DCS FC3 - Sukhoi Su-27

A COMPLETE GUIDE TO AIR TO AIR COMBAT EMPLOYMENT

—

By Santi871

INTRODUCTION

The Su27 can be an absolutely deadly bird. The issue is that to achieve so, certain tactics, strategies and knowledge of the aircraft's systems are required. While the current product is a simplified FC3 module, its systems offer a variety of quirks and tricks that can be exploited to get the most out of it. I'm going to teach you how and when to use these systems, as well as their quirks and tricks.

Things you will **NOT** learn in this guide:

-Aircraft basics ("how the hell do I start this thing up?")

-Navigation

-Basic handling (takeoff, landing, level flight, autopilot, etc.)

-Communication

Revision 2 - 16OCT2015

PART 1: THE MANEUVERABILITY

Dogfights

The Su27 is agile, but you should not rely on its agility when you have a full tank and/or when you're fully armed. Turn fights will bleed all your energy and that's the last thing you want - the F15C has a better thrust-to-weight ratio and the ability to get rid of most of its fuel in an instant. Perform vertical turns, Immelmans, Split-S, oblique turns and so on. Respect the aircraft instead of yanking on the stick all the way trying to out-turn your opponent.

There's a fly-by-wire system in the plane (called ASC - Automatic Control System) that will limit the deflection of flight controls surfaces in an effort to prevent your maniacal flying from bleeding all the energy your plane has. Unfortunately, this also means that if you have plenty of extra energy and you want to spend it to out-turn your adversary, the Sukhoi's true turning capability will be limited by the ASC. There are two ways around this.

Wheel brake button - ASC relax

A little-known feature of the Su27 is the ability to force the ASC to "relax" and let the flight surfaces deflect more than usual. This is achieved by holding the wheel brake button (while flying, obviously) and it will allow you to perform sharper turns than usual. Note that the plane isn't able to stand such a high angle of attack and you will bleed much more energy, but it's very useful when you just need that extra turn rate. Use with care.

The feared "S" button - ASC disconnect

Also known as the suicide button, and usually just a different way to respawn, it can be very useful if you learn to dominate it.

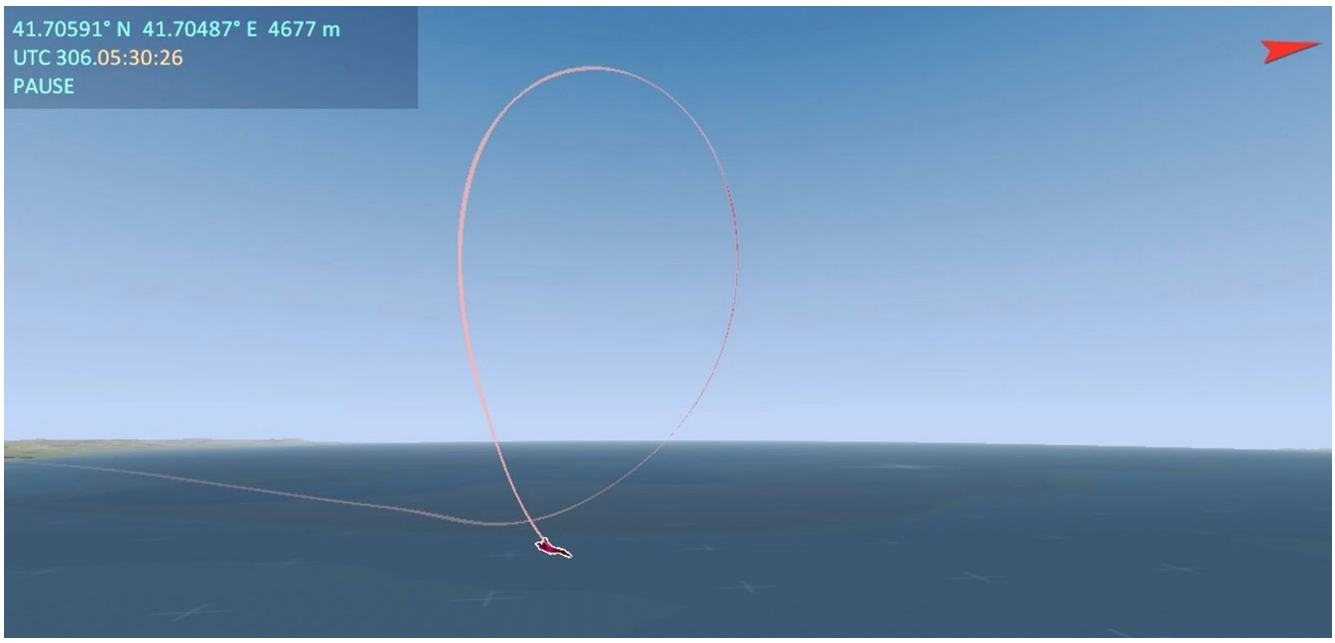
Pressing the "S" key will flip a switch in the cockpit that disabled the ASC altogether, which means there's nothing standing between your controls and the flight surfaces. This will make the plane quite unstable and violent but it can prove useful in a dogfight to surprise your enemy, dodging missiles and recovering from stalls.

First of all, be **very** careful when disconnecting the ASC if you're going faster than 500-600kph, **make sure to reset trim before doing it** - or it will make your plane want to pull an instant frontflip. As a matter of fact, it will always nose down when you disengage it (because you have probably trimmed the plane), and how violently/strongly it does depends on how fast you're going; that's why it's important to pull and hold your stick down slightly **before and while** disconnecting the ASC until the plane is more or less stable. Another important note: the Sukhoi is now extremely sensitive to frontflips so **avoid pushing your stick forward violently** at all costs unless you want to die.

So now you may be wondering why in the world you'd want to use this risky switch.

One of the advantages of this magical little feature is that it will save you from weird stalls. If you haven't noticed, the Su27 gets very unresponsive below 200kph and it starts wobbling in the pitch axis. To fix that, flip this switch and you will gain back some responsiveness, which will allow you to nose down and hopefully recover some speed. Another advantage is the fact that when you pull an insane cobra, your opponent will get confused and try to outturn you, which often ends in them smashing into a mountain. It can also be used when you are diving into the ground and aren't able to pull up properly. Last but not least, if you see a missile coming towards you, you can dodge it with a last second cobra and some countermeasures.

However, bear in mind that proper usage of this feature takes a lot of practice. I suggest that you don't fear it to begin with because the plane is still dominable without the ASC. You should hop on singleplayer or an aerobatics server and practice disconnecting it and flying around before you take it to combat. Either way, you are bound to die plenty of times before you master it, but it's worth it. Oh, and do yourself a favor and bind a button to it in your throttle or stick.

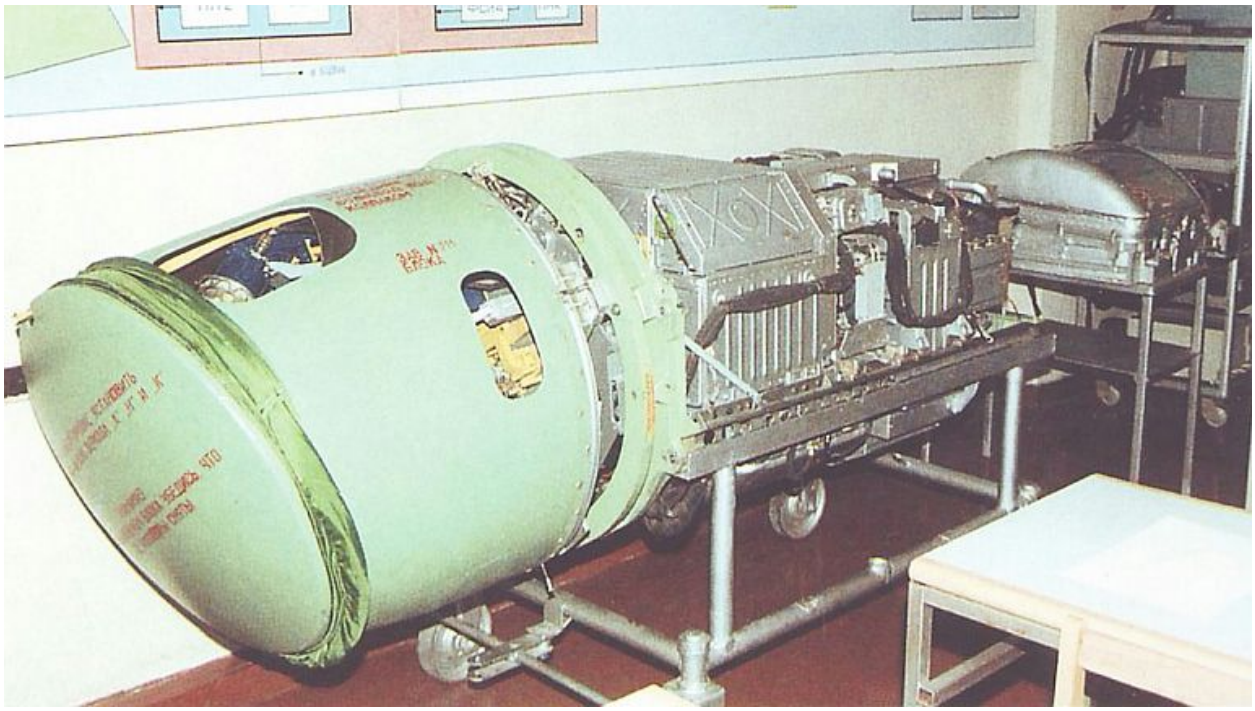


PART 2: THE SENSORS

Introduction

The Su27 has a rather nice combination of a conventional Pulse-Doppler radar and an Infrared Search-and-Track (IRST, also called Electro-optical system, EO or EOS). The two should be used in conjunction to get as much information about your enemies as possible while remaining more or less stealthy. Along with those two there's a passive Radar Warning Receiver that is capable of giving more than enough information for you to have a good time (don't let anyone tell you otherwise).

Radar



The Phazotron N001 Myech Pulse-Doppler radar in the Su-27 is decent, good enough for your needs but not as fast or effective as the F15C's AN/APG-63. On the bright side, it has a very neat integration with the HUD which makes it more intuitive and pleasant to use. In my experience, the max. detection range is about 120km. The azimuth scan arc is 60 degrees.

If you follow my strategies (which we'll get to later), your radar will be off most of the time as it will only be used to briefly check on targets.

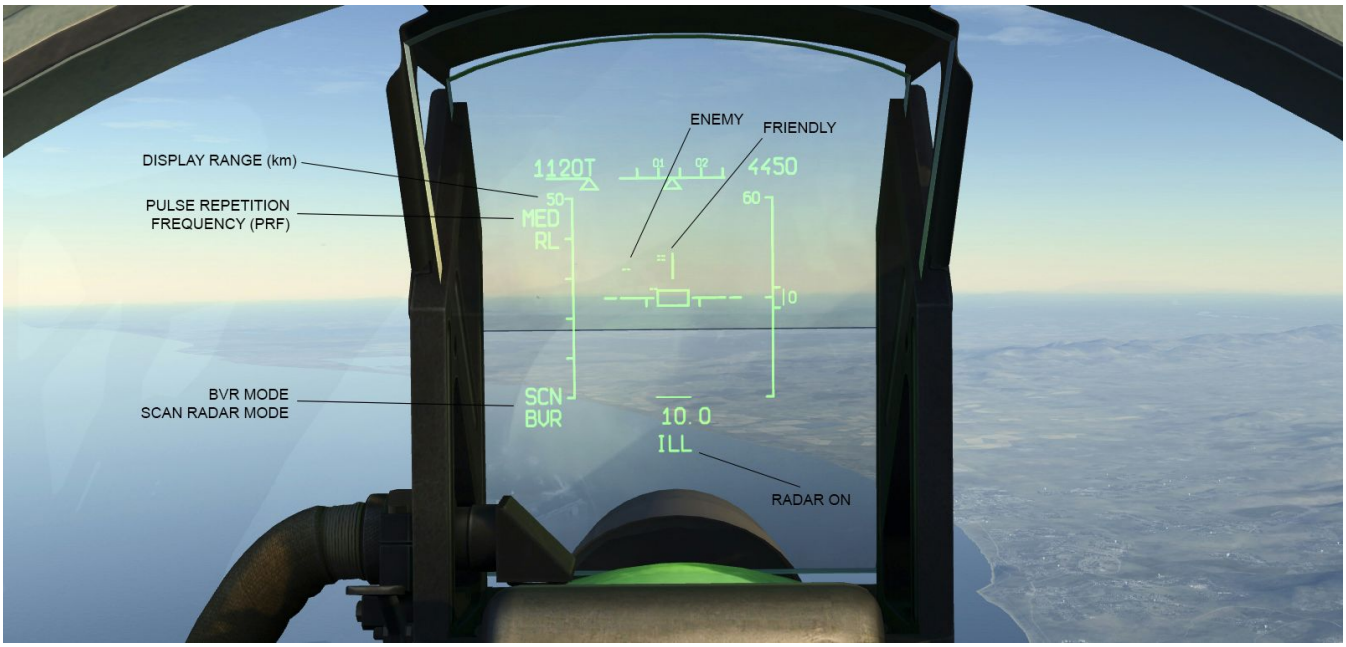
The radar information is accessed by switching to Beyond Visual Range (BVR) mode (default assignment is “2”), then pressing I to turn the radar on. You can change the display range (doesn’t affect the power of the radar, only the display) and Pulse Repetition Frequency (PRF). Use HI (high) PRF for targets that are coming towards you, MED (medium) for targets that are going away or closer than 45km, and ILV (interleaved) for when you don’t know. Using the appropriate PRF gives you a small range boost (maybe 20%).

Modes

1. Scan: for finding targets
2. Track while scan (TWS): for keeping track of a target more accurately and still being able to see other targets
3. Track: aka lock, for firing a missile, getting more precise information or luring
4. Home on jam: for locking onto jammers before punching through them, pretty much useless due to how inaccurate it is

Scan mode and symbology

On the HUD, in scan or TWS modes: enemies are marked with with a dash ‘-’, friendlies are marked with an equals sign “=”. The width of these symbols represent the size of the contact (AWACS and transport or fighters). ILL means that the radar is on. LA means launch authorized.



On the radar screen, friendlies have a circle at the base of the line, whereas enemies do not. The contact's speed is represented by the length of the line that is parallel to their flight direction, whereas their altitude is represented by the length of the line that is perpendicular to their flight direction.

Note: scan mode gives a top down view, so contacts closer to the bottom of the HUD are closer to you and so on.

Locking a contact

To lock a contact, simply move the Target Designator (the box) over the contact on the HUD and press the lock button. They will get a lock warning on their RWR at this point.

Antenna steering and stabilization

The antenna can be steered up, down and to the sides. Usually one or two notches up is enough to detect anyone flying high if you're flying low, and one or two notches down for the opposite case. Steering to the sides is useful when you can't be arsed to the turn the plane and want to scan to the sides.

Additionally, the antenna is stabilized in the pitch and roll axes. That means that when you pitch up, you will have to manually steer your antenna upwards in order for it to "look" where your aircraft is pointing, otherwise it will still look towards the horizon.

Jammers

Detected jammers will be represented with a dotted line pointing to their direction in the radar screen and fuzzy dashes moving around on your HUD. Once you are close enough, your radar will "burn through" the jamming and the contact will appear over the fuzzy dashes or dotted line. Note that until that happens you don't know know whether the jammer is friendly.

Locking onto the fuzzy dashes will enter Home On Jam mode. You will lack certain information compared to a regular lock and if you fire a missile it will be horribly inaccurate, so… don't.

Track While Scan mode

TWS is a bit disappointing in the Su27. It's not as powerful as the F15C's TWS mode. It will not give you target speed and altitude (most of the time) and it will not give you the small circle overlay over the target on the HUD. All it does is give you constant updates on your enemy and it will also automatically steer the antenna to keep track of the designated target. It does not work if any jammer is present on the HUD/radar screen.

To use TWS, simply press your assigned hotkey and slew the Target Designator over your preferred contact. There is no need to press the lock button. When the contact is within the maximum range of your selected weapon, the radar will automatically enter Track mode.

Track mode

Once in track mode, you will get a range scale on the left of the HUD and an arrow that represents the distance to the target. A circle will overlay the target and you will get the target's speed and altitude, indicated above your own in a smaller font. On the bottom left, the letter A will display if the locked target is enemy or AFR if it's friendly. At the bottom of the range scale there is an arrow that represents your target's velocity vector (where it's going relative to you).

Radar screen symbology remains pretty much unchanged.

Electro-optical system (IRST)

The Su27 is equipped with the OLS-27 Infrared Search and Track system. This is straight out the best single feature the plane has to offer. This EOS allows the aircraft to find, track and engage targets without ever popping up on their RWR.

Because this system tracks the infrared emissions from other planes' engines, it is the most sensitive and has the higher range (up to 200km) when your targets are flying away from you or perpendicular to you. However, if your target is on afterburner **and/or you are close enough to it, or you're above or below it, it will work all aspect just fine**. This usually means being closer than 50-60km to the target.

A big flaw of this system that usually results in **a lot** of teamkills (and thus I have to strongly stress it) is that

THE IRST/EOS CANNOT TELL FRIENDLY FROM FOE AND IT WILL ALLOW YOU TO ENGAGE FRIENDLIES WITH NO WARNING

Read it again and repeat it in your head.

For this reason this section is very sensitive and you need to pay attention.

Usage

To enable the EO system, switch to BVR mode and press “O”. The word EO will come up on the left and the ILL on the bottom will go away (if your radar was on), meaning that your radar is now off. The IRST can be steered the same way as the radar.

The EO system has two modes: track and scan.

Scan

The scan mode is very similar to the radar, however it has three major differences:

-Instead of a top-down view, it gives a longitudinal view, so contacts on the bottom of the HUD are below you, contacts towards the top of the HUD are above you, and so on.

-Instead of showing “=” for friendly and “-” for enemy, it will **ALWAYS** show dashes **REGARDLESS OF ENEMY OR FRIENDLY**.

-The width of the dashes depends on how strong the return is, so usually, wider = closer (“----”), but this only applies when the contact is flying away from you. A contact flying towards you will always have only a couple dashes (“--”).

-The last difference is that it doesn’t show contacts on the radar screen when in scan mode.

Track

Track mode is again very similar to the radar’s track mode. On the left, the word EO will appear to indicate that you are using EO to track. Target altitude and speed information may or may not be available. A circle will overlay your target and the target will appear on the radar screen. If you fire a radar guided missile, the radar will turn on automatically.

The range scale will be shown on the left and the range to target may or may not be available. The target’s velocity vector will be shown on the bottom.

It will ALWAYS show “A”on the bottom left regardless of whether your contact is friendly or enemy.

Important

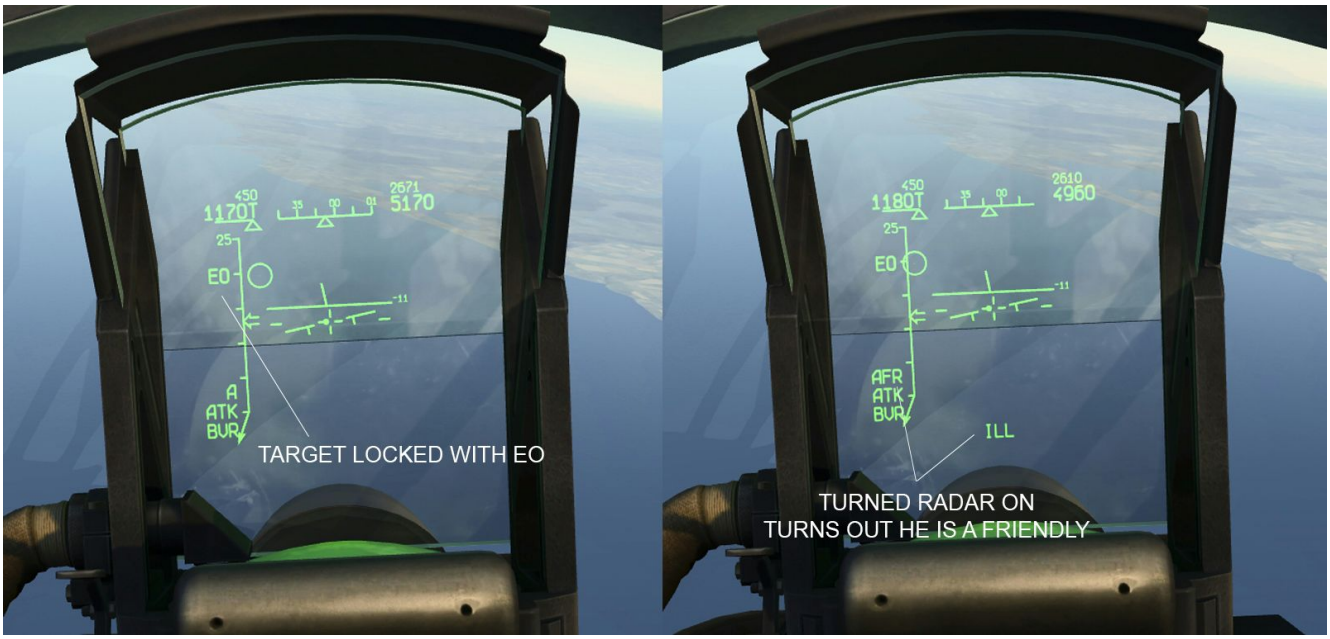
There is a trick to IFF your target (determine whether he is friendly) once you are locked with EO.

The “trick” consists of flashing your radar on and off **WHILE** you are locked with EO. Simply press I twice to flash your radar on and off, without unlocking your target.

This will be represented by the word ILL flashing on and off on the bottom of your HUD.

If the target you are locked onto is friendly, **ONLY WHILE YOUR RADAR IS ON**, the “A” will change to “AFR”. When you turn the radar off again, it will turn into an “A” again.

If the target you are locked onto is enemy, the “A” will remain as an “A” when your radar is on.



Turning your radar on while locked with EO will not give your target a lock warning, and you will not appear on their RWR. It will only give your target a lock warning if you happen to fire a radar guided missile at him.

Please, for the love of everything, take your time and perform this “trick” a couple times before firing to confirm that the target is enemy. **Do not fire if in doubt**.

Practice this technique in singleplayer and practise multiplayer servers before taking it to PvP.

Sample video of this technique.

SPO-15 Radar Warning Receiver

The SPO-15 RWR in the Su27 is not as good for showing the greater picture, but it gives very accurate information about the primary threat. It has a 360 degree azimuth coverage and +-45 degree elevation coverage.

It's unlikely that you will be paying attention to anything in green, as those represent secondary threats (usually ground units) and their information.

To be clear: **yellow = primary threat and its information, green = secondary threats and their information**.

The 8 large yellow lamps on the top half represent the direction of the primary threat. The number inside them is the degrees.

The 2 large yellow lamps on the bottom half with triangles represent left or right rear hemisphere. When the threat is behind you, the RWR isn't as accurate.

The 2 yellow semi-circular lamps in the center of the display with the B and H represent the primary threat's relative altitude (both on is more or less same altitude). Note: these indicators aren't accurate if your plane is banked to either side.

The 6 rectangular lamps on the bottom are the different types of threats. There's no point learning them all by heart. The left-most is fighter radar, the rest are a mix of different ground units and AWACS.

The circle outline lamps represent primary signal strength. To give you an idea, if an F15C was the primary threat, three quarters full means he is quite close, usually

within 50km. Half full would mean that he's between 50 and 100km from you. **In a nutshell, if the circle is half or more full, you should check on it. If it's more than three quarters full, you should turn away and dive into a mountain because the threat is likely to lock onto you soon.**

The red circular lamp in the background turns on when you're locked, and it will produce a steady sound.

When the red circle starts flashing and you start getting an intermittent beeping, that means a radar-guided missile has been fired at you, or that you're being illuminated with FLOOD mode.

How do you tell what's happening then?

If you a radar-guided missile has been fired at you, the signal strength indicator now shows the signal strength from the missile. **As the strength grows, the missile gets closer to you**. You can use this to judge when to use chaff and turn.

If the signal strength doesn't seem to change much, then you are being painted with FLOOD mode, or the missile ran out of energy.

If you bank to the sides like in this picture, it is likely that the RWR ceases to give you warnings.

The RWR does not provide any warning for heat-seeking missiles or EOS.

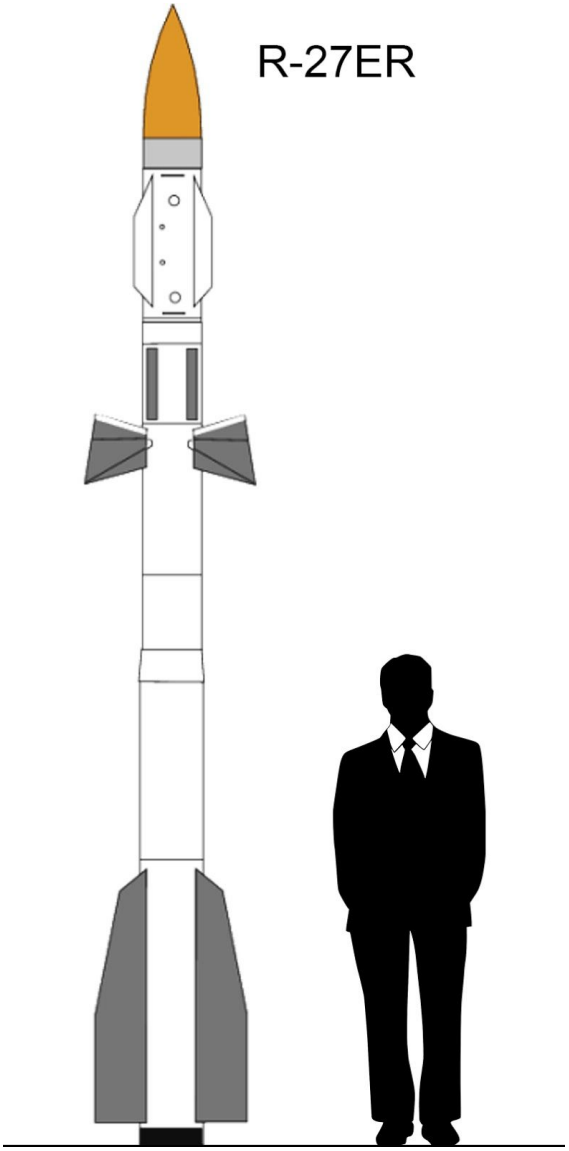
Part 3: The Weapons and Countermeasures

Semi-active radar-homing missiles

Vympel R-27ER

This medium range missile is, unfortunately, garbage. It's very easy to outmaneuver and fool with chaff and as such, it should be used as a last resource, or when attacking your opponent from below or above, where his RWR cannot detect you. Otherwise, expect to use at least two per kill.

In my experience, at low altitude, it has a range of no more than 30km. However, launching at that range would effectively be wasting the missile, so don't use it beyond 20-25km if you want a higher chance to kill.



Vympel R-27R

Same as the ER, just shorter range. Haven't used it and there's no reason to use it unless you're forced to (loadout availability) or want a challenge. I would say don't launch it beyond 15km, which makes it basically a fat R-73.

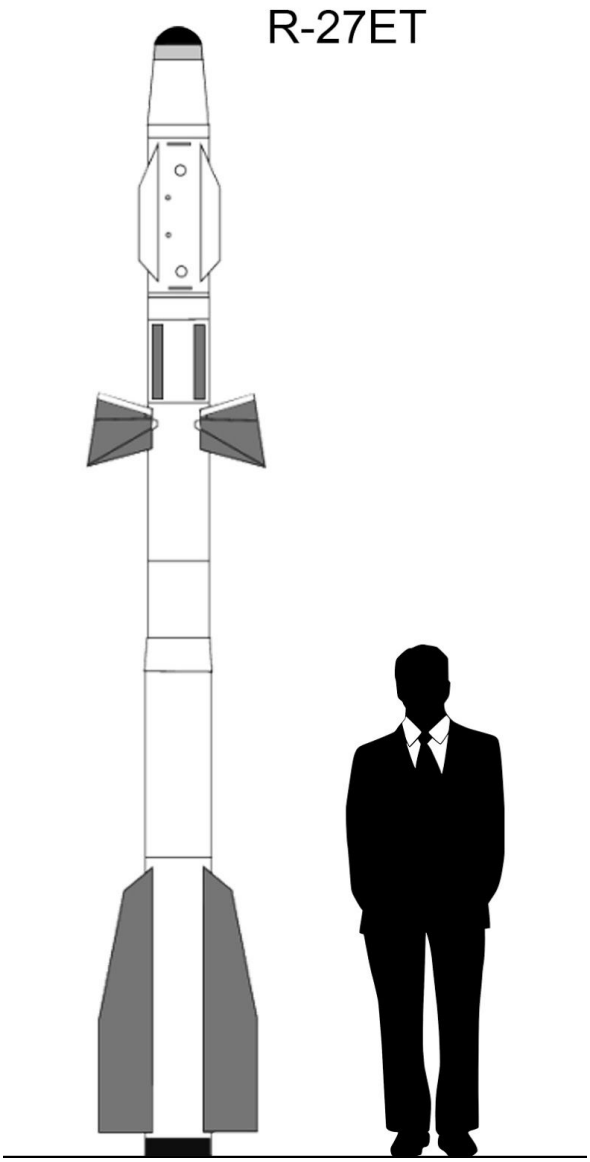
Infrared-homing missiles

Vympel R-27ET

One of the goodies of the Su27. Hated by most F15C pilots, this medium range heater has guidance that is just as bad as the ER's, but being IR guided, it gives no warning, and so unless your enemy sees it, he is bound to die (given that you lock onto him with the IRST).

Like the ER, the maximum range is around 30km at low altitude, but if you want to guarantee yourself the kill, launch it at around 15-20km. Sometimes the LA (launch authorized) will take a bit to appear, depending on aspect.

Best used in conjunction with the EO system (as always making very sure your target is actually an enemy). Will expand more on the tactics section.



Vympel R-27T

Same deal as the 27R. It's the same as the ET except shorter range. Use it if you are forced to (loadout availability) or want a challenge.

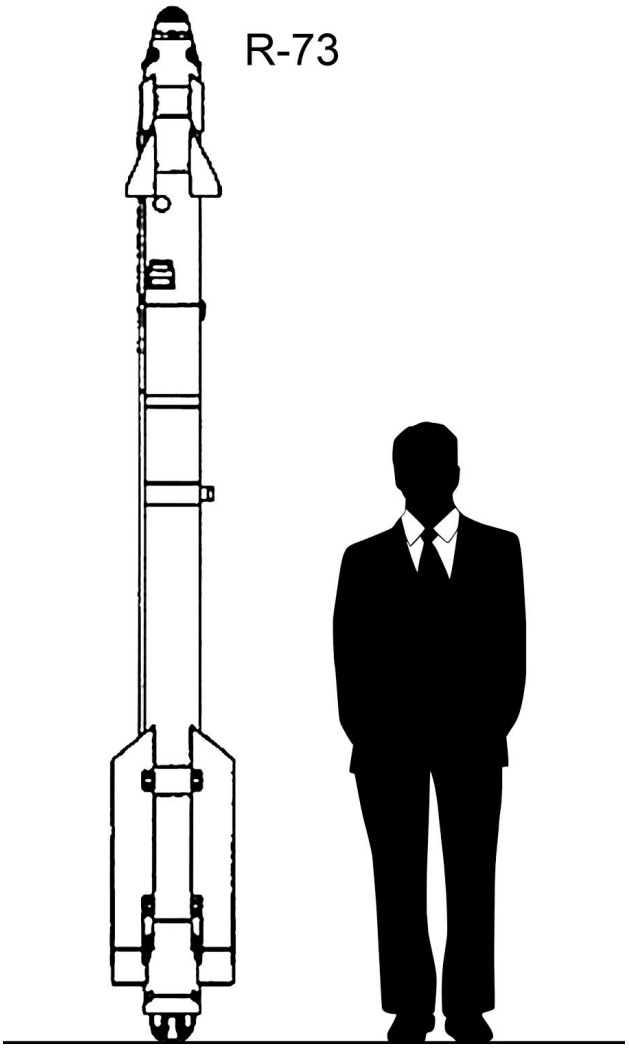
Vympel R-73

This short range heater is, right now, the best short range missile in the game.

With its simple thrust vectoring, the R-73 has exceptional maneuverability. It has a maximum range of 12-15km, though it's best used within 10km. Fairly resistant to flares (don't expect miracles though), it's the only missile I actually trust to get a kill. Combined with the helmet-mounted sight, it can be fired off-boresight (meaning that you don't need to point your plane at your opponent's plane). It can even pull 180 degree turns.

Given the chance, you'll want to get close enough to use this missile, as it'll nearly guarantee a kill.

One note - be careful when firing this missile off-boresight while turning, as it's known for turning around and targetting your own plane.



Guns, guns, guns - the Gryazev Shipunov GSh-30-1

This 30mm cannon is actually quite favored by the EO system in the Sukhoi. Because the EOS locks planes without setting off their RWR, it's very possible to simply approach them and use the cannon on them. The EO will take care of giving the distance solution so you will not need use the gun funnel, which makes aiming quite easy. Being 30mm, it will rip planes apart easily. Just mind your aim, ammo is limited.

The only case it's not easy is when your target is flying perfectly straight. Because it's very likely you will miss and scare him, I recommend you approach him from below. Why below and not above? The IRST can't look down because it's mounted on the nose, so if you want to approach from above you will have to use the funnel.

Countermeasures

The countermeasures in the Su27 are fairly simple. It can carry 96 flares and 96 chaff, although my preferred mix is 30 flares and 162 chaff, because you will usually be avoiding AMRAAMs, and at times you will have to spam as much chaff as you can.

There are two indicators on the right side of the cockpit for chaff (left) and flare (right). Note that they are calibrated for 96 flares and 96 chaff, which means regardless of however many of each you set, the “full” is 96.

Electronic countermeasures - the jammer

Personally, I’m not a fan of it. It will prevent F15C’s from using their powerful TWS mode on your aircraft, but I much prefer a couple of R73’s. Also have in mind that you will clutter the radar screens of friendlies.

Part 4: The HMS and Vertical Scan

Vertical Scan

This is, to me, the most powerful mode of the Su27 because of the large area it covers. The vertical bars represent your lock window, but have in mind they extend above the HUD by X HUD lengths, which means that vertical scan actually covers a big area at once.

Regardless of whether your radar is on (although I suggest you keep it off), vertical scan will use the IRST to lock aircraft. The maximum lock range can be anything from 0 to about 50km depending on target aspect.

The fact that this system uses IRST means that **it does not distinguish friendly from foe** (unless you lock with radar on, or you use the trick I explained earlier).

Holding the lock button down will make it lock onto the first aircraft the IRST detects. This means you don't need to spam your lock button like a maniac.

Helmet-mounted Sight

This is absolutely great for when you have sight of an aircraft. Simply look at it and press the lock button to lock. Again, uses IRST, so it does not distinguish friendly from foe, unless you lock with radar on or use the trick I explained.

Part 5: The Strategies and Tactics

Entering battle

As you fly into the battlezone, I recommend switching to EOS and steer it around, IFF contacts you find with it. Sometimes you happen to find a sneaky lonely enemy that's destroying your friendlies. You can also do it with the radar.

BVR in the Sukhoi

is… a lost cause. The Su27 simply can't hold its ground in a fair BVR (Beyond Visual Range) fight against the F15C's active radar homing AIM-120B and C AMRAAMs. The R27ER are sluggish and produce a huge smoke trail that will easily be visible, not to mention the fact that you need to keep the aircraft more or less pointing towards the enemy whereas the F15C's can just wave off.

I can't stress this enough: **don't *ever* go head on against anyone**. You will die 90% of the times.

Attempting BVR in the Su27 against Eagles is roughly the same as flying into the ground.

So then how do you destroy Eagles?

Luring Eagles into the Sukhoi's game - WVR

The correct way to turn F15Cs into scrap metal is luring and dragging them where you can beat them with easy, and that is WVR.

First of all, I think it's opportune to clarify that WVR means "Within Visual Range". That is the same as saying "within 40km". It doesn't mean that you need to find your enemy visually. Vertical Scan will be finding targets for you 80% of the time.

There is only one requirement for the Su27 to be able to play its game, and that is mountains. If your battlezone is above plains and there aren't any mountains close, you may as well fly a Bf109. The Su27 is unable to do anything without terrain masking. Okay, yes, you can fly a ship of 5 Su27's and fire ER's at everything, but my strategy makes no use of wingmen and allows you to score victories on your own.

If your battlezone is already above mountains, that's the best possible case as you won't need to do anything to lure F15C's - they will come for you.

Let them get close. I usually fly straight towards them until they are at 40km from me. While I fly towards them, I try to find them with the EOS in order to get their altitude and speed. Alternatively, you can briefly lock them with your radar which will get you that information, and it will piss them off a little. Either way, I recommend you keep your radar on and blasting towards them until you reach the 40km mark (more or less).

As you can see in the pictures above, the contact is a little less than 40km from me. I have high PRF selected because I know he is coming towards me since my RWR is being set off by his radar. My radar's antenna is steered upwards a notch because he's flying above me, which I found by simply playing with the antenna steering until he appeared.

At this point, when he's around 40km, you need to dive into a valley to the left, right, or behind, while simultaneously turning your radar off (if it was on).

In my case I dove into a valley to my right and switched to EOS.

After this, carefully fly as low as you can around the valleys and sneak around until they dissapear from your RWR. At that point you are safe to assume that they have lost sight of you and are looking for you. It's now important that you more or less remember their location and guesstimate where they could have flown.

Once you feel it's opportune to turn around (long enough for them to not be right on your ass and not long enough for them to have flown away), try to find a nice mountain to climb and peek out of and switch to Vertical Scan - have your R-73s selected in case he appears right infront of you.

This is the most critical part: right as you peek out of the mountain, **hold down your lock button and start banking your plane to the sides moderately slowly**. The idea here is to cover as much sky as possible with your Vertical Scan. Try going beyond 90 degrees in the banks in case he is below you. As soon as he enters your IRST field of view, he will get locked.

In my case, the Eagle dove into the valleys to look for me and I caught him with Vertical Scan flying towards me at only 2,5km.

I very quickly flash my radar on and off to confirm he's an enemy and fire an R-73 which he has next to zero chance to dodge. In his eyes, I just came up in front of him and his RWR was silent the whole time. Odds are he thinks you haven't seen him.

[Download the TacView file here.]

But what if this or that?

There are lots and lots of variations to this type of engagement: sometimes your enemy will come for you, sometimes he will wave off, sometimes he will fly higher, sometimes he will try to sneak around. Depending on the distance at which you find him, you may want to use ET's or the gun (never really an ER…).

If he locks onto you and fires, perform the exact same tactic while deploying plenty of chaff (now you know why I carry 162 chaff and 30 flares).

Either way, as I said, you will find many different variations, and the only way you will learn how to properly react to all of them is practicing. You get the gist of it. **Wait until they are close, dive down and disappear from their RWR, then sneak around and peek out to find them**. It's important that you understand that mountains and valleys are your biggest friend and savior. When you dive down, any missiles heading to you that are still a few kilometers away will attempt to lead and will crash into the ground.

If you happen to run out of mountains and fly towards flats, it's game over for you, so keep an eye out for cover - always. When you are flying towards your target, at first, and you are nearing the 40km mark, start looking around for possible valleys to dive. **It's all about disappearing as quickly as possible and sneaking around**.

In the case it's not possible to dive or you are extremely close to your enemy, turn around and fly back with full afterburner in an attempt to flee, then come back later and try again.

It's also important that you monitor your RWR because it will alert you of any Eagles nearby. You could do all of what I said above without ever needing the radar, simply looking for at your RWR.

Don't try to use R-27ER's to distract your target because it just doesn't work. He will fire an AMRAAM at you, wave off and laugh his ass off while your ER is wondering what a plane is and you blow up.

Getting the most out of your missiles

A lot of players let their missiles do most of the flying. That's a mistake. You can't trust missiles to do the flying because a) you don't know what your opponent will pull out of his sleeve and b) they have limited fuel.

Think of your missiles as a dumb can that can only fly straight. With the EOS, you can approach your target as much as you wish. The closer you are, the higher the odds you won't waste a missile. I generally try to get within R73 range, and even guns sometimes. If I get interrupted by another enemy, I fire an ET. ETs are also useful when your enemy is high above you and your missile needs to climb.

There are two notches on the range tape on the HUD during EO or radar track mode:

The top one is the calculated maximum range (known as Rmax) for your current selected missile (R27ER in this case, as seen on the bottom right) against a non-maneuvering plane. The notch in the middle is the start of the "no escape zone" (known as Rtr) which is kind of bollocks because your target can still escape. The bottom notch is the minimum range (known as Rmin). As a rule of thumb, don't fire beyond the middle notch, and try to get within it as much as possible. The range tape will automatically change as you get closer to the target.

The Rmax is also shown in the radar screen as an arc with a solid line, both in scan and track modes.

When the Eagles run

Destroying a target that is flying away from you is difficult because your missile has to travel a very long distance. This results in a waste of missiles most of the time.

If your target is within your Rmax, you can try firing an R-27ER with hopes that he will freak out and start maneuvering. Then, unlock him and lock him again with the EOS so he thinks that you're not after him anymore, done that you can nail him with an ET if he gets within range.

If your target is beyond Rmax, you can try locking him with the EOS and following him, but most of the time this will be a waste of fuel.

Conclusion

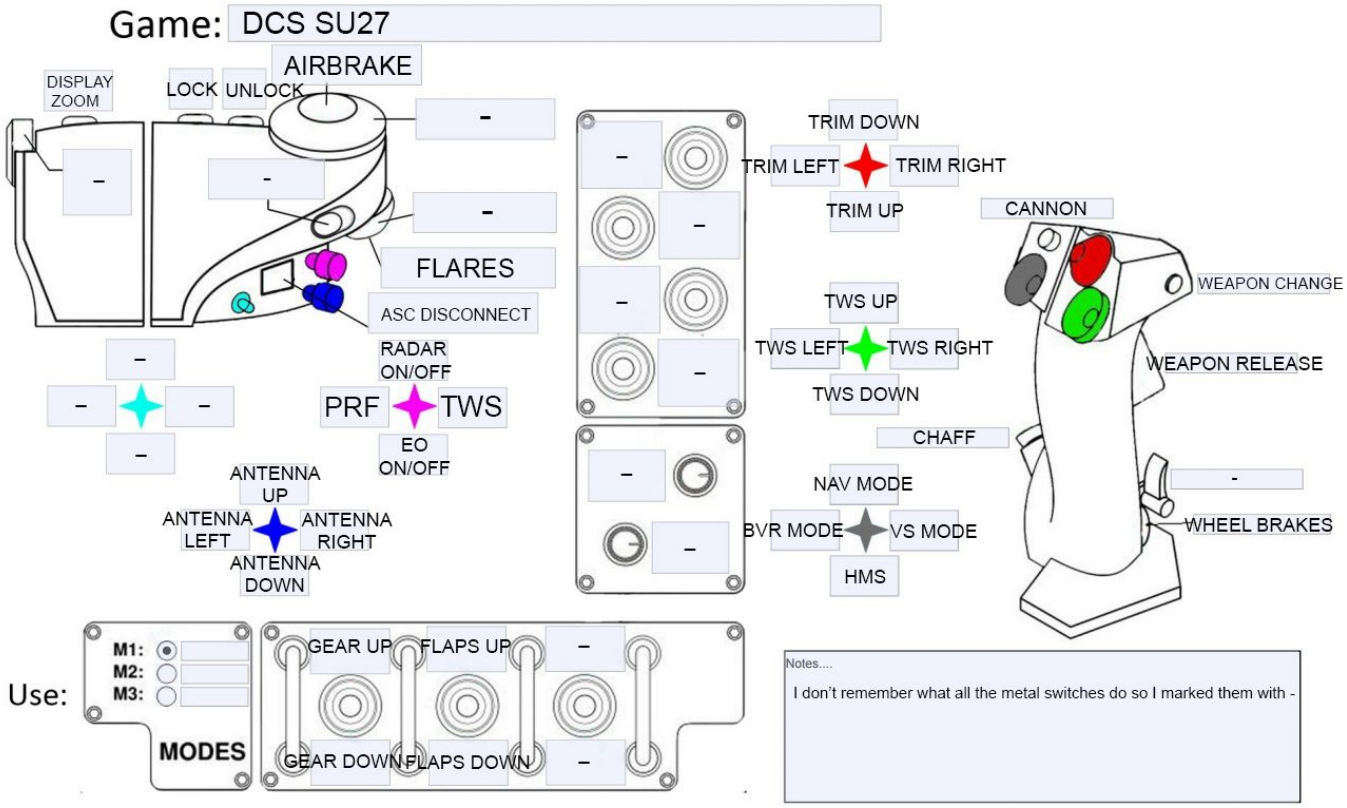
Hopefully this guide is a good starter for you to learn how to properly use the Su27. I would love to describe every single tactic I can think of but that wouldn't be possible, so I recommend that you venture on your own and try to discover them like I did.

Taking the Su27 to PvP is a lot of fun as it's based mostly around ambush tactics. I hope you enjoyed reading this guide as much as I enjoyed making it. As always, practice will make you better. You will die a lot, but you will also learn a lot of things that can't be taught with words.

I will try to update this guide with any corrections or suggestions that come up.

Happy flying!

Addendum: HOTAS setup



[Download my Saitek x55 Su27 profile]