Mudpond Climb Rate Test Gauge

The Mudpond Climb Rate Test Gauge is designed to find the maximum clim rate a flight model can attain at a selected air speed. The gauge provides objective, repeatable, user-independent results for a flight test parameter that has traditionally been extremely difficult to measure.

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This gauge is in reality a special purpose autopilot. It uses the FS autopilot VS mode in a proportional control loop to hold the selected air speed.

The problem with measuring a maximum sustained climb rate is that the climb rate varies considerably with airspeed, and controlling the airspeed manually in a full throttle climb is extremely difficult.

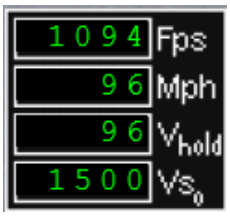
Measuring Maximum Climb Rate

1. Set the target airspeed value (Vhold). This is typically set to the optimum climb airspeed (IAS) for the aircraft. Example: 96 mph
2. Set the initial climb rate (Vso). This is best set to a value somewhat higher than the expected maximum climb rate. Example: Set Vso to 1500 fps for an expected 1000 fps.
3. Set full throttle and stabilize the aircraft at low altitude.
4. Click on the climb rate value displayed (FPS). The FPS and Mph displays turn green as shown below, and the aircraft will start to climb wings level.

After a short period of time, the Vhold and Vso displays will turn green and the gauge will start homing in on the selected airspeed (Vhold).

The gauge integrates the climb rate and airspeed, so these displays change more slowly than the instaneous values.

When the actual airspeed (Mph) and the selected airspeed are equal, the maximum sustained climb rate has been achieved. A measured climb rate of 1094 Fps at 96 Mph is shown in the following example:



To turn off the Climb Rate Test Gauge, click on the value displayed in the 'Mph' window. The gauge will capture and hold the current altitude. With the Climb Rate Test Gauge turned off, an ordinary FS autopilot can take over autopilot functions.

Notes:

If the gauge is allowed to continue running, the climb rate will continue to vary, usually within a 100 fps window.

Normally aspirated engines are more difficult to test because the power decreases with altitude; however, small general aviation aircraft will usually reach a steady climb below 5000 ft.