

Scan Probing in Revelations.



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Scan probing in Revelations

This guide will focus on ship probing; look [here](#) for a guide to exploration by Joerd Toastius. This guide assumes you possess at least basic control over how the Directional Scanner works.

If you have any further questions about ship probing feel free to contact me in game **BUT** please do not ask me about exploration, I don't do exploration and won't be able to answer your questions.

To do scan probing we need a few things, namely a probe launcher, probes, a ship to mount it on and the skills to use them all.

Skills

- **Astrometrics** - Adds one scan group per level. Is the primary skill that determines what probes you can use.
For combat ship probing level 3 will do fine unless the target is in a deep safe for which level 5 is need.
- **Astrometric Pinpointing** – Reduces maximum scan deviation by 10% per level.
Means that you can use a weaker probe and still get a result that lands you in the same grid as the target.
- **Astrometric Triangulation** – 5% scan strength bonus per level of skill.
Higher scan strength means easier to find the target and more accurate results.
- **Signal Acquisition** - 10% faster scanning with scan probes per level.
Must have skill, will cut scan time in half at level 5. Sadly it's rank 8.

Probe Launchers

There are 2 different probe launchers, Scan Probe Launcher I and Recon Probe Launcher I. They have similar fittings (220cpu, 1pg / 220cpu, 2pg) and despite its name the recon probe launcher is not force recon exclusive. It can be used on any ship.

- **Scan Probe Launcher I** – 600 sec base cycle time (can be cut down to 108.4 sec). 10m3 capacity. 15 sec rate of fire. Intended to be used for moon surveys and exploration.
- **Recon Probe Launcher I** – 120 sec base cycle time (can be cut down to 21.7 sec) 1m3 capacity 2.5 sec rate of fire. Intended to be used for ship probing.

It's not possible to fit multiple probe launchers on a ship, not even offline.

Probes

There are 3 different groups of probes. Ship probes, exploration probes and survey probes.

Ship probes are the probes that fit into the Recon Probe Launcher. They include:

- **Observer Deep Space Probe I** - 1000 au range, 1 point sensor strength, 20.000 km max scan deviation, 4800 sec flight time.
- **Ferret Scanner Probe I** - 40 au range, 2.5 points sensor strength, 10.000 km max scan deviation. 2400 sec flight time.
- **Spook Scanner Probe I** - 20 au range, 5 points sensor strength, 5.000 km max scan deviation, 1200 sec flight time.
- **Fathom Scanner Probe I** - 10 au range, 10 points sensor strength, 2.500 km max scan deviation, 600 sec flight time.
- **Snoop Scanner Probe I** - 5 au range, 20 points sensor strength, 200 km max scan deviation, 300 sec flight time.

Range - The max range of the probe, this is a 3d sphere and the probe will not be able to find anything outside this range.

Sensor Strength - Higher sensor strength means larger chance to find the target and more accurate results.

Max Scan Deviation - The maximum distance from the target any scans with this probe will give.

Flight Time – The amount of time the probe stays in space. You need to finish any scan before the flight time runs out or it will fail.

All the other probes are uninteresting for ship scanning. While the exploration probes have very high sensor strength they also have very low range making them unsuited for ship probing.

Ships

The ship of choice for probing is the Covert Ops frigates. There are 2 reasons for this, one is the built in bonus of 10% reduction to scan time per level (level 5 cuts the scan time in half) and the other is the ability to warp cloaked. If you can't get a 0m accuracy result you will need to warp in cloaked and approach manually.

Other ships that are useful for probing is the cloaking force recon ships for the warp cloaked ability and possibly the t1 astrometrics frigate as they have a 5% reduction to scan time per level. But in worst case any ship can be used.

Basic probing

So your target is sitting in afk in a safe spot and you want to find him? This is how it's done.

First warp around a bit and see if you can find him on the directional scanner. If you can see him; get to the closest object and drop the needed probe. Use the range option on your scanner to determine which probe is needed. 5 au = 750.000.000 km, 10 au =

1500.000.000 km. So if you can get within 750.000.000 km use the 5au probe etc. Max range of the directional scanner is 14.35 au.

If you can't find him on the scanner you need to use longer range probes, probably Observator Deep Space Probes or possibly 40 au Ferret probes.

After you launch the probe open your scanner, select the System Scanner tab, select the probe and select the "Ships" group (you might as well include as many groups as your astrometrics skill allow, there is no penalty in using several groups).

Click "Analyze" at the bottom of the window. A timer will appear counting down. If you want you can cloak now but do NOT warp away. If you do the scan will fail. You can switch to the Directional Scan tab and use that without breaking the probe and you can even close the scan window and it will still work.

When the timer reaches 0 you will get a list with results. If your target is not in this list don't fret it. The probing system is now chance base and you might need to scan several times (20+ if you are looking for a very small ship with an observator probe). But first recheck your scanner to see that he is in range of the probe you choose. If he is in range just click "New Scan" and hit analyze again. Repeat until the target is found.

You can also see the results on the system map as coloured dots. The colour indicates the Signal strength.

0-0.4 = yellow

0.4-0.8 = green

0.8+ = red

You can warp to the results by right click on them and choose warp to.

In the result list there are 4 columns. The first is ship type, second is signal strength (more about that in the advanced guide), third is the range from your current position and forth is Accuracy. Accuracy is the range from the spot the probe provides to the target.

Accuracy is determined by several factors where the most important is the probe type and signal strength (see advanced section for formulas). Longer range probes give larger max deviation from the target. There is also some randomness involved here so a new scan might give a more accurate result (or worse). If you can get the Signal Strength above 1.0 with 1 probe you will always get 0m accuracy and can warp in right on top of the target.

As long as you are using ship probes you should never get an accuracy result above 20.000 km.

If the accuracy is not good enough to get inside the same grid as the target you might need to launch and scan with a shorter range probe. Warp to the result by right clicking on it and choose warp to. Click new scan and right click on the probe you used and choose "destroy probe". The reason for this is the fact that you can not launch a probe within the scan radius of another probe. Now launch a 5au (snoop) probe and scan with that. Worst case scenario with that probe will land you just 200km away, most likely a lot closer.

Advanced Probing

Signal Strength

Signal Strength decides how large the chance is that the target will show up on a given scan and also effect accuracy. A signal strength of 0.5 means 50% chance, 1.0 or more give 100% chance etc.

Signal strength is a factor of the sensor strength of the probe, the signal size of the target, the range from the probe to the target and any skills you might have. Sensor strength is listed in the probe attributes.

Target Signal Size = Target Signature Radius / Target Sensor Strength

Large target = easier to find, target with high sensor strength = harder to find. These values can be modified, a target with several shield extenders will have larger signature radius and be easier to find while a target with ECCM will have higher sensor strength and will be harder find.

The following formula (discovered by Daron) give the range multiplier.

Range Multiplier = $e^{-((\text{Target Range} / \text{Max Range})^2)}$

Target Range is the range from the probe to the target, Max Range is the Scan Range listed for that probe type.

This formula will return a result between 1 (at 0km) and 0.3679 (at very close to max range).

The full formula to calculate Signal Strength is:

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

A math example: we are using a Ferret 40 au probe to try to locate a Scorpion 35 au away. We have Signal Acquisition level 3.

Signal Strength = $(2.5 * (1 + 3 * 0.1) / 100) * (e^{-((35/40)^2)}) * (480 / 24) = 0.302$ or 30.2% chance it will show up on our scan.

Accuracy

Accuracy is a factor of the max scan deviation, the signal strength of the scan, any skills you might have and a random number.

If the signal strength of the probe is 1.0 or more the accuracy will always be 0m (unless you are using multiple probes).

The formula to calculate Maximum effective Scan Deviation is:

Maximum effective Scan Deviation = Maximum Scan Deviation * ((0.6 * (Signal Strength ^ 2)) - (1.6 * Signal Strength) + 1) * (1 - Level of Astrometric Pinpointing * 0.1)

The accuracy of the scan is then a linear random range between 0km and the Max effective Scan deviation. Linear meaning it's just as likely to return 0 as it is to return max eff scan dev or anything between.

Math example: We will use the scorp from the last example, we also have astrometric pinpointing level 3.

Max effective Scan Deviation = $10000 * ((0.6 * (0.302 ^ 2)) - (1.6 * 0.304) + 1) * (1 - 3 * 0.1) = 3998\text{km}$. So each successful scan will give a random accuracy between 0km and 3998km. This means there is a 12.5% chance you will get a result in the same grid as the target.

Multiple Probes

You can use multiple probes to affect the outcome of the scan. The probes need to be dropped so the target is inside the intersection of the probes but so that the probes are not located inside the scan range of any other probe.

Using multiple probes effect 2 things, Signal Strength and Accuracy.

Signal strength is the signal strength of each individual probe added together and divided by some yet to be determined modifier. This modifier is larger for shorter range probes and is large enough so that if you combine 2 probes of very different range (5 + 20 or 20 + 40) you will actually get a result that less than if you just used the shorter range probe alone.

Accuracy of multiple probes is better than a single probe would be but worse than the effective signal strength would indicate. So even if you can get the signal strength above 1.0 you will still not get 0m accuracy. 1/10th of the maximum scan deviation seems to be the best you can obtain using multiple probes.

Using multiple probes are for most practical purposes inefficient, you are better of using the time it takes to find positions for the extra probes to just do more scans with just 1 probe. BUT there is one exception from this.

The only practical use of multiple probes are to drop 2 or 3 Spook (20 au) probes just outside the scanner range (14.5au) of the target. This allows you to run a scan which if you have trained several levels of Astrometric Pinpointing will land you 250-500km from the target; in the same grid as it without ever being seen on his scanner.

Rigs

There is one rig that effect scan probing.

Gravity Capacitor Upgrade. The T1 version give 10% less scan time and the T2 15%. The reduction is not stacking penalised.

Directional Scanner

It's still possible to see probes on the directional scanner by setting it to not use overview settings, even easier now as a lot of stuff like npc's and roids have been removed from this list so it will come up much faster and be less cluttered.

To counter act this we now have the ability to destroy the probes at will by right clicking on it in the system scanner tab and choose destroy probe, you can even do this while cloaked or in warp. Destroying a probe will not destroy the results so you can go back and look at them by clicking view results.

You should destroy your probes as soon as you got the results you want from them, especially short range probes. Done right it should only show up on the scanner of the target for around 30-40 sec, short enough time for him to miss it.

Cloaked ships

At the time of writing it is NOT possible to probe for cloaked ships. A dev said in a blog it would be possible to probe for them but it seems they either changed their mind, forgot about it or haven't got it to work yet.

Scan Groups

The following Scan Groups can be chosen when you start a scan, for each level of astrometrics you can scan for more groups at the same time.

- **Drone and Probe**- As the name suggests, drones and probes (not interdicator probes, just scan probes).
- **Scrap** - Unknown, have yet to find anything with this group.
- **Ship** - All player ships, no npc's.
- **Cosmic Signature** - Exploration content.
- **Structure** - POS Structures.

There is no penalty for scanning for multiple groups, if you have astrometrics level 5 go ahead and select them all.

Known Bugs

Attributes window show sensor strength truncated. This is most apparent on Ferret probe as it is shown to have 2 points strength but in reality have 2.5 points.

FAQ

Q: Why do my scans seem to fail all the time, it stops before it is finished?

A: Make sure that the probe does not time out before the scan finishes, if it does the scan will always fail. If the probe has less flight time than your scan takes you need to either train your skills a bit more (covert ops level 4 + Signal acquisition level 3 is enough to use snoop probes in a Scan Probe launcher) or get the Recon probe launcher.

Q: What about the Survey skill, doesn't it effect probing?

A: No Survey has nothing to do with probing (expect skill requirements for moon survey probes). It does not effect probe times, instead it effect items like Cargo Scanners.

Q: Now when NPCs and Roids no longer show up on the directional scanner can I use probes instead to find them?

A: No, the probes does not pick up any npcs or roids. The only thing not related to PvP that the probes pick up are the new exploration sites.

Q: What effect did the latest patch have on scanning for mission runners?

A: The results are still inconclusive but initial tests seem to indicate the effective signal strength of a target inside a dead space area (this includes sitting at the gate leading into it) is cut to 1/100 of its normal value.

This makes any dead space mission outside the range of exploration probes for all intent and purpose impossible to probe. You will only find it through sheer luck.

Some say that drones are not affected by this strength cut. In my tests on SiSi the drones where effected as well but I have yet to test it on TQ so I can't know for sure.