ESA_ Matador

COMPLETE ELECTRONIC WAR JAMMING SCRIPT 1.02

With this script you wlll emulate two different types of Jamming. Defensive, and Offensive.

How to install.

Fist, load MIST last version, then execute the function

EWJamming("Prowler1") or just put the name you want.

DEFENSIVE JAMMING

-- We all know that DCS lacks an Electronic War (EW) enviroment… The ECM, are available only for individual aircraft. But in modern conflicts, since Vietnam, the Jammers, with aircrafts like, F4 Phantom, A6 Intruder, F18 Hornet, or AWACS... have been used to avoid enemy SAMs to shot down aircrafts.

-- What I did in this Script is to Emulate this EW (not simulate!!!). We need to use a little bit our imagination and to imagine, that some aircraft has Jamming Pods... with chaffs, ECMs or whatever. So i recommend that if you or any of your friends is flying as if he is carrying ECM pods... just put One or Two Mk82-84 to simulate that they are carrying this pod. And AVOID them to use them as weapons... (I would love if someone can model an AN/ANQ pod...).

-- To start Jamming just go to F10 radio menú, and select Defensive Jamming On... Take into account that you can also jamm friendly missiles!!!

-- This Defensive Script, creates a bubble with 5 layers (easily increased upon request) surrounding an aircraft called in the function, for instance "EWJamming('Prowler1')". THis will work in the aircraft which pilot´s name is “Prowler1”. What the scripts makes is, to explode the missile if the missile gets close enough the bubble. But the good point is that the missile will explode with certain probablility, depending on the distance to the Jammer, the closer the missile is to the Jammer, the more difficult, is for the missile to get its target.

-- So, long story short... whatever missile guided by RADAR (AG or AA) is launched to an aircraft and the missile cross inside the bubble, the missile will be Jammed with a certain probability. It doesn’t matter if the missile is launched to the Jammer or to another aircraft who is inside its coverage bubble. The closer, the better!!...

-- The layers of the bubble I put is something like this this.... (to modyfy it go to line 320)

-- Layer 1 = 500 probability of succesfull Jamming = 85%

-- Layer 2 = 1000 probability of succesfull Jamming = 65%

-- Layer 3 = 2000 probability of succesfull Jamming = 50%

-- Layer 4 = 4000 probability of succesfull Jamming = 30%

-- Layer 5 = 7000 probability of succesfull Jamming = 15%

-- It gives us plenty of new tactical opportunities and situations to work with. You can fly the Jammer by, escorting in a cruise, create a Shield between the SAMs and the aircrafts, or even to Blind enemy SAMs by overflying them really close.

-- Each one has its adventages and inconvenient.

--You can also use an IA as a ECM carrier or Jammer by using the function, "startDjamming('jammer')"

OFFENSIVE JAMMING

--So there we go… THis is an awesome script... you can be the Stand Off Jammer (EA6 or F18G style!!). And you cannot “jam” only SAMs but shilkas, Vulcans, and every weapon that uses radar guided guns!!! (only, I could not make it work with ships yet)

-- After the V1.0, which was based in a simple script where, it takes SAMs and switched them off depending on the distances and couple of other factors, i made this V2.0 which is much more advanced and have many other factors.

--The script can be used with a player (A6 Prowler style) or with an Standoff Jamming with an AWACS or E2/E3 style... with the command "startEWjamm(jammer)"

-- Now it takes into account, distances, angles between Jammer and SAMs and Aircraft targeted by SAMs (hereinafter “Target”), jammer altitude, Jammer and Target altitude differences, banking, pitching, and few other factors such as the “dice”.

-- In this script I manage probabilities, and go/no go parameters. For instance, if the bank of the aircraft is too high, it takes into account, if the angle between the SAM and the Jammer... if it is not in the proper position, then, the jammer does not work. Others, such as distances, an altitudes, makes the probability of successful jamming to rise the lower the better... but if differences between Jammer and Target altitudes, the higher the differences, the lowest capacity of Jamming.

-- Now I ll explain all these factors so you can plan your successful mission taking into account what is best for your mission profile.

-- Another improvement is now, the radar does not Switch off. It just goes to Green Alarm state, it means, it does not fire, but is still working. Therefore, as in real life, you only know if the jamming is working if you are not being shot at!!!!!!.

-- The script start working, when a SAM is TRACKING (not Detecting) a Target... when it does so, the script start doing checks, and if it is succesfull, the radar goes to weapon hold for few seconds, then it goes to weapons free, and if it detects a Target, the checks starts again.

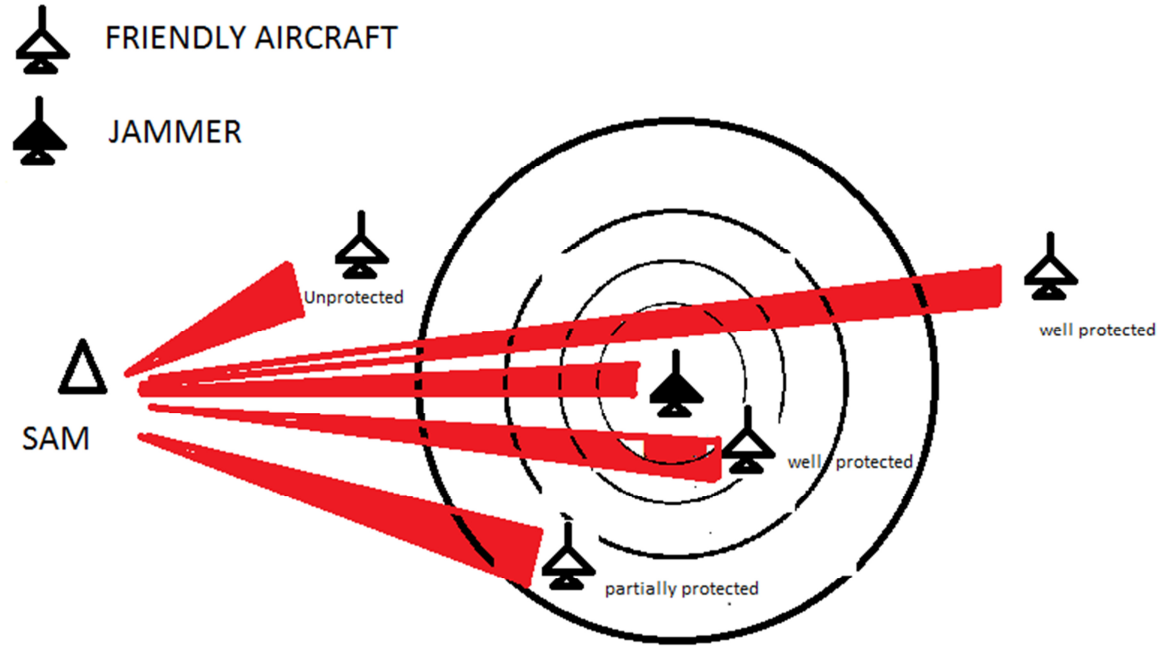
-- So... lets start, you have the instrucctions attached in a PDF document.

DEFENSIVE JAMMING

FACTORS:

DISTANCE:

The only factor here is the distance from the DECM Jammer and the aircraft escorted. Each ring (spherical) has an “influence” against an incoming missile. This POD does not affect the radar, neither lock SAM-Target. The scripts measures the distances between the missiles and the target... the closer to the Jammer the more probabilities that the Missile lost its target, so it explodes in the air... Its really freaking to see missiles coming.... if you maneouver to ensure the evasion, your mates will be out of your ring!!! So what to do??’ will you risk your fleet? In order to save your skin? Or you will be a tough guy and stay calm??? This is not for everyone!!!. Also imagine what SEAD missions you can make with convencional weapons!!!



IF you want to use the IA as Defensive Jammer just do this

EWJamming('Prowler1') or use whatever name that you are using in your mission editor.

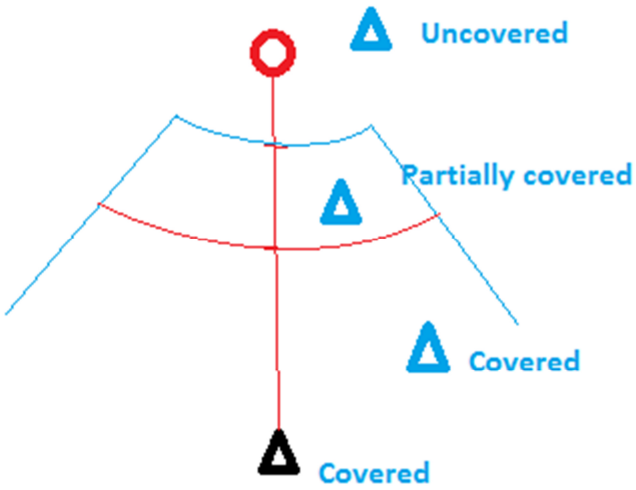
OFFENSIVE JAMMING

FACTORS:

DISTANCE JAMMER-SAM.

There are three different areas of jamming.. They depend on the distance taken between Jammer and SAM. And is proportional, see the drawing. It does not matter, if you are close, or long, it depends where the target is, related to both the SAM and the Jammer.

So, if the Target is flying in the one area or another, is “covered” by the Jammer, partially covered, or uncovered.



There could be the case, that the SAM will fire at you, but will be jammed during the Missile flight so, it will lost contact... so Even with Jamming..... keep an eye on the RWR and look for missiles!!! I am try to be realistic, not a Cheater!!!

Examples:

<u>First Case:</u>

Jammer - SAM distance = 100km

The probability of having a succesfull jamming of a SAM that is engaging a Target that is 50km from the SAM would be around 70%. (see below, that the target would exactly between both, SAM and Jammer)

Second Case:

Jammer - SAM distance = 20km

The probability of having a succesfull jamming of a SAM that is engaging a Target that is 10km from the SAM would be also around 70%. (see below, that the target would exactly between both, SAM and Jammer) because the relations are the same.

Third Case:

Jammer - SAM distance = 100km

The probability of having a succesfull jamming of a SAM that is engaging a Target that is 10km from the SAM would be around 20%. You see, the target is ini the same distance to the SAM that in case 2, but the Jammer is much further!!!.

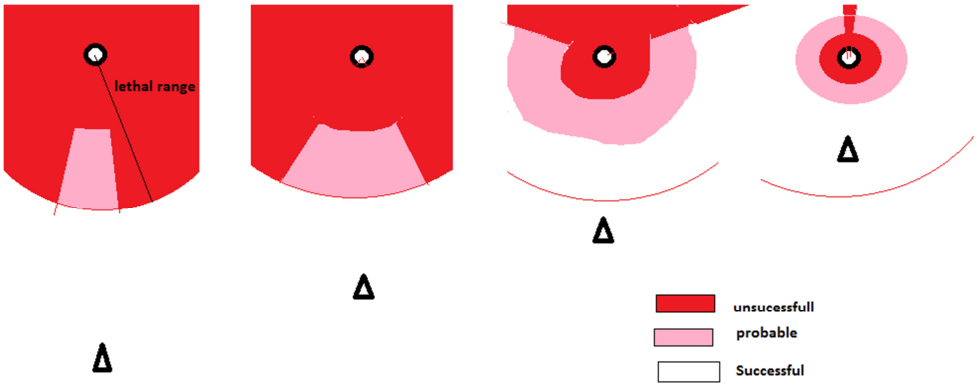
What I tryied to simulate is the BURN THROUGH effect, that is always dependant on these three factors. SAM, JAMMER and TARGET. Take into account that the Jammer can be the Target, that case is always around 90% possibility of Succesfull Jamming (so you have to be always worried about that 10%!!!.

So, if you are the Offensive Jammer... and you are doing a Close Jamming for better protection, you better wear the Defensive Pods!!!.

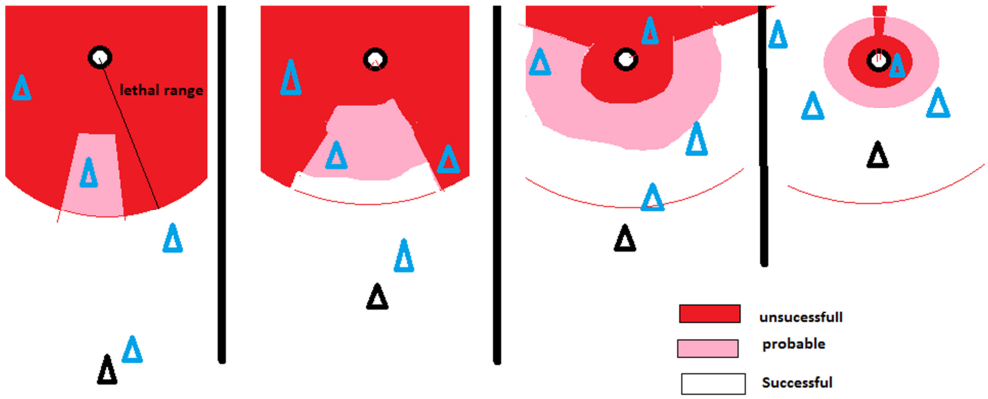
I am flying this with F5, and i put three Mks simulating the weight and the aerodynamic reduction. But you do whatever makes you feel confortable!!

ANGLES BETWEEN JAMMER, SAM AND TARGET

There is a Phenomenon due to the distance between the JAMMER and the SAM. This is the lobe factor. The closer the JAMMER to the SAM, the wider is the effect the jamming has in the SAM detection system. So I simulate this. Aircraft in the opposite side are not covered... unless the JAMMER is very close. Red area is the “Burn through” distances.

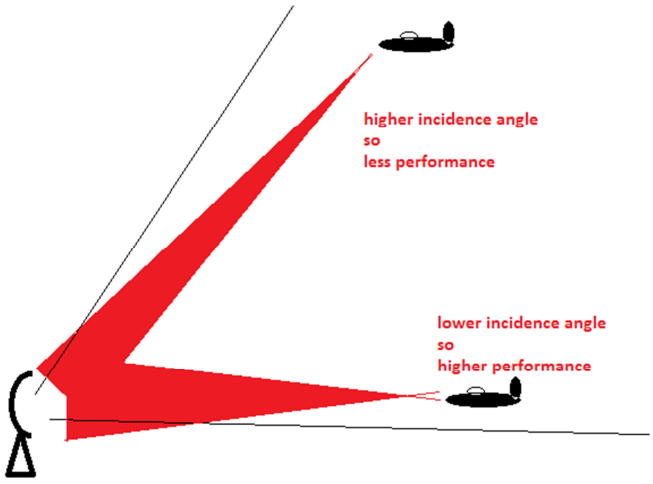


So, what happen if there is a package of Targets flying in the scenery... you guess!!



JAMMER ALTITUDE.

There is not very much information about this... at least for a non technical engineer in the subject like me. But I search for atmospheric conditions that can affect radar emissions. And I found few things that makes me believe that the higher the worst. Some phenomenon such as ducting and others although can make you detect objects from higher distances, the emissions

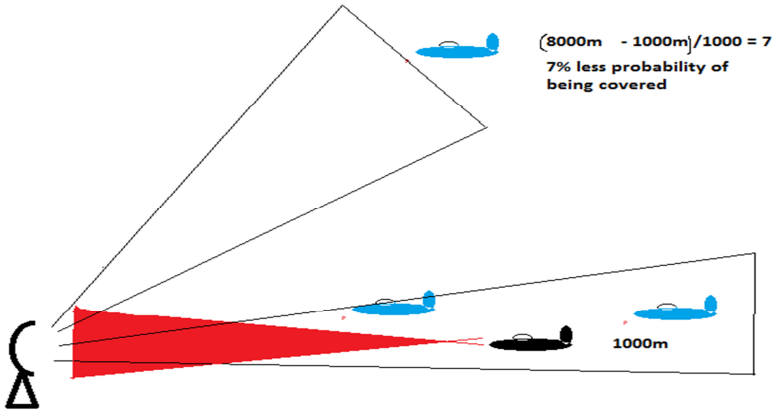


suffers deviations... Temperature, Pressure must be factors.

Also, I guess that the higher is the angle of incidence between the Jammer and the SAM, the less performance on jamming, so... I put a variable against the successful jamming that is, every 1000m of difference between the JAMMER and the SAM will be a 1% against the successful jamming.

Clouds also would be great to add as a variable, but I did not find a way via scripting to know if there are clouds in the LOS of the JAMMER and SAM.

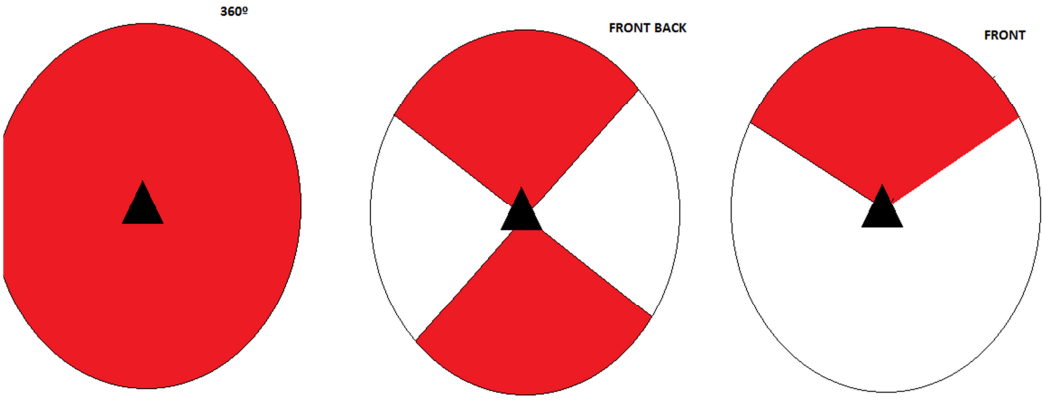
DIFFERENCE BETWEEN JAMMER AND TARGET ALTITUDE.



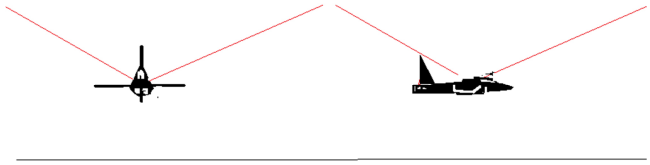
One thing that we have to take into account is the “Burn through” effect, this is when the signal of the TARGET is so high that the JAMMER cant interfere... this depends in lots of factors, mostly technical... But my conclusion is that if the JAMMER and TARGET are in the same altitude the signal received by the SAM will probably better JAMMED as in the picture below. In this script, the probability against successful jamming is -1% for every 1000m of difference

BEARING BETWEEN JAMMER AND SAM.

There is not too much information about this too. But I found that old jammers usually were able to work in certain angles. But modern ones covers the 360º degrees. If you have any source, we can emulate different ones. For the moment, it covers 360º but, an option to be easily edited in the .lua file will be done. You could states which bearings will be jammed and which not, front and the rear angle. See below a top view.

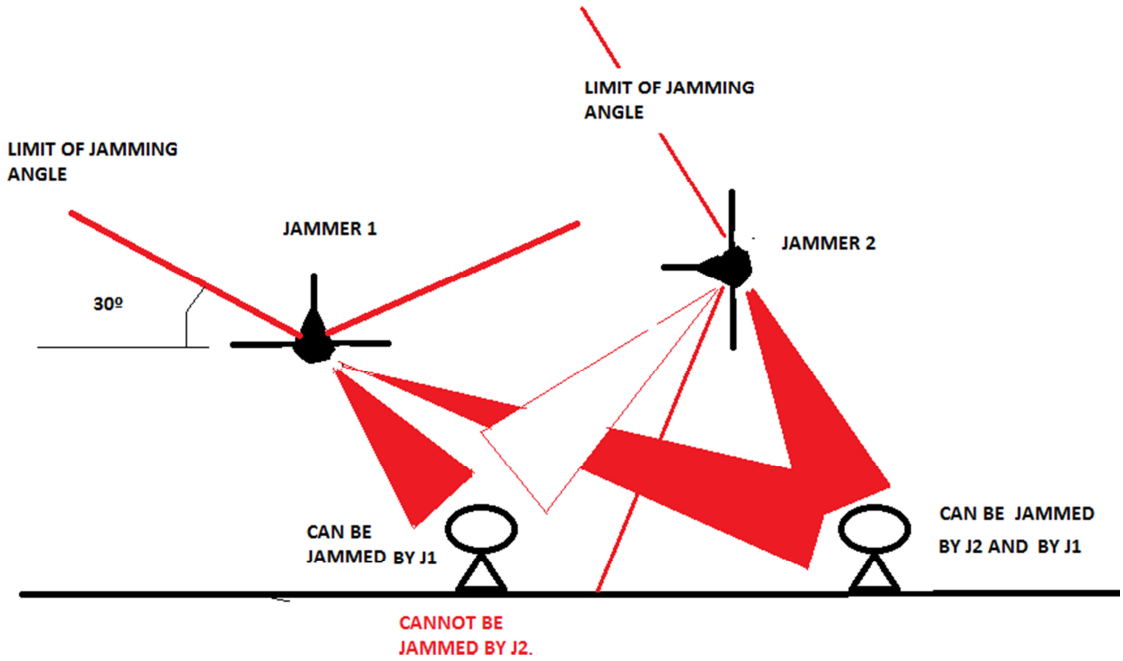


BANK AND PITCH OF THE JAMMER COMPARED TO THE SAM ANGLE.



For a proper jamming, we have to take into account the 3 dimensions. This is the last point that will be taken into account. So, I will describe what angles are covered with a simple picture. The angle of jamming for bank and pitch is 30º over the horizon.

As final example of the last point exposed, you can see in the picture below.



After all described here, you can see that there are a lot of variable that can influence in a successful jamming. Most of them, sounds credible (to me at least) so, I really ask you to help if you have information relevant to the subject.

Thank you, and I hope you enyoy it!!!

IF you want to use the IA as Offensve Jammer just do this:

startEWjamm("jammer") or use whatever name that you are using in your mission editor.

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