Karox's Guide To Almost Everything in Eve
Part 9 – Scanning & Locating Enemies

This guide will be focused on the PVP/Information gathering aspects of using both the the on board scanner and scan probes and will not be focused on exploration. If you need an exploration guide, there is an excellent resource available on the official Eve Online forums, but a PDF copy is available of the guide produced by Joerd Toastius / Dnightmare on Eve Files. The link for those who are interested is http://dl.eve-files.com/media/0705/Exploration_2.01.pdf

The On Board scanner

One of the more confusing aspects in Eve is the ship based on board scanner, which every ship has equipped, and yet very few people tend to use, until they begin to explore PVP and learn the intricacies of the device.

The on board scanner can be accessed from the main HUD when you are out in space, by the default hotkey 'Ctrl-F11' or by pressing the icon which is in to the left of the central shield/armour/capacitor readout. There are 3 subsections to this screen, the exploration and short range 'cosmic abnormalities' scan (system scanner), the directional scanner, and the moon scanner. The first section has a chance to locate small space complexes (combat sites) if you are within 4AU of a planet for those who wish to enter into combat without the interest of finding the more advanced sites via the exploration system, as well as providing the results for the exploration system itself. The moon scanner is used with the moon probing system to identify resources for moon mining. The directional scanner is the focus of the first part of this guide.

The Directional Scanner

This is a pilot controlled scanning system which can identify items within a specified range, a specified angle, and of a specified type, based on your overview settings. A slider bar is available to choose the angle of the scan from 360 degrees down to 5 degrees with angle selections at several key stages in between.

A representation of the scanning angle is shown on the system map which can be accessed by pressing F11 out in space (located at the bottom of the new screen that pops up). The green angle is the current representation of the scan, whereas the grey area is your field of view. Your ship is shown as the red icon on the system view. One of the most important points to realise with this is that the direction you scan, and the field of view is modified by the camera angle of the pilot, actual ship bearing has no impact on scanning results. This means that you can be flying directly away from a station, and find out what is behind you by pointing the camera at your nose and looking towards the rear of your ship. It should also be remembered that the directional scanner works in three dimensions, and the system map only displays as a flat plane (2 dimensions) so there is an equal amount of 'in and out' on the map as much as there is 'width' on the visible scanning angle, and it also does not take any notice if your camera is pointing in any angle other than the horizontal plane.

This becomes very important when you are using small angled scans to attempt to locate something, as if you are pointing too far up, there is a chance that your target could be a little below your scanning angle, and therefore not be picked up.

The distance that you can scan is typed manually into the scanner, and can be set to

anywhere between 1km and approximately 14.35 AU (though it should be noted that the entry can only be done in km, therefore for a quick exchange, it should be thought that 150 million km is around the same as 1AU, the actual conversion rate is 149,597,871 km:1 AU. To quickly get a max-range scan, it is possible to fill the field full with the multiple presses of the number 9 and it will default to maximum range.

There is also an option to choose if overview settings are used or not. This can have a very significant factor on the interpretation of results, as if the decision is not taken to apply the overview settings to the scan, the result will show all items within range that are able to be picked up, including wrecks from mission runners (in busy systems there can be several hundred of these), friendly ships, drones, and many other selections which may mean that the information you want is pushed off the bottom of the results window and can't be seen.

Applying the overview settings applies a filter to the scanner to limit the return of results in the same way that the overview does to local space. Essentially the scanner is an extension of the overview – the overview can see anywhere on the local grid (essentially around 350km and distant warpable objects such as planets and stations if they are selected) but the scanner can see anything within its scanning range.

There is one main difference between the overview and directional scanner in that the overview is updated in real time, and will give an idea of distance from you to the item, possibly relative speeds (if you have those setup to display on the overview), and a certain degree of friend/foe recognition (in that your overview icons will be applied, such as the red/blue markers to identify good standings/bad standings.) The scanner will only identify item names and types and can only give an immediate snapshot of everything that is within range of the scan.

There is a small measure of distance identification, but I believe that only items you can get distances from your overview (I.e. anything on the current grid and the warpable objects that can be seen globally) return a distance value, otherwise it just returns '-' as a distance. The only way to measure distance for far off objects is to scan for a specific range band on the scanner - do multiple scans, one at one extreme of the range, and another at the second extreme, and see if the ship disappears from the scan, then narrow down the scan range to give a good idea of the actual distance from you to it.

One final point to remember is that because the scan is done in 3 dimensions, the scan itself is a cone (unless of course, you are doing a 360 degree or 180 degree scan, which operates as a sphere or half sphere in the direction you face as appropriate with the flat edge behind your camera) which means that as the distance increases, the width of the end of the scan will get wider, as the area of the cone increases. Therefore someone who is located at the very edge of the scan at a very long distance away might not be seen you continue forward in a straight line if the cone is made to pass by them, and as a result you may need to alter your angle a little to find them in space.

<u>Locating things in Space</u>

First, this is a very important point – the ship directional scanner will never give you a warp point to a target – all it can do is tell you if a target is there. This is where Recon probing comes in, which will be discussed later in the guide.

Secondly, the scanner will never pick up NPC ships. This is very rarely an issue for most applications of the scanner however.

What scanning is good for is to locate things in space and to give a general idea where they are so excessive probes are not needed - plus the scanner is guaranteed to give you a result, whereas probing is chance based.

A good deal of scanner use is to find ships, either to locate mission runners for those who wish to interrupt them, or to find PVP targets for those that wish to locate them. It does require a bit of foreknowledge of your target (or pure blind luck) to pick a target out from a crowded scan result due to the scanner only returning ship names and types rather than pilots names, but if you have the information, you have the power to track them down as long as they remain in the system. As a side note of course, this is a very good reason to make sure that your ship is renamed from the default 'person's ship' name as it makes it much easier to locate you by anyone who is interested in scanning for your ship.

In order to scan to find a ship, most people want to see if their target is waiting at a point in space where they can easily warp to – for example a planet, station, asteroid belt or the like. If you start from somewhere, you can scan in any direction you want until you find your target, and see if there is a fixed point you can get to that is closer to the target by seeing what is available in space, and reducing your scanning range until you find something that can be used as a new staging point. If your target is in deep space (either at a safespot rather than a planet/station, or possibly in a mission or exploration site) it's always possible to fly between 2 points in space that pass close to or over the scanned area, manually make a bookmark mid warp and base your next session of scanning from that bookmark (a slow warping ship such as an industrial or battleship is recommended for this). The aim for this is to get as close to your opponent as you can to allow the use of Recon probes, as to get a reasonably accurate lock on your target without wasting too much time or too many probes means that the pilot should be aiming to use the shortest range probes (and therefore the highest strength) which limits the distance they can be launched from.

Other uses for the Scanner

The second main aim of the scanner however is to locate targets before they see you, or perhaps more importantly, before they get to you. If you are expecting an enemy to be chasing after you, it is very useful to pulse the scanner as often as possible to check for ships that you didn't expect to be there, or perhaps more importantly, recon probes which will be potentially giving an opponent a direct warp in point for you. If either of these items appear on the scanner, then it is best to take defensive measures, as with good skills, a recon probe can find a target within 30 seconds, and then whatever time it takes to warp in before you will potentially face a hostile situation. Note that in order for probes to show up on the directional scanner, the overview settings box needs to be unchecked (I.e. so it will give unfiltered results) which can end up with a case of information overload in a busy system.

Another useful ability for the scanner is to see if there is a POS at a moon that you intend to travel to, if you have an intention to put your own POS up. If you blindly fly to a defended moon, especially in lowsec/0.0, it is likely that the defences will destroy your ship in short order. What you can do is to make sure that control towers are selected from the overview settings, and then fly to a planet and scan in the direction of each moon using a short angle scan (using the distance of the moon on the overview as a guide for distance, just in case you end up scanning something behind the moon you intended to scan) and see if there is a control tower present. Remember to get a quick overview to see if there are any defences on any of the moons of a planet, you can simply do a 360 degree scan

at the maximum distance of the furthest moon of the planet, and that will locate how many, if any control towers are there, then you can do further, more accurate scanning if there are any threats identified.

The scanner is also a useful defensive tool. If you are travelling where there is a risk of a gate camp or other defensive setup, it could be possible (with a bit of forward planning, since you need to have an off-grid warp in point to prevent you appearing on the targets overview) to aim towards a gate and scan for targets on the gate. This can identify anyone on the gate that could be intending to do you harm.

Probing

Probing is the act of using Recon probes to locate your target, and provide a warp in point to allow you to reach them. This is essentially an offshoot of the Exploration system, and therefore the skills that are needed for that help with Recon probing as well.

In order to use a Recon probe, it is recommended to use a Recon launcher. This has a much quicker cycle time than the standard exploration probe launcher (120 seconds compared to 600 seconds as a base, which is improved with skills and ship bonuses) which means that more scans can be done in the same time before the Recon probe expires, though due to the size difference of the exploration probes and the Recon probes, only Recon probes will fit into the Recon launcher.

Unfortunately, it is only possible to fit one launcher to any ship, therefore you can't have a 'general purpose' ship able to carry both exploration and Recon launchers, however these do not require a launcher hardpoint, and can fit on any ship with enough resources to fit the High CPU requirement of the launcher – of course, having a ship with astrometric bonuses will assist with scanning speed, and as such they are the preferred ship (either frigate type or Covert Ops type). Note that Force Recon ships (the Tech 2 cruiser type) do not get bonuses to scan speed, but due to the ability to warp cloaked, they can be useful to locate targets too, though at a slower speed compared to the Covert Ops ship.

Probing skills

In order to use probes, the only required skill is Astrometrics – this is related to the type of probe you can use, the longer the range, the higher the skill, though it should be noted that it is preferred to use the shorter range probes as early as possible in the scanning attempt just because it makes it much easier to find the target due to the higher strength of the probe.

Other skills which provide bonuses are as follows:

Astrometric Pinpointing reduces the scan deviation, which will assist with landing closer to the spot that is picked up during the scan.

Astrometric Triangulation improves the strength of the scan probes, and as such helps increase the chance of finding something on any given scan attempt.

Signal Acquisition improves the cycle time of the launcher, reducing the base 120 seconds of the Recon launcher to a much lower value. Along with this skill, many ships have bonuses (for example, Covert Ops ships get a 10% per level time reduction) and Gravity Capacitor rigs also assist with this. With level 5 in both Covert Ops skill and Signal Acquisition, and 2 (Tech 1) rigs fitted to the Covert Ops ship, scan time can be reduced to

24 seconds per cycle. Note that due to calibration limitations, Tech 2 Gravity Capacitor rigs are not recommended.

Probe Types

There are 5 types of Probes which can be launched from the Recon Launcher

Observator Deep Space Probe – 1000 AU Distance, 1.25 strength, Astrometrics 5
Ferret Scanner Probe – 40 AU Distance, 2.5 Strength, Astrometrics 5
Spook Scanner Probe – 20 AU Distance, 5 Strengtth, Astrometrics 4
Fathom Scanner Probe – 10 AU Distance, 10 Strength, Astrometrics 3
Snoop Scanner Probe – 5 AU Distance, 20 Strength, Astromerics 1

There is some speculation that an Observator probe has unlimited range, but this can be assumed for all practical purposes to be the case, as there will be very few, if any systems larger than 1000 AU.

The strength is the same value across all 4 of the standard scan groups (Radar, Ladar, Magnetometric and Gravimetric) which is compared to the strength of your target's sensors to determine the chance of spotting it on any given scanning attempt – the higher the strength of the opponent, the less chance there is of spotting it. Note also that signature radius also plays a part in this equation, so large ships are easier to spot compared to smaller ships. As well as that, the further away the target is from the probe also reduces the chance to spot them.

Each probe has a flight time (or a time before they expire) which is inversely related to their strength – the Observator Probe expires after 80 minutes, whereas the Snoop probe expires after 5 minutes. With a possible cycle time of 24 seconds per scanning attempt, this gives an idea of how many cycles can be fit in per probe. Of course, if you are trying to track someone, chances are they will not wait in the system for up to 80 minutes (or some portion of that) whilst you eventually get a pick up with an Observator probe, so locating the target with the scanner is always a useful way to narrow the search to allow a smaller, stronger probe to find them quicker.

One other issue that needs to be kept in mind is that of the deviation. The Observator probe has a 20,000km deviation from the target, so a warp in point could be up to 20,000km away from the actual location of the target. Other probes have a lesser deviation, but the only one which is very likely to allow you to land on the same grid as your opponent is the Snoop probe that gives up to 200km deviation, of course to use that you need to be very sure of where your opponent is, and get within 5AU to meet the probe's range.

Process of Scanning

This is much the same way as exploration, Launch the probe of choice, scan until you have a hit, and warp to the hit point, and then use a more accurate probe if needed, or if your target is there, do with it what you will.

The probe is launched as with any other ammo using weapon, by clicking on it and the probe will appear in space next to you. You are unable to do anything with the probe whilst the launcher is still in it's 'firing' cycle, so wait for the probe launcher to stop flashing. Note that for Recon probes, this is only 2.5 seconds, but for standard probe launchers, this is 15 seconds, therefore use the Recon launcher as this 15 seconds can be quite a delay

to beginning scanning.

You then choose the probe you launched from the system scanner tab, and then the type of signal you wish to look for – typically, ships if you are trying to locate a ship, although note that in some cases, especially if you are looking for someone who is killing NPC ships or already fighting, checking for Drones can be easier to spot, and is more likely to get a hit due to the Microwarp drives acting almost like beacons for the scan probes. Simply then hit 'Analyse' and wait for the timer to count down until a result (if you are lucky) is returned.

If there isn't a response, it could mean one of a few things – most likely is that the random number generator worked against you, and you were just unlucky – continue to scan until you get a hit. Secondly it could mean that the target has left the system or moved out of range of the probe – this is a bit harder to check for, although at the time of writing this guide, it is easy to see if the target is still in the system by checking the local chat members list. A third option could be that the ship is cloaked, and cannot be found.

Recon probes have the same limitations of exploration probes in that you can't launch another probe within the scan radius of another – so if you have launched a long range probe, found a trace of the target, then you must first destroy the original probe to scan again using a more accurate probe, once you have warped to the identified area. This can be done from the system scanner tab, by selecting the probe on the menu.

As well as giving feedback in the system scanner tab of your on board scanner (not the directional scanner part) of where the target is located, and the signal strength, it is also represented on the system overview map screen (the same one as the directional scanner representation mentioned earlier seen by pressing F11 in space), as a different colour marker depending on the strength (with green being high strength, or a good chance of landing on the target, and red being low signal strength, or a good chance of landing at a high deviation from the target)

Note that the signal strength (as mentioned above) is derived from a formula which includes factors such as the strength of the probe, the sensor strength of the target, the signature of the target, and how far away the target is from the probe itself. The actual formula to determine this has been identified on the official Eve Online forums as:

Signal Strength = (Probe Sensor Strength * (1 + Level of Astrometric Triangulation * 0.05) / 100) * (e^-((Target Range / Max Range)^2)) * (Target Signature Radius / Target Sensor Strength)

What all this means is that a larger, closer, lower strength ship is easier to find than a small, high sensor ship at the extreme edge of the scan probe range. If you can get a signal strength greater than 1.0, then you will be guaranteed to drop in right on top of your target.

Deadspace and Probes

Whilst it is possible to scan for someone inside of Deadspace (i.e. when running missions) the Deadspace area acts as a damper for the scan probes which makes it much harder to get a fix on the target. Under this situation, it can be beneficial to scan for drones instead due to the increased ease of picking them out. This is the primary reason why Lowsec mission running ships should not be primarily drone boats, as they are much easier to scan and locate by Pirates, who could come and attack your ship whilst in the mission.

Note that if you do manage to find a target within deadspace, you will need to follow the usual rules – you can't jump directly into the deadspace pockets, but instead you will need to travel through the deadspace gates to reach the appropriate pockets. This is why it's recommended to get away from the warp in points during missions, as it gives added time to get away from potential threats if you don't have the time to repeatedly check the scanner for enemy activity.

The Virtue Set

The Virtue set of implants, provided by Sisters of Eve as Loyalty Point rewards give bonuses to the strength of scan probes. These are however, only available as a low-grade set. A full set of implants including the Omega gives around a 33% bonus to sensor strength. Note that the Sisters of Eve Recon launcher is not as valuable as the Exploration counterpart, as it does not provide any scan time reduction bonuses, only fitting reductions.