

Karox's Guide to Almost Everything in Eve Part 8 – R&D and Invention

This guide covers the issue of Research and Development (R&D) agents, the datacores they provide, and how those are used in the Invention system to allow a Tech 1 blueprint to be converted to it's Tech 2 equivalent.

R&D

At its most basic level, an R&D agent is no different to any other agent – they have up to 5 levels (though there are no level 5 agents available at the time of writing this guide), and vary from quality level -20 to +20 as with any other. Similar to other agents, they also require enough corporate standing with their mother organisation to access, so to access the higher level agents will require a certain amount of mission grinding to ensure that you can access them.

That however, is about where the similarities end.

R&D agents are only available in the corps that provide R.Db items, such as Core Complexion, Creodron, Ishukone and the like. There is one corporation that does not have an associated R.Db item, which is Nefantar Miner Association from the Ammatar Mandate faction, however this corporation only has 2 level 3 R&D agents, and as many different agents are available elsewhere at a higher level (at least a level 4 agent should be aimed for) this corporation is usually avoided.

These corporations as a rule do not provide medical facilities in any of their stations, so an unfortunate side effect of grinding standing with an R&D corp is that there is no real benefit if you are aiming to raise enough standing to get a jump clone installation station (8.0 minimum) as there is nowhere within these corps to allow the jump clone to be installed. On a slightly more positive note though, these corporations do offer all other standard mission choices including courier and encounter/kill so raising the standing can be done in any way that you prefer.

Finding an R&D agent is typically a long term planned goal. Whilst you can have a preferred corporation to work with, not all agents will have a complete selection of skills to allow any datacores to be generated – so if you have your eyes on a specific datacore production type (more on datacores later) then the corporation should be researched. This can be done from the in game 'showinfo' option on the corporation, simply by checking the chosen corp's R&D agent list – an out of game option is available as well in the form of the website <http://eve-agents.com/> which allows to search the database by agent level and research skill, which will indicate what the highest level of research agent is that is possible to find in game – remember of course that there are no guarantees that the agent reported on Eve Agents will be available in game, it should always be verified via checking the in game corporation before you spend weeks grinding standing for an agent that may not exist.

In order to access an R&D agent, you need to have the appropriate corporation standing to the required level, but there is a second required prerequisite – the pilot needs to have enough personal standing which is at least 2.0 points less than what is required in corporate standing to speak to the agent. Whilst this may be confusing at first, it is rarely an issue, but to explain – if the corporation you fly for has enough average standing from it's members to access an agent, then the agent will speak to you – this applies to any agent, anywhere in the universe. For standard agents this is not a significant problem as by running missions for them (which is the entire point of being able to speak to them in the first place) you will be influencing your corporation's average standing with those agents – if the average is not maintained, then anyone who doesn't have personally generated standing above the level required will lose access to the agent.

For R&D agents, interactions will not modify the corporation standing average, so it was possible to have 1 person get the required faction standing, and as long as no one else did missions for the

corporation, all R&D agents could be spoken to. As a result of this loophole, it was decided that a personally generated lower standing would be required for each character who wished to speak to the R&D agent – as a consequence this would lower the corporation average if they didn't continue to run missions to keep the average high enough, which means that most people who run R&D corporation missions generally meet the listed required standing, which consequently also includes the -2.0 required standing as well.

In order to access the R&D agent it will be required to learn at least level 1 of the research skill that you want to generate datacores for. This choice is generally down to the player, but sometimes they can have preferred datacores for invention (check the invention tab on the blueprint of your choice of module you want to attempt to create a tech 2 version to see the 2 that are required) and sometimes it can be to simply generate the highest value datacore to create a supplemental income, as all datacores can be sold on the market. It should be noted however that it is only possible to use one line of research from any single agent, even if they offer 5 or more options for research.

In order to use more than 1 R&D agent, it is required to train up the 'Research Project Management' skill, which is a mid range price (approx 40 million Isk on the NPC market) and requires quite a significant training investment (Laboratory Operation 5 and Research 5) but each level of the skill allows one additional R&D agent to be accessed, up to a total of 6.

Once you have the required standing and required skills, all a pilot needs to do is fly out to the agent of choice, and request they work with you on a research project, which they will be most happy to assist with. This will start the accumulation of research points based on your skill level added to the agents skill level (which corresponds with the agent level), modified further by the agent's quality level. Obviously the player's skill is a major factor in the generation of research points, so an attempt should be made to get the research skill as high as possible to get the most out of the agent.

Note that not all research accumulates points at the same speed. Research for items that are used to produce modules will generate it at standard rate, items that produce weapons get double rate and items that produce ships get triple rate, however it should be noted that it costs 2 times or 3 times as many RPs to convert the datacores for these items, so ultimately, the values are worth the same amount of datacores per day.

This is due to the primary use of the R&D agents before the invention system was added – the Tech 2 Lottery.

This system is no longer available, but for each and every research point an agent had, the research owner was offered 1 'ticket' for when a new batch of Tech 2 BPOs were placed on the market, but due to the difference between the number of ships that were available compared to the number of weapons, compared again to the number of misc modules this multiplier was used to offset the 'chance' that one of the tickets would be called up due to the lower number of chances that were called.

When a player wishes to convert the research points to datacores, it is simply a case of ensuring the agent has enough accumulated points, and one datacore can be generated per 50 points (or 100/150 for the double/triple exchange rates) and requesting them. The datacores are then dropped into the player's top level hangar for them to do with as they wish.

If there is ever any wish to leave an agent, it should be noted that all non-converted research points are lost when cancelling the research process, so make sure that any unspent points are kept minimal by converting as many datacores as you can before cancelling the agent.

R&D Missions

Approximately once every day (although you may have to visit the agent for a second time after triggering the research process first) you will receive a mail from your agent advising you that there has been a problem with the research. Whilst this sounds alarming at first, it is not a major issue.

This is a trigger to generate a R&D agent mission which typically is a courier/trade or similar mission to grab some materials and bring them to the agent. Your reward will be 1 day worth of research points. If you do not wish for this reward (quite often, R&D agents are situated very far from a main base of operations, and a daily round trip can take a long time) it is safe to ignore this message – RP accumulation will continue as normal. If you do not respond to one of the R&D mission request eve-mails, you will not receive another until you decide to head to the agent and complete their mission they wish to offer, which is usually done when going to the agent to pick up a batch of datacores just to provide a bonus day's production, which may result in additional datacores that are able to be picked up.

Note that these missions count towards the 16 required to generate a storyline mission (as long as you generate 16 missions for the same corporation.)

Invention

Invention is the process of converting a Tech 1 blueprint copy to a lower run, Tech 2 version. Only Blueprint copies can be used for Invention, Blueprint originals cannot be used in any way, shape or form.

Typically players generate their own BPCs from using the copy research option on their own blueprint originals, but it is always possible to simply buy the BPCs from the contracts system directly, and for those without a POS who are forced to wait in queues for generating copies, it can be a commonly used option.

When doing an invention job on a blueprint copy, it should be noted that the ME and PE values do not have any impact on the outcome, therefore if you can find unresearched, max run blueprint copies for cheaper than researched versions, feel free to grab them if you intend to invent with them rather than produce with them.

Skills

The primary skill required to perform invention are the racial encryption skills, which as a prerequisite requires Hacking 2, and from that, Science 5 and Electronics Upgrades 5, so as can be imagined, it can take quite a while to get the skills required. Note that there are 4 racial encryption skills, so in order to invent everything available, then all 4 skills will need to be trained.

As well as this, at least 2 of the research skills (those linked to datacore production) will need to be trained depending on the item that you want to produce. As noted above the in R&D section, this can be located on the blueprint bill of materials tab, under the invention subcategory.

The chance of success for invention is directly linked to how high these skills are trained, so it is recommended that as a minimum level 4 is sought in these skills before invention is attempted, however in reality it can be attempted with the basic required skills (level 1 in each of the 3 listed skills.)

Tools

Invention not only requires skills, it requires tools as well. At the very least, a number of the two types of datacores required for the operation (the quantity required is listed on the blueprint,

typically for modules and small ships it will be 2 of each, but some modules require 3, and ships require much more)

There are also Interface modules required. Each racial encryption type is linked to a specific interface module – Gallente are linked to Incognito, Amarr to Occult, Caldari to Esoteric and Minmatar to Cryptic. The interface modules come in three varieties – the Ship data interface is the most expensive, and is used for ship invention. The Tuner data interface is used for production of tech 2 rig blueprints, and the cheapest is simply called a Data Interface and is used to produce modules.

Blueprints for these interfaces are available from the exploration system, via Radar sites. These are the hacking/codebreaker module sites, which can also provide datacores (as discussed above), and decryptors, which will be discussed later.

These Interface items are available from the market generally from other players, and on average, the ship interfaces are generally seen as a fairly major investment, around 150 million isk or more, the tuner interfaces run around 30-50 million, and the basic data interfaces run to about 10 million.

Whilst the price does seem excessive, these interfaces are simply only used to begin the invention attempt, and after accepting the job, they are deposited back into the hangar that the job was started from (generally your own) to be used for the next invention process or simply taken away and stored.

Finally, some of the more complex items (for example, prototype cloak BPCs to produce Tech 2 cloaks) require additional items, such as R.Db items and data sheets. Any additional requirements are listed on the input BPC as identified above. Note that in most cases, these additional items are only related to copying the blueprint, the invention action does not (to my knowledge) require any additional items.

Decryptors and the Tech 2 BPC output

Decryptors are consumable items which are available from the Radar exploration sites as identified above. They influence the outcome of the returned blueprint after a successful invention attempt, rather than the default -4 ME and -4 PE, 10 or 1 run blueprints. Note that the number of runs on the output blueprint is based on the stats of the input blueprint. For modules and rigs, the output with max runs on the input blueprint is 10 (generally max runs for modules is 300, but rigs are higher, at 1000 runs) and for every 10% reduction in max runs, 1 run is taken off the output blueprint.

Ships are slightly different in that even with a max run blueprint, only a 1 run ship Tech 2 blueprint is produced, however if a decryptor is to be used to increase the number of output runs, the initial 1 run will only be added to the final figure if the input blueprint has maximum runs. If there is no interest to use a decryptor with the ship invention, it is quite acceptable to use a 1 run input copy blueprint, as the output can never drop below a tech 2 1 run copy.

If a +9 run decryptor is used for instance, a max run ship input blueprint will return a 10 run ship Tech 2 blueprint if it is successful, but if a non max run blueprint is used, only a 9 run output Tech 2 blueprint will be produced. If this extra run is worth the added time to copy the blueprints is up to the inventor to decide.

A list of decryptors and their affects on the output blueprint are as follows:

Amarr	Caldari	Gallente	Minmatar	Run Mod	ME Mod	PE Mod	Chance
Formation Layout	Tuning Instructions	Collision Measurements	Calibration Data	0	+3	+3	1.1
Classic Doctrine	Prototype Diagram	Test Reports	Advanced Theories	+1	+2	+5	1.2
Sacred Manifesto	User Manual	Engagement Plans	Operation Handbook	+2	+1	+4	1
Circular Logic	Alignment Chart	Symbiotic Figures	Circuitry Schematics	+9	-2	+1	0.6
War Strategon	Installation Guide	Stolen Formulas	Assembly Instructions	+4	-1	+2	1.8

Meta Items

It is also possible to offer a 'sacrificial item' to the invention chance when producing modules. This will improve the success rate of the invention process, but this item is consumed as part of the process. Only Meta items with levels from 1-4 can be used for this process, which are essentially the looted drops from NPC pirates from missions. The Meta level of an item can be seen from it's properties. Please bear in mind that tech 1 produced items from blueprints are classed as meta 0 and do not give any benefit to the success chance though they can be added to the invention process. High meta level items (3 and 4) can generally be sold for a lot of profit, so if a decision is made to use these in invention, this should be kept in mind.

For ships and rigs, there are no meta items available, only meta 0 (tech 1) which provide no benefit, so do not include a tech 1 copy of the item in the invention process unless you enjoy wasting money.

Invention Process

Once all the prerequisites are met, and all of the materials and tools as identified above have been gathered, it's time to begin the invention process itself. It should be noted that Invention is a research option (much as copying is and ME/PE research) so make sure you have enough research slots available via the laboratory operations and advanced laboratory operations skill to accommodate the number of invention attempts you want to do simultaneously.

For invention inside an NPC station, this process is quite simple. Gather all of the items in your station hangar, right click the blueprint and choose the invention option from the menu.

Pick a free or queued invention slot from the same station as you are at (all of the materials need to be at the station where the work is going to take place) and follow the prompts through – ensure that if the blueprint you are using has multiple output options (for example, some ships have 2 variations they can become such as the Merlin frigate can be invented into a Hawk or Harpy Assault Ship) you choose the output type you require, and add meta items or decryptors as required. Choose accept on the job, and the follow up screen to confirm that you have all materials available, and then the job will begin.

To carry out the work in a POS, it is required to move all of the items to the appropriate hangar on the laboratory module – you cannot remotely start research using scientific networking when there are physical materials involved in the process. After that, the same process as starting in a station should be followed.

In both cases, remember to pick up the data interface once the job has begun as it is not kept back as part of the process.

After the required invention time has passed, it is simply a matter of delivering the job to find out if the invention chance has been successful. If so, a tech 2 blueprint copy will remain in the output area, if not, you will be left with a 'better luck next time' consolation message.

Note that the official invention chances are not public knowledge, so the only recommendation is to raise the skills as high as possible. A circumstantial review of invention chance shows that with level 5 in each skill gives approximately 50% chance on a module invention success.

Note that the base invention chance is also modified by the time of thing that is being invented. Modules and rigs appear to have a 40% base chance, frigates, destroyers, Procurers (for the Skiff) and freighters show an approximately 30% base rate. Cruisers, industrial ships and Retrievers (for the Mackinaw) are 25% and battleships, battlecruisers and Covetors (for the Hulk) seem to have a 20% base chance.

The findings of these circumstantial tests have been catalogued to the invention chance calculators, one commonly used one is on Chruker's site and can be used as a good guideline:

http://games.chruker.dk/eve_online/invention_chance.php

Datacore reference list

This list indicates the appropriate datacores required for invention on each module/charge/ship:

Electromagnetic Physics

- + Electronic Engineering: Cargo Scanner, CPU Enhancer, ECCM (All), ECM (All), ECM Burst, ECM Stabilizer, Passive Targeting System, Projected ECCM, Remote Sensor Booster, Remote Sensor Dampener, Electronics Rigs (All), Electronics Superiority Rigs (All), Sensor Backup Array (All), Sensor Booster, Ship Scanner, Signal Amplifier, Survey Scanner, Tracking Link, Salvager, Analyzer, Codebreaker
- + Graviton Physics: Advanced Railgun Ammo (Javelin)
- + Laser Physics: Gas Cloud Harvester
- + Mechanical Engineering: Hybrid Weapon (Railguns), Hybrid Rigs (All)
- + Plasma Physics: Advanced Blaster Ammo (Void)
- + Rocket Science: Advanced Railgun Ammo (Spike)

Electronic Engineering

- + Electromagnetic Physics: Cargo Scanner, CPU Enhancer, ECCM (All), ECM (All), ECM Burst, ECM Stabilizer, Passive Targeting System, Projected ECCM, Remote Sensor Booster, Remote Sensor Dampener, Electronics Rigs (All), Electronics Superiority Rigs (All), Sensor Backup Array (All), Sensor Booster, Ship Scanner, Signal Amplifier, Survey Scanner, Tracking Link, Salvager, Analyzer, Codebreaker
- + Graviton Physics: Mobile Warp Disruptor (All), Stasis Webifier, Target Painter, Warp Scrambler, Warp Disruptor
- + Laser Physics: Advanced Pulse Laser Crystal (Scorch), Mercorix Mining Crystal, Mining Crystal (All)
- + Mechanical Engineering: Automated Targeting System, Ballistic Control System, Combat Drone (All), Gyrostabilizer, Heat Sink, Logistic Drone (All), Magnetic Field Stabilizer, Mining Drone, Drone Rigs (All), Tracking Computer, Tracking Enhancer
- + Quantum Physics: Warp Core Stabilizer
- + Rocket Science: Advanced Assault Missile (All), Advanced Cruise Missile (All), Advanced Heavy Missile (All), Advanced Light Missile (All), Advanced Rocket (All)

Graviton Physics

- + Electromagnetic Physics: Advanced Railgun Ammo (Javelin)
- + Electronic Engineering: Mobile Warp Disruptor (All), Stasis Webifier, Target Painter, Warp Scrambler, Warp Disruptor
- + High Energy Physics: Smartbomb (Graviton)
- + Quantum Physics: Cloaking Device (All)

High Energy Physics

- + Graviton Physics: Smartbomb (Graviton)
- + Laser Physics: Advanced Beam Laser Crystal (Aurora), Advanced Pulse Laser Crystal (Conflagration), Energy Weapon (All), Energy Weapon Rig (All), Smartbomb (EMP)
- + Nuclear Physics: Advanced Artillery Ammo (Quake), Smartbomb (Proton)
- + Plasma Physics: Smartbomb (Plasma)
- + Quantum Physics: Capacitor Battery (All), Capacitor Booster (All), Capacitor Flux Coil, Capacitor Power Relay, Capacitor Recharger, Energy Destabilizer (All), Energy Transfer Array (All), Energy Vampire (All), Power Diagnostic System, Reactor Control Unit, Energy Grid Rig (All), Shield Flux Coil, Shield Power Relay

Hydromagnetic Physics

- + Laser Physics: Advanced Beam Laser Crystal (Gleam)
- + Nanite Engineering: Armor Hardener (All), Armor Plating Energized (All), Armor Rigs (All)
- + Quantum Physics: Shield Rig (All), Shield Amplifier (All), Shield Boost Amplifier, Shield Booster (All), Shield Extender (All), Shield Hardener (All), Shield Recharger, Shield Transporter (All)

Laser Physics

- + Electromagnetic Physics: Gas Cloud Harvester
- + Electronic Engineering: Advanced Pulse Laser Crystal (Scorch), Mercxit Mining Crystal, Mining Crystal (All)
- + High Energy Physics: Advanced Beam Laser Crystal (Aurora), Advanced Pulse Laser Crystal (Conflagration), Energy Weapon (All), Energy Weapon Rig (All), Smartbomb (EMP)
- + Hydromagnetic Physics: Advanced Beam Laser Crystal (Gleam)
- + Mechanical Engineering: Frequency Mining Laser (Strip & Deep Core), Mining Laser, Mining Laser Upgrade (All), Strip Miner

Mechanical Engineering

- + Electromagnetic Physics: Hybrid Weapon (Railguns), Hybrid Rigs (All)
- + Electronic Engineering: Automated Targeting System, Ballistic Control System, Combat Drone (All), Gyrostabilizer, Heat Sink, Logistic Drone (All), Magnetic Field Stabilizer, Mining Drone, Drone Rigs (All), Tracking Computer, Tracking Enhancer
- + Laser Physics: Frequency Mining Laser (Strip & Deep Core), Mining Laser, Mining Laser Upgrade (All), Strip Miner
- + Molecular Engineering: Hull Repair Unit
- + Nanite Engineering: Armor Repair Projector, Armor Repair Unit
- + Nuclear Physics: Projectile Weapon (All), Projectile Rigs (All)
- + Plasma Physics: Hybrid Weapon (Blasters)
- + Rocket Science: Missile Launcher (All), Launcher Rigs (All)
- + Starship Engineering (by race): All Ships (by race)

Molecular Engineering

- + Mechanical Engineering: Hull Repair Unit
- + Nanite Engineering: Armor Coating (All), Armor Reinforcer (All), Damage Control, Expanded Cargohold, Inertia Stabilizer, Nanofiber Internal Structure, Overdrive Injector System, Reinforced Bulkhead, Astronautics Rigs (All)
- + Nuclear Physics: Advanced Autocannon Ammo (Hail)
- + Rocket Science: Afterburner (All)

Nanite Engineering

- + Hydromagnetic Physics: Armor Hardener (All), Armor Plating Energized (All), Armor Rigs (All)
- + Mechanical Engineering: Armor Repair Projector, Armor Repair Unit
- + Molecular Engineering: Armor Coating (All), Armor Reinforcer (All), Damage Control, Expanded Cargohold, Inertia Stabilizer, Nanofiber Internal Structure, Overdrive Injector System, Reinforced Bulkhead, Astronautics Rigs (All)

Nuclear Physics

- + High Energy Physics: Advanced Artillery Ammo (Quake), Smartbomb (Proton)
- + Mechanical Engineering: Projectile Weapon (All), Projectile Rigs (All)
- + Molecular Engineering: Advanced Autocannon Ammo (Hail)
- + Rocket Science: Advanced Artillery Ammo (Tremor), Advanced Autocannon Ammo (Barrage)

Plasma Physics

- + Electromagnetic Physics: Advanced Blaster Ammo (Void)
- + High Energy Physics: Smartbomb (Plasma)
- + Mechanical Engineering: Hybrid Weapon (Blasters)
- + Quantum Physics: Advanced Blaster Ammo (Null)

Quantum Physics

- + Electronic Engineering: Warp Core Stabilizer
- + Graviton Physics: Cloaking Device (All)
- + High Energy Physics: Capacitor Battery (All), Capacitor Booster (All), Capacitor Flux Coil, Capacitor Power Relay, Capacitor Recharger, Energy Destabilizer (All), Energy Transfer Array (All), Energy Vampire (All), Power Diagnostic System, Reactor Control Unit, Energy Grid Rig (All), Shield Flux Coil, Shield Power Relay
- + Hydromagnetic Physics: Shield Rig (All), Shield Amplifier (All), Shield Boost Amplifier, Shield Booster (All), Shield Extender (All), Shield Hardener (All), Shield Recharger, Shield Transporter (All)
- + Plasma Physics: Advanced Blaster Ammo (Null)

Rocket Science

- + Electromagnetic Physics: Advanced Railgun Ammo (Spike)
- + Electronic Engineering: Advanced Assault Missile (All), Advanced Cruise Missile (All), Advanced Heavy Missile (All), Advanced Light Missile (All), Advanced Rocket (All)
- + Mechanical Engineering: Missile Launcher (All), Launcher Rigs (All)
- + Molecular Engineering: Afterburner (All)
- + Nuclear Physics: Advanced Artillery Ammo (Tremor), Advanced Autocannon Ammo (Barrage)

Starship Engineering (by race)

- + Mechanical Engineering: All ships (by race)