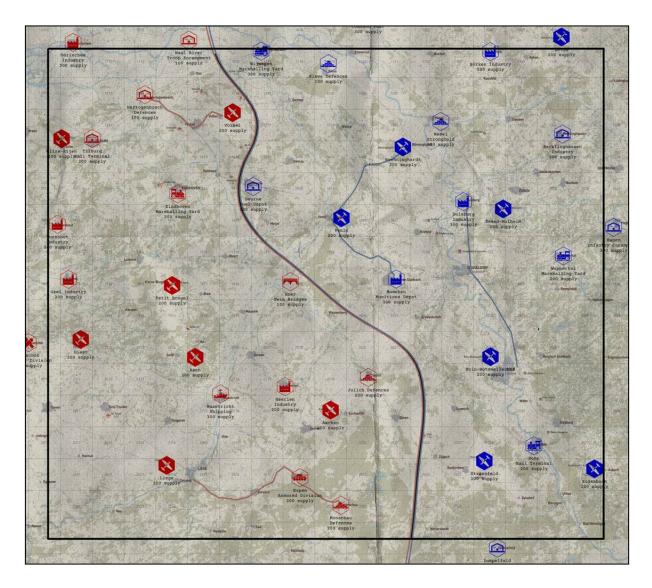


Combat Box "Apollo" Project

Dynamic Campaign Documentation



With special thanks to all those who contributed to this project. This is a group effort including the Combat Box admin team, community members, and special guests. Without your inputs we wouldn't be where we are today – thank you!

Original design document by John "Sketch" C.
Updated by Alonzo, Sketch and Stilgar. Most recent update October 2024.

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Why build a dynamic campaign?

Combat Box has always featured historically inspired, hand-crafted late-war missions. The team created the server with one goal: build a server that we'd want to fly on. While we've been successful and Combat Box is a "top-3" IL2 server, the individual missions feel more like a "capture the flag" sandbox than a cohesive war simulation. We now want to build something new – a true dynamic campaign where pilot actions have persistent effects over the course of the war.

We want to have a diverse plane set and for players to value their virtual lives. But we also want the game to feel welcoming to new and returning players. We want players who are role playing the campaign to be able to fly alongside players who aren't, and we want players who value their pilot life to be as effective as pilots who are simply logging onto a highly populated server for some guaranteed action.

The new Combat Box campaign combines high quality hand-crafted objectives with a persistent war simulation and detailed pilot career tracking. The campaign is integrated with CB Radio, our SRS voice bot, and our simulated radar system, to assist players and act as a force multiplier. The war ebbs and flows with player actions dictating the pace of the war, the movement of the front line, and even the available aircraft at each airfield.

The Apollo campaign engine tracks airfields, airplanes, objectives, convoys, supply levels and the movement of the front line. Apollo even tracks damage down to the individual 'block' in the campaign, including civilian buildings. As the war progresses, towns, airfields and objectives will become visibly more damaged. Players interact with objectives and when they do, it influences the outcome of the war.

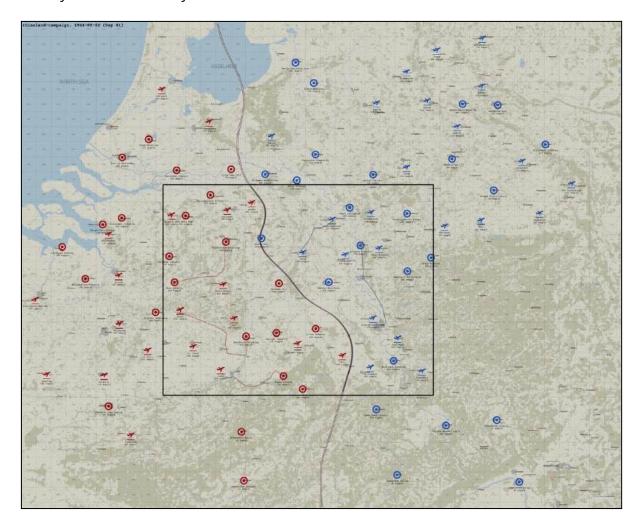
Understanding the campaign

Play area and campaign days

The campaign begins in September 1944 and follows the course of the war across Europe, starting from a predefined position and front line, and takes place across the entire IL2 Rhineland map. There are many airfields and strategic locations that might be included during the full course of the campaign, more than would make sense for fun gameplay for an individual mission. The campaign generator manages the supply state and front-line for the entire campaign map, but chooses a specific "gameplay area" for each day's mission. The campaign progresses through 'days' where a campaign day is an IL2 mission that is two hours long. Some campaign elements, such as aircraft availability, are affected by the date. Each campaign day includes randomized weather, time of day, and wind direction.

The mission generator looks at the front line and positions the day's mission in approximately a $160 \text{ km} \times 140 \text{ km}$ area centered on the front line. This play area is automatically moved to track the "most damaged" point on the front line – the point where player actions caused the

most damage in the previous day. The play area moves at most 20 km each day, to give continuity between one day and the next.



Visualization of campaign progress. Image by Psyrion.

Supply and supply levels

'Supply' is the core mechanic we use to track the 'health' of airfields and objectives in the campaign. Most player actions and campaign mechanics ultimately come down to having an effect on supply. Airfields and objectives are both considered "supply points" within Apollo.

- Small and "pop-up" objectives have a maximum of 100 supply
- Medium objectives and airfields have a maximum of 200 supply
- Strategic objectives have a maximum of 300 supply

At objectives and airfields, and especially at large, strategic objectives, there is a lot of defensive flak protecting that position. But AAA skill, number of guns, and respawn time is affected by the supply level at the objective or airfield. It may be a valid tactic for players to level-bomb an objective in order to knock its supply down a bit, then go back the next day with precision strikes once the AAA has been softened up.

Airfields and strategic objectives are supply generators, and supply moves between supply points in order to repair and reinforce positions. The supply system and resupply calculations are discussed in more detail below.

Airfields

Previous Combat Box missions have included protected airfields, where vulchers are kicked from the server. **The campaign does not include any safe airspace.** In fact, player airfields are highly strategic and likely to be attacked by the enemy. That said, they are well defended and have considerable anti-aircraft capability. With the current size of the campaign play area, both sides usually have five or six airfields available on any particular day in the campaign. This should mean that players at least have a choice about taking off under fire, or moving to a safer airfield.

Airfields very close to the front line are mostly abandoned by their side due to the nearby fighting. Players cannot spawn at these airfields, but they do contain a repair / refuel / rearm truck, marked by yellow smoke, and players can finish their sortie at these airfields if they wish.

Airfields support multiple configurations to account for the different wind directions, ensuring pilots can take off using the best runway for that day's weather conditions. Some airfields feature upwards of four operating directions, others just a couple. The active runway is marked with signal fires, and you can "request airfield conditions" on SRS channel two to get an update from the airfield controller.



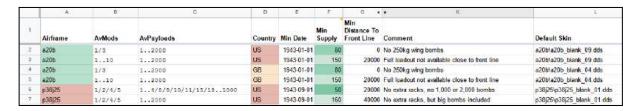
Image of the mission editor showing multiple spawn locations. Only the best location will be chosen for the 'day' in the campaign. Image by Alonzo.

Starting in Apollo XV on Kuban, airfields now also sometimes offer fully customized spawn positions, rather than spawning aircraft in a long line. This means you could spawn inside a concrete 'caponier', near a bunker, between hangars, or other locations on the field. At most one airfield each side offers this customized spawn experience. If your spawn point has a problem, such as being too close to a structure, try despawning and respawning in a different spot (and be sure to let us know with a screenshot showing the problem).

Aircraft availability

The current date in history, as well as supply at each airfield, its distance from the front line, and its runway surface and length determine which airframes and loadouts are available. But:

- Supply dwindles as you get closer to the front line. Because of this, players will get 'worse' airframes at the front line, with more limited loadouts. Rear airfields tend to have more airframe choices, more mods, and better loadouts.
- Aircraft (or aircraft with expanded mods and payloads) have a specific introduction date in the campaign. On the introduction date, small numbers of the aircraft are available at rear fields. As the campaign progresses past the introduction date, the aircraft is available in larger numbers, and closer to the front line.
- Player airfields always have Repair, Rearm, Refuel, marked by signal smoke and a fuel truck. If the truck is destroyed, RRR is unavailable for the rest of that day in the campaign.



Airfields are valid targets for player attacks. Many of the best aircraft types are only available when an airfield has a large amount of supply. Doing damage to enemy airfields is a good tactic for reducing the airframes available to them, but remember that airfields are difficult, well-defended targets.

Destroyed airframes count against supply generation for the next day in the campaign (see below). This means that players who repeatedly get shot down may actually be a net-negative for their side, depending on how much supply damage they were able to inflict on their sortie. Bring your bird home – they're important for the war effort!

Coalition balancing

Apollo includes a 'soft' coalition balancer that progressively closes airfields when one side outnumbers the other. The balancing starts off gently, closing just one or two airfields that are

closest to the front line, but will close all but one rear airfield if one side significantly outnumbers the other.

Control of objectives

Objectives are controlled by one side until either the front line moves past the objective and it is captured, or the objective is damaged enough to reduce its supply value to zero. Objectives do not change sides in one mission roll, they first become neutral for up to three days in the campaign and can then (depending on the position of the front line) switch to being controlled by the side that owns their territory.

After an objective is captured or re-secured, it is immediately repaired, in order to help prevent "flip flopping" of objectives.

At the completion of a 'day' of the campaign, damage done to objectives is used to reduce the supply at that objective. Objectives and airfields resupply each other by moving supply from well supplied to weakly supplied points. Supply only moves 'towards' the front line, however. Airfields are useful in that they can bring in supply by air, effectively creating 'free' supply rather than moving it from somewhere else on the map. Strategic objectives such as industrial areas, ports, and so on, also generate supply.

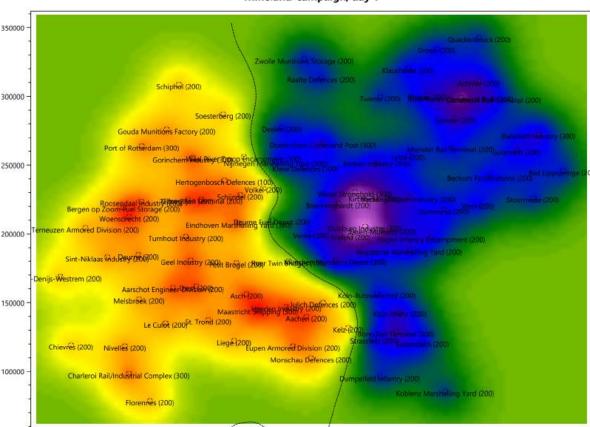
Objectives that are taken down to zero supply but are not quite overrun by the movement of the front line may be available for 'capture' the next day. If an objective is capturable, players can drop paratroopers nearby to try to capture it. The more troops are dropped, the greater the chance of the objective being captured.

Moving the front line

Once player actions are processed, we calculate the new 'supply' value for each objective. Then we recalculate the position of the front line. Objectives and airfields radiate 'influence' across the map and, using the previous day's front line as a starting point, we move along the front line calculating the new midpoint for "no man's land" between the two sides. We then move the front line to match the new midpoint.

Here is an example visualization of the influence calculation. Allied forces are shown in yellow and red in the heat map, Axis forces in blue and purple. The campaign system has plotted a front-line between these two sets of influence, working its way along the "no-man's land" in

between the two sides.



rhineland-campaign, day 1

Heat map of the supply influence calculation. Image by Alonzo.

The new front line is calculated without taking into account any 'repair' or 'resupply' effects. This is to ensure immediate results when players heavily damage or destroy an objective during a day in the campaign – we'd like that objective to be clearly destroyed / out of action for several days in the campaign.

150000

While it could be possible for one side to do serious damage to the other in one day of the campaign, the front line will take a while to move. It's likely that only one or two objectives will be captured each day. The side that captures objectives can then use them to radiate influence into enemy territory and continue the push. Attacking rear objectives still serves an important purpose, however, as it softens up the enemy and reduces supply available to reinforce the front line.

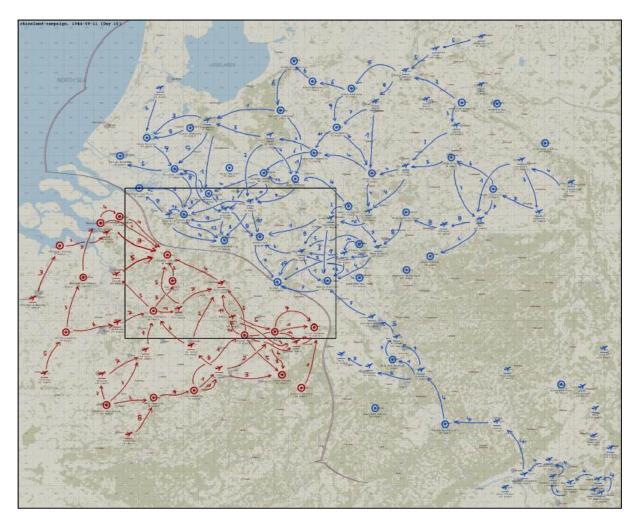
Resupply and repair calculations

After the front line has moved and any destroyed or captured objectives have been flipped to neutral, the airfields and objectives resupply each other.

- Supply points resupply nearby friendly objectives by at most 20% of their own supply level, over a maximum distance depending on their own current supply level
 - o 'Strategic' objectives at 300 supply can send up to 60 supply 75km

- o 'Medium' objectives and airfields at 200 supply can send up to 40 supply 50km
- 'Small' objectives at 100 supply can send up to 10 supply 25km
- If a supply point is damaged, it will be able to send less supply. So a strategic objective that has been damaged down to 100 supply can only send 10 supply a distance of 25km. Supply is affected by linear falloff, so the further a point tries to resupply, the less it will be able to send.
- Supply points need at least 60% supply to donate supplies to nearby objectives.
- Supply points can receive at most 33% supply each day.

Once supplies have moved between airfields and objectives, airfields and strategic objectives receive 25 supply, to a maximum of 300 supply per side across the whole map.



Visualization of supply movement. Image created by Psyrion.

Supplies are used to repair objectives and airfields. In general, smaller items will be repaired faster than larger ones. As the campaign progresses, objectives will become visually more and more damaged, as big items such as hangars and industrial buildings take a long time to repair.

Dynamic convoy system

The campaign contains several dozen rail and road convoys. These are activated based on the day's play area, up to two convoys per side. If a convoy arrives at its destination, it will bring a supply bonus to that location. It's in players' interests to attack (and defend!) the convoys. Convoys always travel from better supplied to worse supplied locations, and if they arrive they give a significant supply boost to the receiving point.



Waypoints in a supply convoy.

CB Radio Voice Bot

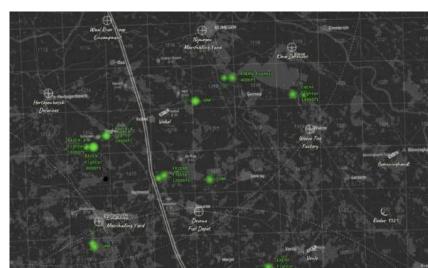
Each day in the campaign brings a new configuration of the map. The Apollo campaign automatically integrates with CB Radio allowing pilots, who use SRS, to get GCI support from *Kenway*, *Longbow* or *Command* as they would expect on a regular Combat Box mission. SRS is a voice communication program that you can get here and learn more about from the Stormbirds Flight Sim News magazine.

Radar Controlled Intercept

Thanks to "The Consultant" we are now able to simulate World War 2-era radar. Several human players volunteer for "RCI Officer" duties each campaign and have access to a radar display. The display shows rudimentary radar data, such as would have been available during the later stages of the war. It is not perfect information – the radar can glitch, lose contacts, and information can fade in and out. At best, the RCI Officer will know friendly aircraft callsigns and altitudes, and enemy aircraft type (fighter / attacker / bomber) and altitude, but any of this information can be lost at any time, especially from contacts that are maneuvering hard. Radar also has a simulated minimum detection altitude, which becomes lower the closer you get to the radar

dish.

Each side has three radar positions at the beginning of the campaign day. The positions are triangulated by the boffins at HQ and revealed to the RCI Officer starting at



around 30 minutes into the mission. The positions are announced by the SRS voice bot if no human RCI is present. Pilots can significantly help their side by hunting down and destroying enemy radar installations – if a radar is destroyed, the radar operator will get no more information on that section of the map. Listen out for enemy radar grids over the radio.

The RCI Officers use callsigns such as SPYGLASS and MAGIC and will talk to you on SRS channel one. If you want to use RCI, first get a callsign from channel two, which will allow the RCI to identify you on their radar display. RCI officers are announced in-game and on Discord so you know when a human RCI is helping your side.

If no human RCI is present, the CB Radio voice bot can give rudimentary radar assistance. For example, if you "request vector to nearest airfield" the bot will know where you are and give you a heading and distance to the nearest friendly field. Bombers who have declared a target and are en-route receive automatic flight following, periodically calling out enemies who get close to them.

What to expect, and how you can help

We're excited to be testing our campaign system with the general IL2 player base. There will be bugs, but the campaign system runs decently, generates sensible front lines and campaign states, and tracks player influence as the war wages across Europe.

We're not sure how performance will scale with players – this system is ambitious and uses a lot of server processing power under the hood. Please bear with us in this public tech alpha.

Stats will be tracked using both the career mode website and the normal IL2 stats website. Career mode is what we are building out – it will be the eventual 'leaderboard' and show pilots, fame, awards, and other career-related stats. IL2 stats will continue to be available (for now) so you can get detailed statistics and cross-check against the career mode website. (For now, career mode development is on hiatus.)

The best way to get involved is to log in and fly! Join us on our Discord or SRS for voice chat, and use our special "apollo-test" channels to give us feedback.

Frequently Asked Questions

OBJECTIVES

How do we know the supply level of an objective or airbase?

Targets have a maximum of 100, 200, or 300 points and will be labeled if they are lightly to heavily damaged. Popups and small targets are generally 100, airfields and medium objectives are usually 200, large objectives like Eindhoven are 300. Exact supply levels for each target (as of mission start) are shown on the website map.

What are the targets at the objective?

At an 'industrial' target all the factory buildings and support buildings are valid targets. At a "marshaling yard" objective everything rail-related is a valid target, as well as supporting military infrastructure. The presence of tents and dugouts near a building is also an indicator that it is a valid target. Things that look like civilian homes are not valid targets. Generally speaking, bigger buildings are worth more supply, smaller buildings and dugouts worth less, parked aircraft and vehicles even less, and AA guns and tents worth the least. Some objects like camouflage nets and crates are worth zero supply. Pick your targets well.

What should be targeted when bombing an enemy airfield? Is everything worth the same amount of supply?

Similar to other objectives, buildings and hangars are worth the most, parked planes and vehicles a bit less, and AA are worth the least.

Are there any recon photos of the various objectives?

-332FG-Wim and Bangat took recon photos of most Rhineland objectives: https://drive.google.com/drive/folders/1Fv-u6AFiK7-CbSNYLbvvi2M2HwgrGkid

There are currently no recon photos for Normandy objectives.

My team disabled an objective/airfield, but the following day it was available again for the enemy team. Why?

If the front line isn't pushed past the disabled objective, it may be resupplied or recaptured. Damage objectives behind wherever you're trying to capture to prevent resupply.

Why is the AAA at targets so rough?

Objectives with a higher level of supply will have more AAA and of higher quality.

- Airfields have a minimum of 5 active AA guns, maximum of 8, depending on supply level. Airfields have "high" skill guns if their supply level is 100 or greater. Below 100 supply, guns are normal or low skill.
- Objectives have a minimum of 4 active AA guns, maximum of 12, depending on supply level. Gun skill is "normal" if the objective has at least 90% supply. Below 40% supply, gun skill is "low". Between 40-90% supply, gun skill is a mix of normal and low.
- Radar locations have a relatively small number of AA guns, but the guns are maximum skill.

I destroyed AAA at a target, but when I went back for a second run it was all back.

AAA at targets respawn after a certain amount of time. Larger guns respawn more slowly, smaller guns more quickly. A high-supply target will bring guns back into action faster than a damaged, low supply target. You cannot definitively kill the AAA at any target until the target itself is destroyed.

I bombed a bunch of stuff at an objective, but the scoreboard shows I only got 2 buildings. What's going on?

The in-game scoreboard in IL-2 is very limited and doesn't understand complex Apollo targets. The scoreboard on the in-game interface is not accurate. The score on the combatbox.net website is what matters.

AIRFIELDS

Why is there only one airfield open for Allies, while Axis has five?

Apollo uses a coalition balancer to encourage even player numbers between teams. The more that one side outnumbers the other, the more of their airfields close. If teams are extremely uneven, there will be only a single airfield available for the team with more players. Consider switching sides to even out the teams.

Why is the runway at airfield X so short? It's not long enough for bomber takeoff.

Planes are available at fields based on supply level. Just because a plane is available at a field, doesn't necessarily mean it's appropriate to use it from that field, or that you can do so with full fuel and a heavy bomb load. Most fields can be used with most airframes if taking off correctly. The fires marking the start of the runway are dynamic and change day to day based on wind direction. Taxi to the fires and taking off in the correct direction to ensure you are taking off into the wind.

I want to rearm at the airfield, but there's no yellow smoke?

All airfields are potential enemy targets in Apollo. If the refuel/repair truck is destroyed during an enemy raid, repair and refuel will be unavailable until the map rolls to the following day.

POP-UP TARGETS

What are pop-up targets?

Pop-ups are infantry, armored, or engineer groups with historical unit names that can appear near the frontline. Think of them as a force being used to help push the front in an area where the enemy is weak. Pop-ups do not interact in the supply flow with other objectives, but they do repair a small amount each night. Importantly, pop-ups do project influence and can move the front line. If one side successfully defends their pop-up, it can help them push the front. Pop-ups remain until they are destroyed, overrun by the front line, or14 in-game days pass, whichever comes first. They appear as a "search area" until damaged, then they are marked on the map from the next day in the campaign.

AIRCRAFT AND LOADOUTS

Do lost aircraft factor into supply in any way?

Yes. Player flown aircraft are worth 2 points. If you are shot down, those 2 points are subtracted from the supply value at the airfield you took off from. If your departure field has low supply, the points will be deducted from a nearby objective. If you inflict less than 2 points of damage and are shot down or crash, your sortie was a net negative for your team.

Are there any AI planes on the server?

During low population times, quick-response AI fighters will defend objectives and airfields if attackers loiter for too long. Just because the server is relatively empty, doesn't mean you can hang around a target without risk.

When do Allies get 150 octane fuel?

150 fuel is available in January 1944, as it was historically. Availability is dependent on supply and also is fudged a bit for team balance.

When does aircraft X become available?

D9s & K4s become available in October 1944. The Me262 is very limited. It is only available when Allies outnumber axis by a significant margin, and then only 2 aircraft at a time are available. Even then, time period limits and supply limits are in effect, so you won't see it at a low supply airfield or prior to 1945. The Arado 234 is available in limited numbers if supply is sufficient.

I want to fly an RAF plane, but only USAAF fields are available (or vice-versa)

Allied airfields belong either to the RAF or the USAAF and are loosely based on their historic locations. Some bases have been changed to prevent complete unavailability of one or the other, but depending on circumstances (supply levels, location of the frontline, number of open fields, etc.) it's possible that RAF or USAAF don't have a field open.

I want to fly plane X, but it's not available at the airfield. What's going on?

There are many factors that determine aircraft availability

- For the Allies, each field is owned by either the RAF or USAAF. Some planes are specific to one or the other. For example, you won't be able to fly the Spitfire IX from a USAAF field, and won't be able to fly the P-47 from an RAF field.
- Planes are only available when they historically would have been. So you won't be able to fly a 190 Dora on the first day of the campaign, since it wasn't deployed to the front yet.
- Some airframes (such as the Tempest) are restricted to a small pool at each field, with a periodic refresh throughout the day in the campaign.
- When new airframes are first deployed, they are available at rear air fields first and slowly trickle toward the front in greater numbers as the days pass.

- Plane and loadout availability are dependent on supply at the field. If you are trying to
 fly from a frontline field that has been under heavy attack, check one of the rear
 airfields with more supply.
- The C-47 and Ju52 are only available when there is a paradrop objective available for capture.

I want to take < loadout X> but it's not available.

Plane and loadout availability are dependent on supply at the field. If you are trying to fly from a frontline field that has been under heavy attack, check one of the rear airfields with more supply. The 6 bomb loadout for the P-38 is not available on Apollo at all, since it was used only in the Mediterranean.

Why are some bombs/other weapons not available?

Various factors determine weapon availability

- Low supply can reduce the availability of some loadouts.
- Some weapons are excluded because they weren't used in real life (for example, the 6-bomb loadout on the P-38 was only used in the Mediterranean theater).
- Some loadouts have been removed for gameplay balance reasons (for example, the Mustang cannot take rockets).

BOMBERS

What about air spawns?

Bomber air spawns are available at fields that are a minimum distance from the front line (approximately 8 minutes of flight from the front). Height is 4,000m.

How do I use my bombsight without knowing the elevation of the target?

Objective altitudes are now shown on the mission map if you mouse-over the objective's icon. Many objectives in Holland are within 50m of sea level.

CONVOYS

How do convoys work?

Convoys feature in the dynamic campaign as both trains and truck convoys. There follow a predetermined route, shown in both the in-game map and the website map. Convoys leave their origin sometime in the first hour of the mission and take some amount of time to get to destination. Attackers are notified when it's 2/3rds of the way to destination. Friendlies get a call out on departure, midway and nearly arrived. When attacked, truck convoys panic stop, then restart once enemy clears.

I shot up a convoy train, but didn't kill every single car. Does it count the convoy as destroyed?

You need to destroy the locomotive plus a minimum number of cars to kill the train. You don't need to destroy every car, but you MUST destroy the locomotive.

How do I know if a convoy has left its origin?

There are voice calls and text messages for both friendly and enemy convoys (2 calls per convoy). For enemy convoys, you will be notified when it departs and when it has nearly arrived.

SRS and RCI

What is RCI?

Radio Controlled Intercept. A human player that has access to radar data and operates in SRS channel 1 to direct pilots to intercept enemies or escape from enemies who may be hunting them.

How does RCI work?

RCI officers are volunteers. They have the ability to join a coalition and monitor radar, then communicate that info to pilots. RCI are limited in what they can see. Pilots who are assigned a callsign on SRS channel 2 will be visible with their name and easier for the RCI officer to keep track of. Friendlies without callsigns are not labeled. To be directed by the RCI officer you must get a callsign at the start of each day and monitor SRS channel 1 for instructions.

How high/low do I need to fly so that the enemy RCI can't see me?

There is no magic safe altitude. There are various radar stations on the map and they all have a limited range. Apollo does model simplistic ground clutter – the further you are from the radar, the higher you can fly without being detected. The further you are from an enemy radar, the less likely you are to be detected. If you are flying very low, you are less likely to be detected. Enemy radar stations can be destroyed, reducing the enemy's visibility. Callouts for enemy radar locations are made either by the RCI (if active) or by the SRS bot (if no RCI is active).

How do I know if an RCI officer is present on a coalition?

The #welcome channel has two reaction roles (a red dot and a blue dot). You can click these to receive a notification when each team has an RCI officer active. If you tune Channel 1 on SRS, you'll hear your team's RCI officer.

Being an RCI officer sounds cool! How can I do it?

Currently, you must be a Patreon member of the server and must apply with the admins.

Is it fair that the team with an active RCO can see everything going on?

The number of trained RCOs is currently limited. It's not possible to ensure that both sides always have an RCO on duty at the same time. Additionally, radar does not cover the whole map. Radar falls off sharply over the front line, so both friendly and enemy contacts usually cannot be detected if they are deep in enemy territory. Radar is not perfect – the location data and altitude data is approximate, and radar operators often lose track of information such as friend-or-foe, callsigns, etc. In contested airspace, the radar view becomes very cluttered and requires a skillful operator to interpret. Radar is designed to help intercept strikes. It does not provide a perfect overview of the entire map.

PARATROOP DROPS

How does objective capture using paratroops work?

Once a target has been completely destroyed and the day completes, there may be the opportunity to capture the destroyed target using paratroopers. If so, there will be a blue or red arrow crossing the front line and pointing to the destroyed objective. Players can spawn Ju52s or C-47s and drop paratroopers over these objectives. It takes a minimum of 3-4 plane loads of troops to capture. Above that amount, each additional drop increases the chance of capture. It is possible for multiple objectives to be capturable on any given day. Planes must be changed from "supplies" to "paratroopers" before spawning. Dropped supplies currently do nothing. Only paratroops work for this mechanic.

Why does the enemy have paratroop targets but my team doesn't?

A paradrop objective will only be available if an enemy objective has been completely destroyed. Additionally, because paradrop operations can move the front line by themselves, there will never be two opposing paradrop missions near each other.

My entire group wants to do a paradrop, but there aren't enough planes. What's up?

There are only 4X Ju 52s or C-47s available at any given time. Each paratrooper is an AI object which causes strain on the server. The planes refresh relatively quickly, so it may be possible to take more than 4 planes at a time, but the likelihood is lowered to prevent server performance issues.

The Ju52 is slow and carries fewer troops than the C-47. Is that fair?

The number of paratroops required by each side has been deliberately balanced, since the Ju52 is slower and carries fewer troops (9 vs 12 for the C-47). This ensures that both sides have a similar opportunity for capturing an objective.

WEATHER AND CONDITIONS

Why are the missions only 2 hours?

Missions in our 'normal' rotation are one-off, historically inspired scenarios. You have three hours to accomplish your objective and then the game is over. Apollo is a continuous war.

Two hours is the best compromise of being long enough to bomb a long distance target, but short enough that the front line moves, targets regenerate, airfields resupply, etc.

Why is it so dark? I don't like nighttime missions!

Missions start up to 30 minutes before sunrise and end up to 30 minutes after sunset, rounded to the nearest quarter hour. You're more likely to get a 'dark' mission during the winter, when daylight hours are naturally shorter.

Why is it so cloudy all the time?

Weather is randomized within certain parameters. Completely clear days are relatively uncommon in Western Europe and this is reflected in the campaign. Heavy clouds with rain or snow will be rare, but cloudy days will be common.

Weather Type	Percent Chance	
Clear	30%	
Mostly Clear	10%	
Partly Cloudy	10%	
Mostly Cloudy	16%	
Overcast	34%	

OTHER

Why do I get disconnected every time the map rolls?

Because of the way the mission generation works, the system does "housekeeping" and shuts down after every few missions and players will be disconnected. Messages are shown to players to indicate that this will happen.

Change log

Beta 18 "Big Normandy" November 2024

Campaign changes:

- "Big Normandy" is a complete overhaul of the Normandy campaign using a much larger playable area. At 180 km by 225 km, it's nearly twice as large as the standard Apollo playable area. The layout for objectives and airfields is new and more evenly spread out, with about 30 km between most objectives on average.
- A full set of pop up objectives has been added to Normandy for the first time.
- The network of truck convoys and railways has been completely redone and is now much more comprehensive. The supply boost from these convoys is increased.
- No more rough airfields, static naval convoys, or uncapturable objectives. These didn't work well and have been removed.
- Mission time is increased to 3 hours instead of 2.
- New custom voices for the CB Radio bot, courtesy of some CB admins and friends. Keep your ears open for them on SRS, and you might recognize someone.

Tech Alpha 15 "Streaks and Spawns" May 2024

Significant all-new features:

- Pilots can now earn bonus supply damage through a 'streak.' Each time a pilot successfully completes a sortie where they inflicted supply damage, they gain a 10% bonus to their damage. The bonus caps at 100% (double damage) and is reset to zero if the pilot dies or is captured.
- Combat Box Apollo now features custom aircraft spawn points, available at one airfield per side, per day. Rather than starting line-abreast with fellow pilots you might find yourself spawned in a concrete bunker, beside a hangar, camouflaged inside some netting, or at some other location on the field. Taxi carefully and watch out for other airplanes operating nearby.

Campaign changes:

- Campaigns now have an explicit end date (usually 300 days or more after the start date). If the end date is reached, Apollo checks to see if one side has gained control of at least 10 supply points compared to the starting position. If so, that side wins, otherwise the campaign is a stalemate.
- Kuban campaign objectives have been overhauled, toughening them up slightly and optimizing the number of objects at each location.

Supply system changes:

- Destroyed airframes now count against supply generation for the next day in the campaign. This means that players who repeatedly get shot down may actually be a net-negative for their side, depending on how much supply damage they were able to inflict on their sortie. Bring your bird home – they're important for the war effort!
- Resupply rates have been slightly decreased across the board, especially during off-peak flying hours. The bonus for re-securing an objective has been removed.

Gameplay changes:

- Cloud configuration has been tweaked. Pilots will find more "medium" types of cloud and less clear or very heavy cloud coverage conditions.
- CB Radio (available via SRS) now includes automatic 'bandit' calls for fighters who have a call sign. Fighters are assumed to be looking for trouble, bombers should declare an objective to enable 'tripwire' style functionality. This feature has both a time-based and geographic cooldown, to reduce radio clutter and ensure the feature isn't too powerful.
- (Rhineland-only) Me-262 availability has been overhauled. The 262 unlocks at a random time in the first half hour of the mission, and at only one airfield, to avoid gaming the availability. Two jets are available with no additional jets during the mission, but jets can now be returned to the 'pool' if they are safely landed at the takeoff field.
- Low-population Ai defensive fighters have returned. If a side has less than 8 players flying, their opponents may encounter Ai fighters if they loiter too long at an objective.
- Flak guns should no longer sometimes kill themselves when surrounded by sandbags.

Tech Alpha 13e "Kuban-replay" March 2024

Campaign changes:

- Start date pushed back to 15th May, 1943. A larger variety of airframes will therefore be available at campaign start.
- Many new ground convoys added, thanks to Jordo.
- Cloud configuration has been changed to reflect historical average weather conditions, thanks to RufusK.
- Many sprawling objectives and airfields have had their objects trimmed back, usually in favor of objects that require bombing to destroy them.
- Airframe losses can now take an airfield down to zero supply and close it (previously this damage stopped at 100 and instead 'splashed' the damage to a nearby objective).
 Airframes are worth 2 supply – pilots should be careful to bring their planes home, or risk closing their own airfields!
- Fixed Apollo's understanding of Li-2 and IAR aircraft. The Li-2 fix should allow paratroopers to be properly detected when dropped from this airplane.
- Improved spawn points at all airfields to allow easier taxiing.

Airframe availability changes:

- Airframes now have an "end date" allowing them to be phased out (for example when a newer version supercedes them, or when a model becomes too obsolete to fly).
- Many airframes have had their availability improved or are now available closer to the front line.
- FW190-A5 and La5-FNs2 are now limited in quantities, and not available at the front line.

Tech Alpha 13 "Kuban" March 2024

New Kuban campaign:

- Kuban is now a flyable map for the Apollo campaign! This is literally only possible thanks to our community contributors. If you see them in the skies, please send a salute to Barnacles, Haluter, RufusK, Jordo, Monkey_Fly and Wim; they're the reason you're flying this campaign.
- The campaign is about 95% complete. We expect to add more rail and ground convoys in future, as they are somewhat limited in this first run of the campaign.

Airframe availability changes:

• Airframes have been customized for the Kuban region, 1943 onwards. As with our other campaigns, new airframes and mods will "trickle in" from rear airfields and become more available over time.

Campaign changes:

- Kuban map added. USSR playable country added.
- "Possible play area" added as a concept to Apollo. In Kuban, this limits the play area to approximately the northern half of the map. Frontline calculation overhauled to match. Please report any weirdness to the admin team.
- Train convoys are now automatically reversible; Apollo can reverse the waypoints if that would make a more useful convoy for the campaign day.

Tech Alpha 10 "Normandy" November 2023

New Normandy campaign:

- Thanks to efforts from the Combat Box community, we are pleased to add Normandy
 as a flyable map for the Apollo campaign. Objectives and airfields are all meticulously
 hand-crafted and we hope pilots will really enjoy flying along the historical beachheads
 and attacking both historical and "inspired" objectives.
- The Normandy campaign has many, many objectives available, too many for us to include all at once, but we want to ensure people get to see all the cool stuff the

community built. Apollo now intelligently randomizes objectives to be included in each run of the campaign, so every play-through will be slightly different.

Airframe availability changes:

- Aircraft introduction dates are now used to determine which airfields actually have that airframe available. On the introduction date, airfields at least 50km from the front line will have the airframe. Each day, the 50km reduces by 1km until all airfields have the airframe.
- Aircraft are no longer available in infinite numbers. At most fields there is a specific number of airframes (from 4 to 20) based on proximity to the front and how recently the airframe was introduced. The further from the front and the 'older' an airframe is, the more that are available. Airframes refresh periodically throughout each day.

Ground target overhaul:

We're running an experimental setup that changes the damage model characteristics
for some ground objects. Metal hangars and large industrial buildings are no longer
destructible using small (50kg) bombs, and instead require larger ordnance to destroy
them. We have modified only a few buildings so far. This change makes loadout
selection more meaningful – instead of "bring as many small bombs as you can"
players might sometimes choose larger bombs for "big game hunting" of these more
heavily armored targets.

Gameplay changes:

- Supply lost through player kills will now count regardless of the health of the airfield from which they flew. If the airfield has too little supply to penalize it, the supply is instead subtracted from a nearby friendly objective. This means that although players cannot hurt their own airfields too much through losses, the supply damage will be felt at least somewhere on their side.
- Allied players now need to drop slightly more paratroopers to capture an objective, to account for the faster flying C-47 (vs the slower Ju-52).
- Wind levels are now randomized based on the season and cloud type, and in particularly heavy winds pilots may encounter wind shear on takeoff or landing. Pay attention to the conditions and be extra vigilant if it's windy!
- Radar installations sometimes now include more than one radar dish. Players must destroy a majority of the dishes in order to knock out the radar.

Tech Alpha 9 "Frontline Pushes" September 2023

Overhauled frontline, influence, pop-up and capture mechanics:

• Supply points (objectives and airfields) now extend their influence intelligently towards the front line, rather than in a circle around them. They choose a nearby enemy objective and 'push' influence in that direction.

- Pop-up targets are now "offensive only" Apollo analyzes the most-damaged objective on each side and considers whether an opposing pop-up should be activated to help push the front line at that point. Pop-ups are now retired after 14 campaign days, regardless of whether they are destroyed.
- Objectives that are destroyed (damaged to zero supply) are knocked out of action for three campaign days. After three days if they are not captured they repair to 33% supply.
- The gameplay area now follows the previous day's "most damaged" objective, rather than Apollo's idea of the most contentious point on the frontline.

These changes should allow players to feel the outcome of their actions more directly, allowing an explicit 'push' on part of the front line.

Gameplay changes:

- Bomber air spawns are now available at any field that is at least a certain 'delta' further
 from the front line compared to that side's closest frontline airfield. The delta is the
 approximate distance a bomber would cover in level flight in the time a ground start
 uses for engine start, taxi, takeoff and en-route climb. Bomber spawns are now at
 4,000m (was 1,500m).
- During low-population times on the server, quick-response Ai fighters will defend objectives and airfields if attackers loiter for too long.

CB Radio changes:

 Bomber pilots en-route to target are now provided automatic "flight following" by radar (if radar is enabled and has coverage). Enemy aircraft will be called out over SRS to give bomber pilots a chance to evade or redirect. Callouts have a cooldown to avoid being too powerful.

Tech Alpha 8 "Paratroopers & Radar" May 2023

New capture mechanic:

• Airfields and objectives that are damaged down to zero supply are 'capturable' if they are near the front line. The opposing side can drop paratroopers from the C-47 (Allies) or Ju-52 (Axis) at the objective, and if enough are dropped, the objective will be captured the next day.

Supply system changes:

We've overhauled the supply system so that in general, front-line positions will be resupplied more slowly, with 'rear' positions better supplied.

 Destroyed objectives that are not captured by the enemy and instead reclaimed by their side no longer receive a 20% supply boost when they return to action.

- Pop-up objectives now participate in the overall supply network, sending and receiving supply like other objectives, instead of regenerating a small amount each day.
- New supply is generated at airfields and strategic objectives *furthest* from the front line, and then moves through the network to the front.
- Reduced maximum amount of resupply received per supply point to 20% per day (was 30% per day).
- Corrected a bug where in some circumstances, a supply point might send more supply forward through the network than was intended.
- Apollo now sends a maximum of one convoy per day to a particular destination.
- Destroyed objectives are now labeled on the map after a few minutes, rather than only on the next day. Should help players avoid "overkill" on an objective.

New 'radar' feature:

- Each side has up to three mobile radar locations active each day. Radar control officers
 can view live radar feeds, with accuracy based on the radar positions. If radars are
 destroyed, the radar operator receives degraded (or completely absent) radar
 information.
- CB Radio now uses the simulated radar data to help players, even if a human RCI officer is not present.

Other changes:

- New objectives added including Weeze Tire Factory.
- Added the BF109-G6/AS. Slightly reduced the supply requirements for BF109-K4 and FW190-D9. K4 "DC" engine available slightly earlier, from 1 March 1945.

Tech Alpha 7 "Career Mode" March 2023

Career mode changes:

- New career mode!
- Full blown web UI powered by next.js
- Discord Login
- Pilot portraits and limited stats
- Mission card
 - Crowd sourced card art
 - Up to 3 planes to choose from, depending on mission type
 - CAP, ground strike, strategic bombing, tank and train hunting and attack/defend convoy missions are all generated
- Mission tracking overhauled. The mission tracker is more sophisticated and will properly track CAP missions.

- Group Operations
 - Share your cards with your friends!
 - Group Operations are tracked just like solo missions, but mission requirements are shared amongst the whole flight.
- Manual added
- Killed/captured pilots are saved for the duration of the campaign

Campaign changes:

- Win condition updated. One side loses if they have fewer than 3 airfields in the active area or if they have less than 700 total supply.
- The campaign back-end now receives bonus events such as bonus supply damage or bonus resupply from the career mode website.
- Deurne is now USAAF, to break up the "big blob" of RAF airfields.
- Supply system overhauled.
 - Both airfields and 'strategic' targets can now generate supply, up to the daily maximum per coalition.
 - The distance supply can move is influenced by the supply level of the 'sending' supply point. A pristine 300 supply strategic objective can send supply 50% further than a medium sized 200 supply objective, and a 100 supply small objective can only move supplies half as far again.
 - The amount of supply that can move is also influenced by the supply level of the sending supply point, with better supplied points able to both send and receive more supply each day.
- Convoys now only travel from a better-supplied point to a worse-supplied point.
- Objective repair overhauled. Individual block damage is still tracked, but Apollo now
 always attempts to repair enough blocks that an objective can be killed with "obvious"
 block damage (bunkers, buildings, etc). Non-obvious damage such as very small ammo
 stores should not be required for an objective kill. Additionally, Apollo repairs block
 categories in proportion each time. This means an industrial objective should always
 have industrial blocks ready for players to destroy.
- Objectives and airfields overhauled
 - All objectives and pop-up objectives now contain more blocks and so should be more easily fully destroyed.
 - Added multiple objectives in the Northeast where there were no objectives nearby, including Schoppingen Long Range Relay Station, Vreden Ball Bearing Factory and Ludinghausen Bridge Blockade.
- Pop-up objectives now spawn slightly less often.

Gameplay changes:

- Durability on "static" tanks has been reduced, so they should be killable with cannon.
- Convoy announcements now also go out via CB Radio on SRS.
- AA overhauled
 - Guns are now chosen with a 25% puffy flak, 50% large calibre tracer, and 25% machine guns distribution.
 - Machine guns respawn faster than large cal tracer guns, which respawn faster than 'puffy' flak.
 - AA at player airfields is stronger, with slightly more guns that respawn quicker.
 Additionally, player airfields with at least 75 supply get 'high' skill guns (previously 100 supply was needed).

Bug fixes:

• Default payload ID for aircraft is now 0, instead of 1, so the aircraft selection screen starts with "vanilla" loadout.

Cosmetic changes:

• Wind speed and bearing is now listed in the in-game mission briefing.

Tech Alpha 6 "Midwinter Edition," February 2023

Campaign changes:

- Apollo now has a win condition! If one side controls fewer than 3 airfields in the active play area, they lose.
- The campaign now switches between seasons based on the date. Players should see the Rhineland campaign begin in autumn and progress through winter, spring, and summer. Mission temperatures are set accordingly, and included in the daily mission briefing.
- More objectives, airfields and convoys have been added to the campaign, especially in the east (territory held by Germany at campaign start). More pop-up targets have also been added.
- We've implemented a coalition balancer to encourage more balanced teams.
 - If one side outnumbers the other by more than 10 players, their front-line airfields will be set to "restricted" mode. If the imbalance grows to 20 players, a second set of airfields will be restricted as well.

- Players can finish their sortie or repair and refuel at restricted airfields, but they cannot spawn new aircraft.
- To encourage players to complete sorties and emphasize the importance of bringing your aircraft home, losing an aircraft now *reduces* supply at the airfield it took off from. This effect cannot take an airfield below 50%, and if a pilot lands at another friendly field there is no penalty.
- "Pop-up" objectives are now slightly more limited, so each side has a maximum of two pop-ups within the play area. Pop-ups that move off the map are cleaned up and removed. Pop-up search areas are now smaller.
- Airfield ownership now follows the "Y is for Yankee" historical rule. If a field was historically British or American, it is set to that country when captured. If the field wasn't held by either of those sides, it's set to the closest country upon capture.
- Supply can now move "along" the front line between objectives that are a similar distance from the front. Previously a strict distance check was applied, so if one objective was fractionally closer to the front it could not resupply the other.

Gameplay changes:

- Pilots are now sent a personalized "instant debrief" when they finish their sortie, giving them feedback on how they did and how the sortie ended.
- Pilots who fail to use the designated runway for takeoffs are now called out in chat, for everyone on their side to see.
- Pilots now have a maximum number of lives per campaign day. Most pilots flying normal sorties will never run into this limit, it's intended to avoid strange behaviors where pilots suicide in the name of 'efficiency'
- Airframes now require a minimum runway length at an airfield. The A-20, He-111, Ju-88 and Arado are not available at a handful of the smaller fields due to this.
- Flak is now randomized better to a 'matching' model (based on type and projectile calibre). This should lead to a better variety of guns at each supply point.
- Convoys now always depart in time to reach their destination. Enemy pilots now get two convoy announcements, once shortly after the convoy departs, and once when the convoy nears its destination.

Bug fixes:

- Play area is now always centered on the front line. Depending on the movement of the front the "combat box" previously lagged off to one side, giving an advantage to the side that was pushing forward.
- Locomotives, train wagons, and wagon-mounted AA guns now count against supply if they are destroyed.
- Convoys arriving at their destination should now always award a supply bonus to the destination supply point.

Cosmetic changes:

- Inactive airfields should now have the correct aircraft and decoration blocks for whichever side controls that spot on the map.
- Inactive airfields outside the play area are now totally removed from the mission.

Tech Alpha 3 "Black Friday Edition," November 25th 2022

Supply and mechanics changes:

- New "pop-up" objectives feature.
 - A "pop-up" objective is chosen by Apollo when the supply levels in an area are low, for example when fighting has heavily damaged or destroyed nearby objectives. Pop-ups can be infantry, armored, or engineers, and they have a historical unit name.
 - The first day a pop-up activates it is marked with a "search area" on the map, rather than a pinpoint location. Once discovered by the enemy, it will be pinpointed on subsequent days in the mission.
 - Pop-ups do not interact in the supply flow with other objectives, but they do repair a small amount each night. Importantly, pop-ups do project influence and can move the front line. If one side successfully defends their pop-up, it can help them push the front.
 - If a pop-up is overrun by the enemy it is destroyed. Destroyed pop-ups never reactivate.
 - Massive thanks to -332FG-CueBall for his work implementing dozens of pop-ups across the entire map.
- Apollo now correctly processes "blocks array" damage events from the IL2 logs. This should mean supply (and block) damage to objectives is tracked more consistently.

- Blocks at objectives should now repair more evenly, rather than single blocks repairing to full overnight. Should make persistent block damage more realistic, and supply and repair calculations more accurate.
- AA guns now have significantly less supply value than previously (now 1 point, previously 5). AA probably should not be ignored, but destroying buildings and ground targets now consistently has much more impact on the war effort.

Campaign changes:

- Airframes and loadouts overhauled by Talon, Barnacles and Sketch. Some airframes (such as the Tempest) are restricted to a small pool at each field, with a periodic refresh throughout the day in the campaign.
- Soesterberg and Schipol are now controlled by USAAF at the beginning of the campaign. This should reduce the chances of a day in the campaign with only RAF or only USAAF airfields.
- Improved / fixed RRR, NDBs, airfield flak and spawn points at several airfields.
- Corrected situations where influence areas would be plotted incorrectly.

Gameplay changes:

- Apollo now understands historical sunrise and sunset times for each day in the campaign. Missions start up to 30 minutes before sunrise and end up to 30 minutes after sunset, rounded to the nearest quarter hour. This should eliminate pitch-black flying conditions but not entirely remove dawn/dusk conditions.
- Small amounts of turbulence and haze are now present, dependent on wind and cloud conditions. Heavy cloud leads to higher turbulence but less haze, clear skies with low wind to less turbulence but a greater chance of haze.
- Objective altitudes are now shown on the mission map if you mouse-over the objective's icon.

Cosmetic changes:

- IL2 stats website now shows day in campaign, time remaining, and mission map, and should update immediately for each day in the campaign.
- Map graphics on the website now include custom icons by Talon and a special "aged paper" effect by Haluter.

Apollo now displays campaign credits 10 minutes after mission start.

Back-end changes:

• Corrected tagging of some British guns, which are now a valid AA option for Apollo to choose.

Tech Alpha 2, October 28th 2022

Supply and mechanics changes:

- Airfields within 10km of the front line are now only available for repair, refuel and rearm, and for ending missions.
- Captured (or re-secured) objectives now repair to 25% immediately.
- Supply points (airfields and objectives) only donate supply to nearby friendlies if they have at least 80% supply to begin with.

Campaign changes:

- Added more train and ground convoys.
- Remove Bergen op Zoom fuel storage. Add Ninove Defences.
- Deactivate airfields at St. Trond, Schijndel, Kirchhellen, Krefeld, Kelz and Koln-Wahn.
- Switch to longer runway option at Boenninghardt. Add siren, repair truck, and better AA to Lette.

Gameplay changes:

- Convoys now use randomized timers to determine when to start, not distance-based check zones.
- Convoys now announce their movements to friendlies (3 times) and enemies (once).
- Check Zone and Flak Gun revamp
 - Check zones are now switched on for only 5 seconds, then off for 20 seconds, to reduce server load
 - Flak guns now respawn even if players stay in the check zone and do not reset it
 - o Flak respawn timers are now configured via global config

• More cloud options, with overcasts at a higher base for easier work underneath.

Cosmetic changes:

• Permanently inactive airfields are now automatically set to look mostly destroyed.

Back-end changes:

- New "campaign analyzer" code to look back at a previous campaign run.
- Campaign manager now spits out a big 'overview' graphic when initializing the campaign.

Future planned features

These features are planned, but not yet implemented.

Unique Missions and Pilot Progression through Fame

These planned features may return in a future iteration of Apollo.

Players who choose to "opt in" to career mode will 'possess' one of three pilot characters – RAF, USAAF or Luftwaffe. Players are able to choose between different types of missions, based on the current status of the war and their preferences. The missions range in difficulty and include rewards, campaign effects, and other consequences. Squadrons can fly missions together as a group by sharing mission cards before they begin their sortie.

The Apollo stats system does not represent the player, but the pilot the player possessed instead. This is the "opt in" feature that is unique to our campaign. The player's pilot is awarded when successful, and players are able to see their pilot's success by viewing their pilot's details page. Players will want their pilot to stay alive as long as possible to gain as many points for their pilot as possible. These points are called fame, and the more fame a pilot has, the more recognition he will receive (including promotions, awards, and more). Players will make legends out of their virtual pilot. Legends will be remembered in the museum, right next to the first Apollo mission to the moon.



What your possessed pilot could look like when famous. Image by Grifforik.

Allowing Passive Players

Players don't have to opt in and can just get into the server for a quick dogfight. When they do, they still possess a pilot automatically. In this way, they are influencing the dynamic campaign, and they can return to their pilot if they choose to opt in. Of course, their pilot character will not become famous and passive players influence the outcome of the war less so than their opted in counterparts.

- Each airfield accommodates both 'casual' players and 'on mission' players. Regardless of where a player spawns, they are taking part in the campaign.
- Players attempting to fly a mission will need to pick the correct loadout. If they alter the loadout, we try to detect it, and warn them that they have the wrong loadout selected (via chat, website, and SRS). (not yet implemented).