OCA Strikes: A New Approach

Introduction

Offensive Counter Air (OCA) Strikes are vital ways of destroying the enemy force's ability to wage war in the air. These specialised air-to-ground attacks are designed to prevent planes from getting airborne and stop missile systems from attacking friendly units in the air.

In **Falcon 4.0: Allied Force**, the most widely generated OCA Strike is one which destroys an enemy runway. This is achieved using specially designed penetrating bombs, BLU-107s, to punch through the runway surface and explode underneath, buckling the concrete slabs around the blast area. This deeper explosion makes the runway much harder to repair, rendering the airfield unable to launch aircraft for longer. OCA Strikes also aim to destroy buildings, control towers, ammunition dumps, in fact any high-priority target on the airfield.

These types of missions are among the most demanding and exciting in **Falcon 4.0: Allied Force**. They require skill not only to penetrate all types of air defences, but also drop bombs accurately and intelligently on target - and of course escape! Nothing gets the adrenaline pumping faster than a low level attack on a heavily defended airbase. The strike comprises a flight of four aircraft and in a typical mission if there's just you flying it means you have three computer-controlled wingmen to rely on to help you achieve a mission success.

The Problem

One of the issues was that sometimes OCA Strikes were a little too dangerous for the computer-controlled pilots, or, as we have come to know them, the AI (Artificial Intelligence). When they flew over the target they exposed themselves to considerable danger, jeopardising the flight.

While mission success is important, so too is survival. There was also the problem of the AI dropping bombs in "clumps" on the runway, rather than evenly spacing the bombs along the length of the strip. Much better to drop four bombs in four places than four bombs in two places. There also seemed little co-ordination or priority when it came to the AI attacking other targets on the airfield.

The Solution

What was needed was a radical rethink of how OCA Strikes operated - both for the AI and also the human player. A considerable amount of expertise and work went into re-coding this aspect of the simulation and the result is a massive improvement.

Nearly 2,000 lines of extra code were developed to make this work as advertised. It means that for *Falcon 4.0: Allied Force*, the AI intelligently uses spacing to deliver their payloads onto the runway and the AI attacks other targets, where necessary, according to military priority.

In addition, different elements within a flight will now target different runways during the same pass, if of course there are two runways at the base. It is an impressive sight watching two computer-controlled pilots from a second element peel away during the last phase of the attack and target the second runway, while you and your AI pilot attack the main runway.

That's not all. New flight commands are included to further refine the targeting process. It allows automatic target select for both the human player and AI pilots, but also allows the flight lead to reassign targets, depending on conditions. Let's take the simplest OCA Strike as an example: a four ship attack on an airbase with two runways. Each aircraft is loaded with 6 x 1 durandal bombs.

The Flight Menu

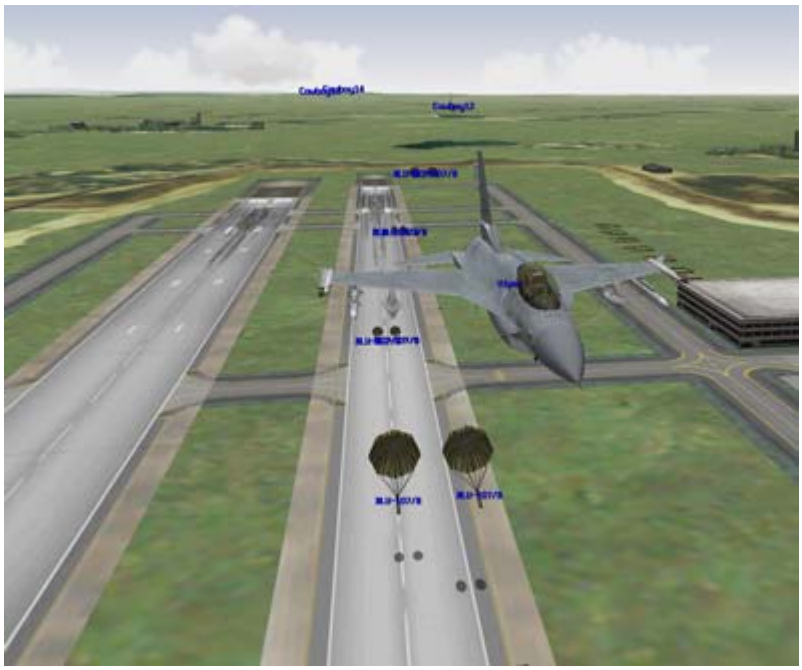
After the usual ingress towards the target, the player calls up the OCA command page from the Flight Menu.

This lists all the available targets at the site. Each player selects their target by pressing the appropriate numeric key along the top of the keyboard. Key “1” selects “Runway 5L / 23R”, the left hand runway as we approach the target.

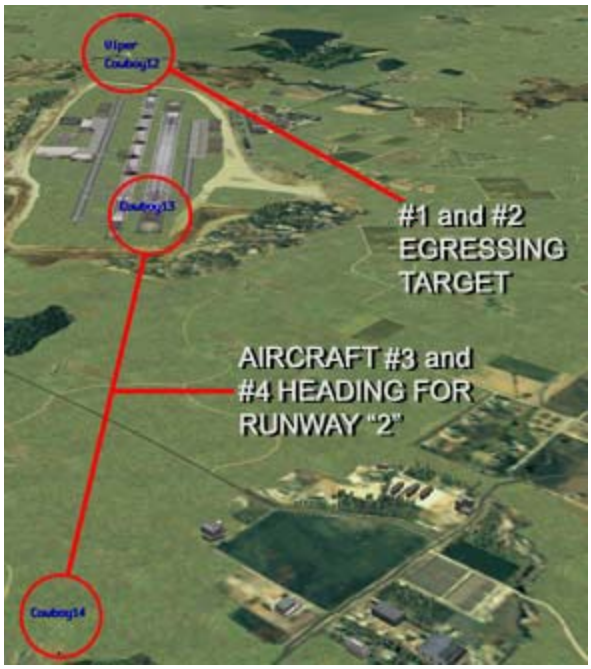
As we pass in the IP (ingress point) the computer-controlled aircraft begin to assign targets to their aircraft, in order of target priority. The OCA list becomes populated, showing which aircraft is targeting which priority target.

Here we can see that #1 and #2 have selected the left hand runway, and the second element of the flight (comprising #3 and #4) the second runway. Now, #1 and #2 will fly a course to drop bombs on their assigned runway, but #3 and #4 a slightly different course to destroy the right hand runway.

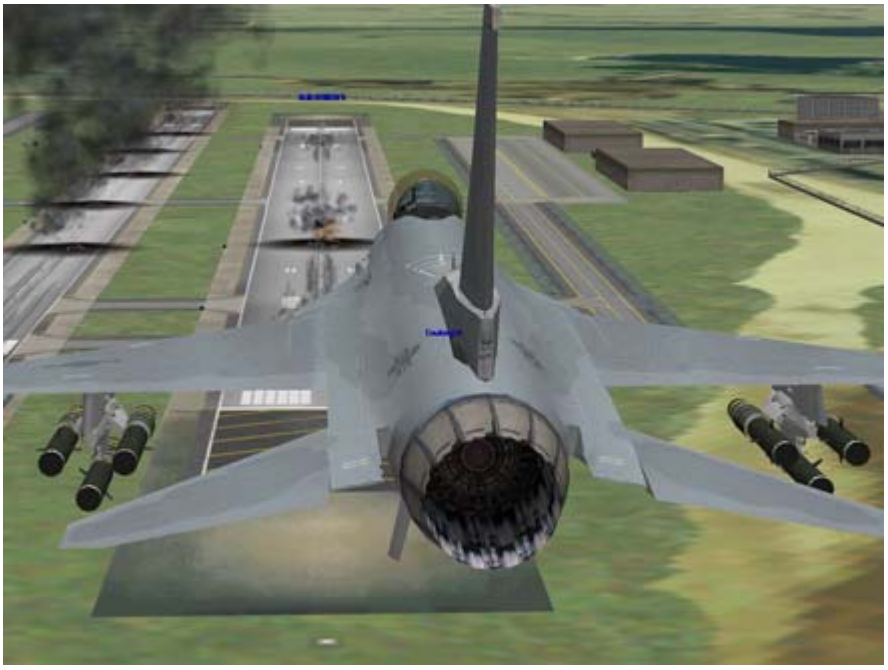
FIG. 3 shows the aircraft approaching the base.



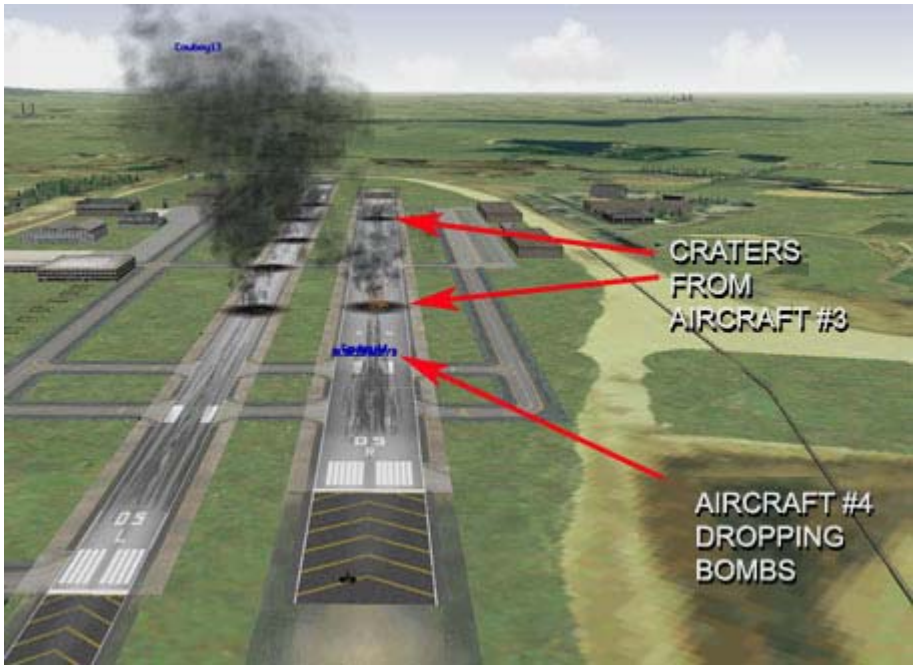
And FIG.4 shows #1 and #2 dropping bombs.



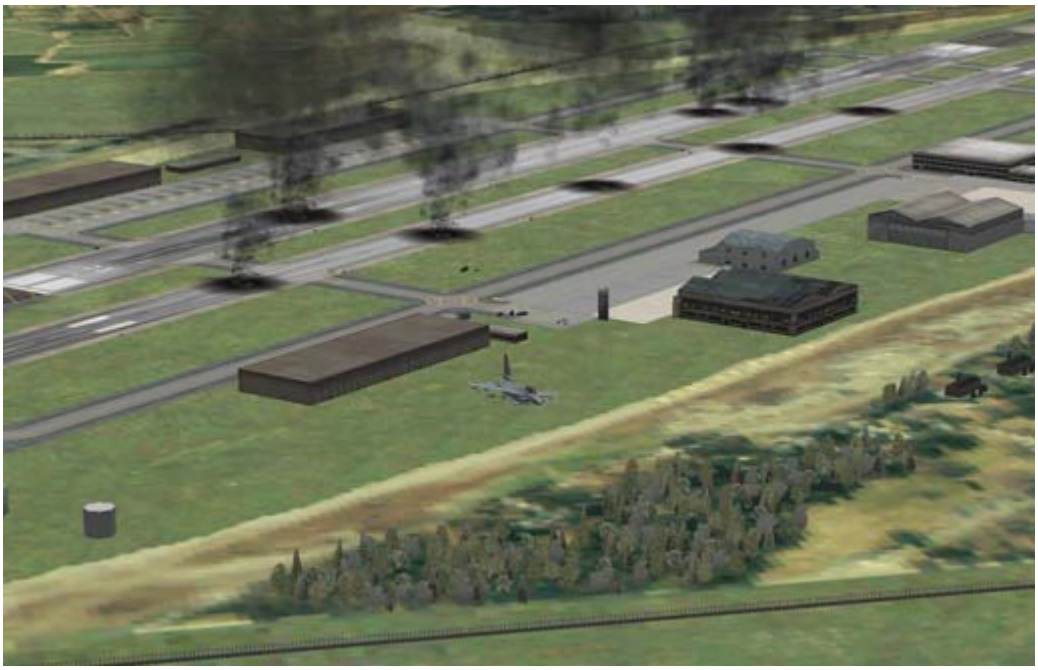
Okay, while #1 and #2 have been dropping their bombs, #3 and #4 have already lined up for the attack on the second runway. See FIG. 5



And here they prosecute their attack, FIG. 6



Now, you can see the results of the attack, both runways destroyed, FIG. 7



Job done, all aircraft in the flight depart the target and head for home, FIG. 8

Designer's Notes

For more on the new execution code, some words from the designer:

"From the Flight menu, a new sub-menu labelled "OCA Targets" is now available. This sub-menu lists the highest priority features present at your assigned target objective. During your ingress to the target site, you are able to nominate two features that you personally intend to attack. At the IP point, your AI flight members will do the same, and they will base these decisions upon feature value, operational status, the number of runways at the airbase, the number of aircraft in the flight, what weapons are being carried, and the primary building (if any) that the flight has been assigned by the UI planner.

The primary input for the decision-making is payload carried and the assigned targets. If the mission is to destroy runways, the AI will target those in preference to other features at the site, unless the weapons being carried are unsuitable for runway targeting. And of course, if the mission is to destroy buildings, as assigned in the planner, the AI will target those in preference to the runways, unless, the weapons carried are unsuitable for buildings. In this instance the AI will most likely target the runways.

Both human and AI pilots are able to select two features. Where the AI is targeting a runway, it will select just the one runway. For other features such as buildings, each AI pilot will target two buildings within the airbase, and in one pass will attempt to destroy both targets."

"When using the OCA Targets menu, you can just toggle a feature on and off. Just as for the AI, you as a human pilot can select up to two features. Essentially, this is a communication system to prevent other pilots in the flight from selecting the same features as another aircraft in the flight (with the exception of runways, which can have multiple aircraft, (usually 2) be assigned to them.

Of course, when the aircraft is bombing buildings, he will fly a heading that allows him to fly a straight line over the top of both buildings. So now during OCA strikes, you can expect to see attacks by aircraft from all angles!”

Final thoughts

This menu system works too in Multiplayer missions, so you can see the selection of targets by human or AI pilots over the net if they are part of your flight. This is just one huge advance in the way an attack is carried out - further pushing back the boundaries of realism, attention to detail and, above all, player enjoyment.