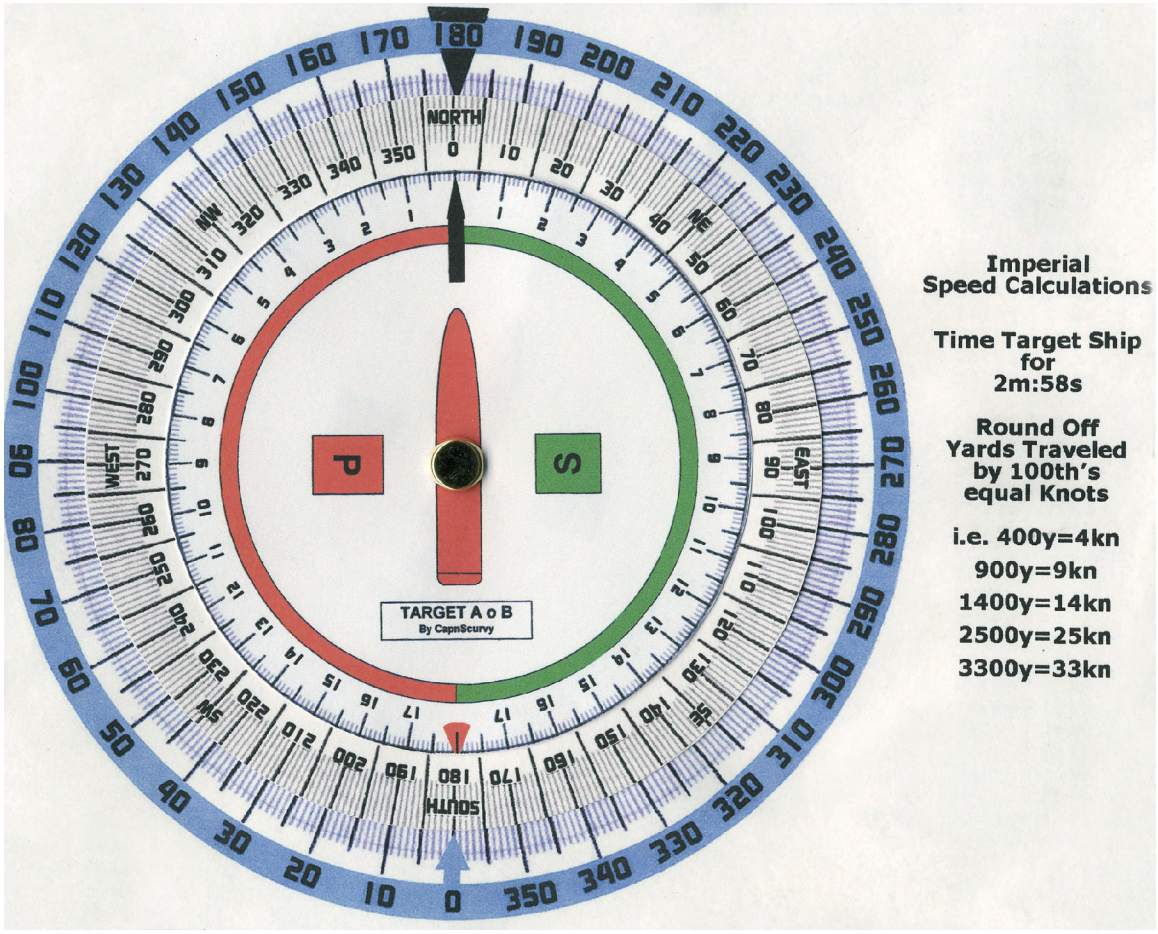
High Realism Tutorial

March 2009

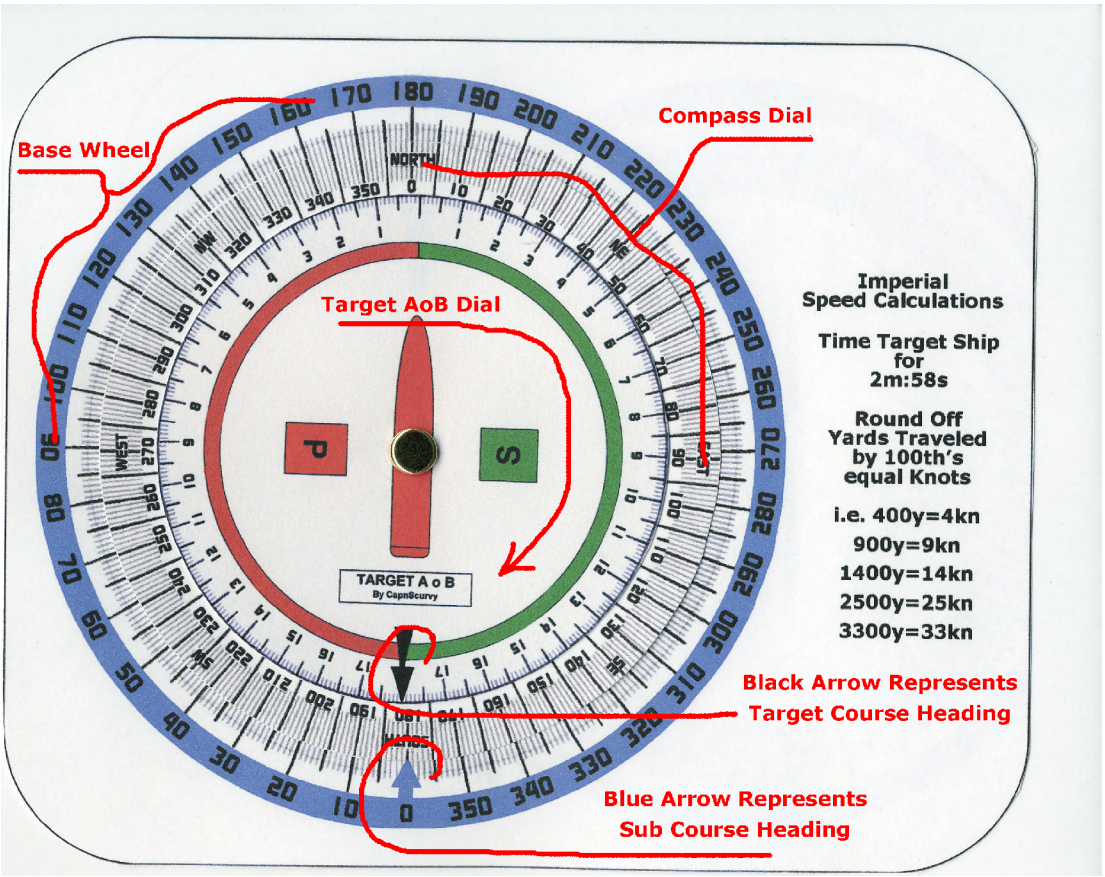


By CapnScurvy

Contents

1. Introduction

These instructions are to aid you in learning to play Silent Hunter 4 with the "High Realism" settings in the Options Menu enabled. Both American and German side of play will benefit in using the Angle on Bow Calculator with the Game Play Settings in SH4 enabled for "Manual Targeting System" and "No Map Contact Update". However, you *may not need* to use the Calculator to achieve the same goal in the American side. The American side of play uses a fine tool called the Position Keeper which (if read properly) can do *almost* the same calculations for you. The German side does not have this device and finding a target bearing is important with the Calculator.



Unlike the Position Keeper, the hand held Calculator can be used while the screen view is at the Navigation Map Station, which makes calculations easier. My intention is to give the player the ability to learn both techniques. I believe the more knowledge one has, the better Captain he will become. The advantage of the Calculator can be readily used for both sides in various ways. Please note the process I am going to describe is only one way to achieve the goal of finding target position manually. I am sure there are other methods that can serve the same purpose. It is my goal to explain MY process to help in your understanding of the method I use. I do not wish to imply that my method is better, or is the only method to achieve the result. Before you start, please copy the "Target Ship Worksheet" found in this PDF.

The Calculator

The Calculator has three parts. The pages must be printed, cut out, and held together with a centered, brass, two-prong brad.

1st. The blue colored Base Wheel represents your sub in two ways. First, the blue arrow at the bottom represents your sub's course heading to the middle Compass Dial. Second, the blue outer bearing degrees represent your view in degrees from the sub or *relative* bearings that correlate with the binocular, the periscopes, or the TBT view bearings.

2nd. The middle Compass Dial represents a typical compass with North being at 0 degree, East at 90 degrees and so on.

3rd. The inner Target AoB Dial represents the target ship with degree marks for either Port, (left) or Starboard (right). There is also a black Arrow at the 180 degree mark that will represent the target ship's course heading to the Compass Dial.

The Position Keeper

Referring to the right image, the top dial represents the target ship data that will be sent from the Attack Data Tool (ADT, more on this later). The lower dial represents your sub. The blue highlighted outer dial represents magnetic (true) north bearings (an understanding of Compass terms will follow in the chapter "Compass 101"). The green inner dial represents your sub's view (relative) bearings. Since 0 degrees represents the bow of your boat (on the green inner dial), the sub in this image is pointing toward approximately the 25 or 250 degree mark (of the outer blue dial), which is your sub's course heading highlighted in red. The small translucent triangle (circled in brown) has two small yellow marks. These marks represent the target ship. The lower tip mark indicates the "target *relative* bearing"; while the upper mark points to the "target bearing to *true* north". In this image the "bearing to *true* north" is 32 or 320 degrees. The "target *relative* bearing" is under a white arrow (highlighted in yellow) which represents the gyro angle settings for the torpedoes. By running the mouse over the arrow you will receive the actual gyro angle which is set by the Torpedo Data Computer (TDC) and the relative bearing of the target. This white arrow (gyro angle) is influenced by different sets of data sent from the Attack Data Tool; the AoB and Speed of the target ship, as well as the Periscopes "Lock on Target" feature. The lower right button circled in light blue is where you turn the PK on or off. To clear the PK after each attack, *make sure you turn it off*. There are several text areas that give you the TDC manual inputs of Range to target, target Speed, and the top area that identifies the particular ship that you identified from the Recognition Manual.

2. Compass 101

To understand basic compass techniques I will assume you know that a real compass is a device that has a pointer attracted to magnetic North. It is circular, and the stationary base is divided equally into 360 points (degrees). Zero (0) represents magnetic North (the 360 degree mark also shares the same point, but is rarely used to convey north). The compass degree point of 90` represents East; South is 180` degrees; while West is 270`.

The game environment is set upon the wide open plain of ocean water, with few stationary objects to aid in judging position or distance. This calls for a point of reference that, for the game purpose, will stay stationary and constant throughout play. This reference point is north. No matter where your sub or target ship may be, its relationship to north is the key to finding its position in the world. A ship has the ability to maneuver within this environment in multiple directions. To determine its direction of travel (course heading) the stationary magnetic north compass position works in real life. For the game, the "top" of the compass along the bottom right in the "Quick Controls" area; and the outer dial bearings of the Position Keeper compass at the subs bow, represents your position to north, and so does the top of the Navigation Map. This bearing is sometimes called "true" north.

Within the confines of your sub, degree points (bearings) are also used to determine in what direction you are looking. The boat has a stationary point of reference much like the position of true magnetic north. The bow (front) represents this position. This relationship to the bow is called "*relative*" bearing, or how a position of interest "relates" to the bow of the sub. The bow is equal to 0 degrees compass reading, with 90 degrees perpendicular Starboard (right) of the bow; 270 degrees to Port (left). 180 degrees will be looking straight back on the boat (over the stern). The view through the binoculars, periscope, and TBT all have a set of degree bearings that scroll along the top of the device in relation to the stationary bow of the sub. This is fine to determine what side of the boat a target may be spotted. However, to plot its position on the Navigation Map, you have to convert the "view position (*relative* bearing) of the target" into the "(*true*) bearing to north". This is where the Calculator earns its keep. Placing known direction headings and/or relative bearings onto the calculator will aid in finding bearing to north without math and that's a good thing.

3. Set up and Record

For the purpose of this tutorial I am going to use images to describe what to do and I will assume you know how to work within the game structure to move and interact with it. These instructions are a learning aid and I recommend that while learning you take a few steps to remove some variables from the process. In the game play settings, checkmark only the Manual Targeting System and the No Map Contact Update parameters. The other critical option of Realistic Sensors should be unchecked. This will give you some help in target data gathering. The other settings have little consequence for us. One thing to do as soon as the call "Ship Spotted" is heard, STOP the BOAT. One moving target is hard enough to keep track of, not to mention a second. If the target ship is off a good bit from your course heading you may wish to turn to meet the target, I have found keeping your target toward the front half of the sub will give consistent range readings. Having your boat at a dead stop is important for accurate plotting, so throw the "Telegraph" to Back Full to stop quickly. Apply rudder to bring the bow to the position you want, and watch the forward speed drop to about 3 knots before going to All Stop. With a little practice and learning to use reverse rudder, you will be able to parallel park back at Pearl. I've seen some modders working on formulas that will aid in sub speed vs. target speed calculations but that's beyond my instructional scope. Use the Pause Button (backspace) frequently during this comprehension process. **I know**, in real life we don't have the opportunity to pause the action but since the game does, take advantage of it while learning. As in true-to-life training procedures, learn the fundamentals in a controlled environment before actually having to use them for real. When you become familiar with the techniques, by all means expand your ability to keep the action rolling as in real life. The game developers recognized that one player doing many tasks in real time would be difficult. This is why many of the stations can still be used when the game is paused.

Ok, your sub is at a stop, the speed reads 0 kn. You are either at the TBT, or periscope and you have turned your view to the target bearing that your message log reports. Lock onto the ship by pressing the "L" key. Pull out the Position Keeper (PK) from the left side and turn it "ON" by mouse clicking the grey button on the bottom right. The button will turn "red" when on. Next press the "N" key to bring out the Recognition Manual (RM). At the top right, pull out the circular device called the "Attack Data Tool" (ADT). Now pause the game; you made it to a good stopping point. There is a method to these steps. The RM won't appear unless the game time is running. The PK can't be turned on if the RM is in the way. You can't lock the target if it's not in the view, and you can't send data from the "Attack Data Tool" if a target isn't "locked".

Now we have time to see what we're up against, and we can start compiling the needed information. If the "Torpedo Fire Control" panel is out, push it back in for some needed room. Find your sub's course heading at the top of the Compass Dial along the bottom right of the screen, or look at the lower Position Keeper dial and find what bearing your sub bow is pointing to on the outer ring. Record your course heading on the Worksheet.

4. Initial Sighting

The picture below shows the contact just being made with the message log reporting its bearing and approximate speed. This speed report is important because this information will get you started in entering data to the computer. Later we will check for accurate target speed through plotting on the Navigation Map.

Warships Speed
Slow = 8kn or less
Medium = 9-19kn
Fast = 20-35kn

Merchants Speed
Slow = 8kn or less
Medium = 9-12kn
Fast = 13-35kn

As a general rule, input a speed from the ADT that is within the above parameters for the target ship contact. This will get the computer heading in the right direction while you gather additional data.

Why is an inaccurate input better than none at all? The Position keeper will follow a particular ship with whatever inputs you give it. At first these can be very inaccurate due to the distance to target; and to think about it, so is the data that you *may* be getting just prior to firing. The task at hand is to constantly check and recheck your data up to firing. With rechecking and resubmitting data you will find the solutions will change as well. This <u>*is*</u> manual targeting, it is **not** a "set it once and forget it" procedure. After a while you will be able to recognize when something doesn't "seem" right with the solutions. What you may see is the range to target varies widely between the most recent check and the last. This tells you the solution is not very accurate. With checking and rechecking, you will have the "feel" for when the solution is proper and correct by receiving consistent solution readings.

To input speed mouse click the lower right ADT button. Click and drag the speed dial to 10kn (roughly merchant medium speed). Click the upper red button to send the speed, 10 will appear on the PK. Please note I have circled the Depth gauge to show approximately 41ft. The sea had a good bit of roll to it. To keep the periscope out of the mess, I raised the sub to a "decks awash" height. You can fire and maneuver from this position but don't get so high that the enemy will see you.

5. Sonar Range

Finding range to target is next. With the target at Long Range the visual Stadimeter is useless, so turn to the Sonar to give you an approximate distance. (I know, I told you to pause the game earlier; however, as I'm writing this I see I left the game run. The pictures are showing the progression of the target closing. My Bad! Do as I say, not as I do!) To get to the Sonar station, unpause the game, and strike the "F8" key. Remember to take the target bearing of the periscope with you. Mouse click the right hand bearing dial at the latest target bearing. In this instance it's 67`. Listen for the "ping" as you click the lower left toggle switch. The left hand dial will indicate its distance traveled. If you were within +/- 2 degrees of the actual target bearing you will hear a second ping as it bounces off the target hull. If you don't hear a second return ping, re-adjust the bearing dial a degree or two and send another ping. An estimated range is shown in the message log screen. Ignore it and click the right hand toggle switch to "send range" to the PK. The accurate distance range will appear in the PK, usually 50 to 75 yards difference from the estimated message log range. A quick word of caution, don't think for a minute you can ping off merchants when an enemy warship is near. You just sent out a red flare that says "Hey, I'm over here"!! The sonar ping will put the warship in a trot heading in your direction with bad intentions.

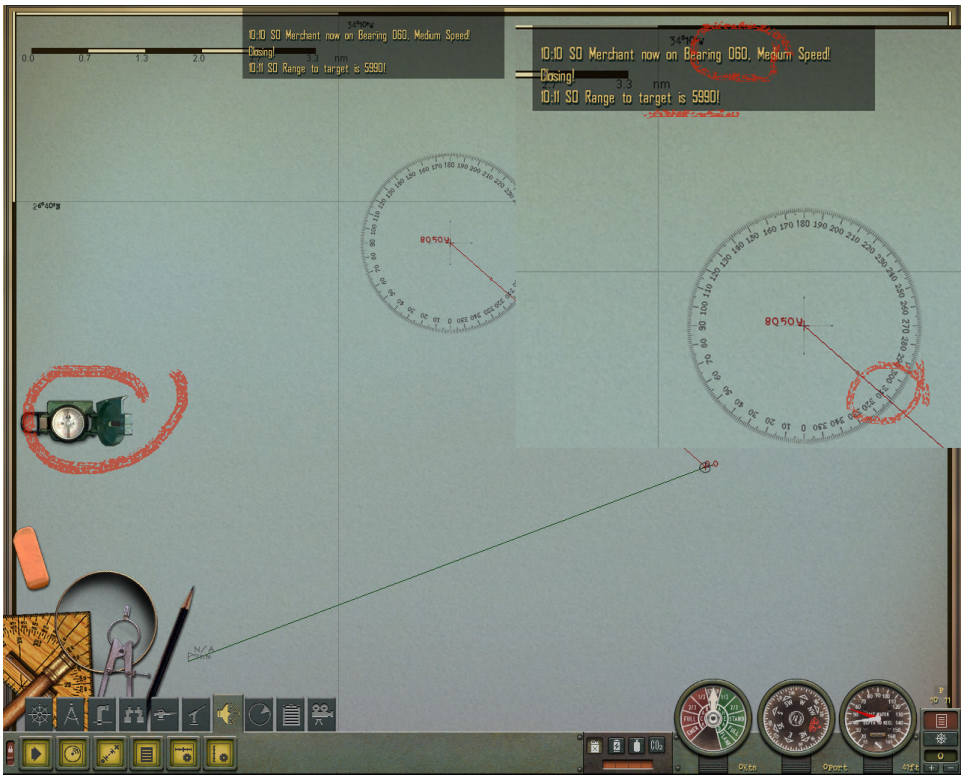
6. Target Identification

Go back to the attack periscope station and pause the game again. We need to make a positive identification of the ship now. The RM can be used with the time paused, so if it's a cargo type ship find the "Merchant" front cover with the arrows and click near the right hand edge to open. Find the target ship, being careful to select the correct one. Mouse click the red checkmark box at the top right of the page. You will see the name of your selected ship type appear on the top of the PK. If the target ship is too far away to make a positive ID, unpause the game and let the ship come a bit closer. Once you can see the target ship better, pause the game again. Leaf through the manual again to make a match and click the red checkmark to send the data. Some good areas to look for differences in ship reference points are funnel placement or size, mast configurations, super structure (wheel house) size and placement. This target has a rear funnel placement, a dead giveaway that it's a tanker. The target is still too far out to make a Stadimeter range estimate (unless you use a mod like MaxOptics3 that increases the views) so go back to the Sonar station and take another range check, send the range to the PK again, and return to the periscope station.

We are almost ready to go to the Navigation Map to plot our first findings. Pause the game for now, while you record your data onto the Worksheet. Write in the ship's name, your subs course heading of **250`** (if you didn't do it before); the target r*elative* bearing of **60`**; (range to target in the PK shows 5729y but I captured this photo just *after* coming back from the Navigation Map) the range I used for the first plot was **5950y**; and the target bearing to north of **311`**; (found at the subs triangular translucent yellow mark over the outer dial ring of the PK). You will notice in the right hand image I have brought out the Chronometer and have pushed down the stem. When the game is unpaused it will start the stopwatch feature to record elapsed time. The time will stop with the next pause. I will be ready to start checking the target's speed when I return from the Navigation Map

7. Map Plotting

We are ready to go to the Navigation Map so strike the backspace key to unpause; strike the "F3" key; then pause the game again taking all of 1 second. Much like the other stations, you can input most of the data while the game is paused.

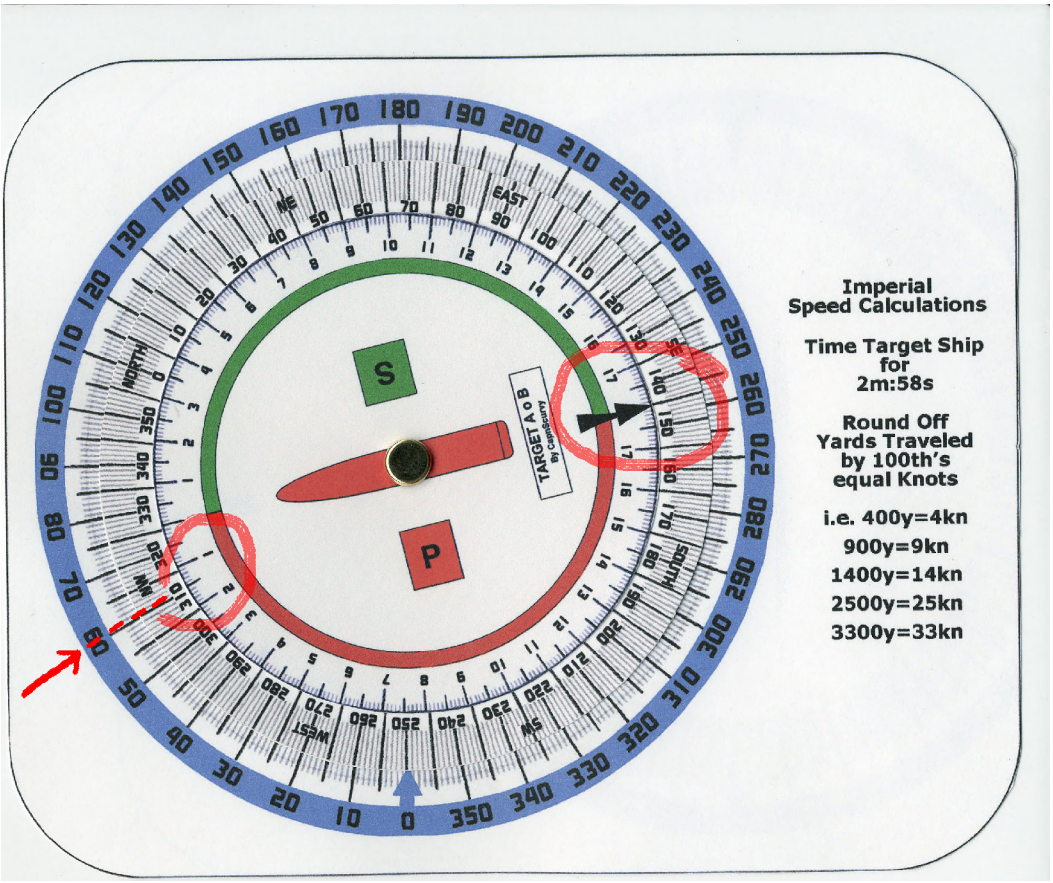


Open the Compass with a left click, and click the Ruler tool to have the protractor appear. You will notice the protractor "looks backwards" with the zero at the bottom of the device. *But*, this is a "plotting protractor" and it's meant to be like this. Put the protractor on any part of the map and draw a straight line towards the top of the map (north). You will see the red drawn line passes right over the zero bearing, zero = north. Centering in the middle of your stopped sub, click and drag a long line, making sure the **protractor edge nearest the sub** is intersecting the target bearing to north figure of **311`** (the red circle on the Protractor shows where you need to read). We have determined the bearing to north is **311** degrees, and have drawn a line from our sub relating to the bearing to "*true*" north figure. It is somewhere along this line that our target is positioned.

8. Calculator Use

I think this is a good time to explain to you how to use the Calculator. As you have seen up to now, the American Position Keeper can give you quite a few reference points for map plotting use. The target bearing to north (**311**`) is an important one. Unfortunately, the German side does not. However, the calculator can be quite helpful when at the Navigation Map with the American side; or to find this target to north bearing when playing the German side. On the Calculator, move the middle Compass Dial to have the Sub Course Heading (**250**`) line up with the bottom blue "Arrow". Make sure this heading is always kept centered at the Arrow while the calculator is handled (at least until you decide to change the subs course). Find the Target *Relative* Bearing (**60**`) along the outer blue Base Wheel and read the matching bearing to the middle Compass Dial. The matching bearing is **311**` which is the target bearing to north. *How about that*, just like the PK figure! Either way you find it, the bearing to north will move with the target as it travels across your path. Keeping the target "Locked" to view is a good idea, but be careful how long you expose your periscope to the enemy. If the target ship spots you her evasive actions may cause her speed to increase, or at least start a zig zag pattern.

You have two ways of determining AoB, either with the calculator or using the Navigation Map to plot the data. I'll explain both, first the calculator. This is a critical task because once you have the target's AoB you can find the target's course heading with the calculator. This task requires you to compare what you see in the periscope/UZO to the position of the calculator's target inner dial and judge the angle that the target is traveling towards you. It's by no means easy to decide if the target ship is on a 20 degree approach or a 40 degree angle? At best it's a guess that is improved with practice. A good practice technique is to have the game options set to allow the computer to find range and AoB. Compare what you see in the periscope to what the ADT is showing for the AoB. After a bit you will see the differences in angle compared to bow wake or mast positions and be fairly accurate.



Pick up the calculator and turn it so the target *relative* bearing (the outer blue numbers) are directly in front of you (in this case **60**`). Make sure the sub heading is still **250**`. Now rotate only the inner target AoB dial to match what you see through the periscope/UZO. Yes it's guess work, but with a little practice you will be accurate most of the time. "Close enough for government work" we used to say! The approximate target course heading is at the black Arrow of the AoB dial. I have guessed that the target AoB is about 1 to 2 (10 to 20) degrees Port, which puts the **target on an approximate 145 degree course heading**.

Remember this is just a first attempt to finding correct data. Better accuracy will occur as the ship closes near and you make additional checks and plots on the map. The Navigation Map process of finding AoB will come later in the tutorial. We still need to make additional plot figures on the map for this method.

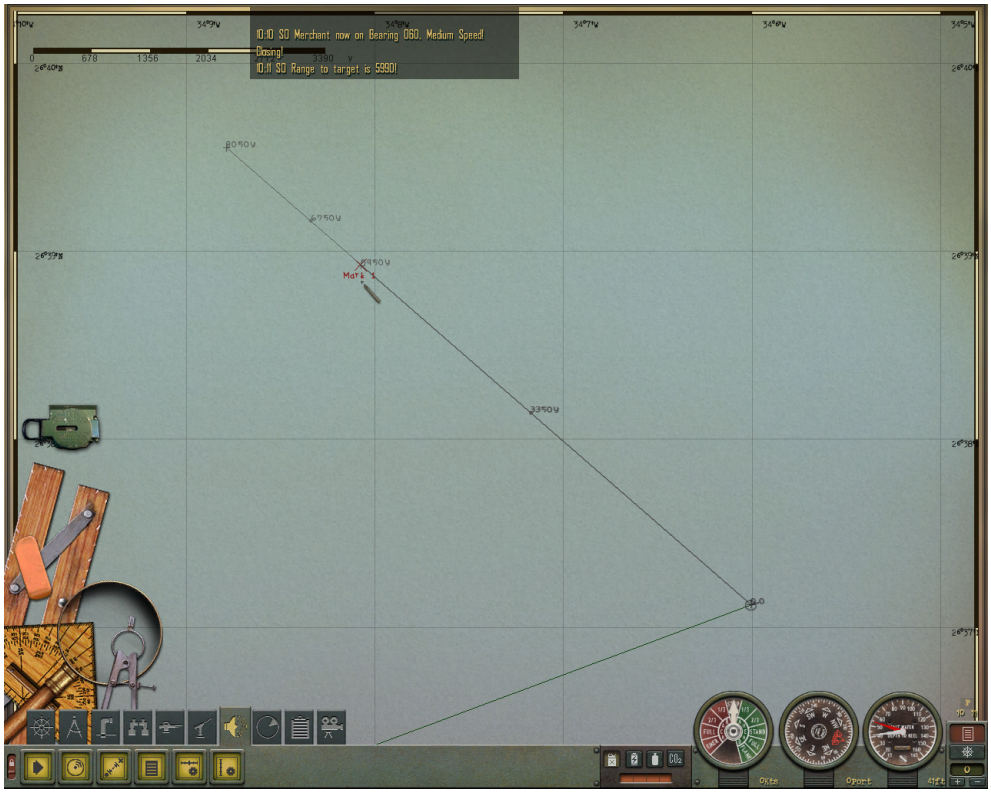
I'll admit the map plotting process is more accurate than the AoB Calculator way. You're not required to make a judgment completely on what you see of a 2 dimensional object from a computer monitor screen. The depth perceptions from computer screens are terrible unlike real life. A good comparison would be to cover one eye and take a look at various objects near and far in real life. Then see the perceptual difference when you have both eyes open. A computer screen does a poor attempt at creating visual 3D true to life images. The visual "Calculator" method is at best, an estimate.

9. Adding Range to the Map Plot

Let's return to the job at hand of plotting the target on the Navigation Map. To find the exact spot along this *relative* bearing line we need to use the worksheet range to target figure of **5950** yards. I closed the compass and used the Ruler to start a new line *next to* where the Protractor was centered on the sub. If you start at the exact spot the Protractor line began, it will become active (turning red) and you will drag it off the sub. Drag the new ruler line *along side* the Protractor line and stop at **5950**y. The right map image shows I am using the Pencil to "mark" the exact spot. We now have the *relative* direction of the target from the sub marked on the map, as well as the general distance to target.

We need to return to the periscope station to prepare for the attack and gather additional information. So let's unpause the game and go to the periscope, this will start the Chronometer (remember we pushed the stem down before coming to the map screen).

BUT, before we do I wish to explain how to determine speed by using map plotting and using the stopwatch to follow a specific *relative* bearing to find accurate target speed.



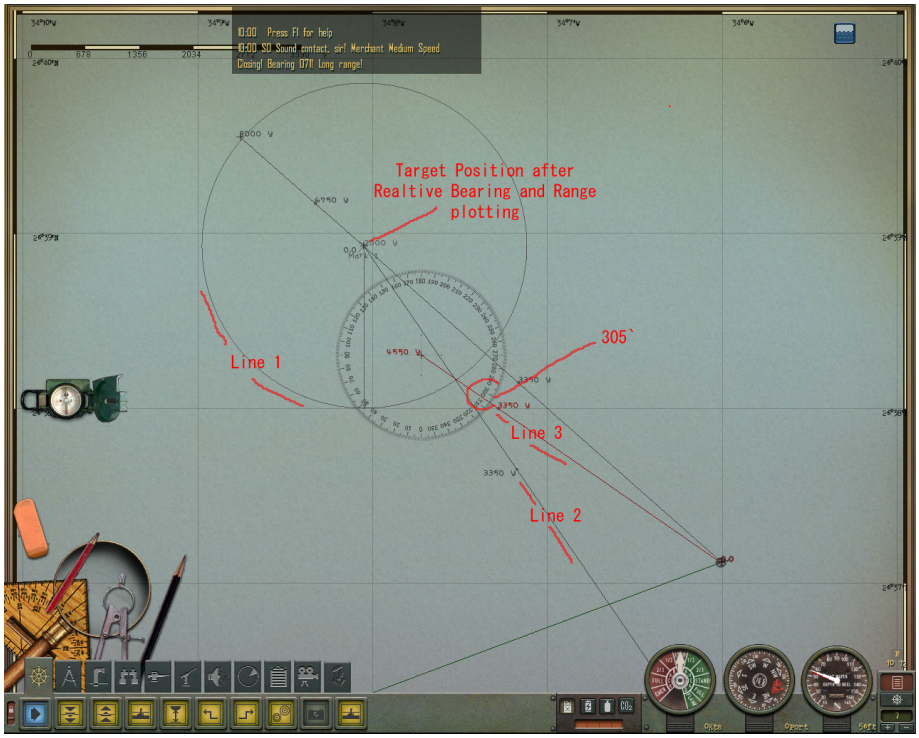
10. Map Plotting to find Speed

Use the map Compass tool to draw a circle (Line 1) out from the target ship's estimated position to the 1 nautical mile mark (use 2 nm or 3 nm circles if the target is a speeding warship, the farther out the greater the accuracy).

1 Nautical Mile = 1852m = 2025y

2 Nautical Miles = 3704m = 4050y

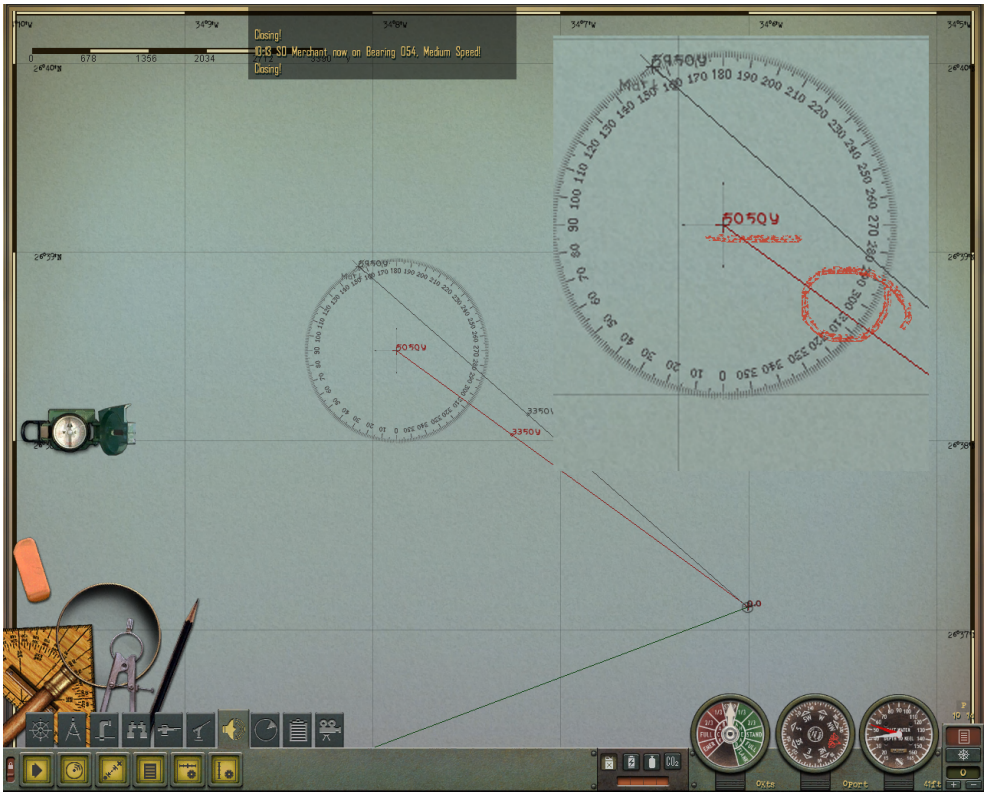
3 Nautical Miles = 5556m = 6075y



Left click the circle to hold it in place, now draw a Protractor line (Line 2) from the target position to the estimated target course heading of **145** degrees, passing beyond the circle. Left click to hold. Placing the Protractor on the sub, draw a line (Line 3) through the two intersecting lines you just drew (the nautical mile circle and the target course bearing line). Read the intersecting bearing from the protractor (**305**`) and find it on the calculator's Compass Dial. With the sub heading (**250**`) still marked at the Blue Arrow, sight from **305**` bearing on the Compass Dial, *out* to the blue Base Wheel *relative* bearing (**54**`); write the *relative* bearing down on the Worksheet (I circle it to keep it separate from the other *relative* bearings). This **54**` *relative* bearing will be the bearing in the periscope/UZO that signals when the target has traveled to the outer edge of the nautical mile circle. Use the Chronometer to time the target's travel from the center of the circle to the outer edge. I have added a separate page to this tutorial that converts elapsed time of nautical mile(s) traveled equals knots. Remember, your accuracy will increase with additional plotting and data gathering. Correct range and course headings will make a huge difference in accuracy and your success in plotting.

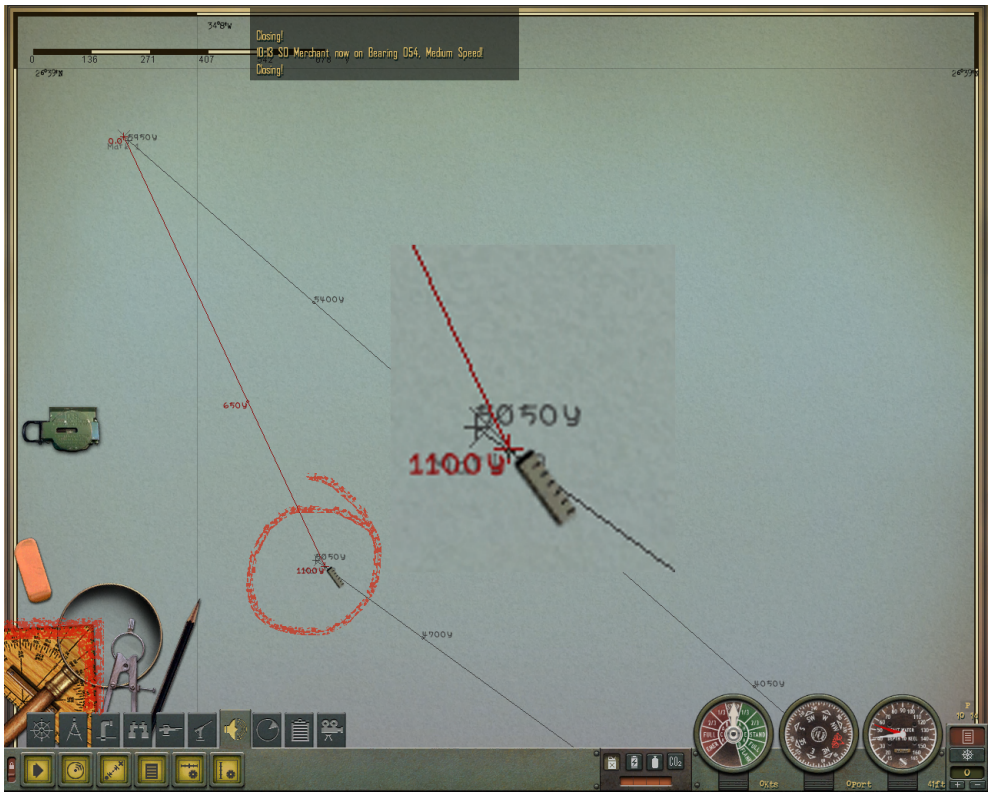
11. Determining Target Speed and Heading

Ok, the game is unpaused and you're back at the periscope station. The Chronometer should be ticking away with the stem still pushed down. As long as you don't reclick the stem the stopwatch feature will continue even if the watch isn't visible. To have a correct speed calculation, follow the correct elapsed time: for Imperial measurement it's 2 minutes: 58 seconds; for Metric measurement it's 3 minutes: 15 seconds. When the elapsed time nears you will need to have the latest bearing and range to target info written on your worksheet. If the target is still over 5000 yards out (4570m), I would rely on the sonar to update the PK with accurate range (again, unless your using MaxOptics3). You can also use this time to set your torpedo's depth, speed and firing mechanisms. My personal preference is to set the "exploder" to contact, "speed" to fast, "depth" to within the Recognition Manual measurement for draft. With the latest data in hand, when the Chronometer reaches the exact elapsed time of 2:58 for Imperial, strike the Navigation Map key, then "Backspace" to pause.



It should be noted that if you left click the Chronometer "stem" to stop the watch, the elapsed time will revert back to zero. To keep the elapsed time on the watch use the pause key of the game to stop the time progression.

As I stated earlier, using the AoB Calculator is only an *approximate* method of finding target heading. To be more precise, map plotting needs to be carried further. With two different *relative* bearing and range figures, a more accurate plot can be achieved. The latest target *relative* bearing after the 2 min 58 second elapsed time was **54** degrees with the Sonar found range of **5050**y. The target bearing to north is about **307** degrees. Using the Protractor, I centered it onto the farthest point of the first line I made, activated the line, then dragged it down to the exact **5050**y distance, with the target bearing to north (**307**`) intersecting the line. I used the Pencil to mark the spot. Reusing lines in this way will keep the map neat, as long as you remember to use the Pencil to keep track of the important points of reference. In this case it's the first estimated target position.



Next, we need to find the distance between these two points, so place the Ruler at the first "mark" and measure down to the second. It's about 1100 yards. That translates into a speed of **11** knots. While you still have the Ruler active, pull a long line down across the map past your sub's position. Make sure the line intersects through the second "mark" you just drew and left click it to leave it on the map. This is the target ship's estimated course. You will notice I have highlighted the Protractor Angle Tool in the left bottom corner of the map screen. We will use this to find the Angle on Bow of the target ship.

12. AoB by Map Plotting

Place the Protractor Angle Tool onto the target *relative* bearing line (it doesn't matter exactly where, just on it). Pull it up to the second mark (where you measured the 1100y distance), left click it at the mark then run it down the target ship's course line. The degree reading at the mark is the Angle on Bow of the target ship (**29**`). Remember, these first readings are close to being correct, but they are estimates that will be more accurate as the distance to target becomes smaller. Now let's unpause the game again, go to the periscope station and update the target speed to **11** knots and put in the AoB angle of **30** degrees Port.

The picture below shows the ADT with the speed button clicked. Drag the dial to **11** kn then send the figure to the PK with a left click of the red top button. Doing the same for the AoB will move the upper target ship dial to the **3** or **30** degree Port on the PK.

I let the ship draw near and compared Sonar range to Stadimeter found range and updated the PK as I went. To check AoB again, I waited several minutes and took my latest readings of range and bearing back to the map. Again I drew out the same lines from the sub with the new measurements and calculated that the AoB was now **35** degrees Port. The speed of **11** kn is the same as before. The solution is beginning to look consistent from one check to the next. This tells us we're on target for an accurate solution.

13. Final Checks

We're getting close to *go* time. I am taking a final reading of the target ship with the Stadimeter. I'm using my Ship Centered, Accuracy Fix (SCAF) Mod to take range at the reference point of the Nippon's crane structure. Range to target is almost three times the game manual recommended distance.

A good rule of thumb is to fire your torpedoes within a 30 degree arc (15 degrees port or starboard of the sub's *relative* zero bearing). Waiting for the target to get into the "crosshairs" will help to eliminate the chance of the Gyro angle being too far off to make an accurate hit.

Don't forget to open the torpedo doors before firing. If you have ever wondered why in "automatic range finding" firing a torpedo struck the target at the stern or missed completely, is because the tube doors were not opened before firing. The delay is programmed into the gyro angle and that's why a torpedo will run unexpectedly to the rear of a target.

Ok, so I couldn't wait. I've fired the torpedo's at about a **23**` *relative* bearing. You will notice the range to target is 2801 yards. Almost 3 times the recommended distance the game states you should fire a torpedo with good results (less than 1000 yards).

The Chronometer now has a red needle to indicate the projected time of impact. The projected run time is about 1 minute, 36 seconds.

The results speak for themselves.

I hope you enjoy trying manual targeting with the game settings set to High Realism. It opens new techniques to achieve the same purpose of setting the Rising Sun.

See you under the sea.

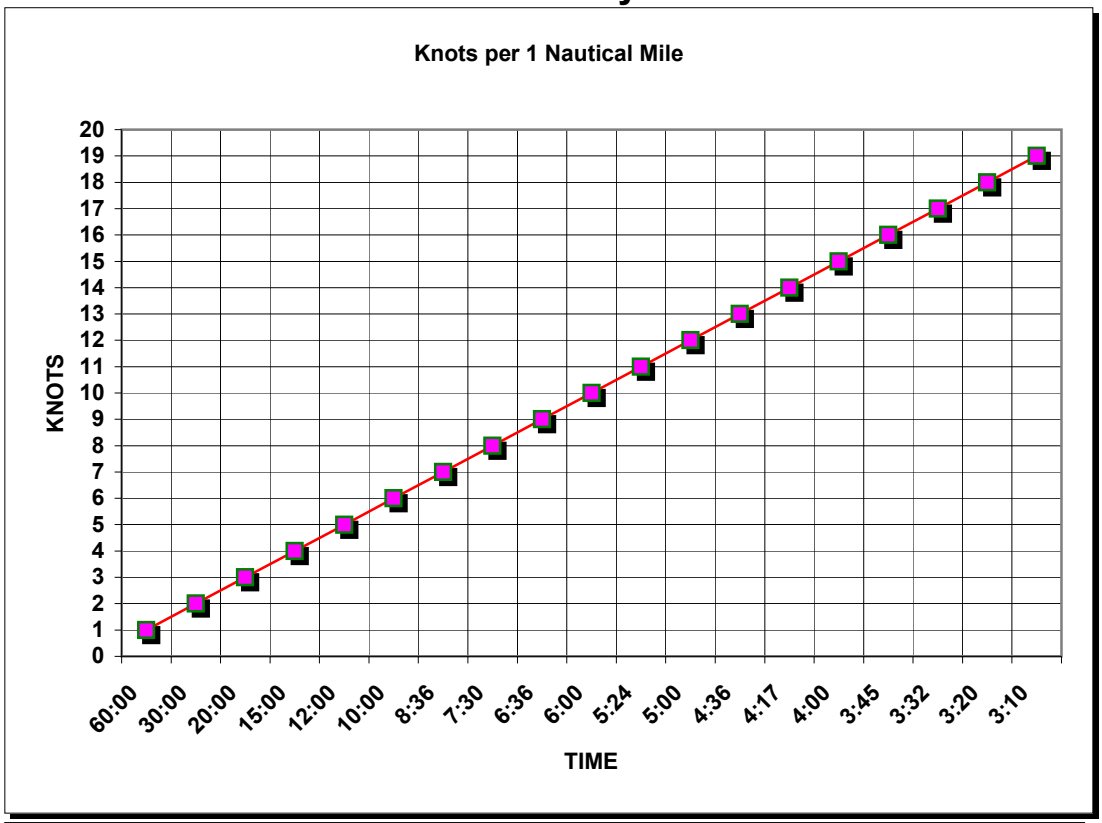
Target Ship Worksheet

Ship Name	Sub Course Heading	Target Relative Bearing	Range to Target	Target Bearing to North	Angle on Bow	Target Course Heading	Target Speed

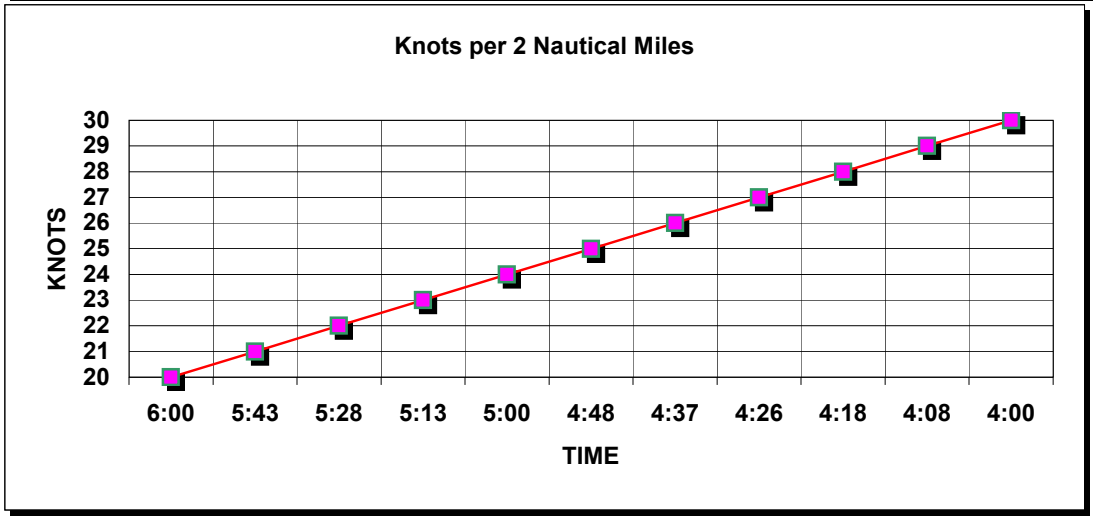
By CapnScurvy

1nm = 1852meters = 2025yards
2nm = 3704meters = 4050yards
3nm = 5556meters = 6075yards

TIME = KNOTS	
After 1nm	
Minutes:Seconds	
60:00	1
30:00	2
20:00	3
15:00	4
12:00	5
10:00	6
8:36	7
7:30	8
6:36	9
6:00	10
5:24	11
5:00	12
4:36	13
4:17	14
4:00	15
3:45	16
3:32	17
3:20	18
3:10	19



After 2 nm	
6:00	20
5:43	21
5:28	22
5:13	23
5:00	24
4:48	25
4:37	26
4:26	27
4:18	28
4:08	29
4:00	30



After 3nm	
5:49	31
5:38	32
5:24	33
5:19	34
5:10	35
4:59	36
4:52	37
4:44	38
4:37	39