2.3 Using Point Filters

AutoCAD's Point Filter features provide a means for borrowing and building coordinate pairs from existing geometry. They provide an ideal way to produce accurately aligned drawing features without the use of additional or reference constructions.
Point filters are transparent by design and are intended to be used during both drawing and editing commands. Once mastered, point filters are a natural add-on to AutoCAD's autoediting and geometric calculator functions.

Every point in AutoCAD has a set of XYZ coordinates associated with it. This can be seen when using the ID command to identify the location of any point in a drawing.

Command: **ID↵**
Point: **select any point↵**

X = 2.50   Y = 1.75   Z = 0.0

The "borrowing" aspect of *point filters* is the process of pulling out the X, Y, or Z value from any point in a drawing, holding it in abeyance, then inputting (or borrowing again) the remaining coordinates to complete a coordinate entry. At a minimum AutoCAD needs a X and a Y coordinate pair, as such whenever a coordinate(s) is missing during the building of a coordinate pair using point filters AutoCAD prompts for it.
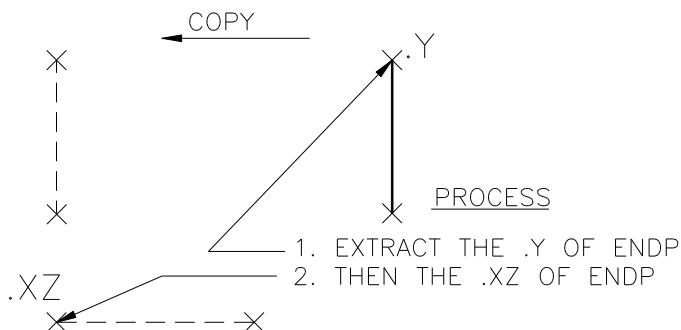

Figure 3-2

In Figure 3-2, the CAD Operator wants to copy an existing vertical line to a point directly over the left endpoint of the horizontal line shown, while maintaining the Y coordinate.

Steps:
Command: **CP**↵
Select objects: **select vertical line.**↵
<Base point or displacement>/Multiple: **END.**↵
of   **select endpoint of vertical line.**↵
Second point of displacement: **.Y**↵
of   **@.**↵
(need XZ): **.XZ.**↵
of   **END.**↵
of **select left side of endpoint of horizontal line.**↵

Note: This example illustrates a method of using AutoCAD's *point filters* and may not be the most appropriate command for the task shown. In the case of figure 3-2, the Offset command's "Through" option would have accomplished the same task with less input. ***Can you do it using the offset command's "through" option?***

Figure 3-3 depicts the same methodology for using Point Filters to edit entities during an editing session. The CAD Operator wants to move the horizontal line from its current position to a position aligned with the center of the existing circle.
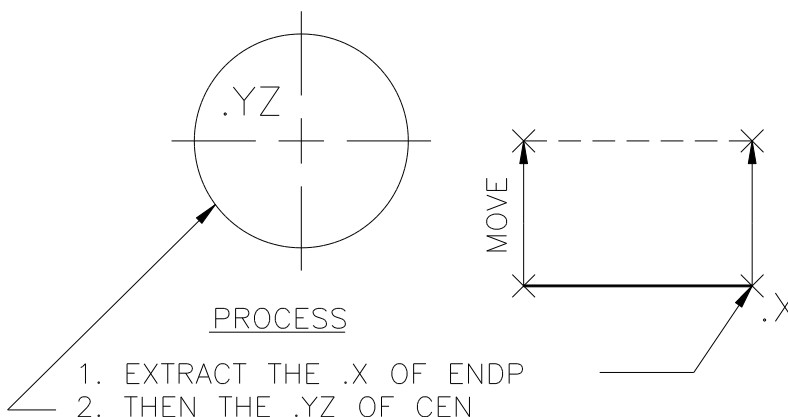

Figure 3-3

Steps:

Command: **M↵**

Select objects: **select horizontal line↵**

<Base point or displacement>/Multiple: **END↵**

of   **select endpoint of horizontal line↵**

Second point of displacement: .**X↵**

of   **@↵**

(need YZ): **.YZ↵**

of   **CEN↵**

of **select CEN for the circle↵**

The relative symbol (@) is commonly used when using Point Filters. It allows the user to filter a coordinate (X,Y, or Z) transparently from the current drawing position. This allows the user to work accurately with relative coordinates during command execution.

Figure 3-4 illustrates the development of a right side view of a circular plate without the need for additional constructions or the need to ID existing geometry.
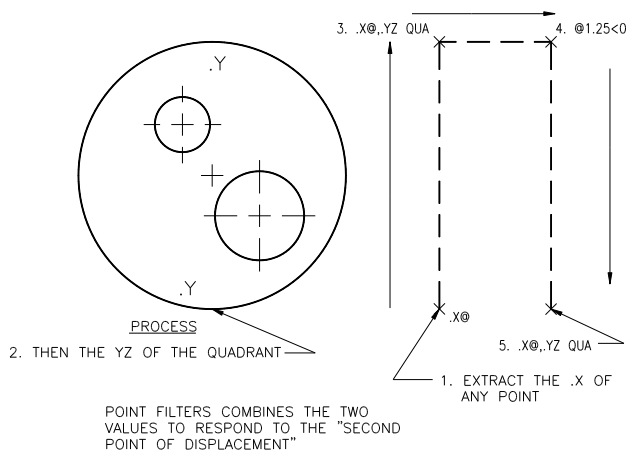

Figure 3-4

Command: **L**↵
From point: **.X**↵
of (need YZ): **.YZ**↵
of **QUA**↵
of   **select lower quadrant of existing circle**↵
To point: **.X**↵
of **@**↵
(need YZ): **.YZ**↵
of **QUA**↵
of   **select upper quadrant of circle**↵
To point: **@.75<0**↵
To point: **.X**↵
of **@**↵
(need YZ): **.YZ**↵
of **QUA**↵
of   **select lower quadrant of circle**↵
To point: **C**↵

As can be seen from the preceding examples, **Point Filters** provide valuable access to existing geometry's coordinate pairs. They eliminate the need to create additional constructions and simplify the process of drawing accurately. Positioning new geometry with respect to existing geometry is also greatly enhanced.