships within the smoke | Add 6 to TN |
|  | All guns firing at other ships beyond the smoke (and lose ranging bonus) | Add 10 to TN |
|  | No Guns firing at this vessel | Subtract 5 from TN |
|  | Fire Control but NO Directors | Add 5 to TN |

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| **TABLE 7a - Penetration by Gun or Bomb Type against Belt Armour** | | | | | | | | | | | | |
| Thickness in inches | IM 24” | GM 22” | CM 20” | XM 18” | HM 16” | SM 15” | MM 14” | LM 12” | GS 10” | CS 8.2” | XS 6” |
| Belt | **Ranges in cms.** | | | | | | | | | | | |
| 18” | 304 |  |  |  |  |  |  |  |  |  |  |
| 17.5” | 306 | 278 | 255 |  |  |  |  |  |  |  |  |
| 17” | 308 | 280 | 257 | 233 | 193 |  |  |  |  |  |  |
| 16.5” | 306 | 282 | 259 | 235 | 195 | 155 | 84 |  |  |  |  |
| 16” | 308 | 284 | 261 | 237 | 199 | 161 | 88 | 76 |  |  |  |
| 15.5” | 310 | 286 | 263 | 239 | 203 | 167 | 92 | 81 |  |  |  |
| 15” | 312 | 288 | 265 | 241 | 207 | 173 | 96 | 86 |  |  |  |
| 14.5” | 314 | 290 | 267 | 243 | 211 | 179 | 100 | 91 | 20 |  |  |
| 14” | 316 | 292 | 269 | 245 | 215 | 185 | 104 | 96 | 25 | - | - |
| 13.5” | 318 | 298 | 271 | 247 | 219 | 191 | 108 | 101 | 30 | 28 | - |
| 13” | 320 | 296 | 273 | 249 | 223 | 197 | 112 | 107 | 33 | 31 | - |
| 12.5” | 322 | 298 | 274 | 250 | 226 | 202 | 114 | 112 | 36 | 34 | - |
| 12” | 323 | 299 | 275 | 252 | 229 | 207 | 120 | 117 | 40 | 38 | - |
| 11.5” | 323 | 299 | 275 | 252 | 231 | 211 | 125 | 123 | 43 | 41 | - |
| 11” | 323 | 299 | 275 | 252 | 232 | 214 | 130 | 129 | 46 | 44 | - |
| 10.5” | 323 | 299 | 275 | 252 | 234 | 217 | 137 | 136 | 50 | 48 | - |
| 10” | 323 | 299 | 275 | 252 | 235 | 219 | 143 | 142 | 54 | 52 | - |
| 9.5" | 323 | 299 | 275 | 252 | 235 | 220 | 151 | 148 | 60 | 58 | - |
| 9" | 323 | 299 | 275 | 252 | 236 | 222 | 159 | 154 | 66 | 64 | - |
| 8.5" | 323 | 299 | 275 | 252 | 237 | 223 | 167 | 160 | 71 | 69 | - |
| 8" | 323 | 299 | 275 | 252 | 238 | 225 | 175 | 166 | 77 | 75 | - |
| 7.5" | 323 | 299 | 275 | 252 | 238 | 226 | 183 | 172 | 83 | 81 | - |
| 7" | 323 | 299 | 275 | 252 | 239 | 227 | 191 | 178 | 89 | 87 | - |
| 6.5" | 323 | 299 | 275 | 252 | 240 | 229 | 199 | 184 | 94 | 92 | - |
| 6” | 323 | 299 | 275 | 252 | 240 | 230 | 207 | 190 | 100 | 98 | 57 |
| 5.5” | 323 | 299 | 275 | 252 | 240 | 230 | 213 | 196 | 109 | 107 | 63 |
| 5” | 323 | 299 | 275 | 252 | 240 | 230 | 218 | 201 | 120 | 118 | 72 |
| 4.5” | 323 | 299 | 275 | 252 | 240 | 230 | 223 | 208 | 134 | 132 | 85 |
| 4” | 323 | 299 | 275 | 252 | 240 | 230 | 227 | 213 | 144 | 142 | 100 |
| 3.5” | 323 | 299 | 275 | 252 | 240 | 230 | 230 | 219 | 150 | 148 | 116 |
| 3” | 323 | 299 | 275 | 252 | 240 | 230 | 230 | 227 | 154 | 152 | 129 |
| 2.5” | 323 | 299 | 275 | 252 | 240 | 230 | 230 | 230 | 155 | 153 | 135 |
| Maximum Range that Weapon can Penetrate 2” or less | 323 | 299 | 275 | 252 | 240 | 230 | 230 | 230 | 156 | 154 | 136 |
| 2.5 | American Skip bombing technique against an armoured target with 1000lb bomb | | | | | | | | | | | |
| 1.5 | American Skip bombing technique against an armoured target with 500lb bomb | | | | | | | | | | | |
|  | | | | | | | | | | | | |
| **TABLE 7b - Penetration by Gun or Bomb Type against Deck Armour** | | | | | | | | | | | | |
| Thickness in inches | IM 24” | GM 22” | CM 20” | XM 18” | HM 16” | SM 15” | MM 14” | LM 12” | GS 10” | CS 8.2” | XS 6” |
| **Deck** | **Ranges in cms.** | | | | | | | | | | | |
| 8.5 | 224 | 229 | 234 | - | - | - | - | - | - | - | - |
| 8.25 | 220 | 225 | 230 |  |  |  |  |  |  |  |  |
| 8 | 217 | 222 | 227 | 232 | - | - | - | - | - | - | - |
| 7.75 | 213 | 218 | 223 | 228 |  |  |  |  |  |  |  |
| 7.5 | 210 | 215 | 220 | 225 | 230 | - | - | - | - | - | - |
| 7.25 | 206 | 211 | 216 | 221 | 226 |  |  |  |  |  |  |
| 7 | 202 | 207 | 212 | 217 | 222 | 227 | - | - | - | - | - |
| 6.75 | 198 | 203 | 208 | 213 | 218 | 223 |  |  |  |  |  |
| 6.5 | 195 | 200 | 205 | 210 | 215 | 220 | 230 | - | - | - | - |
| 6.25 | 172 | 177 | 182 | 187 | 192 | 197 | 207 |  |  |  |  |
| 6 | 149 | 154 | 159 | 164 | 169 | 174 | 184 | 224 | - | - | - |
| 5.75 | 144 | 149 | 154 | 158 | 164 | 169 | 179 | 217 |  |  |  |
| 5.5 | 139 | 144 | 149 | 154 | 159 | 164 | 174 | 210 | - | - | - |
| 5.25 | 133 | 138 | 143 | 148 | 153 | 158 | 168 | 203 |  |  |  |
| 5 | 127 | 132 | 137 | 142 | 147 | 152 | 162 | 196 | - | - | - |
| 4.75 | 120 | 125 | 130 | 135 | 140 | 145 | 155 | 188 |  |  |  |
| 4.5 | 113 | 118 | 123 | 128 | 133 | 138 | 148 | 180 | - | - | - |
| 4.25 | 96 | 101 | 106 | 111 | 116 | 121 | 126 | 162 |  |  |  |
| 4 | 79 | 84 | 89 | 94 | 99 | 104 | 114 | 144 | 170 | - | - |
| 3.75 | 78 | 83 | 88 | 93 | 98 | 103 | 113 | 142 | 167 |  |  |
| 3.5 | 77 | 82 | 87 | 92 | 97 | 102 | 112 | 140 | 164 | - | - |
| 3.25 | 75 | 81 | 86 | 91 | 96 | 101 | 111 | 138 | 161 |  |  |
| 3 | 75 | 80 | 85 | 90 | 95 | 100 | 110 | 136 | 158 | 156 | - |
| 2.75 | 74 | 79 | 84 | 89 | 94 | 98 | 108 | 133 | 154 | 152 |  |
| 2.5 | 73 | 78 | 83 | 88 | 93 | 96 | 106 | 130 | 150 | 148 | - |
| 2.25 | - | 70 | 75 | 80 | 85 | 89 | 99 | 122 | 141 | 139 |  |
| 2 | - | 62 | 67 | 72 | 77 | 82 | 92 | 114 | 132 | 130 | 120 |
| 1.75 | - | - | - | - | - | - | 79 | 97 | 119 | 107 | 107 |
| 1.5 | - | - | - | - | - | - | 62 | 80 | 107 | 105 | 94 |
| 1.25 | - | - | - | - | - | - | - | 72 | 90 | 90 | 86 |
| 1 | - | - | - | - | - | - | - | 64 | 74 | 76 | 78 |
| .75 | - | - | - | - | - | - | - | - | 67 | 69 | 70 |
| 0.5 | - | - | - | - | - | - | - | - | 61 | 62 | 63 |
| 3.5 | 1000 lb bomb dropped from DB or High Level | | | | | | | | | | | |
| 2.5 | 1000 lb bomb dropped from Medium Level | | | | | | | | | | | |
| 2.5 | 500 lb bomb dropped from DB or High Level | | | | | | | | | | | |
| 1.5 | 500 lb bomb dropped from Medium Level | | | | | | | | | | | |
| Note none of HS, SS, MS nor LS can penetrate any armour at all | | | | | | | | | | | | |

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| **TABLE 8a - Damage by Gun and Armour Type – Modified XXXX YYYY** | | | | | | | | | | | | | | | | |
| Weapon Size | IM | GM | CM | XM | HM | SM | MM | LM | GS | CS | XS \* | HS \* | SS | MS | LS |
| **Armour Type** | 24” | 22” | 20” | 18” | 16” | 15” | 14” – 12.7” | 12” – 11” | 10” – 9.2” | 8.2” – 6.7” | 6.1” – 5.2” | 5.9” - 5.2” | 5.1” - 4.5” | 4.4” – 3.5” | <= 3.4” |
| Armoured if penetrated) | 27 | 24 | 21 | 18 | 15 | 12 | 11 | 10 | 9 | 8 | 6 | 0 | 0 | 0 | 0 |
| Medium Armour Weapon can penetrate double the Armour Belt + 1”) | 15 | 13 | 11 | 9 | 7 | 6 | 5 | 4 | 4 | 3 | 2 | 0 | 0 | 0 | 0 |
| Un-armoured Belt | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 3 | 3 | 2 | 2/12 | 12 | 9 | 6 | 4 |
| Un-armoured Deck | 27 | 24 | 21 | 18 | 15 | 12 | 11 | 10 | 9 | 8 | 6/12 | 12 | 9 | 6 | 4 |
| No Penetration | 7 | 6 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |

\* Note, the XS column includes guns of between 6.1 and 5.25” mounted on Cruisers and larger vessels, loaded with AP shells, the HS column includes 5.9” mounted on Destroyers, eg the Narvik class, which only fire High Explosive shells, no Armour Piercing shells are carried on any Destroyer or smaller craft. All smaller guns in the HS column and below fire only High Explosive shells. Main and Secondary XS guns will carry a percentage of HE shells to be determined by the player (suggested at least 33%, DD=100%). The two figures given for XS vs unarmoured sections assume Armour Piercing/High Explosive shells are used respectively. All DP guns after 1942 will carry a percentage of proximity fuzed AntiAir shells to be determined by the player (suggested at least 33%) – these are not the same as HE shells which may only be fired at unarmoured targets. Proximity fuzed AA shells add a -4TN to the chance to hit aircraft, -6TN after 1943.

For Long Guns, eg German 15”, 14”, 12”, 11”, 8.2” and 6.7”, treat them as if their Range and Belt Penetration was one band larger and their Deck Penetration was one band lower (damage is as for that band). Eg German 11”Long has Range and Belt Penetration of MM, Deck Penetration of GS and damage of LM.

For Short Guns, treat them as if they were 6” smaller in calibre – smallest band is always LS. If they are also Howitzers, swap the Belt and Deck hit chance. If you roll a Belt hit then instead it hits the Deck. So 4”Sh or 4”How will still be an LS band. XXXX is this correct – very unlikely to hit belt with How.

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| **Table 8b – Damage by Torpedo and Armour Type** | | | | |
| Torpedo Size | XT/HT | ST | MT | LT |
| **Armour Type** | 24” all types | 21” approx | 18” approx | 15” approx |
| Armoured if penetrated) | 48 | 36 | 24 | 12 |
| Medium Armour Weapon can penetrate double the Armour Belt + 1”) | 60 | 45 | 30 | 15 |
| Un-armoured Belt | 72 | 54 | 36 | 18 |
| Un-armoured Deck | n/a | n/a | n/a | n/a |
| No Penetration | 24 | 18 | 12 | 6 |

XXXX penetration shouldn’t be an issue with Torpedoes!!!

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| --- | --- |
| **TABLE 9 – TN Mod for Torpedo Angle of Attack** | |
| Launched from directly ahead of the target | +4 |
| Launched from approximately 45 degrees off the bow, this is the ideal point from which to attack | 0 |
| Launched from approximately beside the target 50 degrees to 135 degrees from the bow) | +2 |
| Launched from behind a line 45 degrees off the stern. | +8 |

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| --- | --- | --- | --- | --- |
| **TABLE 10 - Damage by Bomb and Armour Type** | | | | |
| Armour Type | 1000lb Bomb | 500lb Bomb | 250lb Bomb | 40lb Bomb |
| Armoured (if penetrated) | 8 | 4 | 2 | 1 |
| Armoured (not penetrated) | 2 | 1 | 0 | 0 |
| Un-armoured | 16 | 8 | 4 | 2 |

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| **TABLE 11 – TN Mods caused by Increasing Accuracy over Time - RADAR FIRE CONTROL only** | | | | | | | **On entering new Damage Block** | | |
| **Radar Type** | 1st Move | 2nd Move | 3rd Move | 4th Move | 5th Move | 6th Move | Breakdown Chance | Destruction Chance | Time to Repair |
| Radar Type 1 – Poor | +5 | +3 | +1 | -1 | -3 | -5 | 3-7 | 1 or 2 | 6-10 moves |
| Radar Type 2 - Medium | +3 | +0 | -3 | -6 | -6 | -6 | 3-5 | 1 or 2 | 3-6 moves |
| Radar Type 3 – Good | +2 | -2 | -6 | -8 | -8 | -8 | 3 | 1 or 2 | 1-3 moves |

# APPENDIX B – Damage Sheets

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TABLE 12a – DAMAGE BLOCK SIZES FOR CAPITAL SHIPS | | | | | | | | | | |
| Period | SDr | EDr-EW1 | MW1-LW1 | EIT-LIT | PLT | EW2 - MW2 | LW2 | 60K+ | 80K+ | 100K+ |
| BB | 20 | 24 | 26 | 28 | 30 | 32 | 36 | 40 | 44 | 50 |
| BC/AC | 15 | 18 | 19 | 21 | 22 | 24 | 27 | 30 | 33 | 37 |

Note, ships built smaller than the expected size for a period will have a block size that is half way between the earlier size and the size for the period in which they are built. For example a ship built in the PLT period that is the same size as HMS Bellerophon would have a block size of 27 – round up where necessary. Similarly a BC built in the LIT period the same size as Von der Tann would have a block size of 20.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **TABLE 12b - DAMAGE BLOCK SIZES FOR SMALLER SHIPS** | | | | | | | | | | | | | | | | | | | |
| **Vessel Type** | | PB | CA | CL | LC | LC<4500 tons | DF | DD | DE | DT | SS | VA | VF/B | VL | VE | LL | LS | MV | OI |
| Suggested Change XXXX | | 15 | 12 | 10 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 16 | 12 | 9 | 6 | 5 | 4 | 4 or 2 | 2 or 1 |

PB of > 20,000 tons should be 18 but are really light BC.

EVB (the 60 aircraft version) are classified as a VA

VS (seaplane carrier) are classified as a VE as is the 10,000 ton RMS

The midsized RMS is equivalent to a LS and the small one a MV

Mini versions of ships as used in my campaign rules are half the normal version of the ship rounded down plus one.

For example a Mini BC in the MW1 period would be 10 (19/2 = 9+1)

The two values for MV and OI are for 10,000 and 3,333 ton versions respectively

Treat a TA as an OI rather than a MV if it has Crude Oil on board. Treat an OI that is unladen as a MV for the same reason.

Give an OGT (Ocean Going Tug) a block size of 3 as it is strongly built to do its job

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| **TABLE 13 – AFFECT OF DAMAGE BLOCKS** |

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| --- | --- | --- |
| **Damage Block Number** | Add to TN to Hit | Subtract from Max Speed |
| First | 0 | 0 |
| Second | 2 | 3 |
| Third | 4 | 6 |
| Fourth | 6 | 9 |
| Fifth | 8 | 12 |
| Sixth | 10 | 15 |
| Seventh | 12 | 18 |
| Listing | 14 | Dead in Water |
| Sunk | n/a | n/a |

The amount of damage that each type of vessel can take within each Damage Block is recorded in the*Table 12 - Damage Block Sizes For Vessels Of Different Types*. The Affects of a Damage Block only comes into play once at least one point of damage is recorded in the Block.

# APPENDIX C – Sighting Rules

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| **TABLE 14 – Spotting Ranges** | | | | | |
| Range is in Nautical Miles | Point Blank | Close | Mid | Long | Extreme |
| Target is Coal Fired Ship | 14 | 24 | 36 | 48 | 60 |
| Target is Oil Fired Ship | 14 | 18 | 27 | 36 | 42 |
| Target is Submarine Surfaced | 4 | 6 | 8 | 10 | 12 |
| Target is 3 or 4 Engined Aircraft | 2 | 4 | 6 | 8 | 10 |
| Target is Twin Engined Aircraft | 1 | 3 | 5 | 7 | 9 |
| Target is Single Engined Aircraft or Submarine Awash | 1 | 2 | 4 | 6 | 8 |

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| **TABLE 15 – Base Spotting TNs** | Point Blank | Close | Mid | Long | Extreme |
| Base Spotting Chance | 5 | 15 | 21 | 30 | 45 |

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| --- | --- |
| **TABLE 16 – Spotting Types** | |
| Spotting Types | Spotters |
| 1 | SS awash, MM, LI, OI, single seat aircraft, Within Sight of Land (Random Unit) |
| 2 | SS surfaced, DF/DD/DE, two seat aircraft |
| 3 | All BB/BC, Cruisers, Carriers, multi seat aircraft |
| 4 | All land bases |

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| **TABLE 17 – Spotting Modifiers** |  |
| Largest Target is HZ | +2 |
| Largest Target is SZ | +4 |
| Largest Target is MZ | +6 |
| Largest Target is LZ | +8 |
| Extra XZ target in formation | -2 per extra target |
| Extra HZ target in formation | -1 per extra target |
| Extra MZ target or multi engined AC | -1 per 2 extra targets |
| Extra LZ target in formation | -1 per 3 extra targets |
| Coal Fired at Cruising Speed | -1 |
| Coal Fired above Cruising Speed | -2 |
| Oil Fired at Cruising Speed | 0 |
| Oil Fired above Cruising Speed | -1 |
| SS and other diesel powered | +1 |
| SS on running bateries | +3 |
| Aircraft is the Target of the spotting attempt | +2 |
| Ordinary Aircraft Spotting | -3 |
| Specialist Recce Aircraft Spotting | -6 |

Note a squadron of single engined aircraft would be +8-5 and if more squadrons are in the group then subtract 5 for each extra squadron.

In the case of multiengined aircraft eg Wellingtons escorted by one squadron of fighters then add 6 as the largest target is MZ, subtract 4 because there are 8 more MZ targets then subtract 5 for the fighters giving a total of -3.

Two VA/VF (largest size is XZ so 0), -2=extra XZ, two cruisers -2 and 8 destroyers -4 = -8APPENDIX D – Errors in Reports from Spotters

Note, if formation spotted at Long Range add an extra “hit” to determine the tables below.

If a formation is spotted at Mid Range, add 2 extra “hits” to determine the tables below.

If a formation is spotted at Close Range, add 3 extra “hits” to determine the tables below.

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| --- | --- | --- | --- |
| **TABLE 18 – Error in Numbers of targets - Single Dice Roll** | | | |
| 1 Hit | 2 Hits | 3 Hits | Result |
| 1-3 | 1-2 | 1 | Remove two HZ (or nearest equivalents) from report, at least one target will be reported |
| 4-7 | 3-8 | 2-9 | Report Correct Number of targets (also for 4 or more hits) |
| 8-10 | 9-10 | 10 | Add two extra HZ targets if appropriate (not applicable to Aircraft or Subs) |

|  |  |  |  |
| --- | --- | --- | --- |
| **TABLE 19 – Size Change for Each Reported Target – one Single Dice Roll per Target** | | | |
| 1 Hit | 2 Hits | 3 Hits | Result |
| 1-3 | 1-2 | 1 | Reduce Target Size by 1, (increase if target is LZ unless it is an AC or SS) |
| 4-7 | 3-8 | 2-9 | Report Correct Size of target |
| 8-10 | 9-10 | 10 | Increase Target Size by 1, (reduce it if target is XZ) |