

# **HELP VINNY RPN CALCULATOR v1.15**

## **CONTENTS**

### **INTRODUCTION**

### **KEYBOARD KEYS**

### **DIALOG BUTTONS**

### **DATA FORMAT**

### **SAMPLE PROBLEM**

# HELP VINNY RPN CALCULATOR v1.15

## INTRODUCTION

Vinny RPN Calculator is a Reverse Polish Notation utility program for science and engineering students. It temporarily converts the computers numeric key pad into a RPN calculator by allowing direct use of key pad digits, [ +, -, \*, / ] keys, [Enter] and [Up/Down Arrow & Page] keys. Trigonometric and logarithmic functions are provided by mouse clicking on dialog box buttons. Numbers can be input in decimal or exponential format. A period or a comma (European format) can be used to separate the whole number digits from the decimal digits. Linkage to other applications is available through use of the Windows clipboard. Optional features include window stay on top and window shrinkage. Try opening several instances of Vinny RPN Calculator at on time. You can move data from one instance to another using the copy and paste buttons.

## KEYBOARD KEYS

### [ENTER] KEY

Vinny RPN is set up with a four register stack. In most RPN calculators only the bottom register is displayed to the user. Vinny RPN displays all four registers. They are:

T: T or top register.

Z: Z register.

Y: Y register.

X: X or working register.

The X register is used for data entry and display of all results. All other registers are read only and are displayed for information and to help in understanding the operation of RPN. When a digit is keyed in from the numeric key pad it appears in the X register. When all the desired digits are keyed in for a given number the user presses the computer [Enter] key to complete the data entry. This pushes the X value into the Y register, the Y value into the Z register and the Z value into the T register. Note the value in the T register is pushed off the stack and is lost. Each time the [Enter] key is struck the stack is pushed up one notch.

### [UP/DOWN] ARROWS KEYS

The [Up] and [Down] arrow keys roll the registers as follows:

[Up]: X=T; Y=X; Z=Y; T=Z

[Down]: X=Y; Y=Z; Z=T; T=X

### [+] [-] [\*] [/] KEYS

The plus, minus, multiply and divide keys operate as follows:

[+]:  $X = Y + X$

[-]:  $X = Y - X$

[\*]:  $X = Y * X$

[/]:  $X = Y / X$

After any of these operations the stack is moved down one notch as follows:

X = Result of operation; Y=Z; Z=T; T=T

As you can see the value in the T register is duplicated in the Z register. This automatic downward movement of the stack in RPN calculators makes chain calculations very convenient.

### [Page Down] [Page Up] KEYS CHANGE SIGN OF X AND EXPONENT OF X

The [Page Down] key has been designated to act as a sign change key for the value in the X register. (ie The [Page Down] key toggles the X register value between plus and minus.) The [Page Up] key has been designated to act as sign change key for the exponent of the value in the X register. (ie The [Page Up] key toggles the X register exponent value between plus and minus.)

### [CTRL C] [CTRL X] [CTRL V]

[Ctrl C] Copies the value in the X register to the Windows clipboard.

[Ctrl X] Copies the value in the X register to the Windows clipboard and deletes the value from the X register.

[Ctrl V] Pastes any value in the Windows clipboard into the X register and moves the stack up one notch.

## DIALOG BUTTONS

### ENTER, +, -, \*, /,

Left mouse clicking these dialog buttons works the same as striking the corresponding keyboard keys.

### CA, CX, YX, R, EDIT X

Left mouse clicking these dialog buttons provides extra register control as follows:

**CA:** Clears all registers values.

**CX:** Clears X register value.

**XY:** Interchanges X and Y register values.

**R:** Down rolls register values.  $X=Y$ ;  $Y=Z$ ;  $Z=T$ ;  $T=X$

**Edit X:** Allows editing of the digits in the number in the X register.

### +/-, Y^X, SQRT(X), X^2, 1/X, E+/-

Left mouse clicking these dialog buttons performs the following functions:

**+/-:** Changes the sign of the X register value.

**Y^X:** Sets  $X=Y^X$  and moves the rest of the stack down one notch.

**SQRT(X):** Sets  $X=X^{0.5}$  and has no other effect on the stack.

**X^2:** Sets  $X=X^2$  and has no other effect on the stack.

**1/X:** Sets  $X=1/X$  and has no other effect on the stack.

**E+/-:** Changes the sign of the exponent of the X register value.

### DEG/RAD, DEG>RAD, DEG<RAD

Left mouse clicking these dialog buttons performs the following functions:

**DEG/RAD:** Alternately changes the trigonometric functions units from working with degrees to radians and back again. The word degree or radian is displayed on the dialog box in red to indicate the current trigonometric units state.

**DEG>RAD:** Converts the X register value from degrees to radians.

**DEG<RAD:** Converts the X register value from radians to degrees.

## TRIGONOMETRIC AND LOGRITHMETRIC FUNCTIONS

Left mouse clicking these dialog buttons performs the indicated function on the value in the X register and has no other effect on the stack.

### STO, RCL

In addition to the stack registers one extra internal memory register (M) is provided. Data can be stored and recalled from this memory location by left mouse clicking the STO and RCL buttons. The STO button sets  $M=X$ . The RCL button sets  $X=M$  and moves the stack up one notch.

### Copy, Paste

Left mouse clicking the Copy button copies the value in the X register to the Windows clipboard. Left mouse clicking the Paste button pastes any value in the Windows clipboard into the X register and move the stack up one notch. The Windows shortcut keys [CTRL C] and [CTRL V] can also be used to activate Copy and Paste. These functions provide for data transfer between Vinny RPN Calculator and other Windows applications and they can also be used as another memory location if desired.

### Top, Back,

The Top/Back button is used to make the calculator window either stay on top or allow it to be hidden by other windows. When the button displays TOP the calculator window is set to stay on top. When the button displays BACK the calculator windows can be covered by other application.

## **Shrunk, Trig**

The Shrunk/Trig button changes the calculator window size. When the button displays SHRUNK the calculator window size has been reduced by eliminating the log and trig functions. When the button displays TRIG the calculator window is at full size and the log and trig functions are available.

# DATA FORMAT

## Decimal or Exponential

If the result of a calculation is too large or too small it is automatically displayed in exponential format.  
For example:

The decimal number:

1 230 000 000 000 000 is displayed as 1.23E+15.

The decimal number:

0.000 000 000 000 001 23 is displayed as 1.23E-15.

Numbers can be input in decimal or exponential format. A period or a comma (European format) can be used to separate the whole number digits from the decimal digits. Use the [Page Up] key or the E+/- button to change the sign of the exponent value.

## **SAMPLE PROBLEM**

### **Add 4.4 to 3.6 and divide the result by 1.25**

In most cases you can input new values to an RPN calculator without first clearing the calculator. This is because there are not any pending operations. ie all RPN operations are performed on the current values in the X and Y registers.

#### **Steps**

Strike the [4], [.] , [4] keys.

(This displays the 4.4 in the X register. )

Strike the [Enter] key.

(This to pushes 4.4 into the Y register.)

Strike [3], [.] , [6] keys.

(This displays the 3.6 in the X register. )

Strike the [+] key.

(This displays the intimidate result 8 in the X register. )

Strike [1], [.] , [2], [5] keys.

(This pushes the previous result 8 into the Y register and displays 1.25 in X register.)

Strike the [/] key to get the final result 6.4

