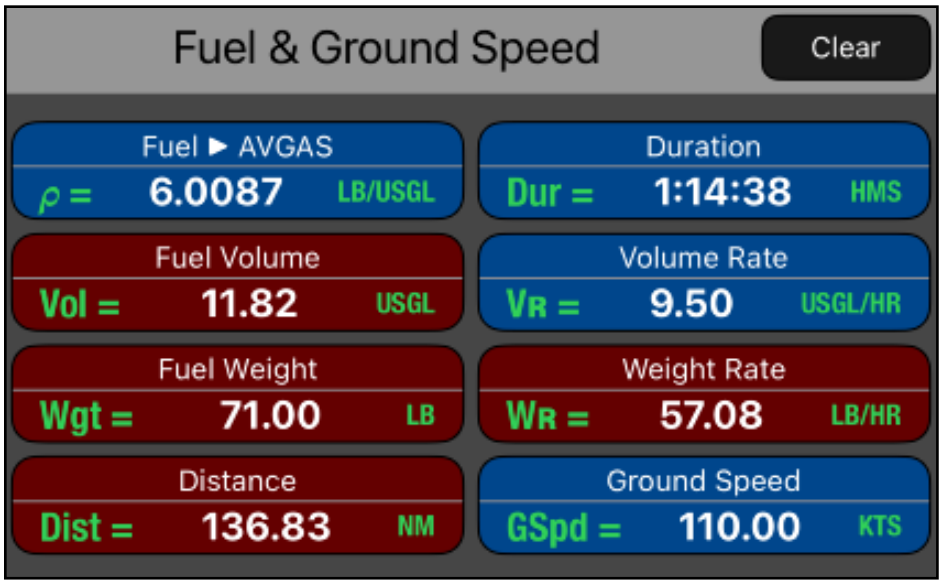
# Fuel & Ground Speed Worksheet




| Airspeed Calculations Buttons | |
|---|---|
| **Clear** | Set all variables to a invalid state keeping the current value. If it is touched again, clears all values to 0. |
| ρ | **Fuel Density:** Select the fuel density to use in the calculations. To Store a custom value use the **[STO] [ ρ ]** sequence. To select an standard type of fuel, touch the unit symbol to show the fuel menu. |
| **Vol** | **Fuel Volume:** Store or validate **Vol** value for the calculation of **Wgt**, **VR**, **WR** and/or **Dur**. |
| **Wgt** | **Fuel Weight:** Store or validate **Wgt** value for the calculation of **Vol**, **VR**, **WR** and/or **Dur**. |
| **VR** | **Volume Rate:** Store or validate **VR** value for the calculation of **Vol**, **Wgt**, **WR** and/or **Dur**. |
| **WR** | **Weight Rate:** Store or validate **WR** value for the calculation of **Vol**, **Wgt**, **VR** and/or **Dur**. |
| **Dur** | **Duration:** Store or validate **Dur** value for the calculation of **Vol**, **Wgt**, **VR**, and/or **WR**. |
| **Dist** | **Distance:** Stores or validate the **Dist** value for the calculation of **Dur** or **GSpd**. |
| **GSpd** | **Ground Speed:** Stores or validate the **GSpd** value for the calculation of **Dur** or **Dist**. |

This worksheet allows the calculation of the amount of fuel consumed over a specified time duration and consumption rate in base of volume or weight (the conversion from volume or weight is performed according to the fuel density). Also, from the same time duration calculates the distance or the ground speed.

This worksheet calculates:

- **Fuel Burn:** With the inputs of **Dur** and **VR** or **WR**, calculates the **Vol** and **Wgt** of the fuel consumed.

- **Endurance:** With the inputs of **Vol** or **Wit** and **VR** or **WR**, computes the duration time to consume all the fuel.

- **Rate of Consumption:** With the inputs of **Vol** or **Wgt** and **Dur**, computes the rates of fuel consumption **VR** and **WR**.

- **Ground Speed:** With the inputs of **Dist** and **Dur**, computes the **GSpd**.

| **NOTE: Always verify the physical units** |
|---|
| To change the units of a variable, tap over the unit symbol and select the right one from the pop-up menu. To change the whole units in the worksheet select “Set Metric Units” or “Set US Units” from the **[ UNITS▶]** button in the Navigation Bar. |

All the following examples use US units. So please select “Set US Units” from the **[UNITS▶]** menu in the Navigation Bar.

## Example 1:

How much fuel will burn in 1 hour, 14 minutes and 38 seconds at a rate of 9.5 gallons per hour ?.

Solution:

| Keystrokes | Description |
|---|---|
| **[ Clear ] [ Clear ]** | Clears all variables to start a new calculation. |
| type 1.1438 **[ Dur ]** | Stores 1 hour, 14 minutes and 38 seconds in **Dur** (the button change to blue). |

| Keystrokes | Description |
|---|---|
| type 9.5 **[ VR ]** | Stores 9.5 USGL/HR in **VR** (the button change to blue) and automatically calculates the values of:<br>**Vol = 11.82 USGL** (the button change to red).<br>**Wgt = 71.00 LB** (assumes AVGAS density).<br>**WR = 57.08 LB/HR** (assumes AVGAS density). |

## Example 2:

What is rate of fuel consumption if 9,500 pounds of fuel were burned in the last 2 hours and 30 minutes?

Solution:

| Keystrokes | Description |
|---|---|
| **[ Clear ]** | Invalidate all variables. |
| type 9500 **[ Wgt ]** | Stores 9,500 LB in **Wgt** (the button change to blue). |
| type 2.3 **[ Dur ]** | Stores 2 hours and 30 minutes in **Dur** (the button change to blue) and automatically calculates the values of:<br>**WR = 3,800.00 LB/HR** (the button change to red).<br>**VR = 632.42 USGL/HR** (assumes AVGAS density).<br>**Vol = 1,581.04 USGL** (assumes AVGAS density). |

## Example 3:

How much flight time do you have with 38 gallons of fuel on board and a power setting that gives a fuel burn rate of 9.5 gallons per hour?.

Solution:

| Keystrokes | Description |
|---|---|
| **[ Clear ]** | Invalidate all variables. |
| type 38 **[ Vol ]** | Stores 38 USGAL in **Vol** (the button change to blue). |
| type 9.5 **[ VR ]** | Stores 9.5 USGL/HR in **VR** (the button change to blue) and automatically calculates the values of:<br>**Dur = 4:00:00 HMS** (the button change to red).<br>**Wgt = 228.33 LB** (assumes AVGAS density).<br>**WR = 57.08 LB/HR** (assumes AVGAS density). |

## Example 4:

Was is the ground speed if 5 nautical miles are flown in 2 minutes and 32 seconds?.

Solution:

| Keystrokes | Description |
|---|---|
| **[ Clear ]** | Invalidate all variables. |
| type 0.0232 **[ Dur ]** | Stores 00:02:32 HMS in **Dur** (the button change to blue). |
| type 5 **[ Dist ]** | Stores -31 ºF in **OAT** (the button change to blue) and automatically calculates the value of:<br>**GSpd = 118.42 KTS** (the button change to red). |

# Appendix : Equations Used

The equations that this worksheet calculates are:

**Vol** = **Dur** · $\mathbf{V_R}$

**Wgt** = **Dur** · $\mathbf{W_R}$

**Wgt = Vol** · $\rho$

**GSpd = Dist / Dur**

The fuel standard density in KG/$M^3$ are :

| | | |
|---|---|---|
| **AVGAS** | = | 720.0 |
| **Jet-A** | = | 750.0 |
| **Jet-A1** | = | 804.0 |
| **Jet-B** | = | 820.0 |
| **TS-1** | = | 865.0 |
| **JP-8** | = | 815.0 |
| **Oil** | = | 899.0 |