

IMPORTANT NOTICE

The Fourth Dimension recommend that you use a backup of the discs (or copy them to Hard Disc) and keep the originals in a safe place. The discs may only be backed up for your own use.

Copying the discs for any other reason is tantamount to theft and could lead to criminal prosecution.

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Loading Instructions

Thank you for purchasing Birds of War. If you are reading this manual for the first time, then please read this chapter before loading the game.

Birds of War can be either loaded from disc, or be copied to and run from a hard disc. The game will load far faster if copied to a hard disc. Risc PC owners should consult the subsection entitled **If you own a Risc PC ...** later on in this chapter.

Loading from disc

We recommend that you backup all the discs and keep the originals in a safe place. The discs may be backed up **for your own use only**. Find the disc entitled *Game* and insert it into drive 0. Click on the drive 0 icon and double click on the *!BirdOfWar* icon. Press a key or mouse button to skip the introductory sequence. You will be prompted to insert disc changes as needed.

Loading from hard disc.

You will need to copy the contents of all the discs onto the hard disc before loading it. Create a new directory, and open it. Copy the contents of each disc into this new directory. Once you have completed this procedure, you can double-click on the *!BirdOfWar* icon to load the game.

If you have about 3.5Mb of hard disc space after installation, you may want to run the *!MapObjs* tool located on the *Objects* disc. This will reduce the amount of time taken to load game data. You must double-click on each of the four map folders and the objects folder before running *!MapObjs*, otherwise an error will be reported.

If you own a Risc PC ...

If you own a Risc PC, the software cannot be run from the discs, but only from hard disc. **You cannot copy Birds of War onto Hard Disc using the procedure shown above.** Instead, load the *!Install* program on disc 1. Drag the directory you wish to copy Birds of War to onto the *!Install* dialogue box, and click on the *Install* icon to start the installation procedure. You will be prompted to insert the other discs during this time. When the process is complete, you can load the game as shown above.

Introduction

Birds of War is a huge game which will provide endless hours of fun. You can choose any one of four eras – **1920, 1945, 1960** and **1990** – and one of eight aircraft of the period – from the *Sopwith Camel* to the *Stealth Bomber*. This manual is fairly comprehensive, and it is worth reading it all before playing the game properly. However, if you cannot resist having a go, then read **Chapter 1 – A Quick Taste**.

The manual is split into four distinct chapters:

A Quick Taste: How to play without reading the whole manual.

The Game Structure: This part of the manual describes the various screens you will come across as you play the game – basically an overview of the whole game

Playing the game: This section deals with actually flying the aircraft and using its functions, from using weapons to using different viewpoints.

Control Summary: Birds of War uses much of the keyboard, and the diagrams and descriptions shown in this section will guide you through the use of the various features of the aircraft.

Redefining controls

Don't worry if the controls used in Birds of War are not to your satisfaction, or you own a Risc PC, which has a slightly different keyboard layout altogether. You will find on the first disc or *Game* disc, the application *!BOWKeys* which allows you to redefine all the keys used in the game. Further instructions are provided in the *!Help* file inside the *!BOWKeys* directory.

Disc problems

The Birds of War game discs are unprotected, and as such, you can make backups of the discs, **but only for your own use**.

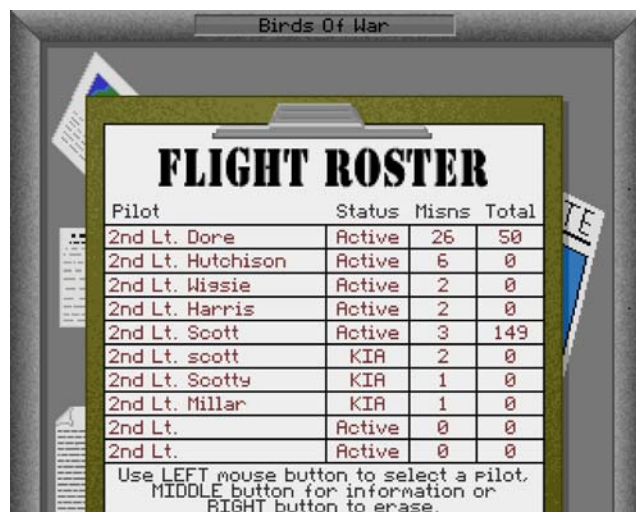
If any of the discs are faulty, send them back to the Fourth Dimension for an immediate replacement. You can find the address and phone number on the back cover of this manual. We do hope your discs are not faulty, and we apologise in advance if you are unlucky enough to have a defected copy.

Chapter 1 – A Quick Taste

Here's how to play the game straight away without having to read all of this manual beforehand.

Load the game, as described in **Loading Instructions**, and after a little while, a pilots roster clipboard (shown right) will appear on screen. Click the **SELECT** (left) mouse button on one of the four pilots at the top of the clipboard.

Click the **ADJUST** (right) mouse button to skip the commander briefing sequence and select **TAKE OFF** from the *Operations Room* screen (in the bottom left hand corner). You will now be in your first plane. Hold down **SELECT** to increase the engine power to 100%. You will notice the needle in one of the large dials move clockwise, and an engine noise increasing in pitch.



Now release the wheel brakes by pressing **B**. The plane will start to move. Now press **F** to lower the flaps and wait for the plane to move faster. Once you've got a fair bit of speed, pull the mouse back and the plane will take off.

The other two mouse buttons, **MENU** (the middle button) and **ADJUST** will slow down the plane, and fire the gun or cannon.

There! Now you know how to take off and fly the plane. But to find out how to land it, read **Chapter 2 – The Game Structure**.

Chapter 2 – The Game Structure

In Birds of War, a pilot can only play in the era he or she has chosen i.e. you cannot use a 1920 era pilot in the 1990 era, for obvious reasons!

In each era, there are six campaigns, each containing eight missions. These campaigns are graded *Easy*, *Fair* and *Hard*. Once a pilot has completed all six campaigns (48 missions), then he or she must retire. When this happens, or you simply die in combat, then the pilot cannot be selected again – corpses and retired pilots cannot fly planes!

The screens you will come across in Birds of War will now be described, including a broad account of the cockpit screen.

The Pilot Roster

This is the first screen that is displayed upon loading. It is a record of pilots past and present. To use an existing pilot, simply click on the entry with **SELECT**. To read a more detailed description of a pilot, click **MENU** over the required entry. To actually enter a new pilot, which is what you're more likely to do, click **ADJUST** on an entry. You can now enter the new pilot's Surname, Christian name and Callsign. **Retired pilots and dead pilots are not permitted to fly.**

To actually enter a new pilot, which is what you're more likely to do, click **ADJUST** on an entry. You can now enter the new pilot's Surname, Christian name and Callsign. **Retired pilots and dead pilots are not permitted to fly.**

Pilot	Status	Misns	Total
2nd Lt. Dore	Active	26	50
2nd Lt. Hutchison	Active	6	0
2nd Lt. Wissie	Active	2	0
2nd Lt. Harris	Active	2	0
2nd Lt. Scott	Active	3	149
2nd Lt. scott	KIA	2	0
2nd Lt. Scotty	KIA	1	0
2nd Lt. Millar	KIA	1	0
2nd Lt.	Active	0	0
2nd Lt.	Active	0	0

Use LEFT mouse button to select a pilot.
MIDDLE button for information or
RIGHT button to erase.

The Era Selection Screen

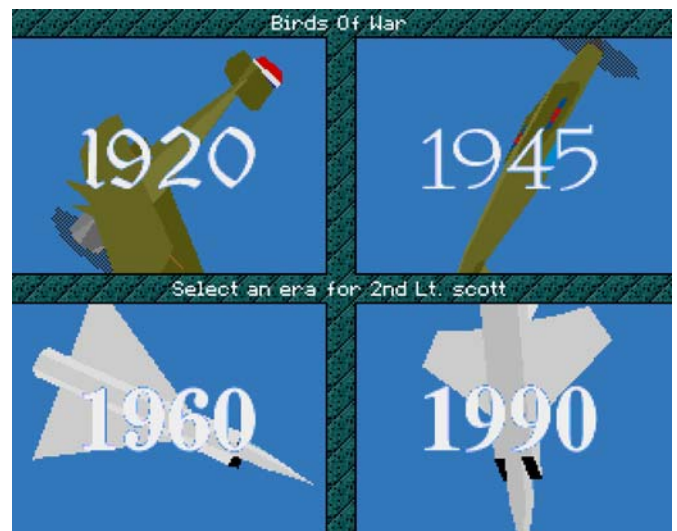
This screen is displayed when a new pilot is entered, and is thus not on assignment. Choose one of the four eras by clicking **SELECT**. The four eras are:

1920: Dogfight over the skies of Europe during World War I. You will be flying the famous *Sopwith Camel* and *Triplane* against a variety of monoplanes, biplanes and triplanes. You will also encounter *Zeppelins*, barrage balloons and all manner of land and sea vehicles/targets.

1945: Fly such famous aircraft as the *Spitfire* and *Hurricane*, the *P-47* or *Mustang* against *Messerschmitt 109's*, *Zero-Sens* and *Junkers JU88's* among others. Strafe *Tiger II's* on the ground or battle the Pacific fleet.

1960: Battle for the Korean or Vietnam skies flying *F-86 Sabres* or *F-4 Phantoms* against *Migs*, *Mirages* or *Sukois*. Try your hand at close ground support or at high level interception.

1990: Fly the latest jets all over the world. Take a *Tornado Mk 3* or an *F-16* up against *SU-27's* or try to sneak past coastal *SAMs* using the latest *F117a Stealth Fighter*. You can even try the unproduced *EFA* jet in combat conditions.



The Campaign selection screen

Once an era has been selected for your pilot, you must specify his or her first campaign location. Each era comprises of six possible campaigns which are represented on screen by miniature maps of the campaign area. Any campaigns which have been completed by the pilot are marked with a red cross and are unselectable. The difficulty level of the campaign will be displayed as you move the mouse pointer over it. Click **SELECT** on your chosen campaign map. Your commanding officer will now appear to give you a general briefing on the campaign and the type of missions you are likely to face. Use **SELECT** to step through the briefing, or **ADJUST** to skip the briefing and go on to the **Operations Room**.

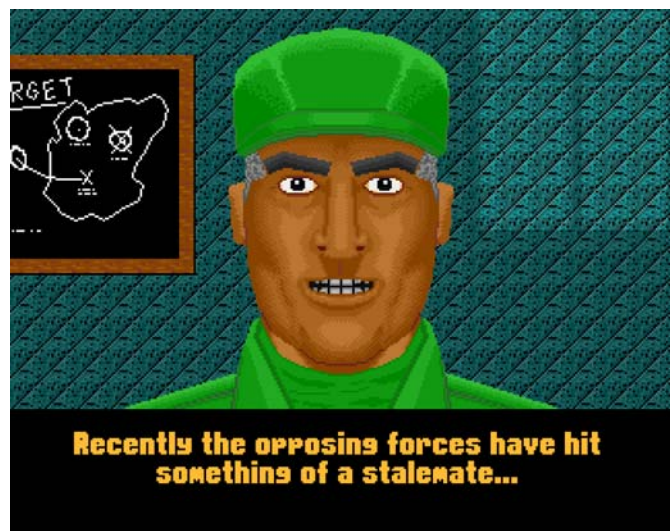


The Operations Room

This screen is where you can choose various options before taking to the skies. To select an option, click **SELECT** over the appropriate door or item. The available options are:



BRIEFING This is an important option because without it, you won't have a clue as to your mission objectives. If you are re-attempting a mission, the briefing isn't so vital. A more concise version of the mission briefing can be found on the **INTELLIGENCE** screen. Like the campaign briefing mentioned earlier, your commanding officer will appear to give you the mission details. Use **SELECT** to step through the briefing, or **ADJUST** to return to the operations room.



INTELLIGENCE The intelligence department gives you access to a large map of the campaign area. Various information can be overlaid, such as your target locations and proposed flight plan. For more modern eras, waypoints can be set for the *Inertial Navigation System* on the plane. The location of friendly and neutral units can also be investigated to help you avoid innocent casualties.



CONTROL This door gives access to various difficulty and control settings. These settings are saved as part of the pilot roster, so they can be set independently for each pilot. The options are:

Enemy pilots: Sets the skill of the enemy pilots.

Ground forces: Sets the skill of the enemy ground forces.

Landing Difficulty: Sets how exact your landings have to be. Beginners should select the Easy option, as with the previous options.

Music (not available on Risc PC) Controls the music volume. The music is not played during a mission.

Sound FX: Controls the volume of the in-game sound FX.

Cockpits: Lets you specify either normal, full cockpit displays or a reduced, faster version for lower-powered ARM2 machines.

Control: Lets you specify the default control method, either the mouse or keyboard. The control method can also be altered within the game.

Detail: Lets you specify the default graphics detail level. The more detail you have, the slower the game will run. The detail level can also be altered within the game.

The remaining options are aimed at novice players, and having them all activated makes for extremely easy missions!

Infinite fuel/ammo: Stops you running out of fuel or ammo.

Infinite FCD (1960 and 1990 eras only): Gives you an endless supply of *Flares*, *Chaff* and *Decoys*.

Invulnerable: Prevents you from being damaged by enemy fire. You can, however, still fly into objects or hit the ground.

No SAMs: Disables any *SAM* (*Surface to Air Missile*) bases.

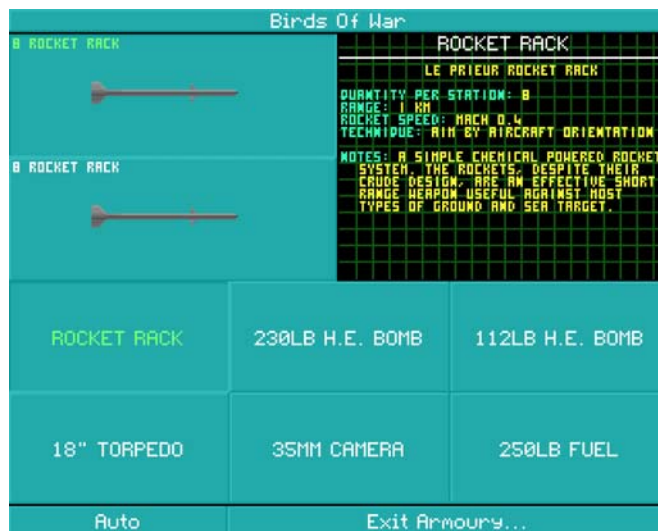
No AAAs: Disables any *AAA* (*Anti-Aircraft Artillery*) bases.

No fighters: Removes any enemy fighter threat.

Floppy: Saves the above settings to disc or hard disc



ARMOURY This door gives you access to the immense range of firepower and ordnance that is available to you in the campaign. The ordnance available will depend on which era you are in. The aircraft's weapon stations are shown in the top left corner of the screen. Click **SELECT** to activate the current station. Click **ADJUST** to clear any contents. Click **MENU** on one of the offered items to bring up information onto the display panel. Clicking with **SELECT** on an item will bring up information in the same way as with **MENU**, but will also load the item into the current station. Clicking on the *Auto* button will set the ordnance to the recommended payload for the mission. Note that all aircraft have an integral gun/cannon in addition to the weapon stations.



HANGAR The hangar is where you choose which of the eight available aircraft for the era you are going to use for the mission. Clicking on any of the eight aircraft buttons will select it as the current one and its information will be shown on screen. Each aircraft has its strengths and weaknesses, so it is important to choose an appropriate one for the mission at hand.



EXIT This option returns you to the desktop, after confirmation.

ROSTER Clicking on the pilot roster will return you to the pilot roster screen to select a new pilot.

TAKEOFF This begins the mission.

REPLAY This is where you can show off your favourite missions to your friends. This is a facility for replaying your previous mission. You can also save files here, so you can be vain and reload them again and again. The screen is divided into three areas. In the centre is the main view screen. To the left hand side are some video-recorder style icons, while on the right are some viewpoint icons. The left-hand icons, from top to bottom, are:



Eject: Click on this to return you to the Operations Room.

Play: Click here to play the recently played or loaded file.

Fast/Very Fast: These buttons alter the speed of replay. Click on Play to reset.

Stop: This stops the replay. Click on play to continue.

Step: Click repeatedly to step through frame by frame. Click on Play to reset.

Rewind: Click this icon to return to the beginning of the replay.

The icons to the right are fairly self-explanatory, but there are another set of icons which can be revealed by clicking **MENU**. These icons are:

Orbit+/Orbit-: These speed up and slow down the orbiting camera, if it is selected. Click on the **!Orbit!** icon to stop the camera.

Range+/Range- : These let you zoom in or out on your external view, whatever the angle.

Fly-by : This positions a camera in mid-air, allowing you to fly past.

Tactical: This displays a tactical view of the action.

Default: Click on this to reset the viewpoint to inside the cockpit.

Save/Load: These icons let you save and load a replay file. Just enter a filename at the prompt, press Return, and your file will be saved or loaded.

Please note that the Replay feature cannot be used to cheat, and take over the plane at any time!

If Replay is selected before a mission is played, then you will be asked for a replay file to load. Press RETURN to take you back to the Operations Room.



The Cockpit Screen

Clicking on the **TAKE OFF** icon of the Operations Room screen will bring you to the game proper. An animated sequence will begin from outside the aircraft, working its way towards it. You will then be placed in the cockpit ready to begin your mission.

Although there are 32 types of aircraft to choose from, the cockpits in them are basically the same, give or take several instruments. As you can see from the above screenshots, there are far more dials and instruments in the 1990 era than in the 1920 era, but don't let this put you off. Here is a brief guide to the most common instruments. Detailed diagrams of the 1920, 1945 and 1990 cockpits can be found in the centre pages (the 1960 era is too similar to the 1990 era, so is not shown).

Chapter 3 – Playing the Game

As mentioned earlier, even though the wide variety of aircraft available offer many different features and instruments, they are all controlled in a similar manner. The following pages will list all the controls available to you. If you want to change them (or you own a Risc PC) then you can use the *!BOWKeys* application supplied on the *Game* disc. Full instructions are available within the program.

The mouse and keyboard are used to give fully proportional control inputs for the elevators and ailerons. The controls are quite sensitive which gives very fine control. Moving the mouse forward (or **'** on the keyboard) will make the aircraft dive, back (**?**) will make it climb. Moving it left (**Z**) or right (**X**) will roll the aircraft in the appropriate direction. The equivalent keyboard controls are shown in brackets from here onwards.

The throttle is controlled by two of the mouse buttons. **SELECT** (+) will increase, and **MENU** (-) will decrease the throttle. The third mouse button, **ADJUST** (**Alt**) will fire the currently selected weapon.

Principal Flying Functions

L – RAISE/LOWER UNDERCARRIAGE When lowered, the undercarriage produces drag which reduces the aircraft's maximum speed. At very high speed damage can be caused, signified by a dull thud. Note that not all aircraft have a retractable undercarriage, especially very early ones such as biplanes.

D – DEPLOY/RETRACT AIRBRAKE Some aircraft, notably the more modern ones, have airbrakes which, when deployed, produce drag to slow the aircraft down. This is primarily used during a landing procedure.

F – RAISE/LOWER FLAPS Some aircraft, notably the more modern ones, have flaps in the wings which can be lowered to produce more lift and improve the aircraft's stall speed. These are especially useful for ground attack and when landing but may get damaged if used at high speed. This is indicated in the same way as a damaged undercarriage – a dull thud.

E – RE-START ENGINE Used to restart the engine after it has stalled due to you exceeding your aircraft's maximum ceiling altitude. Note that a stalled engine may sometimes be difficult to restart.

B – WHEELBRAKES ON/OFF Wheelbrakes are used for stopping the aircraft on the runway. A mission is only complete when you come to a complete halt on the correct destination runway.

Navigation Controls

The following keys on the keyboard aid you with navigation during a mission:

M – VIEW MAP This key lets you view the campaign map. In the 1920 and 1945 eras, pressing **M** toggles the map on/off. In the 1960 and 1990 eras, however, electronic maps in the aircraft can be viewed in five orders of magnification, by repeatedly pressing **M**.

W – TOGGLE WAYPOINT On more modern aircraft, waypoints for targets can be set for the *Inertial Navigation System* (INS). Pressing **W** will cycle through the available waypoints. Use this with the tape compass on the HUD, to guide you to the required target.

H – TOGGLE HUD ON/OFF This toggles the *Head Up Display* (HUD) on/off, on the modern aircraft.

Cursor Left/Right – STEER NOSE WHEEL These keys are used for nose-wheel steering while on the ground. Note that this feature only works on modern aircraft.

I – INSTRUMENT LANDING SYSTEM This key displays the *Instrument Landing System* (ILS) information on the aircraft's HUD, if it is available. This will help you to line up with the runway.

DELETE, COPY (END on Risc PC), PAGE DOWN – 1st/ 2nd/3rd MULTIFUNCTION DISPLAY These keys cycle through all available modes on the first, second and third *Multi-Function Display* (MFD) of the modern aircraft's HUD.

Weaponry Controls

These keys help you to select weapons and targets:

SPACE – TOGGLE WEAPON This cycles through the available weapon stations.

RETURN – SELECT TARGET This selects the next target for the currently selected weapon. Repeated pressing will cycle through all suitable targets.

Defence Controls

Defending yourself is important – you wouldn't last very long otherwise, so these keys will aid you during your mission:

R – SELECT RANGE FOR RADAR If the aircraft has radar, this key cycles its range through 10km, 5km, 2.5km and 1.25km before resetting to 10km.

T – SELECT RANGE FOR THREAT DISPLAY If the aircraft has a threat display, this key cycles its range through 5km, 2.5km, 1.25km and 0.625km before resetting to 5km.

LEFT SHIFT – DROP CHAFF Chaffs are used to mask your radar signal from radar guided missiles. If this is present on your aircraft, then the missile will lose track of you.

LEFT CTRL – DROP FLARE Flares are used to confuse infra-red guided missiles away from your aircraft, if they are present.

TAB – LAUNCH DECOY Decoys – if present on your aircraft – can be deployed against both infra-red and radar guided missiles, and have a higher success rate than chaff and flares.

PRINT – EJECTOR SEAT If you are in danger of being killed, then the only way is out. Press this key to eject yourself from your plane. Do not use this when you are close to ground level, otherwise your parachute will not be deployed in time, killing yourself.

Although there may appear to be a lot of controls, most of them are only used occasionally.

Game Function Controls

These keys are concerned with graphic and sound output, plus the effect of time in the game:

N – TOGGLE ENGINE SOUND ON/OFF If the engine sound gets irritating, use this to switch its noise off.

S/Q – TOGGLE SOUND EFFECTS ON/OFF If all the sound in the game gets irritating, then these keys will be useful.

K – TOGGLE CONTROL METHOD This key toggles between mouse and keyboard control. The

control method can also be selected from the **Options** screen.

F1 – TOGGLE SOLID/WIREFRAME DRAWING This key toggles the display between wireframe and solid graphics modes.

F2 – TOGGLE GRADUATED HORIZON ON/OFF The graduated horizon does look nice, doesn't it? No? Well, if you feel you don't want it, then this key is for you.

F3 – TOGGLE GLOBAL SHADOWS ON/OFF This key toggles the ground shadows on and off.

F4 – TOGGLE HUD COLOUR Press this key to toggle the HUD display colour between a selection of the finest hues.

F5 – NORMAL TIME MODE Does this make sense? If not, then read on...

F6 – ACCELERATED TIME MODE During brief periods of inactivity in your mission, you can speed up the game moderately, by pressing this key. The effect is cancelled if any gun or missile fire takes place. Now you know the purpose of **F5**.

F7 – FAST ACCELERATED TIME MODE For unusually long periods of inactivity, the game can be speeded up even more by pressing this key. Like the accelerated time mode, this effect is also cancelled if there is any gun or missile fire. Use with care – it is *very* easy to lose control of the plane!

F8 – TOGGLE CLOUDS ON/OFF Some missions take place in bad weather. But if you want less cloud, don't wait for the weather to clear, just press **F8**. Press it again to turn the clouds back on.

F9 – MINIMUM DETAIL SETTING For less powerful machines, use either this or the medium detail setting to prevent the game from slowing down, or blowing up the computer.

F10 – MEDIUM DETAIL SETTING This setting provides adequate detail for most missions.

F11 – MAXIMUM DETAIL SETTING For owners of ARM3 machines or Risc PCs, use this setting for maximum graphics detail.

F12 – AUTO DETAIL SETTING If you can't decide which setting is best for your machine, press this key, and the computer will choose the optimum detail setting to maintain game speed.

Action Viewpoints

Birds of War would be extremely difficult to play if you could not look around for enemy planes. Hence, there are a number of ways you can view the outside world. If you fancy an out-of-body experience, then you can choose from a variety of different viewpoints from outside the aircraft.

ENTER – TOGGLE INTERNAL/EXTERNAL VIEW This will cycle the chosen viewpoint between inside the cockpit, and outside the aircraft.

KEYPAD 8, 2, 4, 6 – AHEAD, BEHIND, LEFT AND RIGHT INTERNAL/EXTERNAL VIEW These allow you to view the sides or rear of the aircraft.

KEYPAD 5 – INTERNAL FULL SCREEN AHEAD VIEW This key removes the cockpit from the ahead view, and will display brief information such as airspeed and compass heading.

KEYPAD 0 – RESET TO DEFAULT INTERNAL VIEW This reverses the effect of keypad 5.

KEYPAD . – INTERNAL/EXTERNAL UP VIEW This allows you to look above for any enemy aircraft.

KEYPAD 7 – ORDNANCE VIEW This allows you to view from the most recently fired ordnance, either a bullet or missile.

KEYPAD 9 – SELECTED TARGET VIEW This allows you to view from the currently selected air or ground target.

KEYPAD 1 – TAKEOFF RUNWAY VIEW This view tracks your position from the takeoff runway.

KEYPAD 3 – EXTERNAL TACTICAL VIEW This view makes you airsick – it glides around your aircraft, so you can see targets without having to press too many keys.

KEYPAD / – EXTERNAL CAMERA VIEW A very fancy outside shot that tracks your aircraft's position.

KEYPAD *, # – SLOW DOWN/SPEED UP ORBITING CAMERA These keys slow down the rate at which your tactical camera moves about the aircraft.

KEYPAD -, + – ZOOM IN/OUT EXTERNAL VIEW These keys zoom in or out on the currently selected view.

PAGE UP – FLY BY VIEW Another fancy viewpoint – your plane passes a stationary camera that pans across with you, before moving to another location for another great shot. However, it is of limited use during combat.

Taking Off

To take off, use **SELECT (+)** to increase throttle to 100%, press **F** to lower the flaps (if present), and then press **B** to release the wheelbrakes. The aircraft will now begin to move. If you are flying a modern plane, then it will start to move anyway, so make sure the wheelbrakes are off, otherwise you will not gain enough speed to take off. Once you are past the stall speed, pull back on the mouse (/) to about +5 degrees of pitch and press **L** to raise the landing gear (if present). Read **Chapter 1 – A Quick Taste** for more details.

Landing

Landing is a little more tricky at first, and depends on the plane you are flying and whether you are landing on a ground runway or aircraft carrier. Here is one landing method. Fly towards the runway until you are about 1km away. Now turn and fly parallel to it until you are from 5 to 15km away (depending on the aircraft) at about 1000ft.

Now execute a 180 degree turn towards the runway. If you are in a modern aircraft, use the waypoint indicator on the tape compass to direct you to the runway. You may need to press **W** to toggle to the right waypoint beforehand if you are flying a modern aircraft. Also switch on the ILS by pressing **I** to help you line up parallel with the runway.

Reduce power and use the airbrakes and flaps to reduce speed as you start to descend. When you are about 1km away from the near-end of the runway, deploy the undercarriage, by pressing **L**.

Try to cross the runway threshold at about 50 feet travelling about 40 knots faster than the stall speed. Pull the nose up at the last moment to flare the landing.

Once touchdown is achieved, reduce power to zero, apply the wheelbrakes, and use the **left and right arrow keys** to keep your plane straight if necessary. Touching down with more than +10 or less than -5

degrees of pitch or with the wings too far from the horizontal will result in a crash.

Of course this is not the only way to land. But this is a tried and tested method. Closing your eyes and hoping for the best is usually fatal in Birds of War.

Afterburners

If the aircraft is fitted with afterburners, they will automatically engage when 100% thrust is selected. Afterburners give about 50% more thrust at the expense of greatly increased fuel usage.

Firing Weapons

The amount of firepower available to you depends on the era you are in, and the plane you are flying. But all the aircraft have an integral gun/cannon fitted, fired by pressing **ADJUST (Alt)**.

More complicated weapons, however, require a target to be selected. Pressing **RETURN** will cycle through all the targets in the immediate area which are suitable for the selected weapon. The currently selected target is shown on the HUD by a *square*, or a *diamond* if the target is in range of the selected weapon.

The weapons available fall into five basic categories:

BALLISTIC These are unguided weapons such as cannon and rocket pods which are aimed by pointing the aircraft at the target.

AIR-TO-GROUND MISSILES These are missiles such as the *Maverick* and *Hellfire* which are radar or infra-red guided to the target. The missiles can only track targets within a 45 degree cone in front of the aircraft. If the target leaves this cone, the missile will lose it. To fire these weapons, press **RETURN** until the correct target is selected then press **ADJUST (Alt)**. The missile does the rest.

AIR-TO-SEA MISSILES These are similar to the air-to-ground missiles, except they lock onto marine targets.

AIR-TO-AIR MISSILES These are also similar to the air-to-ground missiles but are faster and more agile. They only lock onto airborne targets and can be confused by chaff, flares or decoys.

BOMBS Although there are three types of bombs, they are all fired in the same way. Use **RETURN** to select the target as usual. A *fall-line* is shown on the HUD from the gunsight towards the ground to indicate the direction the bomb will fall. A short horizontal *foot* is drawn at the end of the fall-line to indicate the projected point of impact. A range-bar is shown across the top of the HUD to indicate how far from the target the projected impact point is.

When the bar has reduced to a single line, it is time to drop the bomb. To hit the target, the bomb fall-line should pass through the target rectangle when it is released. Bombs are the trickiest ordnance to target, but they are also the most destructive and can be used against land, sea and even airborne targets! The three types of bomb are:

Free-fall: These simply fall from the aircraft until they hit the ground. Because they fly at the same speed as the aircraft, you have to fly high enough and not get caught in the blast.

Retarded: These bombs either have fins or use a parachute to slow their descent. This gives the delivering aircraft time to clear the blast area, so they can be dropped at lower altitudes.

Glide: These bombs incorporate lift surfaces which allow them to literally 'fly' towards the target.

This means that their range is dictated by how high they are when you drop them. If dropped from above 3000 feet, they can often travel for several kilometers before impact.

The Enemy

The enemy, as you would expect, come in many forms. You will have to contend with enemy fighters armed with cannon and missiles on most missions. There are also ground based *Anti-Aircraft Artillery* (AAA) and *Surface-to-Air-Missile* (SAM) emplacements. As well as this, most enemy vehicles and ships will carry one or more machine guns or 20mm Anti-Aircraft cannon.

The enemy does not sit waiting to be destroyed. Enemy ships will patrol their waters and tanks and self-propelled guns patrol roads. You may also encounter bombers, cargo aircraft, oil rigs, trains and all manner of other vehicles and structures.

Please remember that not everything you will see are enemies. There are both friendly and neutral targets which you should be careful not to destroy, or else you will get more than a slapped wrist from your commanding officer on your return!

The skill level of enemy aircraft and ground emplacements can be selected from the **Options** screen.

Combat Tactics

When you are attacked by cannon/guns your best bet is to simply try to outmanoeuvre the gunner with evasive action. Avoiding missiles is a little more tricky. There are three types of missile:

1st GENERATION INFRA RED (IR) These missiles can only lock on to exhaust heat from behind. They can sometimes be confused by dumping a flare and trying to turn to face the oncoming missile.

2nd GENERATION IR These missiles can lock onto aircraft surface heat as well as the exhaust plume which makes them harder to avoid. Again, dump a flare and try sharp turns, dives or climbs to evade it.

RADAR GUIDED These are the most difficult to avoid. Chaff can be used to mask your own radar signal followed by a high-G manoeuvre and some praying.

Decoys can be used against both IR and Radar guided missiles and usually have a higher chance of drawing the missile away from you.

Do remember that you are not the only one to have these defensive measures at your disposal, enemy fighters also have chaff and flares and will try their best not to get blown out of the sky. SAM sites are usually armed with radar guided missiles which again can be confused with chaff or decoys. Note that although they will show on the threat display and will light the incoming missile warning lamp, they will not sound the warning klaxon – sometimes the only warning is when one zips past your nose at mach 4!

Weather

The forces of nature cannot delay the course of war. You may be sent on missions in any condition, day or night. Rain, snow, thunderstorms and sandstorms can all be somewhat distracting and will reduce visibility. All but thunderstorms can usually be climbed over. Sometimes there may be low cloud to contend with. This will obscure objects on the other side of it and reduce visibility to zero while flying through it!

Aircraft Carriers

You will on occasion be required to take-off from and land back on aircraft carriers. The takeoff procedure is identical to the norm except that when you release the brakes, the carrier's catapult will accelerate you off the deck.

Landing is a little more complex as you must come in from the rear of the carrier to catch the arrester wires – your wheelbrakes are not good enough to stop you on their own. If you try and approach from the front of the carrier, then you will miss the wires and plunge off the other end of the carrier. This is rather irritating after completing a particularly difficult mission.

Completing the Mission

Once you have completed the mission objectives and have come to a halt on the specified runway, your commanding officer will re-appear to de-brief you. Your performance will be assessed and you will be informed whether the mission was a success or a failure. Your pilot can only progress onto the next mission once the previous one has been completed successfully. A pilot can, however, attempt a mission any number of times in order to complete it.

Once all eight of the missions have been completed you must select another campaign. Once all six campaigns have been completed, the pilot has no choice but to retire from active duty. If a pilot is killed in action, his or her record will be retained on the roster but he or she cannot fly any more. Makes sense really.

Damage

Depending on the aircraft being flown, there are some aircraft components which will fail as the aircraft is damaged by gunfire, or bad luck. Somewhere in the cockpit there will be a set of eight small boxes. As each of the following aspects of your plane are damaged, one of these boxes will light up. Some items may become completely inoperational while others will suffer from reduced performance. The various components are:

NAVIGATION If the navigation system becomes inoperable you will lose ILS feedback, waypoint information and the electronic map.

HYDRAULICS When the hydraulic system fails the flaps, airbrake, landing gear and wheelbrakes will all become inoperable, remaining in their current position. Do remember to raise your undercarriage and flaps on take-off, otherwise they may become inoperable, making it impossible to land!

WEAPONS The weapons system can become damaged to the extent where you will get no feedback from the HUD. You therefore have no way of telling which is the current target, when a target is in range or have access to the bomb sight.

HUD the HUD can suffer a catastrophic failure, rendering all HUD functions such as weapons information, heading and altitude inoperational.

RADAR If the radar fails, you will lose the main radar display and the threat display.

FUEL The fuel tanks can be damaged to the extent that they will leak at a constant rate.

ENGINE If the engine is damaged, it will develop only 50% of its usual thrust. If afterburners are fitted, they will become inoperational.

AVIONICS The avionics of the aircraft may be damaged, resulting in sluggish response and much reduced agility.

Please note that aircraft of the first and second eras do not have indicators for damage suffered, so your only indication of this is when they stop working!

Modern Aircraft

The last part of this chapter will cover some of the weird and wonderful instruments you will find in your plane. These instruments have been covered briefly earlier in this manual, but this section goes into more detail.

INSTRUMENT LANDING SYSTEM (ILS) Most of the aircraft have this feature, and is designed to assist you in making a smooth landing. The principle behind the ILS is that an imaginary beam is projected from the runway. A pilot must “ride down the beam” to make a perfect approach. Pressing I will display a large crosshair in the centre of the HUD. The vertical line shows horizontal deviation from the runway, while the horizontal line shows vertical deviation. So to achieve the right position, the crosshair must be centred precisely. If you are off-line, make minor directional adjustments to correct your alignment, using the mouse or keyboard control.

MULTI-FUNCTION DISPLAYS (MFDs) These are the most important instrument in the cockpit after the HUD. You can have up to three MFDs in any one plane, mostly those of the 1990 era. Aircraft of the 1960s are less advanced, and have only one or two. Each MFD however, has several modes at your disposal. They can display waypoint information, electronic maps, threat displays, radar, and even tracking camera views of the currently selected target, although this does not function if you are using cannons.

Some of the modes are visual representations of other instruments, such as damage. This is shown as a profile of your aircraft, with affected areas shown in red.

To toggle through the available modes on your MFDs, use the **Delete**, **Copy** (or **End** on the Risc PC), and **Page Down** keys

INERTIAL NAVIGATION SYSTEM (INS) AND WAYPOINT INDICATOR If your aircraft has a an INS and waypoint indicator, then they will prove useful in finding enemy targets mentioned in your briefing. You may need to toggle through the available modes of any one of your MFDs to find the waypoint information display. The display consists of a list of bearings, and your distance from them. One of the waypoints will be highlighted in a different colour.

At the top of your HUD, just above the compass, you will see a yellow line, pointing either left or right. Read the bearing on your MFD, and turn to face the appropriate direction. A small vertical line will then show directly on the compass, showing you precisely the bearing of your desired target. To select a new viewpoint, press **W** and the next bearing in the list will be highlighted on your MFD.

Once you know how to use the INS and waypoint indicator, you will find the missions of the 1960 and 1990 eras much easier to play.

Chapter 4 – Control Summary

This section contains a briefer list of all the controls used in Birds of War, as described in **Chapter 3**.

You will find in the centre pages of the manual, some keyboard diagrams for the following groups of functions, plus a function keystrip. You can remove these if you wish for easy reference during play.

Principal Flying Functions

Mouse or:

Z Roll left
X Roll right
' Climb
' Dive
Select/+ Increase throttle
Menu/- Decrease throttle
Adjust/Alt Fire selected weapon

L Raise/lower undercarriage
D Deploy/retract airbrake
F Raise/lower flaps
E Restart engine
B Wheelbrakes on/off

Navigation Controls

M View map
W Toggle waypoint
H Toggle HUD on/off
Cursor left Steer nose wheel left
Cursor right Steer nose wheel right
I Display ILS info on HUD
Delete Toggle modes on 1st MFD
Copy or End Toggle modes on 2nd MFD
Page Down Toggle modes on 3rd MFD

Weaponry Controls

Spacebar Toggle weapon station
Return Select target for weapon

Defence Controls

R Select range for radar
T Select range for threat display
Tab Launch decoy
Left Shift Drop chaff
Left Ctrl Drop flare
Print Ejector seat

Game Function Controls

N Toggle engine sound on/off
S Enable sound effects

Q	Disable sound effects
K	Toggle control method
F1	Toggle solid/wireframe drawing
F2	Toggle graded horizon on/off
F3	Toggle shadows on/off
F4	Toggle HUD display colour
F5	Normal time mode
F6	Accelerated time mode
F7	Fast accelerated time mode
F8	Toggle clouds on/off
F9	Minimum graphics detail setting
F10	Medium graphics detail setting
F11	Maximum graphics detail setting
F12	Auto graphics detail setting

Viewpoint Controls

Enter	Toggle internal/external view
Keypad 8	Internal/external ahead view
Keypad 2	Internal/external rear view
Keypad 4	Internal/external left view
Keypad 6	Internal/external right view
Keypad 5	Internal full screen ahead view
Keypad 0	Reset to default internal view
Keypad .	Internal/external up view
Keypad 7	View from recent ordnance
Keypad 9	Selected target view
Keypad 1	View from takeoff runway
Keypad 3	External tactical view
Keypad /	External camera view
Keypad *	Slow down orbiting camera
Keypad #	Speed up orbiting camera
Keypad -	Zoom external view in
Keypad +	Zoom external view out
Page Up	Fly-by view

And finally...

This manual has been written and designed to help you get the most out of Birds of War, and because of its size, can only give you general information on how the planes are used. The manual would become

extremely large and cumbersome to use otherwise. For serious flying purposes, it is best to consult more informative books, written by people experienced in the field of aviation - this is particularly so if you are more fond of the more modern aircraft. These will explain the workings of the aircraft in far greater detail than is possible in this manual.

From time to time, extra missions discs may be released. Each data disc consists of four sets of 48 missions (192 missions). Contact the Fourth Dimension for further information on their availability.

If you have any comments and suggestions about further improving Birds of War, then again contact us, and if demand is sufficient, we will set about incorporating your features into future versions.

The Fourth Dimension hope you have many hours of enjoyment with this game.

Happy flying!

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Final update 13th December, 1996