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1. MINIMUM SPECIFICATIONS

In order to play The Forgotten Battles on your computer, your system must meet the following criteria:

• Windows® 98/ME/2000/XP
• Pentium III 800/AMD Athlon 700 or better
• 256 MB RAM (512 MB RAM recommended)
• 3D video card (DirectX 8.1 compatible) w/32MB RAM
  (64MB recommended)
• Sound Card (Direct 8.1 compatible)
• DirectX 8.1 or higher (included on disc)
• 4X CD-ROM or better (Not recommended for use with CD-RWs)
• Internet connection (56 kbps or better) or LAN for multiplayer
• Hard Drive Space 1.1 GB

Overall quality will depend on the user's processor speed and
3D graphics accelerator.

2. INSTALLATION

To install The Forgotten Battles, please follow these simple steps:

Start your computer's operating system.

Insert The Forgotten Battles CD into your CD-ROM drive.
The Autorun menu should appear and start automatically.

Note:
If the Autorun menu does not automatically appear, double-click on
the My Computer icon on your computer, and then double-click the
icon that corresponds to your computer's CD-ROM drive. The
Autorun menu should now start. If the file directory on the CD-ROM
comes up instead, find the Set up.exe icon and double-click on that.

Click the Install the Forgotten Battles button. The CD will walk you
through each step of the installation process.

After you have finished installing the game, you can select IL-2
Forgotten Battles from your computer's Start menu or double-click
on the IL-2FB.exe in the installed directory. Either will start the game,
and Forgotten Battles will automatically start.

Note:
IL-2 Sturmovik and IL-2 Sturmovik: Forgotten Battles are not
compatible with each other when playing online.

3. HARDWARE SETTINGS

Once installation is complete, the Set Up program starts automatically.
This program enables you to select the correct settings for your video
driver, video card, sound, and input devices. In order to do this, you
need to know at least the basic types of hardware installed on your PC.

VIDEO
1. Driver – Driver and Video Mode Set Up
These settings are similar to the internal IL-2 Video Modes dialog.
(See the section on In-Game menus below for a description.)
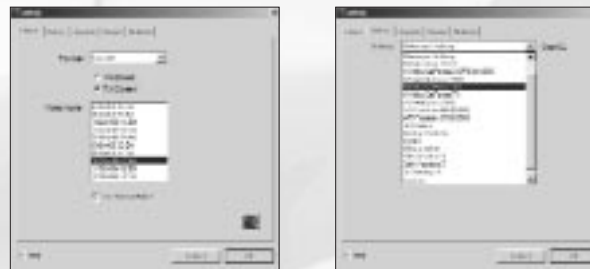
2. Video – Video Driver Adjustment
This adjusts the game for correct operation with the appropriate driver.
OpenGL/DirectX settings are defined separately. It is recommended
that the latest video card drivers be installed.

If you should have any problems, check your driver settings in Windows.
These can be found in Control Panel/Display Properties/Advanced.

If the game locks up or if the screen refreshes very slowly, check that
other 3D applications or games (OpenGL/DirectX) start up and function
properly. We advise against overclocking your video card or processor,
or using non-standard settings for them. Otherwise, uninterrupted game
functioning is not guaranteed!

Settings – Drop-down menu for video-card selection and set up.

The following are special options
in the Settings menu for detailed
video-driver adjustment:
• *Safe* – Operating mode with minimum
demand on the driver (the lowest quality
and speed).
• *Default* – Operating mode with average
demand on the driver.
• *Custom* – Detailed adjustment
(at your own risk).

- *Texture mipmap filter* – Regulates quality of texture filtering.
- *Texture Compression* – Saves considerable memory (the highest quality is obtained with S3TC).
- *Polygon Stipple* – Emulates shadow transparency in the absence of a Stencil Buffer.
- *Dither* – Controls dither mode for 16-bit modes.
- *Use Vertex Arrays* – Reproduces geometry via vertex arrays.
- *Disable API Extensions* – Forbids the use of video-driver extensions.
- *Multitexture* – Can be used for multitextures.
- *Combine* – Improves texture combining.
- *Secondary Color* – Can be used for fog and lighting.
- *Texture Anisotropic Extensions* – Enables anisotropic texture filtering.
- *Texture Compress ARB Extension* – Enables S3TC compression.

3. Video Modes – Choosing Video Modes

Driver – Choose between DirectX8 and OpenGL drivers. Choose the driver for your video card that renders the best speed and quality.
Resolution – Choose the screen resolution and color depth. Low resolution, e.g. 800x600x16 is recommended for earlier video cards; 1024x768x32 and higher should only be used on newer cards. This setting has the greatest effect on quality and frame rate.
Windowed/Full Screen – Switch the main game display between windowed or full-screen mode. Only full-screen mode is currently recommended.

Attempt Stencil Buffer – Utilize stencil buffer. The Stencil Buffer is used to make shadows translucent, etc. It mostly works in 32-bit modes. It often produces a dramatic drop in the frame rate on a number of older video cards. Recommended for GF3.
Apply – Apply new settings and return to the previous menu.
Back – Return to the previous menu.

4. Video Settings - Graphic Settings

This dialog box is used to define quality and efficiency. Results depend on the video settings in the IL-2 Set Up (i.e., maximum quality is achieved with maximum video settings and when your video card supports a maximum number of options).

Simple – Move to simplified settings.
Very Low/Low/Medium/High/Excellent Settings – Choose overall quality.
Apply – Apply new settings.
Back – Return to previous menu.

Custom – Go to detailed settings.
Visibility Distance – Visibility distance for objects.
Objects Lighting – Quality of object lighting.
Objects Detail – Detail of objects.
Landscape Lighting – Landscape lighting and shadows from objects.
Landscape Detail – Landscape detail (forest/trees/terrain/geometry).
Cloud Detail – Cloud visualization distance (you can prevent their complete shutoff in network play).
Perfect Mode of Landscape Detail Using Custom Settings – Special quality mode currently used for high polygon-count model of landscape and special hardware shader effects (water, trees, etc.). Only for Shader feature–compatible hardware like GF3+, Radeon 8500+ (latest WHQL drivers recommended). Be sure to turn on 32-bit Color and Depth modes with 8-bit stencil.

SOUND SET UP

Once installation is complete, a separate IL-2 Set Up Configuration program will start up. You can also use this program for a more detailed adjustment of hardware settings (at your own risk).

The easiest way to adjust the sound is to choose from existing configurations. Please choose your sound card from the list. If it does not appear on the list, follow the instructions below:

- If your card supports 3D sound hardware acceleration or you are unsure about it, choose Minimum or Maximum Settings.
- If your card does not support 3D sound hardware acceleration or you experience sound-related problems, choose No Hardware Acceleration in accordance with the OS you are using.
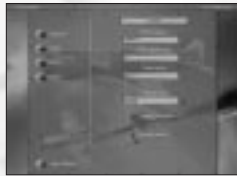
If you want to adjust all the settings yourself, choose Custom Settings. The options in this dialog box reuse those in the game's sound menu.

MAIN IN-GAME SETTINGS
1. Sound
Use the Sound Set up->Audio menu to adjust the main sound settings:

Sound Engine
To enable the sound, use DirectX.
To switch off the sound, use Disable Sound.

Enable Extensions
If your sound card has hardware acceleration, turn the switch on. This enhances the sound quality considerably.
If there is no acceleration, the position of the switch is irrelevant.
Should any sound-related problems occur, the switch must be turned off.

Playback Channels
If your sound card has no hardware acceleration or if the hardware acceleration has been switched off with the Enable Hardware switch, the parameter has a great effect on the CPU load. Use the Default or 16 values. We recommend that you use value 8 for Windows 2000 and NT.

Audio Quality
Use this switch to adjust the sound quality and for the most part the CPU load. The optimal Audio Quality value is 44 kHz.

Note: Use 48 kHz only with Creative SoundBlaster Live (it doesn't play a big role in the sound quality).

Speaker Type
Specify the type of audio device you are using: headphones, desktop speakers, or system 5.1 (surround).

Reverse Stereo
If the stereo channels seem to be reversed, use the Reverse Stereo switch.

2. Volume
Use the Sound Set Up -> General menu to adjust the sound volume:

Master Volume
General level of volume for all sources.

Objects Volume
Relative sound effects volume.

Music Volume
Relative music volume.

Voice Volume
Relative volume of voice messages and network telephone.

3. Music Playback
Music in the game is activated via the Play Music switch in the Sound Set Up -> General menu. The music volume is adjusted using the Music Volume control in the General menu. Turn the music on or off for any given gameplay episode in Sound Set Up -> Music menu:

Play Takeoff Tracks
Play music during takeoff.

Play In-flight Tracks
Play music while in flight.

Play Crash Tracks
Play music when damaged.

You can add music files at your own discretion via Samples/Music/Directory. The music should be in Windows WAVE-file, MPEG 1.3 format. The files for playback are chosen at random.

4. Network Voice Communication
Tune the network telephone in the SoundSet up->Radio menu.

Voice Communication
Enables the telephone.

Mic Input Level
Adjusts the level of input from the microphone.

Transmit Mode

You can choose between two modes of telephone transmission via the Transmit Mode pop-up window:
• Voice Activated – Transmission will be enabled automatically when a microphone signal is detected.
• Voice Activated Sensitivity – Allows you to adjust the input signal.

Press to Talk

In this mode, transmission is enabled by pressing a button, which you can define in Controls (Controls->Misc->Radio Mute key. By default – F12).

Test

You may also test your microphone using the Test button. An indicator will alert you to the arrival of transmissions and display the Mic Input Level.

Voice Volume

Adjust the volume using the Voice Volume switch in the Sound Set Up->General menu.

Selecting a Channel

You can select a channel for communication in the chat window. Only players using the same channel can hear each other. If you enter "." (dot) in the text-box window, a list of channels will appear at the bottom of the screen. You can use this list to select your desired channel by pressing the UP and DOWN arrows or by entering its number. The channel number and name are followed by the number of players in that channel (indicated in brackets). The current channel is highlighted in a different color, and has a "*" symbol.

Adjusting the Sound in Windows

DirectX sound settings in Windows can be found in the Control Panel->Sounds and Multimedia->Audio dialog box. (Sounds and Multimedia may simply be called Sounds in some versions of Windows.)
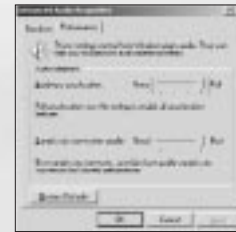
To adjust the sound hardware acceleration, choose Sound Playback->Advanced (see below).

If you have several sound devices installed (for example, a chip on the motherboard and a separate card), choose the one you prefer in the Preferred Devices list and select the Use Only Preferred Devices option.

In addition to this dialog box, your sound card may have additional adjustment options.

Choose the sound device you are using in the Speakers dialog box.

Choose the Hardware Acceleration->Full position of the switch in the Performance dialog box. If this creates problems with the sound, select Basic Acceleration or, as a last resort, Emulation Only.

TROUBLESHOOTING

No Sound

Make sure the sound is not switched off in the Sound Set Up->Audio menu. Make sure the volume is not muted in the Sound Set Up->General menu.

No Music

Make sure the volume is not muted in the Sound Set Up->General menu and that music is selected in the menu.

No Network Voice Communications

You can hear other players' messages in Windows NT4.0, but in most cases, you can't talk. This does not hold for Windows 2000. Make sure your telephone is switched on (see above).

Joystick Set Up

IL-2 Sturmovik generally supports a vast range of joysticks by different manufacturers. Select Use Joystick in the set up program. Press the Properties button and make sure that the joystick drivers have been installed and work correctly with your joystick. If the set up program detects your joystick's Force Feedback feature and displays it, you can enable or disable this feature. Read about other features and the control settings in the Controls section of this manual.

4. AIR COMBAT TACTICS

A fighter pilot's goal is rather simple:
Find enemy planes and destroy them before they can do any damage.

However, once you look deeper into air combat, you will realize that it's not that simple. The short phrase above actually assumes four things:
1. You notice the enemy in time.
2. You can get into firing range.
3. The enemy is destroyed by your gunfire.
4. You live to tell about it.

Each one of these tasks is complicated enough in itself; all of them together make success questionable, at best. Let's look at each one of them in a little more detail.

1. Finding the Enemy
This is difficult, as your eyes are your only instrument for finding the enemy. You have to be on a constant lookout for enemy planes, from the moment you takeoff to the moment you land.

2. Getting Close
"...we found ourselves in position behind and above the enemy. We split the schwarm up into two groups of two and dived down to attack. We shot through the fighters and then started to make life unpleasant for the schlachtflieger. I attacked the plane that was flying furthest to the left, moved in quickly and opened fire from 70 to 100 meters. I managed to score quite a few hits, but my shots just cannoned off the IL-2. Its heavily-armored body was even able to withstand 2 cm cannon projectiles!"   – *Erich Hartmann*
Quote from: Jäger, Manfred (1995), Erich Hartmann – The Most
Successful Fighter Pilot in the World, Motorbuch.

If you are up against enemy bombers, you must trade surprise for speed. What good is coming in unnoticed if the enemy has time to bomb their primary objective?

On the other hand, if you intend to attack enemy fighters, or other planes that present no immediate danger to friendly forces, you can take your time and position yourself for attack as you please.

3. Destroying Your Target
This is the most difficult part of air combat. Even the most qualified marksmen, lying on the ground with a scoped rifle, can miss a fixed target. Now imagine firing at a small maneuvering target hundreds of meters away, while both you and the target are flying at 400 km per hour.

It's not impossible, but it is very difficult. Many young pilots return from their first missions with empty ammo stores, but not a single hit. Only constant practice and unwavering confidence can help you score your first combat kill.

4. Getting Out
Success in this task depends largely on how well you fared in the previous three. If you missed an enemy target in the first stage, you risk getting shot out of the sky by an unseen opponent. If you came in clumsily and ended up in the midst of an enemy formation, you're as good as dead. And if you missed your target when you fired at it – you have yet another angry pilot in pursuit.

Summary
• There is no skill more important as a pilot than destroying your target. All the aerobatic wonder-moves in the world are of no use if you can't get a kill when the time comes. All that matters in combat is being able to get in quickly, shoot, and get out even more quickly. If you can't destroy your target, you're no good as a fighter pilot.
• Always look for the enemy! Most shot-down pilots never saw what hit them. Whether you're by yourself or with a hundred others, never stop looking around!

Protect Your Mates!
Whatever you do, destruction of enemy aircraft is always secondary to protecting friends. No enemy target is as important as the life of your mate!

DESTROYING YOUR TARGET
There are two main parts to this task: maneuvering for the kill, and shooting the enemy down.

Maneuvering for the kill has been the topic of many hefty books; we cannot possibly explain it in sufficient detail within this manual. However, the main principles remain simple:

• You must maintain your guns on your target long enough to destroy it.

• You should never hesitate to act on your hunch, however unconventional it may be. All tactics were invented by pilots in the heat of a dogfight. A fighter pilot who does everything by the book becomes predictable, and therefore vulnerable. Fight using your brains, and always improvise!

Aerial Gunnery

Many factors work against you when you fire.

First of all, your bullets don't fly in a perfectly straight line. Your plane shakes in the air, your guns recoil and twist, Earth's gravity pulls the bullets toward the ground, and the air slows them down. All of these things combine to create something called bullet dispersion. A bullet stream from one machine gun at 50 meters will fit into an area fifty times as small as the same bullet stream at 500 meters. This makes long-range fire extremely difficult. Keep in mind that bullets lose power over distance. Using the same example, a bullet at 50 meters can puncture light to medium armor, but at 500 meters it may even bounce off human skin.

Secondly, most targets you encounter will be armored. Some planes have armor strong enough to deflect any bullets or shells you fire; your ammunition will bounce off your target without doing any damage. However, no airplane has the same thick armor all over. Even the heaviest armored airplane has some weak spots, where just a few hits can be enough to bring it down.

Gunnery Practice Suggestions

• Set up flights of friendly bombers in the Quick Mission Builder.
• The larger your target, the better. The Pe-8 from the Soviet side is a great target, and the He-111 or Ju-52 make great German targets.
• Slow the game down with the [key when you're ready to fire. This will help you learn to aim and maneuver.
• Once you begin to hit your targets easily, set up the same large targets as Hostile. Try shooting them down as they take defensive action and fire back at you.
• Only after you're sure you can destroy an enemy bomber, try to go against fighters. It takes a great deal of skill, patience, and determination to shoot down an enemy fighter.
• Review the track of your flight afterwards. Analyze your performance, find mistakes, and correct them in your next mission

Summary

• *Know your enemy's weak spots.*
Learn the capabilities of all enemy planes: their blind spots, defensive fire arcs, and performance relative to your aircraft. Only by setting your strengths against your enemy's weaknesses can you be effective in combat.

• *When you think you're too close – get closer!*
Bullet dispersion and power loss mean that long-range shots are ineffective, unless you are very lucky. Press the trigger only when you're sure to hit your target with every bullet! Since this is only possible from point-blank range, open fire when your target fills your whole windscreen.

• *Practice!*
I wish that following these principles could guarantee you a kill every time you press the trigger. Unfortunately, it isn't so. Prepare to miss a lot. Only by dedication and taking a steady, structured approach to training can you become a true ace.

As we said above, it's impossible to cover all aspects of aerial combat in one book, however large it may be. We will not attempt to do that; rather, we'll show some common situations and try to illustrate the most fundamental principles of fighter vs. fighter combat. We will only cover one-on-one scenarios here. Multiple aircraft engagements are extremely complicated, and success in them is directly based on your ability to win one-on-one engagements.

Most critical to a pilot's survival is his airspeed. If you're slow, you can't maneuver well and you can't escape enemy attacks. The worst position for a fighter is low and slow, chugging along at tree-top level. When you're there, all you can do is cross your fingers and hope. At all times during an engagement, climb! This should become your strongest instinct, to gain altitude whenever you have a chance. Stay above your opponent, and you will hold the advantage.

We will assume the most common scenario: both you and the enemy notice each other at the same time from a distance, and are going straight for each other's throats.

Correctly approaching during this stage is key to your success or failure. No amount of skill can guarantee you a kill in a pure head-on pass, and we would not recommend leaving this to chance. Committing to a head-on attack is like tossing a coin in the air to determine who gets shot down.

However, you can largely increase your odds even before the initial pass is completed. Look at this diagram, illustrating the importance of separation between your flight paths:
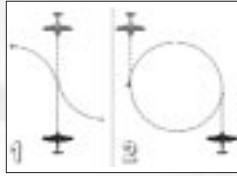
In case one, the two fighters approach head-on, and both choose to turn left. It will be at least two full turns before one can possibly get his guns on his target.

In the second case, the fighters pass each other at a diameter of exactly one turn circle. This brings them onto each other's tails very rapidly.

We recommend the following approach path: fly straight towards your enemy. When you're about three or four firing ranges away, quickly break away until you're almost in range, and then turn back on a path parallel to your enemy's. Of course, flight path separation does not need to be horizontal; it can be vertical as well, or both.

You can increase your odds even more by executing something called a lead turn. Unlike in the diagram above, you turn before you pass your opponent. If a lead turn is executed correctly, it can get you on your opponent's tail in as little as half a turn circle.

After the first pass, everything depends on relative skill! Know your plane's capabilities, and respect your adversary. If your plane turns better than the enemy, follow him into a turn and try to catch up with him as soon as you can. Forget everything else: chop your throttle, drop your flaps, even your gear! If your plane is faster than the enemy's, climb up to where he can't follow you, and then dive down with your guns firing!

Summary
• *Speed is life.*
There is no more important principle in combat than this one.

• *Your first burst should be your only burst.*
"Spray and pray" will only amuse your opponent. Make every shot count!

• *Stay alert!*
Where there's one enemy, there's always more nearby! When you're lining up on that perfect pass, look behind you and check for your target's wingman.

Do you think you're getting there? Great – it's not all that complicated, is it?

WHAT TO DO IN CASE OF DAMAGE
"The anti-aircraft guns fired at us fiercely from all directions, and suddenly I felt our aircraft hit. My left foot slipped down into an empty space below me, the bottom of the cockpit had been shot away. I felt something hot streaming down my left arm and leg – I was wounded. Blinded by the searchlights, I could discern nothing in the cockpit. I could feel moisture spraying inside the cockpit; the fuel tank had been hit. I was completely disorientated; the sky and earth were indistinguishable to my vision. But far in the distance I could see the sparkle of our regimental runway floodlight, and it helped restore my orientation. An air wave lifted us, and I managed to glide back over the river to the neutral zone, where I landed the aircraft in darkness."
– *Nina Raspopova, 46th Guard Bomber Regiment*
Quote from: Noggle, Anne (1994): A Dance With Death. Texas A&M University Press.

Sooner or later, it's bound to happen – unless, of course, you've activated the invincibility option in the Difficulty settings menu. You will be hit by enemy fire, flak, machine guns, or canons, and your plane will be damaged. You will notice that maybe the steering isn't working properly, that the engine sounds strange, or maybe you'll even see black marks on the armor plating in front of you. There is a high probability that that is really your oil. At any moment, your engine could stop, burst into flames, or even explode. What can you do? Well, that depends.

The first thing you should do is to get a clear idea of how serious the damage actually is and who perpetrated this awful deed. It goes without saying that this analysis has to take place quickly, as an enemy fighter may be moving into position right behind you. If this is the case, then you have unfortunately already made the serious mistake of not paying attention! Try to escape your pursuer with defensive maneuvers if the damage to your plane will let you. Perhaps you can swerve your way out of danger or even shoot your opponent down.

Whatever action you take, you should make certain that you pay close attention to your instruments, in particular the displays for oil pressure, engine temperature, and coolant. What do these displays tell you? Is the engine temperature rising? If so, the engine could give up the ghost at any moment. Hopefully you are still flying at an adequate height. Cut back on the throttle to take the pressure off the engine a little and make a flat descent in order to maintain speed. Just in case, you should keep an eye out for a suitable place to make an emergency landing and make preparations for bailing out. Pull out all the stops in trying to get back to base. Good luck!

If the plane can only be controlled with difficulty, you may have been hit in the hydraulics system or the wires of your steering mechanisms

may have been damaged. The control surfaces themselves may also be damaged. Try setting course for your home airfield – you can forget about combat for the time being and try to make it back to base. Steer carefully, because if you end up stalling, you may not be in a position to do anything about it.

"I bailed out with a parachute on two occasions, once during training, and I made fourteen emergency landings, but not once was I hit by an enemy fighter in battle."   – *Erich Hartmann*
Quote from: Sims, Edward H.: Fighter Tactics and Strategy, 1914–1970.

If you manage to make it back in a somewhat-battered plane, you must make sure that your landing gear is still working before trying to land. Pay attention to the monitoring lights and switch to an external view via the F2 key if necessary. If the landing gear cannot be lowered automatically, you may have to do it manually. Make sure that you are familiar with the appropriate keys (see chapter 6). The landing flaps may also be damaged. If this is the case you will touch down at higher speed – be careful! And pay more attention next time, ok?

5. ENGINE AND CREW MANAGEMENT

CONTROLLING MULTI-ENGINE AIRCRAFT
When flying a multi-engine aircraft, you have the option of controlling its engines separately.You may choose which engines you wish to control using the engine selection keys found in the Controls menu. Your current engine controls (e.g. throttle, prop and mix positions, radiator set up, etc.) apply only to the engine(s) you have selected. Note that if you have enabled the Separate Engine Start key in the Difficulty settings, you will not be allowed to start all of the engines simultaneously, and will have to select them for ignition one by one.

Advanced Engine Controls
The engine control routines have been reworked and expanded for The Forgotten Battles; you now have more detailed control over your engines, with more realistic feedback. However, some tasks (like the engine start-up procedure) remain simplified and can usually be performed with a single keystroke.

Throttle Control
Throttle control remains essentially the same as it was prior to The Forgotten Battles. Yet, now you may push it farther than Combat Power (100%) to force your engine into the War Emergency Power (Emergency) mode (up to 110%). Note that there is no Power 110 keyboard shortcut, so you'll have to use the Increase Engine Power control key (keyboard + by default) to gain War Emergency Power (Emergency) when controlling throttle with the keyboard.

Emergency Power
Many aircraft modeled in the game have special systems allowing an engine to gain advanced performance over a short period of time (as in the notorious nitrous oxide injection system). The principles of operation vary for these systems, but for all aircraft that are equipped this way, their systems may be engaged using the Boost (WEP) On/Off control button:
• Special Emergency Power, such as for FW-190A-8, FW-190A-9, FW-190F-8, FW-190D-9 1944.
• MW-50 (Water-Methanol injection), such as for FW-190D-9 1945, Bf-109G6/AS, Bf-109G-14, Bf-109G-10, and Bf-109K-4.
• GM-1 (High-altitude nitrous oxide injection system), such as for Bf-109E-7/Z.
• Water injection device, for cooling down the engines of the P-47D-10 and the P-47D-27.

Supercharger Control
High-altitude engines are equipped with superchargers or turbochargers of different design. While many of these are automatic, others have manual controls. In aircraft with manual controls, you have to use Supercharger Next Stage and Supercharger Previous Stage to adjust the supercharger gear as your flight altitude changes. Most of the chargers are 2-stage, and only require shifting up one gear when passing altitude at around 2500 meters. Note: This function will not work for planes that have fully automatic pitch or superchargers with multiple stages (for Example Bf-109 or FW-190).

Mixture Control
Most of the engines allow the pilot to adjust mixture richness manually. While the nominal position of this control (Auto Rich) should provide normal engine operation in all flight configurations, some input may be required at high altitude or when the engine has taken damage in battle. It is common to use increased (Full Rich) set up during takeoff or as a means of Emergency Power.

Radiator Control
New to The Forgotten Battles is advanced radiator control. In Advanced Engine Controls difficulty mode, you now have 5 cowl or radiator-flap positions to provide more accurate control. Plus, on certain aircraft, you may put the radiator flap in automatic mode.

Propeller Pitch Control

Control Propeller Pitch with the same keys as before Forgotten Battles, with the addition of the Increase Prop. Pitch and Decrease Prop. Pitch control keys for more convenient and accurate propeller control. The propeller governor routines have also been reworked to achieve a more detailed and accurate model, and several governor mechanism types were added.

Fixed Propeller

Some older airplanes found in the game (like TB-3) are equipped with simple fixed-pitch wooden propellers. Those, of course, have no automation or control, and require no pilot input.

Variable Pitch Propeller

These propellers have variable airscrew blade incidence. In this case, Prop. Pitch Control directly varies the airscrew blade pitch, and needs to be adjusted constantly as the airplane's speed changes. Note that setting the blade pitch too low may result in engine over-revving.

There used to be special equipment on the Bf-109 (F, G and K series) and FW-190 fighters providing automatic propeller control; however, the pilot may input changes of pitch and adjust blade angles manually whenever he finds necessary.

Constant Speed Propeller

The most advanced, yet most common propeller in WW-II-era aircraft was the Constant Speed Propeller. With these, the pilot uses the Prop. Control to set his desired engine RPM, while the propeller governor attempts to maintain the set RPM.

Aeromechanical Screw

This type of airscrew balances aero-dynamical forces and propeller inertia to maintain optimal blade incidence. It requires no input from the pilot.

Propeller Feathering

Some propellers have an option to "feather" the blades – or turn the blades parallel to the airflow to reduce drag. This becomes essential when an engine fails in-flight.

Magneto Control

Piston-aviation engines use magnetos to drive the spark plugs. There are two magnetos, left and right, and normally both operate. However, you may set the active magneto using the Magneto Next and Magneto Prev. control keys, or switch them off to shut down the engine.

Extinguisher Control

A number of aircraft, mostly large airships, had build-in fire extinguishers in the engine compartment. On aircraft equipped with extinguishers, you may fire the extinguishers on selected engines using the Fire Extinguisher control key. However, this isn't guaranteed to put out the engine fire, and the extinguisher has only a limited number of charges.

MANNING MULTI-CREW AIRCRAFT

The Forgotten Battles includes several types of multi-crewed aircraft. One type is level bombers, which the user needs to operate with bombsights. Here is the general information for such planes.

Single-Player

As in previous versions of IL-2, you may change positions within your aircraft using the Pilot or Gunner Position key (C by default). Now you can also assign up to 10 control keys (Jump to Cockpit #N) in the Controls menu to make navigation in multi-crew aircraft quicker: pressing a Jump to Cockpit #N button puts you directly into that position.

When you leave a cockpit (for another one), the computer AI usually takes control of the position you have left (i.e., it flies the plane when you man the rear gun, and operates the rear gun while you control the plane). You may disable this option using the Toggle Level Autopilot button. In this case, you'll have to toggle the computer AI controller manually for any and every position you jump into. This gives you the ability to control your aircraft (using your joystick) and operate a gun turret (using your mouse) at the same time.

Multiplayer

Most of the single-player cockpit navigation and AI automation options work in multiplayer mode. However, some restrictions apply.

In multiplayer mode, navigation and flying autopilot cannot be engaged, leaving the responsibility of flying the aircraft on the human players. In the co-op mode, players who have taken gunner seats in the briefing menu may only jump to gunner positions in their aircraft. However, the pilot of the plane has the option to move to any cockpit of his choice (although he still is responsible for controlling the aircraft).

USING THE BOMBSIGHTS

To operate the bombsights, you must define the bombsight control keys in the Controls menu. These control keys are specific to certain bombsight models, and not all of them apply to all models.

Using the Bombsight in He-111

This bomber is equipped with a Lotfe 3D bombsight.

Prior to making the bomb run, bombing altitude and aircraft speed must be entered into the bombsight. The true distance from the target to the plane can be entered using the Increase Bombsight Altitude and Decrease Bombsight Altitude keys. The plane speed is entered using the Increase Bombsight Velocity and Decrease Bombsight Velocity keys. Note that the true (not indicated) airspeed must be set (it can be obtained from the speed gauge when in No-Cockpit View mode).

After the bombsight is set up, the bombardier has to acquire the target with the bombsight crosshair. Tap Toggle Gunsight (Shift-F1 by default) to lean to the ocular. Use Increase Bombsight Distance and Decrease Bombsight Distance to adjust the bombsight viewing angle to the full-forward position (85 degrees) and scan the horizon for the bomb run target. The crosshair automatically stabilizes and levels within 30 seconds, but tilting the aircraft throws out the sight tuning – the bombsight turns off the crosshair lightning, and you have to level the plane and wait for the sight to recover and stabilize again; the crosshair lightning then switches back on.

After starting the bomb run, a plane may not be banked more than 4.5 degrees or the bombsight will lose stability. Only slight adjustments in direction are allowed.

Use the Increase Bombsight Distance and Decrease Bombsight Distance keys to adjust the crosshair position. When the crosshair is on target, turn on targeting computing using the Toggle Bombsight Automation control key. The bombsight will begin tracking the target. Be sure that the target remains within the reticle cross, and correct the crosshair movement with the Increase Bombsight Velocity and Decrease Bombsight Velocity keys if necessary (you may not use the Increase Bombsight Distance and Decrease Bombsight Distance keys for this). The bombs drop automatically when the plane reaches the proper position for a bomb drop.

Using the Bombsight in TB-3

This bomber is equipped with an OPB-1 optical bombsight. Prior to making the bomb run, bombing altitude and aircraft speed must be entered into the bombsight. The true distance from the target to the plane can be entered using the Increase Bombsight Altitude and Decrease Bombsight Altitude keys. Input the plane speed using the Increase Bombsight Velocity and Decrease Bombsight Velocity keys. Note that the true (not indicated) airspeed must be set (it can be obtained from the speed gauge when in No-Cockpit View mode).

Use the Toggle Gunsight control key (Shift-F1 by default) to lean the bombsight lenses. The intersection of the central vertical line and the horizontal curved line form a crosshair. The bombardier must release the bombs manually when the target is under this intersection.

6. TRAINING

This section is intended for beginners who are getting acquainted with flight simulators for the first time. Each training mission is built in such a way that during the flight demonstration, a text explaining the pilot's actions appears on-screen.

7. BEFORE YOU START

A brief list of options appears in the main menu. The most important of these are:

Pilot Roster – Here you can create (or choose) your pilot for different modes of the game.

Single Mission – Single Mission mode is for missions that do not anticipate career growth.

Pilot Career – Campaign mode. In this mode, your hero accomplishes one task after another, keeps his battle statistics, regularly updates his equipment, and receives ranks and awards over time. In a word, he fights.

Multiplay – Multiplay mode.

Quick Mission Builder – Quick generator of random missions. We'll take a closer look at the way it operates below.

Full Mission Builder – Mission editor. Just like the quick generator, it creates missions, but here the user controls the entire process of creation. It is a more complicated instrument, but also a more powerful one. Please see the special section below for instructions on how to use it.

Training – Missions for beginners.

Play Track – IL-2 enables you to create tracks. In other words, everything that you accomplish during your task is recorded. This menu option allows you to play back these tracks.

View Objects – Here you can take a close look at all 3D objects modeled for the game and find detailed information on the fighting abilities of military equipment.

Controls – Here you can reassign control buttons and create your own configuration.

Credits – It would be very nice if you pressed this button at least once, out of curiosity.

Hardware Set Up – Here you can adjust the settings pertaining to your hardware. With this option, you can optimize your computer's performance by determining the rate of program operation versus the detail of the 3D images.

Difficulty – Includes various realism-related settings. The level of realism in this flight sim can become a problem for beginners. Even fans are divided about this – what some think quite appropriate is deemed unfair and unrealistic by others.

Exit – Quitting the game; sometimes, it is necessary.

Now let's consider each menu item in more detail.

8. PILOT ROSTER

IL-2 can store information on several virtual pilots simultaneously. When you press the Create button, a new entry appears in the list of personal files. All you have to do is enter a full name and call-sign by clicking in the corresponding fields. Record as many pilots as you like, and then select one by clicking on it and pressing the Select button. After that, you will be returned to the main menu, where the chosen pilot will appear in a special indicator. All individual control settings will be preserved.

9. CONTROLS

As mentioned above, this reassigns the controls. The Controls menu is a rather long menu that can be scrolled through using the slider on the right. The left side of the menu includes a list of actions (e.g., use Lower the Landing Gear); the button initiating the action is indicated on the right (in this case, it is G). If, for some reason, you find that you are not satisfied with the default settings, click on the field where the button is indicated. The field will subsequently be surrounded by a gray frame and you only have to press the hotkey (or alternatively a mouse/joystick button) that you want to use instead.

You might decide that the previous settings were better. We have devised a Reset to Default button for this purpose, which immediately returns the configuration to its default status.

To adjust HOTAS controls, perform the actions described above with one difference: after you have clicked on the axis you want to assign for your HOTAS, move your preferred device slightly in the corresponding direction.

If you want to quit the menu, press the Apply button. All changes made will be activated immediately.

Additional In-Game Joystick Settings
Find and press the Hardware Set Up button in the game's Main menu. You are now in the Hardware Set Up menu. Press the Input button. Here you can set up the following features for your joystick:

1. Dead Band is used to set a dead zone where small movements of stick would cause almost no reaction. This feature can be helpful if you are playing a flight simulator for the first time or have the old type of joystick. If you are an experienced flight simmer, we strongly recommend that you set Dead Band in the left position or very close to the left position.
2. Filtering allows you to set a digitized filter if your joystick has problems with adequate reaction.
3. You can select basic joystick axes and change their profiles by Fine-Tuning in the special table used to adjust the stick reaction curve. Some joysticks need fine-tuning, but most work correctly with our default settings. You can select the axis for fine-tuning in the left combo-box.
4. To enable or disable the Force Feedback feature, set the Force Feedback switch to On or Off.
5. If you find that our initial settings were more appropriate before your changes, press the Default button. All the settings will revert to default status.
6. Press Back to quit this menu. Any changes made will be applied automatically.

10. VIEW OBJECTS
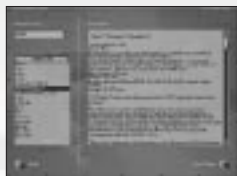
There are a lot of 3D objects in the game. When you choose this menu, you immediately access the next one where all the objects are divided into classes.
• *Aircraft* – All aircraft.
• *Tanks* – Not tanks alone, but also self-propelled artillery mountings or SAU.
• *Ships* – Ships, cutters, and surfaced submarines.
• *Vehicles and Artillery* – Towed vehicles and artillery. The list includes mobile rocket launchers – our Katushas.

Having chosen any of the above-mentioned objects, you directly access the viewing mode. Here the list of objects falls into two categories, divided by nationality – Soviet and German military equipment. Make your choice via the Select Country drop-down menu.

Now choose what you want on the left side of the menu. Once you have done so, a description of the object appears in a large window. By pressing the View button in the lower right corner, you can display its 3D image. You can zoom in or out on this image by pressing the left mouse button and moving the mouse forwards or backwards. You can also rotate the image by pressing the right mouse button and moving the mouse in any direction.

After examining the object, you can return to its text description using the same button (the description under the button will change to Text).

To quit View Mode, press the Back button.

11. PLAY TRACK

There are two types of tracks, normal and online.

Normal track - Tracks recorded in the course of the mission are saved as special files with the .trk extension in the Records directory. The Play Track option in the Main menu is used to play them back.

Once you have chosen this option, a menu appears controlling playback of the tracks. At the top of the screen, there is a window in which to choose the appropriate track. Below it, there are four toggles that switch the options listed below on or off (on is the upper position).

• *Loop* – Used to switch off the loop playback, which is convenient for editing.
• *Manual Time Compression* – Enables/disables time compression during track playback.
• *Manual View Control* – Enables/disables switching your view.
• *In-Flight Messages* – Determines whether the messages received by the pilot during his mission should be displayed on-screen.

There are two buttons below these options:
• *Main Menu* – Returns to the Main menu.
• *Play Track* – Begins track playback

Once you have chosen the track and pressed the Play Track button, the program will load it and start playback. You can interrupt the process at any time by pressing Esc; you will subsequently be returned to the Playback menu. The only difference will be in the buttons: the left button will now be called Stop Playing Track, and the right one, Continue. They will either resume playback or stop it completely.

If you press the Stop button, the buttons will revert to their original commands – Main Menu and Play Track.

Online track - This feature works in all modes of online gameplay as well as in single-player play. There are two ways to begin recording:
• While playing the game, you may press Esc and then press the Start/Stop Recording button with the mouse in the displayed menu.
• You may define a special button in the Controls menu to start or stop recording more quickly. While playing the game, you simply press this button, and the program will start or stop recording. Each recording will be automatically named and saved as quick0000.ntrk. (your next recording will be saved as quick0001.ntrk, etc.).

You may then play and edit these tracks in the same manner as for normal tracks.

Special Feature
In online track recording, you may save just part of the normal track. You may press Start/Stop several times during long play and record only the most interesting parts of the battle or flight. This function is great when you playback your online tracks and would like to cut to the most important scene.

Important Notes
• All user skins will be stored in an online track file.
• If Voice Communication has been enabled, then all speech will also be recorded in the online track files.

12. SINGLE PLAYER

With IL-2 Sturmovik, you can play virtual combats for the U.S.S.R., Germany, Finland, Hungary, or the U.S.A.

Single Missions
You can accomplish one task of your choice in this mission. Your performance will have no effect on your pilot status and private account.

When you activate this mode, you access the Mission menu, which contains the following items:
• *Select Country* – Here you choose the country for which you wish to fight.
• *Mission Type* – Dogfight or bomb run.
• *Mission Files* – Each mission is stored in a special file. You can load any of the files in the list. To make things clear, we have placed a short mission brief to the right of the list.

Pilot Career (Campaign Mode)
There are two kinds of campaigns in IL-2: The Forgotten Battles – static branched and dynamic. Static-branched campaigns are standard IL-2 program campaigns. Missions in these campaigns are created in the Full Mission Builder and then united into a campaign. Static campaigns, made by IL-2 fans, are available for download from the Web. You can design a static campaign to your taste and imagination, and take on a mission that is exactly how you want it to be.

Dynamic campaigns are a new feature of IL-2: The Forgotten Battles. Dynamic campaigns are created automatically. You select your nation, a squadron, and the planes that you want to fly in every operation. You decide when you want to join the war. After that, the first mission in the campaign is generated and offered to you. When you finish the mission, the results will be processed, and another mission generated – and so on, until the end of the war. Missions in dynamic campaign will never repeat, because the conditions, targets, time of day, weather, opposition, and almost everything else are determined randomly.

In any operation, your forces will advance or retreat. The frontline moves historically, but you can speed it up or slow it down to a limited degree. If you destroy an object, it will stay destroyed for whatever time is determined by its nature. Every destroyed plane, friendly or hostile, reduces the total number of planes of this type, making their appearance less likely. Lost trains and transport columns will affect the supply rate. If you kill or capture an enemy ace, he will not appear in future battles.

One of the most important features in dynamic Campaign Mode is your squadron. Every pilot has a name, photo (it is possible to replace the default photo with your own or your friends' photos), rank, medals, sorties, and kills. His skill level is defined by combat experience. Pilots can be killed, captured, promoted, awarded, or transferred. Your losses are replaced, but new pilots will likely have little or no combat experience. Your squadron has a limited amount of combat-ready planes, and below a certain point, you have to fly shorthanded until re-supplied.

You can choose to play any time between 1941 and 1945.

You can choose to play for Germany, Russia, Finland, or Hungary:
German Stuka Pilot (Ju-87)
German Fighter (Army Group North)
German Fighter (Army Group Center)
German Fighter (Army Group South)
German He-111 Bomber
Soviet Fighter (Leningrad)
Soviet Fighter (Other Fronts)
Soviet Sturmovik
Soviet TB-3 Bomber
Finnish Fighter
Hungarian Fighter

Every career consists of campaigns (Lvov, Smolensk, Moscow, etc.). A typical campaign consists of approximately 30 missions and a career includes 4–8 campaigns, or 100–250 missions.

Once you have entered Campaign Mode, choose your country and the level of difficulty. Note that you will not be able to change the settings later; you can only view them.

When you choose the Pilot Career option in the Main menu, you access the campaign manager (provided that you have saved campaigns – if these are not available, you should create a new one; we will explain how to do this below).

For each campaign, you will immediately see the class of aircraft that will be flown in the campaign, the national affiliation and military rank of the main character (from junior lieutenant to colonel and correspondingly from Oberfeldwebel to Oberst, from Kersantti to Kapteeni, and from zászlós to ezredes; info about Finnish and Hungarian ranks and awards may be found in the Glossary below), the number of awards and completed missions, as well as the level of difficulty.

You can access more detailed information about the level of difficulty by pressing the Roster button.

The Roster button provides detailed information on how the campaign proceeds – how many and which enemy targets were destroyed, the awards received, and how many aircraft the player lost in fighting. That info is available for all pilots listed in the roster (see below).

The lower panel has four buttons:
• *Back* – Return to Main menu.
• *Delete* – Delete selected campaign.
• *New* – Begin new campaign.
• *Load* – Load selected campaign.

Starting a New Campaign
If you enter a new campaign, you should indicate:
• *Country* – The country for which you will be fighting.
• *Rank* – Depending on your rank, you will receive more or fewer planes under your command. Further promotion and demotion are possible (not to mention the possibility of being sentenced to death or sent to a penal battalion).
• *Career* – Here you choose what to become – ground assault pilot or fighter pilot. Again, you can only choose between these two if you are playing for the Soviet Union.
• *Difficulty* – The level of difficulty now and for the whole campaign.

Now you type your place of birth and select the period from which you prefer to start. You may start from any date within the war – your career will continue until the end of the war.

Generate – Press this button to generate the campaign.

Every campaign starts with a historical briefing.

At the end of a campaign, you'll be shown a summary, evaluating your squadron activity, successes, and losses, as well as a historical summary.

Every mission ends with debriefing, and you'll be able to see your route and every event in the mission on a map.

Roster – Press this button to look at the list of pilots. A file of every pilot that left your squadron because of transfer, capture, or death can be seen, along with his whole career.

Pilot Profile – Select a pilot from the list using your mouse and then press this button. You'll enter the Pilot Profile menu.

In the Pilot Profile menu, you may read more info about the selected pilot and view his awards (press on the image of the current award, if present).

Note:
You may change the photo of the pilot if you wish. The name of the file is displayed under the picture of the pilot. You may find this file in the folder DGen > de (or other subfolders fi, hu, ru1, ru2, ru3. The name of the folder corresponds to the country that you selected in the campaign).

Your own missions are recorded in your pilot's logbook.

During missions you can be attacked by enemy aces. The list of aces can be modified in the corresponding folder of the game, and you can use custom skins. This one was made by Christian "CsThor" Schulz.

But the ace was not lucky.

TIP:
Before embarking on your Pilot Career, read the sections Receiving the Task, Arming Your Plane, and Using Commands to Give Orders to AI Pilots (Comms).

IL-2-Style Campaign Mode
IL-2-style Campaign mode no longer exists in The Forgotten Battles, but we have kept the most important part of its description for those who have never played IL-2 and who want to download or make their own static-branched campaigns.

The first thing you do after entering Campaign mode is choose your country and the level of difficulty. Everything here is like dynamic campaign mode.

When you choose the Pilot Career option in the Main menu, you access the campaign manager (provided that you have saved campaigns – if these are not available, you should create a new one; we will explain how to do this below).

For each campaign, you will immediately see the class of aircraft that will be flown in the campaign, the national affiliation and military rank of the main character, the number of awards and completed missions, as well as the level of difficulty.

You can access more detailed information about the level of difficulty by pressing the View Difficulty button.

The View Career Statistics button provides detailed information on how the campaign proceeds – how many and which enemy targets were destroyed, the awards received, and how many aircraft the player lost in fighting.

The only differences between this and dynamic campaign mode are in a couple menu buttons and menu features:
• There are no Roster or Pilot Profile menus for each pilot.
• There are different statistics menus, and awards only go to players.

TIP:
As in dynamic campaign mode, before embarking on your Pilot Career, please read the items Receiving the Task, Arming Your Plane, and Using Commands to Give Orders to AI Pilots (Comms).

Receiving the Task (Mission Briefings)
Here you will get to know your route and destination, and choose the weapons for your plane. You are advised to read the text concerning the task right away – it is placed on the right.

The Map
Your route is indicated on a map. You can scroll around the map by pressing the left mouse button and moving the mouse in any direction.

The map has several scales. You can switch between them by pressing the right mouse button; the scale increases up to the highest value before scaling back down.

The route is determined by a series of waypoints. There are several types:
• *Takeoff* – A square with a picture of a plane taking off. It determines the airdrome from which your aircraft will start the flight.
• *Turn* – A circle with a point in the middle. Here your aircraft will have to change its course.
• *Attack* – A triangle with a picture of a bomb. This point is set on target; it is where you perform your task.
• *Landing* – A rectangle with a picture of a diving plane. In reality, it does not dive, but prepares for landing. This is where, providing everything is fine, you will conclude your task and land again on the airdrome.

From here, you can adjust the following settings:
• *Difficulty* – Press this button to activate a menu with different realism options. We will deal with these settings in more detail a bit later.
• *Arming* – Choose the guns for your combat task.

After you have read the task and gone through the corresponding preparations, you can press either:
• *Fly* – To proceed directly to fulfilling the task, OR
• *Back* – To return to the Mission menu.

Arming Your Plane
Or planes, to be more precise. In many cases, you will have to command someone – and correspondingly determine the loadout of your subordinates.

You will find the list of weapons and their corresponding descriptions in the Game Glossary section.

Later, if you become a commanding officer during your single mission or Campaign, you can change your Flight loadout (the name of the aircraft or a group of aircraft is emphasized in red) or that of the whole Squadron. It is easy to find out whether you have the authority to do it or not – just click on the Weapons window in each of the aircraft groups (each Flight has a corresponding window). If you are given the option of choosing something else, you are free to do so. However, we offer optimal armament and loadout for this mission by default.

Aircraft Customization
(Arming in other menus)
This function allows you to change several parameters, which can be defined during armament:

Convergence – Generally speaking, gun and machine-gun shots are not directed parallel to the axis of the shooting aircraft at all. This convergence can be modified; everything depends on your preferences. It should be pointed out that no matter whom you command, this operation can only be performed on your own aircraft.

Rocket Delay – All rockets (except armor-piercing rockets) have two fuses – a contact and a time fuse. Here you can set the time when the fuse will snap into action; possible delay can be up to ten seconds.

Bombs Delay – Sometimes you have to bomb at very low altitude. In this case you run the danger of being hit by the blast of your own bombs. To prevent this, you can adjust their fuses in such a way that they will explode with a small delay; meanwhile, you will have just enough time to leave the zone of destruction. The delay can be set anywhere from 0 (instantaneous explosion) to 10 seconds.

Fuel Quantity – If the flight is going to be short, you can save on fuel. It goes without saying that too much economy of this kind can lead to sad consequences.

Aircraft – This function works only for multiplayer Dogfight mode and Quick Mission Builder (advanced set up). You may select any of the listed aircraft. In addition, in Quick Mission Builder, you may set the skins for every single aircraft in every flight group without manual edit and without using Full Mission Builder.

Country – This function works only for multiplayer Dogfight mode and Quick Mission Builder (advanced set up). You may change the country for which you will fly and the corresponding markings.

Regiment – This function works only for multiplayer Dogfight mode and Quick Mission Builder (advanced set up). You may select available regiments (emblems) for your corresponding country.

Skin – Change the skin (camouflage scheme). This works in all modes.

Pilot – Here you may change the skin of the pilot face and the skin of your flying suit separately.

Markings – If you switch this one off, then you get no numberings and no country markings on the skin of your plane. It only works for all planes in the flight simultaneously. It's a useful function if no paint scheme is useful for you and you'd like to paint manually over your own skins.

Note: It is easy to find out whether you can change the settings or not – just click on the window. It's possible that in campaigns, single missions, and cooperative missions, you can't change the aircraft, country, and regiment in that window, but you can change them in multiplayer Dogfight mode and in Quick Mission Builder. The program is designed this way to free up more RAM; we use the same window design for all single-player and multiplayer modes.

Using Commands to Give Orders to AI Pilots
In all cases – Single Missions, Pilot Career, and Quick Mission Builder – you can and sometimes should use the opportunity to command from Wingman to Squadron.

To quickly master the basic commands, you should train in the Quick Mission Builder and create different mission variants with varying quantities of friendly aircraft (from 2 to 16) and a small amount of enemy aircraft. Although not all opportunities for such commands can be tested in the Quick Mission Builder, the skills you can acquire here will come in handy when you play Pilot Career.

By default, the Tab control settings button activates communication (comms) between player and AI-pilots. The principle is very simple: after pressing the Tab key, a list of commands corresponding to 1–0 on the keyboard appears on the screen. Most of the orders or

requests have additional submenus, where the list of orders or requests corresponds to actual tasks. They, too, correspond to keys 1-0 on the keyboard; by selecting and pressing them, you will get a response from the AI-pilots.
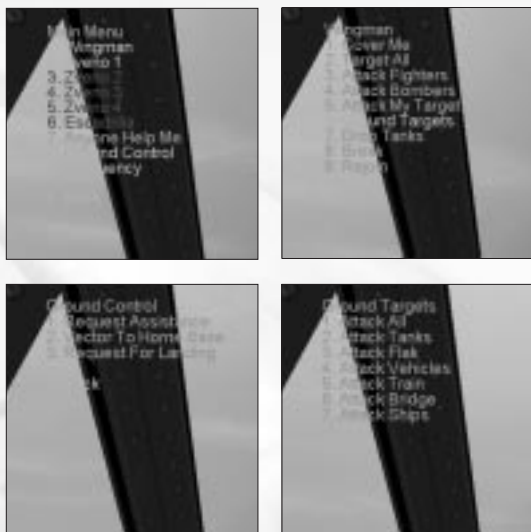
If you get no reaction, this may be a result of an incorrect order or an incorrect time of order. For example, if the friendly planes do not belong to your flight, group, or squadron, they will never follow your order. Another example of an incorrect order is when you try to issue an order for bombers to attack fighters. They may try to do it, but with an awful result for the bombers (you will usually get such a situation only in Quick Mission Builder or if a user designs an incorrect mission). A third example of an incorrect order is if you try to give an order to rejoin, when some of the planes are very busy with the enemy. Their reaction to your order may cost them their lives.

So, train yourself thoroughly on orders for AI-pilots and their groups! Good training will bring you great success in Pilot Career.

Special Feature
To eliminate game subtitles appearing on-screen for pilots' voices:
1. Using the Windows notepad, open the conf.ini file.
2. Find the string [game] in the conf.ini file.
3. Find the NoSubTitles line and change the 0 to 1:

NoSubTitles=1 (No subtitles for pilots' voices.)

Realism Settings
Bear in mind the following: if the Realism switch is On, a red bulb lights up on its left.

Separate Engine Start – If this option is selected, you will need to start the engines separately. (This works only for multi-engine aircraft.)

Complex Engine Management – If this option is selected, the functions of radiators, cowl flaps, superchargers, and fuel mixture will work according to the actual settings of the corresponding aircraft.

Engine Overheat – If this option is selected, you run the risk of overheating your engine if you force it or fly at full speed. As in real life, consequences can be disastrous.

Torque and Gyro Effects – Torque occurs as a result of propeller rotation. The aircraft leans to the opposite side than its propeller is rotating. To fly evenly, you have to compensate for this movement.

Gyro Effect – When the engine is operating, you have a rather heavy mass on one side of the aircraft rotating at high speed, resembling a gyroscope rotor. As a result, when you try to turn the gyroscope axis in space, you'll experience additional torque perpendicular to your effort. In short, when you do a turn to the right, the nose dives, and vice versa.

Flutter Effect – Flutter is a complicated aerodynamic phenomenon. Because planes experience increased vibration at high speed, you have to quickly bring the plane out of the flight mode in which the flutter started to prevent the aircraft from disintegrating.

Stalls and Spins – These situations are extremely dangerous; an inexperienced pilot might not cope with them.

Blackouts and Redouts – With high positive overloads, blood rushes away from your head and everything goes dark before your eyes. This is called blackout effect. If you do not use an anti-overload suit (which is not very likely to be honest), this effect starts at approximately +5G. Blackouts can considerably reduce your field of vision or wipe it out altogether.

Redouts occur with negative overloads (starting at approximately -2G). In this case, blood rushes to the head and a red screen appears before your eyes. It should be pointed out that both man and aircraft have a harder time with negative overload than positive overload.

This option enables you to switch off these unpleasant physiological reactions, though if you do so, the level of realism lowers considerably.

Wind and Turbulence – Selecting this option disrupts the conditions you would face while flying your plane. Normally, side wind influences takeoff and landing, and turbulence prevents smooth flying.

No Instant Success – If this option is enabled, you have to complete each mission before continuing to the next. If this option is disabled, then you may begin the next mission even if you didn't complete your current mission.

Realistic Landings – If this option is selected, you might break the landing gear on rough landings.

Takeoff and Landing – These are two of the most difficult elements of flying, especially landing. With this option, you can eliminate the necessity of bothering with it. You will start and finish your task in the air.

Cockpit Always On – When this option is selected, you cannot make your cockpit invisible. Flying with an invisible cockpit is nice and easy because your field of vision is clear. In real life, this is practically impossible. This option is designed for those who enjoy full realism.

External Views – Some people think that taking a detached view at oneself is cheating because a real pilot has no such opportunity. This opinion is not universal, however. In IL-2, we offer you the possibility of deselecting this option, which naturally adds realism.

No Padlock – Padlock is a mode of vision in which the direction of your glance follows the chosen target. There have been a lot of discussions about the realism of such an approach; you can switch it off here if you want to.

Head Shake – Aircraft often experience intense shake, which means that the head of the pilot also shakes, hindering your field of vision. If you deselect this option, you can eliminate this phenomenon.

No Icons – If this option is deselected, each object in the air bears a special icon. Icons make an object much more noticeable and indicate the nationality of the object by color. In addition, a special inscription on the icon gives the type of aircraft and the distance it is away. Strictly speaking, one cannot call it entirely unrealistic. Our ability to perceive our actual environment far surpasses our ability

to perceive its virtual analogue in terms of resolution and the field of vision, even if all other conditions are similar. However, in real life, there are no icons on targets, and you can deselect the option if you feel like it.

Realistic Gunnery – Deselecting this option produces two effects. First, gun and machine-gun bullets travel in a straight line. Second, the explosive effect of bullets and shells triples.

Limited Ammo – If you deselect this option, you will have an unlimited supply of ammo.

Limited Fuel – If you deselect this option, you will have an unlimited supply of fuel.

Vulnerability – Invulnerability could not be a more standard option. If this option is deselected, you become invulnerable. Congratulations! The invulnerability option only works if enemy shells or shots hit your aircraft. If you hit the ground, your aircraft will still self-destruct.

No Map Icons – If this option is enabled, the icons on the map do not appear.

No Minimap Path – If this option is enabled, your path does not appear on the flight map.

No Speed Bar – If this option is enabled, the speed bar in the bottom-left corner of the screen disappears.

13. QUICK MISSION BUILDER

This is not an editor, but a generator to be exact. You feed in the necessary parameters and a mission is output for you, which you carry out immediately. This mode can be extremely useful for preparing for online combat, since losing to a computer is less embarrassing. This section explains how this part of the game works.
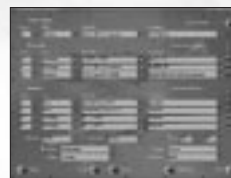
When you choose the Quick Mission Builder option from the Main menu, you access a new menu with the following items:

Select – This option allows you to choose the country for which you will be playing. Click the button to switch over from red star to black cross – these symbols should speak for themselves.

Your Flight – Indicate the number and characteristics of your wingmen.

Friendly – Enter information on the other flights that will be fighting on your side.

Hostile – Enter information on the flights that will be fighting against you.

You can also set the following parameters for each flight:

Num – The number of aircraft in the flight, ranging from 0–3, with your own flight as the only exception. Fighting without being close at hand is rather difficult. Your own flight should have at least one unit – you.

Skill – Select the class of pilots.

Aircraft – Determine the planes constituting the flight.

Loadout – Select the battle armament for mission.

Map – Determine where the action will take place.

Altitude – Decide the altitude at which the action will start.

Weather – Enter your desired weather.

Time – Enter the time of day. These last two factors – weather and time of day – can exert considerable influence on the development of your operation.

Situation – Indicate which of the parties will have a tactical edge over the other:
• Disadvantage – You start at a lower altitude than the enemy.
• Advantage – You start at a higher altitude than the enemy.
• None – You and your enemy begin at the same altitude.

Target – Select the type of ground target (or leave it out if you want to).

Defense – Here, you can either include ground anti-aircraft defense or leave it out.

Once you have selected your settings, you can save them and load them later using the Save and Load buttons respectively. Then, press the Fly button – and start your flight.

If your intentions change, you can always hit the Back button and return to the Main menu.

Special Features

Advanced Set Up Window – In this window you may set additional parameters for your flight or enemy. The main feature of this window is that you may change the skins for each aircraft, including AI. This set up works in the same manner as Arming Your Plane (see the Arming Your Plane section of this manual).

Aircraft – Here you may select any of the listed aircraft. This will not return you to the main QMB screen. This window defines how many aircraft will be in the flight.

14. MULTIPLAYER

IL-2 offers two main options for working on live targets: via the Internet, or through a LAN. The choice is made in the Multiplayer Mode settings menu (accessed via the Hardware Set Up item in the Main menu).

Hitting live targets is not necessary, though. IL-2 offers two multiplayer types:
• *Dogfight* – A fight between live opponents.
• *Cooperative* – Cooperative fulfillment of a mission, where the part of opponent or ally can also be played by AI (computer-controlled aircraft or vehicles and other ground objects).

Having chosen the Multiplayer item in the Main menu, you access a new menu with the following options:
• *Join Server* – Log on to the existing server.
• *Create New Server* – Create a new server.
• *Main Menu* – Return to the Main menu.

Logging on to the Existing Server
After choosing the Join Server option, you have two options:
1. Enter the server address in the Server Address field.

2. Search for all servers available using the Search for Local Servers command (for more information, read the IL-2 README file in Windows: Start Menu > Programs > Ubi Soft > IL-2 Sturmovik > Read Me 1st).

The result of the search will be a list of servers with the following parameters:
• *Address* – Server address.
• *Name* – Server name (if it was set on the server).
• *Ping* – Indicator of each server's connection speed. The lower the value, the higher the speed (and this is exactly what you need).
• *Users* – The number of players logged on to the server.
• *Type* – Type of game (Dogfight or Cooperative).

You should choose a server from the list and press the Join button. You can also interrupt the process and return to the Main menu with the help of the Back button.

Note: You can only join an existing Cooperative server BEFORE the game begins. However, you can connect to a Dogfight server at any time.

Creating a Server
At minimum, you need a 28.8K modem connection to your Internet Service Provider for acceptable Internet play performance.

Before launching the server, you need to detect your server IP. Do this by running the command IPCONFIG.

• Win98 > run Programs > Dos prompt > type IPCONFIG and read the IP ADDRESS.
• Win2000 > run Programs > Accessories > Command Prompt > type IPCONFIG and read the IP ADDRESS.

Send this IP ADDRESS to your friends.

For network play, launch the IL-2 integrated server. You must choose the Multiplayer item in the Main menu, and then Create New Server. After that, you can proceed to the following items:

Name – Enter the name of your server.

Description – Here you can list the map, time, weather, and other conditions and settings you wish to use. Clients will see this string before the connection and decide which server to choose.

Game Type – As mentioned previously, a Dogfight is air combat between live enemies. Cooperative stands for cooperative mission fulfillment.

Max. Players – The maximum number of players on a server, which ranges from 2 to 32 in a Dogfight or up to 16 in Cooperative. Naturally, a larger number of players makes more serious demands on your hardware.

Password – Use this item if you want to create a game only for the people you know. Multiplayer sessions can be locked with a password to keep stray gamers away. You can set a password; those who want to log on to your server must know it. To change your password, press the Change button.

Once you have set the above parameters, click the Create button and your server will be created. The next step is choosing your mission. You can load any standard mission or a mission you created with the built-in mission editor. In either case, all mission data will be sent to the clients.

After the mission has loaded, you can change the Difficulty settings. This can only be done on the server. Clients get these settings from the server, and so they all have the same Difficulty settings.You then have to decide the home base and equipment for the host and clients.

Press the Fly button to begin play.

After Connecting
Dogfight – Before you press the Fly button, you should choose the aircraft you wish to fly (press Arming), and set the Convergence, Delay, and Fuel Quantity, as described in the Single-Player section. The difference lies in the fact that here you can take a look at everything, change the aircraft's camouflage (if other skin variants are available), the face of the pilot, nationality, number of your plane, etc. (See additional features in the IL-2 README file In Windows: Start Menu > Programs > Ubi Soft > IL-2 Sturmovik > Read Me.)

When you are through with these operations, go back to the previous menu and choose your home base on the map, from which you prefer to start playing (whether you start from home base or in the air above it depends on the server's Difficulty settings).

Cooperative – Here you are taken to the "waiting hall," where everyone gathers and waits for the mission. The mission is then chosen (this is done from the server) and all agreements between the players are set. For these purposes, you can use a built-in chat or voice chat.

You should choose an aircraft or gunner seat (if available) that has been previously agreed upon with other players. The gunner/pilot seat you have chosen will be shown to you and the other players

before the start of the mission. You will also see all free or occupied aircraft at this time.

When everything is settled and chosen, press the Fly button. The mission starts from this point for all players connected to your server.

Note: All the Difficulty settings can only be set on the server. Other players can read them by pressing the Difficulty button, but cannot change them. Thus, the same level of difficulty is set for all players.

Chat in Multiplayer
Chat works all the time and in all the Multiplayer menus, except when you are just beginning to set up the server or to connect.

After connection in any multiplayer menu, you can activate chat by pressing the button that you defined in Controls. In flight, press this button or press the M key (which displays the map by default), and click the mouse button on the chat window.

In chat, you can type messages:
• To all players.
• To your army. (Your army is defined by airfield color and icons, if icons are selected in the Difficulty settings.)
• To any online player.

To send a message to all players, type the message, and then press Enter. The program subsequently prompts you to select a recipient of the message. Select ALL and press Enter.

To send a message to your army, type the message and then press Enter. Then, as above, the program prompts you to select the recipient of the message. Select MY_ARMY and press Enter.

You can also send messages to any player. To do so, you need to know the player's correct nickname. Type the message, select the free text line, and type the player's correct nickname (call sign) before pressing Enter.

To find out the nicknames of all of the players, type the following in the message line:

>user

…then press Enter. You will see the nicknames of all players currently playing the game.

Other Chat Features
Preset Messages – Another important feature of chat is that you can preset certain messages that you may use often. This really saves time, since you no longer have to repeatedly type the same messages.

To do this, activate the chat window, select the line below the chat line using the cursor keys, and type your message, for example, Break Left, Break Right, etc. To use this message without having to type it out again, activate chat, select the message using the cursor keys, and press Enter. Then select the recipient (see above). If you need to make corrections or replace the old preset message with a new one, use the Delete and Backspace buttons.

Resize or Move Window – You can resize the chat window or move it using the mouse.

Special Features
Notes on the Speed Bar Command
The server hosting an online game now has the ability to disable the so-called Speed Bar – the digital information displayed in the bottom-left corner of the screen. The command syntax is:
speedbar [SHOW|HIDE]

If you don't want players connected to your server to use these digital instruments, enter speedbar HIDE.

You can type in speedbar SHOW to restore the default settings and allow players to use the Speed Bar.

Notes on Event-Logging
Any user participating in an online Cooperative game or playing in Single-Player mode may now have events logged into a text file. To enable this option, add an eventlog key under the [game] section in the conf.ini file. E.g.:
    [game]
    eventlog=coop.lst

In this case, all major activity will be logged into the "coop.lst" file, and may be reviewed later (i.e. with the help of the Notepad).

In addition to this, when playing a Cooperative mission, the current status of every player in the game is automatically logged into this file at the end of the mission (with score, kills, and dead/alive state), including players that left before the mission ended.

The AI unit names are their "mission" names and are basically intended for log-parsing software.

The number in brackets after an aircraft name (i.e., r01011(0)) represents an individual crew member of the given aircraft (with 0 being the pilot, 1 the co-pilot or rear gunner, and so on).

Online Stat Messages

The server hosting an online game may set the level of detail of the server auto-generated stat messages. The level is set in the conf.ini file in the IL-2 folder, in section [chat], in the autoLogDetail key. E.g.:
    [chat]
    autoLogDetail = 3

You can set the keys to the following options:
0 – Disables all stat messages.
1 – Only player-vs.-player kill messages are displayed.
2 – Player-vs.-player and AI-vs.-player kill messages are displayed.
3 – A lot of chit-chatting.

Icons in Online Games

The server hosting an online game now has the ability to set the distance at which plane icons will become visible. The command syntax is:
    mp_dotrange [FRIENDLY|FOE] [DEFAULT] [COLOR <km>] [DOT <km>] [RANGE <km>] [TYPE <km>] [ID <km>] [NAME <km>]

FRIENDLY or FOE keywords define what party the following parameters apply to – the aircraft of the viewer's army, or the aircraft of the hostile armies.

The following keys define the distance at which the appropriate icon is enabled:
COLOR – The distance at which icons take the color of the inbound plane's army. Icons farther away will be drawn in gray.
DOT – The distance at which the "dot" plane marker becomes visible.
RANGE – The distance at which the distance measurement appears in the icon.
TYPE – The distance at which the airplane model or model family becomes visible.
ID – The distance at which the tactical number is visible.
NAME – The distance at which the aircraft's pilot name is visible (if it is driven by a human pilot).
mp_dotrange DEFAULT restores the IL-2 predefined icon set up.
mp_dotrange run without parameters prints the current icon set-up ranges (which may be issued by both client and server).

Timeout Limits and Auto-Kicking

There is a new [MaxLag] section in the conf.ini file. E.g.:
    [MaxLag]
    farMaxLagTime = 10.0
    nearMaxLagTime = 2.0
    cheaterWarningDelay = 5.0
    cheaterWarningNum = -1

farMaxLagTime – Defines the maximum delay (in seconds) between packets received from a given client. A delay greater than this time is considered a warp.

nearMaxLagTime – Defines the maximum lag time allowed for an aircraft in an endangered position, or when it is considered to be jeopardizing a hostile aircraft. Giving lower values is meant to address warping on purpose.

cheaterWarningDelay – Defines the time in which the system will refrain from taking action against a player acting out of bounds. This can be used to avoid issuing multiple warnings on one glitch.

cheaterWarningNum – Defines the number of warnings issued before kicking the player off. Setting a value of -1 disables auto-kicking.

Online Time of Day Commands

The online host can change the time of day in the mission at any time while it is running. The command must be run from the command console. To view the command console, press the ~ key to bring up the chat window, and then the > key to enter the console mode.

The syntax of the Time of Day command is as follows:
    tod [hour.minute]

Hours should be written in military format, i.e., 17 hours for 5 pm, 23 hours for 11 pm, etc. For example, to set the time of day at 6:30 am, run the following command:
    tod 06.30
    To set time of day to 10:15 pm, run:
    tod 22.15

Online Score

In addition to the ">user" command you may press the Online Rating button (S by default) to view scores during a multiplayer session.

Integrated FPS Meter

This feature is activated and deactivated via a console command. To view the command console, press the ~ key to bring up the chat window, and then the > key to enter the console mode. The command syntax is:

fps [START|STOP] [SHOW|HIDE] [LOG <sec>]

The START or STOP keys are used to make the meter start or stop running. Upon stopping, it prints the FPS statistics accumulated at that moment.

SHOW or HIDE indicates whether the FPS stats are shown in the upper part of the game screen.

LOG sets the interval (in seconds) at which the FPS stat would be printed to your console. LOG 0 disables printing. E.g.: To start accumulating stats silently, use fps START HIDE LOG 0. You may now use fps STOP to view your average FPS.

15. FULL MISSION BUILDER

It is high time we talk about the mission editor. This editor provides for the completely manual creation of missions, with thorough control over all the possible details. Its interface differs considerably from the game's general interface, and operates predominantly with pull-down menus.

Remember that the editor can work both in 2D and 3D modes. 3D mode can be very useful for determining the exact position of ground objects. For instance, it allows the defense's tanks to use natural shelters effectively.

PULL DOWN MENUS
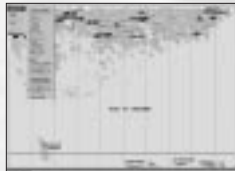
File Menu
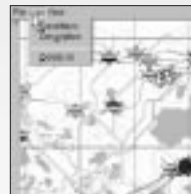Used for loading necessary data, testing the results of your work, and saving. It contains the following options:

Load Map – Loads the map where the mission will unfold.
Load – Loads a previously saved mission.
Save As – Saves a created mission.
Play – Launches a created mission for testing. The mission must be saved on your disk beforehand.
*Exit* – Quits the editor.

Edit Menu

As suggested by the title, this menu is designed for editing various mission parameters.

Conditions – This option activates a dialog box where overall conditions for the mission are set. These include the time of the day, weather conditions, and clouds.

Description – This activates a dialog box where all information related to the mission is edited, including its brief and full description and the text corresponding to the combat task.

Delete All – This command deletes all the objects you have created. It is very convenient when you have just finished creating a mission and want to start creating another one. If you use this option, it saves you the necessity of reloading the same map.
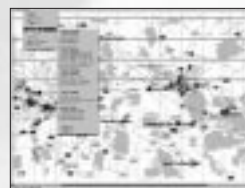
View Menu

This menu is intended for manipulating objects. It contains the following menu items:

Landscape – This allows you to change the lighting on the landscape. Having set the optimal level, you can create a sharper contrast between all mission-related signs and the landscape. You can also choose to display or hide the landscape.

Destruction – This sets the initial level of building destruction in towns, cities, and settlements.

Brightness – Here you can adjust color brightness in the area of operation.

Brush Size – This adjusts the thickness of the "brush" determining the zone of destruction.

Destruction Level – This sets the level of destruction. The left position (bright green) represents no destruction; the right position represents maximum destruction (red). By simultaneously using the mouse cursor and pressing the F key, you can color destruction zones on the map. In Destruction mode, you can also use the mouse to destroy any bridge in a given area. Just click the left or right mouse button on the bridge to destroy or recover that bridge. (This function only works only in 2D mode when you zoom into the object and center it on the screen.

Display Filter – This menu item enables or disables the display of different types of objects. This is required to prevent a complicated picture from becoming overloaded with unnecessary icons.
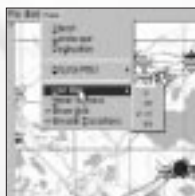
Icon Size – This determines the size of conventional icons. It can be modified to reach an optimal correlation between icon readability and overall picture readability at different resolutions.

Hover Camera – This sets a fixed camera height in 3D mode, which aids your ability to see shifting objects.

Show Grid – This option shows or hides the reference grid.

Smooth Transitions – If this option is switched on, the transition from 2D to 3D is performed more smoothly.

OPERATIONS IN THE EDITOR

Working with the Map and 3D Landscape

Switching between 2D and 3D Modes
Press Enter. This works when the zoom level is fully zoomed in.

Scrolling the Map in 2D Mode
Map scrolling can be done in two ways.
1. Using the vertical and horizontal scrollbars – the same way as any other scrolling in the Windows interface.
2. Using the cursor of the mouse with the left button pressed.

Landscape Navigation in 3D Mode
The cursor is the center of all movement; it remains in the center of the screen. Changing the direction of your glance against the cursor can be performed with the help of the mouse. Approaching/moving away is done by moving the mouse up and down without releasing the left button. The cursor itself can be moved using the mouse with the right button pressed (here the cursor does not change its position, but the landscape under it starts moving).

Changing the Scale
If the scale is at 0.3 of the minimum, the map mode switches off and the editor turns to 3D relief representation mode.

Here two means are used:
1. The scale can be changed using the vertical scrollbar on the left of the screen. To scale up, drag the scrollbar down.
2. When you move the mouse with the left button pressed and press SHIFT at the same time, a small frame appears on the screen. As soon as the button and the key are released, the editor will fit the field into the frame.

Working with Objects on the Map/Landscape
Setting the Chosen Object
First, select the object. Then move the cursor to a point on the landscape and press the left button and CTRL at the same time (or just press Ins). The object will appear in the designated place.

Editing the Route of an Object
Once you have set the object, you can choose a route for it using turning points.
• A new turning point can be set in the same way as an object (see above).
• To choose a turning point, click on it; the turning point will become yellow.
• To set an interim turning point, you should choose one of the ready points on the route and press Ins, or, while holding down the CTRL key, press the left button of the mouse. The new point will appear on the route in the middle of the segment between the chosen point and the one after it.
• To cancel a choice, press the right button of the mouse. A menu will appear right under the cursor. Choose Unselect; the yellow marks subsequently disappear and all points of the route become red.
• You can delete a chosen turning point by pressing the right button of the mouse and choosing Delete in the menu. The chosen point will be deleted. Deleting point number 0 annihilates the object.

Object Parameter Settings Window
The parameters are divided into four main groups according to the category of the available object. All objects are divided into categories. A more detailed account of this division is provided below.

After you set the object category, you can choose it from the list and, if necessary, see its 3D picture (for this press the View button). You can revolve it by clicking on it with left mouse button.

When the picture appears on the screen, the View button changes to Hide. If you press it again, the 3D image will be deleted

Here you can set the parameters related to each object. These depend directly on its category:

1. Aircraft or Air Object Category

Army – Here you set the side for which the selected object will fight. There are two variants: Red (the Soviet Union) and Blue (Germany). The choice is not bound to any specific type of object; you can make "Messerschmitt" carry red stars in your mission if you want to and vice versa.

Regiment – Here you choose the regiment, squadron, and flight. Each squadron can have up to four flights. Your choice influences the corresponding markings on the aircraft. Moreover, the same subdivision cannot be employed twice as two different objects.

Weapons – The list of possible weapons an aircraft can carry depends on its type. The Default variant means that only guns and machine-guns are included. The None variant means that all weapons have been removed.

Fuel – Amount of fuel carried by each aircraft at the onset of the mission (as percentage).

Planes – The number of planes in a flight (ranges from 1–4).

Skill – Skill level of the flight pilots (ranges from 0-beginner and 3-ace).

AI Only – This check box allows you to set the whole flight as AI only, even if you have selected a plane that can be controlled by a player. The AI-Only feature is useful for the creation of Cooperative missions by limiting the number of players.

CAUTION:
To prevent situations involving the incorrect behavior of AI-led aircraft, always comply with one rule – the aircraft controlled by the player should always be in the first flight. It is also important to stay away from tasks that cannot be fulfilled (for example, assigning bombers with fighter tasks).

TIP:
You can create a mission in which you are not going to participate directly at all. In other words, you don't select the Player option. In this case, you will find yourself in observer position at the beginning of the mission, and you will be able to switch between views of different objects. To do this, press P right after the start of the mission to pause the game, and then find the appropriate position for viewing the action by switching between the different views (using the mouse with a combination of buttons: Next Enemy Chase View, Next Friend Chase View, Chase View, External View on Ground Target, External Padlock to Closest Ground Target, External Padlock on Air Target, External Padlock to Closest Air Target, Fly-by View, Next Enemy View, Next Friendly View, Wide View, Normal View, and Zoom View). You can also switch between views over and over again, choosing the most interesting moments of fighting both in the air and on the ground. After that, you can also record a track file and edit it later.

## 2. Armor, Vehicles, Trains, Ships, and Artillery Categories

These carry no functional meaning in mission structure and serve only for explanation.

3. Waypoints

Here you set the parameters for a selected waypoint. As in the Chief Actor section, these depend to a large extent on the category of the object.

To make the choice of waypoints more convenient, we have placed Prev. and Next buttons on the Waypoints panel. If pressed, they activate the previous or next waypoint on the route. On their right, there is a sign that looks like A(B), where A is the number of the current point and B is the overall number of waypoints. Waypoint numbering starts from 0.

Waypoint Parameters for the Air Category
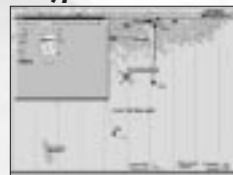
Height – Waypoint height above the earth, in meters.

Speed – The speed at which the flight of planes should pass the point.

Time – The time at which the flight should arrive at the point. Changing the Time parameter affects the Speed parameter along the whole route and vice versa.

Type (of Activity) – What the aircraft will be doing at the designated point. There are four options:
• *NORMFLY* – This is the default and indicates normal flight.
• *TAKEOFF* – The waypoint will be moved to the nearest airdrome.
• *LANDING* – In this case, the waypoint will also be moved to the nearest airdrome. If you place it manually at some point in the field, the aircraft will land there.
• *GATTACK* – This signifies ground attack.

Target – You can select the target in this mode. If you press the Set button, the cursor will switch into selection mode (you can cancel this by pressing the right mouse button). When the flight reaches the waypoint, it will try to attack the target. If you choose Ground Target, the type of activity will change into GATTACK.

Note:
1. For dive bombers, fighters with bombs, and IL-2s, you have to set target objects for the GATTACK point. Otherwise, they will attack the nearest enemy object to the waypoint, if they can find it.
2. For transports with bombs and level bombers, set the waypoint directly over the object that you would like to destroy, and then set GATTACK for that waypoint. Planes will drop the bombs in that area (you must set the GATTACK waypoint WITHOUT a target object!). Do the same if you use planes with paratroopers as loadout.
3. For dive bombers and fighter-bombers (IAR-81, some of FW-190s) with bombs, the altitude has to be more than 1300m for dive bombing. Otherwise, they drop bombs as level bombers.
4. If you want any of selected groups of planes with bombs to do level bombing, see item 2 above.
5. Don't set an altitude that is too low in bomb target areas for level bombers. They may be destroyed by their own bomb explosion.
6. Don't set the previous waypoint too close to the point of GATTACK. Planes won't have time to rejoin the right formation for the attack. Usually it is enough to set 7–10 km between these waypoints.

TIP:
If you have difficulty setting GATTACK on a bridge or other objects/units, you need to center them on the map and use the zoom.
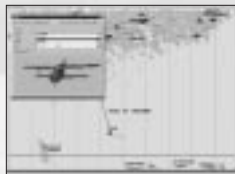
4. Plane1, Plane2, Plane3, Plane4
Here you set the following parameters and features for each of the aircraft in a flight.

Player – Select this if you are going to lead the flight yourself. Make sure that the planes in the flight are in the flyable list, i.e., can be piloted by the player.

In Single Missions where ranks are not envisaged, you are automatically appointed commanding officer. If the mission is created for Campaign mode, your rank and your career determine which plane in the flight you will fly.

Skill – Set the individual AI level for every aircraft in the flight.

Skin – You may change the skin (camouflage scheme) for each aircraft in a flight, including AI-only aircraft. The selected skin file will be shown in a window below its corresponding aircraft.

Pilot – As in multiplayer, you may change the skin of the pilot for each aircraft of the flight.

Markings – If the box is checked, then the game will use the standard system of markings for the aircraft, country, and numbering. If the box isn't checked, the planes will have no markings over the standard or user-made paint scheme (skin).

Special Feature
How to Make Air Trains of He-111z and Glider Me-321, or Li-2 and Glider G-11
1. Set all waypoints for the flight of He-111z (or Li-2).
2. Set only ONE waypoint for glider Me-321 (or G-11) and locate the waypoint close to the FIRST waypoint of He-111z (or Li-2).
3. Set the target object of that Me-321 (G-11) first waypoint at the first He-111z (Li-2) waypoint.
4. Don't set any waypoints other than the first for the glider (Me-321 or G-11). The glider will follow the plane automatically.
5. You can set these first waypoints for both planes and gliders in the air or on the ground (Takeoff).

Note:
These trains can't land. If you set the landing waypoint for the plane, the glider will disconnect and try to find an area for landing. When you carry out such missions, you should remember that only in the test flights can you get the right result and the glider will make the right landing (not in a forest or a city, for example). The glider does not use the engine and will merely glide to the closest free area, if there is one.

Waypoint Parameters for Armor, Vehicles, and Ships
Time – Here everything is much the same as in the AIR category with just one exception – you cannot vary the object's speed. The object will do its best to arrive on time, but in the end, everything will depend on its maximum speed and the type of landscape.

Timeout – You can make a ground or sea object stop and wait for some time before it resumes movement.

Note:
Setting objects for Armor and Vehicles categories by roads or directly on roads that run in the direction of your next Waypoints forces these objects to automatically continue their movement along these roads (except the main roads branching into smaller ones in towns and settlements, where the correct movement of objects can only be set with a large number of waypoints, placed on the curves and turns of the streets).

Note:
Units in the Ships category have simplified AI. They fully interact with the environment in modeled battles, but will never do AI-controlled maneuvers. So, you need to set all their waypoints manually in order to avoid collisions between ships and the beach. For example, if you model the attack of a torpedo boat, you should create the right trajectory of waypoints on the map to get the correct final picture of sea battle. For this purpose, use several static cameras placed in the battle area to watch the interaction between the ships running in the scenario in FMB, and then correct if necessary.

Waypoint Parameters for Trains
Everything is much the same as in the previous cases, except for the fact that the trains do not stop on the route. There is no Timeout parameter for trains.

Stationary Armor, Stationary Objects, Stationary Aircraft, Stationary Ships Categories
These objects are stationary. Waypoints are not set for them. All stationary objects placed on the map and having weapons (except planes) will also take an active part in military operations.

Note:
After you have set a Stationary Object, you should define its correct position in relation to other objects. For example, correct the direction of gun fire against the advancing enemy or correct the placement of the aircraft on the airdrome. To do this, click on the object with the maximum zoom in 2D mode and orient it in the right direction using the Right (Gray) Num Pad buttons.

Special Feature
In the Stationary object category, you may select the objects that are designated simply as object1, object2, etc. These objects are all buildings, bridges, and details that are used for the building of cities and rural places. You may use these to make your own scenarios with new cities, factories, etc. To define which object you want to use, simply use the Show/Hide window.

Setting Mission Purposes
This is also done using the window for setting object parameters. Choose your Target category in the Type section. During task editing, the parameter window consists of two sections: Type and Target. The purpose of the mission is placed on the map (or landscape) just like any other object.

Type Section
Below is the list of possible purposes:
Destroy – The object nearest to the designated waypoint receives the Destruction icon. The task is considered fulfilled if the marked object has been destroyed.

Destroy Bridge – The same as Destroy, only in this case the icon is placed on exclusively bridge-type targets.

Destroy Ground – An area of set radius is marked around the designated point. To fulfill the task, you must destroy at least half of the enemy objects within that radius. The size of the zone of destruction and the time interval are set in the Target section.

Escort – You must escort a group of planes and protect them from air attacks. The time interval within which you should escort them is set in the Target section.

Defense – You have to protect a ground object from being destroyed by enemy forces.

Defense Bridge – The same as Defense, but here only a bridge can be the focus.

Defense Ground – As with Destroy Ground, an area is marked around the designated point. To fulfill the task, you must preserve at least half of the ground objects in the area. The time interval within which you must defend the area is set in the Target section.

Recon – You have to fly above the waypoint at a distance not exceeding the set parameter and stay there for the set time period. The size of the area and time interval are set in the Target section.

Target Section
In this section you set the parameters of the task.

Priority
PRIMARY – The main task that you must fulfill for the overall success of the mission.

SECONDARY – An additional task. Fulfilling it is not compulsory, but if you do you will be rewarded later when the regular awards and promotions come about.

HIDDEN – A "secret" task that goes unsaid, which you can discover yourself in the course of the mission. This means that you have another chance to excel!

Note:
You cannot set Destroy and Defense purposes as the Target for static and artillery units. You only can set them for Destroy Ground and Defense Ground.

Timeout
Some tasks have to be fulfilled before a set time has gone by. If you do not fulfill the task within the assigned period, you are considered to have failed. The Timeout field is used to indicate the time before which you should fulfill the task. This condition is activated when you choose Timeout.

In certain cases, it is impossible to set the time limit. This concerns Defense Ground, Defense Bridge, and Recon tasks.

Distance Bar
If the task involves an area, this parameter sets its radius.

Landing
This option only concerns tasks of Recon type. If placed, you have to land in the area indicated in addition to simply flying along this point.

Note:
When you design your own missions, the following points become very important:
1. If you create a mission where you start on an airfield and plan to reach high altitude, you should set enough waypoints with the right trajectory or spiral curve so that the climb corresponds to the capabilities of the planes. It is also very important to give the right settings for AI planes. Use climb rate data for each plane from the View Object menu. To make sure that AI planes will achieve the given altitude, set the correct time between each waypoint so that planes can climb to the next altitude. We recommend that you set a realistic data climb rate on the low altitudes and 2–3 times less at altitudes higher than 4,000 meters. It is also very important to know that the first waypoint (at takeoff on the airfield) shows the direction of the takeoff – the icon on the runway border indicates the direction.

2. If the last waypoint of the aircraft flight is landing on an airfield, make sure that the previous waypoint was set at an altitude of not more than 200–250m and is at least 1.5 km before the final landing point in the direction of the landing glide slope on the closest runway border (the icon shows the side from which the plane will land). If your flight was at high altitude, make sure you establish as many waypoints as are needed for a smooth dive to the point of the final approach. If you ignore this advice, we cannot ensure that your plane or the AI plane will not be damaged when diving from high altitudes at critical speeds. This is especially important for bombers!

Static Camera Category
Static cameras are placed the same way as Static Objects. The difference between the two lies in the fact that you can vary camera height, which enables you to observe both ground and sea objects and targets. The Static Camera option enables you to create missions that are beautiful and interesting to observe. It is specifically recommended that you use it in the following cases:
1. You have created an extremely interesting mission that you want to record as a track file and show to your friends as a film, or place it on the Internet so that other game owners can look at it.

2. A rather large-scale ground battle is taking place and you'd like to control your mission creation. Place enough Static Cameras without placing them over the whole battlefield. You should bear in mind that the Static Camera is also an object that reduces the overall Frame Rate.

Note:
We recommend that you immediately place all created missions into corresponding directories. For example, if you have created a Single Mission, you should save it in a Single directory. The folder corresponding to the country and type of the mission can be chosen in the same folder. If you have created a mission for Multiplayer, save it in a corresponding directory for Dogfight or Cooperative.

HOW TO COMBINE THE CREATED MISSIONS INTO A CAMPAIGN
All missions created for Campaign mode are combined by name or number in a special file. You can do this in one of two ways:
1. *Linear* – In this case you will proceed linearly through all the missions in a list.
2. *Random* – In this case, the scenario for the mission will be randomly built, i.e., a randomly branched scenario.

Example of a file for a linear scenario:
[Main]
Class il2.game.campaign.CampaignBlue
awards Class il2.game.campaign.AwardsDEfighter
[list]
BF109_1_1.mis
BF109_2_1.mis
BF109_3_1.mis
BF109_4_1.mis
BF109_5_1.mis

Example of a file for a randomly branched scenario:
[Main]
Class il2.game.campaign.CampaignBlue
awards Class il2.game.campaign.AwardsRUbomber
[list]

IL-2M_1_1.mis IL-2M_1_2.mis IL-2M_1_3.mis
IL-2M_2_1.mis IL-2M_2_2.mis
IL-2M_3_1.mis IL-2M_3_2.mis IL-2M_3_3.mis
IL-2M_4_1.mis IL-2M_4_2.mis IL-2M_4_3.mis IL-2M_5_3.mis
IL-2M_5_1.mis IL-2M_5_2.mis IL-2M_5_3.mis

Note:
1. For randomly branched scenarios, you can set as many single
scenarios as you want. It may be 1 or 100. In the last case,
the program will randomly select one of 100.

2. Do not forget that for each scenario that you would like to start
randomly, you should use only one map for all scenarios starting at that
point. This is necessary to track all your successful destruction of ground
objects, such as buildings and bridges, for the next mission scenario.
Otherwise, the program will automatically skip these changes of landscape.

The file is created using the Windows Notepad and is saved in the
same directory as the missions. For example, folder Campaign > RU
(or DE) > Fighter. (If the folder Fighter was created earlier, you should
manually create a new folder in the same directory and in good time,
so as not to delete a previously-created campaign. Use, for instance,
"Fighter2," "Bomber2," "Fighter-Bomber," etc. Use Windows
Explorer for this purpose. All single missions or campaign missions
and all subdirectories should be stored in the Missions directory of
the game root directory.) The file should be named campaign.ini and
should not take any other name; otherwise, it will be useless. In
addition, using the Windows Notepad, in the folder RU (or DE), you
need to create or edit the all.ini file where you create or add the
name of the new folder with missions for your own campaign.

Example of file all.ini
   [list]
   Fighter
   Bomber
   Fighter-Bomber

Once everything has been done correctly,
you can start playing the new campaign you
have created; all actions are performed in
the standard way. Simply choose the
country for which you have created your
pilot's career and for whom you have
created a new career in the Pilot Career
menu. You will find the campaign you have
just created in the Career window.

Special Feature: B/W Intermission Tracks
To make a pre-recorded track file play as a B/W movie between
missions in a given campaign, insert a link to it, preceded by a *
symbol, into the [list] section of the campaign.ini found in the given
campaign folder.

Example:
   [list]
   * Intros/Intro.ntrk
   recon20.mis
   * Intros/EndIL2.ntrk
   recon21.mis
   * Intros/End109.ntrk
   recon22.mis

Note:
The code supports both types of tracks, but we recommend using
only the online type of track (*.ntrk type).

How to Create Multiplayer Missions
1. Dogfight
For this Multiplayer mode, you should create spawn points and
choose a corresponding color for them. Spawn points should only
be located on airdromes. The chosen color will later be visible on
the icon, indicating that it belongs to a certain army or airdrome.

CAUTION:
You can only set stationary anti-aircraft and place them only on the
ground, not on the water. Stationary ships must be placed on the water.
If you ignore our recommendations and set something else, these will
be automatically withdrawn from the scenario. We also advise you to
steer clear of this to prevent the program from locking-up or crashing.

2. Cooperative
Here everything conforms to Single Mission requirements: all AI-
objects available for Single Play can be used in Cooperative mode as
well. Nevertheless, you must bear in mind the restrictions imposed by
data transfer speeds via the Internet:
• The number of players in planes, including gunner seats, should not
exceed 32.
• Do not overload your mission with a large number of AI-objects.
The communication channel may not be able to cope with it, causing
the game to periodically hang up and prevent you and your friends
from enjoying the fun.

We do not want to restrict you to a set number of AI-objects, but the
fewer you use, the better. A huge number of objects can be set at your
own discretion and risk. You yourself should determine the possibilities

of your communication channel and those of your friends for gaming in Cooperative mode via the Internet. We highly recommend that you familiarize yourself with similar missions shipped together with the game. For this purpose, load our missions in the Full Mission Builder and see how they are done.

Note:
We do not recommend using the maps with a large amount of buildings in the cities (for example, Berlin, where over 500,000 houses are displayed on the map.) The status of each house is regularly checked by the program and sent via Internet to other players. This can lead to noticeable online game freezes. Recommended maps include special maps for online play as well as *Prokhorovka*, which was initially modeled for not only Single Play, but for Cooperative Play, as well.

Special Feature: Cooperative or Dogfight Briefings
When you need to make restrictions for armies in briefings (especially important for cooperative missions), use some simple keywords that will help you program your briefing.

Begin by writing the common things, like conditions of weather, dates, etc. – any info that is the same for both sides. This part of the briefing will be displayed for all players (in both dogfight and cooperative missions) before the keyword line <ARMY NONE>

Below <ARMY NONE> are restrictions for armies.
    <ARMY NONE>

Below <ARMY NONE> you may place a short brief for all armies that is displayed before you select your aircraft. It is possible to write nothing or to notify others to select their aircraft (in dogfight and cooperative, both.) Before you select your aircraft, all the briefs below are not shown. Once aircraft or the position of multicrew aircraft are selected, one of the briefs below will be displayed, depending on which side the aircraft was selected to play for. At the same time, the text that was there <ARMY NONE> will disappear.
    </ARMY>
    <ARMY RED>

Below <ARMY RED> you can write the briefing for the Red side.
    </ARMY>
    <ARMY BLUE>

Below <ARMY BLUE> you can write the briefing for Blue side.
    </ARMY>

Note:
Keyword lines are not displayed in the Briefing menu. Armies in keyword lines may be any color described in Full Mission Builder, so it is possible to use it not only for two armies, but for all 16 (in a dogfight).

Here is a sample brief for a Cooperative mission:
    Time 12:00
    Clouds: 1,000 m
    Map: Hungary

    <ARMY NONE>

    Select the aircraft or position of the multi-crewed aircraft/
    </ARMY>
    <ARMY RED>
    Attack Me-210s near the city of…
    </ARMY>
    <ARMY BLUE>
    Cover Me-210s ……
    </ARMY>

Home Base Features in the Full Mission Builder
The Home Base object has the Aircraft tab in its properties. You may need to resize the Object window to see it in its entirety.

The aircraft listed in the Available pane will be available on that Home Base when online. You may add planes to the Available list or remove them to In Reserve individually, or by category, such as Country of Origin, Year of Service, or Aircraft Type. Note that you can only operate on currently flyable aircraft.

By default, or when running a mission with Home Bases of a previous version, all flyable aircraft are Available.

16. CREDITS

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17. SPECIAL THANKS

We wish to acknowledge the Ilyushin Aviation Complex for letting us use the IL-2 and IL-2 Sturmovik trademarks.

For their help, testing and great support:
Carl Norman, Aaron Watson, Mark Degan, Viktor Kabanov, Thomas Hertzler, Jennifer Mitchell, Olivier Lefebvre, Jukka Kauppinen, Christopher Starr, Ilya Shevchenko, Andreas Preuße, Dietger Pohl, Ulrich Kenter, Sami Kukkonen, Ville Pitkänen, Sergey Archakov, Radek Jakubiak, Jörgen Torgersson, Sean Trestrail, Jerry Boucher, Debbie McDowell, Csaba Becze, Federico Aloisi, Martin Naß, Steffen Trombke, Philippe Willaume, Moharos Csaba, Bernt Stolle, Guillaume Lelevé, Bennie Broughton, Vadim Kolosov, David Wheeler, Dan Crenshaw, Christophe Donnet, Daniel Martinez-Normand, Johannes Ritter, Waldemar Lindemann, Gian Vitzthum, Theo Braat, Ferdinando D'Amico, Juraj Vanovcan, Baráti Kristóf, Scott Gentile, Max Mikhalevsky, Michel Vibert, Nuno Resende, Dalibor Jovanovic, Jan Niukkanen, Marc Winter, Pavel Tupitsin, Andrey Poddoubnyi, Pedro Alvim, Tom Cofield, Werner Kremer, Bill Johnson, Youry A. Puzynia, Stefan Overgaard Kristensen, Jari V_nttinen, James Vincent Jones, Pierre Berger, Laurent Bertin, Patrick Bravin, Dominique Lebreton, Jean-Vincent Prost, Santiago Moreno, Joerg Wiedemann, Martin Ilg, Demian Souza, Attilio Guzzeloni, John Keener, Oleg Kirillov, Christer Bergström, Andrey Mikhailov, Vadim Alexeenko, Julio Martins, Yakov Filatoff, Victoria Avalon, Robert Murphy, Greg Leon Guerrero, Volker Alperstädt, Peter Robbins, Millei Adam, Thomas Spann, Peter Webber, Martin Ilg, Demian Souza, Frank Moellenhof, Franck Le Roux, Kaj Laaksonen, Douglas and Gail Helmer, Christoph Lemke, David Carmeli, James Ulrich, David Zurawski, Richard D. Goldblatt, David Wheeler, Philippe Gensou, Nick Schreger, Brian Yeates, Christian Richter, James R. Campisi, Manuela Raudasch, Len Hjalmarson, Bernhard Kast, Ronald Engelhardt, Andrej Tscheprassow, Hans Schmid, The RAF museum Hendon (UK), and Monino (Russia) museum.

Great thanks to MeatWater(TM) – Nick Schreger and co-producer Detlef Piepke definitely deserve the reputation of flight simulators and sound specialists!

PROOF OF PURCHASE

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