AGPS-Shape Pro
User manual

Advanced Geo Positioning Solutions, Inc.
www.agpsinc.com

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Revision: 6/3/2009

AGPS-Shape concepts documentation

Files Used :

Most of the files you work with are stored in the directory named "C:\AMW\DATA". See the icons named "Data", "Datacmd" and "Load Data From Floppy" in the "C:\AMW" folder you see upon startup.

SVY File :

This file will contain all data points captured turning on A_Cap. Also, "Location Instrument" setup information and other relevant information are logged to this file. This file will be created for you and will start out empty when you create a new job. If your jobname is "MITS1", you will have a file named “MITS1.SVY". See "SAMPLE.SVY". Points from this file will be displayed on your plot window as dots.

DRW File :

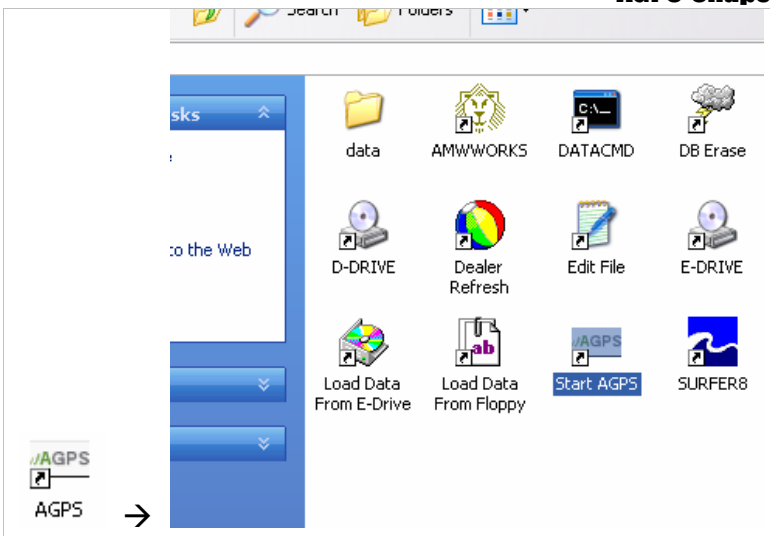
This optional file defines a background-drawing that will be shown on the plot window along with other data.

You can easily build this file from a "DXF" file that comes out of most "CAD" (computer-aided-drawing) programs. The DRW file creation process is described later in this manual. If your jobname is "MITS1" you may use a DRW file named "MITS1.DRW" . See "SAMPLE.DRW" .

CTL File: Is used for "Control Points" used in setting up the "Location Instrument" (usually GPS or Total-Station). If your jobname is "MITS1" you will need a CTL file named "MITS1.CTL". The user must provide this file before work can begin. This file uses the following columns: **“Name Northing(N) Easting(E) Elevation(Z) Description”.** One may be automatically built for you or can be copied from "AMODEL.CTL" or "SAMPLE.CTL". It is best to have one already on your hard-drive or USB drive before going out to a job. Points from this file will be displayed on your plot window as small triangles. It is good to have 3 or more control points defined in this file. *What is a Control Point? Sometimes called a benchmark, this point is a known world feature in which coordinates are also known. Control points are important to make your coordinates match those used earlier.

FBG File : Is used to describe the ground surface as it exists. It can be as simple as just a list of points or as sophisticated as a set of triangles (a TIN). It is usually built from a SVY file or it can be easily built from a "DXF" file exported from some "CAD" program. See the file "SAMPLE.FBG" for a sample set of input points. If your jobname is "MITS1" you will need a FBG file named "MITS1.FBG" .

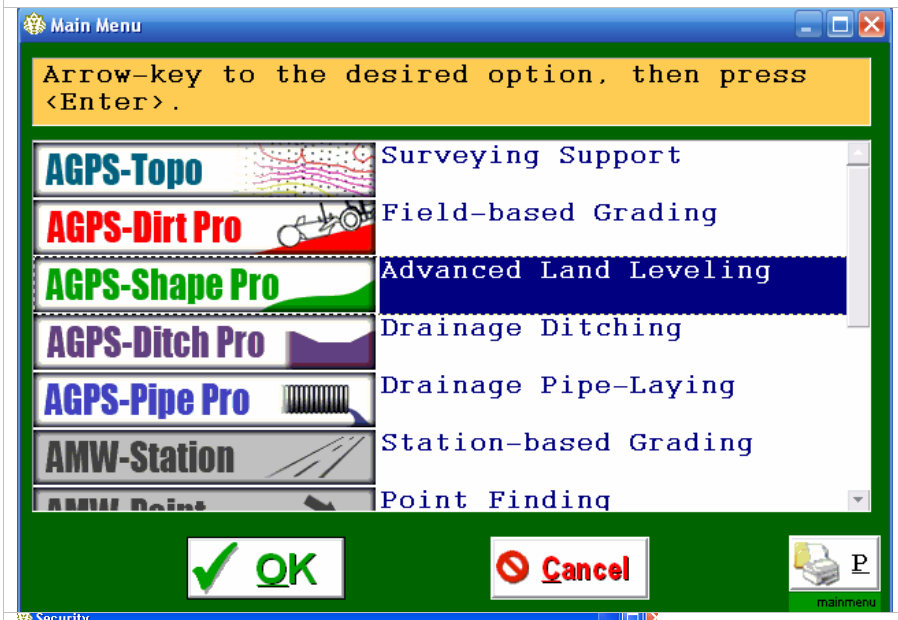
PLN File: Is used to store completed profiles after they are written. The PLN file contains parameters, path, and elevation information for a proposed profile.



Start the AGPS program.

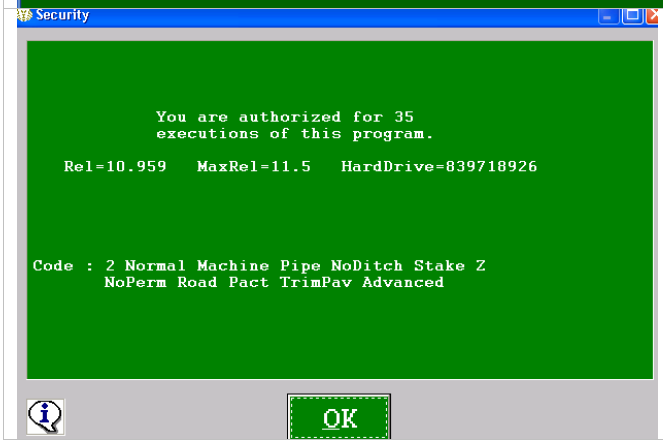
Click AGPS on the desktop. If one of the options below is on the desktop you can pick that directly.

Then select one of the following:
Start AGPS
Ditch Pro
amwworks
(Some computers may start the program when turned on)



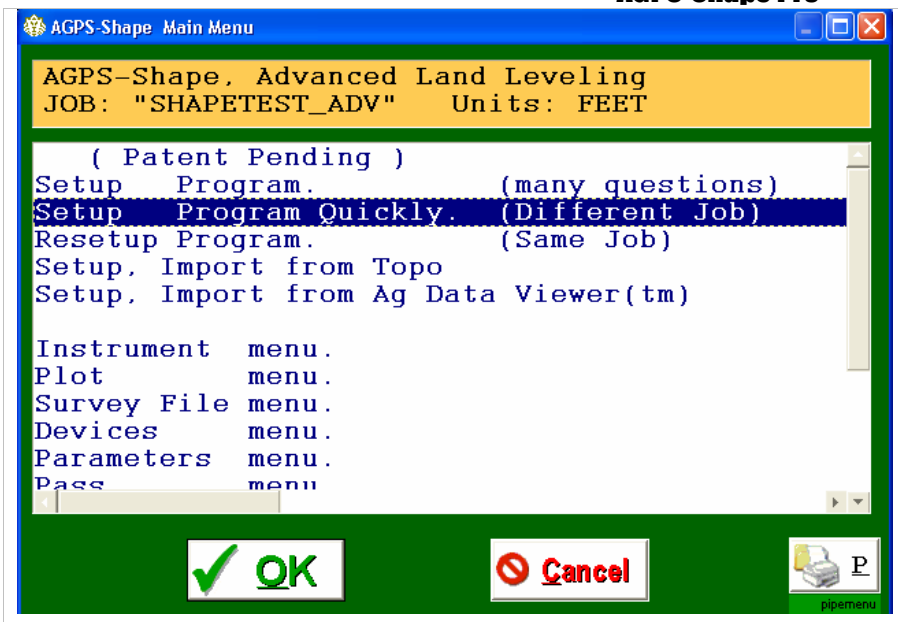
Select AGPS-Shape Pro

If you do not see this screen, and you are taken to the AGPS-Shape Main Menu, your program is in Quick Setup mode … Skip to the Main Menu: on next page.



You are informed how many uses are remaining and the programs you have access to.

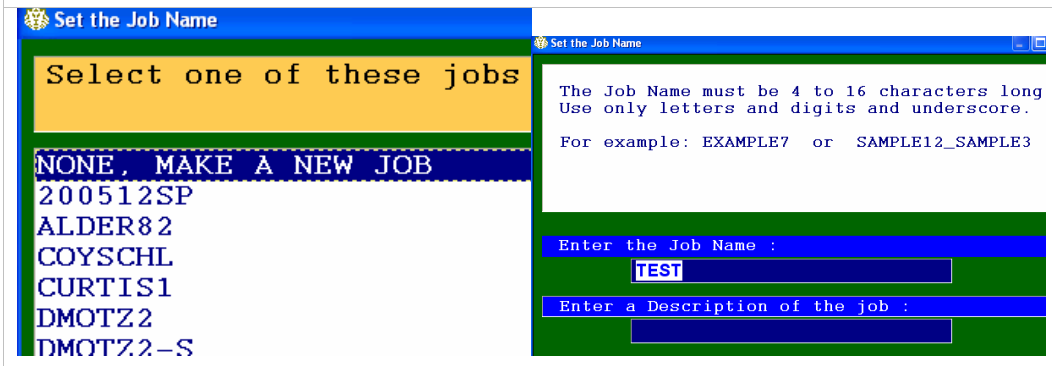
Press OK or the screen will go away after an amount of time.



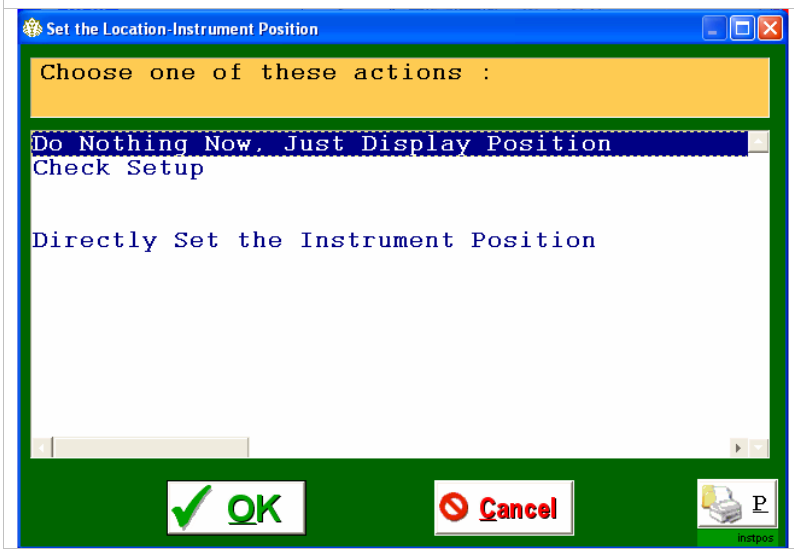
To work on a different job:
Select Setup Program Quickly (different job)

To work on the same job:
Select Resetup program (same job)
Skip the next step

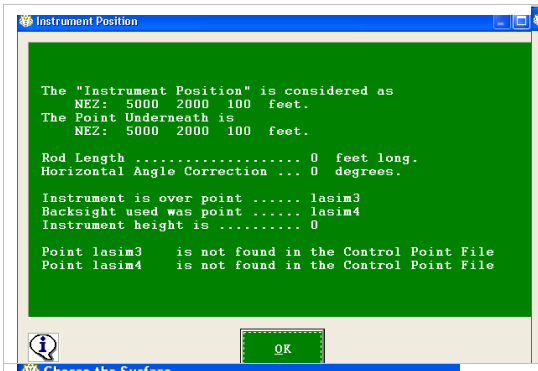
Many questions:
Select Setup Program (many questions). This asks all questions about the program, from Instrument, to files. Typically only done once after install.

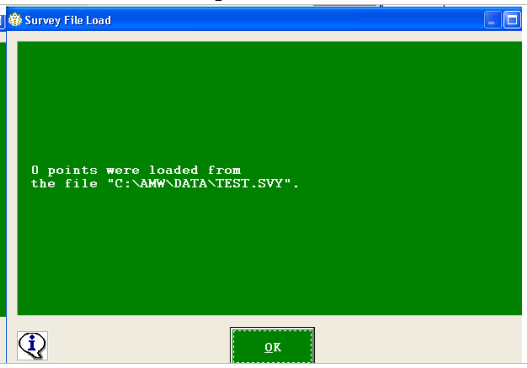


None, Make a new Job
Enter the job name
4-16 characters; letters, digits, & underscore "_"
In the second box, a description of any length may be entered.
**If you already have the jobname on the list select it.

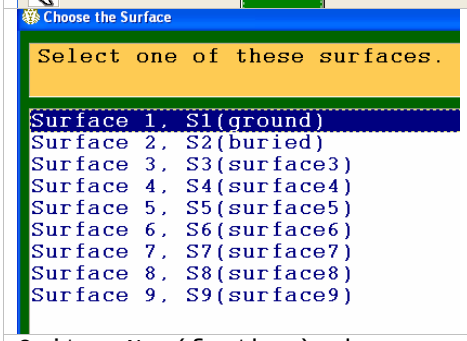


…Display Position…

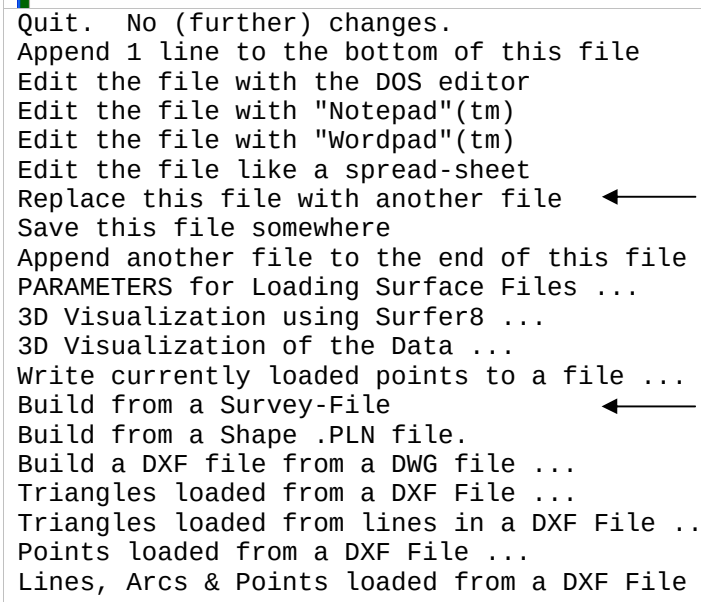




You are shown a couple green misc. info. screens.
First, Instrument Position explains the control points used.
Then you are told how many points loaded from the .svy file.
Press Enter (OK) to get by each.

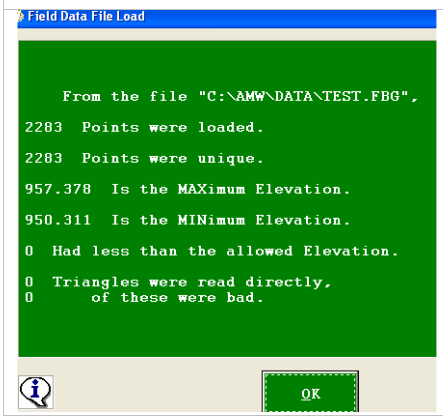


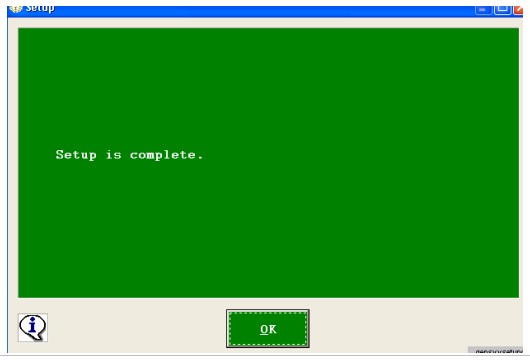
On a new job, you will be asked to Select the surface to create (typically S1 "ground")
If you do not get this question skip to the next page.



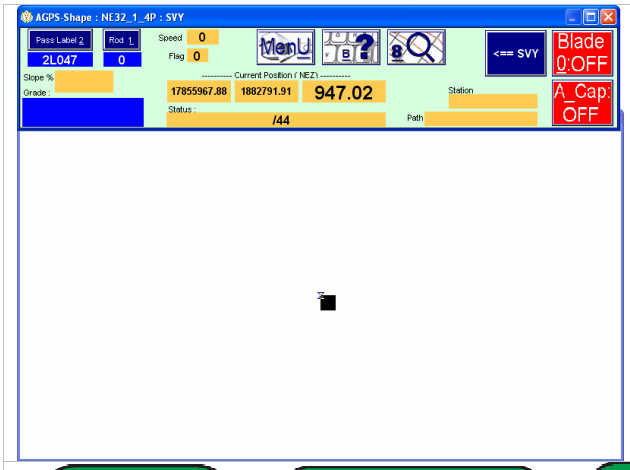
Next you receive a scrollable menu asking how to make the .fbg file.
All options are listed to the left.

"Replace this file with another" if you have a file with data in columns: pt# N E Z
"Build from a Survey-File" if you have a .svy collected with AGPS-Topo

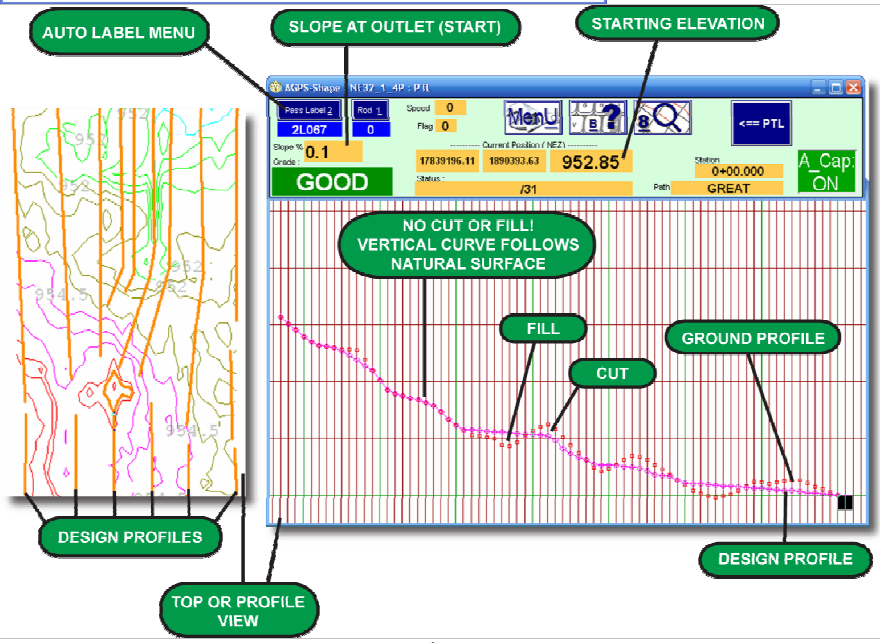




After points are loaded and stored, you are given the details about the points. Click OK
You will be asked if your profile will be UP-Hill (starting point low) or Down-hill (starting point high). Select up-hill.
Finally, setup is complete.



You are taken to the working screen and the program is ready.



Working screen explained:

These notes show a side view with a profile generated (process described later). There is also an example top view on the far left.

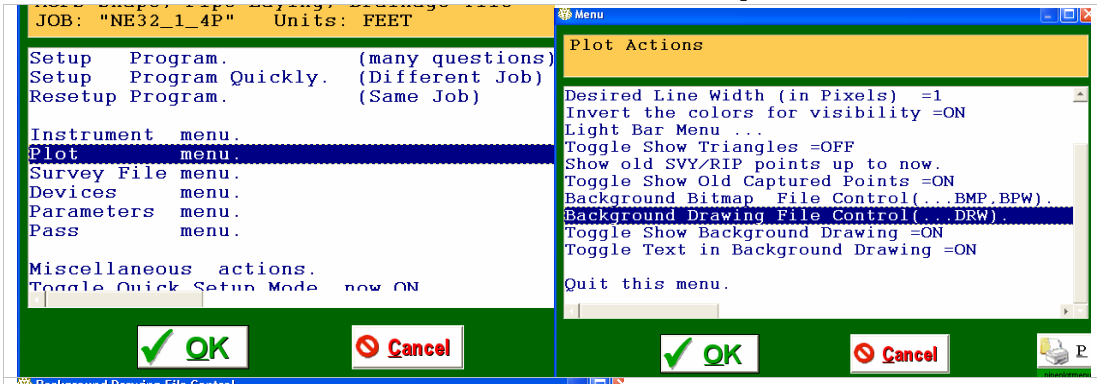
```
SVY Pass,       Survey Pass done at a constant
                      offset from the ground.
LAY Pass,       Needs previous RIP or SVY Pass.
TOPO Mode,      Just record like AGPS-Topo .
PTL Pass, Previous-Topo-Lay, no SVY passes.

RESTART the Current Pass, or start a new one.
Modify Minimum-Slope and Restart Pass ...


Erase the last PTL target point.
Edit Previous-TOPO File (..FBG file) for PTL
Switch Previous-TOPO Surface for PTL
Area Calc. Between Plan and Ground ...
Auto Balance this Line's Area ...
Auto Balance ALL Unbalanced Lines ...
Write Current Plan to ".PLN" File
Manipulate Old Passes from the ".PLN" File
3D View of ".PLN" File using Surfer8(tm)
Volume Calculation of ".PLN" File w. Surfer7/8(tm)
Prepare files for AGPS-Dirt

Quit this Menu.
```

```
Area Calc. Between Plan and Ground ...
Auto Balance this Line's Area ...
Restore this line from the ".PLN" File
Remove Balance Info for this line.
Delete  this line from the ".PLN" File
---- On All Passes : ----
Auto Balance ALL Unbalanced Lines ...
Remove Balance Info if worse than ...
```

Pass Menu:

On the keyboard press P or touch Menu - Pass Menu – OK

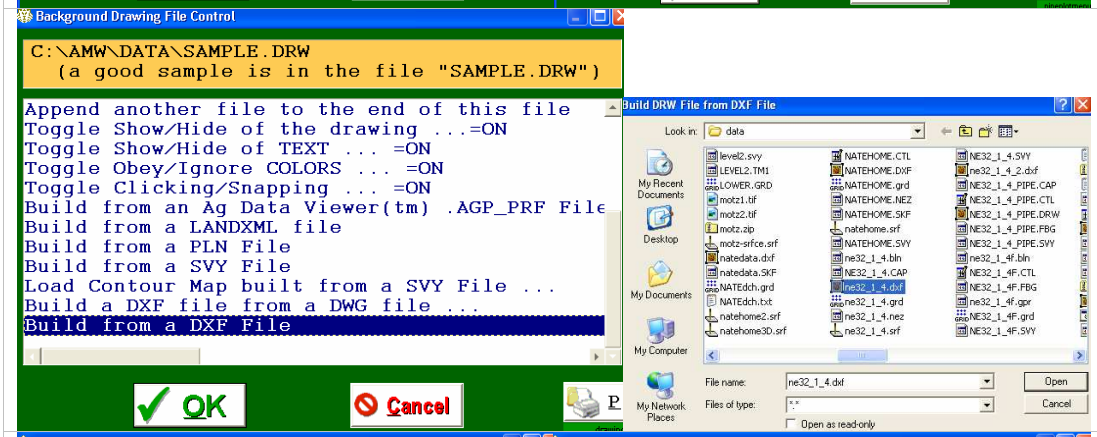
Listed on the left are all the options available.



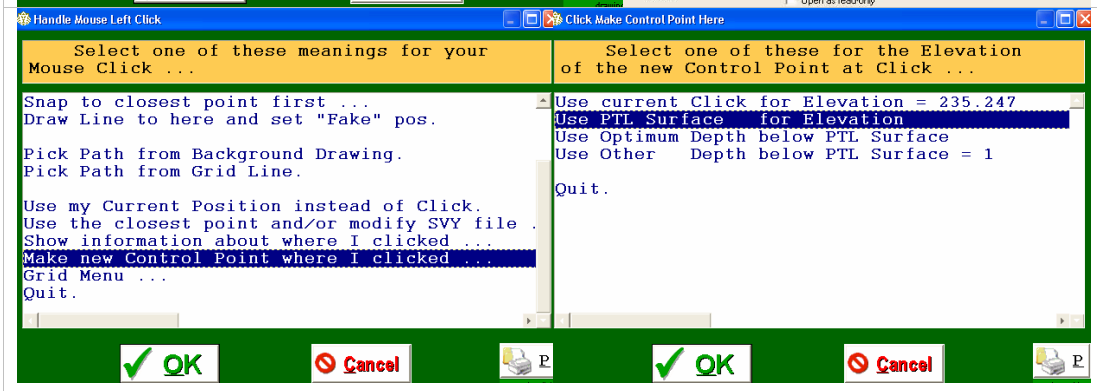
Adding background drawing:

Assuming you have already created a background drawing .dxf somewhere, it needs to be loaded as a .drw

Press MenU select Plot Menu Background Drawing File Control (…DRW)

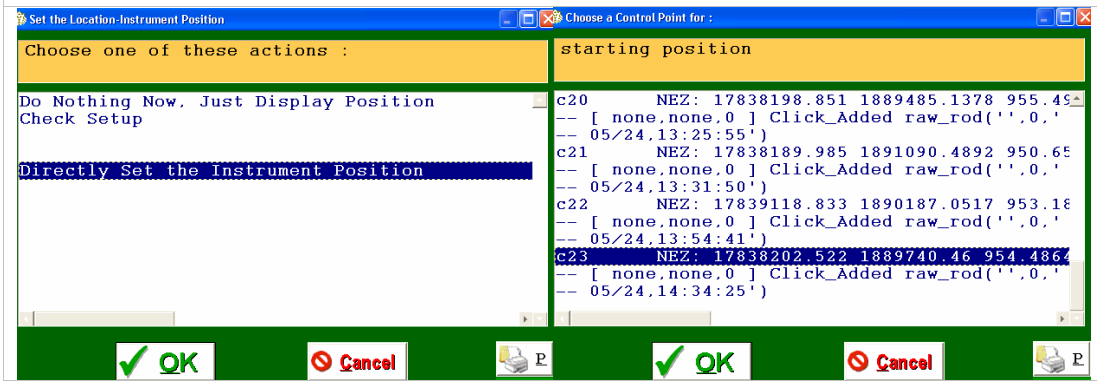


Select:
Build from a DXF File (bottom option)
Select your dxf file from the list.
After the black screen processes, the DRW menu returns then select:
Quit. No (further) changes.

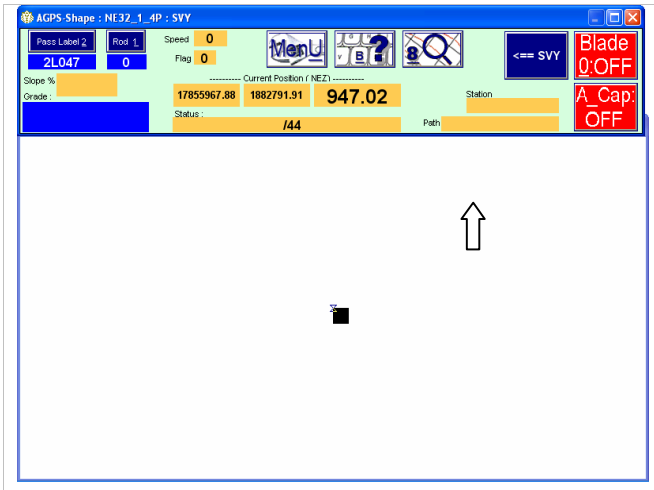


To create your profile start position:

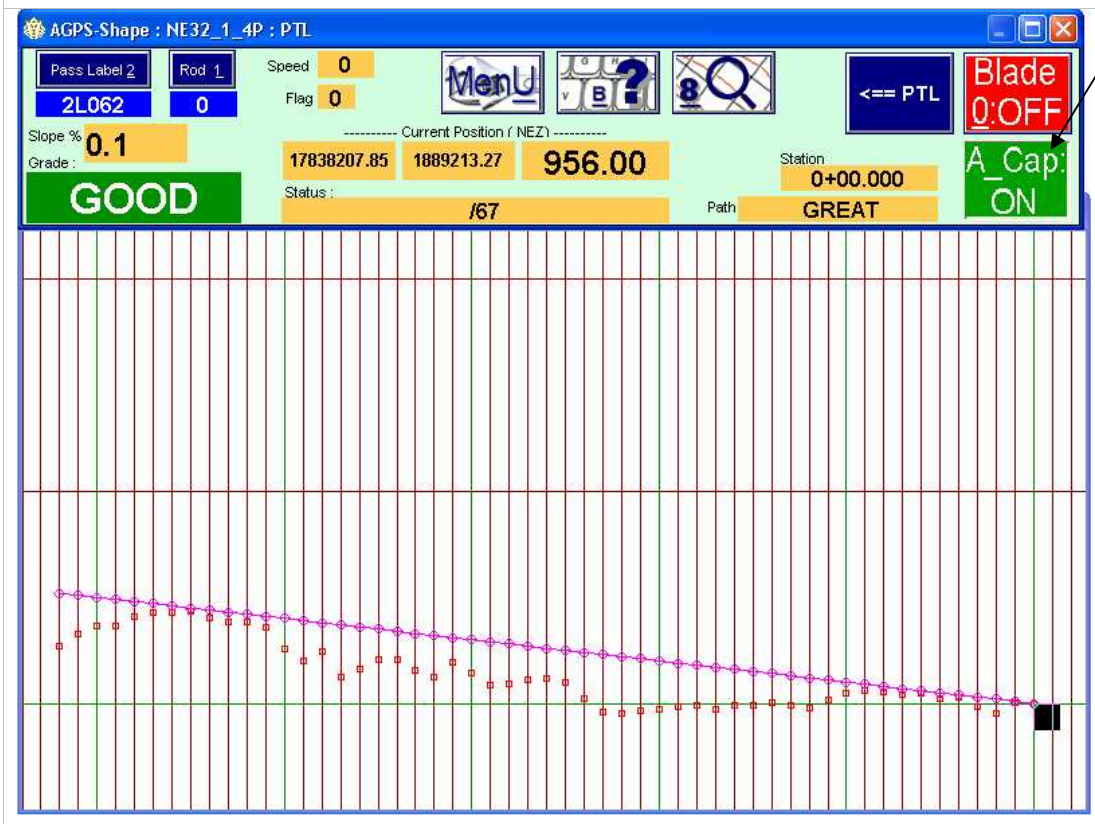
Click where you would like to start.
Select "*Make new Control Point where I clicked*."
Select how you would like to assign an elevation to your point.



On the Instrument Position screen select "*Directly set the Instrument Position*"
Then select the most recent point.



Target point:
Click the screen on the destination of your line. Add a PTL target (UP): either "further away" (from last target to your click, you can add as many further away as you like.) OR "along gridline" (straight line on your set grid) OR "along a background drawing" (follows the DRW line closest to your click)

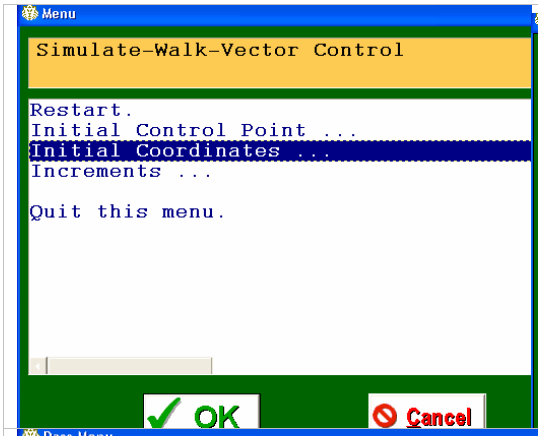


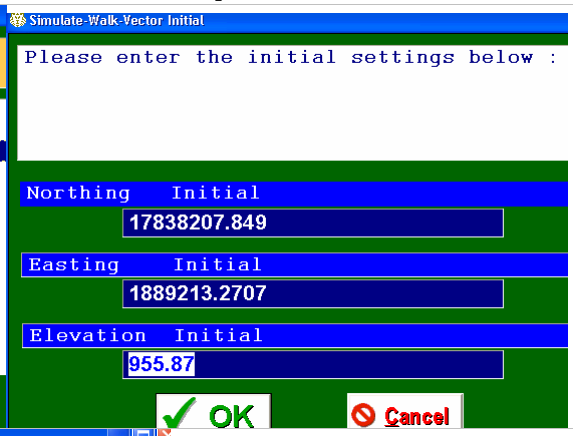
Once your target point(s) are set, press 'Spacebar' on the keyboard or click A_Cap to profile.

Manually balancing plans:

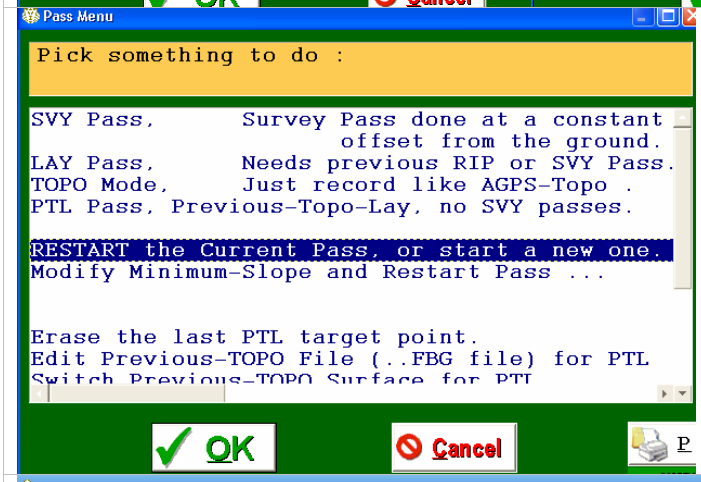
Starting Parameters:
0.10 Minimum-Slope
2.00 Maximum-Slope-Start
2.00 Maximum-Slope-Rest
1.00 Maximum-Slope-Change
1.00 Maximum-Depth
0.00 Optimum-Depth
-1.00 Minimum-Depth

This plan is too flat to get the minimum slope. In this case, the current elevation is surface elevation, so the outlet could be lower.

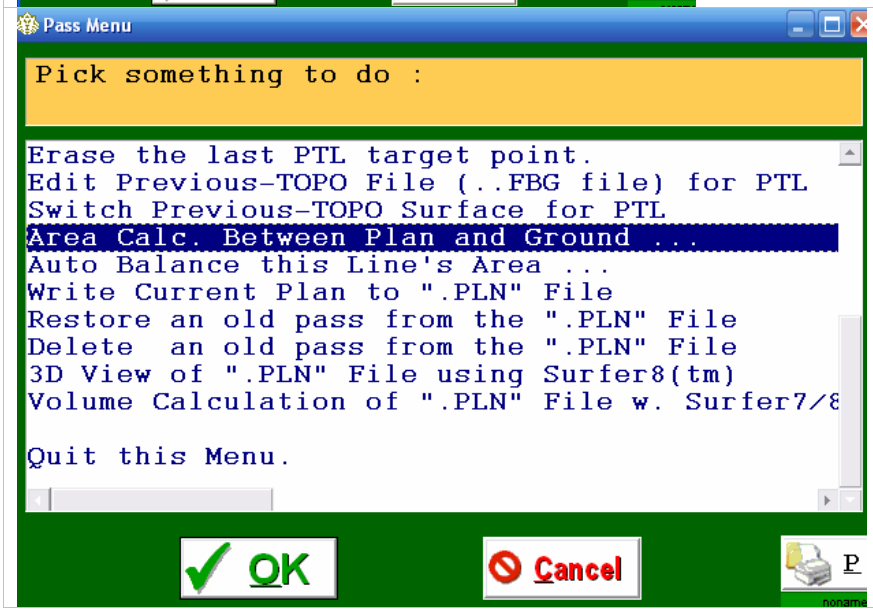




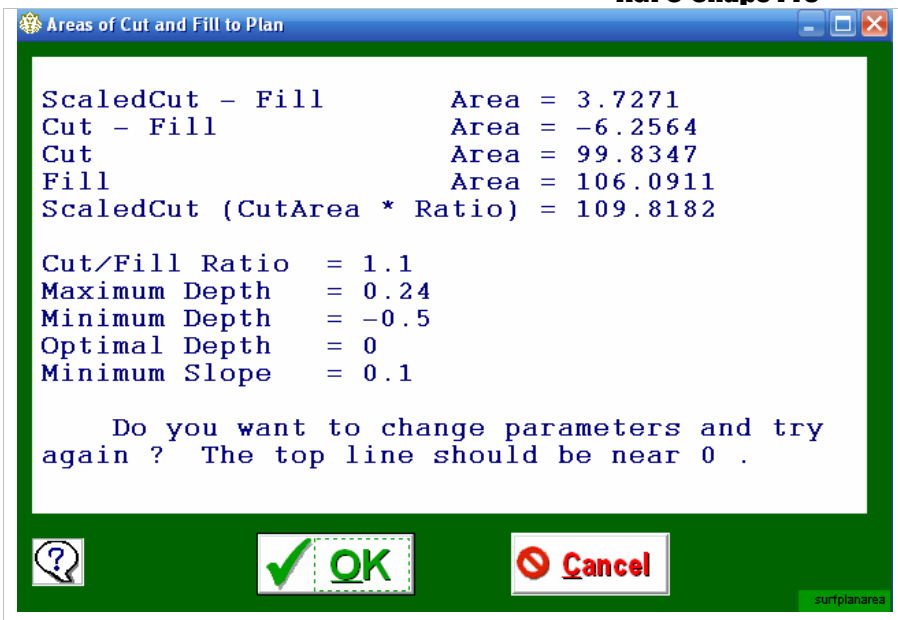
To modify the profile start coordinate, Press the number 6 on the keyboard. This will control the simulated instrument.
Select *Initial coordinates.*
Change the elevation (sometimes Northing/Easting)



After changing a starting position or parameter, go to the Pass menu and *Restart the Pass*. Then press A_Cap. This will recalculate the profile.

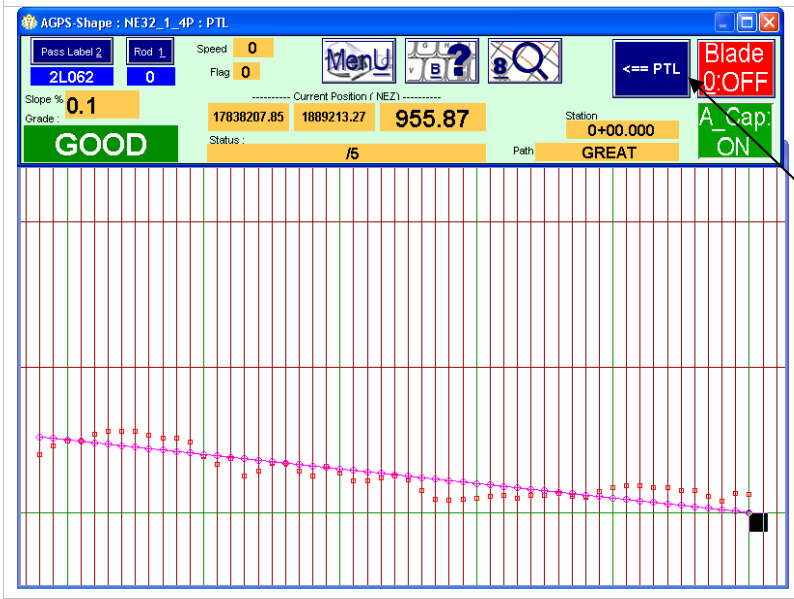


Area calculation:
With a profile shown, go to Pass and select *Area Calc. Between Plan and Ground*



This information will show the area of Cut and Fill. It will also show a scaled cut based on the Cut/Fill ratio entered in the Parameters menu. The top number shows ScaledCut-Fill When a profile is balanced, this number should be near 0.

You are asked if you want to try again. If you click OK, you will be taken to the parameters menu; then the plan recalculates and displays this again. When acceptable press Cancel.

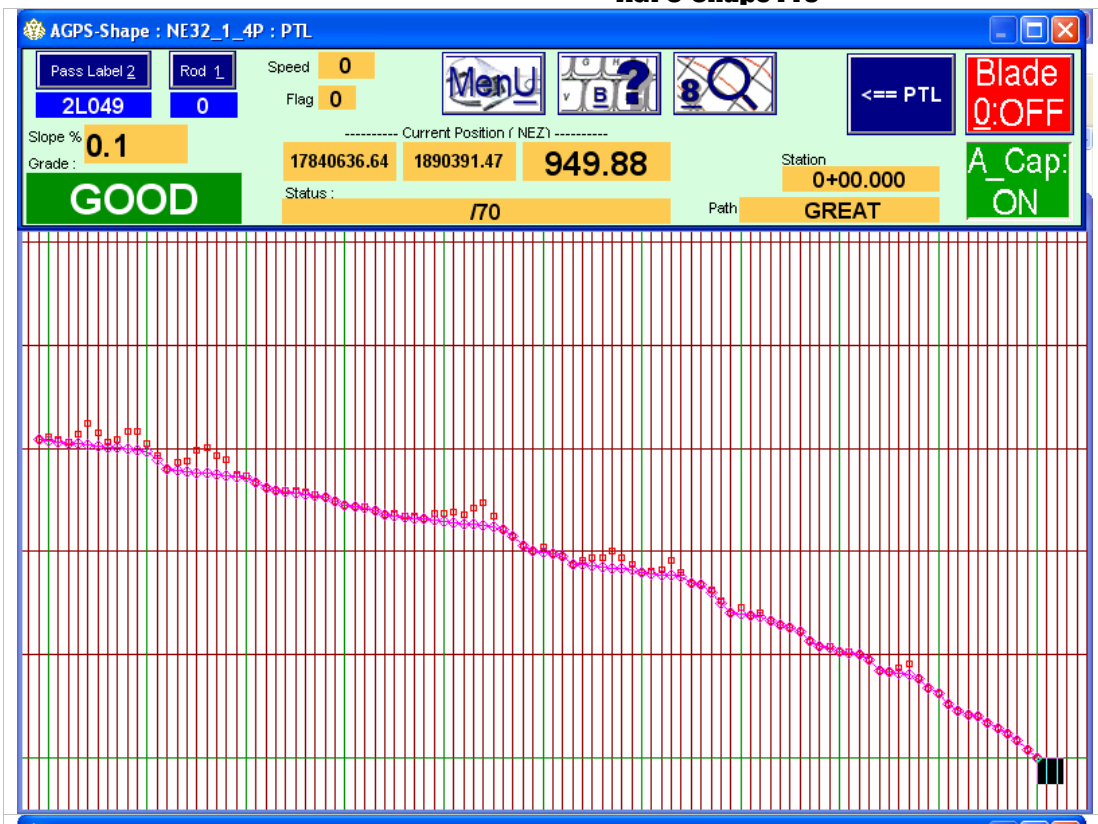


Lowering the outlet balanced the profile and kept the same parameters.

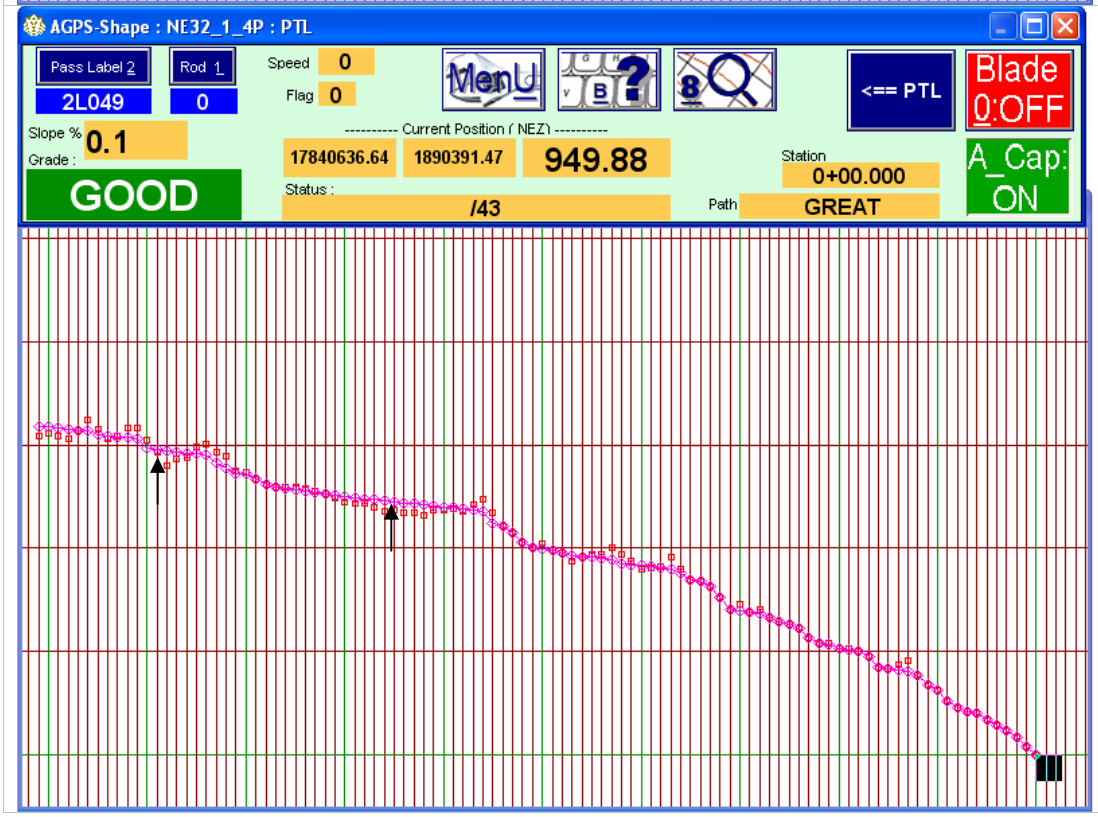
When the plan is acceptable, go to Pass menu and **Write current plan to .PLN file**

To start the next profile, press 'Backspace' or click the blue PTL button.

Then select Up-hill and go to Create start position (ex. on page 7)

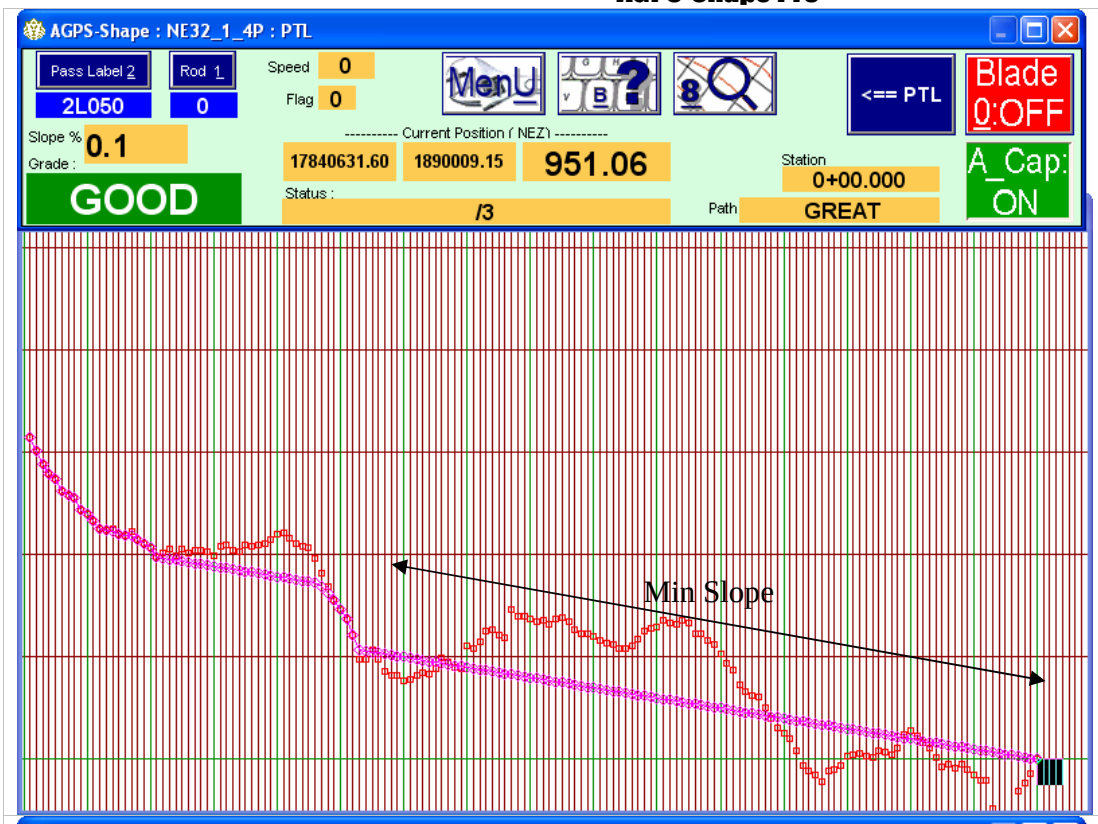


This plan appears to be all cut.

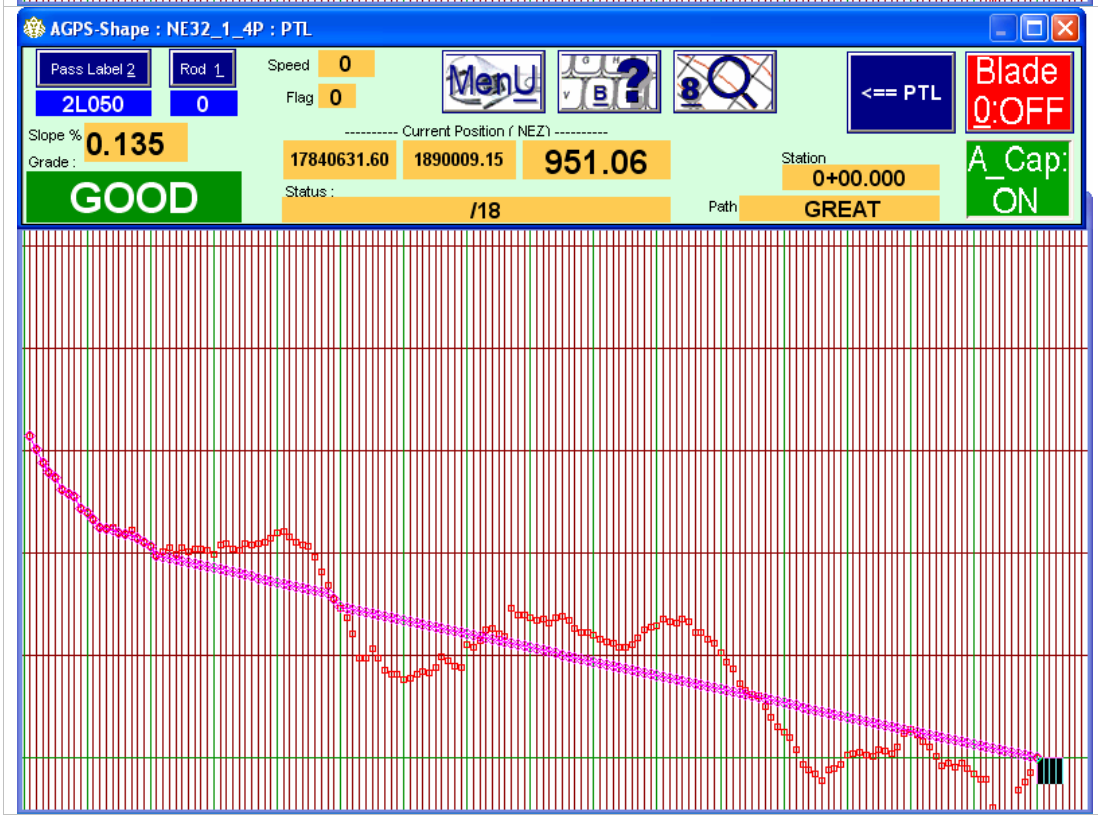


Decrease “Maximum Depth” to: 0.11

This told the program not to cut more than 0.11 feet, which made the cuts less severe and created a fill.

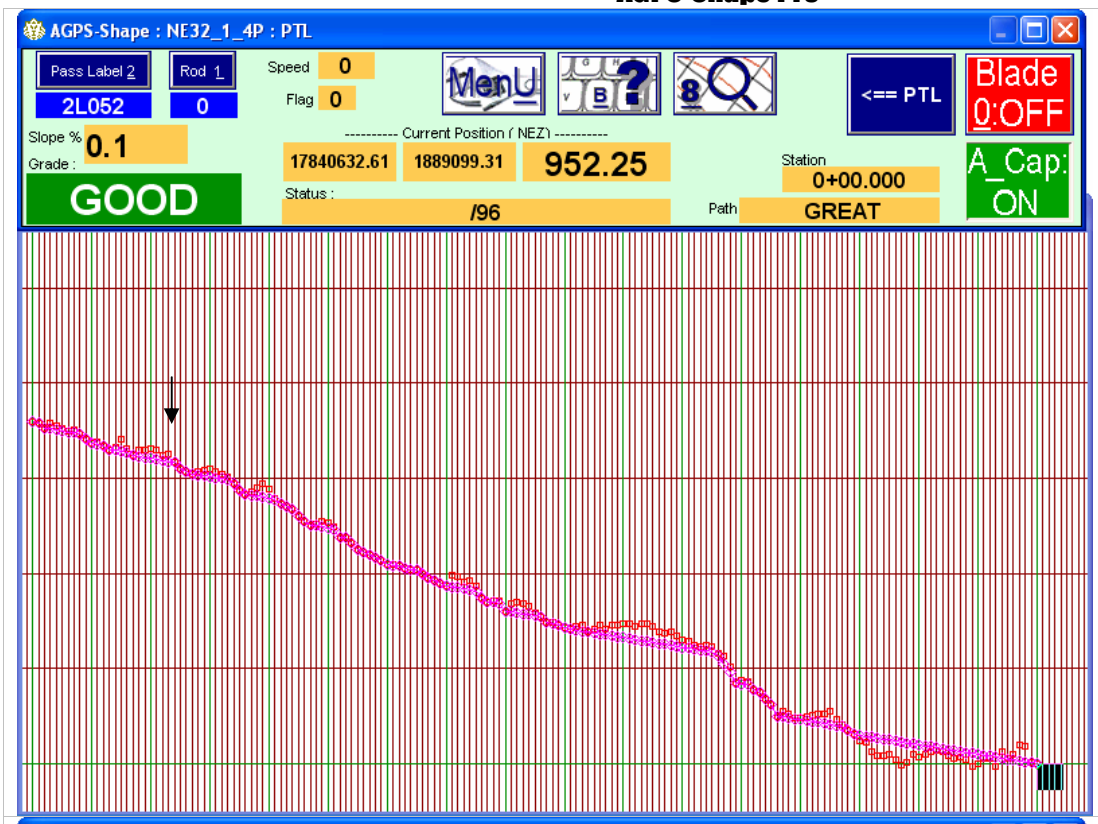


This plan has more cut than fill, and seems to follow minimum slope.
This is noticed by the fact that the grade does not break in to a vertical curve.

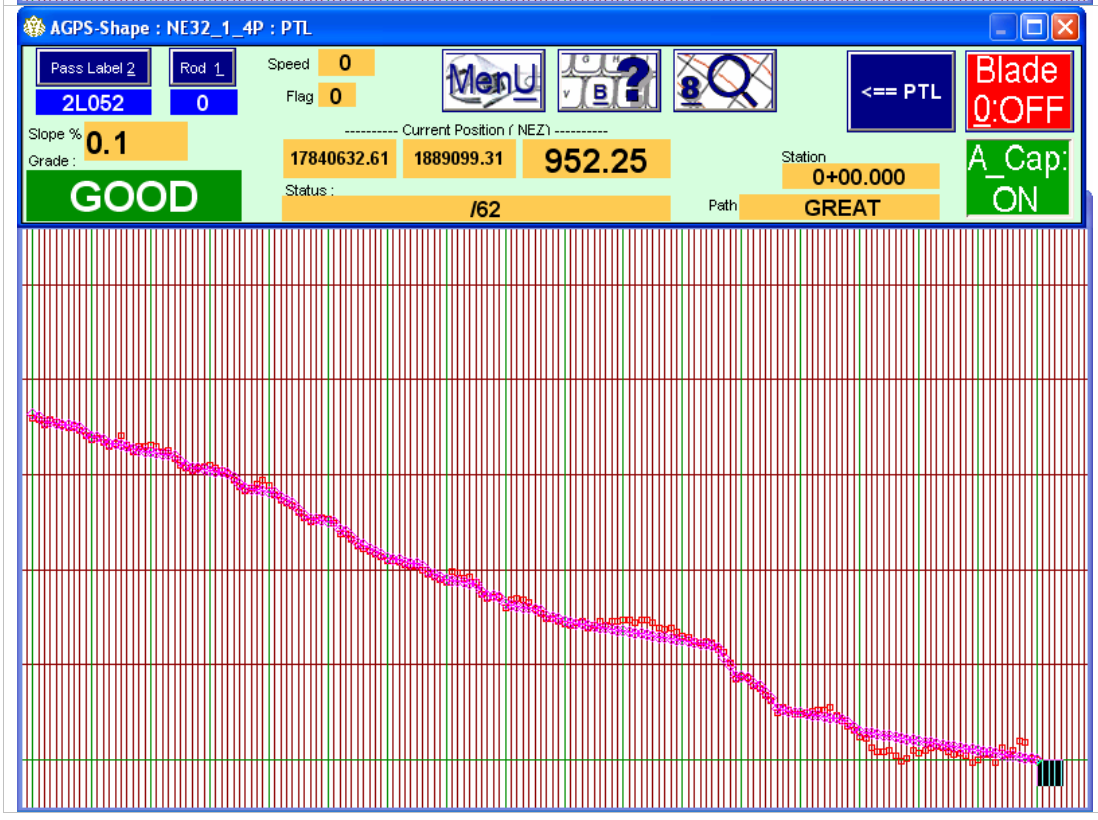


Increase “Minimum Slope” to: 0.135

Increasing slope raised the middle of the line to achieve balance and give more slope than originally intended.

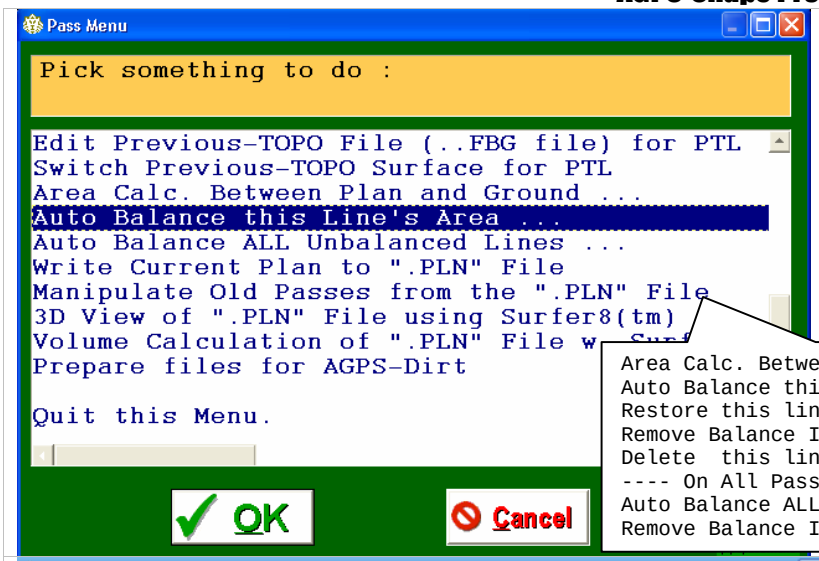


This plan is nearly balanced at first, but there is still more cut than fill. Also it features several tiny cuts.



Decrease “Optimum Depth” to: -0.03

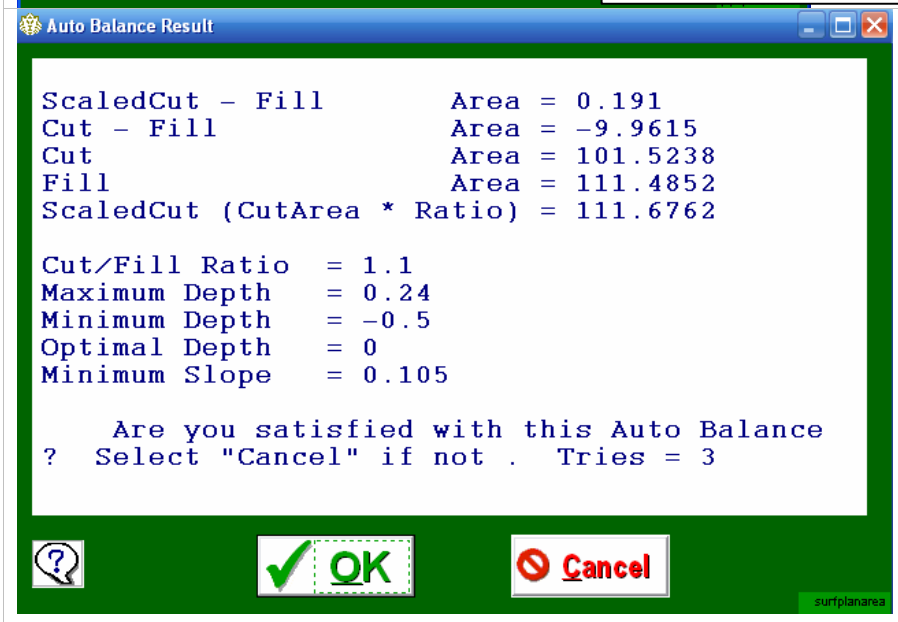
A negative number means above the ground, so the plan has now been raised 0.03 in most places to have places to fill.



Automatically balancing plans:

After you have target points set and a profile generated (see Page 8), you can “Auto Balance this Line’s Area…”

*You can also “Manipulate Old Passes from the .PLN File” if you wish <



Auto Balance will make a number of Tries adjusting Maximum Depth, and Minimum Slope. Optimum Depth can also be included in the auto balance by turning on this option in the Parameters menu.

You will be shown the results once the ScaledCut-Fill is +/- 10.

You can now press ‘OK’ if satisfied or ‘Cancel’ to try again.

To manually balance press ‘OK’ then follow steps on Page 8.

Quitting the program:

Press Q for Quit.

If you do not have a keyboard touch Menu then Quit this Application.

On the Quit options menu, you can “Prepare files for ‘Dirt’ program” if you wish. When done, pick “Quit Now”.

When you select “Quit Now” you will be taken to the Main Menu. To work with another application scroll up to select it. Select Quit for the desktop. If you are done with everything you can “Quit and Shutdown computer”