A Practical Guide to Carlson Software Fundamentals 2022

Rick Ellis
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Duke Gardner

A CADapult Press Publication

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Duke Gardner has served the land surveying and civil engineering communities for over 35 years in a wide variety of support roles. His focus on the theory as well as the practice skills needed to achieve successful implementation made him an excellent partner in the author team for this guide.

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Exercise Data

I would like to thank the City of Springfield, Oregon for providing the data for this book. The dataset provided is for illustration purposes only. While it is based on real world information to add relevance to the exercises, it has been altered and modified to more effectively demonstrate certain features as well as to protect all parties involved. The data should not be used for any project work and may not represent actual places or things. It is prohibited to redistribute this data beyond your personal use as a component of training.

A Practical Guide to Carlson Software Fundamentals 2022

Introduction

Congratulations on choosing this course to help you learn how to use Carlson 2022. The term “practical” is used in the title because this course focuses on what you need to effectively use Carlson Software, and does not complicate your learning experience with unnecessary details of every feature in the product.

Each lesson contains the concepts and principles of each feature to provide you with the background and foundation of knowledge that you need to complete the lesson. You then work through real world exercises to reinforce your understanding and provide you with practice on common tasks that other professionals are performing with Carlson Software in the workplace every day.

You can take the lessons in this course in whatever order is appropriate for your personal needs. If you want to concentrate on specific features, the lesson for those features does not require that you complete prior lessons. With this course organization, you can customize your own individual approach to learning Carlson.

When you complete this course, you will have the background and knowledge to apply Carlson Software to your job tasks, and become more effective and productive in your job.

Course Objectives

The objectives of this course are performance based. In other words, once you have completed the course, you will be able to perform each objective listed. If you are already familiar with Carlson Software, you will be able to analyze your existing workflows, and make changes to improve your performance based on the tools and features that you learn and practice in this course.

After completing this course, you will be able to:

- Navigate the Pull-down Menus and Ribbon Menus
- Set up Carlson Software to use the Project approach
- Work with Coordinate Files
- Draw Points into the Drawing
- Edit Points in the Drawing and External Point Database
- Create Point Groups
- Prepare Surface Data using Points and 3D Polylines
- Create Surface Models
- View and Edit Surfaces
- Perform Surface Inquiries
- Generate and Label Contours
- Perform Basic Drawing and Editing in CAD
- Import and Export Land XML Data
- Work with Google Earth and World files
- Work with Centerlines
- Generate Linework Labels
- Convert Carlson Point Blocks to Civil 3D Points
- Convert Civil 3D Point, Surface, Alignment and Label objects to Carlson data

Prerequisites

Before starting this course, you should have a basic working knowledge of AutoCAD®. A deep understanding of AutoCAD is not required, but you should be able to:

- Pan and Zoom in the AutoCAD drawing screen.
- Describe what layers are in AutoCAD, and change the current layer.
- Create basic CAD geometry, such as lines, polylines and circles.
- Use Object Snaps.
- Describe what blocks are, and how to insert them.
- Perform basic CAD editing functions such as Erase, Copy, and Move.

If you are not familiar with these functions, you can refer to the AutoCAD Help system throughout the course to gain the fundamental skills needed to complete the exercises.

For a more in-depth AutoCAD tutorial check out our book, ***A Practical Guide to AutoCAD 2022***.

Conventions

The course uses the following icons and formatting to draw your attention to guidelines that increase your effectiveness in Carlson Software, or provide deeper insight into a subject.

The magnifying glass indicates that this text provides deeper insights into the subject.

The compass indicates that this text provides guidance that is based on the experience of other users of Carlson Software. This guidance is often in the form of how to perform a task more efficiently.

Downloading and Installing the Datasets

In order to perform the exercises in this book, you must download a zip file and install the datasets.

Type the address below into your web browser to load the page where you can download the dataset.
www.cadapult-software.com/data

Unzip the Files

Unzip the file **APG_CARLSON_FUND_2022.zip** directly to the C drive. The dataset will be copied to the folder:

C:\Carlson Projects

A folder called **APG 2022 Data** is created that contains several folders with source data for the exercises in this book.

There are also folders created called **APG 2022 Lesson X_X** These folders contain project files and drawings where the lesson number of the folder corresponds to the lesson numbers in the book. This will allow you to jump in at the beginning of many of the lessons in the book, and do just the specific exercises that you want, if you do not have time to work through the book from cover to cover.

Exercises

The exercises in this course have been designed to represent common tasks that are performed by civil engineers, surveyors, designers and drafters. The data included in the exercises are typical drawings, point files and other data used by professionals like you. Exercises provide higher level process information throughout the exercise tasks. You are given information about not only what to do, but why you are doing it. Many images are included to help guide you.

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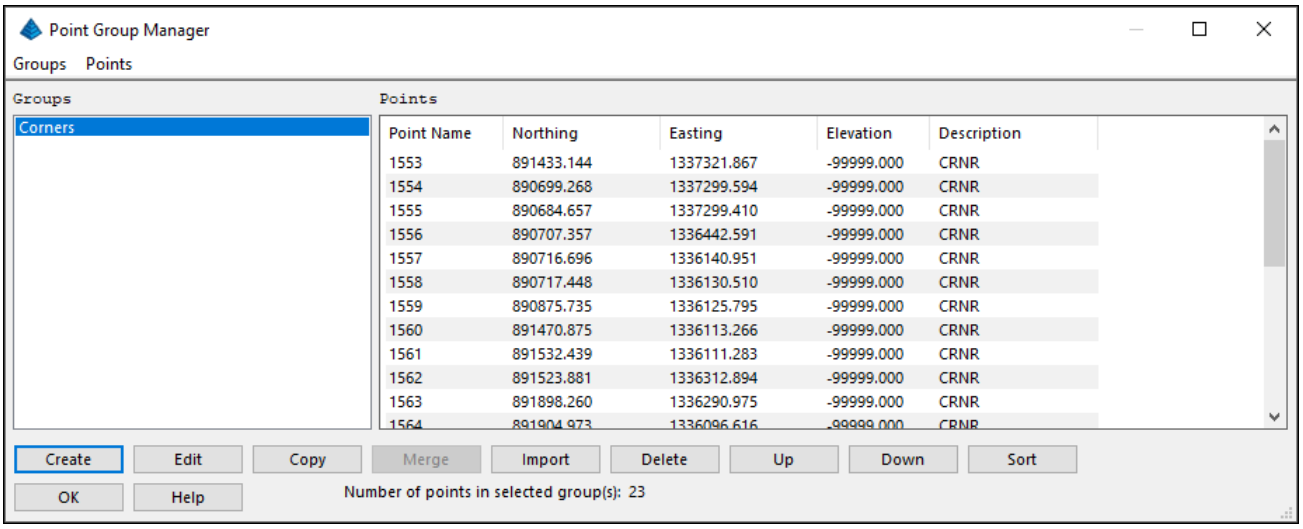
Sample Lesson

3.8 Lesson: Using Point Groups

Introduction

In this lesson we look at the use of Point Groups to organize your point data, and some of the subsequent uses of those groups.



Key Concepts

Concepts and key terms covered in this lesson are:

- Point Groups
- Filters
- Applications of Point Groups

Objectives

After completing this lesson, you will be able to:

- Learn what Point Groups are
- Learn how to Create Point Groups
- Learn various applications of Point Groups

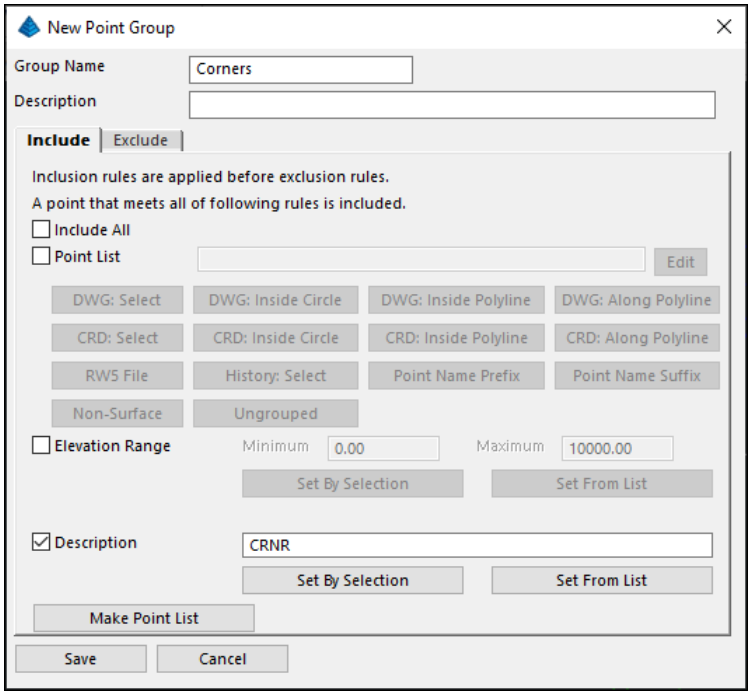
Advantages of using Point Groups

Point Groups are a powerful and versatile tool to organize your point data. Some uses of Point Groups include:

- Controlling Point Display
- Editing Points
- Drawing Points
- Field to Finish
- Selecting Points to build a Surface
- Exporting specific Points
- Creating Point Tables
- Generating Reports

Creating Point Groups

Point Groups are saved selection sets of points. They can be created by setting up a query (or filter) that sorts through all the points in the current .CRD and selects the ones that match the criteria. Point groups can be based on a variety of criteria including point numbers, point elevations, point descriptions and logical combinations thereof.

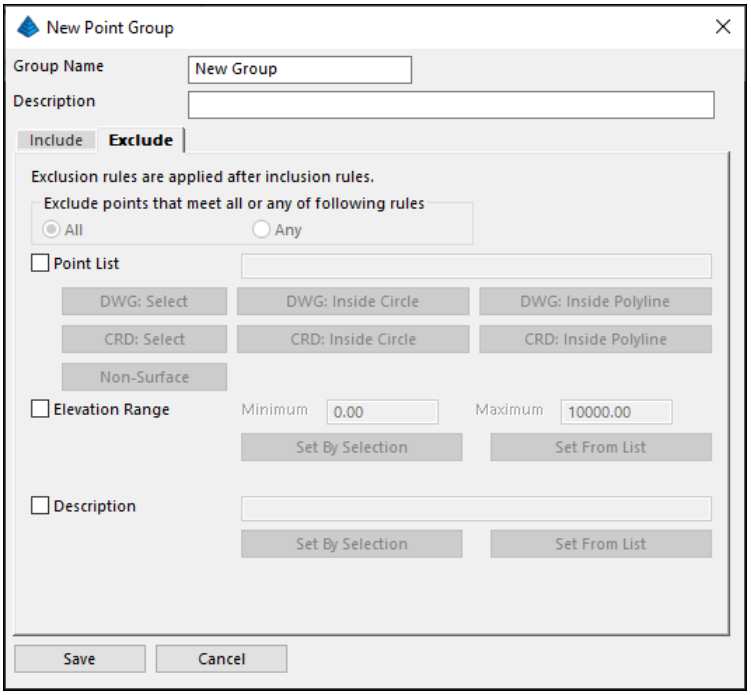


The *New Point Group* dialog box consists of an *Include* tab and an *Exclude* tab. First the filtering criteria specified on the *Include* tab is applied to the entire current coordinate file. The resulting list of points is created and held in memory. Note that on the *Include* tab, all specified filter criteria must be met for a point to be included.

Components of the Query can include any combination of:

- A Range of point numbers, selected from the Drawing or the .CRD, found in the Drawing or the .CRD that fall within a drawn Circle, or found within the Drawing or the .CRD within a drawn Polyline
- Elevation Range
- Descriptions
- All Points in the database

Next, the filtering criteria specified on the *Exclude* tab is applied to that temporary list. Any points in the list that match the exclude criteria are removed from the list to create the final Point Group.



On the *Exclude* tab, the user specifies whether the points to be excluded must match *All* of the filter criteria, or *Any* of the filtering criteria. Using all of these variables in different combinations can produce a very specific set of points.

Components of the Query can exclude any combination of:

- A range of point numbers, using the same methods as described for Include
- Elevation Range
- Descriptions

How Point Groups Work

The parameters that define Point Groups are stored in files with a .GRP file extension, and the same filename as the .CRD coordinate file they are to be applied to. Each Point Group file is associated with one and only one CRD file, as determined by the filename. For example, Test.grp will only refer to points in Test.crd in the same directory.

Each Point Group file contains a number of Point Groups. Each Point Group contains rules for selecting the points within the *.crd file. This file is not intended to be edited manually. The Point Group Manager in Carlson Software is the correct tool to use to edit the Point Group rules and/or to add or remove Point Groups.

Point Groups are dynamic, inasmuch as the .CRD file is read in its current state whenever Point Groups are employed. So if Points that belong in a specific Point Group are added to or deleted from the .CRD, the next time Point Groups are used, they will be updated to the current state of the .CRD.

Exercises: Working with Point Groups

In these exercises you create a Point Groups, using filtering of descriptions, and then use the new Point Group with *Draw-Locate* to draw that specific set of Points in the Drawing.

You do the following:

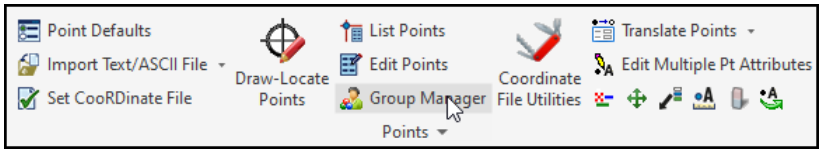
- Create a Point Group
- Draw a Point Group

3.8.1 Creating a Point Group

1. Continue working in the drawing **Basemap.dwg**.

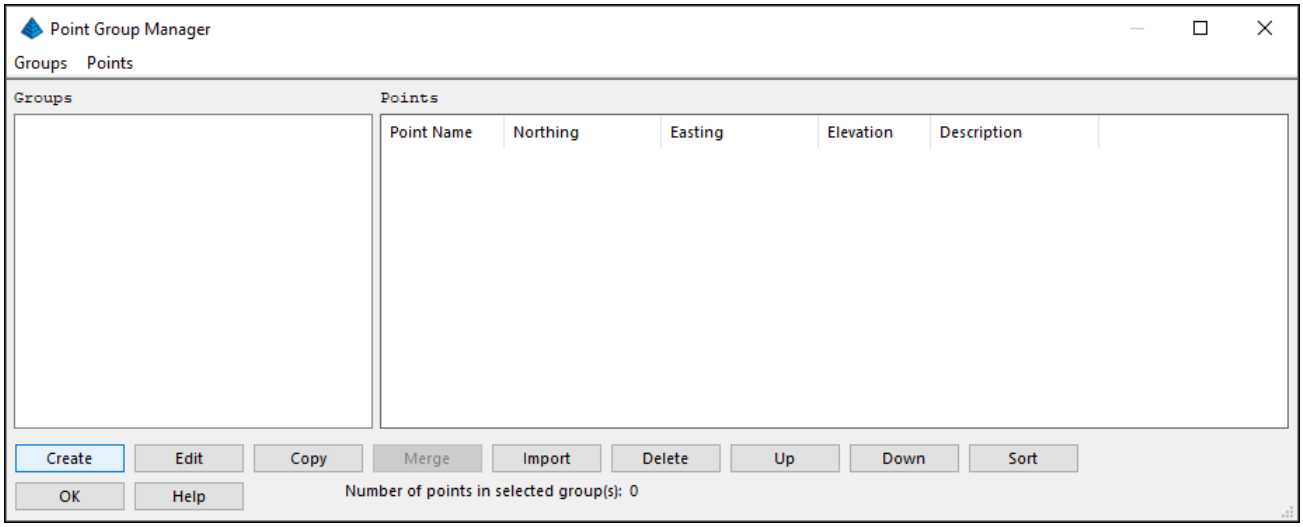
If you have not completed the previous lessons:
Open *3_8.dwg* from the project folder *APG 2022 Lesson 3_8*.

2. Select **Ribbon: Points ⇒ Points ⇒ Group Manager.**

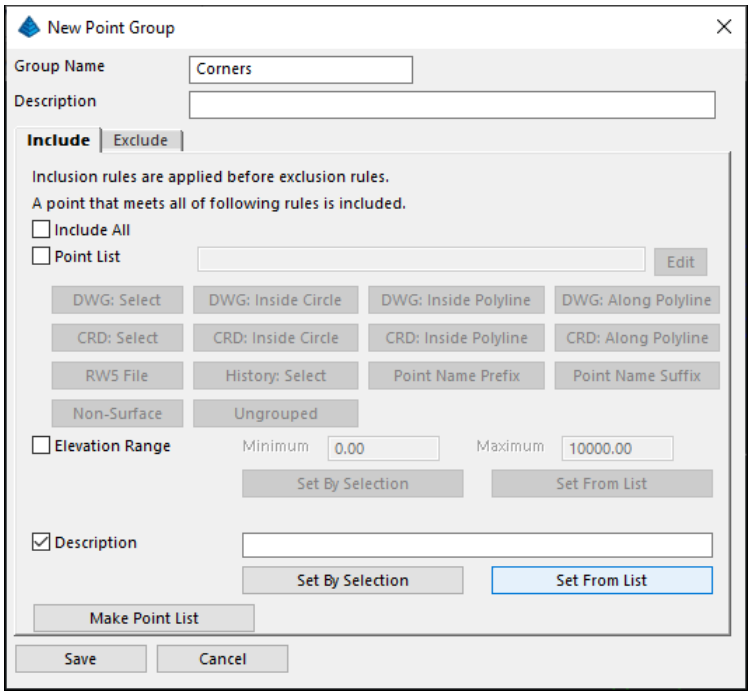


Alternatively, from the pull-down menu:
Select **Points ⇒ Point Group Manager.**

The *Point Group Manager* opens.



3. Click **<<Create>>**.



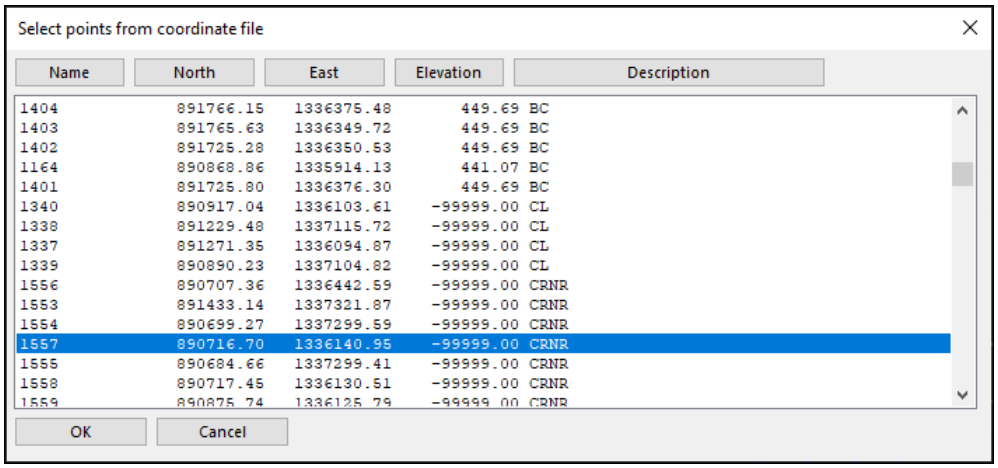
4. In the *New Point Group* dialog box for the **Group Name** enter **Corners**.

5. On the *Include* tab disable **Include All**.

6. Enable **Description**.

7. Click **<<Set From List>>**.

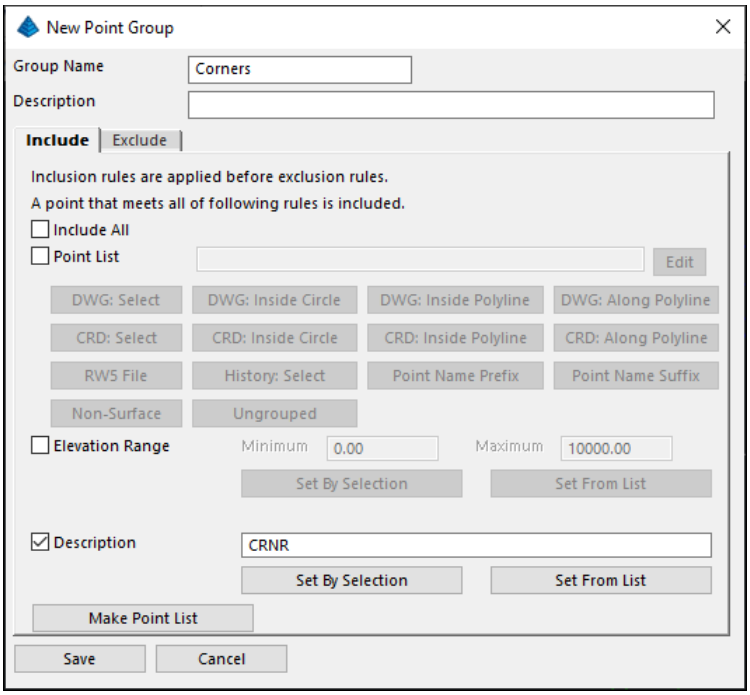
This opens the *Select points from coordinate file* dialog box. Here you can see all the points in the current .CRD file, sort them, and select the descriptions that you want to use to create the point group. It saves time and reduces errors by allowing you to see the description of points that are in the point database so you don't have to type them in from memory.



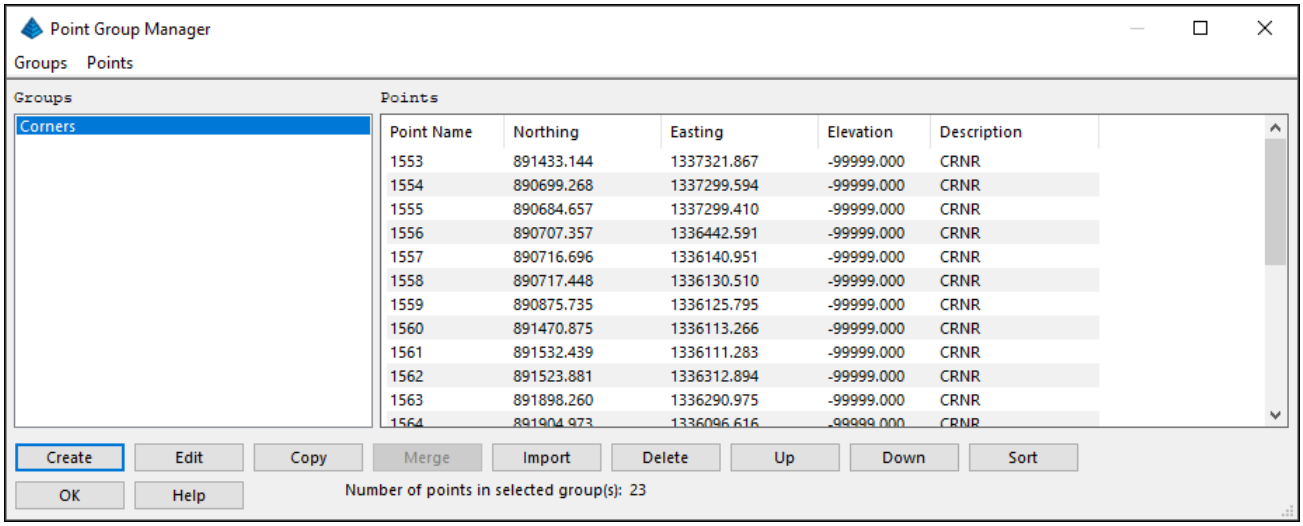
8. Click **<<Description>>** to sort the list by the description.

9. Find a point with a **CRNR** description and select it.

10. Click **<<OK>>**.



11. Back in the *New Point Group* dialog box click **<<Save>>**.



12. In the *Point Group Manager* notice the new point group Corners. It contains 23 points and is limited to points with the description CRNR.

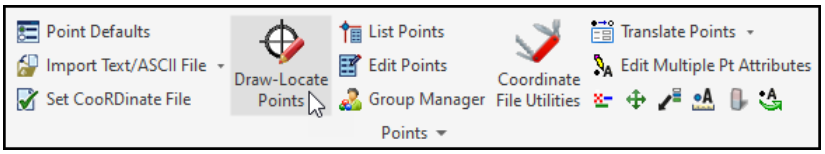
13. Click **<<OK>>**.

3.8.2 Drawing Points by Point Group

1. Continue working in the drawing from the previous exercise.
2. From the pull-down menu: Select **Points ⇒ Erase Point.**
3. At the command line respond to the prompts as follows:
4. Select points from screen, group or by point number [<Screen>/Group/Number]? **S**
5. Graphically select all the points in the drawing and press **Enter.**
6. Delete points from coordinate file [Yes/<No>]? **N**
7. Delete point symbols, attributes or both [<Both>/Symbols/Attributes]? **B**

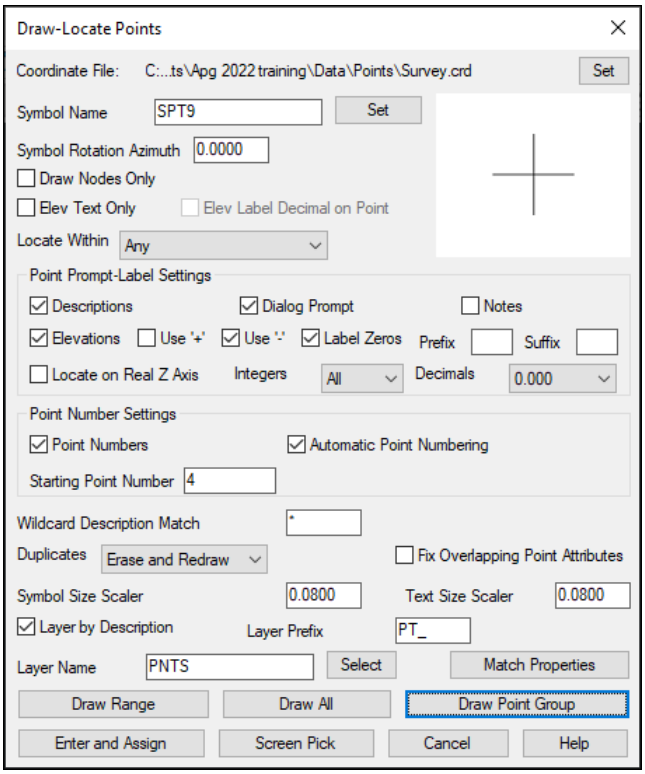
All the points are now removed from the drawing, however, they still exist in the point database.

8. Select **Ribbon: Points ⇒ Points ⇒ Draw – Locate Points.**



Alternatively, from the pull-down menu:
Select **Points ⇒ Draw – Locate Points.**

The *Draw-Locate Points* dialog box opens.



Many of the settings within the *Draw-Locate Points* dialog box are already set to the choices you made in the *Point Defaults* dialog. However, they can be changed here, and the changes will be used for this specific point creation.

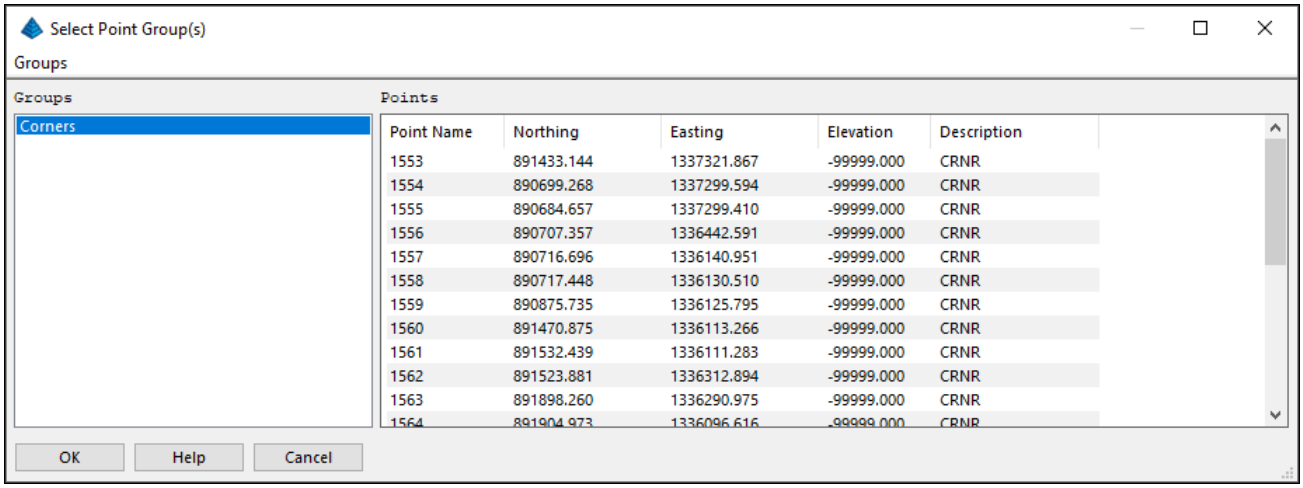
9. Confirm **Layer by Description** is enabled.

10. Confirm the **Layer Prefix** is set to **PT_**.

11. Confirm the remaining settings are set like the graphic above.

12. Click **<<Draw Point Group>>**.

This opens the *Select Point Group(s)* dialog box. Here you can select one or more point groups to draw into the drawing.



13. Confirm the point group **Corners** is selected.

14. Click **<<OK>>**.

Only the points representing corners are created in the drawing and should look like the graphic below.

Lesson Review

In this lesson you learned about using *Points Groups* in *Carlson Software*. First you created a *Point Group* by including all the points in the .CRD file with a certain description. Then you used that *Point Group* to draw the points into the drawing.

Chapter Review

In this chapter you learned about many aspects of working with points in *Carlson Software*. You looked at the use of the external point database, the coordinate file, known as the Carlson .CRD file. You also learned about several methods for the creation of point blocks in the drawing to represent the records in the external point database. You then learned how to edit the point blocks in the point data, how to erase point blocks and point data.

A solid understanding of the use of points in Carlson is essential. Practice these exercises and try other commands on the points menu that we did not cover. You are on your way to becoming a Carlson Software master and being a master of points is a solid step along the way.

Next we look at creating Surfaces using points and break lines.

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