ET Predictor Pro 7 ™ - Instructions

Introduction

The ET Predictor Pro™ is our entry level Windows ET Prediction software. It supports all Windows versions from XP through Windows 10. While you can store an unlimited number of runs, it does not have a full searchable database like our RaceLog Pro software. Weather data must be entered manually from your weather station or gauges. It can predict for gasoline, methanol, and E85 fuels.

The ET Predictor Pro uses our proprietary Horsepower Correction formulas for ET Prediction, the only completely scientific formulas in the industry. Our ET Prediction is based on the amount of relative **OXYGEN** in the air and a **Computer Model** of your particular car's performance. We **do not** average weather data, run data, or use outdated (and inaccurate!) Density Altitude calculations for ET Prediction. Our original formulas are perfectly accurate and have never needed updating. We are the original ET Prediction software developer and the original innovator in this industry! We have been the "ET Prediction Experts" since 1986.

Our ET Predictor software has always used Vapor Pressure and is the only ET Prediction software to handle humidity correctly. You won't find any "fudge factors" in our software. Here are some of the calculations provided:

Current HCF (Current HP Correction Factor)
Air Density (Air Density Index)
Density Alt (Density Altitude)
Vapor Press. (Vapor Pressure)
Water Grains (Grains per Pound)
Dew Point T. (Dew Point Temperature)
HPC Weight (Horsepower Corrected Weight)
STP Correction (Standard Pressure ET Correction)

Predicted 60' ET
Predicted 330' ET
Predicted 660' ET
Predicted 1000' ET
Predicted 1320' ET
Throttle Stop Prediction
Run Completed ET
TrueWind 660' Prediction
TrueWind 1000' Prediction
TrueWind 1320' Prediction

Installation

The CD will automatically start the installation. By default, it will be installed into the directory:

C:\ET Predictor Pro 7

If you'd like to install a shortcut on your desktop, you can choose that option during the installation process.

Registration/Activation

You can use the program for up to 15 days from installation without registering it, just click on the button labeled **Continue**, on the reminder screen that appears. Once the program is activated, the reminder screen will no longer appear. It is easiest to activate by email. You will need your Registration Number that appears on the reminder screen from the computer you will be using at the racetrack. You can avoid errors by using Copy and Paste features. Place your mouse cursor over the Registration Number, Right Click, and select Copy. The Registration Number is copied to the Windows Clipboard.   Then, in your email program, Right Click, and select Paste. Email the Registration Number, your full Name, and your Invoice Number to:

Register @ ifamilysoftware.com

We will email an Unlock Code and User Name for you to Activate the program. Just click on 'Activate' and enter the code and user name that we send to you. If you upgrade later to a new computer, your license can be removed from one computer and transferred to another. Please contact us for help in transferring your license.

Starting the Program

You can start ET Predictor Pro from your Start Menu, Programs Menu, or Desktop. You will be presented with a menu screen where you can select the quarter, or eighth mile mode.

Getting Started

The ET Predictor Pro's main screen has a menu bar with the functions: **File**, **Program**, **About**, and **Help**. These functions are fully described later on in this text. Then there is a text box showing the current file that is open. Below that is the Fuel Mode Box, the Base Run Info Box, the New Air Conditions Box, the Predicted ET Box, the Current Air Box, the Run Completion Box, the Throttle Stop Prediction, Box, and the Corrected STP ET Box. Each of these boxes have Data Fields.

Data Fields

Each data field has two parts, a label and a text box. The label is the description of the data field. The text box holds the actual data value. All data fields are **numerical**. For example, look at the data field for **Barometer**. The label is "Barometer". The text box holds the value, for example, "30.02". If you place the cursor on the label of any numerical field, the expected range will be displayed. Place the cursor on "Barometer" and you will see "**12.00 to 35.00**" displayed. You must enter a number value in this field in this particular range. All numerical fields are validated. If you enter a value that is outside the normal range for that field, the operation is canceled and the cursor will be placed in the data field where the error was found.

Fuel Mode Box

The fuel mode box is used to set the weather correction calibration used in the program to either Methanol, Gasoline, or E85 and to display the current setting. When correcting elapsed time (**ET**) to Standard Pressure (**STP**) or when predicting ET, the program needs to know what fuel you are using. While in Edit Mode, clicking on one of the two option buttons will change the fuel mode. When you are saving your record, be sure that you have set the fuel mode properly for that run.

New Air Conditions Box

After you enter the Elevation, Barometer, Temperature, and Humidity and click on the **Air_Calculate** Button, the program displays the current Horsepower Correction Factor (**Current HCF**), Air Density Index (**ADI**), and Density Altitude (**DA**), Vapor Pressure, Water Grains, and Dew Point Temperature. If you've entered the Vehicle Weight and Ballast in the Base Run Info Box, the Horsepower Corrected Weight (**HPC Weight**) will also be calculated. The ET Predictor uses a standard of 0 elevation, 29.92 In Hg pressure, 60 degrees F, and 0 % relative humidity. Under these conditions the HCF equals 1.0000 and the ADI will equal 100.000 percent. Here is a further description of the input data used in these calculations:

Elevation - Range: -3,000 to +26,000 Feet - **This field is not track elevation!** Elevation is only used if you are using an **altimeter** or a **corrected** barometer. If you're using an **un-corrected** barometer (absolute pressure), always enter 0 for the elevation. If you have an altimeter, calibrate it to 29.92 In Hg and enter the reported altitude as the elevation. If your area requires that you use a corrected barometer, then you should always enter as Elevation the number of feet equal to the amount of correction when you calibrated the barometer.

Barometer - Range: 12 to 35 Inches Hg - If you're using a barometer to obtain the air pressure, enter the barometric pressure from the gauge. When using an altimeter, you must always enter 29.92 in this field.

Temperature - Range: 10 to 130 degrees F - Enter the temperature from a digital thermometer or other temperature gauge. Never use the temperature readings reported on your time card. These sensors are not accurate! From round to round, temperature changes are apt to affect performance more than any other variable.

Humidity - Range: 0 to 100 Per Cent - You can use a digital hygrometer to find the relative humidity. At low temperature, relative humidity has the least effect on performance. However, at high temperatures, the effect is much greater. For example, 50% RH at 60 F will result in a .01 loss in power, while at 90 F the addition of 50% RH equals about a .03 loss in power. Changes in temperature are also more critical under high humidity.

Wind Speed – Range: -99 to 99 MPH – The value in this field is used in **TrueWind™ ET Prediction**. The ET Predictor screen uses the measured head or tail wind speed to adjust the predicted ET to accurately reflect changes in performance due to the wind. A head wind is entered as a positive number without any sign. For example, a 12-mph head wind would be entered as **12**. A tail wind is entered as a negative number with a minus sign. For example, an 8-mph tail wind would be entered as **– 8**. If you are using a hand-held wind meter, stand and hold the meter facing the starting line to measure only the true amount of tail wind. Then enter the mph read as a negative number. Stand and face the finish line to measure only the true amount of head wind. If you do not enable the TrueWind™ ET Prediction feature in the ET Predictor screen, this value will not be used in any calculation.

Vehicle Weight - The Vehicle Weight (including driver) and **Ballast** is used in the computation for finding the Horsepower Corrected Weight. It is NOT used in calculating the predicted ET.

The following is more information on the resulting calculations:

Current HCF (Current HP Correction Factor) - The Horsepower Correction Factor is computed using the current weather conditions that you enter. In other words, the HCF equals the current elevation, barometer, temperature, and humidity. When the HCF is higher, fewer horsepower is produced, and the car will run slower. So, the lower the HCF is, the faster the car will run. You can use the HCF to determine the variance in horsepower or torque that is being produced under different weather conditions. For example, if your engine produces 400 horsepower with an HCF of 1.012, it will produce 404.80 horsepower at sea level conditions (STP) or 1.0000 (400 x 1.012=404.80).

Air Density (Air Density Index) - The Air Density Index (ADI) is the computed ratio of the current density to that of STP with STP having an index of 100 percent. This factor is used to determine the correct jetting or pill size required under varying weather conditions. The higher the ADI, the more air there is available for combustion. Therefore, more fuel must be burned to maintain the correct air/fuel ratio. When using gasoline, a four (4) percent change in the ADI will usually necessitate a change in jet area in order to maintain the same level of performance. Holley jet sizes are about 4 percent apart in flow area. If the ADI goes up four (4) percent, for example 100.0 to 104.0, increase all jet sizes by one number. And, if the ADI goes down four (4) percent, for example 100.0 to 96.0, decrease all jet sizes by one number.

Density Alt (Density Altitude) – Density Altitude (DA) is the current air density expressed in feet of elevation. DA is also known as the corrected or relative altitude.

Vapor Press. (Vapor Pressure) – Vapor Pressure (VP) is the amount of water vapor (humidity) in the air expressed in inches of mercury. Absolute humidity, Water Grains, and Vapor Pressure calculations all express the amount of water vapor in the air.

Water Grains (Grains per Pound) - GRLB is a calculation of the mass of water to the mass of Dry Air. It is nothing more than Absolute Humidity or Vapor Pressure! Absolute Humidity, Water Grains, and Vapor Pressure calculations all express the amount of water vapor in the air.

HPC Weight (Horsepower Corrected Weight) - The program uses the input variables, Vehicle Weight and Ballast, as the total vehicle weight and then corrects this weight to the current air conditions. The reported HPC Weight changes with the weather conditions entered. If you are using ballast to run a specific Index instead of a throttle stop, the HPC Weight should be logged for every run that you make. By adding or removing ballast, the car can be made to run the same Elapsed Time in different air conditions without changing the throttle stop. For example, under previous air conditions, the reported HPC Weight was 1720 and the car ran an 8.900 ET. Later on, the HPC Weight is now 1740 because of worsening air conditions. If you remove 20 pounds of ballast (1740-1720=20), the car will still run an 8.900 ET in these new air conditions.

Base Run Box

Using a base line of performance consisting of a previous ET (**Base ET**) and its associated Horsepower Correction Factor (**Base HCF**), this function will calculate and predict your ET under new air conditions. This is used to determine the proper dial-in or in determining a need to adjust a throttle stop. This program will also predict 60', 330', 660' and 1000' times if these are entered into the Base Run Info Box.

The Base Run box is where you enter your time slip and other performance information. It becomes the Base Run that you can predict from.

After making a run, click on **Edit**. The background color of the data fields change to Cyan when you are in the Edit Mode.   Make sure that you have selected the correct **Fuel Mode** at this point.

The mouse cursor is moved to the **New Air Conditions** box. Enter the barometric pressure, temperature, humidity, and wind speed (measured head or tail only) and click on the **Air_Calculate** button. The program will calculate the Current Horsepower Correction Factor (**Current HCF**) and transfer this value to the Base Horsepower Correction Factor (**Base HCF**) in the Base Run box. The wind speed will also be transferred for you. This is the "air" from the current run. The cursor is moved to the Base HCF field.

Now, enter the 60', 330', 660', 1000', and 1320' elapsed times from your time slip.   These are numerical fields for the interval times on your time slip. Also enter your throttle stop duration and throttle stop factor if you used a throttle stop on the run.

Then, click on **Save.** I like to use a file name that describes the date and run number. For example, "**0300308T1**" for time run number 1, or "**030308E1**" for elimination round number 1. This way you can always identify the correct run to use.

When you are ready to predict your ET, just Open the file you want to use as your base run, enter the new air conditions, and click on the **Air_Calculate** button. Your predicted ET's will appear in the **Predicted ET** box.

Base Run Box Buttons

Edit – Clicking on Edit puts the Base Run box into **Edit Mode**. All the data fields change to a Cyan (blue) background whenever the database is in Edit Mode to alert you that the data can be changed by this operation. Unless it is in Edit Mode, none of the data in the box may be modified. You can use the Tab key, the Return key, or the mouse to quickly move from one field to another. Each time you enter a new field, the data value in that field will be highlighted. If you want to replace the value, just enter a new one. The old value will be erased as soon as you begin typing. If you want to edit the value, use the arrow keys to move around in the field.   You can then edit the individual characters or numbers in the field.

Save – This option is only activated when the database is in Edit Mode. Clicking Save will perform all calculations based on the current air, store the data into a new file, and exit Edit Mode. Before saving the file, all the data that has been entered or modified is validated for possible user errors.

Throttle Stop Prediction Function

The function is used to predict a throttle stop setting based on a previous run, previous throttle stop duration (**T.S. Duration**), and existing throttle stop factor (**T.S. Factor**). First, calculate your **Predicted ET**. The Predicted ET is transferred to the **Predict Throttle Stop** box automatically. In the Predict Throttle Stop box enter the Dial or Index you want to run. If you want to use a different Predicted ET than the one shown, you can edit the one shown. This function uses the **T.S. Duration** and **T.S. Factor** values from the Base Run Info box. Make sure that these values are correct and then click on the **Predict_TS** button.

Corrected STP ET Function

This function is used to quickly correct any ET (60', 330', 660', 1000', or 1320') to standard pressure (**STP**) conditions. It uses the air conditions entered in the New Air Conditions Box, the current **Fuel Mode**, and the **Actual ET** that you enter. First, set the Fuel Mode. Then, enter the air conditions that were present at the time of the run. Then, enter the Actual ET, and click on the **STP_Correction** button. As an example, for gasoline fuel and weather conditions of 0 elevation, 29.65 barometer, 75 temp, and 45% humidity, an ET of 9.337 would be equal to 9.204 after being corrected to STP. Comparatively, for weather conditions of 0 elevation, 29.80 barometer, 67 temp, and 68% humidity, an ET of 9.298 will also equal 9.204 at STP. Actually, the program calculates and then removes the effect that the current air density had on the run. This creates a basis to directly compare one ET against another regardless of the weather conditions associated with the run. The corrected ET (STP ET) is how fast the car would have run under perfect (STP) weather conditions.

Run Completion Function

Make your Base Run, the one you predicted from, is the Current file. Based on the information entered under your **Base HCF**, **Base ET**, this program will report a **projected ET** on a run where you had to hit the brakes or lifted the throttle.

Enter the air conditions, from when you made the run, in the New Air Conditions box. The program uses the **Base 1000'** time and enters it for you under **Base SEG**, assuming that you are running on a 1/4-mile track and

that you ran the car on full throttle past the 1000' cone. If you lifted earlier, you can enter the 660' time for the **Base SEG**. (Likewise, if you are running on a 1/8th mile track, you may use the 330' or 60' time for the Base SEG). For the **New SEG** (New Segment) field, enter the new 1000' time from your time card. Click on the **Run_Completion** button and the program will compute the Projected ET, or what the car should have run in those air conditions.

> **Hint:** When the TrueWind™ Option Box is checked, the Projected ET will be calculated using the current TrueWind™ settings.

ET Predictor Form - Menu Functions
Here is a listing of the ET Predictor Form menu functions and what they do:

File Menu
Open - Click on this function to open an existing ET Predictor data file. All existing data files will appear in the list box. Just double-click on the name of the data file you wish to open. Or, you can highlight the filename and click on Open.

Save - Click on this function to save the current data in the ET Predictor workspace to a data file. Enter a name for your file in the file name box and click on Save. It isn't necessary to add the file suffix to the file name that you enter. The program will do this for you. Be sure to use a unique name for your data file so that you can remember what the data is for. I like to use the date and the round for my data files. For example, if you name the file, "**021105E1**", you'll know exactly what run the data pertains to.

Exit - This closes the Program.

Programs Menu
Calculate TS Factor – This function quickly calculates a throttle stop factor (T.S. Factor) using two runs. The second run (STP ET #2) must have more timer duration and must be the slower run, or the function can't work. You should first correct both runs to STP using the Corrected STP ET function. Otherwise, the two runs must have been made in exactly the same air conditions, or the result will not be accurate. Enter the STP ET from the first run in the field labeled, STP ET #1. Then, enter the timer duration that was used on that run in the field labeled TSD #1. Next, enter the STP ET and timer duration from the second run and click on the Calculate button.

TrueWind™ Option Checkbox – If you place a check in this box, the ET Predictor will adjust the predicted ET using the TrueWind™ value in your Base Run, the Current TrueWind™ value, and your specific Wind Factor. If the box is unchecked, the TrueWind™ option is turned off and wind conditions are NOT used.

Wind Factor - The Wind Factor is saved by the program and can always be manually edited at any time.

A vehicle's terminal speed, frontal area, and aerodynamics, are only a few of the variables that could be used in determining your wind factor. However, frontal area calculations are often inaccurate. For this reason, frontal area can not possibly be used as a component in such an equation! The only way to ascertain an accurate Wind Factor is to use a computer model of your car's performance under varying wind conditions. Quarter mile racers will see the majority of wind effect in the 660 to 1000 foot segment (1000' ET minus 660' ET) and in the 1000 to 1320 foot segment (1320' ET minus 1000' ET). The Wind Factor can then be calculated by using simple math. Just add the total time difference (between two runs) from these two segments and divide by the difference in MPH.

For example, on the first run you have a –3 mph tail wind. On the second run, you have a 5 mph head wind. The total difference in wind force is actually greater by 8 mph. The total time difference of the two segments on the second run is greater by .01 seconds. Divide .01 seconds by 8 mph and you get a Wind

Factor of .00125. This shows that one (1) mph of wind effects your cars performance by .00125 in elapsed time.

TrueWind™ ET Prediction is purely optional. If you are not monitoring the wind, then you don't have to use it. Or, if you are unsure about using it, you can start out using a very small wind factor and track the

results. And, if you are a low mph, eighth mile racer only, it may be insignificant. In testing last year, it has proved its accuracy and value to me as a racer. As a starting point, some approximate Wind Factors you may try are:

Dragster: .001 to .004
Door Car: .003 to .006
Roadster: .005 to .008

Help Menu

Clicking on Help will load these instructions into a separate Windows Help style window. You can scroll through the instructions or optionally print a copy using your Windows compatible printer.

Screen Display Resolution

The ET Predictor Pro was designed to work on both 800x600 and 640x480 VGA displays. However, the appearance of some screens is better at a resolution of 800x600. There is no reason to use less than an 800x600 resolution in Windows unless your hardware won't support it. To check your display settings in Windows, click on Start, select Settings, click on Control Panel, and double-click on Display. Next, click on the Settings Tab where you can adjust the screen resolution in the Screen Area Box. When done, click on OK

Air Fuel Ratio Management

On gasoline burning engines, the air/fuel ratio must be about 12.5 to 1 to predict performance accurately. There is no benefit from running a lean mixture. When using a computer to predict your dial-in, you *want* the car to respond to changes in atmospheric conditions. There must always be enough fuel present to use all of the available oxygen or the car will be unpredictable.

Find a day when the air density is average for the racing season in your area. Then richen the mixture until the car slows down. The car may go faster at first, as it is probably too lean. After this, you shouldn't have to re-jet until the air density changes four (4) per cent or more. By adjusting the fuel mixture for an average air density of 96 per cent, for example, the air can range from 92 to 100 per cent, without having to re-jet. A quick way to check for proper fuel mixture is to check the color inside the headers. This should be a very dark gray, or almost black. If they are white to a light gray, the mixture is way too lean. As the air density changes from week to week, you can actually see the color change. The header color will appear lighter as the air density increases and darker as it decreases. You can also use an Exhaust Gas Temperature (EGT) gauge to evaluate jetting changes. **Call us for more information on our inexpensive digital EGT kits and innovative DataMaster™ data recorders**