

REC-TEC

P R O F E S S I O N A L

REC-TEC

Startup Guide

George M. Bonnett, JD

REC-TEC LLC

P.O. BOX 561031

ROCKLEDGE, FLORIDA 32956-1031

321-639-7783

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DISCLAIMER

The information contained in this manual is based to the best of REC-TEC LLC's knowledge on viable although innovative practices in the investigation of incidents as applied to vehicular collisions. However, neither REC-TEC LLC nor the author assumes any liability in connection with the use of this material. Every acceptable procedure may not have been presented and some circumstances may require additional or substitute procedures. Also, statutes, ordinances and organizational policies differ widely and wherever these are in conflict with the information contained herein, the former should govern.

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When Viewing This Document Electronically

Select *View* then *Text Size* or *Zoom* to change the way this manual appears on the screen.

Downloading REC-TEC

Our software has been used since 1984 by Law Enforcement, Military, Engineers, Physicists, and other professionals in the field of accident investigation and reconstruction with no complaints of any harm to computers or other peripheral equipment. While you certainly should be cautious about downloading software from the internet, we have a perfect track record for doing no harm.

If you see the message "Windows (8) protected your PC" - Click on the "More info" line then on "Run anyway" to continue with the download.

As an alternative we invite you to visit [Inside REC-TEC](#), the Manual and Tutorial for the program, posted on our website for anyone to use. It goes into detail covering just about all of the available options for every module in the program and contains hundreds of screen images. Either option will let you explore the power of REC-TEC enabling you to decide if it will assist not only you but others, towards a better understanding of the physics governing the collision events.

Quick and Easy Instructions:

- Download information is available from the **Download** page of the REC-TEC website <http://rec-tec.com/rtprove.html>
- **"Run"** the program from the website. This will automatically start the **WinZip Self Extractor**.
- From there you will download the latest copy of the REC-TEC program. If you have previously downloaded the program, it is suggested that you remove the REC-TEC folder and start from scratch. It is very strongly recommended that you place the REC-TEC folder in C:\Program Files, thus creating the C:\Program Files\REC-TEC folder. This will eliminate confusion in the future.
- The new Installation will try to start the program as an Evaluation copy unless you deselect this option on the **WinZip Self Extractor**.
- When the program Starts, it will display several messages (Trial copy only) before bringing you to the white **Configuration** Screen. You will see a **Yellow** button to make a REC-TEC Icon. You can use it now to set up an Icon which

will point to the program. The **Configuration** Screen can be called by going to **Settings > REC-TEC** on the top line of the **REC-TEC** program Window.

- When you receive the **Sentinel.rtx** license file as an email attachment, **Save** it to the **RECTEC folder**

Military - LEO - Special Projects:

- When **REC-TEC** is started, it may ask for your Name, Password and Status Identifier depending on your security track. That information will be given to you or sent separately in an email if applicable. Each part of this information must be entered in the specified block exactly as they appear in the email or packet given to you. Once **REC-TEC** accepts the information, your name or the name of your Department will be shown and the program will reset to **REC-TEC Platinum**.
- If the **Name** and **Password** are entered correctly (use Copy and Paste from the Email), your **License Name** will appear on the top line near center-right of the **REC-TEC** Window. If the program fails to function as described, it will be necessary to delete the folder and try again from the beginning. If it fails a second time, contact us by email or phone.
- Once the program is licensed and running, **Copy** the entire folder to your other USB drives and computers. Set up the Icon (**Settings > REC-TEC**) on the computers - Use "**Run_REC-TEC.bat**" on **USB** drives.

Microsoft Vista, Windows 7 & 8:

The download file (RTProVE.exe) may be "run" from the website, automatically starting the extraction process.

With newer versions of Windows, it will be necessary to Right click on the Program Icon and select Properties at the bottom of the Dropdown Menu. Go to Properties. Go to Compatibility. Near the bottom under Privilege Level check the box to "Run this program as an administrator." Check OK. Close the window.

Note: As an option, in Windows explorer go to C:\Program Files\RECTEC and open the folder. Place your cursor on RECTEC.exe (application with REC-TEC Icon) and right click. Go to Properties. Go to Compatibility. Near the bottom under Privilege Level check the box to "Run this program as an administrator." Check OK. Close the window.

If you have a problem with Windows 7 or Windows 8 trying to place files in a library, unzip the files to a USB drive (N:\RECTEC - where the N is the Drive Letter of your USB Drive). Copy the entire folder to C:\Program Files.

It may be necessary to manually allow **REC-TEC** through the Windows Firewall (see **Helpful Tips** below).

Helpful tips:

If WinZip generates a message that it is unable to create the output file, it means that a copy of REC-TEC is currently running. It will be necessary go to Windows Task Manager and End all running copies of **REC-TEC**, or simply reboot your computer to terminate the running copy.

To show common file types:

In **My Computer** select the specific drive (C:)>**Tools>Folder Options>View**. Uncheck the block "Hide extensions for known file types"

To Disable Windows Libraries:

Google "Disable Windows Libraries" and find out how to Disable/Enable this function in W7 and W8.

Windows Firewall:

Windows > Start > Control Panel > System & Security > Windows Firewall

Click on: Allow a Program or Feature through Windows Firewall
 Change Settings
 Allow Another Program

Browse to and Select:
 C:\Program Files\RECTEC\RECTEC.exe

Exit

Getting Started

Printing from REC-TEC

The easiest way is to just hit the Print button in **REC-TEC** and print the page in either "Portrait" or "Landscape" mode.

Below you will find the Help screen for printing from **REC-TEC**. The process is easy and flexible to suit your needs. The Capture feature within the program or [Ctrl][Prt Scr] will capture the image of the screen. This image can be "pasted" directly into a word processor or it may be pasted into paint and modified before being *selected, copied and pasted* into the word processor.

Printing Reports (Text & Graphics) using REC-TEC Plus Professional

Note: Use the Graphics Icon on the Toolbar to set the Graphics Background Color (Blue or Windows Default) and Line Width that best suits your needs.

Quick and Easy

Print each individual Image using the Printer Icon or assemble a professional looking document in Microsoft Word or WordPad.

Print Image:

Use the Print Icon to print the "Captured" Image or the active REC-TEC form.

Assemble a Report using Microsoft Word, WordPad, or PDF Print Spooler - (Integrated Automatic Process)

Use the arrow next to the Report Form Icon and Click on "Initiate/Activate the Document Link or PDF Print Spooler"

Once the Document opens, minimize Word/WordPad or use [Alt][Tab] to send it to the back, bringing REC-TEC to the front.

Click the Report Form Icon to transfer a "Captured" Image or the active REC-TEC screen (Default if no captured Image).

Minimize Word/WordPad and repeat above step as necessary to complete Document.

Use the features in Word/WordPad to open/insert files, add text or data, manipulate the images, finalize, name and save the document file.

Other Text Editors and Word Processors

Assemble a document in a word processor or text editor - (Manual Process)

1. Select the word processor (configured using the REC-TEC Setup form) by clicking on Tools on the Main Menu Bar.
2. Toggle [Alt][Tab] the word processor and REC-TEC program bringing REC-TEC to the front.
3. Select an individual text or graphics screen using the steps outlined above under Main Menu Bar, the Capture Image Icon or the selections provided in the small arrow to the right of the Icon to "Capture" the specific image required.
4. Toggle [Alt][Tab] the word processor and REC-TEC program bringing the word processor to the front.
5. Position the cursor at the location where the Image will be pasted.
6. Select "Edit" and then "Paste" on the word processor Main Menu Bar.
7. Repeat steps 2 through 6 until all of the required REC-TEC information (including screens or documents from the Internet) is incorporated into the document.
8. Information from other Windows compatible programs may also be "Captured" and "Pasted" into the document being prepared.
9. Individual users may also want to create a template document that can be used as a Master Report Form that can be called up in the word processor and used to create future reports.

Running a problem in REC-TEC

Use the drop down menu by clicking on the **REC-TEC** button (upper left of the screen) and select the basic type of problem. If Time/Distance is selected you have several choices. For the example here we will use a Single Surface Deceleration problem, By clicking on this selection a Deceleration Single Surface form is called up.

Data may be entered into the blank form or one of the saved problems can be called up using the "Open .TDD file" button in the lower right of the screen.

If entering data into the blank form the program will try to assist as to what information is needed. Once the program has sufficient information to develop a solution it will be displayed usually to the right of the entry inputs. The TDD (Time Distance Deceleration) form can display additional information if a Lateral Distance is entered.

As you will soon see, **REC-TEC** treats your computer as a computer by determining as much (solution) information as possible for the data entered. Most other software programs require the user to pick a formula and then their program treats your computer as a (very expensive) calculator. **REC-TEC** takes the information that you have and develops a solution and in many sections will display the formulae employed in arriving at a solution (Click on the Formulae* button).

Many of the features in **REC-TEC** are on the cutting edge of accident reconstruction and some may be far beyond that covered in basic Accident Investigation, Accident Reconstruction and Commercial Vehicle classes. Please see the [Classes](#) section for additional training opportunities.

[Inside REC-TEC](#) is a comprehensive Training Manual and Tutorial available from our website. It contains detailed explanations of the inputs and outputs of every module in the program along with worked sample problems to assist the user in getting familiar with the module. It uses several problems in each section to illustrate the functionality of each module. *Inside REC-TEC* is as close as you can get to having an instructor available at the touch of the F5 key from the program. *Inside REC-TEC* can also be called up independently from our homepage, even with a smartphone.

REC-TEC also has a built in Manual accessible using the F1 key in any section of the program. Please check out the [On-line Articles](#) which were designed to let you get the most out of our software.

TABLE OF CONTENTS (Underline indicates Hyperlink – Click Back Arrow in Browser/Cell Phone to Return)

This entire document was assembled using Microsoft Word, Screen Hunter 6 (free) and REC-TEC Platinum software. All screen shots were captured using REC-TEC Platinum Software, [Alt PrtSc], or Screen Hunter 6 for Screens with drop down or sub menus.

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- **Lower Navigation Bar Features**
 - Capture Image
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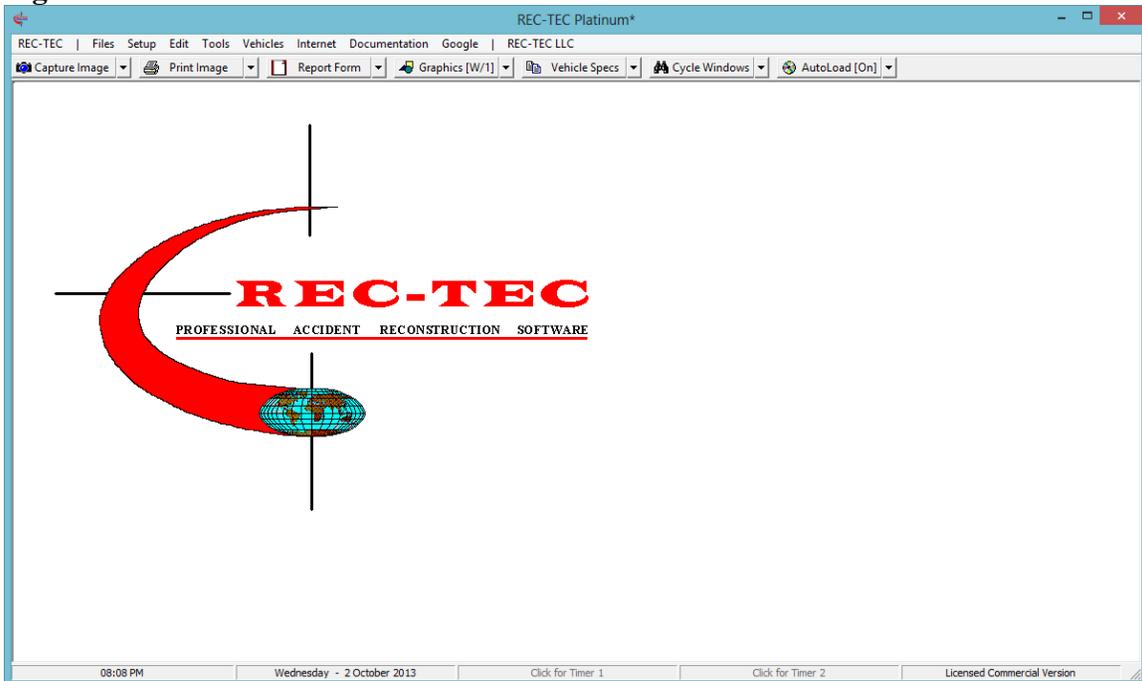
- **Report Form**
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INTRODUCTION:
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REC-TEC can work in any Imperial/Metric (or hybrid) system and can be switched between systems at any time. Some of the content may not apply to your particular version. It will assist in becoming familiar with the various modules, and show how the program can solve very different, difficult, and complex problems. The **Training Manual and Tutorial** uses a step-by-step approach to **REC-TEC** accident reconstruction. It is not intended to teach the basics of accident reconstruction, but to assist the accident reconstructionist in solving problems using **REC-TEC**.

Fundamentals of Traffic Crash Reconstruction, Volume 2 of the Traffic Crash Reconstruction Series by John Daily, Nathan Shigemura, and Jeremy Daily, published by IPTM, is highly recommended as a basic tool for learning the science and art of accident reconstruction.

Figure 1



REC-TEC BASICS

REC-TEC takes a modular approach to accident reconstruction problem solving, just as reconstructionists have always done. Each problem is broken down into solvable components:

- Determine the primary objective of the investigation.
- Break the overall problem down into solvable components.
- Combine the individual answers into a unified solution to the problem.

Navigating the Program

Before we begin to work problems, it may be beneficial to take an in depth look at the main screen and take a tour of the many features to get a better understanding of the functionality of the program. The **F1 – F5** keys will now work from the Main screen. The **F5** Key will call this document from the **REC-TEC** web site.

Figure A

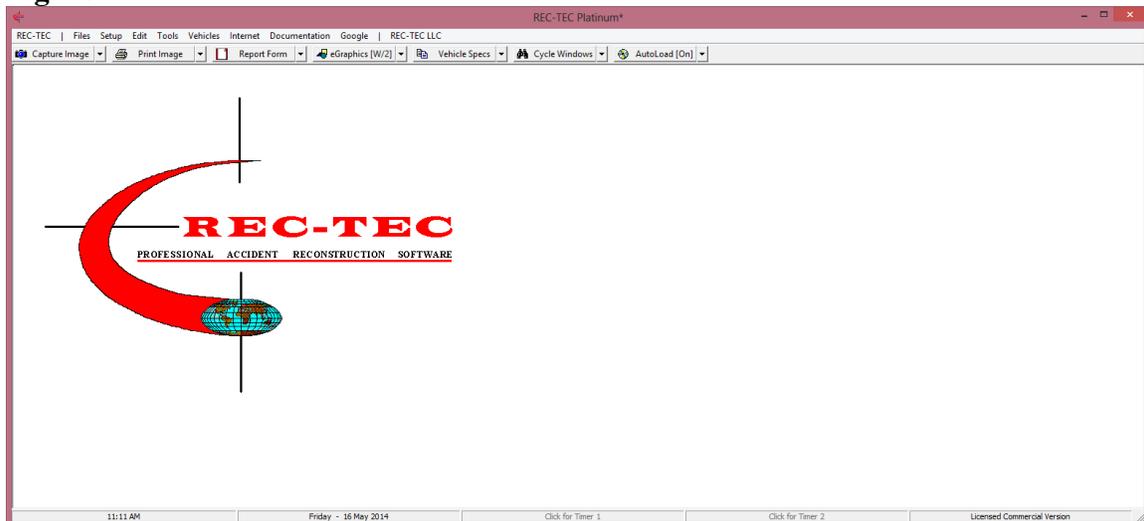
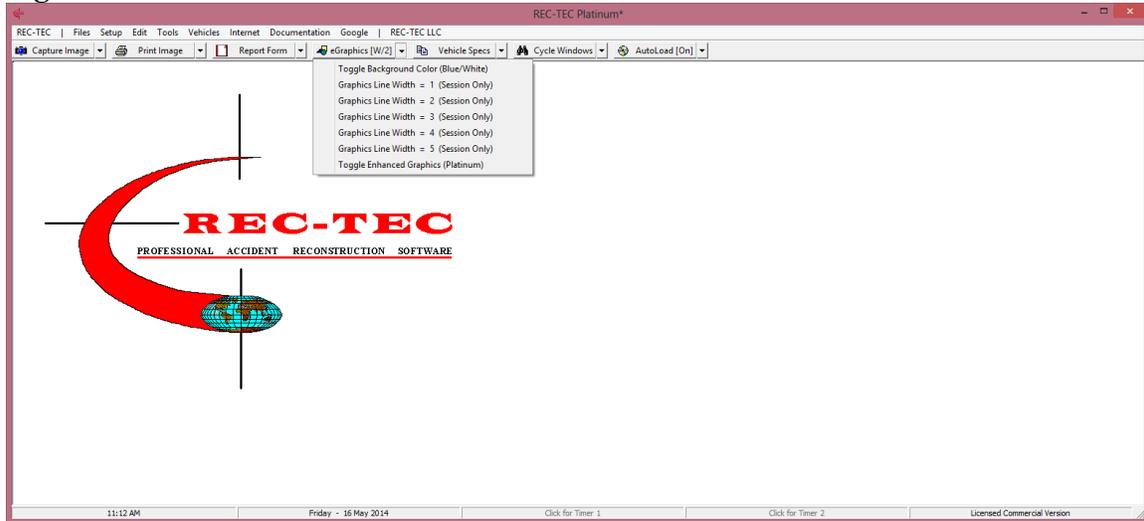


Figure A displays the new "eGraphics" button on the Lower Navigation Bar. When the button shows eGraphics the new graphics upgrades will replace the original graphics functions. Graphics and eGraphics are toggled using the selection "Toggle Enhanced Graphics (Platinum)" on the Down Arrow button to the right of the Graphics/eGraphics button as seen in Figure B.

Figure B



eGraphics consist of crosshairs that follow the cursor on selected graphics screens throughout the program. Two or more blocks will also appear with Time, Distance, Speed, or Lateral Distance matching the crosshair position. The crosshair position and data blocks can be "frozen" or "unfrozen" using the [Ctrl] key. This allows the cursor to be moved for other purposes such as clicking on the Report button to place the image in the report, or drawing on the image using the right mouse button as in original Graphics.

Modules with the enhanced graphics include:

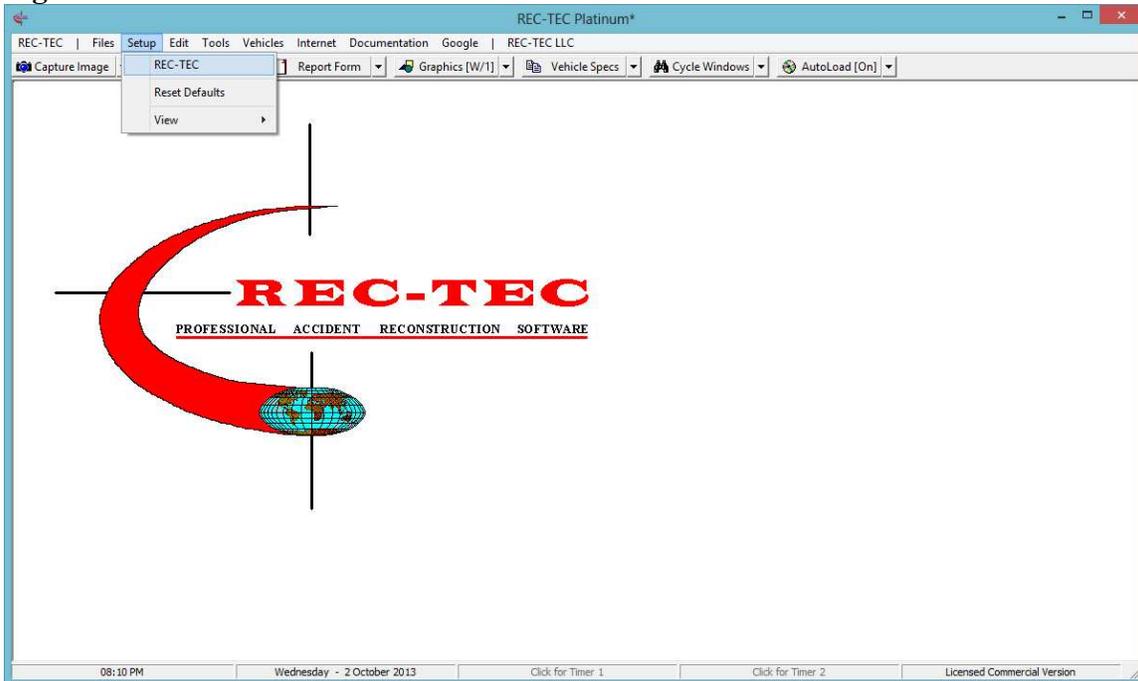
- Collision Avoidance Following Maneuvers
- Collision Avoidance Turning Maneuvers
- Time Distance Acceleration
- Time Distance Deceleration
- Time Distance Multiple Vehicles
- Time Distance Omni
- Time Distance (EDM)

eGraphics is a Platinum Option only upgrade that also includes a unique new feature in the Time Distance (EDM) module. When the crosshairs are on the TD-EDM graphics, clicking on the left mouse button will immediately capture the point on both curves where the vertical crosshair is located and will place the corresponding Time, Distance, and Speed in the center data blocks below the graphics.

As before, the Data blocks below the Graphics screen can still be used to find and position a set of crosshairs on the Graphics corresponding to a Time, Distance or Speed. The new eGraphics permits using the vertical crosshair to select a position on the either curve and get the corresponding Time, Distance, and Speed information.

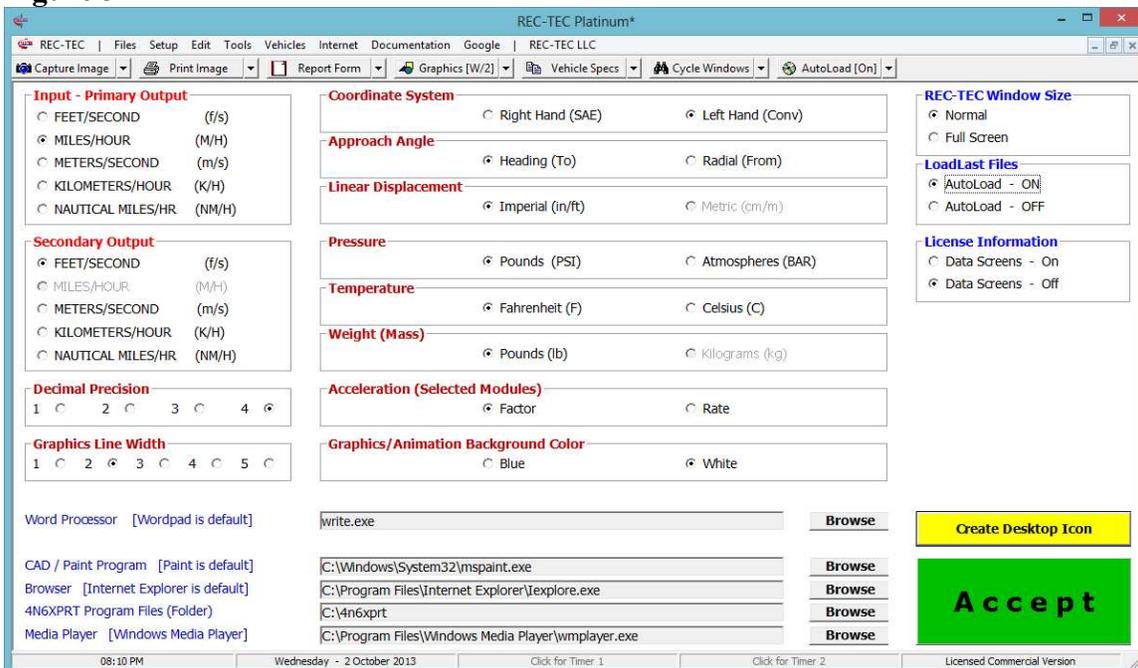
CONFIGURATION (Table of Contents)

Figure 2



On the top navigation bar of the main screen, select **Setup > REC-TEC** (Figure 2) to call up the **Configuration** screen (Figure 3). All problems will assume the following configuration unless otherwise specified:

Figure 3



The preferences selected using the **Configuration** screen (Figure 3) will be set every time the program is started. This screen may be called at any time to change the preferences set at program start. Temporary changes can be made in the various modules or by using the **Graphics Icon** (or drop-down) on the main screen.

The configuration screen will set the basic input/output displays throughout the program as well as which additional programs **REC-TEC** will call (word processors, drawing packages, etc.). The F1 help files may be translated into many languages. Use the F7 key to pull up the HTML file from the website and right clicking on the English version in order to use one of the many Translation Accelerators now available.

Many display options can be set here as the default, but can be changed temporarily from the **Graphics** icon on the lower navigation bar.

Modules

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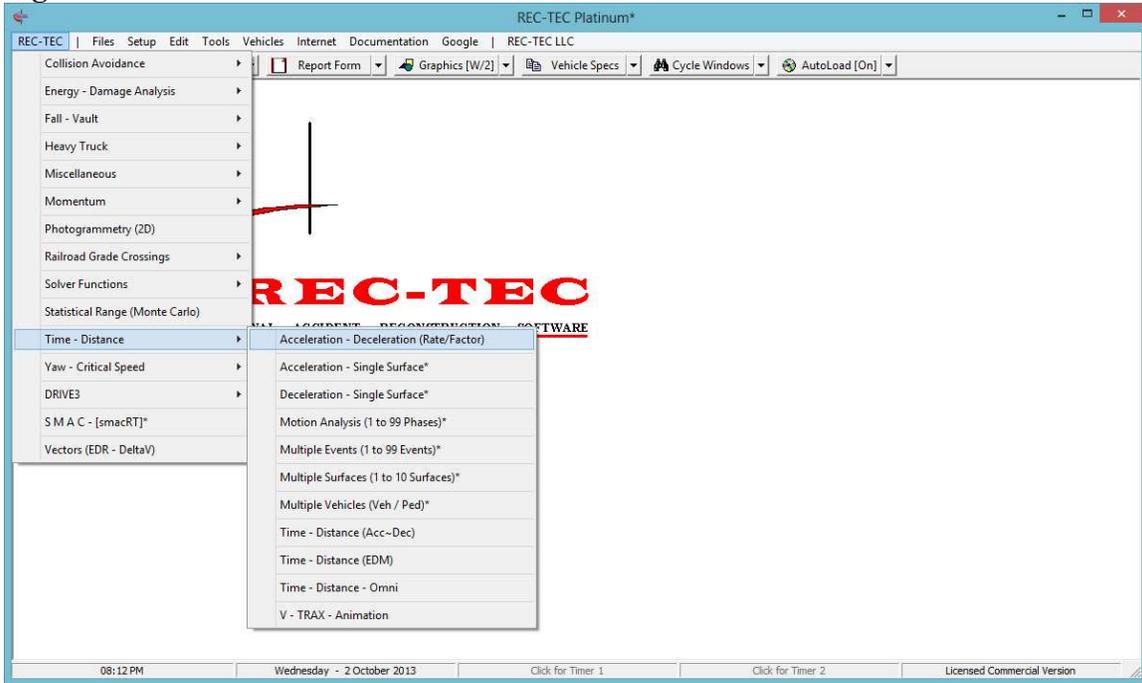
REC-TEC consists of various modules that, by treating your computer as a computer instead of a calculator, compute the answers for the maneuver, not just a single formula. Most modules offer iteration and graphics. Many offer animation and finite difference analysis. These tools will assist the professional in analyzing the problem and help provide confidence in the solutions. Many of the modules will integrate with other modules, providing additional analysis and support.

Upper Navigation Bar

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Opening a module – At the **REC-TEC** pull down menu (top navigation bar – left side), select **Time - Distance** then **Acceleration - Deceleration (Rate/Factor)** from the submenu (Figure 4).

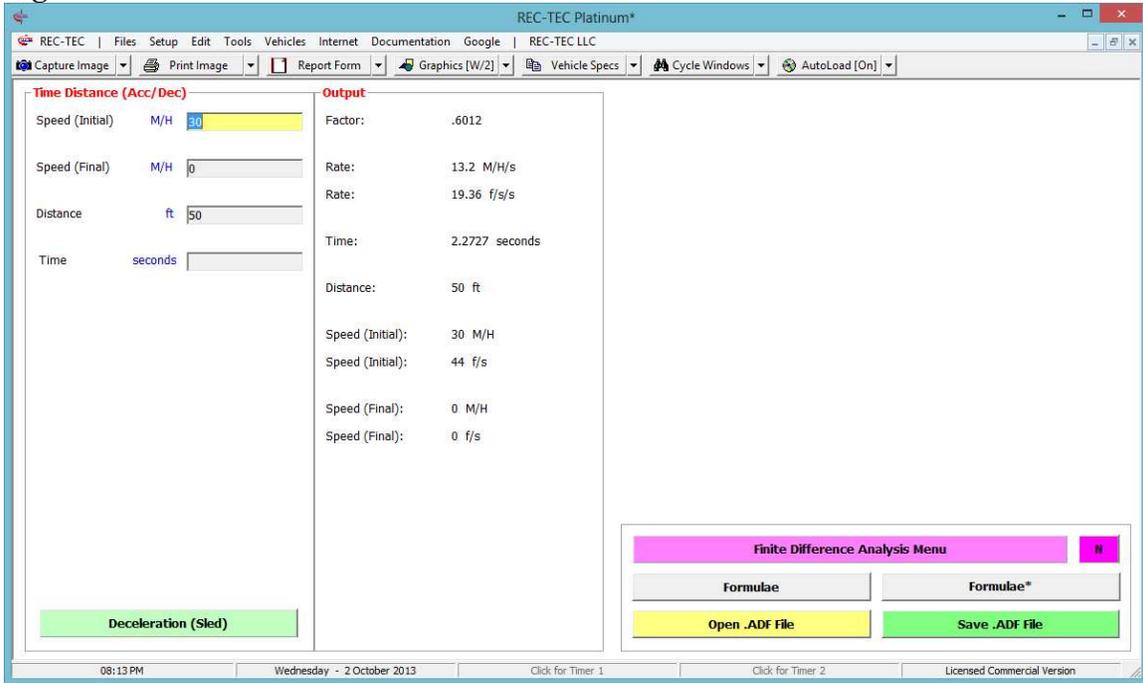
Figure 4



Note: Modules followed by an asterisk are capable of generating an animation text file. These files can be imported into third-party animation software capable of creating high-resolution animation using the X, Y, and Z positions for each time key frame computed by REC-TEC. A list of these modules and what is required is in the **Manual > Overview** Help file.

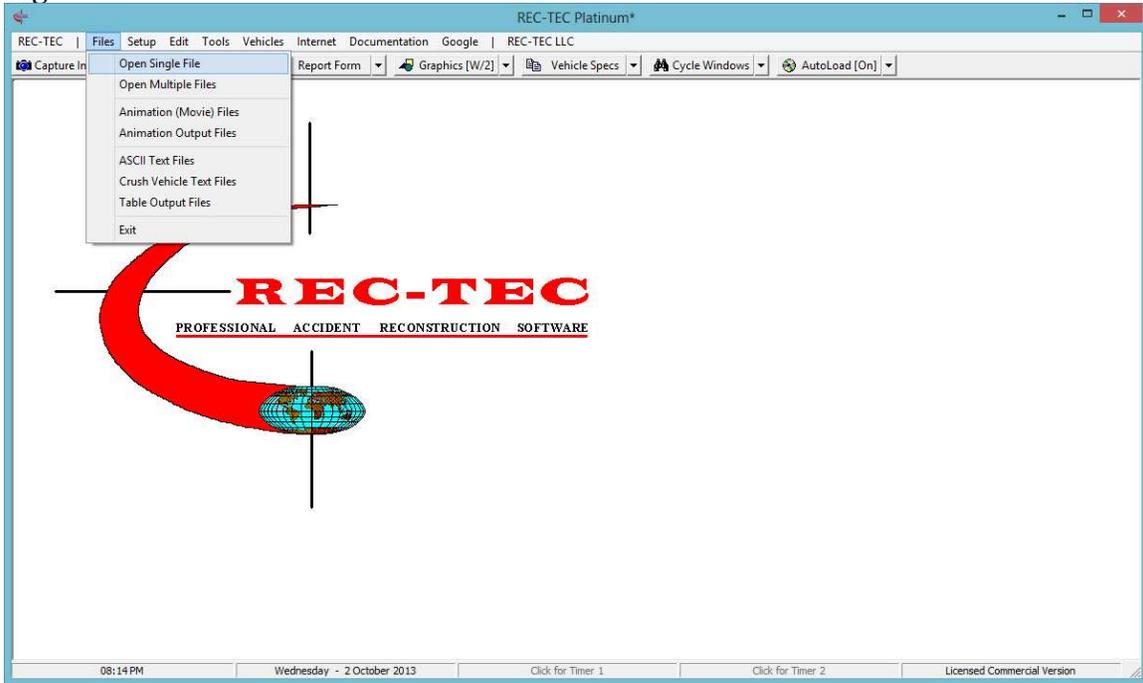
Click on Acceleration - Deceleration (Rate/Factor) and the Time - Distance Acceleration - Deceleration screen appears (Figure 5).

Figure 5



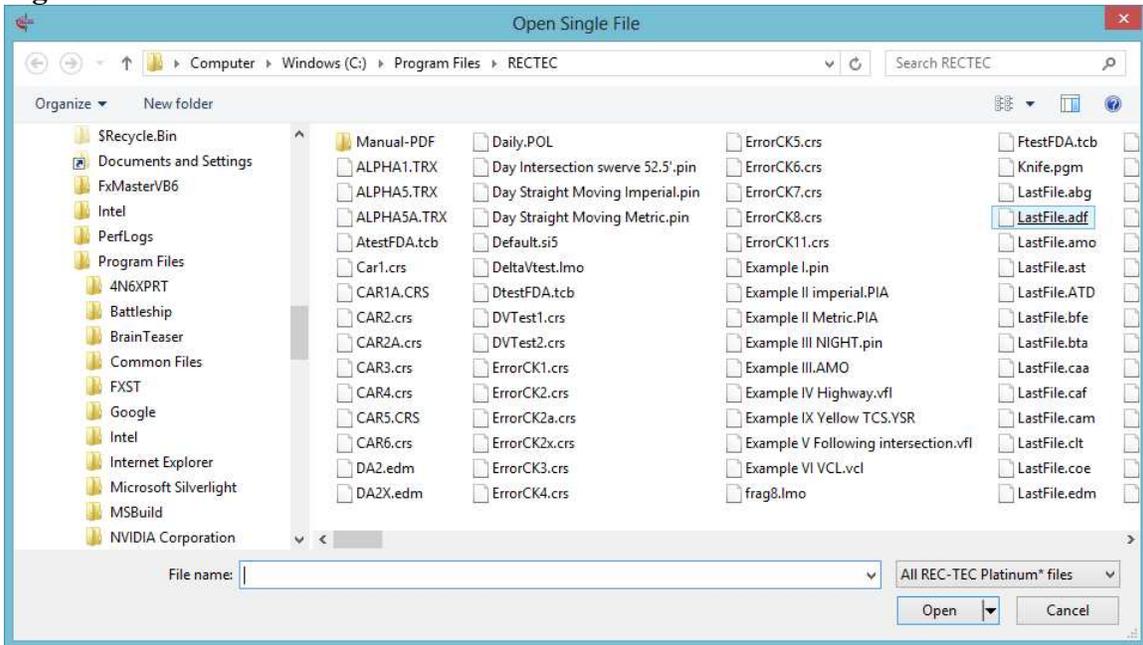
As an alternative, a file (or multiple files) can be selected from the upper navigation bar Files > Open Single File (Figure 6) or Files > Open Multiple Files.

Figure 6



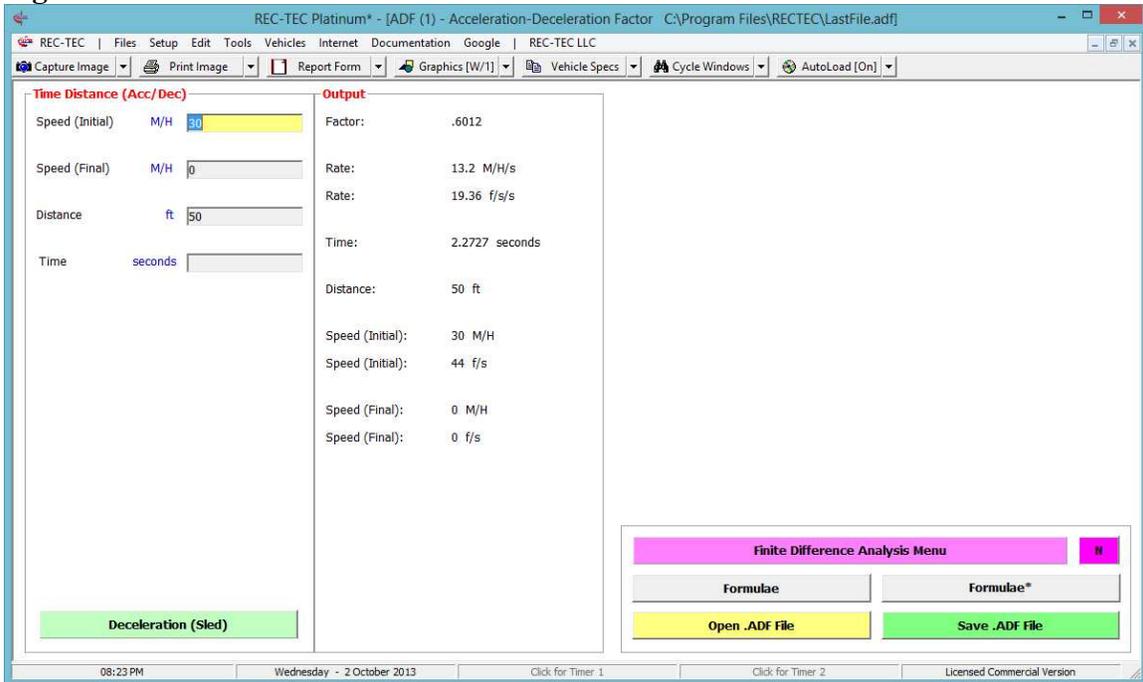
This will call up a box showing all of the files in the Folder selected.

Figure 7



Clicking on **Open** will call up the Module and automatically open the file in the appropriate module (Figure 8).

Figure 8



If Open Multiple Files is selected, the user may open multiple files in one or more modules. To end this process, click on the Cancel button in the file display box.

Notice in Figure 8, on the lower navigation bar on the right hand side the icon labeled **AutoLoad**. In Figure 8, **AutoLoad** is turned off (**AutoLoad[Off]**). When a module is exited, or the program is exited, all modules save their current data to a file named “**Lastfile**” with the appropriate extension for the particular module.

Caution – if multiple copies of the same module are opened with different files, be sure to save the data as “named” files as the last module to close will overwrite the other “Lastfile” in identical modules.

Files – Opening and Saving Files

Almost every module allows saving the data to a file that can be re-opened later, redisplaying the original computations. Each of these text files carries an extension (.???) unique to a particular module. When a module is closed, the data (or lack of data) in that module is automatically saved as Lastfile.(ext). If AutoLoad is set to [On], the file for the module will open using this Lastfile.(ext) unless the module is opened by selecting a particular named file.

Once a module is open, a file can be opened at any time using the **Open .EXT File** button. The **Save .EXT File** button will save the data with a user selected name.

Other **Files** options are available which call up text files produced by various modules for third party animations. Many popular movie (animation) formats can also be called up using the **Files** menu.

Setup

The submenu > **REC-TEC** calls up the **Configuration** screen, which can be viewed or modified.

The submenu > **Reset Defaults** calls up the **Configuration** screen with the default settings, which can be viewed or modified.

The (Figure 9) submenu > **View** permits the user to independently view or hide the lower (Icon) navigation bar and the Status bar at the bottom of the screen.

Figure 9

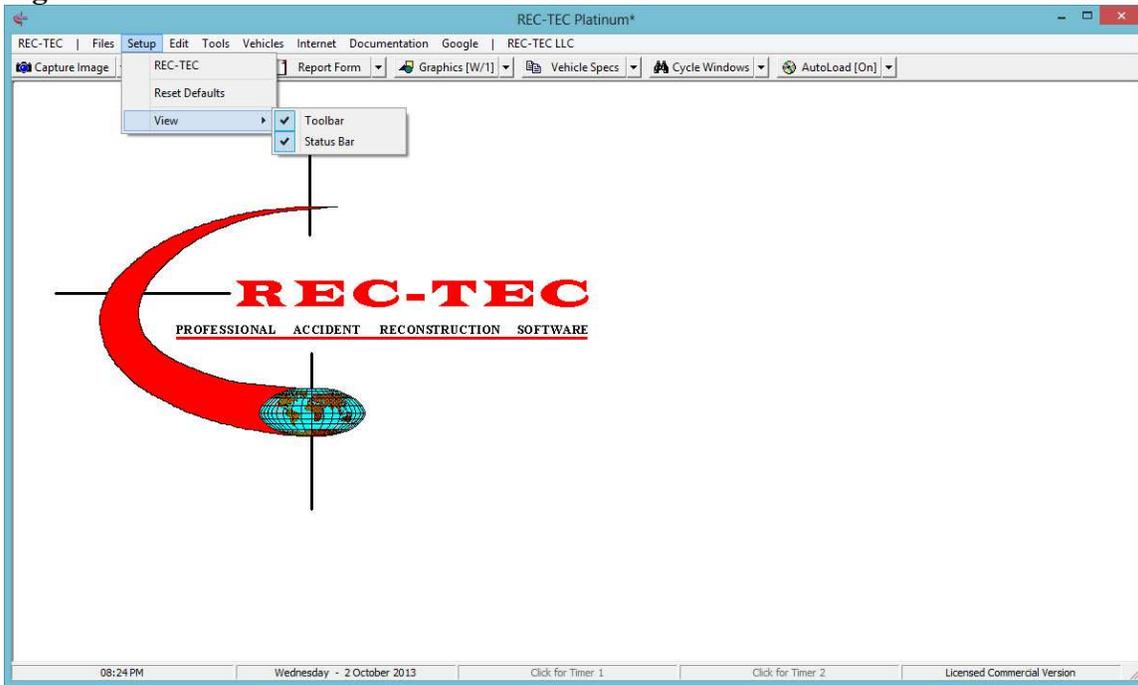
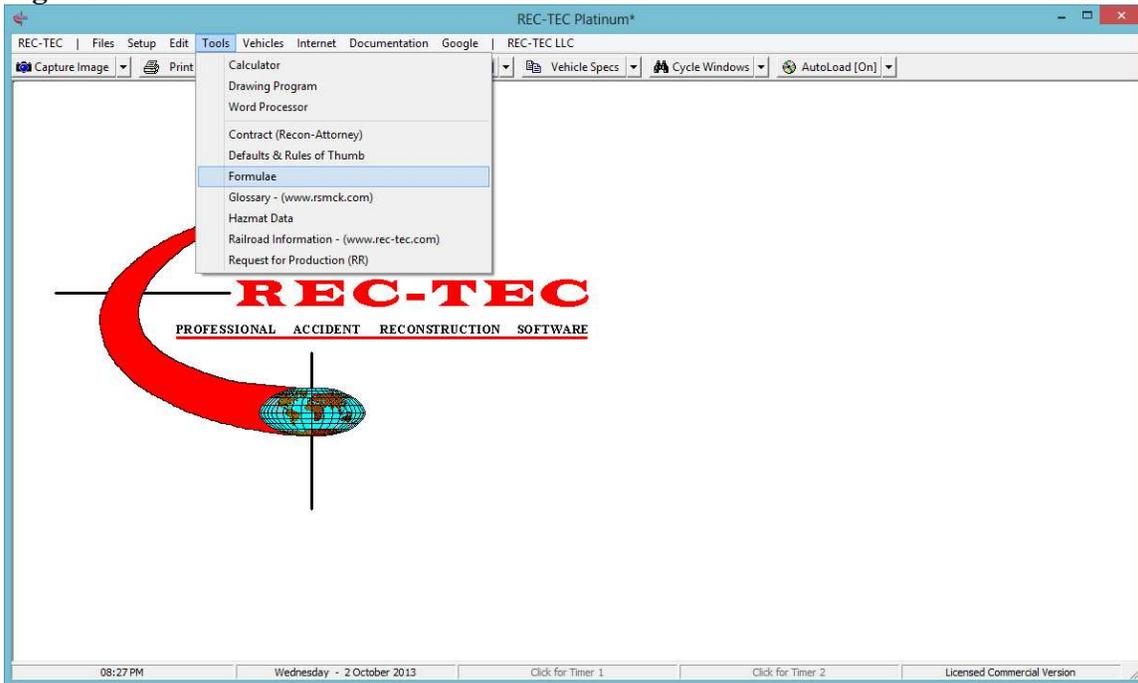


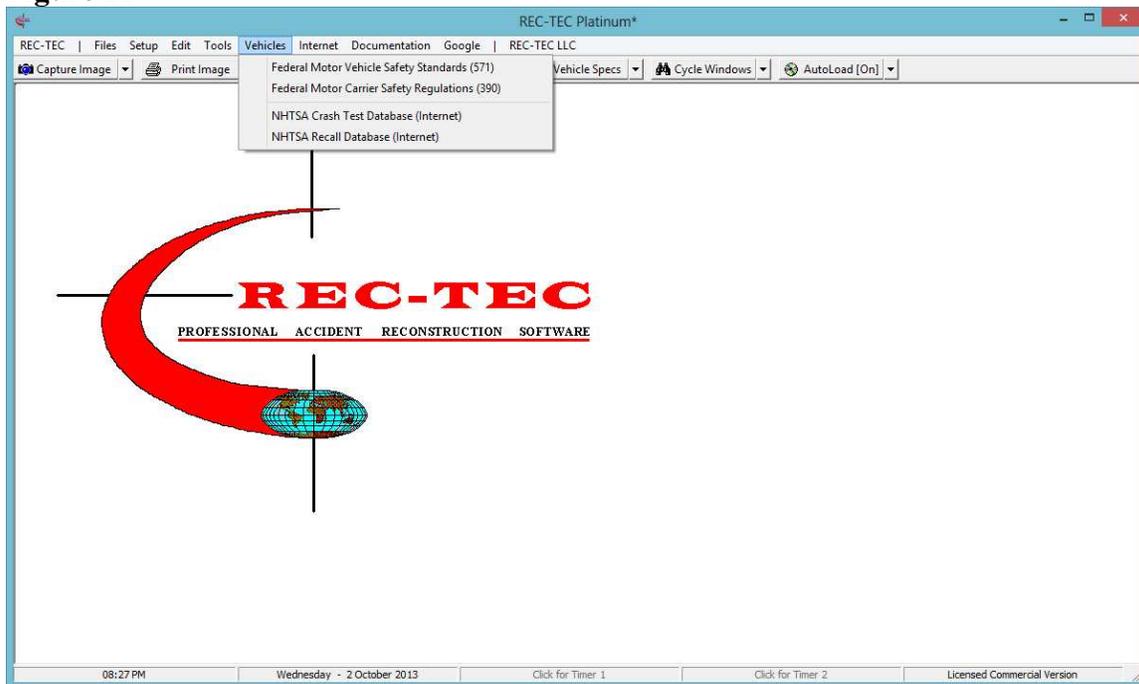
Figure 10



Tools (Figure 10)

- Submenu > **Calculator:** Windows Calculator (Switches between Normal and Scientific).
- Submenu > **Drawing Program:** Set on **Configuration** screen.
- Submenu > **Word Processor:** Set on **Configuration** screen.
- Submenu > **Contract (Recon-Attorney):** Sample contract.
- Submenu > **Defaults & Rules of Thumb:** Collection of values.
- Submenu > **Formulae:** Formulae used in program (two formats).
- Submenu > **Glossary – (rsmck.com):** Useful AR glossary.
- Submenu > **Hazmat Data:** Hazmat information.
- Submenu > **Railroad Information (rec-tec.com):** Useful Railroad information.
- Submenu > **Request for Production (RR):** Sample document (Railroad).

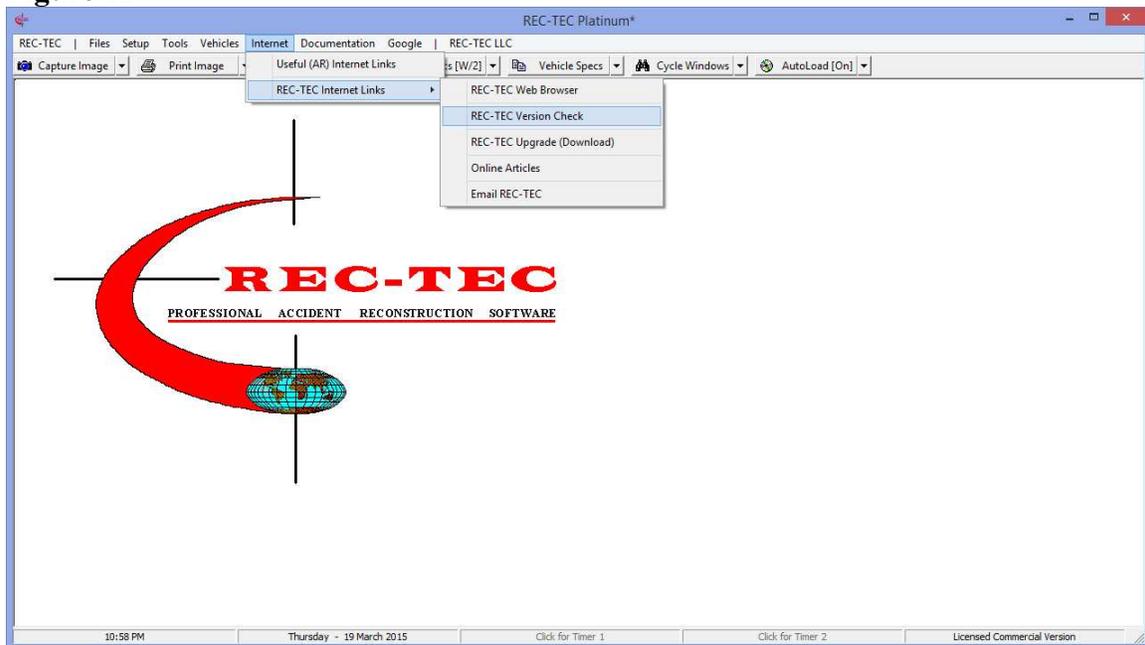
Figure 11



Vehicles (Figure 11)

- **Federal Motor Vehicle Safety Standards (571)**
- **Federal Motor Carrier Safety Regulations (590)**
- **NHTSA Crash Database (Internet)**
- **NHTSA Recall Database (Internet)**

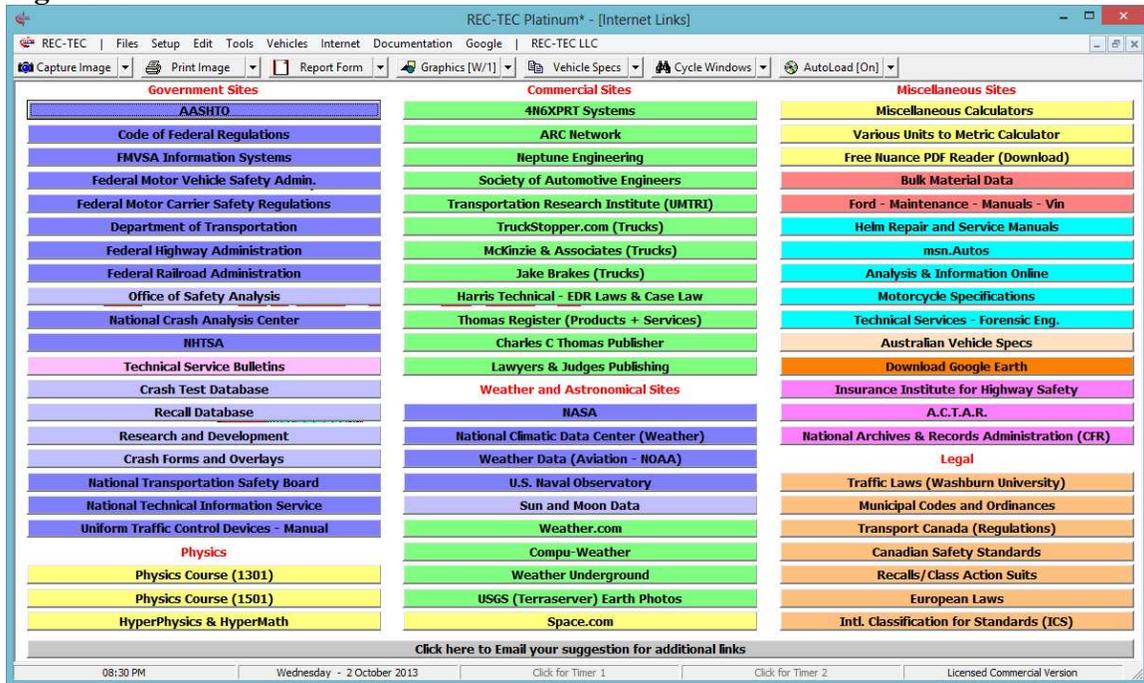
Figure 12



Internet

- **Useful AR Internet Links** (Figure 13)
- **REC-TEC Internet Links**
 - **REC-TEC Web Browser**
 - **REC-TEC Version Check**
 - **REC-TEC Upgrade (Download)**
 - **Online Articles**
 - **Email REC-TEC**

Figure 13



Documentation (Figure 14)

- **REC-TEC - Email Information for License**
- **All F1 Key (Help).PDF Files**
- **[F1] key Program Overview or Help**
- **[F2] key Finite Difference Analysis Overview**
- **[F3] key Animation Overview**
- **[F4] key Module Overview**
- **[F5] key Inside REC-TEC (www.rec-tec.com)**
- **[F6] key Same as [F1] key**
- **[F7] key Same as [F1] key (www.rec-tec.com)**
- **[F8] key Inside REC-TEC (PDF)**
- **[F9] key REC-TEC Startup Guide (PDF)**
- **[F10] key REC-TEC Version Check (www.rec-tec.com)**
- **About Coordinate Systems (Diagram of Coordinate Systems)**
- **Printing Reports and Graphics (Figure 15)**

Figure 14

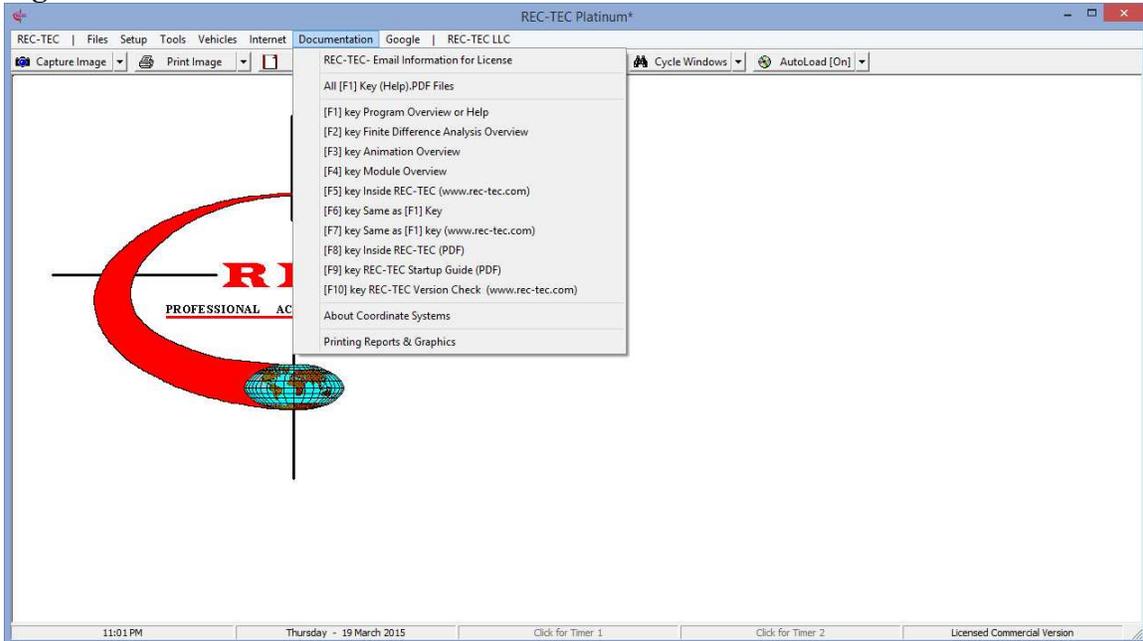
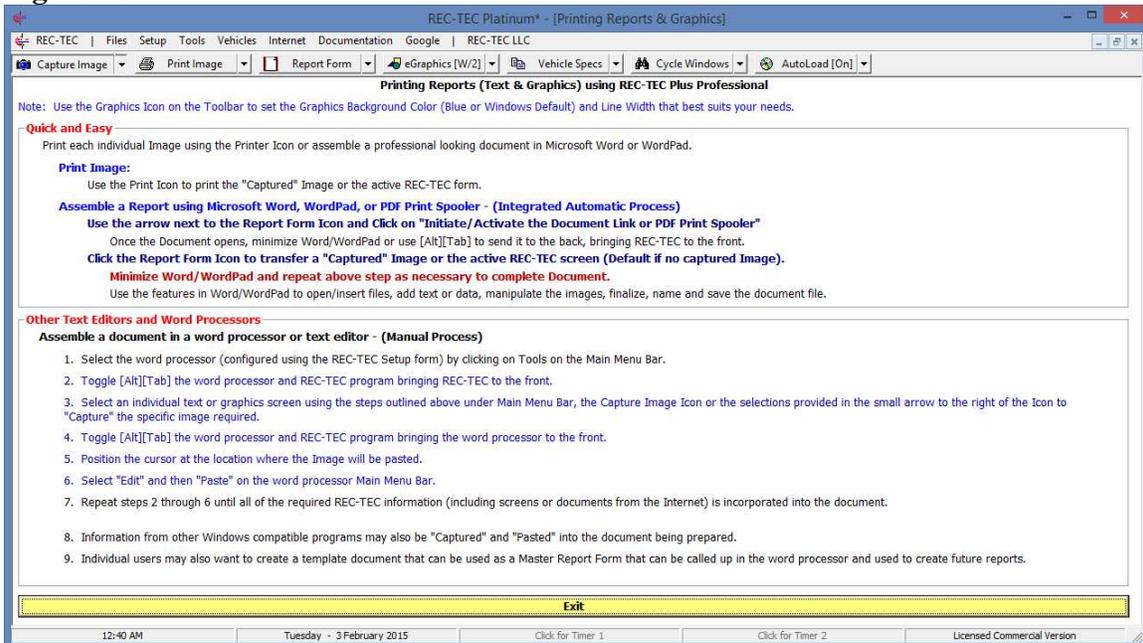


Figure 15



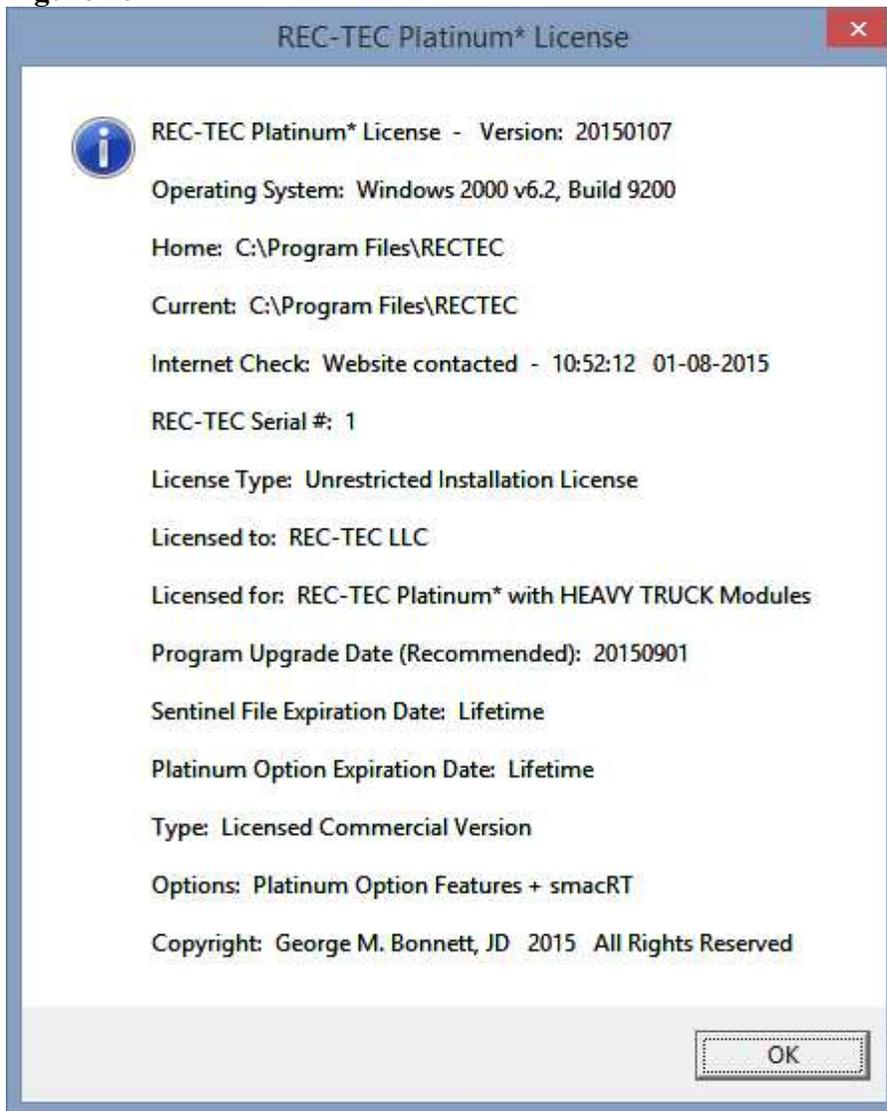
Google

- Calls Google for Answers to many AR/Other questions

Name

- REC-TEC License (Figure 16)

Figure 16



Radio Button Functions

To the right of certain (**Primary Output**) Speeds in selected modules there is a “**Radio Button**” that will transfer the value of the Speed to the “**Windows Clipboard**” for transfer into other modules within **REC-TEC** or anywhere else the user may select using the **Paste** option after Right Clicking on the **Mouse**. This option appears on the following modules:

- Time Distance Multiple Surfaces (Initial Speed)**
- Fall-Vault Airborne**
- Vault-Slide Integration**
- Yaw-Critical Speed of a Curve**
- Kinetic Energy**
- 360 Linear Momentum (Impact Speeds)**

At every entry point in the program calling for an Acceleration/Deceleration Factor, there is a small round “Radio Button.” Clicking the Radio Button will cause the Acceleration/Deceleration Factor module to appear. Computations can be made for timed or measured vehicle tests or for Drag Sled **Pull** weight divided by **Sled** weight. The user may then transfer the result of the computation and Exit the module or Exit the module without transferring a value.

**Lower Navigation Bar (Icons and dropdown menus) – See Figure 1
(Table of Contents)**

- **Capture Image** – Captures REC-TEC Image on Clipboard
 - **Capture Entire Screen**
 - **Capture REC-TEC**
 - **Capture REC-TEC (Active Form)**
 - **Capture Active Window (time delayed capture)**
 - **Display Captured Image (Displayed on REC-TEC Form)**
 - **Clear Current Image**

- **Print Image** – Prints REC-TEC image to default printer

- **Report Form** – Sets link to Word/WordPad/Adobe printer driver
 - **Display Help – Printing**
 - **Initiate Document Link with Word (Integrated)**
 - **Initiate Document Link with WordPad (Integrated)**
 - **Activate PDF (Adobe) Document Spooler**
 - **Copy Image to Report**
 - **Close Document (Spooler to PDF Document)**

- **Graphics** – Toggles Graphics background color
 - **Toggles Background Color (Blue/White)**
 - **Graphics Line Width = 1 (Session only)**
 - **Graphics Line Width = 2 (Session only)**
 - **Graphics Line Width = 3 (Session only)**
 - **Graphics Line Width = 4 (Session only)**
 - **Graphics Line Width = 5 (Session only)**

- **Vehicle Specs** – Calls AutoStats Lite from 4N6XPRT Systems
 - **List of 4N6XPRT Vehicle Specs programs installed on computer (if any)**
 - **Canadian Vehicle Specs (Windows Version)**
 - **Sisters and Clones**
 - **Motorcycle Specs (Internet)**

- **Cycle Windows** – Cycles (multiple) modules to foreground
 - **Cascade**
 - **Tile Horizontally**
 - **Tile Vertically**
 - **Arrange (Icons)**
 - **Minimize All**
 - **Restore All**
 - **Close All**

- **AutoLoad** – Toggles **AutoLoad[On/Off]**
 - **Save Change**
 - **AutoLoad – ON**
 - **AutoLoad – Off**

And so our journey begins....

We need to learn how to accelerate and decelerate. These are much the same and often just referred to as Accelerations. A deceleration is a negative acceleration. While this sounds very simplistic, it will help us get through one of the most difficult areas in learning how to use **REC-TEC**.

It is often said that Time-Distance is the heart of Accident Reconstruction. It is the foundation of Accident Reconstruction. The cornerstone of this foundation is Acceleration. If Acceleration is understood, Reconstruction becomes much easier.

Almost all Time-Distance problems that ask for the Input of a Factor can be solved using Time Distance Single-Surface Acceleration (**Module 2**). They could also be solved using Time-Distance Single-Surface Deceleration (**Module 3**). Time-Distance Omni (**Module 8**), will solve for Accelerations, Decelerations, Constant Velocity, and Acceleration (and Deceleration) Factors. So why confuse everything with so many different modules?

It may help to think of **REC-TEC** as an Accident Reconstruction Toolbox. Each of the modules in **REC-TEC** is a unique tool designed for a special purpose. While it is possible to drive a nail with a wrench or a screwdriver, a hammer is usually more efficient. And just think of all of the specialized hammers some stores carry.

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