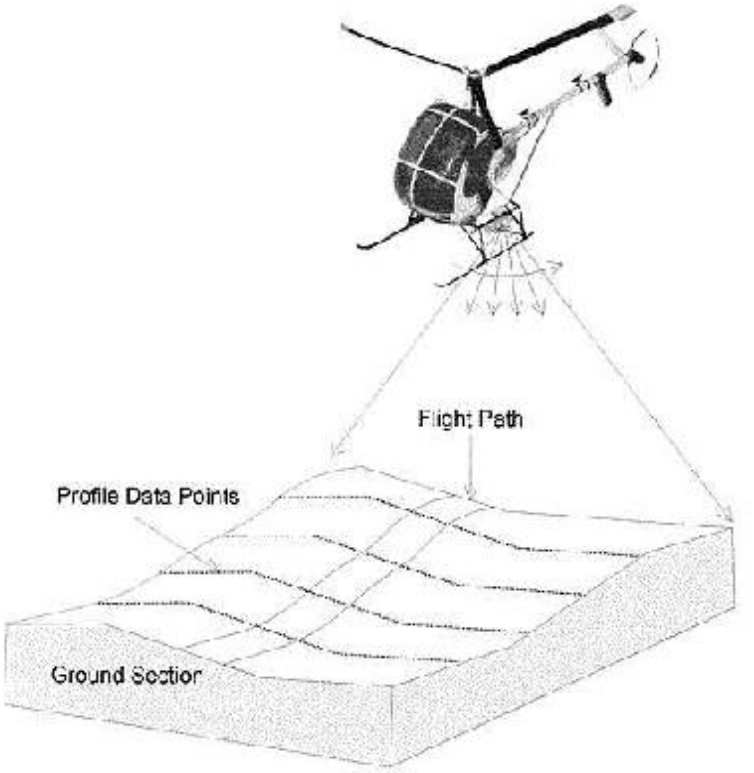
POWER LINE® SYSTEMS · INC ·

Using FLI-MAP™ data in PLS-CADD

Overview:



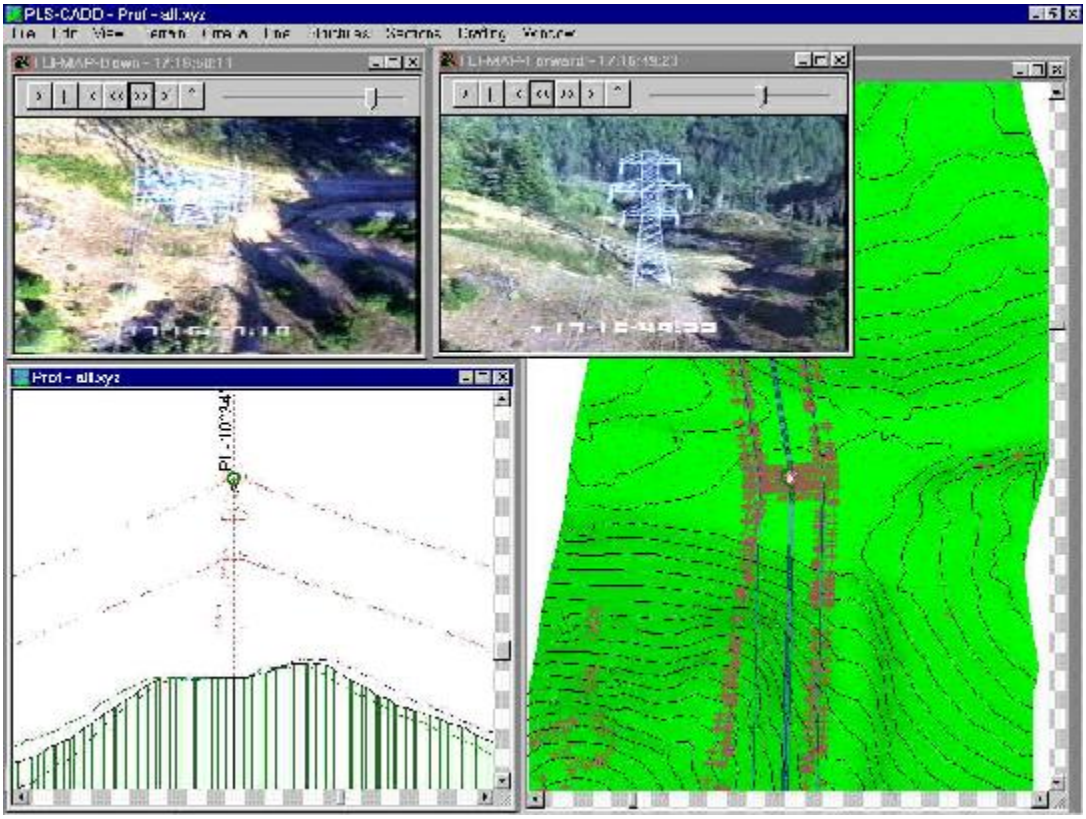
PLS-CADD is frequently used to model older lines. Sometimes digitized plan & profile sheets can be used to model the profile, the structure locations and the sags for an existing line. The problem with this approach is that old drawings don't always accurately portray the actual structure positions and conductor tensions. If you want to be sure about structure positions and conductor tensions you will need to survey the line.

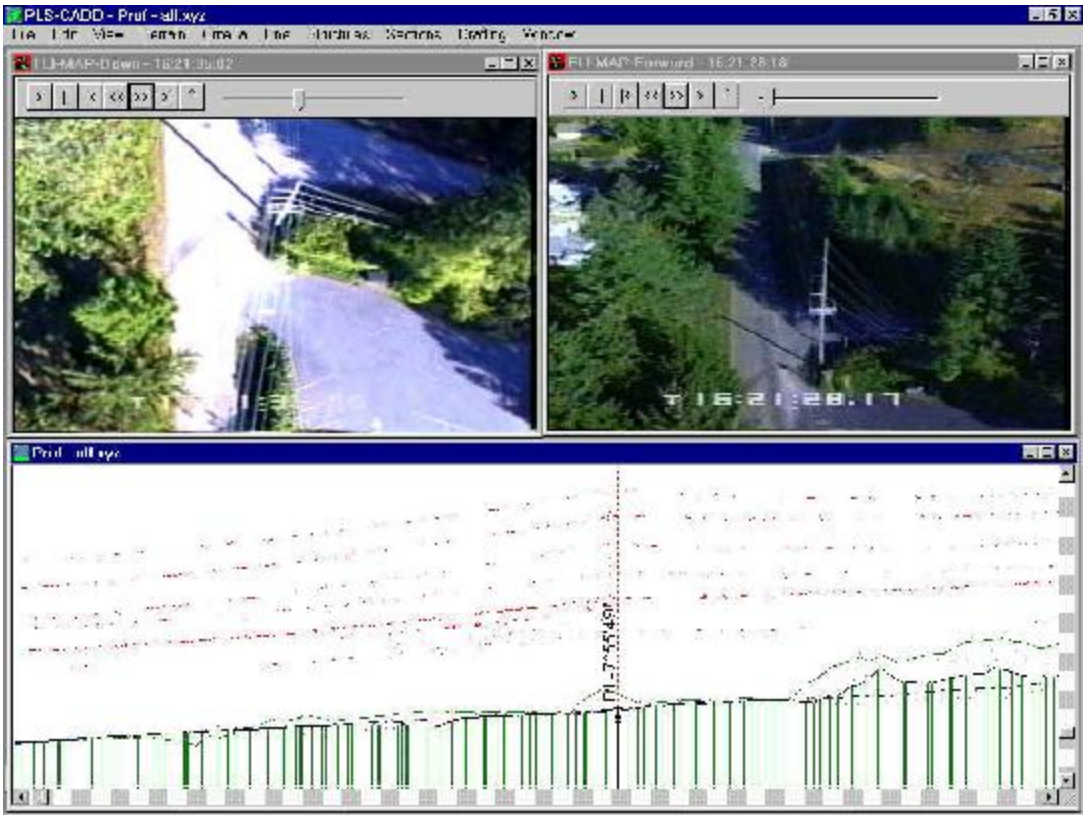
The John E. Chance & Associates, Inc. FLI-MAP™ system addresses this need. The system uses a helicopter mounted laser to scan the line. It records the three dimensional coordinates of millions of points on and around the line while also taking forward and downward looking videos. Chance uses specially developed software to classify these points into ground points, structure points and wire points.

PLS-CADD is the ideal tool for converting FLI-MAP™ data into an engineering model of a line. The data is easily read into PLS-CADD where alignments are defined and profiles are generated. Next you spot structures and string wire using PLS-CADD commands specially modified with the needs of the FLI-MAP™ user in mind. Thanks to a cooperative effort between Chance and Power Line Systems, you can even view the FLI-MAP™ videos from within PLS-CADD by simply clicking on the location in the line that you want to see.

For more information about FLI-MAP™ visit the John Chance Land Surveys FLIMAP™ web site, or contact Blaine Thibodeaux at 337-268-3282.

FLI-MAP™ Video Integration Sample:





FLI-MAP™ Data Import Example:

The example below shows how FLI-MAP™ data can be brought into PLS-CADD and how an engineering model can be created from the data.

This example is an H-frame line about 8 miles in length. The data set has been processed and reduced by Chance to following four data files (procedure can be modified to include filtering steps if the data set has not been reduced or is too large):

1. EXAMPLE.DXF: a DXF file containing planimetric information digitized by Chance
2. GROUND.PTS: 91297 points on the ground
3. POLE.PTS: 58 points representing the poles (one point per pole)
4. WIRE.PTS: 57381 points on the wires

The .PTS files in the list above contain the X, Y and Z coordinates for each point. The sample below shows the first three lines of the GROUND.PTS file:
Note: Starting in January 2000 there may be an additional time stamp column which is used for the video integration feature. When present this column should be read into the PLS-CADD plan view comment field.

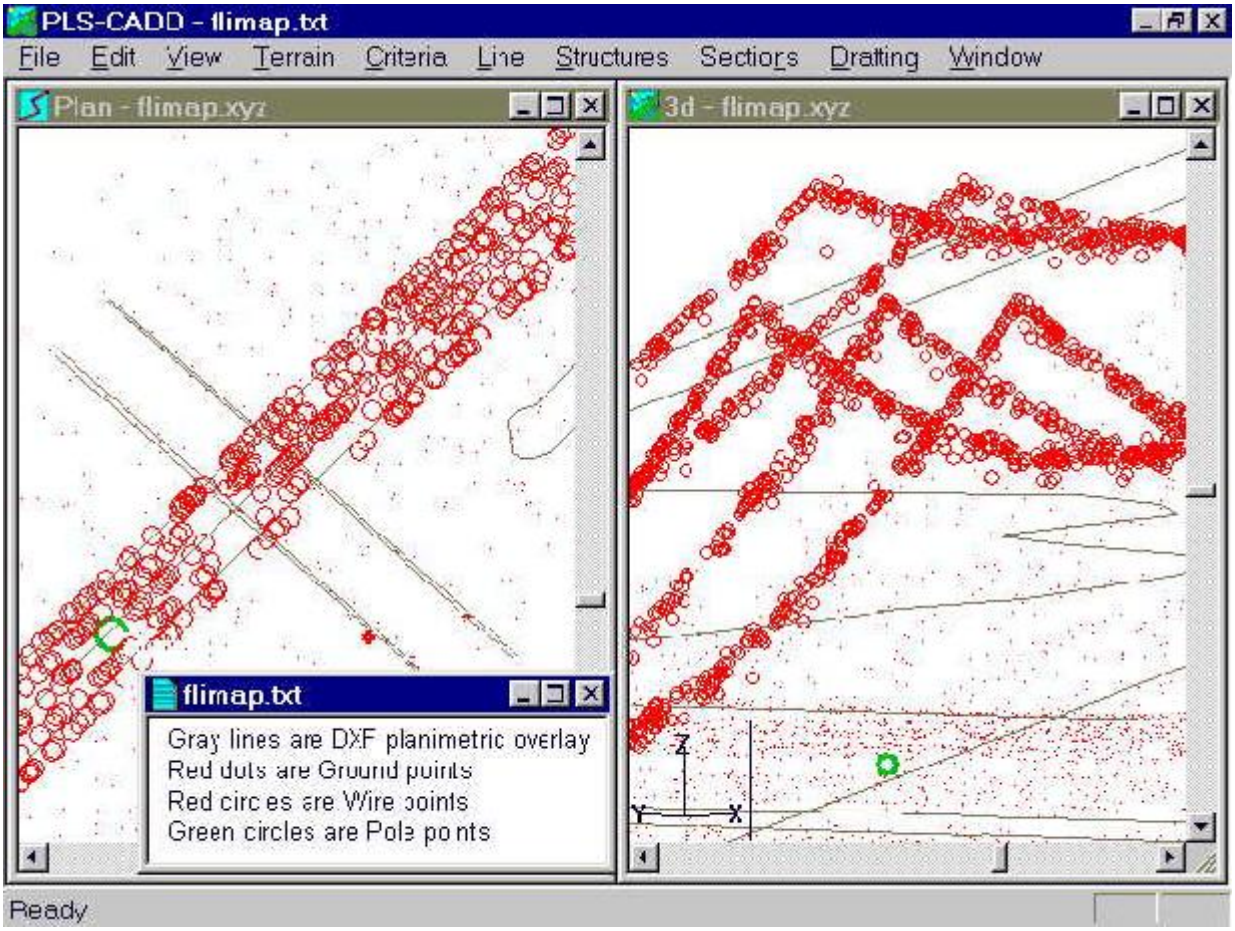
2445457.1500 468297.6600 280.0800
2445461.1100 468294.9300 279.7200
2445469.3400 468291.0700 279.6900

Step 1: Bring in the FLI-MAP™ data

The following PLS-COMMANDS were used:

- File/New to create a new project
- Drafting/Attachment Manager/Attach command to read EXAMPLE.DXF planimetric info.
- Terrain/Merge XYZ points from user defined XYZ file to import points from GROUND.PTS giving them the feature code Ground.
- Terrain/Merge XYZ points from user defined XYZ file to import points from POLE.PTS giving them the feature code Pole.
- Terrain/Merge XYZ points from user defined XYZ to import points from WIRE.PTS giving them the feature code Wire.
- Terrain/Feature Code Data/Edit to tell program to exclude Wire shots from ground model and to pick different symbols for the Ground, Pole and Wire shots.

Total elapsed time since start of project: 3 minutes.



The picture above shows the imported data from two different perspectives. Note how the top geometry of the structure is painted out by the Wire points.

Step 2: Define the alignment

Since we already know the positions of the poles we can construct the alignment automatically by using the PLS-CADD Terrain/Alignment/Automatic Alignment and specifying the feature Pole feature code. Unfortunately this will place a PI at every pole including the tangent poles. This problem is fixed using Terrain/Alignment/Delete Small Angle PI command to remove delete PI points having a line angle less than .2 degrees.

Total elapsed time since start of project: 3 minutes 30 seconds

Step 3: Create the digital terrain model

Use the Terrain/Tin/Create TIN command to generate the digital terrain model. The computer will take a few minutes to create the model due to the large number of points. For this example the entire 200 ft. corridor width was included in the TIN model. Limiting the TIN model to a narrower width would speed up the process and save memory.

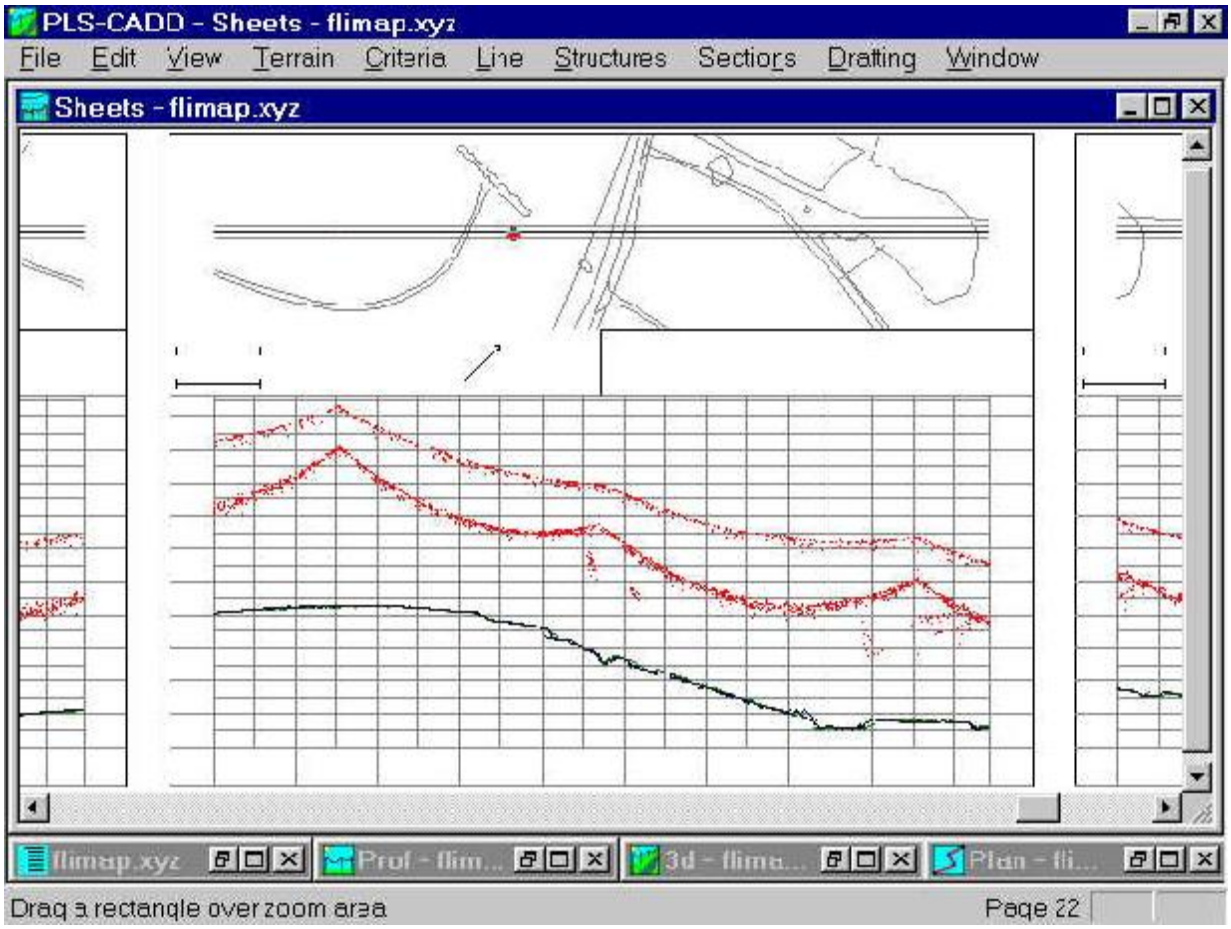
Total elapsed time since start of project: 8 minutes 30 seconds

Step 4: Generate the profile

Use the Terrain/Tin/Create Interpolated Points command to create points along the side profiles and centerline. Once the computer finishes calculating the profile is visible in the profile view window and in the plan & profile sheet view.

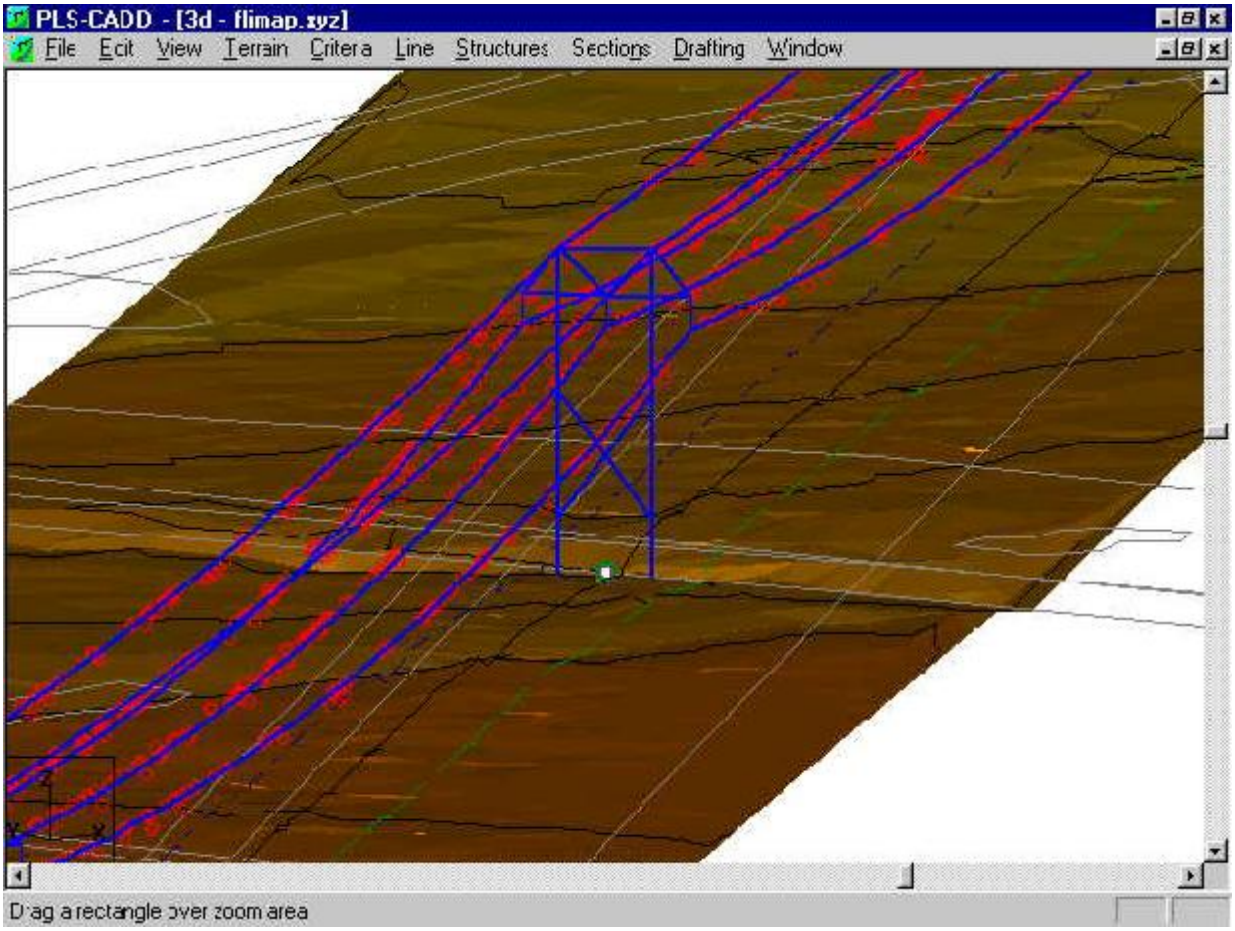
Total elapsed time since start of project: 10 minutes

Terrain modeling is now complete. P&P sheets can now be drawn in a few seconds even though no structures have yet been placed.



Step 5: Spot structures and string wire

At this stage it is simply a matter of using the standard structure and section commands to spot structures and string wire. The Structure/Height Adjust Snap can be used to make minor adjustments to the structure height so that a designated phase exactly matches a surveyed wire height. Additionally, the Section/Graphical Sag command can be used to sag a section so that it passes through the surveyed wire points.



Further information on PLS-CADD is available at the Power Line Systems Inc. web site at www.powline.com. Details on PLS-CADD FLI-MAP integration are located at www.powline.com/products/flimap.html.

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