Scenario Description

Welcome to the Simple Air Intercept tutorial.

This is the third in a series of tutorials designed to teach players the fundamentals of air operations in Command. In this tutorial, the following topics will be covered:

- Intercepting an airborne target.
- Shooting down an airborne target.

Pop-ups will appear with important messages during this scenario. You can find a PDF of them in the documents folder that comes with these tutorials. The default location is: C:\Program Files (x86)\Command Modern Operations\Scenarios\Tutorials\Air Warfare Tutorials\Flight Tutorial\Documents.

For Steam users, they will be located at: C:\Program Files (x86)\Steam\steamapps\common\Command - Modern Operations\Scenarios\Tutorials\Air Warfare Tutorials\Flight Tutorial.

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Scenario Briefing

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Message 1

Good morning!

Today you will impersonate the commander of the Ramat David Air Base in Northern Israel and you will learn how to intercept and engage an airborne target.

You have six F-16I Sufa, two Gulfstream G550 AEW Nahshon, two 707 Saknayee tankers, and two Hermes 900 Star UAV under your command.

Message 2

An Iranian-built Shahed-129 UAV is flying from Syria to Israel. We don't want them to collect intelligence over our territory, so the intruder must be destroyed.

To accomplish this goal, you will need to use the knowledge gained in the two previous tutorials.

To intercept the enemy aircraft, you can choose to assign some aircraft to an AAW Patrol mission over an area that will be crossed by the bogey, or manually direct the fighters to the enemy aircraft.

The choice is yours.

Message 3

Now that your fighters are in the air, how can you destroy the target?

The best way to engage an air target is to use a Air-to-Air Missile.

There are various types of AAMs, so here is a short guide:

Missiles 101

Rear-Aspect and Stern-Chase: Is a missile that can engage a target aircraft only when it is flying away from the attacker. This makes engagement with cannons or infrared homing missiles easier because of the minimal lateral target movement relative to the

attacker and the fact that the hot engine exhaust are pointing directly at the attacker, making the infrared seeker's task of tracking the target much easier. These are usually old short-range missiles.

All-Aspect: A missile able to track a target no matter which way the target faces relative to the missile. An All-Aspect missile can be launched against a target in a tail-chase engagement, in a head-on engagement, in a side-on engagement, from above, from below, etc. These are usually newer medium or long-range missiles.

Off-Boresight: Helmet Mounted Display Systems allow the pilot to aim weapons at targets that are off-boresight from the line of sight of the aircraft. The missile can be launched to a point beyond its seeker limits to then start an autonomous target search. Using cues from the aircraft radar, a helmet-mounted sight, or off-board targeting data, the missile can thus undertake engagements in a 360-degree radius around the launch aircraft.

Active Homing: Active homing missiles use a radar system on the missile to provide a guidance signal. Typically, electronics in the missile keep the radar pointed directly at the target, and the missile then looks at this "angle" of its own centerline to guide itself.

Passive Homing: Infrared homing is a passive system that homes in on the heat generated by the target. Typically used in the anti-aircraft role to track the heat of jet engines, this means of guidance is sometimes also referred to as "heat seeking".

Semi-Active Radar Homing: Semi-active homing systems combine a passive radar receiver on the missile with a separate targeting radar that "illuminates" the target. Since the missile is typically being launched after the target was detected using a powerful radar system, it makes sense to use that same radar system to track the target, thereby avoiding problems with resolution or power, and reducing the weight of the missile. Semi-active radar homing (SARH) is by far the most common "all weather" guidance solution for anti-aircraft systems, both ground- and air-launched.

It has the disadvantage for air-launched systems that the launch aircraft must keep moving towards the target in order to maintain radar and guidance lock.

Mid-course Guidance: These missiles can be guided during the flight before the terminal guidance. This means that during the flight the missile will get updates on the target position and will react accordingly.

Terminal Guidance: Refers to any guidance system that is primarily or solely active during the "terminal phase", just before the weapon impacts its target.

Energy-based Flight Model for Boost-Coast Missiles: Boost-coast anti-air missiles (i.e., most tactical missiles that are not powered continuously) use a realistic flight model that distinctly models the initial boost-sustain and post-burnout regimes and takes into account the effects of gravity (shedding speed while climbing and regaining it when diving) and aerodynamic drag. The drag changes with altitude, built-in drag coefficient and whether the weapon is maneuvering (pitching/turning) or not. This change makes it possible to apply real-life exhaust the threat tactics and constrains edge-of-envelope shots.

Default Aircraft Defensive Maneuvers: When evading incoming missiles aircraft will first try to outrun the missile while matching its relative pitch (i.e., climb if the missile is below them, or dive if it's above them), and if the missile closes the distance, they will then attempt to beam it (or its parent guidance) while also reversing their climb/dive.

Now we can open the database and search for the weapons on the F-16I Sufa.

The aircraft today have the Python 5 Light 004 loadout; they have 4x Python 5, 5x 20mm Vulcan Burst and 12x Chaff and 10x Flare Salvo.

Chaff and Flares are defensive systems used to defeat incoming missiles. Chaff are used against radar-guided missiles, while Flares are used against heat seeking missiles.

The Python 5 is a short/medium range missile. The Vulcan is a Gatling cannon. Below we can see the specifications for the Python 5.

Range: 0.2 - 15nm (short/medium range).
Air PoH: 95% (a very lethal weapon, rarely misses).
Guidance: Inertial (INS) mid-course plus Passive-Infrared (IR) terminal guidance.

Press "CTRL + SHIFT + F9" to bring up the Side Doctrine, EMCON and WRA window, or you can select your aircraft and press "CTRL + F9" to bring up the Unit Doctrine, EMCON and WRA). The difference being changing side settings will affect all units on the side, whereas changing just the individual unit settings will affect only that unit.

In the WRA page you can set the parameters of the various weapons.

The Python 5 has a high PoH, so by default only 1 missile is allocated per target. If you are engaging a high-value target, you can change that and allocate more than one weapon.

Firing Range is another important parameter. By default, missiles will be fired at 75% of max range. This offers a balance between increased chance to hit an evading target and safety for the firing aircraft. A maximum range shot would be safer if the enemy can shoot back but there will be a high chance the missile will never reach the target. As the UAV is unarmed, you can further reduce the range to 2, 5 or 10 nm.

Now you are finally ready to engage the enemy UAV.

You can do that by pressing "F1" and clicking on the target. In this way, the F-16I will attack the target automatically or you can press "SHIFT + F1" and then click on the target to conduct a manual attack.

Message 4

Well done! The Shahed-129 has been destroyed!

You can try this scenario again and try to shoot down the UAV with a different weapon or move on to the fourth tutorial where you will encounter evading targets.