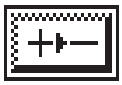
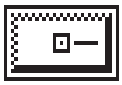
Points TOOLKIT

POINTS allows you to control `magnetic' snap points. You can manually create snap points at mid-points and intersections, control the automatic creation of snap points, and switch the display of snap points on and off. You can also turn off all the snap points.

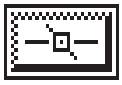
To activate an icon, simply select it from the Points palette. to turn it off, select it again.



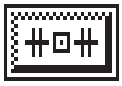
SNAP: Turn cursor snapping onto snap points on or off. The cursor snaps onto a point when it nears it when Snap is on. When Snap is off, the cursor moves freely about the screen ignoring any snap points which may be there. This has no effect on grids or traps.



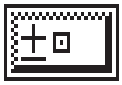
DISPLAY: Turn the display of snap points on or off. Fixed points such as the ends of lines are shown as small squares and handles as small triangles. The current datum point is shown as a circle with four radial lines (See Draw: Elements: Handle).



INTERSECTION: Find intersection points and add them to the snap list. A Select Item cursor is displayed for selecting the intersections required. Position the cursor over an intersection and click the button to create a snap point there.



MID-POINT: Find mid-points and add them to the snap list. A Select Item cursor is displayed for selecting the Entities whose mid-points are to be found. Position the cursor over a line or arc and click the button to create a snap point at the mid-point.



EDIT CREATE: When this icon is active, new endpoints and handles created by Edit and Copy functions create snap points. Without it, snap points are only created as you *draw* Entities with the cursor or keyboard input.

To remove the palette, select Points from the menu again. To continue drawing, select another function. The Points palette remains visible and you can alter its settings (like the Set Up: Page palette). Like the Speed Filter settings, the Snap and Display settings in this palette are always in effect, even if the palette is not visible.

The Intersect and Mid-Point functions in the palette stay in effect until they are switched off, or escaped from with **ESC**, or another function is selected.

Details: Snap points are affected by the visibility of the drawing's layers: snap points created by Entities (end points and handles) are only active and displayed if the Entities that cause them are in a visible layer. You can use Intersect to find intersections between any visible Entities, even if they are in different layers. Snap points created with Intersect and Mid-Point do not belong to any layer and will be effective until they are destroyed by Wipe, or a new drawing is Loaded. They can be saved when the drawing is filed in the library — see Library: File.

The `range' of snap points is usually 9 pixels (dots on the screen). You can change this by using Set Up: Trap Zone.

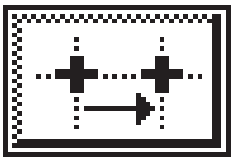
Intersect and Mid-Point have the same effect as planting a snap point with **F5** or **F7** (See Draw: Keyboard Input), but are much more convenient for intersections and mid-points.

Advanced: If the N-Tan Trap is active when you use Intersect or Mid-Point, it will move to the new snap point's position. With the Intersect option, the trap will be aligned on the older of the intersecting Entities (the one drawn first); for Mid-Point, it will be aligned on the selected Entity.

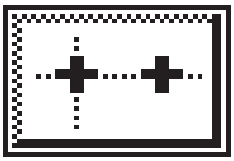
Angle Trap TOOLKIT

Angle traps are dotted construction lines, placed at user-set angles to the horizontal axis or relative to the direction of the last Entity added to the drawing. When angle traps are switched on and you move the cursor near a construction line, the cursor will snap onto that line.

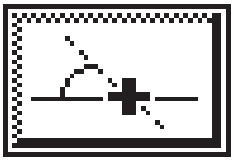
A palette is displayed as follows:



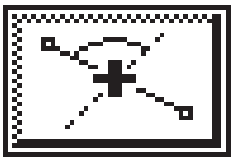
AUTO UPDATE: the traps move to the start of each new Entity as it is planted in the drawing (converse of Fixed).



FIXED: leave traps set at the point they were at when the traps were activated with **OK**. This is the converse of Auto Update.



ABSOLUTE: calculate the positions of trap lines by measuring the angles from the horizontal axis. Accucadd can use “Clockwise from west” or “Anti-clockwise from East” conventions for angles, which are described in Appendix C, “Configuration”.

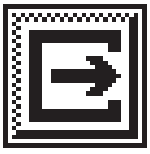


RELATIVE: measure the angles of trap lines with respect to the direction of the last Entity added to the drawing. Either angle convention can be used. This facility is mostly useful with Draw: Elements: Line.

SELECT ANGLES: select traps to be displayed when activated with **OK**. There are six trap angles, but only four can be selected at a time.

OK: switch all the selected traps on.

CANCEL: switch all the traps off.



EXIT: Removes the palette but leaves the traps operational. To remove them, select Angle Trap again and use Cancel, or select another grid or trap function.

Select the angles to be used, and then the **OK** icon to activate the trap. If you select an angle that is already active, it will be turned off. If you try to activate more than four angles, an error message is displayed.

To select relative traps or automatic updating, position the cursor over the icon and click the button. The icon remains highlighted, confirming

that it is on. To switch it off, move the cursor over it and click the button again.

To change an angle, position the cursor over the box in which the angle's value is displayed and click the button. An input window is then produced for you to enter the new angle. If you press **ESC** while typing, or type something that cannot be understood as an angle, the old value for the angle is retained.

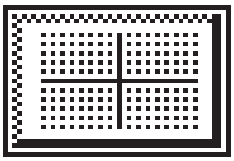
Details: Angles can be entered in degrees, radians or grads; this is explained more fully under Draw: Keyboard Input in the section `Entry Formats'.

If a snap point is close to an Angle Trap, the cursor will obey the snap point rather than the trap, unless snap points have been turned off (see Toolkit: Points). The reverse is true for grids, and the other kinds of traps.

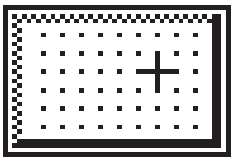
You can set the `range' of Angle Traps by using Set Up: Trap Zone.

A grid is a regular lattice of points, like a sheet of graph paper, displayed on your screen. The cursor `snaps' to these points to enable precise positioning.

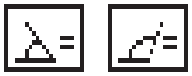
When you select Snap Grid, a palette is displayed. Its options define the size and shape of the grid and how and when it should operate.



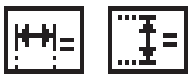
CENTERED: requests a centered grid. This is centered at the middle of the drawing area, with its spacing defined by the palette settings. It has cross-hairs passing through the center of the grid. The user-defined grid doesn't have cross-hairs.



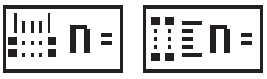
USER: requests a grid defined by the angle, spacing and step settings.



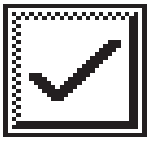
X & Y AXIS ANGLES: The values next to these icons define the angles of the X and Y axes for the User grid. Angles are entered in the form described under Toolkit: Angle Trap.



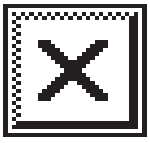
X & Y SPACING: The values next to these icons define the spacing between vertical and horizontal grid points for both grids. Setting the X spacing sets the same value for the Y spacing, but not vice-versa.



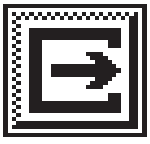
X & Y STEPS: The values next to these icons define which points on the USER grid are to be displayed. Setting the X value sets the Y value, but not vice-versa.



OK: switches the selected grid on, so that it attracts the cursor. You can set the range of the attraction with Set Up: Trap Zone.



CANCEL: switches the grid off.



EXIT: Removes the palette but leaves the grid operational. To remove it, select Snap Grid again and use Cancel, or select another grid or trap function.

Operation Select the required settings from the palette and then select **OK** to activate the grid, which will be drawn on the screen.

To select an angle, length or number, move the cursor over the icon box and click the button. To change a value, move the cursor over the value box, click the button and type the required setting on the keyboard, ending it with the **Enter** key.

Grid layouts

The origin of the centered grid is always at the center of the drawing area, irrespective of the current view.

The user-defined grid is centered, when it is first activated, on the last point entered in the drawing. It will remain centered on this point until it is switched off and on, when it will be re-centered on the newest point at that moment. It can therefore be easily moved by switching it off, planting the cursor at the desired point and switching it on again. zooming in will not add more points to the grid, but move the existing ones further apart on the screen.

Steps

The Steps values works as follows: with a value of 1, every point in the User grid is displayed. At 3, only every third row of grid points is displayed as dots, and only each third point in such a row is shown. At 10, only every tenth point is shown, and so on.

Warnings:

If you request an unreasonable grid (e.g. more points than pixels) Accucadd will not display it.

This function sets up a circular grid.

The grid consists of a series of circles of points. Any number of points may be placed in a circle.

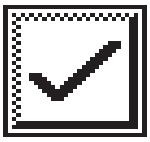
A palette is displayed containing the following icons:

START: The value next to this icon defines the start angle.

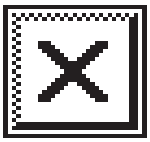
INCREMENT: The value next to this icon defines the incremental angle (This controls the Points value, below).

RADIUS: The value next to this icon defines the incremental radius.

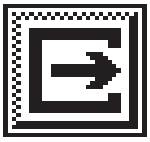
POINTS: The value next to this icon defines the number of points (This controls the Increment value, above).



OK: switch the grid on. Like Snap Grid, the `range' of attraction of the Radial Grid can be set with Set Up: Trap Zone.



CANCEL: switch the grid off.



EXIT: Removes the palette but leaves the grid operational. To remove it, select Radial Grid again and use Cancel, or select another grid or trap function.

Operation

If the grid parameters are correct, select **OK** to switch the grid on. If not, position the cursor over the appropriate icon's box, click the button and type in the new value on the keyboard, pressing **Enter** to terminate it. After you have switched the grid on, move the cursor back into the drawing area to have it displayed.

You may enter either an incremental angle or the number of points required, not both, since defining one automatically defines the other.

Grid layout:

Once activated, the grid is shown as a ring or rings of points around the grid center point. Where the size of the radius permits, more than one circle of points is displayed, successive circles being separated by the given radius (e.g. 40mm, 80mm and 120mm for a 40mm incremental radius).

If you enter an angle size which does not divide exactly into 360 degrees, the program makes the last gap smaller than the rest and displays the number of whole traps followed by the fractional trap enclosed in parentheses. For example, an angle of 32 degrees gives eleven whole traps and a smaller final trap of eight degrees, so the screen would display the number of traps as 11(.25).

The center of the radial grid is set at the last point entered in the drawing at the time the grid was activated. To move the grid to a new position, switch it off, place the first point of an Entity (say, a line), relocate the origin and then switch it on again (see Snap Grid).

Warnings: The size of the angle increment affects the number of points around the circle, and vice versa. If you are changing the number of points you may only enter whole numbers — the program will calculate the angle required to give this number of points.

This function provides orthogonal angle traps.

This trap appears as a pair of dotted perpendicular lines with their intersection passing through the end point of the last Entity added to the drawing. With no drawing, the trap is displayed with its center at the screen center.

As you draw, the trap will move its origin to the start point of each new Entity as it is planted. Where this is useful, it moves to each point in the Entity as it is planted. This depends on the type of Entity being drawn.

The trap is always set to horizontal and vertical lines. If you require a right-angled trap at angles other than 0^{o} and 90^{o}, use Angle Trap. Orth Trap is equivalent to Angle Trap with two traps at 0^{o} and 90^{o}, and Absolute and Auto Update active.

Details: When drawing some kinds of Entity (e.g. Circles, Dimensions) you will notice that it is the `+' cursor controlled by the mouse, rather than the animated cursor that is dragged by it, which is affected by the trap.

You can set the `range' of the trap by using Set Up: Trap Zone.

Lines that you draw using Orth Trap may seem to be dotted as they are drawn. This is an effect of the dotted trap lines, and does not affect the linestyle selected for the lines.

This function provides normal-and-tangent angle traps.

This trap appears as a pair of dotted perpendicular lines with their intersection passing through the end point of the last Entity added to the drawing. With no drawing, the trap is displayed with its center at the screen center, with its lines horizontal and vertical.

As you draw, the trap will move its origin to the start point of each new Entity as it is planted. Its lines move so as to stay at a normal and a tangent to the last Entity drawn — parallel and normal to a line, tangent and normal to the endpoint of an arc. Where this is useful, it moves to each point in the Entity as it is planted. This depends on the type of Entity being drawn.

N-Tan Trap is equivalent to Angle Trap with two traps at 0^{o} and 90^{o}, and Relative and Auto Update active.

Details: When drawing some kinds of Entity (e.g. Circles, Dimensions) you will notice that it is the `+' cursor controlled by the mouse, rather than the animated cursor that is dragged by it, which is affected by the trap.

The trap position can be updated by Toolkit: Points.

You can set the `range' of the trap by using Set Up: Trap Zone.

Lines that you draw using N-Tan Trap may seem to be dotted as they are drawn. This is an effect of the dotted trap lines, and does not affect the linestyle selected for the lines.

X-Y Coord TOOLKIT

This function allows you to display the position of the cursor. It is useful in conjunction with Keyboard Input.

Select X-Y Coord from the menu. The X-Y Coord palette is displayed and gives a continuous readout of the cursor position. Select it from the menu again to turn it off.

Details: If you position the cursor over the X or Y coordinate displays and click the button, you can input a new X or Y coordinate in just the same way as you would using the **F1** or **F2** function keys.

The Keyboard Input controls are summarized in section 3 of this manual and explained in full under Draw: Keyboard Input.

Some changes of precision or units will switch X-Y Coord off automatically. Select it again from the menu to re-activate it.

This function resets the current position in the drawing to a selected point at the end of an arc, then calculates the direction of the arc at that point.

Move the cursor over the end of the arc you wish to use and click the button to select it.

If you select Draw: Elements: Blending Arc, you will then be able to draw a blending arc tangential to the chosen arc, from the selected end of it.

This function (and Line Direction) are most useful when used from within Elements, as they can be used while Blending Arc is selected.

LINE DIRECTION TOOLKIT

This function sets the current position in the drawing to a chosen point and calculates the direction of a line through that point so that a blending arc will connect tangentially at that point.

Move the cursor to the start point of the line and click the button to confirm selection. Repeat this process to select the line's endpoint.

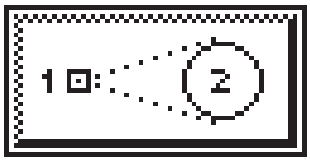
If you select Draw: Elements: Blending Arc, you will then be able to draw a blending arc tangential to the chosen line, from the end selected as the endpoint.

Details: The line defined by the start and end points need not appear physically in the drawing. You may set a direction simply by marking two points on the screen, and the system will calculate the direction of the imaginary line from the first to the second point.

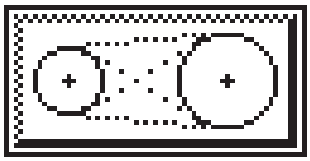
Advanced: This function can be used to set the direction for a relative angle trap (see Toolkit: Angle Trap). If such a trap is active, it treats the imaginary line drawn with Line Direction as if it were real. A real line can then make use of the trap.

This function calculates and draws tangents between a point and a circle or arc, or between two circles or arcs.

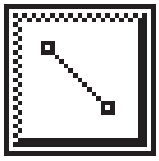
The Toolkit: Points palette is displayed, with the Tangent palette:



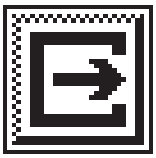
POINT-CIRCLE: find tangents between a point and a circle. Accucadd prompts you to select a circle, then the "handle position" of the point. You can select an arc instead of a circle.



CIRCLE-CIRCLE: find tangents between two circles. Accucadd prompts you to select two circles. You can select one or two arcs instead.



DRAW TANGENT: If this icon is active, a tangent line is drawn, using the current color, layer, line style and weight, as described under Draw: Elements. The tangent is drawn from the tangent point on the (first) circle closest to the actual position at which you selected the circle.



EXIT: leave Tangent.

Select the type of tangent you require, then select the point and the circle or the two circles to be used by positioning the Select Item cursor over them and clicking the button. If the cursor box does not contain exactly one element, a message to that effect is displayed and Accucadd waits for you to select another circle.

When tangents have been found, Accucadd marks the points at which they connect with the point and/or circle as snap points. To have these displayed, switch Display on in the Toolkit: Points palette. If the Draw Tangent icon is active, the line is drawn. If there are no tangents, Accucadd tells you so.

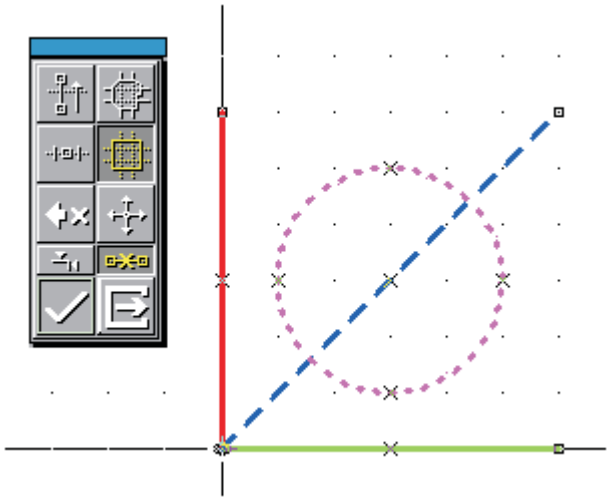
When the tangent points have been created, Accucadd waits for you to select more circles and/or points, or to leave Tangent.

Details: Arcs may be used in place of circles — Accucadd will simply treat the arc as if it were a complete circle, including creating tangent snap points on the `missing' section of the arc.

This function displays all the properties of the entities selected in a plain-language format.

Select Find Layer from the menu. The whole entity selector palette is displayed. Using this palette select the drawing entity or entities that you wish to examine. Click the check mark when you are done selecting.

A text window is displayed containing the information about the selected entities. The following list was produced for the drawing shown, which is on a 0.5in grid, screen centered.



```
type              : LINE
offset            : 0
layer             : 1:
line-style        : 1
line-weight       : 3
color             : 133
end-point A       : 0.0000", 0.0000"
end-point B       : 0.0000", 3.0000"
length            : 3.0000"

type              : LINE
offset            : 44
layer             : 1:
line-style        : 1
line-weight       : 3
color             : 60
end-point A       : 0.0000", 0.0000"
end-point B       : 3.0000", 0.0000"
length            : 3.0000"
```

```
type            : LINE
offset          : 88
layer           : 1:
line-style      : 6
line-weight     : 3
color           : 32
end-point A     : 0.0000", 0.0000"
end-point B     : 3.0000", 3.0000"
length          : 4.2426"

type            : CIRCLE
offset          : 168
layer           : 1:
line-style      : 3
line-weight     : 3
color           : 6
center-point    : 1.5000", 1.5000"
radius          : 1.0000"
length          : 6.2832"
```

You can select some or all of the text in the window using the mouse cursor, and copy it to the Windows clipboard using the text window's Edit: Copy command (or Ctrl-C). This information can then be pasted elsewhere using the regular Windows commands.

You can save the contents of the text window to a file using the window's File: Save command.

In Accucadd this is a read-only or display-only text window: you can't edit the information in it (and so change the drawing).

Details: When using the "Pick single item" cursor, Text, Nib and Hatch elements should be selected by corner, seed point or handle, as appropriate, just as for Edit: Erase, and Inserts should be selected by their Handles.

Advanced: If you use the "Pick single item" cursor to try to select Inserts that have coincident Handles, then a window is displayed for you to choose which single insert you want selected, as described under "Advanced" under Edit: Group. If you want to select all the inserts use a multiple entity selection cursor like the box or fence.