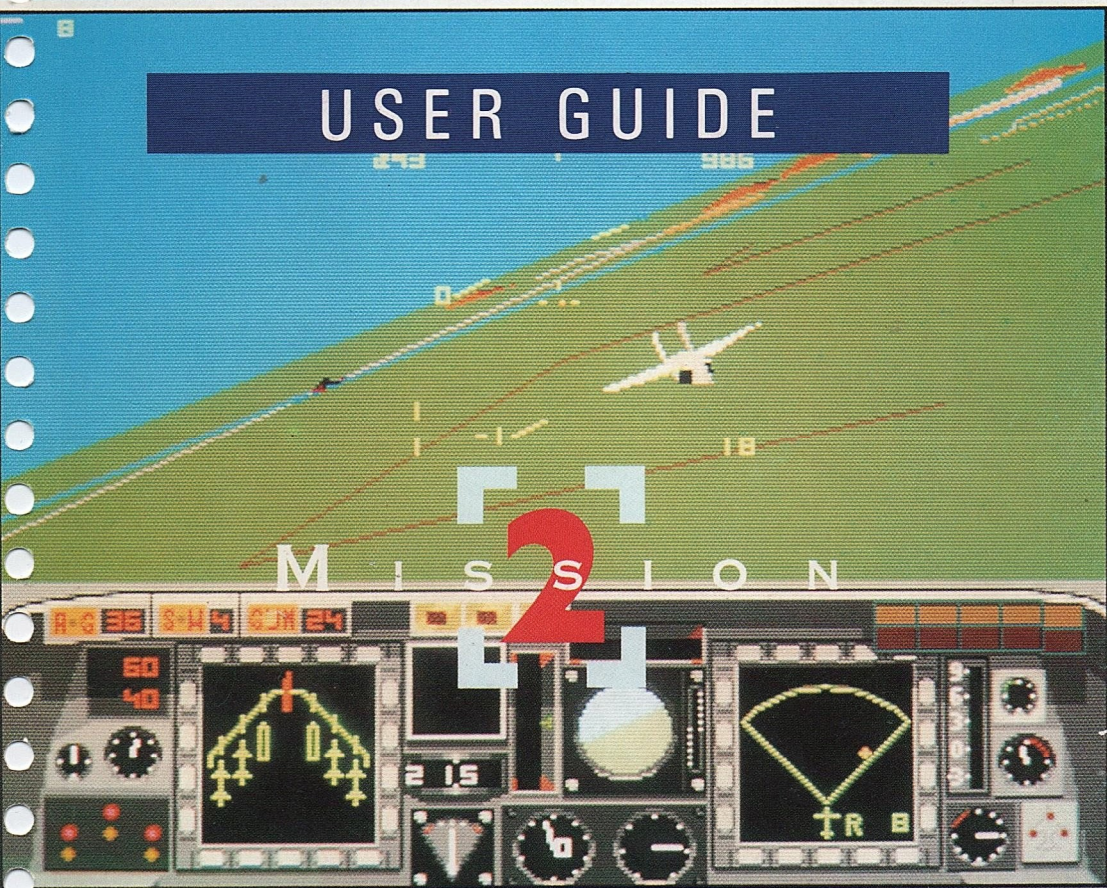


C L A R E S

# INTER DICTOR



USER GUIDE



*Fighter Pilot Control System*

FLIGHT SIMULATION



# Interdictor II

Programmed by

**Simis Ltd**

Published by

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# Keyboard Summary

## Aircraft control summary

A	Autostab on/off
B	Brakes on/off
D	Air brake on/off
E	Engine on/off
L	Landing gear up/down
<-	Rudder left
->	Rudder right
1 to 3	Mouse control power
Shift +	Full throttle
Shift -	Minimum throttle
=	increase throttle
-	decrease throttle
Keypad +	pitch trim up
Keypad -	pitch trim down
Keypad <Enter>	reset pitch trim

## Weapon control summary

G	Gun(cannon) select
S	Sidewinder select
R	Rocket select
F	Fire flares
C	Drop chaff
H	HUD on/off
\	Radar scale zoom
;	Navigation select waypoint
[	Cycle left display mode
]	Cycle right display mode

## Game control summary

Keypad #	Map page
Keypad 8	Forward view
Keypad 5	Full screen forward view
Keypad 2	Rear view
Keypad 4	Left view
Keypad 6	Right view
Keypad 9	Forward Right view
Keypad 3	Rear Right view
Keypad 1	Rear Left view
Keypad 7	Forward Left view
P	Pause on/off
N	Engine noise on/off
Q	All sounds on/off
<Ctrl> I	Select analogue joystick
<Ctrl> J	Select Delta Cat joystick
<Esc>	to quit game
<Copy>	Save state (Map page)
<Home>	Load state (Map page)

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# Making A Backup

Before using the Interdictor II disc you should make a backup copy for everyday use and put the original disc away for safe keeping. The method used for copying discs is covered in your RISC OS or A3000 User Guide.

Interdictor II can be installed on a hard disc as a RISC OS application by copying the folder !InterdII to any directory. The top level of the hard disc is the most convenient.

We have decided not to copy protect our Archimedes software discs to make life easier for you. However, this program is protected by means of colour codes which are required at the time you run the program. This procedure is detailed later.

Of course we are taking a chance in not copy protecting our software but we hope that Archimedes users will be more sophisticated and able to understand the major problems caused by software theft, for whatever reason. Please do not pass copies of this software around your friends, colleagues or school as it will only result in higher prices for all. Why should you pay increased charges so that your friends can have free software?

Please make sure that you return your registration card as we are unable to provide support or upgrades unless you are registered.

## Loading Instructions

Interdicator II runs on an Archimedes with at least 1 MB of memory and RISC OS. This includes the BBC A3000 micro.

*Note: Before running Interdicator II on a 1 megabyte machine, including the A3000, double click on the !Max application supplied on the disc.*

Interdicator II is run from the RISC OS desktop by cataloguing the disc to show the !InterdII icon and then double clicking on the icon. This pops up a box containing four colours and a grid reference. You must click on the colour which is shown at that grid reference on the colour chart supplied in the manual. You must do this twice. If you enter the wrong colour the program terminates and you must re-boot. When the correct colour sequence is entered the program runs as normal.

Interdicator II is not a desktop application and it takes over the screen and keyboard whilst running. Interdicator II can be stopped by pressing <Escape>. Depending on the amount of spare memory remaining, other desktop applications may be left running and can be resumed when you have finished running Interdicator II. It is strongly recommended that you save any important data from these applications before running Interdicator II.

# Introduction

Interdictor II is based on the Interdictor I flight simulator, and it inherits many of the original Interdictor features. It also has many new features. It has a more accurate aircraft model and a 'flying brick' model. This enables you to explore without the normal problems. For example you cannot be killed and you can fly very slow or very fast. Interdictor II has a wealth of ground detail and a large number of simulated vehicles.

Interdictor II is a blend of pure simulation and gameplay. You are in control of a high performance jet whose performance and handling characteristics have been carefully designed. The realism and responsiveness of this simulation are the most striking features of the game. The enemy actions are also simulated; there are no pre planned scenarios and the action depends on how you choose to play. There are no mission briefings or long startup sequences; you can get on with the real game immediately. The cockpit instruments do not mimic any real aircraft, they are there because they are needed and enhance the gameplay.

The view of the outside world uses no hand drawn pictures of missiles or explosions. Everything is a perspective display of a simulation. The explosions consist of hundreds of particles each following a unique trajectory under the influence of gravity. The debris from explosions consists of bits of the object falling with gravity and air resistance. Each bullet and cannon shell is modelled and the exact impact point on any object is calculated. Structures are solid and are modelled the way they appear. Trucks and cars really drive along the roads. Enemy aircraft need fuel and ammunition and they have to land at an airfield to get them.



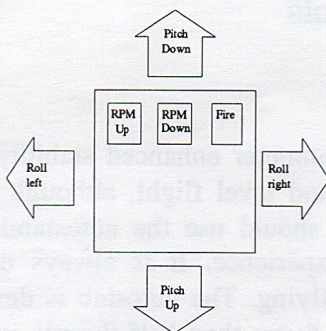
Enemy defences are combat aircraft, ack-ack guns and surface-to-air missiles (SAMS). Your weapons are 30mm cannon, air-to-ground rockets and heat seeking air-to-air missiles. You have to use the best weapon for a particular task. In general, buildings and solid structures can only be destroyed using air-to-ground missiles, whilst enemy vehicles (ground/sea/air) can be destroyed using cannon or missiles.

Interdictor II is not easy to fly and requires practice before the mission can be attempted with any hope of success. The flying tutorial chapter is provided to give a basic grounding in the art of flying a modern jet fighter and you are advised to read this chapter before starting your mission.

# Controls

Interdictor II uses the mouse and keyboard as default controls. Optionally a mouse joystick (e.g. Voltmace DeltaCat) can be used, this provides more intuitive but less accurate control. A true analogue joystick may also be used (with the games card). An analogue joystick provides both an intuitive input and very fine and accurate control.

The mouse is used to represent an aircraft joystick. Imagine that the mouse is the top of a joystick. Pushing the mouse away lowers the nose of the aircraft, pulling it towards you raises the nose. Moving the mouse left rolls left and moving right rolls right.



*The mouse controls*

The neutral position is wherever the mouse started and it must be returned to this position for no control input. The joystick position indicators on the display are useful for fine centring of the mouse. It takes a while to get used to using the mouse, but once mastered the extra control and precision makes keyboard or switched game joystick control seem inadequate.

The mouse buttons are used for throttle and firing weapons. The left button increases power and the middle button reduces power. The right button fires the selected weapon. An easy way to use the buttons, for a right handed pilot, is to have the second finger always on the fire button and to move the index finger from the left to the middle as required.

The other aircraft controls use keys on the keyboard. The keys have been chosen, where possible, to use the first letter of a word describing the key's function. Becoming familiar with the layout during training makes it easier to hit the right key while in the heat of action later.

## **Aircraft controls**

### **Autostab: 'A'**

The aircraft has computer enhanced stability. This makes it tend to return to straight and level flight, although you can still fly in the normal way. You should use the autostabiliser, autostab for short, while you gain experience. It is always useful for long distance straight and level flying. The autostab is designed for flying at half throttle. If you fly faster than half throttle in the stable position this results in the aircraft climbing and if you fly slower you slowly lose height. For combat the autostab hinders aerobatic manoeuvres and should be switched off. When the autostab is switched on the elevator and aileron are returned to the centre and it is therefore useful when you become disorientated. The easiest technique is to let go of the mouse and switch the autostab on and leave the aircraft to right itself.

## **Wheel brakes: 'B'**

The wheel brakes work on all wheels and are needed for slowing down after landing. You have to release the brakes before starting your takeoff. A useful technique is to throttle up to full power before releasing the brakes as this reduces your takeoff run. The wheel brakes will not work if you are landing with hydraulic system failure.

## **Air brakes: 'D'**

The airbrakes provide extra drag (hence the use of 'D'). This helps you to reduce speed which can be useful while in a steep ground attack or when you are going too fast on a landing approach. Slowing down also reduces your turning circle, which makes the airbrakes useful in dogfights. They operate using hydraulic power and therefore get stuck in the current position when there is a hydraulic system failure.

## **Landing gear: 'L'**

The landing gear produces a lot of drag and should be raised for normal flight to increase performance. You cannot lower or raise the landing gear after a hydraulic system failure. It is possible to land with the gear up if the descent rate is very low and the wings are almost level.

## **Centre controls: 'Z'**

The elevator and aileron are returned to their centre positions. This is useful if you become disorientated.

## **Rudder: '<-', '->'**

You will find the rudder controls most useful for steering on the ground. In the air the rudder turns the aircraft without roll, but is very ineffective. It is useful for making coordinated turns where aileron and rudder are both needed to prevent sideslip. You can use the rudder for small aiming corrections while attacking ground targets and for final heading correction while landing.

## **Engine controls**

### **Engine on/off: 'E'**

The engine must be started before the throttle controls work. The RPM dial shows minimum when the engine is on at low power and zero when the engine is off. You must switch the engine off after landing to refuel and rearm.

### **Full throttle: 'SHIFT +'**

Sets the throttle to its maximum position.

### **Minimum throttle: 'SHIFT -'**

Sets the throttle to its minimum position. The engine will idle.

### **Increase throttle: '='**

Increases the throttle setting linearly.

## **Decrease throttle: '-'**

Decreases the throttle setting linearly.

## **Pitch trim up: 'Keypad +'**

Moves the centre position for the aircraft joystick back towards the pilot, this has the effect of bringing the nose of the aircraft up when the joystick is centred. It is essential when using an analogue joystick to use the trim controls.

## **Pitch trim down 'Keypad -'**

Moves the centre position for the aircraft joystick away from the pilot, this has the effect of pushing the nose of the aircraft down when the joystick is centred.

## **Reset pitch trim 'Keypad Enter'**

Reset pitch trim to default.

## **Mouse control power: Main keyboard '1', '2', '3'**

You can choose the mouse control response that is best for your flight mode and experience. Low power (1) is useful for training, normal power (2) is useful for most flying, high power (3) is best for dogfights but makes precise control difficult. The overall mouse response is also affected by the mouse speed settings you make before running Interdictor. This is deliberate as you will probably prefer the mouse gearing that you use for other programs.

## **Weapon controls**

### **Gun: 'G'**

The gun is a general purpose 30mm cannon. It fires tracer rounds to show you its trajectory. The gun is the default weapon on start up. As soon as you take off the gun is armed. To fire press the right mouse button. You only have 250 shells so it is unwise to use very long bursts. Cannon shells will destroy enemy aircraft, trucks, SAM sites and gun emplacements.

### **Sidewinder: 'S'**

The sidewinder is an air-to-air heat seeking missile and your aircraft is equipped with four of them. When you select sidewinders the heat seeking head in the next missile to be fired is activated. When it has detected a target you will hear a locked sound and the sidewinder locked light flashes to indicate that you are locked onto a target. Pressing the right mouse button launches the missile, but only if it has detected an enemy air target. The enemy aircraft may use flares to decoy the sidewinder or may turn tightly, causing the sidewinder to miss. The sidewinder detects the heat from the hot exhaust of the aircraft, so the sidewinders can only be launched from behind an aircraft.

### **Rockets: 'R'**

The rockets are gyroscopically stabilised but unguided. This means they have a flat trajectory. They have a contact fuse on the warhead which causes them to explode on contact with another object. They

are most useful against ground targets although you can destroy an aircraft with a direct hit. Bridges and buildings can only be destroyed by rockets. Trucks can also be destroyed but this is a case of overkill. You have 36 rockets, which are fired in pairs.

### **Flares: 'F'**

You will need to use infra-red flares to decoy heat seeking enemy air-to-air missiles. When you hear the missile approach warning you should fire flares. They only work against heat seeking missiles, so they are useless for radar guided surface-to-air missiles. Four flares are dropped each time and you only have 60. This means that you have to be careful not to waste them when the enemy missile is too far away.

### **Chaff: 'C'**

Chaff is a cloud of fine metal strips designed to scatter radar signals. Enemy surface-to-air missiles are radar guided and can be confused by chaff. However it disperses slowly and works best if dropped before a SAM is actually launched and the chaff is between you and the SAM. You have 40 units of chaff and two units are dropped each time.

### **Hud on/off: 'H'**

Turns the head up display on/off. The reversionary Level Flight Display, LFD is still displayed when the HUD is turned off.



## **Radar scale: '\'**

The radar starts with a range of 30 Km. You can change the range to zoom in to 15 and 8 Km. You should approach hostile territory with the radar on full range and reduce it for air combat.

## **Waypoint select: ';''**

Pressing the ';' key cycles through the four waypoints shown in the Navigation display. The currently selected waypoint is highlighted in yellow. The heading indicator, called BUG, is shown on the HUD as a yellow vertical line. To head towards the currently selected waypoint ensure that the BUG lines up with the inverted T sight.

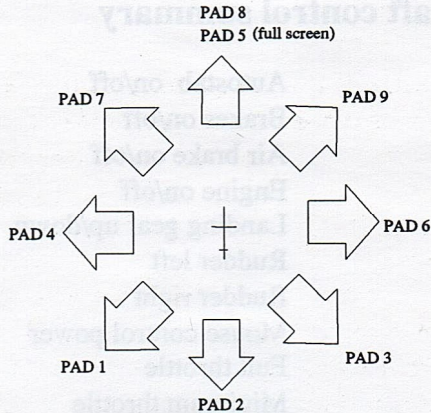
## **Display modes: '[' , ']'**

Each head down display can show one of 4 modes. These are: radar, weapons, navigation and situation. You can choose which mode you prefer on each display. You cannot have the same mode on both displays.

## Game controls

### View direction:

The diagram opposite shows the directions available from the keypad.



### Pause: 'P'

You can pause the game at any time by pressing 'P'. Pressing 'P' again continues the game.

### Engine noise: 'N'

You may find the engine noise irritating. Pressing 'N' switches it off but leaves the other noises on. Pressing 'N' again switches it back on.

### All noise off: 'Q'

For that late night mission you can disable all sounds by pressing 'Q' for quiet. You will have to rely on the warning lights for missile approach and sidewinder lock. Pressing 'Q' again switches the sounds back on.

## Aircraft control summary

A	Autostab on/off
B	Brakes on/off
D	Air brake on/off
E	Engine on/off
L	Landing gear up/down
<-	Rudder left
->	Rudder right
1 to 3	Mouse control power
Shift +	Full throttle
Shift -	Minimum throttle
=	increase throttle
-	decrease throttle
Keypad +	pitch trim up
Keypad -	pitch trim down
Keypad <Enter>	reset pitch trim

## Weapon control summary

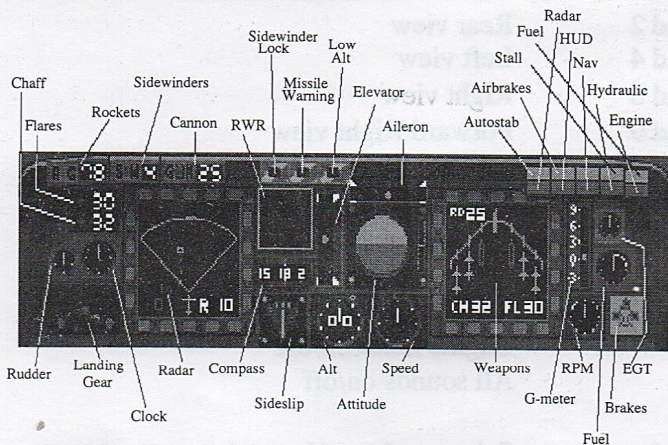
G	Gun(cannon) select
S	Sidewinder select
R	Rocket select
F	Fire flares
C	Drop chaff
H	HUD on/off
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;	Navigation select waypoint
[	Cycle left display mode
]	Cycle right display mode

## Game control summary

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Keypad 1	Rear Left view
Keypad 7	Foward Left view
P	Pause on/off
N	Engine noise on/off
Q	All sounds on/off
<Ctrl> I	Select analogue joystick (see ReaMe file on disc)
<Ctrl> J	Select Delta Cat joystick
<Esc>	to quit game
<Copy>	Save state (from Map page only)
<Home>	Load state (from Map page only)

# Displays

The instrument panel has been carefully designed to give you the information you need to fly Interdictor.

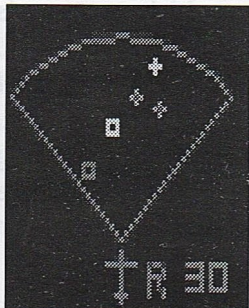


*The instrument panel*

The two main electronic displays, labelled Radar and Weapons above, can each be in one of four modes. The modes can be selected by pressing the keys '[' and ']' for left and right respectively. This causes the displays to be toggled from one display to the next. The four modes are:

**Radar**  
**Weapon**  
**Navigation**  
**Situation**

## Radar display



The radar display shows radar signals in the cone of view of the radar, which is about 45 degrees around the nose of your aircraft. As in real life some signals are due to your radar reflecting from air targets and some are due to enemy airfields and SAM sites illuminating your aircraft. The radar can distinguish between different signals and displays an appropriate symbol to indicate what it has detected:

Green squares - enemy fighters

Yellow squares - enemy cargo planes

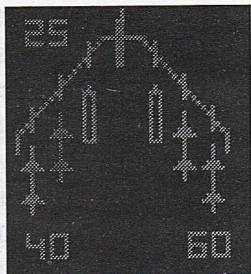
Red crosses - are SAM sites

Yellow crosses - enemy airfields

Blue crosses - captured airfields

The radar display shows the positions and ranges of targets relative to your position and heading. There is no height information. The maximum range (in Km) can be varied using the ` key. This toggles the range from 30 to 15 to 8 and back to 30. Targets that are too close are not displayed so you should use the 8 Km range for dogfights.

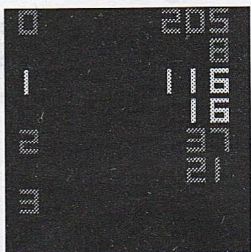
## Weapons Display



The weapons display shows which weapon is currently selected by changing its colour to red. The display is a plan view of the aircraft indicating that you have a single central cannon, 2 wing mounted rocket launchers and four wing mounted sidewinders. When sidewinders are selected the next missile to be launched is shown in red and the symbol vanishes when it is fired.

The number at the top left indicates the number of cannon rounds remaining, to the nearest ten. So 25 is equivalent to 250 shells. The lower left number shows the number of chaff left and the lower right number is the number of flares left.

## Nav Display



The navigation display shows the range (in Km) and the compass bearing to the four waypoints, which are set on the map page. The currently selected waypoint is displayed in yellow. If the HUD is on, the bearing to the currently selected waypoint is displayed as a yellow line in the heading tape (see HUD section).

## Local Situation Assessment Computer (LOCSAC)



The LOCSAC is a computer generated display combining information from radar, infra red, and low bandwidth camera sources. The on board computer uses data from these detectors to put together a picture of the surrounding airspace (for a range of 5Km). The LOCSAC display presents this information to you as a heading up plan view. The interdicator is shown as a green aircraft symbol in the centre of the display. Enemy aircraft being tracked are shown as a short coloured line with a white dot behind it. The direction of the line shows the relative heading of the enemy. The position on the display represents the relative position of the enemy. The white dot shows the last recorded position of the enemy and the direction of the coloured line indicates the heading of the enemy relative to you. The colour of the line indicates the height of the enemy aircraft relative to you.

*Blue = enemy aircraft is more than 100M above interdicator.*

*Red = enemy aircraft is within 100M of interdicator altitude.*

*Green = enemy aircraft is more than 100M below interdicator.*

The display above shows three enemy aircraft within 5Km of the interdicator:

The blue line (1) shows an aircraft above you about 3Km in front and to your right travelling towards you.

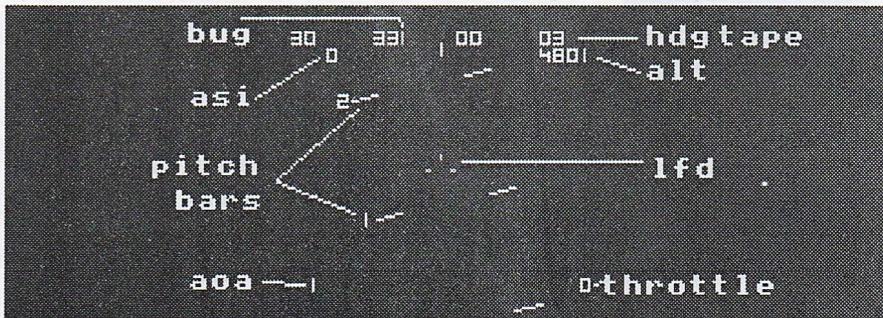
The red line (2) shows an aircraft about the same altitude as you,



2Km to your right and travelling away from you.

The green line (3) shows an aircraft below you about 3Km behind you and travelling away from you.

## Head up Display



*The head up display*

The head up display has been made simple to avoid obscuring the outside world. The most important features are the lines. These are called pitch bars and stay parallel with the ground at all times. You can therefore use them to recover from unusual attitudes and to keep you wings level when the horizon is not visible. The lines are at 10 degree intervals with a cross at 90 degrees. When you see the cross you are either heading straight up or straight down.

The number at the top left, ASI, is airspeed in knots. The number at the top right, ALT, is altitude in feet.

The heading tape, hdgtape, shows compass bearing. The BUG is an

indicator of the heading to the currently selected waypoint. When it is central you are on target.

The small symbol in the middle, the LFD or Level Flight Display, is where the centre of the fuselage is pointing. This can be used to aim the cannon and rockets.

The bottom left number is the Angle of Attack, AOA and the right number is the throttle setting.

## **Warning and Status Displays**

The most important warning display is the radar warning receiver (RWR). This is situated just above the compass. The RWR shows the relative bearing of an enemy radar signal. A green line indicates an enemy aircraft and a red line indicates a SAM. The lines only appear when an enemy radar is pointing at you. The lack of a line does not mean there is nothing close, merely that nothing is heading towards you. However an enemy has to point towards you in order to attack so you will get some warning from the RWR.

The three indicators at the top left of the instrument panel are for the weapons. These are, from left to right, rockets, sidewinders and cannon. A green lamp indicates the currently selected weapon and the number is the number of that weapon left.

The three green and yellow squares at the top centre of the instrument panel have red warning lamps which illuminate when they are active.

## **Sidewinder lock**

The left indicator indicates that you have sidewinder lock on an enemy aircraft and can launch a missile.

## **Missile approaching**

The centre indicator is an infra-red missile approach warning and indicates that an enemy air-to-air missile is approaching.

## **Low altitude**

The right indicator is a low altitude warning which operates when you are below 300 feet with landing gear up.

## **Indicator lamps**

There are five indicator and warning lamps in the top right corner of the instrument panel. The upper half of each is an indicator:

1. Green - Autostab engaged.
2. Green - Airbrakes on.
3. Not used
4. Orange - Stall warning; the aircraft angle of attack is too high, the nose must be lowered to regain normal flight.
5. Low fuel warning; you should land to refuel.

The lower halves are red warning lamps, numbered from left to right:

1. Radar failure.
2. HUD failure.
3. Navigation system failure.
4. Hydraulic system failure; your landing gear and airbrakes are stuck in their current position and your wheel brakes will no longer work. You should attempt a landing for repairs.
5. Engine failure; your engine has been damaged, it produces only low power. You can reduce power by switching off the engine. You should land for repairs.

## **Landing gear**

At the bottom left of the instrument panel a group of three lamps indicates the landing gear state. The upper, red, lamps indicate gear up and the lower, green, ones indicate gear down.

## **Wheel brakes**

At the bottom right of the instrument panel three red lamps indicate the wheel brake state. The lamps are on when the brakes are on.

## **Gauges and Instruments.**

Starting from the left and just below the indicator for the number of rockets remaining the instruments have the following uses:

## **Flares**

The top number is the number of flares left, with a firing indicator which flashes when you have fired a flare. You start with 60 flares and use four each time that you fire flares.

## **Chaff**

The next number down is the number of chaff left, with a firing indicator which flashes when you have fired some chaff. You start with 40 chaff and two are used each time.

## **Rudder**

The leftmost dial is rudder position indicator. It moves left for left rudder and right for right rudder.

## **Clock**

The second dial from the left is a clock showing minutes since the game started.

## **Compass**

To the right of the lefthand electronic display is a compass showing your heading in tens of degrees. Zero is equivalent to North.

## **Sideslip indicator**

Below the compass is a sideslip indicator. Sideslip is when the aircraft is skidding sideways in the air. The indicator is useful for performing coordinated turns using the rudder to reduce the effects of sideslip.

If the indicator reads to the left, you are slipping left and should bank less or use left rudder to coordinate the turn. The same applies for banking right with the indicator reading to the right. You will often be sideslipping when you are turning steeply and should be careful when flying low.

## **Attitude indicator**

The large ball in the centre of the instrument panel is an attitude indicator. This shows your roll and pitch relative to the horizon. The blue half is up and green is down. The attitude ball is useful when your head up display has failed.

## **Elevator & Aileron position indicators**

To the left of the attitude ball is the elevator position indicator and above it is the aileron position indicator. These are both setup to show the slightest control input so that you can centre the mouse precisely. The pointer triangle goes red when the control position is off the display range.

## **Altimeter (ALT)**

Below the attitude ball are two dials. The left dial is your altitude. The number in the middle is height in thousands of feet and the needle indicates from 0 to 1000 feet. This means that 2300 feet is shown as 02 on the digits with the needle at the third white mark reading clockwise from the top.

## **Air speed indicator (ASI)**

The right dial is airspeed in knots. Zero is at the 12 o'clock position with each white mark being 100 knots. These last two instruments are essential when your head up display has failed.

## **Vertical speed indicator (VSI)**

To the right of the attitude ball is a vertical speed indicator. This shows your rate of climb or descent. The top half of the gauge shows green when climbing and the bottom half shows red when descending. This gauge is especially useful when turning steeply near the ground. If it shows descent you should pull up.

## **G Force meter**

To the right of the right electronic display is a thermometer type gauge. This indicates the inertial force you are experiencing due to manoeuvring. The units are in gravitational force, g for short, where one is normal gravity. The gauge moves up for positive g and down for negative g.

The rightmost dials are from top to bottom:

### **Exhaust gas temperature**

This indicates that your jet engine is working correctly.

### **Fuel gauge**

Full is at the twelve o'clock position. The needle rotates anti-clockwise as fuel is used. The rate of fuel consumption depends on engine RPM. You also have the low fuel warning indicator described earlier.

### **Engine RPM**

This shows the engine revolutions per minute which indicates the engine power. This is controlled by the left and middle mouse buttons. When the needle is straight up the engine is off.

### **Sounds**

The most useful sound is the missile approach warning. This duplicates the warning light on the instrument panel. It sounds when a missile exhaust has been detected and therefore works for heat-seeking air-to-air missiles which give no radar signal. When you hear the warning you should take evasive action, and drop some flares.

When a sidewinder is your selected weapon the heat seeking head on a missile is activated. If it locks onto a target it causes the sidewinder



lock sound. You can not launch a sidewinder before you hear the noise. The signal is accompanied by a warning indicator on the instrument panel.









# Map

The map page is accessed by pressing the '#' key on the numeric keypad. It shows the whole Interdictor II world in nine sections. You can move between the map sections using keys 8, 2, 4 and 6 on the numeric keypad. These move you up, down, left and right respectively. You cannot move diagonally on the map page.

The map also shows the state of enemy targets and the current position of enemy aircraft and trucks. You may set waypoints anywhere in the world using the map page; these are used for navigation when flying. Facilities for save/load state and selecting aircraft model are also provided on this page.

## Tactical Information

Each map is a section of the world approximately 50Km across. It shows topographic information e.g. mountains/ridges photographed by a reconnaissance aircraft flying at 37000M. Tactical information, i.e. the position of enemy vehicles, is shown by overlaying small icons representing the type of vehicle on the map. The state of enemy target positions is also shown using the same technique.

	live target		waypoint
	dead target		fighter
	live sam (red)		cargo
	dead sam (grey)		truck

*Map key*

## Waypoints

As well as providing useful information the Map pages also allow waypoints to be set. Positioning a waypoint on the map (controls outlined below) results in the latitude and longitude of the waypoint being stored in the Interdictor II navigation computer. During flight the navigation computer uses this data together with inertial navigation data to calculate the range and bearing to each waypoint. This information is displayed on the Head Up Display and the Electronic Head Down Displays. There are three programmable waypoints (1,2,3); waypoint 0 is always set to your current base.

Waypoints are used in two primary roles. Individually they mark targets to be destroyed. Two waypoints can be used together to set up an approach path to a runway, one is positioned a couple of Km from the end of the runway and the other over the runway.

## State Save/Load

The current state of gameplay can be saved/loaded from this page. The <Home> and <Copy> keys are used for this purpose.

### Save State <Copy>

This saves your current position in the world, the state of all enemy targets and also of all enemy vehicles. It effectively suspends the game allowing you to recommence play from the same position at a later time. You may only save the state of play when the Save (S) flag is showing.

## **Load State <Home>**

This loads the game state from disk. The Map display is updated to reflect the loaded game state. You may only load a state when the Load (L) flag is showing. The 'L' flag only shows at the start of a game.

The game state is saved in a file called 'state', to have multiple saved states use the RISC OS desktop to copy or rename the current state file.

## **Brick/Model**

Interdictor II has two aircraft models which you may fly. Selecting between them is accomplished using the <Space bar>. A brick/aircraft icon on the control bar shows the currently selected model.

## **The Flying Brick**

This is exactly what the name suggests, it has all the aerodynamic features of a brick (none!). It is provided to allow easy exploration of the world and familiarisation with the controls and displays. The brick cannot be killed and has limitless supplies of fuel and weapons. However, once you have used the brick in any part of the game you will be unable to save the game state (that would be too easy!).

## **The Real Aircraft Model**

This is a true force model of a jet powered fighter aircraft. See the Aerodynamics chapter for a full description of how to fly this model.

## Status Display

This shows you current progress through the world together with some statistical information relating to your performance. The nine sections of the world (Alpha-Iota) are shown in colour to indicate their current state.

Blue - Friendly

Red - Hostile

Also shown is; time taken, aircraft lost, and relative performance, which is your score.

## Map Page Control Summary:

Keypad Enter: Starts the game

Movement around the world maps:

Keypad 8: up

Keypad 2: down

Keypad 4: left

Keypad 6: right

Keypad 0: show status page

The Waypoints indicator is shown as a small square on the right edge of the status screen. You can cycle the waypoint numbers by clicking on this square or by pressing Keypad + or -. With a waypoint selected you can place or remove that waypoint.

## Waypoint control

Keypad +	select next waypoint
Keypad -	select last waypoint
Left Mouse button	set selected waypoint to position at mouse pointer on map
Right Mouse button	clear selected waypoint

# Flying Tutorial

In a computer simulation it is expensive to really turn the pilot upside down when the aircraft rolls over and so the simulated world is turned instead. This means that you stay upright in front of the screen and you see the view of the world move. When you bank over to the left what you see is the horizon rolling to the right. Remember that you are controlling the aircraft and have to use your imagination to see this as you banking relative to the world. Once you get used to this it makes flying easier and more realistic.

## Basic Training

Interdictor II starts up with you in the cockpit and the aircraft sitting facing East at the end of a runway ready to go. Only the essential instruments need to be considered at this stage. These are the Air Speed Indicator (ASI), Altimeter (ALT) and ENGINE RPM. Airspeed and altitude are available in the head up display (HUD). The only controls needed are throttle and stick (which are on the mouse) and autostab, rudder, engine start and wheel brakes which are on the keyboard.

When you are flying the rate of pitch and roll is directly proportional to the distance that the mouse is moved from its start position. This proportional input is essential for precise aircraft control; this is the reason that the mouse is used rather than a switched game joystick or the keyboard. When the game starts the position of the mouse is taken as neutral and the mouse has to be returned to that position to stop control input.

The mouse position indicators are very useful for centring the mouse and it is a good idea to use them to get a feel for mouse control. The mouse sensitivity is effected by the mouse speed setting in use prior to running Interdictor II and has been deliberately left that way to allow you to customise the control response. If you normally have the mouse on the fastest setting you may find the controls too sensitive.

## Takeoff procedure

Move your mouse to the centre of your work area. It is advisable to use a mouse mat as your work area as this gives more precise control. This is now your neutral position. Switch on autostab by pressing the 'A' key. Switch on engine by pressing the 'E' key. The RPM is now at idle. Increase power by pressing Select, left mouse button, until the RPM is at maximum. Now release the wheel brakes by pressing the 'B' key.

Let the aircraft accelerate down the runway until the air speed indicator, ASI, is 150 knots. Next move the mouse back about 1/2" being careful to avoid sideways movement which will cause unwanted roll. The aircraft will lift off and start to climb. Move the mouse forwards until the elevator position indicator is slightly down from the neutral position, again keeping roll movement as small as possible.

The aircraft should now be climbing at about 10 degrees nose up and with the ground just visible. If you have trouble holding the aircraft steady you may want to press the '1' key to reduce mouse sensitivity.

You should press 'L' to raise the landing gear which improves performance.



When you have climbed to about 5000 feet you should move the mouse forwards until the green inverted T, the sight, on the head up display is on the horizon. You should now be flying straight and level.

## **Straight and level flight**

If the green T sight is above the horizon the aircraft is climbing and if it is below the horizon the aircraft is diving. Level flight requires that the green T sight is on the horizon, and this should be practised until automatic. This is difficult to achieve at first because the aircraft will also roll and this has to be corrected by moving the mouse from side to side. The independent control of pitch and roll using a mouse is difficult to learn and requires practice. However, once you can do this you will be able to control the aircraft much better and will then have a chance of completing your mission.

When you switch on the autostab the control position is centralised so if you lose control the easiest recovery procedure is to let go of the mouse and then switch the autostab on. If it is already on then the 'A' key has to be pressed twice to get the desired effect. The aircraft will then recover to straight and level flight.

Whilst practising it is preferable to recover control without relying on the autostab. Your best procedure for this is to first get the wings level and then worry about the pitch. If the horizon is not visible you should use the lines on the head up display. These lines are always parallel to the ground and can therefore be used instead of the horizon. When the wings are level you should pitch the aircraft until the green T sight is on the horizon.

## Controlled turns

When you have mastered flying straight and level and covered at least 3 miles, your next goal is to fly to a chosen destination. Initially it is a good idea to try to land at your home airfield. The best way to find this is to press the '[' key until the Nav display is shown, this is the one with 0 in the top left. The two figures on the right are target bearing and the distance from the target. To head towards waypoint 0 you should get the BUG, the small vertical yellow bar, in the centre of the heading tape on the HUD. If you are very high your destination may not be visible below you, so you should lose height until you are at about 5000 feet.

You turn the aircraft by moving the mouse left or right to bank over. The rate of turn depends on the angle of banking, with 90 degrees being the fastest. At first you should limit yourself to 45 degrees. You will notice that the nose drops slightly as you bank over. You have to pull the mouse back slightly to keep the nose level with the horizon. The steeper you bank the more you have to pull back to maintain a level turn.

On a fast jet the rudder is almost useless for turning. This is because you need to bank over to get the lift from the wings to pull you round. When you are banked over, the elevator becomes more vertical and is therefore much more use than the rudder. When you are banked at 90 degrees the rudder will just raise and lower your nose relative to the horizon. The elevator provides all the turning control.

When you have spotted a destination, like an airfield, you should roll the wings level to fly towards it. Remember to always roll before

pitching, you can only easily control your pitch when your wings are level. If your destination is to the right of you, you should bank right to head towards. If the destination is to your left you should bank left.

## Landing

Once you can fly a controlled course the next problem is landing. The secret here is to line up with the runway whilst you are still a long way off. This allows you to make a controlled descent. The green inverted T indicates where the aircraft is going in both heading and pitch, so placing it, and keeping it, on the near end of the runway means that the aircraft will fly to reach that point.

The engine RPM has to be reduced as you fly towards the runway so that you cross the start of the runway at between 150 and 200 knots, the exact throttle setting depends on how steeply the aircraft is descending, the steeper the dive the faster it goes. You should cross the start of the runway with less than 100 feet of height and continue to lose height until about 20 feet up. The nose can then be raised by gently moving the mouse back until the green T is pointing just below the horizon. The aircraft will continue to descend until it lands. The throttle should then be reduced to idle and the wheel brakes put on. The aircraft will then slow to a halt.

If your descent rate is too high or your wings are too far from the level position you will crash instead of landing. You are then taken back to the start point of the game.

If the aircraft needs to be steered on the ground after landing, the rudder should be used. This gives nosewheel steering on the ground.

Pressing the left arrow key turns left and the right arrow key turns right.

## **Setting Waypoints**

Before setting off to capture an enemy target it is advisable to set waypoints, which will help with your navigation. We assume that you are starting from scratch for this exercise. Waypoints can be moved to other targets at any point in the game. To set a waypoint press '#' on the numeric keypad which takes you into the map display and shows you positioned on runway Alpha. Press the '6' key on the numeric keypad, which displays the area around runway Beta. The current waypoint marker in the box at the right of the screen shows a '1'. You can see a red castle by the river. This indicates a target. Click on the red castle with Select and you will see a number 1 in a four cornered box. If you then click on the waypoint box at the right side of the screen it toggles to number 2. Now click with Select on the runway of airfield Beta.

You can now use these waypoints to find your way to the relevant targets, as described earlier in the section on controlled turns.

## **Weapon aiming**

Once you can take off and land the next problem is aiming the weapons. The game starts with the cannon selected but you will be best using rockets for this exercise. When you are airborne press the 'R' key to select rockets. Pressing the right mouse button launches two rockets but don't waste too many as you will need them soon.

The easiest targets to start with are the buildings near the Beta runway and the building at the airfield itself. The previously set waypoints will help you to get to these targets. Press the '[' key to display the Navigation display and then press ';' to select waypoint 1. The selected waypoint is highlighted in yellow. Now turn so that the yellow BUG is in the centre of the heading tape on the HUD. This means that you are flying towards target 1. The information on the Navigation display shows the bearing and distance to target.

When you arrive at your target you will need to descend towards the target. It is advisable to put your airbrakes on by pressing 'D' and to slow down. To destroy the target buildings you will need to use rockets. There are no defences in this arena so you will not be shot down. Having eliminated the buildings at the first waypoint you should press ';' to select waypoint 2 and proceed as above. When you have eliminated these buildings the flag at the airfield turns blue to indicate that you have captured it. You can then land on the runway and save your state by pressing the <Copy> key whilst on the Map or Status display.

## **Aerobatics**

When you have mastered the basics of controlling the aircraft you should practice aerobatic and precision flying. Interdictor II has an aircraft model which can perform any aerobatic manoeuvre that a fast combat jet can perform.

### **Steep turn**

Bank to 90 degrees and then pitch up hard. Keep the roll input at zero.

## **Loop**

Start by flying level on full power. Pitch up keeping your wings level. Use the pitch bars in the HUD to stay level. Cut back on power when inverted to prevent excess speed during the second half. The only problem is avoiding unwanted roll input movement.

## **Roll**

Use full roll input while keeping the pitch input at zero. Return the mouse to centre before the wings are level to allow inertia to complete the roll. If the nose drops during the roll use rudder and elevator to keep it up.

## **Stall**

Reduce power and hold the nose up whilst slowing down. When the angle of attack exceeds 15 degrees the wing will stall. Your elevators are so powerful that you may be able to hold the nose up, even whilst stalled, so you may have to return the elevator to neutral to recover.

## **Tail Slide**

Fly upwards at about 70 degrees pitch up under full power. Cut the power to idle whilst holding the nose up. The aircraft should start to fall backwards and the nose will drop. Use down elevator to drop the nose faster. Keep down elevator on until the stall warning light goes out, and then pitch up to recover.

## **Immelman Turn**

This manoeuvre is very useful for coming back for another attack on a ground target, especially a truck. Use full power and pitch up as if doing a loop. When the aircraft is inverted cut the power and roll 180 degrees until the wings are level and you are flying the opposite way. Don't forget to restore the power.

## **Horizontal Figure 8**

Start with full power and pull up to 45 degrees. Roll through 180 degrees and continue to climb at 45 degrees. When you are high enough pull back and loop round until you are again climbing at 45 degrees. Roll 180 degrees and repeat for the second half of the 8.

There are many other manoeuvres you can find in aerobatic displays or invent for yourself.

# Scenario

## The Interdictor II World

The Interdictor II world is approximately 10,000 square kilometers, with hundreds of kilometers of roads, river and railway. There are nine combat arenas, each with an airfield at its centre. Reconnaissance photographs have been used to produce a map of this world, each of the nine arenas has been designated with a character from the Greek alphabet (Alpha-Iota).

The interdictor starts on runway Alpha, this is the only non-hostile arena. Your mission is to remove all enemy presence from the remaining designated combat arenas.

Each combat arena consists of a runway and a number of targets, these are identified of your tactical map briefing. Whilst the enemy is in control of an arena you may not land on its runway. To take control of an arena you must destroy all the targets in the arena and the hanger next to the runway.

Once in control you may use the runway as a base for future operations. If during your attack on an arena you are detected by the radar of any other active enemy arena then that arena will undertake to re-enforce the arena under attack. This will take the form of supplies carried by plane and truck. When (and if) supplies reach a runway their cargo will be deployed throughout that arena. There is no pre set order for attacking the enemy. You plan your own campaign!



## **Enemy Defences**

### **Anti-Aircraft Artillery (AAA)**

AA guns are used to defend enemy runways and targets. They fire cannon shells. They can be destroyed by either cannon or rocket.

### **Radar Guided Surface-to-Air Missiles**

Surface to Air Missile Sites (SAMs) are used by the enemy to protect areas of land. They have a ground based radar which will track the Interdictor and guide the SAM missiles. This radar may be confused by chaff. The radar may be avoided by flying a ground hugging profile. (i.e. flying below 300 feet). The effective range of the radar and the release rate of the missiles may vary. SAM sites can be destroyed with cannon or rockets.

### **Fighter Aircraft**

The enemy fighter aircraft have similar flight performance to the Interdictor II model. They are armed with cannon and heat seeking missiles (for which flares may be used as a decoy). They can be destroyed with any of your weapons.

### **Cargo Aircraft**

Cargo aircraft carry a maximum of eight supply trucks (and usually less). They have no armament, but they have radar. They will track the Interdictor as it approaches and attempt to deploy all the cargo before potential destruction. The cargo aircraft have Infra Red Suppression

capability which effectively renders heat seeking missiles useless, so cannon is the only potent weapon you have.

## **Tanks**

Tanks are armed with unguided ground to air rockets.

## **Trucks**

Trucks are used to transport supplies to enemy airfields. When a truck arrives at an airfield its cargo is used to re-enforce to area of the world surrounding that airfield.

## **Buildings and Structures**

Buildings and large ground structures must be destroyed using Air to Ground Rockets.

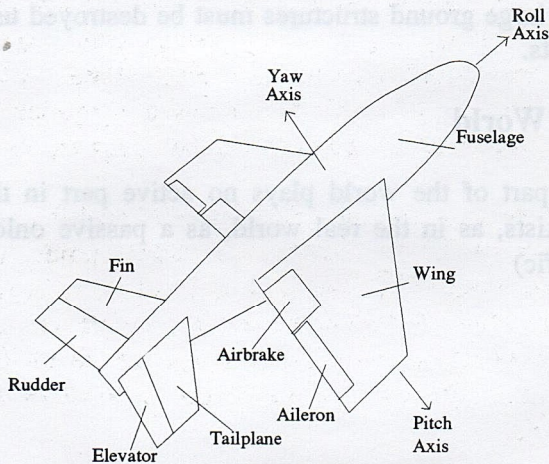
## **The Passive World**

A significant part of the world plays no active part in the combat scenario. It exists, as in the real world, as a passive onlooker. (e.g motorway traffic)

# Aerodynamics

This chapter is a brief introduction to the way aircraft fly and are controlled. It is not essential to the game but it provides some background into how aircraft behave.

An aircraft is free to move in any direction at any angle. It can fly upside down or dive straight towards the ground. This can cause problems with the meanings of words like up and down. In this chapter all these words are relative to the pilot of an aircraft and not to the outside world. This means that up is always the direction of the top of the head even if the aircraft is upside down and this direction points towards the ground.



*Aircraft parts*

A real aircraft is flown using a joystick and rudder pedals. The joystick moves freely backwards and forwards and from side to side. Sideways motion moves the ailerons, which causes the aircraft to rotate about the roll axis. Moving the stick right rolls the aircraft to the right. Backwards and forwards motion moves the elevator which causes the aircraft to rotate about the pitch axis. Moving the stick back pitches the nose up. The rudder pedals move the rudder, which causes rotation about the yaw axis. Pressing the right pedal yaws the nose to the right. Interdicator uses the left and right cursor keys in place of the rudder pedals.

The controls of an aircraft are such that it continues to move in a particular direction whilst there is control input and stops moving any further in that direction when the control is neutral. To level the aircraft an opposite control is required. For example if the aircraft is in level flight with neutral controls, and the joystick is moved left then the aircraft will roll left, the further the joystick is moved the faster the roll rate. When the desired angle of roll is reached the joystick has to be returned to neutral. To level the wings the joystick has to be moved right and then back to neutral when the wings are level.

An aircraft flies because its wing generates lift. This lift always points upwards. The aircraft also has weight which always points towards the ground, but not necessarily downwards. In level flight lift is equal to weight. The amount of lift depends on the speed of the aircraft and the angle of the wings to the airflow. This is known as the angle of attack. The slower the speed of the aircraft the higher the angle of attack must be to maintain lift.

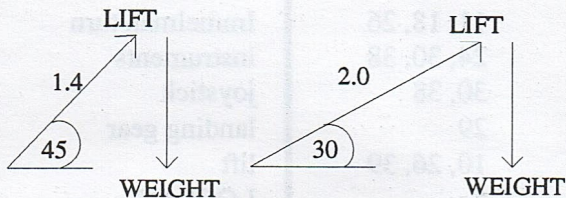
In a trimmed condition at a given speed the angle of attack is kept

correct by the tailplane which acts in the same way as the flaps on an arrow to keep the aircraft flying forwards. The angle of the tailplane is set by the elevator, which is a part of the tailplane that can be tilted by moving the joystick back and forward. Moving the joystick back tilts the elevator up. The elevator then deflects air upwards causing the tail of the aircraft to drop. This causes the angle of attack to increase, producing more lift and causing the aircraft to move up. This upward motion reduces the angle of attack and therefore the lift so the aircraft becomes stable at a new angle.

To the pilot this process is normally seen simply as the nose of the aircraft moving up whenever the joystick is moved back and vice-versa. However the situation is complicated because the wing only produces more lift at greater angles of attack up to about 15 degrees. At this point the lift suddenly reduces and the wing stalls. In level flight this means that the aircraft weight is greater than the wing lift so the aircraft starts to fall towards the ground which causes the nose to drop, the speed to increase and the angle of attack to reduce until the lift is again sufficient to support the weight.

The other balance required for stable flight is between engine thrust acting forwards and drag acting backwards. Drag varies with speed squared, which means that the faster the aircraft goes the more power is required to cause a fixed speed increase. In steady flight for a given power setting there is a speed at which drag matches thrust. A high performance aircraft has a maximum thrust of over 1 g, which means it can climb vertically until the air becomes too thin to provide power. When pointing straight down gravity adds to thrust giving maximum speed

The situation becomes more complex when the aircraft is rolled over. The lift from the wings always acts upwards, so if the aircraft is banked over at 45 degrees the lift has to be 1.4 times greater than normal to match the weight. At 60 degrees lift has to be twice normal. The diagram below shows this.



The extra lift acting at 90 degrees to gravity moves the aircraft sideways. Due to the stabilising effect of the tailplane and fin this causes the nose of the aircraft to turn. The maximum that most pilots can take is 8 times normal gravity, and this corresponds to an 80 degree bank turn. At more than 80 degrees, if the nose of the aircraft is level with the horizon the aircraft will lose height. A 90 degree bank turn can only be maintained by pointing the nose up with the rudder and using engine power for lift.

In a dogfight, high gravity (g) manoeuvres are normal and the extra 1g acting towards the ground becomes less significant. The important thing is to roll until the target is 'above' the aircraft so that the aircraft can be turned towards the target using only pitch. 'Above' means above the pilots head, which if the aircraft is flying upside down means towards the ground. The importance of gravity is to trade height for speed, which means the higher aircraft usually has an advantage. Therefore, a useful attack position is to be flying level upside down above the target. You can then use pitch only to position the target in your sights.

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