

Tutorial Description

Hello and welcome to the Flight Tutorial.

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

- Detecting an airborne target.
- Shooting down an evading target.

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Briefing

Welcome to the Realistic Detection and Intercept Tutorial.

In this scenario you will be guided through the following topics::

- Detecting an airborne target.
- Shooting down an evading target.

In this scenario pop-ups will appear with important messages. You can find them in the document that comes with the tutorial or you can open the message history in a second window by pressing Ctrl+Shift+M and scrolling to the appropriate message.

Note: To successfully complete this scenario, you will need to use the knowledge gained in the previous tutorials.

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 detect and engage an airborne target that is trying to evade.

You have 6 F-16I Sufa, 2 F-15A Baz in the 1995 version, 2 F-15A Baz in the 1985 version, 2 Gulfstream G550 AEW Nahshon, 2 707 Saknayee tankers and 2 Hermes 900 Star UAV under your command.

Before we start, a quick recap of Missiles 101:

Missiles 101

Rear-Aspect and Stern-Chase: 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 infra-red 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/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° radius around the launch aircraft.

Active Homing: Active homing uses 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. This has the potential to bring the aircraft within range of shorter-ranged IR-guided (infrared-guided) missile systems

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.

Other than the F-16I with the Python 5 that you should already know, this time you have 2 F-16I armed with the AIM-120C-7 AMRAAM. This is an All-Aspect Long-Range missile with Datalink (DL/INS) mid-course plus Active Radar Homing (ARH) terminal guidance. The range is 2-60nm.

You also have some F-15 under your command. These are armed with the AIM-7F Sparrow III Semi-Active Radar Homing (SARH) Long-Range (2-55nm) missile and either the AIM-9L Sidewinder (All-Aspect mid-course plus Passive Infrared terminal guidance and a range of 0,2-10nm) and the Python 3 (All-Aspect mid-course plus Passive Infrared terminal guidance and a range of 0,2-8nm) or the AIM-9J Sidewinder (Rear-Aspect mid-course plus Passive Infrared terminal guidance and a range of 0,2-10nm).

Message 2

We have good intelligence that a Syrian Cessna AC-208B Combat Caravan is flying from Syria to Israel. Even if the aircraft shouldn't be armed, we don't want the Syrians to collect intelligence over Israel, so the intruder must be destroyed.

We can't see it yet, so you need to activate a radar to find the intruder.

You have 4 possible choices:

A) Key "CTRL + SHIFT + F9" and in the EMCON page select "Active" in the Radar menu.

This will activate every radar on every platform on your side. However, usually this is not the recommended solution as an hostile side will rapidly identify every unit under your command.

B) Select one of the three radars north of Ramat David, press "F9", uncheck the "Unit obeys EMCON" box and only then check the "Radar" box.

This will activate the radar of the selected unit and is a good way to find an enemy airplane.

This is one of the preferred solutions, but you will not always be in command of a fixed radar unit, and they are a good target for enemy airplanes with ARM missiles. If you choose this during a scenario, just make sure to have a CAP (Combat Air Patrol, airborne fighters on patrol) nearby to protect your radar.

C) Assign a Gulfstream G550 AEW Nahshon to a Support Mission, checking that the Radar EMCON of the mission is set to "Active".

This is the other preferred solution in real life, as AEW and AWACS airplane have long range radars best suited for this task and, being mobile, the risk of losing it to an enemy attack is reduced.

Again, just make sure to have a CAP nearby.

D) Use the radar on your fighters.

This solution has a few drawbacks, as the radar of fighters are ill-suited for the task and using them gives away their position (and if the enemy has some ELINT platform, even their type).

Whatever solution you pick, it's time to get some airplanes airborne and try to intercept the intruder!

Note that the Hermes 900 UAV are a powerful jamming platform. You shouldn't need them against a Cessna Caravan, but they are really useful when you engage armed hostiles.

To accomplish these tasks, you will need to use the knowledge gained in the previous tutorials.

Message 3

You have just detected an airplane. As there shouldn't be other airplanes in the area, you can safely assume it's the enemy plane.

Note that usually there are civilian planes in the Area of Operations, so you should clearly identify your targets before firing.

Now, it's time to shoot down the intruder before he can collect intelligence over Israel.

Remember that if you have selected the F-15 and you want to shoot the AIM-7 Sparrow, you will need to keep the airplane pointed at the target with the radar switched on during the entire engagement, otherwise the missile will lose guidance and will self-destruct.

Message 4

Well done! The enemy airplane has been destroyed!

I suggest you try again this scenario using different airplanes and weapons, to learn the various differences between them. This will be really useful when you will face more difficult aerial engagements.

When you think to be ready, head over to the next tutorial, where you will learn to shoot down armed enemy airplanes.