

Beechcraft Baron 58



Description Of The Basic Autopilot

General information

Note Autopilot functionality can be different between aircraft. Some of the AP functions are not final in the early access version.

You can control the autopilot by two different ways.

- You can control the autopilot from the cockpit using the mouse and mouse wheel, or with your VR controllers (VR Mode).
- You can bind autopilot controls to your keyboard keys or controller buttons for convenience (Settings/Controls/Autopilot).

The autopilot can stabilize the heading, airspeed, altitude as well as the vertical speed. The autopilot cannot be switched on/off and will disengage when one of the following limits is exceeded:

- bank angle larger than 60 degrees
- pitch angle larger than 45 degrees
- airspeed less than 1.2 times the stall speed
- when the aircraft is on the ground.

Autopilot modes

WINGS LEVEL (ROL)

In this mode the autopilot will attempt to keep the wings level (ROL)

PITCH ALTITUDE HOLD (PIT)

The Pitch Attitude Hold (PIT) mode allows constant attitude climbs and descends.

AIRSPEED (SPD)

The airspeed mode / auto-throttle will adjust the engine power to keep the selected airspeed. The target airspeed is shown in magenta at the virtual cockpit and can be changed by individually programmed buttons or keys.

HEADING HOLD (HDG)

The heading hold mode can be activated and deactivated by tapping on the heading indicator. The box around the heading will change its color to green to indicate the heading is controlled by the autopilot. If no heading was selected, the current heading will be selected and shown in magenta. The target heading can be changed by tapping the + / - buttons below the heading indicator. Pressing these buttons repeatedly will change the selected heading by 5 degrees. The target heading can be changed while the heading mode is engaged, the autopilot will then turn the aircraft to the selected heading.

ALTITUDE HOLD (ALT)

Hold a constant altitude. This mode is perfect for cruise flight at a constant altitude. Tap the altitude indicator to activate this mode. When engaged, the autopilot will climb / descend to the target altitude and level off. The vertical speed in this phase can be selected by using the + / - buttons below the vertical speed indicator . When the target altitude is changed by tapping the + / - buttons below the altitude indicator, the autopilot will initiate a climb / descend to the new altitude. The vertical speed for this will be the last selected vertical speed, provided it has the right direction. If a descent would be required to reach the new altitude and the last selected vertical speed was a climb at 1000 ft/min, this would be changed to a default of -1500 ft/min and vice versa.

Vertical speed (V/S)

Climb / descend at a constant rate. When engaged, the autopilot will try to climb / descend at the selected vertical speed. If the aircraft cannot climb at the selected vertical speed, it will loose airspeed until the autopilot descends at minimum speed. This mode can be selected by tapping the vertical speed indicator. The v/s mode will override the altitude mode, so this can be used to leave an altitude that was previously held constant by the autopilot. On the other hand, if the altitude mode is active, the vertical speed mode will disengage 500 ft before reaching the target altitude to allow levelling off and avoid crossing a selected altitude.



Two axis stabilization (ROL + ALT)

The easiest way to use the autopilot is the ROL/ALT mode. The ROL mode will be enabled automatically if you start the autopilot via the (AP) button on the autopilot panel.

After that press the (ALT) button on the panel. Now the aircraft will be stabilized automatically.

Heading mode (HDG)



- Click the (AP) button to activate the autopilot
- Click on (HDG) button to activate the Heading Mode. You also will see “HDG” on the panels display

Note - To change your heading manually, turn the heading indicator bug until your new heading is achieved. You can use your mouse wheel to turn the heading bug.



- You can change the altitude by turning the select knob (mouseover and mouse wheel).
- Click on “Arm” to activate the selected height
- Click once again on “ALT” to activate the Pitch, displayed by “PIT”
- Click repeatedly on “UP” or “DN” to select the climb/descend rate

Note - Setting up the autopilot in this way will target the preset height and will hold the flight level automatically. At this point you can change the flight level by pressing the “up” or “down”.

Vertical speed mode (VS)

The vertical speed (VS) mode allows variable vertical speed climbs and descents.



- Click on (AP) to activate the autopilot
- Click on (VS) to activate the vertical speed Mode
- Click on (UP) or (DN) to select vertical speed rate
- Control the rate by the vertical speed indicator or climb rate on your instrument panel

Note - You can now add the heading mode by clicking on (HDG) if preferred. You can control the course via the “HDG” select knob and climb rate with the “UP” or “DN” buttons.

ILS Approach Tutorial

You are a beginner pilot just getting familiar with Aerofly FS 2. You made some VFR flights and tried some landings. **Note** - VFR = Visual Flight Rules; pilot operates aircraft under visual conditions.

Now let’s do the next step and try an ILS approach. **Note** - ILS = Instrument Landing System.

In this more complex tutorial we gather some preflight information, use both the location and navigation maps, adjust aircraft instruments, and finally do an automatic approach assisted by ILS.

Preflight Preparation

For this tutorial we will be flying into San Francisco International Airport (KSFO), and want to approach runway 19L. Open the site <http://airnav.com/airports/> and search for San Francisco, SFO, or KSFO.

Note - KSFO is the ICAO code of the airport, also shown in Aerofly FS 2.

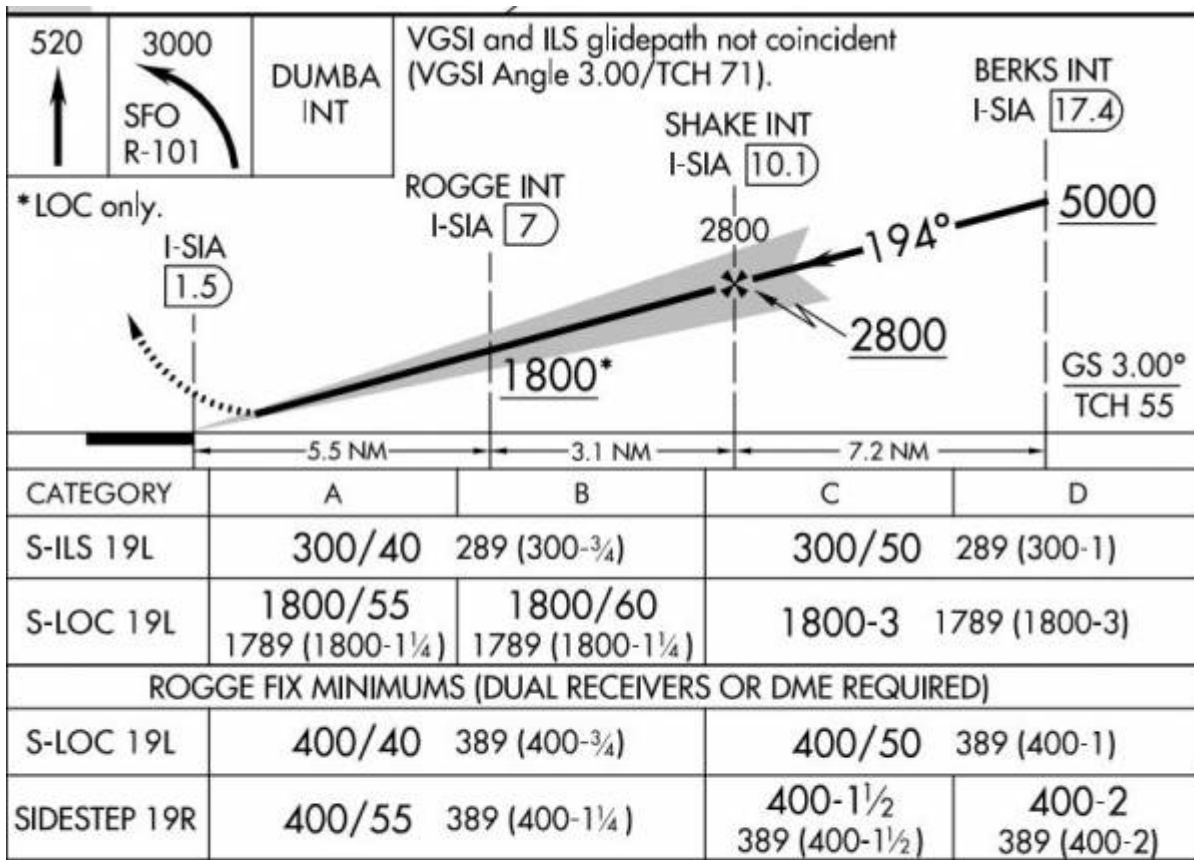
The KSFO page tells you everything that you need to know about the airport.

Scroll down to **IAPs - Instrument Approach Procedures** and open the PDF file **ILS OR LOC RWY 19L**. The layout of this file is standardized and explained in various locations of the web. To begin, we will only concentrate only on the information pertaining for us for this tutorial.

SAN FRANCISCO, CALIFORNIA

LOC/DME I-SIA 108.9 Chan 26	APP CRS 194°	Rwy Idg 8650	19L 7650	19R 7650
		TDZE 11	11	11
		Apt Elev 13	13	13

- The frequency of the localizer (LOC/DME) is **108.9 MHz**,
- *The approach course (APP CRS) is **194 degrees**.
- The available runway length (Rwy Idg) is **8650 ft**.
- The touch down zone elevation (elevationTDZE) is **11 ft**.



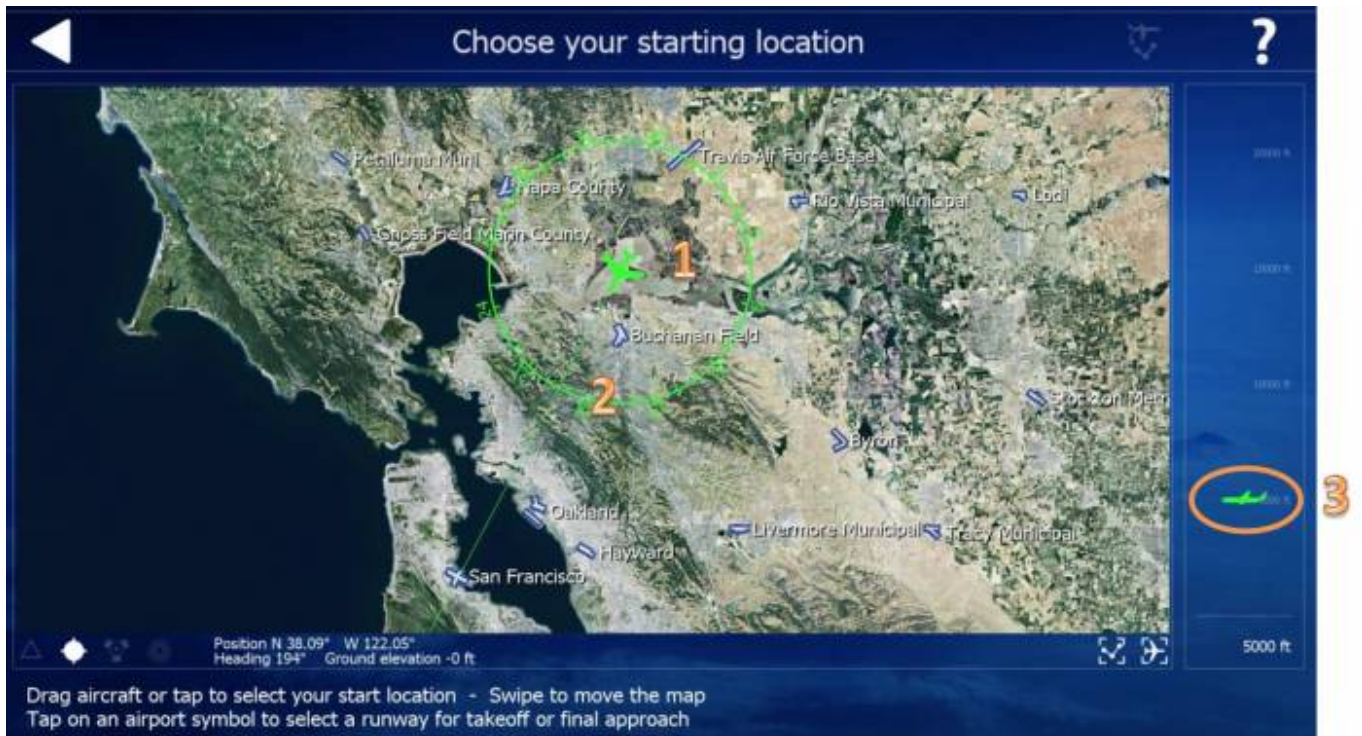
37°37'N-122°23'W
SAN FRANCISCO INTL (SFO)
ILS or LOC RWY 19L

This is the glide path to the runway. To intercept the glide path, our flight level in a distance of **17.4 nm** is at or below **5000 ft**. The final approach fix (FAF) is in a distance of **10.1 nm at 2800 ft**. Our aircraft should be in line now and follow the glide path.

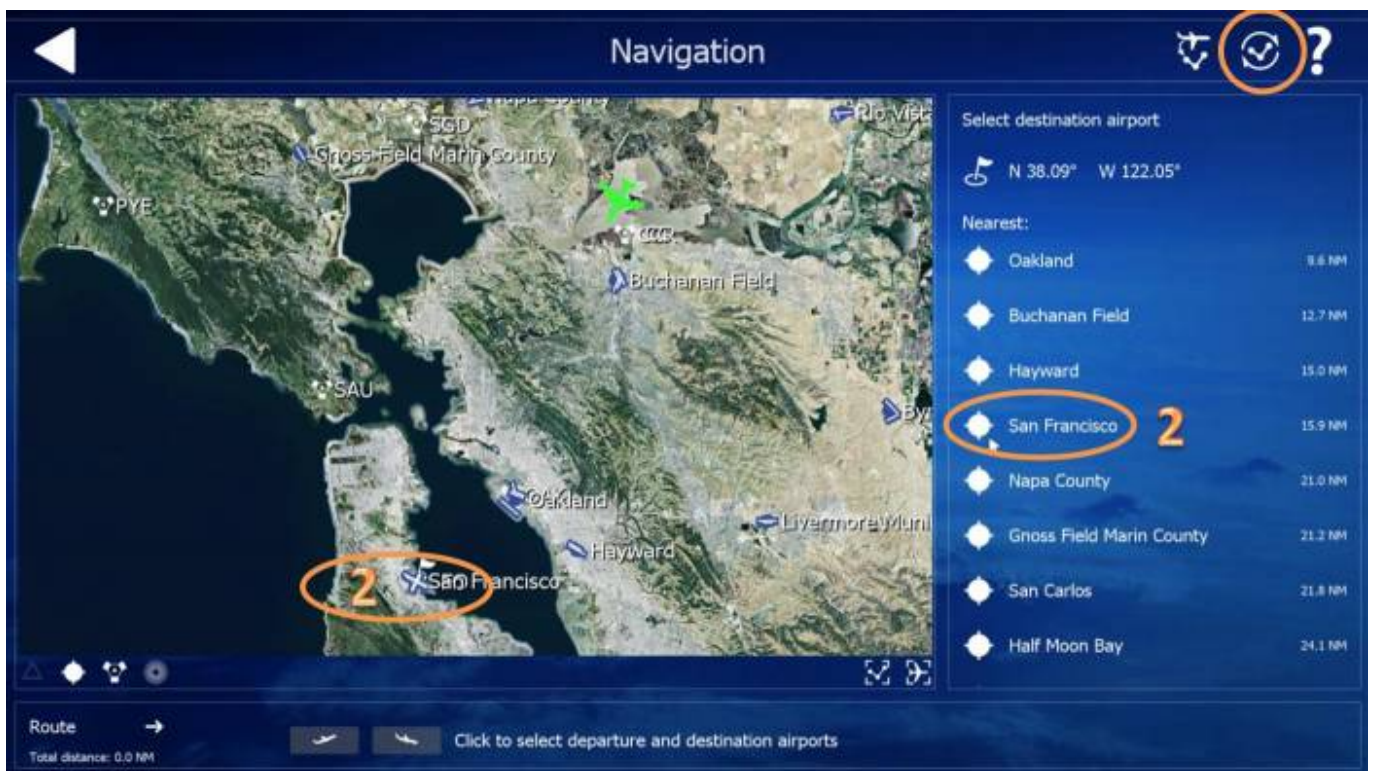
Setting Up Your Flight

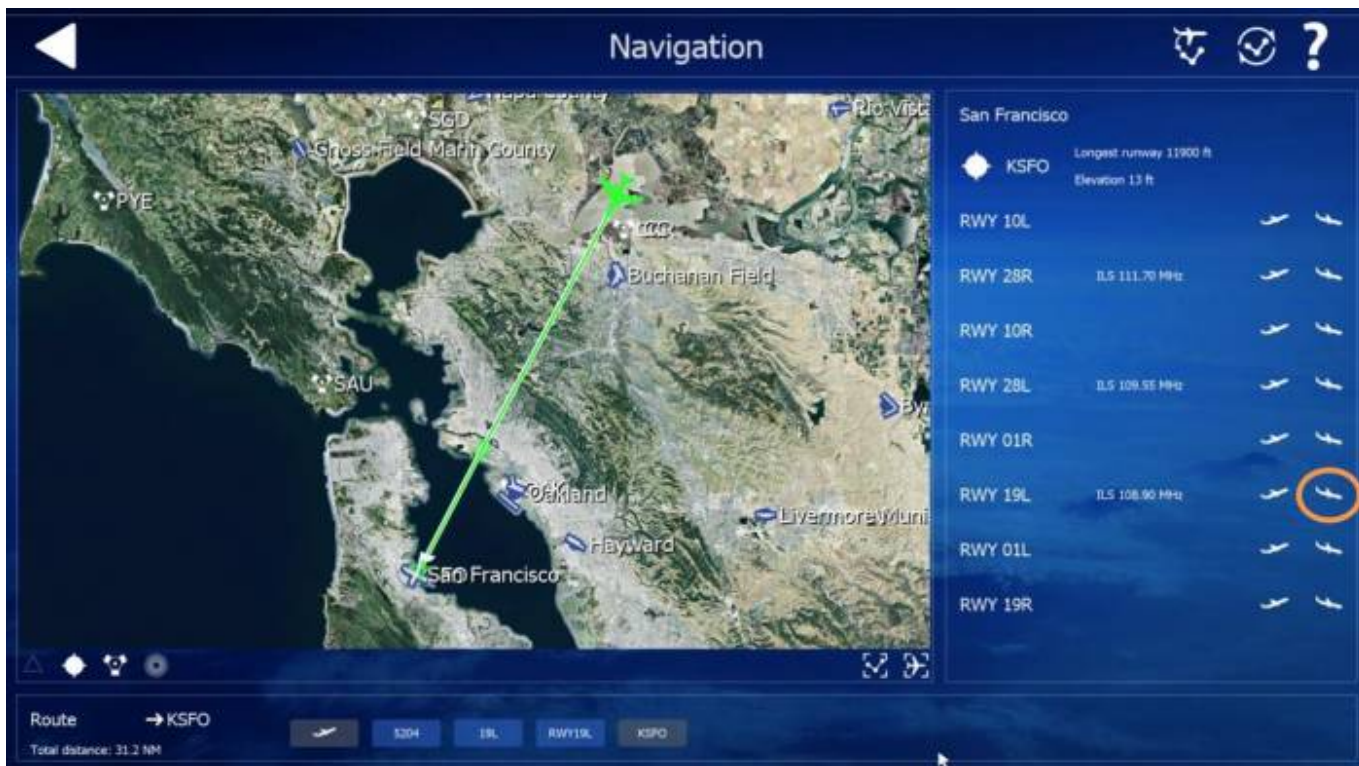
Once you have the information needed for your flight, start Aerofly FS 2. For this tutorial we are going to use the Baron 58 aircraft. **Note** - The instruments may be different in other aircraft, but the concept learned in this tutorial is basically the same.

- First select the **Baron 58** aircraft.
- Open **Location** and place your aircraft just above Buchanan Field (NE of San Francisco near position N 38.09 degrees W 122.08 degrees), turn your aircraft to face San Francisco (around 194 degrees), and set your altitude to **5,000** feet. **Note** - This will be your starting point for this tutorial.



- Leave the Location menu and enter the navigation menu.
- Delete any previous route settings
- Click **San Francisco Airport** on the map and select **runway 19L**. Take note of the additional information like the ICAO code, the ILS frequency and the total distance of 31.2 nm.





- Leave the Navigation menu and **start the simulation.**

Flying The Aircraft

- Adjust the average power, trim and level out the aircraft
- Activate the Autopilot by clicking on "AP". **Note** - This will give you time to enter your flight data.



- Turn the frequency knob of NAV 1 to 108.90. (1) **Note** - point to outer ring for large change, inner knob for decimal changes
- Press the active/standby button. The active frequency 108.90 swaps to the left. (2)
- Turn the heading knob of the HSI instrument to 194 degrees. (3)
- Turn the knob to the same direction. (4)



- The ILS is now active. Note the distance, the average speed and minutes to our destination just below the HSI. (1)
- Turn the Omni bearing selector (OBS) knob to 194. (2)
- Turn the course deviation indicator (CDI) knob to 194. *The knob is hidden behind the yoke in the below image (3)*



Fly with autopilot to your destination with course approximately 194 and flight level 4000-5000ft. **Note** - Autopilot is active.

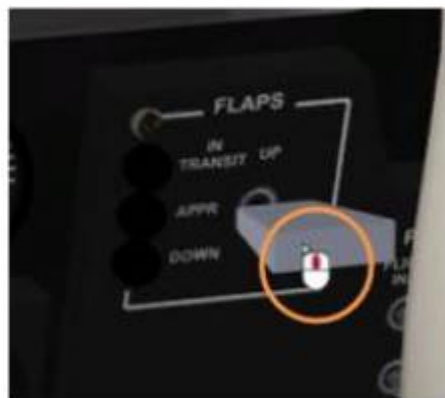


Next press the (APR) button on the autopilot. **Note** - The text APR may be displayed on the second line of the autopilot display. As soon as the signal is picked up the test will move onto the first line (at a distance of approximately 26nm). Alert may blink for a while. As soon as it gets the vertical glide path the alert disappears. This is much closer at a distance of approximately 17nm.



The navigation system will perform a complete automatic approach at this point.

- Watch your airspeed indicator and manage your speed during approach
- Set flaps during approach
- Deploy your landing gear as you approach final



The autopilot isn't certified for landing so at about 100ft above the runway you need to turn off the autopilot and take the control of the aircraft at this point.

You have now completed your first ILS approach. A special thank you to "Karl-Heinz" for the writing of this tutorial.

V Speeds

What are the v-speeds?

Symbol	Description	Indicated Air Speed
VSO	Stall speed at landing configuration	74 KIAS
VS1	Stall speed at clean configuration	84 KIAS
VR	Rotation speed (Takeoff)	85 KIAS
VX	Best angle-of-climb speed	92 KIAS
VY	Best rate-of-climb speed	105 KIAS
VFE	Max flaps extended speed	10 deg 152 KIAS

Symbol	Description	Indicated Air Speed
		10-30 deg 122KIAS
VA	Maneuvering speed; Abrupt movement	156 KIAS
VNO	Max structural speed	195 KIAS
VNE	Never exceed speed	223 KIAS
Approach		100 KIAS
Glide		115 KIAS
VLO/VLE		152 KIAS

Take Off and Landing Setup

Climb

Landing Gear	UP
Flaps	UP
Climb Power	Set
Engine Instruments	Check
Cowl Flaps	As Required
Airspeed	105-136 KIAS
Checklist	Complete

Cruise

Cruise Power	Set
Mixtures	Lean
External Lights	As Required
Fuel Boost Pumps	As Required
Cowl Flaps	As Requires
Ice Protection	As Required
HSI/Compass	Checked
Checklist	Complete

Descent

ATIS/AWOS/ASOS	Obtain
Mixtures	Adjust
Throttles	Set
Cowl Flaps	As Required
Fuel Selectors	On
External Lights	As Required
Ice Protection	As Required
Approach Briefing	Complete
Checklist	Complete

Recommended Descent Speeds (KIAS)

16,000 - 13,000 FT	160
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Below 13,000 FT	170
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Before Landing

Landing Gear	Down/3 Green
Flaps	As Required
Fuel Boost Pumps	Off Per OAT
Mixtures	Full Forward
Propellers	Full Increase
Checklist	Complete

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