

AIRBASE OPERATIONS

One of the aims of Lead Pursuit is to deliver a fully realistic working environment of airbase operations, and **Falcon 4.0: Allied Force** moves us much closer to that goal. The controllers in the tower have a huge responsibility to safely schedule the arrivals and departures of expensive aircraft vital to the war effort.

As in real world airspace, the airports and carriers are the busiest areas for aircraft and with the exception of the Forward Line of Troops (FLOT), they are the areas of highest risk to individuals and hardware. A single pilot error or wrecked aircraft on the runway can render the airbase closed for hours. So intelligent management of flights in and out of the base – and around it too -- is essential. In these development notes, Mike Laskey walks us through airbase operations.



With AI routines, players tend to notice very quickly when things aren't working quite right. The aim of our ATC focal area was to deliver subtle AI that you don't notice. We'll begin with some of the primary improvements:

- Advanced ATC awareness of the approach and departure queues. The controllers in the tower are ever watchful, and have a good understanding about aircraft separation. For example, if a large transport aircraft is waiting on the taxiway ready to depart with an F-16 on final approach, ATC assesses carefully the position of the F-16 before giving the transport aircraft clearance

onto the runway. The transport will be held in the “hold short” position until the F-16 touches down. At that point, ATC will clear the transport onto the runway. ATC will grant takeoff clearance once the conditions are safe for the transport aircraft to depart.

- In some circumstances where ATC determines a backlog of aircraft to depart, additional time buffers are introduced between each arriving aircraft to allow the departure backlog to clear. Airbase operations can be extremely busy – it’s a difficult balancing act for the busy virtual controllers living inside the battlefield!
- One important area of the ATC is supporting pilots as they limp back to base with wounded birds. We wanted to give pilots every good chance of making it back to base, whether they choose to divert to a closer airfield or struggle back home. In our product, we are excited to allow players and AI aircraft to participate in airbase stacking. More on this later.
- Calling an emergency dramatically increases the workload of the ATC controllers and adds additional risk to other aircraft as they are expected to remain airborne for longer. Therefore, ATC does not approve of “hoax” emergency landings or landings without permission. All pilots are expected to operate within the rules and penalties are dealt out to pilots who do not comply.
- Airbases in **Falcon 4.0: Allied Force** can at times be tremendously busy. The “TowerCam” puts you right into the controller’s seat and allows you to watch and zoom in on any of the aircraft around the airbase. It’s fun to buzz the tower with the low altitude fly-by, replicating a great scene from a classic air combat movie.
- **Falcon 4.0: Allied Force** supports two-ship formation take-offs for player and AI controlled aircraft. Only fighters can utilise this privilege and only when carrying air-to-air ordnance.
- We’ve added a new controller’s voice to provide full support for the Balkans theater of operations and a bunch of new radio calls. For example, ATC will now assign departure headings and warn you about traffic conflicts.





STACKING

As we've already mentioned, one important feature is "stacking". This is an assigned area close to the airfield where aircraft are held in an "airborne queueing" arrangement, while ATC deals with an emergency. The act of a pilot calling an emergency landing is enough for ATC to divert other aircraft that are already in the pattern, into the stack instead.



Typically those that are on final approach and not too far from landing are permitted to continue their approach. But where other aircraft already in the pattern and those attempting to join the pattern are considered a conflict, then one or more aircraft will be diverted into the stack. Whenever ATC is stacking aircraft, ATC will give a new heading and a new altitude above the standard landing pattern. This considerably adds to the immersion factor, making the player feel even more that they are part of a *living* battlefield environment.

Once you reach the stack, ATC will order you to orbit and will confirm your assigned altitude. Each aircraft in the stack is separated vertically by 1,000 feet and stacking operates on a first-in first-out basis. Those arriving later are placed on the top of the stack. Once the emergency is over (hopefully the aircraft in trouble landed safely!), ATC will empty the stack from the bottom.

One by one, ATC will call the aircraft at the bottom onto the base leg to start its approach, and as that aircraft leaves the stack, ATC will order each pilot remaining to reduce altitude by 1,000 feet. Note that until the stack is completely empty, any new aircraft attempting to join the pattern will continue to be added to the stack.

On a playability note, during stacking, it's vital for the safety of fellow pilots to maintain the altitude they have been assigned to by ATC, to avoid collisions. Should the pilot find himself stacking and short of fuel, he or she must make the problem heard and call an emergency. This is about the only other situation where calling an emergency is legitimate though.

LANDING HELP

After leaving the stack, the pilot will be given bearings and directions to land. Of course, successfully landing is critical, but it is far from the easiest of experiences. That's why we've developed a "landing tutor" to help ease to process of bringing the bird home safely.



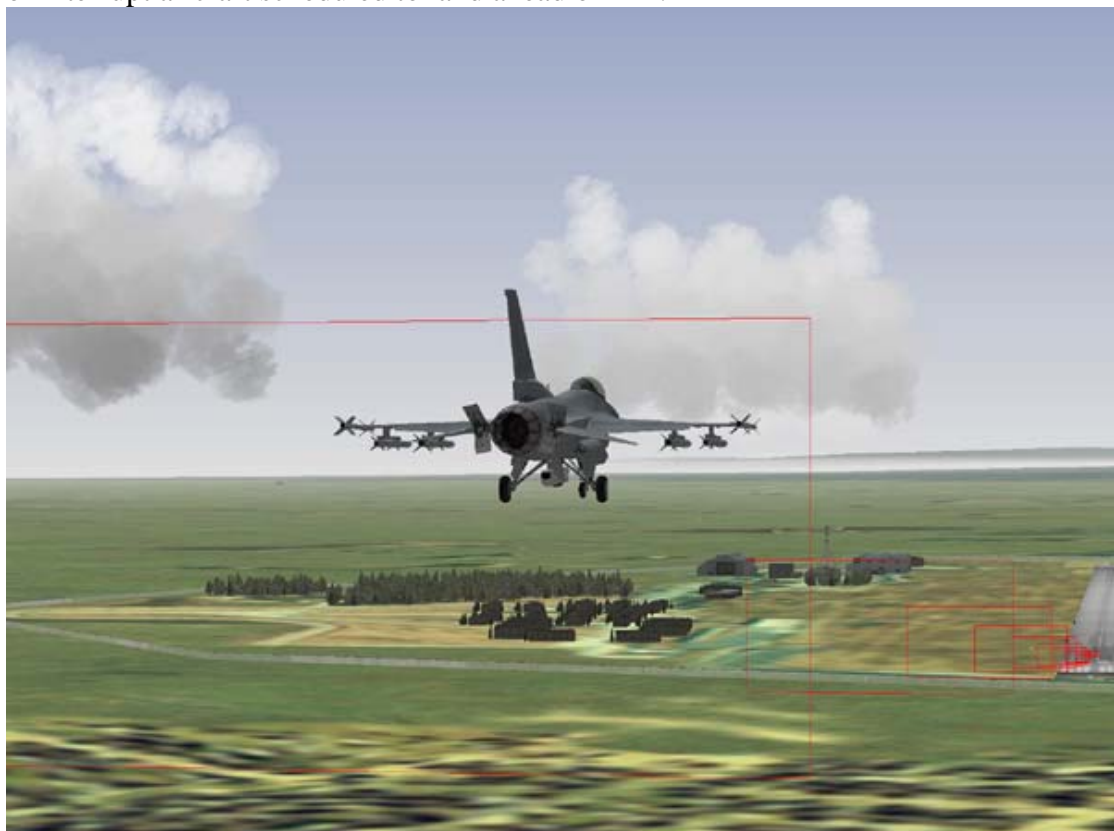
A series of rectangular indicators showing the path to the active runway are drawn in the sky. This pathway consists of four distinct sections: the base leg, the turn to finals, the 3° descent onto the runway and the flare. As the distance decreases between the indicators and the runway, the rectangles become smaller and smaller to emphasise the increased importance of accurately following the glidepath.



The landing help system also teaches speed control which trains the player to land in a timely fashion without flying too quickly nor too slowly. This is conveyed visually by gradually changing the colour of the pathway indicators. At the correct speed, the pathway indicators will be coloured black. As the aircraft slows to below the expected speed, the indicators will begin to turn blue to let the player know that the speed should be increased slightly.



If the pilot fails to respond appropriately, the indicators will turn more blue. It is likely in this case that the pilot will either fall short of the runway, or risk interrupting traffic that might be landing behind him. Conversely, if the aircraft velocity is too fast, the indicators will gradually turn to red, and the pilot is likely to overshoot the runway or interrupt aircraft scheduled to land ahead of him.



During final approach, the player should aim to fly directly through the centre of the indicators with the flightpath marker positioned at the base of the runway. Within two hundred feet of the runway, an on-screen text description prompts the pilot to commence the flare. At this point, the pathway indicators no longer represent a 3 degree descent but instead level out more to help visualise this concept. At the start of this phase, the indicators are likely to change to red to inform the player to reduce the speed of the aircraft. The pilot should reduce throttle and pull back on the stick to flare the aircraft smoothly onto the runway.



After touchdown, an assessment of the landing is displayed to the pilot. To enable/disable this feature, press ALT-H. The aircraft must be flying in order to turn the landing help on, and it is automatically disabled once the aircraft comes to a stop.