KeyCAD Pro

For Windows

and Macintosh

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United States of America

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***IMPORTANT NOTE**: In order to receive technical support and notification of product upgrading and enhancements, please register this product.*

Table Of Contents

KeyCAD Tutorial

Introduction

While you continue to improve your various drawing techniques with this tutorial, you will find that new information is introduced in a gradual manner. This will assure you of a precise learning process that can be adjusted to your specific needs without having to acquire unnecessary information before practising the basic design techniques.

The following tutorial has been created to further assist you in your understanding of the basic features found within **KeyCAD Pro**, which leads you to the many powerful design techniques available within the program. It does this by providing a general design foundation from which you can work within.

After completing the tutorial, you will be able to use the Draw Tools, Snap To Tools, Edit Tools and Dimension Tools which are available within the program. Finally, you will have an appreciation of how **KeyCAD Pro** allows you to develop professionally detailed drawings with the least amount of time and money invested.

To help in keeping this tutorial fast and user friendly, many of the **KeyCAD Pro** features and combinations of tools were not included in this tutorial. For more detailed and comprehensive coverage of how to use all features, refer to the on-line User Manual.

System Requirements (Windows)

- ❒ 386 PC or higher
- ❒ DOS 3.0 or higher
- ❒ 2MB of RAM minimum
- ❒ A hard disk
- ❒ Windows Compatible monitor
- ❒ Microsoft Windows version 3.1 or higher
- ❒ Windows Compatible mouse

Recommended Hardware

- ❒ 4MB RAM
- ❒ Math Coprocessor *(**KeyCAD Pro** is fully functional without a math coprocessor, however the Math coprocessor increases the speed of the program.)*
- ❒ VGA Color Monitor or higher

System Requirements (Macintosh)

- ❒ Macintosh SE/30 or higher
- ❒ 4MB RAM (5MB recommended)
- ❒ System 6.0.7 or higher (System 7 recommended; System 7.1.2 or higher required for PowerMacintosh(tm))

KeyCAD Pro Installation

Windows 95 Installation

Microsoft Windows 95 must be already installed on your PC in order to install **KeyCAD 2.0**. With the computer turned on and Windows already running:

1. Place the **KeyCAD PRO** CD-ROM into the CD-ROM drive.
2. Click on the **Start** button and select *Run* then type:

   D:\START.EXE and press ENTER, where **D** is the letter designation of the CD-ROM drive. Follow the on-screen instructions to select options and complete the installation.

Windows 3.1 Installation

Microsoft Windows Version 3.1 must already be installed in order to install **KeyCAD Pro**. With the computer turned on and Windows already running:

1. Place the **KeyCAD Pro** CD-ROM into the CD-ROM drive.

   From the **File** Menu choose *Run* then type :

   D:\START.EXE and press ENTER

   where **D** is the letter designation of the CD-ROM drive.

2. Alternatively access the File Manager and double click on the SETUP.EXE program in the CD-ROM drive and directory. Refer to the Windows Manual for the correct procedure.

   The **KeyCAD Pro** CD-ROM installation program gives the user a choice of installing either the program, the **symbol libraries** or both. Choose the required option by clicking on it.

   The **KeyCAD Pro** installation automatically installs both the program and symbol libraries.

   The user is then prompted for a directory name to install **KeyCAD Pro** into. The default directory is **C:\CADPRO**. To accept the default directory, click on OK or press ENTER.

3. To install to a different directory, type in the full path name of the directory (drive and directory name), then click on OK or press ENTER.

4. If the directory does not exist the installation program asks the user to confirm the creation of the new directory. Press ENTER to create the new directory or Cancel to enter a different path name.

At the conclusion of these instructions, **KeyCAD Pro** is fully installed and ready for use.

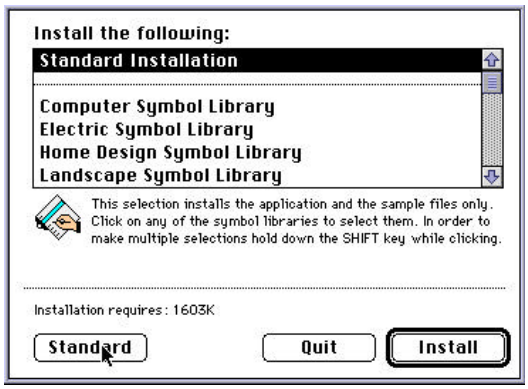
Starting KeyCAD Pro (Windows)

The installation program automatically creates a program group and the program item ready to run **KeyCAD Pro**. To start the program, double click on the **KeyCAD Pro** icon. Also provided is a list of symbols included with the program, to access this list, double click on the **README** icon.

The **README** icon is only provided if the symbol libraries option is chosen during the installation.

KeyCAD Pro is now installed and ready for use.

Macintosh Installation



Custom Installation Dialog Box (Macintosh)

1. Place the **KeyCAD Pro** CD-ROM into the CD-ROM drive.

2. Double click on the KeyCAD Pro Installer.

3. Follow the on screen instructions.

The **KeyCAD Pro** installation, installs both the program and symbol libraries by default.

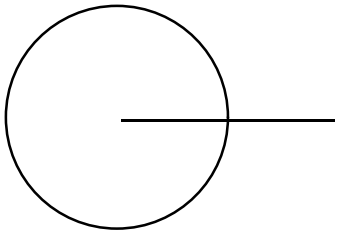
The user also has the choice of installing the **symbol libraries**, by choosing Custom. Choose the required option by clicking on it. To choose multiple options, press and hold the SHIFT key while clicking on your selections.

The user is then prompted for a directory name to install **KeyCAD Pro** into. Click Install to copy the program to the default location or type another location. Then, click Install to continue.

KeyCAD Pro is now installed and ready for use.

Exercise 1

Create a 2.0 in. diameter circle with its center at the end-point of a horizontal line.



Example Design

Answer 1

Step 1

First, select the Circle tool from the Draw toolbox, and draw a 2.0 in. circle. To draw the circle, move the cursor to the desired start point, click and drag the mouse while holding down SHIFT. Watch the readouts at the bottom of the screen to obtain the correct size for the circle.

Circle Tool

The Readouts Window

Diameter

Step 2

Once a 2.0 in. diameter circle has been created, select the Line tool from the Draw tools.

Line Tool

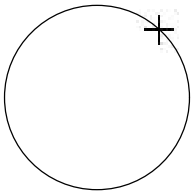
Step 3

Select the Center Point Snap To tool. (Remember that the Snap To tools are designed to work in conjunction with the Draw tools.) The SnapTo toolbox can be activated from the Toolboxes option under the Windows menu.

Center Point Snap To Tool

Step 4

After you have selected the Draw and Snap To tools, place the cursor near the boundary line of the circle and click and drag the mouse to the desired line length while holding down SHIFT. Notice that when you first click the mouse, the start point of the line automatically snaps to the center point of the circle.



Place cursor near boundary line

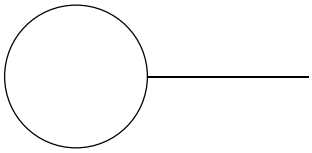
Step 5

Release the mouse button once you have reached the desired line length. (*You can select a different Snap To tool for the end-point of the line by pressing the Tab key during the drawing of the line.*)

NOTE: Holding the SHIFT key down while drawing the line, draws a line only along the horizontal or vertical axis.

Exercise 2

In this exercise, create a line perpendicular to a circle.



Example design

Answer 2

Step 1

You must first create a circle, the circle can be any size. To draw a circle, select the Circle tool from the Draw toolbox and place the cursor at the desired start point. Then, click and drag the mouse while holding down SHIFT. The SHIFT key allows you to create perfect circles, if you release the SHIFT key the tool will draw ovals.

Circle Tool

Step 2

After you have drawn a circle, select the Line tool from the Draw toolbox.

Line Tool

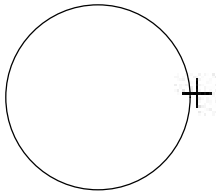
Step 3

Then, select the Perpendicular Snap To tool from the Snap To toolbox. (Remember that the Snap To tools are designed to work in conjunction with the Draw tools.)

Perpendicular Tool

Step 4

Place the cursor near the boundary lines of the circle, then click and drag the mouse to any desired line length. Notice that the line you are creating automatically snaps to a perpendicular position in relation to the circle. The perpendicular angle is determined by the position of the start point of the line. In this example, the start point of the line is fixed at a horizontal position in relation to the circle.



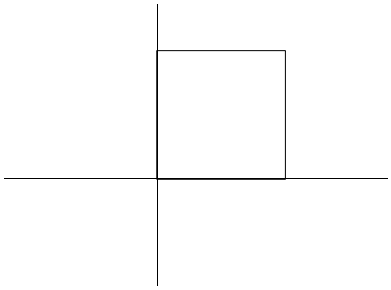
Place cursor near the boundary line

Step 5

Once you have reached the desired line length, release the mouse button. This method of creating a perpendicular line by combining Draw tools with the Perpendicular Snap To tool, works with any of the objects in the Draw toolbox.

Exercise 3

In the following exercise, draw a rectangle with it's start point at the intersection point of two lines. This exercise is designed to demonstrate how you can start any object from the intersection point of any two objects.



Example design

Answer 3

Step 1

First, create two lines that intersect as shown in the example above. Use the Line tool from the Draw toolbox.

Line Tool

Step 2

Now, select the Rectangle tool from the Draw toolbox.

Rectangle Tool

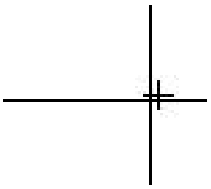
Step 3

Select the Intersection Snap To tool from the Snap To toolbox.

Intersection Snap To Tool

Step 4

Place the cursor near the intersection point of the two lines. Then, click and drag the mouse to create a rectangle, hold down the SHIFT key to draw perfect squares. Notice that the start point of the rectangle snaps to the intersection point of the two lines.



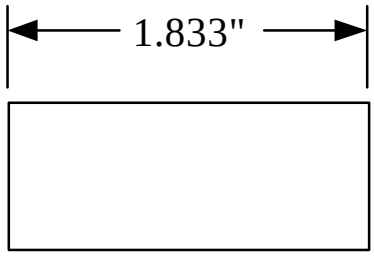
Place cursor near intersection point

Step 5

Drag the mouse button to the desired size, and then release the mouse button. Watch the Readouts to obtain certain dimensions. This method of creating objects with their start points at the intersection point of any two objects works with any intersection point, by combining Draw tools with the Intersection Snap To tool. (*A different Snap To tool can be selected for the end-point of the rectangle by pressing the Tab key during the drawing of the rectangle.*)

Exercise 4

The following exercise demonstrates how to use the Linear Dimension tool, when dimensioning a rectangle. This example uses a simple object such as a rectangle, but you can use the same steps when dimensioning between any two points.



Example Design

Answer 4

Step 1

First, create a rectangle similar to the one in the example above. Use the Rectangle tool when drawing your rectangle.

Rectangle Tool

Step 2

Select the Linear Dimension tool from the Dimension toolbox.

Linear Dimension Tool

Step 3

Double click the End-Point Snap To tool from the Snap To toolbox.

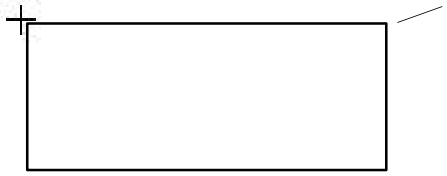
End-Point Snap To Tool

Step 4

Then, place the Dimension tool cursor near the first point of the rectangle. Click and hold down the mouse button while dragging the

cursor to the second point of the rectangle. Release the mouse button at the second point. Since you selected the End-Point Snap To tool, the dimension lines automatically snap to the corner points of the rectangle.

Click near first point Drag to second point

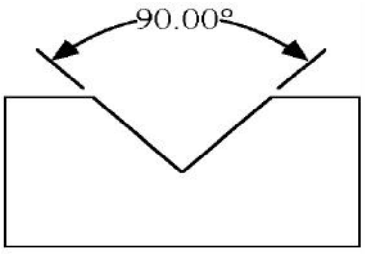


Step 5

After you release the mouse button at the second point of the dimension, move the cursor away from the rectangle, notice how the dimension lines follow the cursor movement. Once you reach the desired distance from the rectangle, click once to anchor the dimension. After you click the mouse button to anchor the text, the dimension automatically appears between the arrowheads.*You can select a different Snap To tool for the start or end-point of the dimension you are creating by pressing the Tab key during the drawing of the dimension.*

Exercise 5

This exercise demonstrates how to use the Angular dimension tool. The following example illustrates a closed polygon with the 90 degree V-shape in the middle of the polygon.



Example Design

Answer 5

Step 1

Create a polygon similar to the one in the example shown above. Use the Closed Polygon tool found in the Draw toolbox.

Polygon Tool

Step 2

After you have created the closed polygon, select the Angular Dimension tool from the Dimension toolbox.

Angular Dimension Tool

Step 3

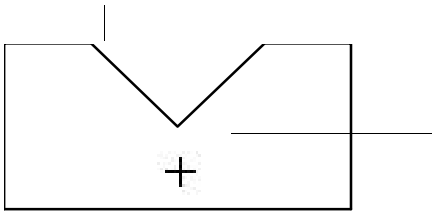
Select the End-Point Snap To tool from the Snap To toolbox. Be sure to double click on the End-Point tool so that the tool is locked.

End-Point Snap To Tool

Step 4

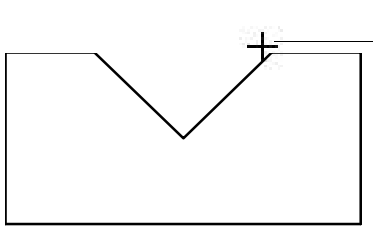
Place the cursor near the angular point of reference as shown below. Then, click and hold down the mouse button, while dragging the cursor to the second point of the angled line. Once you are near the second point of reference, release the mouse button. This operation indicates to the program from which line you want to obtain an angular dimension.

Second point of reference



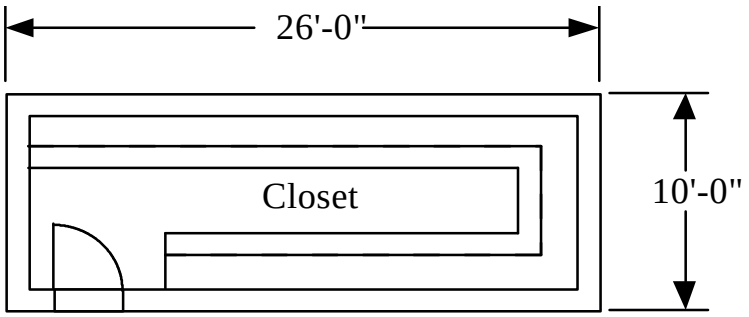
Step 5

After you release the mouse button at the second point, notice how the program has built an angular dimension line which follows the mouse movements. Now, drag the cursor to the third reference point as shown below, and click the mouse once. This is telling the program the size of the angle you are dimensioning. Drag the mouse away from the object and click once to anchor the text and the arrows for the dimension.



Exercise 6

In the following exercise create a closet that would be used in a typical floorplan. For the purpose of this exercise create the design using a scale factor of 1/8" = 1'.

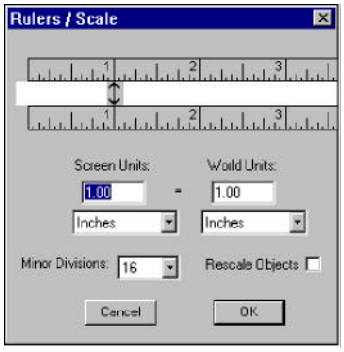


Example Design

Answer 6

Step 1

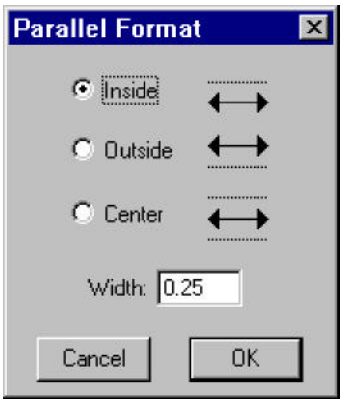
The first step in creating the closet shown above, is to set the scale factor of the design. Select Rulers /Scale from the **Layout** menu. Set the Screen Units to 0.25 Inches and the World Units to 2.0 Feet as shown below. Then, click on the OK button, your document has a scale factor of 1/8" equals 1' foot.



The Rulers/Scale Dialog box

Step 2

Select the Parallel Dialog box from the **Layout** menu. Select the Inside option button and set the width to 1.00, then click on the OK button. The Width value is in World units, feet.



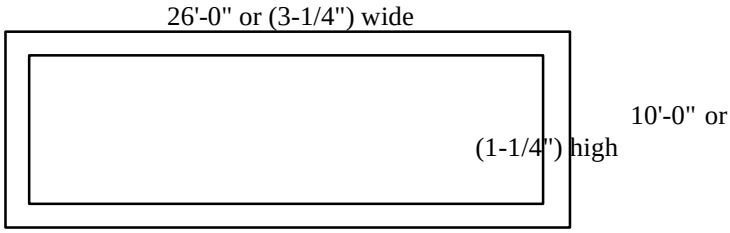
The Parallel Format Dialog box

Step 3

Now that the parallel options are set, select the Rectangle tool from the

Draw toolbox. Then, select the Draw Parallel option from the **Layout** menu, a check mark beside the option indicates that it is active. Now draw a 26'-0" (3-1/4") wide by 10'-0" (1-1/4") high rectangle. This represents the outer walls of the closet.

The Draw Parallel option



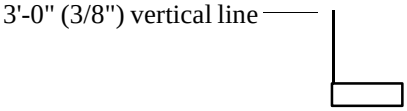
Step 4

Create a 3'-0" door for the closet. Select the Rectangle tool, deselect the Draw Parallel option and draw a 3'-0" (3/8") wide x 1'-0" (1/8") high rectangle.

3'-0" (3/8") wide x 1'-0" (1/8") high rectangle

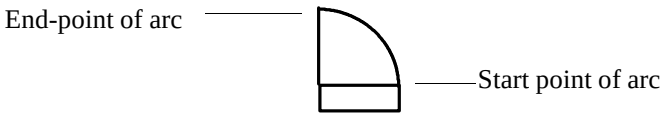
Step 5

Draw a 3'-0" (3/8") vertical line extending up from the upper lefthand corner of the rectangle created in Step 4. The example below shows how the line and rectangle should look.



Step 6

Now select the Arc tool from the Draw toolbox and draw a circular arc from the upper right-hand corner of the rectangle to the end-point of the vertical line.



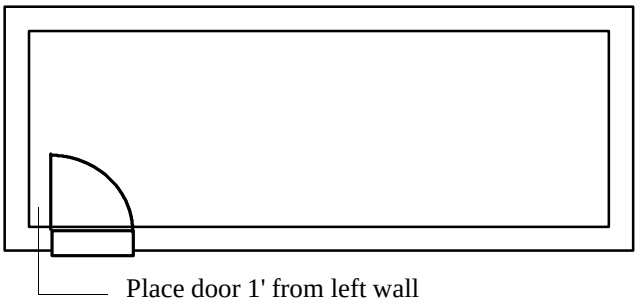
Step 7

After creating the door, select all objects that make up the door by dragging a selection rectangle around the entire door assembly, using the Selection tool. Then, select the Group command to group the entire door assembly. This helps in relocating the door to its proper position. You can group objects by selecting the Group command from the **Options** menu or by clicking on the Group button found on the Menu Bar.

Menu Command **Group Button**

Step 8

Place the door in the proper location as shown below. The door is 1' from the left interior wall.



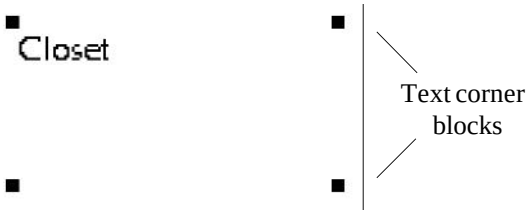
Step 9

Use the Polygon tool to create the shelf in the closet. Draw the shelf approximately 2'-4" wide. Then place a dashed-line set back 1'-0" from the edge of the shelf, this represents the clothes rod for hanging clothes on. Use the Polygon tool to create the dashed line. You can change the line type from the Lines option under the **Layout** menu.

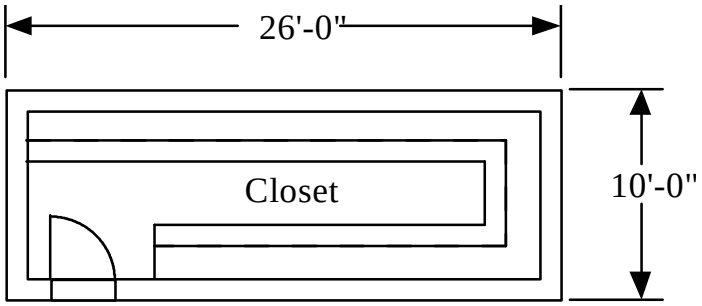
Step 10

The Text can be added by selecting the Text tool in the Edit toolbox and clicking once on the drawing to start typing.

Type in the word 'Closet' then click on the Selection tool from the Edit toolbox. The box frame for the text can be resized to better fit the text.



To resize a text block, click and hold down the mouse button on one of the four corner blocks while moving the cursor to change the size of the text frame. Now position the text in the middle of the closet.



Step 11

Now select the Linear Dimension tool and dimension the closet as shown above. Be sure to use the End-Point Snap To tool when dimensioning the closet.

End-Point Snap To Tool

NOTE: To display the dimensions in Feet and Inches as shown above select Readouts under the Layout menu and set the display to 0'-0".

Decimal Equivalents Inch / Fraction

Frac.	Equiv.	Frac.	Equiv.	Frac.	Equiv.	Frac.	Equiv.
1/64	0.015625	17/64	0.265625	33/64	0.515625	49/64	0.765625
1/32	0.03125	9/32	0.28125	17/32	0.53125	25/32	0.78125
3/64	0.046875	19/64	0.296875	35/64	0.546875	51/64	0.796875
1/16	0.0625	5/16	0.3125	9/16	0.5625	13/16	0.8125
5/64	0.078125	21/64	0.328125	37/64	0.578125	53/64	0.828125
3/32	0.09375	11/32	0.34375	19/32	0.59375	27/32	0.84375
7/64	0.109375	23/64	0.359375	39/64	0.609375	55/64	0.859375
1/8	0.1250	3/8	0.3750	5/8	0.6250	7/8	0.8750
9/64	0.140625	25/64	0.390625	41/64	0.640625	57/64	0.890625
5/32	0.15625	13/32	0.40625	21/32	0.65625	29/32	0.90625
11/64	0.171875	27/64	0.421875	43/64	0.671875	59/64	0.921875
3/16	0.1875	7/16	0.4375	11/16	0.6875	15/16	0.9375
13/64	0.203125	29/64	0.453125	45/64	0.703125	61/64	0.953125
7/32	0.21875	5/32	0.46875	23/32	0.71875	31/3	20.96875
15/64	0.234375	31/64	0.484375	47/64	0.734375	63/64	0.984375
1/4	0.2500	1/2	0.5000	3/4	0.7500	1	1.0000

Metric Equivalents

MM		In.	MM		In.	In.		MM	In.		MM
1	=	0.0394	17	=	0.6693	1/32	=	0.794	17/32	=	13.493
2	=	0.0787	18	=	0.7087	1/16	=	1.587	9/16	=	14.287
3	=	0.1181	19	=	0.7480	1/32	=	2.381	19/32	=	15.081
4	=	0.1575	20	=	0.7874	1/8	=	3.175	5/8	=	15.875
5	=	0.1969	21	=	0.8268	5/32	=	3.968	21/32	=	16.66
6	=	0.2362	22	=	0.8662	3/16	=	4.762	11/62	=	17.462
7	=	0.2756	23	=	0.9055	7/32	=	5.556	23/32	=	18.256
8	=	0.3150	24	=	0.9449	1/4	=	6.349	3/4	=	19.050
9	=	0.3543	25	=	0.9843	9/32	=	7.144	25/32	=	19.843
10	=	0.3937	26	=	1.0236	5/16	=	7.937	13/16	=	20.637
11	=	0.4331	27	=	1.0630	11/32	=	8.731	27/32	=	21.431
12	=	0.4724	28	=	1.1024	3/8	=	9.525	7/8	=	22.225
13	=	0.5118	29	=	1.1418	13/32	=	10.319	29/32	=	23.018
14	=	0.5512	30	=	1.1811	7/16	=	11.112	15/16	=	23.812
15	=	0.5906	31	=	1.2205	15/32	=	11.906	31/32	=	24.606
16	=	0.6299	32	=	1.2599	1/2	=	12.699	1	=	25.400

Glossary

Angular Dimensioning: A tool found in the Dimension toolbox, which allows dimensioning of angular objects or lines.

ANSI Standard: The ANSI Standard is the most universal standard used in the USA. ANSI stands for American National Standards Institute.

Application: A program that has been created to perform a specific task such as word processing, database information, spreadsheets, etc. **KeyCAD Pro** is an example of a graphics or draw application.

Arrowheads: Arrows which appear at the end of the dimension lines indicating the points being dimensioned.

Associative Dimensioning: This means if one area of the dimensioned object is adjusted, all parts of the dimension area are adjusted accordingly. Any change to a single object or dimension causes all components of that dimension to be automatically updated to reflect the new changes.

Axis Lines: The lines that are positioned horizontally and vertically within a document window. Axis lines help in providing guidelines for creating objects horizontally and vertically.

Background Color: The color that **KeyCAD Pro** uses to fill any area that is not filled with an object fill pattern or color.

Block: A Block (Text Block) is the rectangular area enclosing any text that has been typed in the document.

CAD: Computer Aided Design - this is using a computer to assist in the creation of blueprints or precision graphics.

Chamfer Tool: An Edit tool which allows corners of joined objects to be chamfered. Chamfering is the process of *clipping* off a corner of an object, thus giving the object an angular corner.

Clipboard: The clipboard allows text, graphics, and objects to be moved within the same document, or to move objects to and from other applications.

Dimension Line: Shows the direction of any dimension. This line also shows the relationship of a dimension to the referenced object.

Duplication Options: Assigns duplication coordinates and repetitions to any selected object.

Edit Tools: Tools which appear in the Edit toolbox permitting the edit or alteration of points and objects. These tools include selection, point selection, resize, skew, rotate, chamfer, fillet, etc.

Elliptical Arc: A tool found within the Draw toolbox which is used to create curved lines.

Equilateral Triangle: A triangle with three equal sides.

Extension Lines: These lines occur when the dimension is established outside of an object's boundary lines. These lines are designed to*tie* the dimension line and the numerical value of the objects being dimensioned.

Fillet Tool: An Edit tool which allows corners of objects to be rounded off to a specific radius.

Floating Point Accuracy: The format used for precise mathematical computations. This format uses extended precision storage to avoid excessive round-off errors in all objects created.

Ghost Lines: These are dashed-lines which run parallel to the selected points while moving or editing within a document. These lines move as the mouse is repositioned.

Grow Buttons: The small boxes found in the upper right-hand corner of your window title bar. These buttons are activated by clicking them once with the mouse cursor. These buttons are used to enlarge or decrease the window size.

Horizontal Dimensioning: An option in linear dimensioning for finding the horizontal distance between any two points.

Isosceles Triangle: A triangle with two equal length sides.

Layer: A level in the document used to help in the organization of objects.

KeyCAD Pro allows designs to be created in separate*transparent* sheets and stacked on top of one another. Layers can be temporarily hidden to view the document in different ways.

Linear Dimensioning: A special tool found within the Dimension toolbox, which allows the linear dimensioning of any two points.

Line Tool: A tool found within the Draw toolbox, which is used to construct individual horizontal or vertical lines of any length or angle.

Math Coprocessor: Computer processing chip which aids in the mathematical calculations of creating objects.

Numerical Value: The number which is displayed when two points have been dimensioned.

Origin: The location which is represented as Zero for all Draw and Edit tools. The Origin is also referred to as the Absolute Point of the document.

Precision Readouts: The numeric values displayed at the bottom of the document. This information window contains the Absolute, Incremental, Percentage, and Angular information about objects and their position.

Radial Duplication: This is where objects are rotated and duplicated simultaneously around a specific point.

Relative Point: The Relative Point represents a point in space against which angles are measured. The Relative Pointautomatically has a circle drawn around it.

Relocate: To move objects to a new location or coordinate.

Resize: The Edit function, that changes an object size.

Rotate: An Edit function which allows objects to be moved around a fixed point.

Scaling: The process of assigning different scale factors to objects. Scaling can be performed in English or Metric measurements.

Scroll Bars: The *gray bar* area at the right-hand side and bottom of each document window. Press the arrows at the end of the scroll bars to move across the drawing area within a window.

Selection Points: The small circles and squares which appear at vertex points within objects.

Skew: An Edit function which allows objects to be slanted or sheared in a specific direction.

Symbols: An object or groups of objects which are saved in individual files, with the capability of being recalled for future use.

Text Tool: A tool found within the Edit toolbox which allows words, sentences, and paragraphs to be created in blocks and placed anywhere within your document

Toolbox: A palette of tools which appear within the program window.

Vertical Dimension: An option found within the Dimension toolbox for finding the vertical dimensions of any two points.

X-Axis: The horizontal plane in a document.

Y-Axis: The vertical plane in a document.