Scenario Description

Welcome to the Introduction to Basic Anti-Submarine Warfare tutorial.
This is the fourth in a series of tutorials designed to teach players the fundamentals of surface operations in Command. In this tutorial, the following topics will be covered:

- Operate active and passive hull sonar
- Engage targets with anti-submarine rockets (ASROC)
- Engage targets with over-the-side torpedoes
- Utilize Sprint and Drift movement
- Perform combined ASW operations with embarked helicopters

Pop-ups will appear with important messages during this scenario. You can find a PDF of them in the documents folder that comes with these tutorials. The default location is: C:\Program Files (x86)\Command Modern Operations\Scenarios\Tutorials\Surface Warfare Tutorials\Documents.
For Steam users, they will be located at: C:\Program Files (x86)\Steam\steamapps\common\Command - Modern Operations\Scenarios\Tutorials\Surface Warfare Tutorials.

Scenario Briefing

Welcome to Basic Surface Operations 1.4
In this scenario you will have command of a Thai anti-submarine frigate. Using pop-up messages like this, you will be guided through the following topics:

- Operate active and passive hull sonar
- Engage targets with anti-submarine rockets (ASROC)
- Engage targets with over-the-side torpedoes
- Utilise Sprint and Drift movement
- Perform combined ASW operations with embarked helicopters

Your mission is to detect and destroy a variety of underwater targets and simulated OPFOR submarines operating in your area. You will need to make use of your sensors to detect and localise and identify underwater contacts before engaging, while remaining in the time limit.
In this tutorial as with others in this series multiple pop-ups will appear with important messages. If you need to review any of these later, you can open the message history in a second window by pressing Ctrl+M and scrolling to the appropriate message.
This tutorial is designed to stop time compression with pop-ups at important moments. Surface operations can be slow paced due to the speeds and distances involved, so feel free to use time compression in the tutorial knowing that any significant developments will be accompanied by a time-stopping pop-up.

To make use of this in your own gameplay, or fine-tune pop-up settings for this tutorial go to Game > Game Options > Message Log and select 'Raise Pop-Up' for any event that you wish. Useful pop-ups for Surface operations include 'Contact Change', 'New Contact', 'Special Messages' (this should always be on), 'Unit Damage', 'Unit Lost' and 'New Weapon Contact'.
In this scenario pop-ups will appear with important messages. You can find them in the documents that come with the tutorial. The default location is: C:\Program Files (x86)\Command Modern Operations\Scenarios\Tutorials\Surface Warfare Tutorials\Documents.

Message 1

We are currently on station in our assigned exercise area. An old and obsolete submarine has had its weapons and sensors removed and is approximately 10 nautical miles to your north.
Your frigate is equipped with a AN/SQS-26CX Hull Sonar; the bleeding edge of sonar technology when it was first introduced in the 1960's. The SQS-26CX is capable of operating in passive mode and active mode. Passive mode is always operating, there is no action required from the player. Active mode needs to be turned on in the sensors dialog (F9) or in the EMCON section of the right hand status bar.
Active sonar is very much like radar in that it sends out energy--in this case sound energy--and analyses the returned energy that is reflected off objects in order to make detections. Like radar, active sonar is also not generally able to determine the identity of an object--merely its presence and location. A corollary of this is that using active sonar also gives away your presence, as well as possibly your location and identity in much the same way that using radar does.
Passive sonar simply listens to sounds in the water and analyses their characteristics to detect and identify contacts. With enough sound data contacts can be identified right down to individual vessels within a class, and if the contact is held for long enough a good estimation of position can be made. Unlike active sonar, the use of passive sonar gives no outward indication that can be detected by other platforms.
Sonar in both its active and passive forms is affected by external noise, the most important factor contributing to external noise is the speed of the platform the sonar sensor is attached to. For surface ships, passive sonar is of minimal use above about 5 knots. Active sonar can still make detections at speeds up to around 20 knots but the range at which objects are detected is reduced markedly as speed increases.
Leave the sensor settings at their pre-set state for now and move north at 5kts until you make passive sonar contact.

Message 2

We have detected an underwater contact.
If you have been following instructions, this will be a passive sonar contact detected by the SQS-26CX hull sonar.
Note that there is an area of ambiguity around the contact, and that we do not have depth information for the contact. Since passive sonar uses target motion analysis to deduce the position of contacts it is normal to have some ambiguity about the position--the noisier the contact and the better the sonar sensor, the less ambiguity will exist and vice-versa.
Now switch on active sonar by checking the 'active' box next to the entry for the SQS-26CX in the sensors dialog (F9) or by changing unit EMCON settings in the right hand side status bar.
Note that the area of ambiguity disappears after a few seconds and we now have a firm position for the contact.
As mentioned earlier, the contact is an old obsolete submarine that has had its weapons and sensors removed--it's harmless. Close in until you have a type classification on the contact. Try different speeds and turning the active sonar on and off to see some of the factors that determine whether a contact is able to be tracked.

Message 3

We now have a 'type' classification of SS, which indicates a diesel 'fleet submarine'.
Submarines have either nuclear or conventional propulsion, and their roles can be broadly defined as strategic strike (e.g. nuclear ballistic missiles or high volumes of conventional cruise missiles) or tactical (e.g. nuclear attack submarines, diesel patrol submarines).
Nuclear submarines are much faster--with some reaching in excess of 35 knots at flank speed--and have essentially unlimited range, but are typically larger and have a higher baseline level of noise from reactor pumps and other support systems which cannot be turned off. A major advantage of nuclear powered submarines is that they can remain submerged indefinitely, as they produce their own oxygen to support the crew and have no need to recharge batteries using diesel engines.
Diesel (also called conventional) submarines are much slower than nuclear submarines and are limited in their range by the amount of fuel they can carry. When operating on the surface or 'snorkelling' at periscope depth, conventional submarines use their diesel engines to recharge an array of batteries that power the submarine when it is completely submerged. Running the diesel engines is noisy, and the exhaust plume from the snorkel can be detected from quite a distance by aircraft with infra-red sensors. When running on battery power, however, a conventional submarine is extremely quiet and therefore very difficult to detect. This, combined with their small size and low cost makes conventional submarines a popular choice for many of the world's navies.

Continue to close with the submarine and hold contact until you are able to make a positive identification with passive sonar.

Message 4

We've positively identified the submarine.
Most modern warships are equipped with over-the-side torpedo launchers stocked with light-weight torpedoes. These are the same torpedoes that are dropped from aircraft--they have a limited range and relatively small warhead compared to the heavy-weight torpedoes carried by submarines.
Outside of this training scenario, **closing with a submarine with the intention to attack it using light-weight torpedoes fired from a surface ship is not recommended.**
Against modern submarines with wire guided torpedoes, these light-weight torpedoes are little more than self-defence weapons. The most common use of these over-the-side launchers is to fire a snap shot down the bearing of a detected incoming torpedo before commencing evasive manoeuvres. The chances of destroying the submarine are slim, but the possibility of forcing the submarine to break its guidance wire is quite high and this increases the ships chance to evade the torpedo.
With that said, the submarine we're about to engage has all sensors and weapons removed and is no threat. Engage and sink the submarine with torpedoes from your frigate. Just remember that this is not how you should be routinely engaging submarines with surface ships.
You may also wish to practice bearing-only launches, simulating the response from a detected incoming torpedo. Press Ctrl+F1 and click on a position within torpedo range of your ship. A weapons allocation dialog will appear with the position as the target; this is where the torpedo will commence its search pattern so set the position as close to the suspected position of the submarine as possible.

Message 5

Good work, we've destroyed an old submarine using tactics that would get us sunk under normal conditions. Let's sharpen things up a bit.
Your frigate is equipped with anti-submarine rocket-launched torpedoes (ASROC) which have been temporarily disabled (they will be enabled when you are cleared to fire on your next target). The ASROC type are distinct from anti-submarine rockets like the RBU series employed on Soviet/Russian built ships, and are essentially a light-weight torpedo

(LWT) attached to a booster rocket with a guidance system. The booster flies to the target and once in position the LWT is deployed and begins a search pattern. This is no different from dropping an LWT from a helicopter, and is an effective way to engage a submarine at arms-length if a helicopter is not available.
There is a (noisy, old) nuclear submarine operating at reference point (RP) Echo. It is constrained to be within 12nm of RP Echo, but this still gives us 452 square nautical miles to search!
Set a course to RP Echo and set your speed to flank. Ensure your sonar is set to passive to avoid giving away your presence as you transit.

Message 6

We are approaching RP Echo and are currently just outside the first convergence zone. At a simple level, convergence zones are ring shaped areas surrounding a sonar receiver where sound can be detected as it travels in a curved path through water. Convergence zones only occur in deep water, and the distance between them varies according to environmental factors-as a general rule however, they are around 30nm apart.
Looking at our frigate with the 'Underwater Sensors' map setting on, we can see a shaded green circle representing the convergence zone. In some cases you may see multiple convergence zones, but in this case there is only one.
Since the submarine we're now hunting is armed and dangerous, we want to maximise the distance at which we detect it. The convergence zone effectively extends the range of our hull sonar, so to take advantage of this we should slow down so that our passive sonar is able to listen effectively.
We have quite a lot of area to cover, and a limited amount of time. To cover more ground, we can use sprint-drift movement. Open the speed and altitude dialog by pressing F2 and check the box titled 'Sprint and Drift', then move the speed slider to set your desired average speed at 12 knots. Your crew will then alternate between 'drifting' at creep speed to listen for contacts, and 'sprinting' at flank speed to cover ground. The duration of each sprint phase and drift phase will depend on the desired average speed. This is a trade-off that sacrifices continuous sensor coverage for speed over ground.
Configure your ship to sprint and drift directly towards RP Echo; if you wish you may use active sonar to detect the target--but remember this will also give away your presence and location; and unlike the last one, this target is armed.

Message 7

We've detected an underwater contact. Turn off Sprint and Drift, set your speed to creep and alter course towards the contact if necessary and close to investigate.

Message 8

We have classified the contact as an SSN. It is very likely that this is our target, but we should wait for a positive ID before engaging.
Set your speed to creep and alter course towards the contact if necessary, and close to investigate.

Message 9

We have identified our target. You are cleared to engage with ASROC.

Message 10

Nice work! Unlike the last submarine, this one was a real threat. Engaging with ASROC allowed us to engage while keeping out of range of the submarines torpedoes.
Your embarked ASW helicopter is now readying for action in our final serial. Ship-borne ASW helicopters can be broadly categorised as hunters, killers, and hunter-killers. Hunters are equipped with sensors that enable them to independently detect, track and identify submarines. Killers are equipped with weapons that enable them to destroy detected submarines. Hunter-killers are equipped with both sensors and weapons. Hunter-killers are by far the most common configuration for modern ASW aircraft, and pure hunter aircraft are almost unheard of since the late 1970's.
Let's take a look at the aircraft we have at our disposal. Open the Air Ops window by pressing F6 and click on the hyperlinked aircraft type to open its database entry. We've embarked a Lynx Mk300 that is equipped with radar, FLIR, ESM/ELINT, DECM and MAD. Of these sensors, the radar may catch an unlucky submarine at periscope depth, the ELINT may detect a careless submarine using its radar, the FLIR might detect a snorkelling diesel sub, and the MAD may pick up a relatively large submarine that is operating at shallow depth in deep water--none of these are exactly great situations to rely on for detecting a submarine in the expanses of the ocean.
Examining the equipped loadout reveals that our helicopter is also equipped with LWTs and a few active-only sonobuoys. Active-only sonobuoys have short range and can be easily detected (and therefore avoided) by submarines. They may be effective at scaring off a potential threat submarine, but they are not effective for area search.

Based on all of this, we can deduce that our embarked ASW helicopter is suited to the killer role. Its sensors are adequate to localise a contact detected by other platforms and it carries weapons to attack if the contact is deemed to be hostile. It does not, however, have sensors that are effective at area search. In our current situation--a lone surface ship with a killer-type ASW helicopter conducting open-water ASW--it is highly recommended that the helicopter be kept on deck until an underwater contact is detected by the surface ship. Once it is assessed that the contact is likely a submarine, the helicopter is launched to localise and destroy the probable submarine.
Plot a course to RP Foxtrot to the west, where another old, noisy nuclear attack submarine is on patrol. Manage your speed and sensors in order to detect the submarine operating within 12nm of RP Foxtrot. Leave your helicopter to continue readying for the moment--it will become available automatically when you need it.

Message 11

We've detected an underwater contact. For the purposes of the exercise it is assumed this is a probable submarine. All weapons have been removed from your ship--but your ASW helicopter is now armed and ready to launch.
Launch your helicopter and direct it to engage the underwater contact (F1). Be sure to keep your ship a safe distance from the underwater contact.
If you are unsuccessful in destroying the target with the two LWTs carried on your helicopter, you can access a special action to bring your helicopter immediately to ready status once it is back on deck. Click the special actions button in the toolbar or select Game > Special Actions and then select the special action named 'Ready ASW Helicopter' and click 'execute'. The helicopter will then be immediately ready to take off and make another attack.

Win

Congratulations! You were able to make use of active and passive sonar, over-the-side torpedoes, sprint and drift , ASROC and an embarked ASW helicopter to detect and destroy underwater targets.