

## **Karox's Guide to Almost Everything in Eve**

### **Part 4 – Electronic Warfare**

There are primarily 4 main types of electronic warfare in Eve, each race has their own specialisation. Caldari are the masters of ECM, Gallente are the sensor damper wizards, The Amarr specialise in Tracking disruptors, and Minmatar prefer the damage increasing bonuses of Target Painters.

Each race has ships specialised in improving their racial electronic warfare tasks, spanning across both tech level 1 and tech level 2, though most of the electronic warfare ships are cruiser hull sized and frigate hull sized. Caldari are the exception with Battleship and Black Ops ships which have an ECM specialisation built into their hulls.

In addition to this, the classic electronic warfare measures, warp scramblers, webifiers and energy neutralisers and energy vampires will be discussed at the end of this article.

#### **ECM (Electronic Counter Measures)**

ECM has always been hailed as the king of electronic warfare, and it does deserve it's reputation as a battle-turner.

The principle of ECM is that upon a successful jam attempt, the target ship will lose all locks on it's targets and subsequently, all the modules that rely on those locks (mainly weapons, as well as scramblers and webifiers for instance) will switch off. This effectively means that you have no offensive power whatsoever unless you have drones in space and they are attacking of their own accord.

ECM is the most complex system of electronic warfare for the pilot to utilise, as there are a whole raft of modules that can be used to boost the effect, and if the wrong one is fitted against an opponent, the ability to jam them will be greatly reduced.

The basis of ECM is a simple chance ratio – offensive sensor strength divided by defensive sensor strength to give a percentage chance of jamming. This occurs separately for each module, so it is impossible to guarantee a jam by stacking modules repeatedly, though if several are used and the activation is staggered, its possible to get an 'overlap' of active jams to keep the opponent permanently jammed if you are lucky.

Each ship has a sensor strength that is the basis of it's operation. For Caldari, this is Gravimetric, for Amarr, this is RADAR, for Minmatar, LADAR, and for Gallente, Magnetometric. There are racial specialised jammers that can be fit which have a greater effect against the specific sensor strength, and a much reduced strength against those not of that class.

As well as the racial specific jammers, there is a general purpose 'multispectral' jammer which has an equal (but lower than the specific modules) strength across all 4 categories. The downside to using this module, aside from the lower chance to jam due to lower sensor strength is that it also requires more capacitor to use and has a lower range. The downsides need to be weighed up against the improved chance of jamming non racial ships. If you know what your opponent is flying, it is much easier and effective to use racial jammers, but that information is not always available.

A third type of jammer is the ECM burst. This is a multi-directional short range blast much like a smartbomb which has equal jamming strength as the racial jammers, but a very limited range (to the order of 5,000m to 6,000m) and a very high capacitor use. These also have the potential downsides of hitting friendlies which can cause havoc if it occurs when it is not expected.

ECM bursts are best used to escape close in tackling frigates as it does allow them to immediately re-target once they lose the target lock, so align to a warpable object, hit the burst, and disappear

before the tackler can re-establish the lock again.

In order to counter ECM it is possible to boost sensor strength by using ECCM modules or the projected equivalent (for third party boosting) which consequently reduces jammer chance. Tech 2 ships are usually a bit better off against ECM than their tech 1 counterparts are they usually have higher sensor strengths, and the larger a ship the better, as frigates have much lower sensor strengths than battleships.

### **Sensor Dampers**

Sensor dampers perform 2 tasks – lowering targeting range, and reducing the scan resolution of your opponent's ship.

This basically means it takes longer for the opponent to get into range to target you, and when they can get into range, it will take much longer to achieve the lock.

It is possible to fit a script to the sensor damper module to specialise in either target range reduction, or locking time reduction whilst removing the other effect from the damper, typically these will be decided based on the opponents you are going to fight. It should be noted however that scripts can be altered in flight as they simply count as an ammunition, so tactics can be adjusted based on need.

Primarily long range snipers will suffer most from a lock range reduction (as long as you can hit them with the sensor damper effect at their long range from you) as these ships are typically not built for approaching a target once they are at their ideal range.

Close in ships can suffer with the scan resolution reduction, especially slow locking ships such as battlecruisers and battleships meaning that it will take a long time to target small opponents such as frigates or interceptors.

The obvious counter for sensor dampers is to fit a sensor booster module which gives directly opposite effects to the damper, or to get remote sensor boosted from a fleetmate.

The module has limited appeal in PVP. Whilst it can be used to bring ships in closer, against ships designed to be close in such as interceptors, the range reduction aspect of the damper does not apply to any great deal. The targeting speed reduction is useful, but against smaller ships, these generally have very high signature resolutions so can target very quick, an extra 20% targeting time doesn't matter when it's only adding less than a second to targeting times.

Against frigates that are designed to operate at maximum range however (mainly Caldari ships such as the Crow or Kestrel frigates) the reduced locking range can bring them closer to warp disrupt/webifier range which can prove to be very effective at taking these ships down if the pilot is too aggressive and approaches without thinking through the consequences.

### **Tracking Disruptors**

These work by reducing the optimum range of the targets weapon, as well as lowering the tracking speed, meaning it will be hard to hit something that is moving.

This module is incredibly useful for frigates to use against larger opponents as the tracking speed of their weapons is already slower than what would be expected to be able to hit the weapon well, so reducing this chance even further can only be a benefit. Conversely, it has next to no use on a battleship attempting to disrupt a frigate that is close in, but on the other hand, the frigate will do next to no damage to the battleship by firing its weapons anyway, so it's not too big a loss.

Tracking disruptors have one major disadvantage – they can only be used against turret ships. Whilst these form the bulk of craft – any ship which mounts projectile weapons, lasers or hybrid

weapons are counted, there are 2 weapons classes – drones and missile users who are typically unaffected by the system. Drones can be targeted individually and feel the effects of course, but it is unlikely an opponent will field 5 dampers to reduce the effectiveness of the drones.

Tracking disruptors can use the script system to specialise in what they will effect, either tracking speed or optimal range. Again, this can be altered based on tactical need as they are simply classed as ammunition and can be loaded/unloaded in flight at will.

Tracking computers provide an opposite effect to this module, and can prove an effective counter. These boost optimal range and tracking speed, or specialised on one or the other if a script is used.

### **Target Painters**

Primarily used by Minmatar, but other races such as Caldari have occasional ships which get bonuses, this is a curious electronic warfare module as it does not directly impact an opponents ship, but instead boosts the attacking ships effectiveness instead.

Each weapon has a signature radius where if an opponent is smaller than this size, they can avoid a large portion of this damage, where the ship is basically too small to get hit by the larger rounds most of the time (think of it like a flak cannon, a smaller craft can avoid the explosions whilst larger ships cant help but take the brunt of the damage)

A target painter increases the radius of your opponent thereby allowing the larger calibre weapons to hit much more.

There is no counter to a target painter, the only way to avoid the effect is to run away, but conversely, if the target you are shooting at is larger than your weapon's signature radius the target painter has no additional effect and does not increase damage if there is a larger signature. Therefore the target painter is useless in most frigate against frigate battles and so on, but instead is best used when a larger opponent is taking on smaller ship opponents instead.

Missiles gain the greatest benefit from target painters, as there are no secondary effects such as tracking speed involved in the hit chance to further reduce the damage (unless of course your opponent can outrun the missile)

A main problem with Target painters is that they simply do not improve the effectiveness well enough to make it worth it for most cases. Raising a frigate from 50m to for example 80m size does not have too much of an effect when cruiser guns may be looking for targets at 120m size, and battleships could be looking for 400m size or more. Target painters generally don't push a ship up into the 'next category' of size but only improve on the losses that the gunner would otherwise face.

### **Warp Disrupters / Scramblers**

These modules are intended to stop your opponent from running away. They add either 1 point (disrupter) or 2 points (scrambler) of 'warp removal strength' to your ship which unless it is countered by using a warp core stabiliser to get the warp removal strength to 0 or lower (each stabiliser provides -1 strength) means that a ship cannot initiate warp.

Disrupters and Scramblers have 2 distinct roles. Disrupters are longer range (approx 24k or so with a decent module and skill set) but use more capacitor to maintain, the shorter range scrambler uses much less capacitor to maintain, but has a very short range. An additional effect of the scrambler is proposed that also shuts off a targets Microwarp Drive when it is active to assist with preventing it running away, disrupters are not scheduled to get this bonus.

Aside from these modules there are specialised variants of these. Interdictor and Heavy Interdictor

ships are designed to stop ships warping away. Interdictor ships can launch warp disrupt probes which create a bubble at the target which prevents warping in it's effect. Heavy interdictors can use a warp field generator which creates the bubble at the ship, making it a mobile warp disruption bubble. There are also anchorable structures which carry out the same effect which do not need a specific ship to launch, but are quite bulky and may only fit in the larger capacity ships, which are usually not combat-effective.

Warp bubbles can only be deployed in 0.0 space, for use in empire space, a Heavy Interdictor can use a script to convert it's warp field generator to a focused target instead, which creates an infinite strength warp disruption effect on a single target, which is impossible to warp away from when under it's effect.

Gallente Tech 2 electronic warfare ships get a bonus to the range of warp disrupters and scramblers, although as these are not typically the range-dictating part of the electronic warfare offensive system, this bonus is rarely utilised.

### **Webifiers**

Webifiers are designed to lower the maximum speed of the target ship. Currently they can reduce the speed of ships by around 90% but in the future, this value is expected to be reduced to around 60%-70%

Webifiers are relatively short ranged systems, usually around 10-12km maximum range, but some ships, notably Minmatar tech 2 electronic warfare vessels do get significant range increases.

Webifiers can generally mean a quick and messy death for any frigate caught in their range. As they are unable to use their natural speed as an advantage, tracking issues or missile outrunning issues apply less and less, so damage goes up accordingly. If a ship is caught in a webifier when using a microwarp drive, the added signature radius coupled with the reduced speed can mean that larger ships can quickly decimate these smaller ships.

### **Energy Vampires & Neutralisers**

These weapons are intended to disrupt the capacitor recharge of your opponent. An energy vampire takes capacitor charge directly from your opponent's ship, and adds it to your own capacitor reserve, as long as there is room for it. The energy vampire will not provide any benefit if the ship using it has not expended any capacitor itself.

The energy neutraliser directly removes your opponent's capacitor energy, whilst costing the attacking ship a similar amount of energy.

Because of this, the 2 systems are generally used in parallel. Neutralisers remove the targets capacitor, whilst vampires help offset the loss from the neutralisers, and also aid with removal of the opponent's capacitor reserves.

Typically these are short ranged systems, so the ship needs to risk getting into webifier range to get their effect. Amarr tech 2 electronic warfare ships get bonuses to the range and effectiveness of the modules making them extremely potent in their hands.

These modules are usually the best defence for a larger ship against a smaller one. As the capacitor is much smaller on a smaller ship, and there is no need to 'hit' the target with a neutraliser as long as it is in range, the smaller ship can find its capacitor drained in 1 or 2 cycles of the larger ships greater effect modules leaving it all but defenceless.