COOK'S AGPS LLC

AGPS PIPE PRO USER MANUAL

www.CooksAGPS.com

Manual revision date: 5/9/23

Table of Contents

Welcome

Thank you for purchasing AGPS-Pipe Pro™. This manual will guide you through the setup and running of the program.

AGPS-Pipe Pro™ provides assistance in laying drainage pipe (or "tile"). The program will calculate the elevation and grade of the pipe and control the plow blade in laying the pipe.

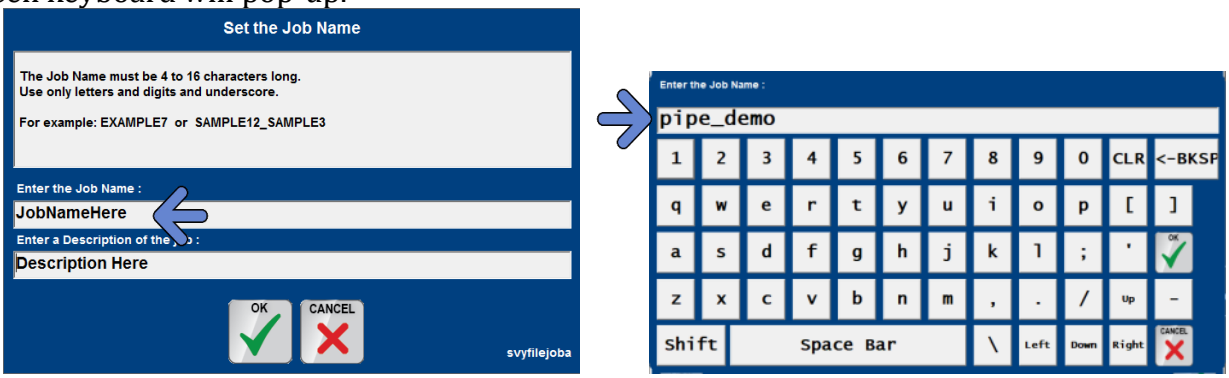
If you have further questions, please contact your AGPS Dealer or the AGPS technical support via email: support@agpsinc.com

Basic Concepts

AGPS-Pipe Pro™ will capture the topography of a tile line, either by surveying the line, ripping the line or by utilizing previously captured topography, and based on that topography and on certain parameters (like minimum-slope, minimum-depth, optimum-depth) will calculate a plan of elevations where the pipe should be laid, show it to you and, and control the plow blade.

AGPS-Pipe Pro™ can be navigated with either the touch-screen interface or utilizing a standard keyboard. Most of the instructions in this manual are based on utilizing the touch-screen interface. For shortcut keys with a keyboard, see the Buttons menu on page 23.

The touch-screen interface has an on-screen keyboard function – when you need to enter text (job name, naming a control point, etc.) simply touch where you need to enter text and the on-screen keyboard will pop-up.



How the Program Calculates Grade

AGPS-Pipe Pro™ Designs the tile line based on what the user selects as the minimum slope and optimum depth. The program will attempt to place the tile line at the Optimum Depth while never violating minimum slope.

Units of Measure

AGPS-Pipe Pro™ can be set to work in Feet (International); Feet (U.S. Survey); or Meters. A typical user in the United States will choose Feet (U.S. Survey). For both Feet (International) and Feet (U.S. Survey) will be calculated and displayed in tenths of feet, so that 6.5' is the same as 6'6".

Inches and Eighths to Decimals of a Foot

In.	0	1/8	1/4	3/8	1/2	5/8	3/4	7/8
0	.00	.01	.02	.03	.04	.05	.06	.07
1	.08	.09	.10	.11	.12	.14	.15	.16
2	.17	.18	.19	.20	.21	.22	.23	.24
3	.25	.26	.27	.28	.29	.30	.31	.32
4	.33	.34	.35	.36	.38	.39	.40	.41
5	.42	.43	.44	.45	.46	.47	.48	.49
6	.50	.51	.52	.53	.54	.55	.56	.57
7	.58	.59	.60	.61	.62	.63	.64	.65
8	.67	.68	.69	.70	.71	.72	.73	.74
9	.75	.76	.77	.78	.79	.80	.81	.82
10	.83	.84	.85	.86	.88	.89	.90	.91
11	.92	.93	.94	.95	.96	.97	.98	.99

Example: 3-½" = .29"

Glossary of Terms

Capture	Auto Capture: Automatically captures a data points after user set interval (typically 10 feet) has been traveled. This distance uses both horizontal and vertical measurement. Toggling the Auto Capture button on and off will capture a single point at your current location. Toggled ON/OFF by keyboard spacebar.

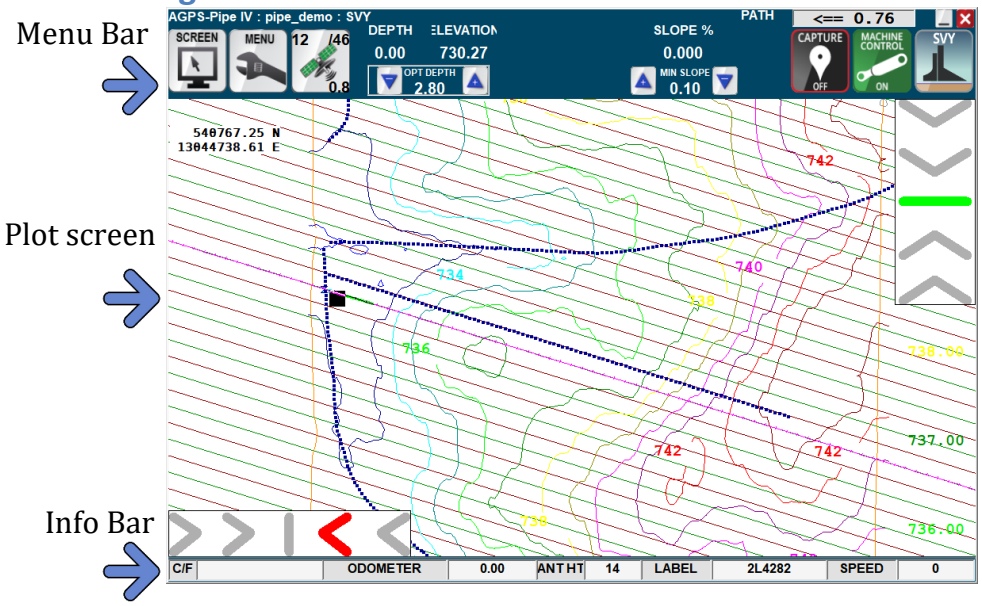
<table>
<tr><td>Machine Control</td><td>In the program the term Machine Control refers to the automatic control of the blade. The control can be toggled by keyboard 0. There are other places in the program that blade used in a sentence will have different context.</td></tr>
<tr><td>Control point (.ctl file)</td><td>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. See Control Points on page 45.</td></tr>
<tr><td>Data folder</td><td>All job file data opened and saved by the program is stored by default in C:\amw\data\</td></tr>
<tr><td>Device</td><td>Other forms: Device Menu, External Device, Control Device, etc. The Device refers to interface device that operates the automatic blade control, such as a DAC-7000/DAC-8000™ or a LaserTech™ 308 control module.</td></tr>
<tr><td>Instrument</td><td>Other forms: Instrument Menu, Measuring Instrument, Read Instrument, etc. The instrument is the positional equipment. Although typically a GPS, there are many other types, and combinations of multiple instruments. See Working with RTK-GPS on page 19.</td></tr>
<tr><td>Local Point</td><td>A NEZ coordinate system that uses “fake” coordinates, meaning they are not consistent with State Plane or UTM. An example of this is program default “ptafake 5000 2000 100”.</td></tr>
<tr><td>NEZ</td><td>Abbreviation for Northing(N) Easting(E) Elevation (Z). Coordinates are always in NEZ. NEZ coordinates are in Feet (or meters if selected) rather than Latitude Longitude and Altitude.</td></tr>
<tr><td>.nez file</td><td>A file that uses the following columns: “Name Northing(N) Easting(E) Elevation(Z) Description”. (Description is optional)</td></tr>
<tr><td>Path</td><td>The line (curved or straight) you wish to follow. You can set a path by touching the path you wish to follow on the Plot. See also: Plot</td></tr>
<tr><td>Plot</td><td>Other forms: Plot Menu, Plot Window, etc. The Plot is the lower screen that the field is graphically drawn in. Any options to adjust a feature drawn here are found in the Plot Menu. See Plot Menu on page 53.</td></tr>
<tr><td>Quick setup mode</td><td>A toggled option to automatically start this application instead of going to the Main menu to select an application.</td></tr>
<tr><td>Rod (length)</td><td>The distance from the reading point (on the GPS antenna) to the blade or ground. The term Antenna Height is also used interchangeably. See Rod Length on page 21.</td></tr>
<tr><td>State Plane</td><td>A NEZ coordinate system with zones designed for a particular US State. Every State has one or more zones. See UTM and State Plane on page 62.</td></tr>
<tr><td>Odometer</td><td>The current distance from the start of the selected Path.</td></tr>
<tr><td>Status (GPS)</td><td>Shown on the working screen to describe GPS status and other related messages. Shows something like “ok: 19 4 1.1 /53” Where 19=satellites 4=datatype 1.1=precision and /53=read counter.
Use the table below to evaluate the data type and precision meaning for your GPS.
<table>
<tr><td></td><td>RTK Fixed</td><td>RTK Float</td><td>No RTK base</td><td>Precision</td></tr>
<tr><td>GGA (Most manufacturers)</td><td>4</td><td>5</td><td>1</td><td>HDOP</td></tr>
<tr><td>John Deere™</td><td>4</td><td>3=extend
5=float.</td><td>1</td><td>HDOP</td></tr>
<tr><td>NovAtel™ (Raven™/AgLeader™)</td><td>50</td><td>49/48/34/17</td><td>16</td><td>Alt. Std. Deviation</td></tr>
<tr><td>Topcon™ (Javad™ GGA)</td><td>4</td><td>5</td><td>1</td><td>HDOP</td></tr>
<tr><td>Trimble™ (GGK)</td><td>3</td><td>2</td><td>1</td><td>PDOP</td></tr>
</table></td></tr>
<tr><td>Survey File (.svy)</td><td>This file will contain all data points captured. Also, "Location Instrument" setup information and other relevant information are logged to this file. Points from this file will be displayed on your plot window as dots. The Survey File Menu includes options to modify this file.</td></tr>
<tr><td>UTM</td><td>A NEZ coordinate system with zones designed on Longitude lines. The program can automatically detect your UTM zone. See UTM and State Plane on page 62</td></tr>
</table>

The Main Working Screen

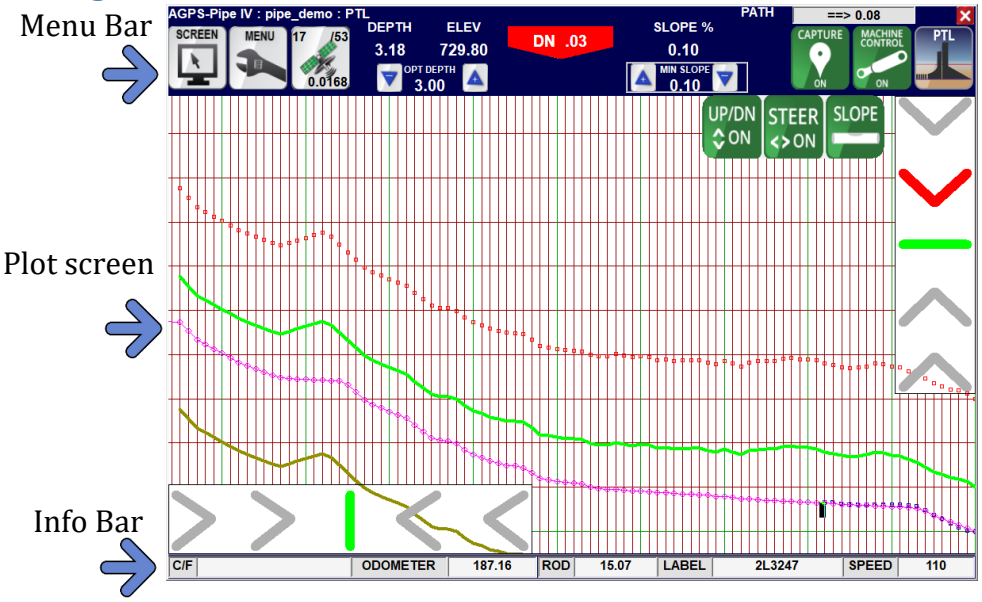
The AGPS-Pipe Pro™ working screen is divided into three sections:

1. The Top Menu Bar on page 8
2. The Middle Plot Screen, with an Overhead View on page 9 and a Profile View on page 10
3. The Bottom Info Bar on page 11

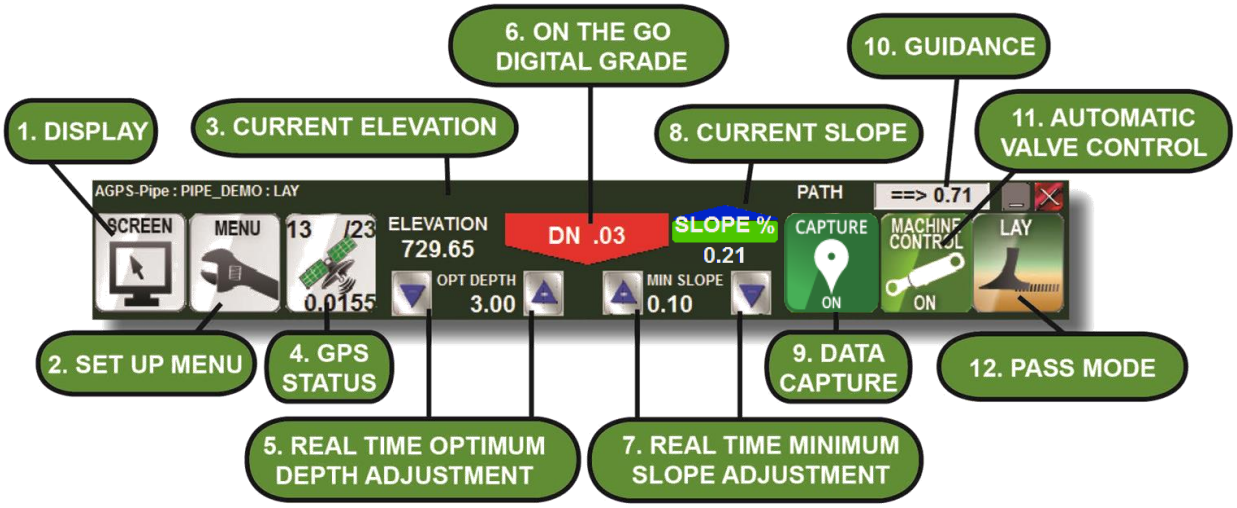
The Main Working Screen – Overhead View



The Working Screen – Profile View



The Working Screen – Menu Bar



The majority of icons in the Menu Bar are touch active. Several also have a secondary function that can be accessed by pressing and holding the icon for 3 seconds.

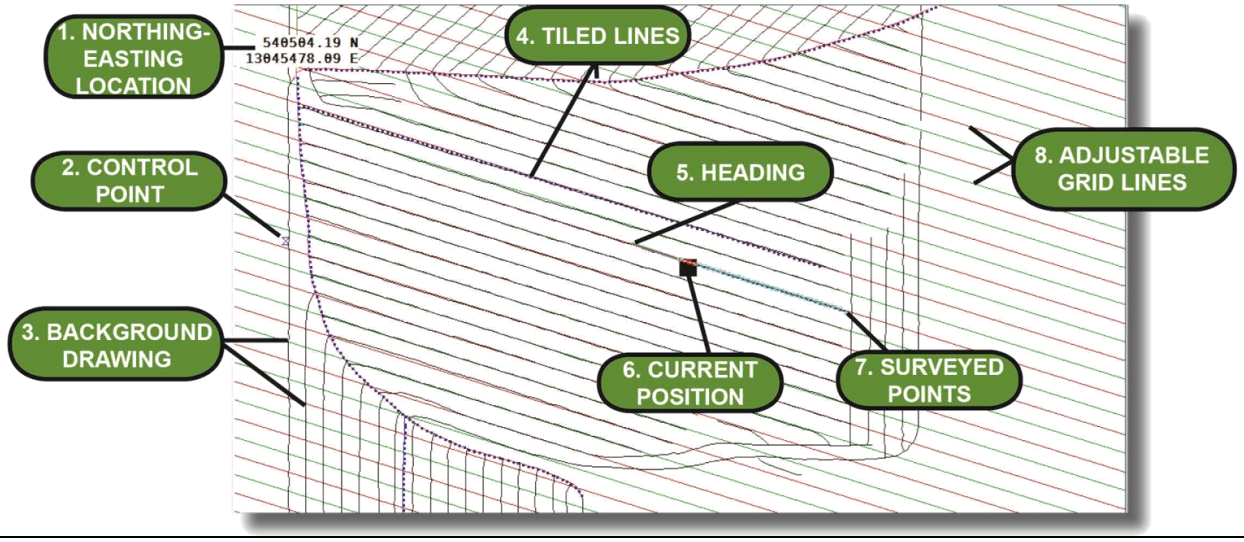
The Menu Bar will change color depending on the Current Pass Mode. See Pass Menu on page 32.

1.	Display	Touch this icon to drop down the display menu where you can adjust the zoom level, scroll around the screen or adjust the grid. See Adjusting the View on page 22.
2.	Set Up Menu	Touch this icon to start a new job, switch to a different job or adjust your parameters. See Setting up the Program on page 11.
3.	Current Elevation	The current elevation of the plow blade. Can be in meters, feet-international or feet-survey. See Setting up the Program on page 11.
4.	GPS Status	Icon showing current GPS status. Must be green for the program to work. Touch to access the Control Instrument Menu see Instrument Menu on page 51. The following menu shows the data types for often used RTK-GPS systems. Shows something like "ok: 19 4 1.1 /53" Where 19=satellites 4=datatype 1.1=precision and /53=read counter.
5.	Optimum Depth Adjustment	Adjusts the Optimum Depth of the tile line. Please note that AGPS-Pipe Pro™ will redesign the tile line from your current location, removing previously laid tile points for that line from the screen. The amount the Optimum Depth Adjustment buttons adjust can be set in the Parameters Menu on page 56.
6.	Digital Grade	Visual real-time indicator of the position of the plow in relation to designed grade.

	RTK Fixed	RTK Float	No RTK base	Precision
GGA (Most manufacturers)	4	5	1	HDOP
John Deere™	4	3=extend 5=float.	1	HDOP
NovAtel™ (Raven™/AgLeader™)	50	49/48/34/17	16	Alt. Std. Deviation
Topcon™ (Javad™ GGA)	4	5	1	HDOP
Trimble™ (GGK)	3	2	1	PDOP

7.	Minimum Slope Adjustment	Adjusts the Minimum Slope of the tile line. Please note that AGPS-Pipe Pro™ will redesign the tile line from your current location, removing previously laid tile points for that line from the screen. The amount the Minimum Slope Adjustment buttons adjust can be set in the Parameters Menu on page 56.
8.	Current Slope	Slope of the design or ground at the current point. When using a slope sensor on the plow, there will be arrows indicating if the back of the boot needs to go up or down to match desired slope.
9.	Data Capture	Auto Capture icon. Green for On, black/red for Off. When on, AGPS-Pipe Pro™ will capture a point after a preset distance (default is 10 feet). Adjust this distance in the Parameters Menu on page 56.
10.	Guidance	Distance from the survey path.
11.	Valve Control	Automatic control of the machine hydraulics. Green for On, black/red for Off. Press and Hold to access the Devices (machine control menu).
12.	Pass Mode	Current Pass Mode. Press and Hold to change pass mode. See Pass Types on page 33.
	 (Option)	Independent Valve Control Toggles. Does not override Machine Control above. Show/hide of these buttons is an option. Press and Hold the Menu Icon and select 'UsrPref', then check/uncheck 'Machine controls'.

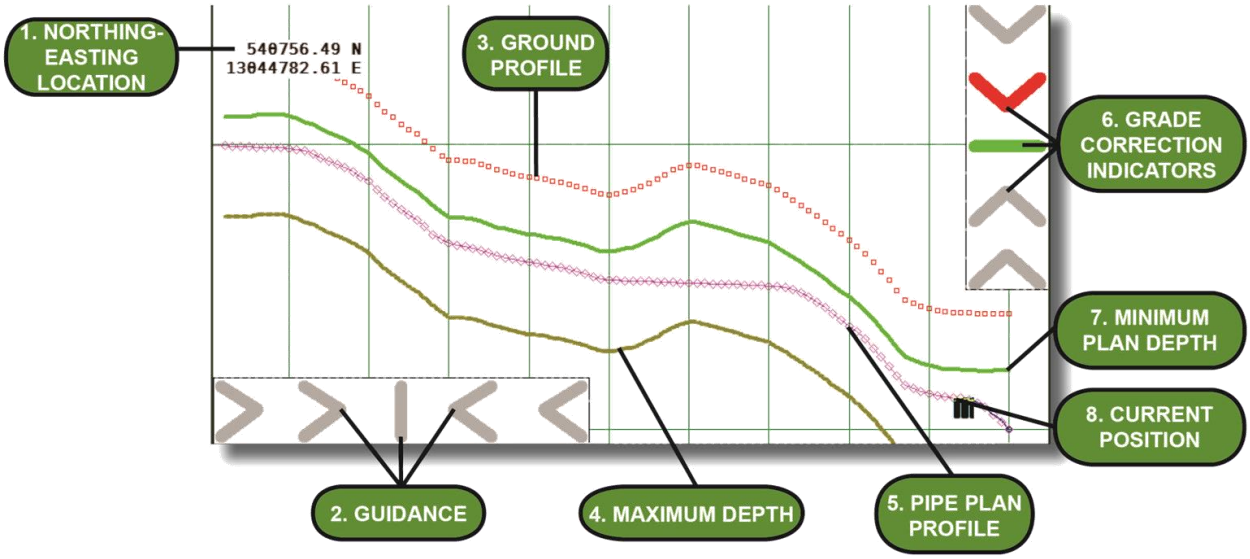
The Plot Screen –Overhead View



1.	Northing-Easting Location	Real time display of your current location in Northing and Easting in Feet (or Meters).
2.	Control Point	Visual indication of the location of a Control Point. See Control Points on page 45.
3.	Background Drawing	An example of lines in a Background Drawing. A Background Drawing can be built and imported from multiple design programs such as Surfer™, Ag Data Mapping Solutions™, Auto-Cad™, Farm Works™, AGREM™, among others. See Loading Background Images on page 29
4.	Tile Lines	Previously Tiled lines appear as dark blue dotted lines. If you label your lines you can also have the main lines appear as magenta lines, see Previous Topo Lay on page 40.
5.	Heading	Green line that shows real time heading of the current position. The heading is drawn from the upper left-hand corner of the icon.

6.	Current Position	Visual real-time indicator of the position of the plow. The upper left-hand corner of the icon is considered the 'true' position of the plow. You can set a 'fake' position by touching the screen and either setting where you touched as the fake position or by 'snapping' to a point and setting that as the 'fake' position. 'Fake' positions are useful in rotating the grid around a point and in setting Previous Topo Lay points.
7.	Surveyed Points	As you survey or rip, a light blue dotted line will be drawn.
8.	Adjustable Grid Lines	Grid lines to aid in surveying/tiling. See The Grid Menu on page 27
	Touching the overhead view	Touch/click a location on the overhead view will bring up a menu titled "Handle Mouse Left Click". More information on page 23.

The Plot Screen – Profile View

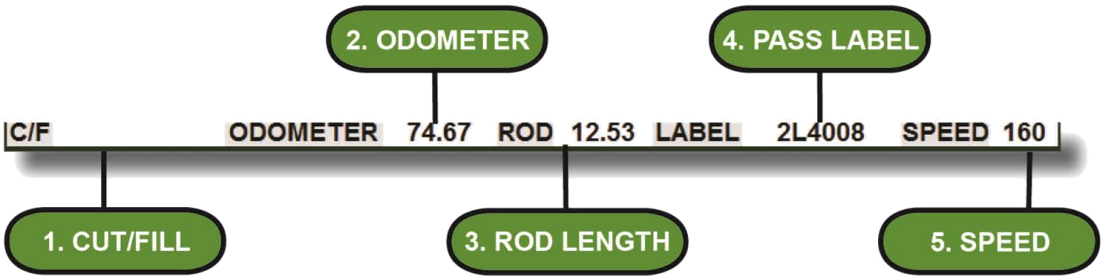


***Important Note**: In the Profile View the X and Y (elevation and distance) are NOT drawn to the same scale in order for both the horizontal and vertical lines to fit on the screen. This will cause some lines to seem more steep over distance than they actually are and vice versa.

1.	Northing-Easting Location	Real time display of your current location in Northing and Easting in Survey Feet.
2.	Guidance	Real time guidance light bar. Visual indicator of how far off the original survey pass you are. By pressing the left/right arrow chevrons the program will offset the Path a set offset. See "Manual Path Offset" in the Miscellaneous Actions Menu on page 60 to set the offset value.
3.	Ground Profile	Red data points showing the relative elevation of your original survey pass.
4.	Maximum Depth	The Maximum Depth of the tile line. AGPS-Pipe Pro™ will not allow the pipe plan to go below this line. It can be adjusted in the Parameters Menu, on page 56.
5.	Pipe Plan Profile	Where AGPS-Pipe Pro™ has calculated the tile should be placed based on the topography of the line and the Parameters. AGPS-Pipe Pro™ attempts to place the tile at the Optimum Depth with never violating the Minimum Slope.

6.	Grade Correction Indicators	Real time Elevation guidance light bar. Visual indicator of how far off the Pipe Plan Profile the plow blade is. Also functions as a blade offset button. By pressing the up arrow chevrons the program will offset the plow blade a set amount above plan. See Light Bars on page 25 for more information.
7.	Minimum Plan Depth	Visual indication of a desired minimum depth. AGPS-Pipe Pro™ MIGHT violate minimum depth in order to keep the Pipe Plan Profile from violating Minimum Slope.
8.	Current Position	Visual real-time indicator of the vertical position of the plow blade. The upper left-hand corner of the icon is considered the 'true' position of the blade.

The Working Screen – Info Bar



1.	Cut/Fill	The current amount above or below grade AGPS-Pipe Pro™ is laying tile at. Touch to set a different Cut/Fill.
2.	Odometer	Real time odometer of the distance of the current pass
3.	Rod Length	The Current Rod Length/antenna height. The rod length is defined as the distance from the measuring instrument (i.e. GPS globe) and the tip of the plow blade. See Rod Length on page 21
4.	Pass Label	Current pass label. Touch to choose a different label. See Pass Labels on page 31.
5.	Speed	Current speed in feet or meters per minute

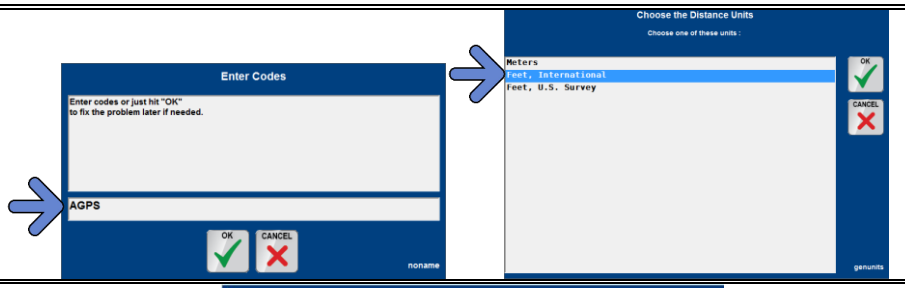
Setting up the program

Setting up the program for the first time:

Follow these procedures for the first time you set up AGPS-Pipe Pro™. If you have previously set up the program or an AGPS-Pipe Pro™ Technician has completed these setup procedures, please skip to **Starting a New Job or Restarting a Current Job, via Dashboard** on page 15

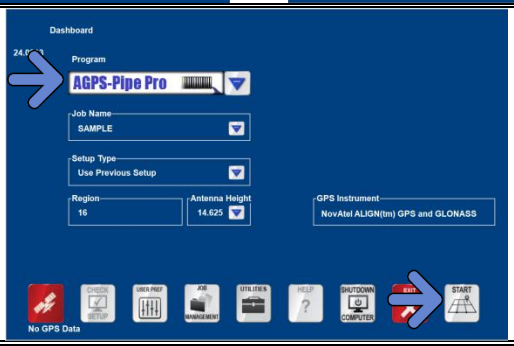
Start AGPS-Pipe Pro™		If the program does not load on computer startup, locate and double tap the Start the AGPS icon on the desktop. A starting screen will briefly appear.

Enter the code **AGPS**. Touch the entry field to pull up a touch screen keypad.
Select the unit of measure (typically Feet U.S. Survey for U.S. users).



Select AGPS-Pipe Pro™ from the Dashboard's "Program" Dropdown menu.

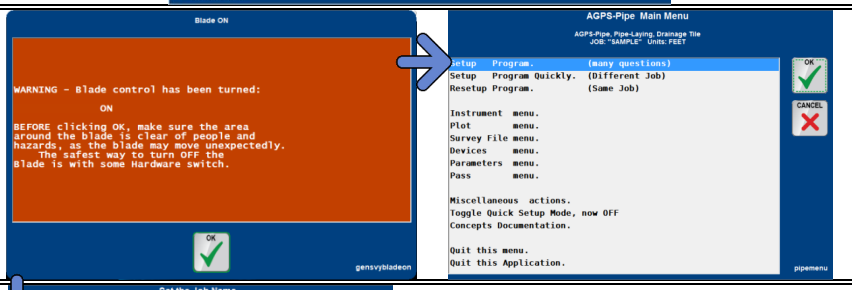
Press Start button.



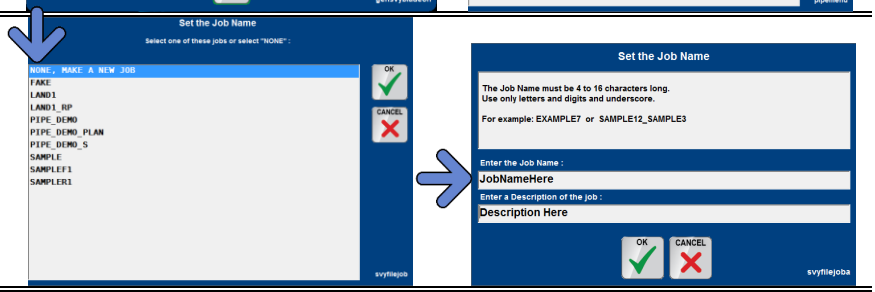
Agree to the Disclaimer, you must do this every time you start AGPS-Pipe Pro™

Press Menu 

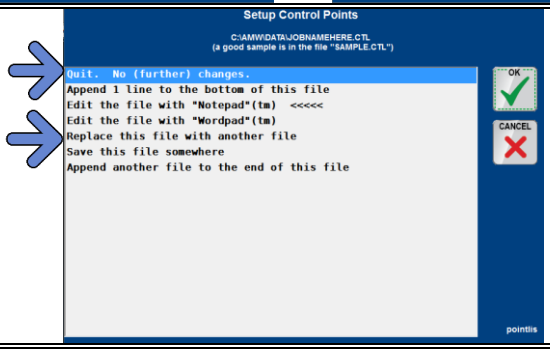
Select Setup Program (many questions).



Select None, Make a New Job.
Enter the name of the job (i.e. the name of the field or the name of the customer). You may also enter a description of the job.

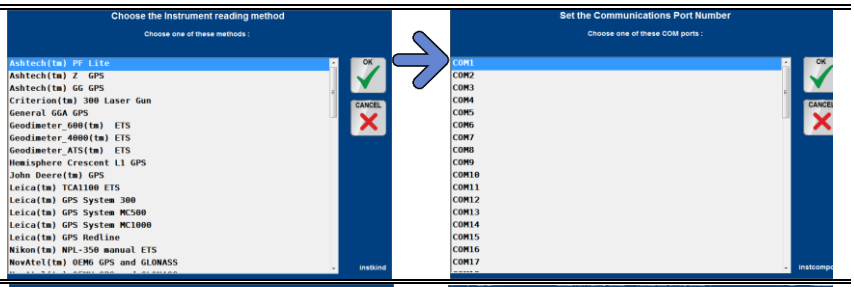


Setup your control points. If you have no control point for this job, select **Quit, No (further) Changes.** If you have control points (see Control Points on page 45) you can choose to **edit the control point file** and add the point.



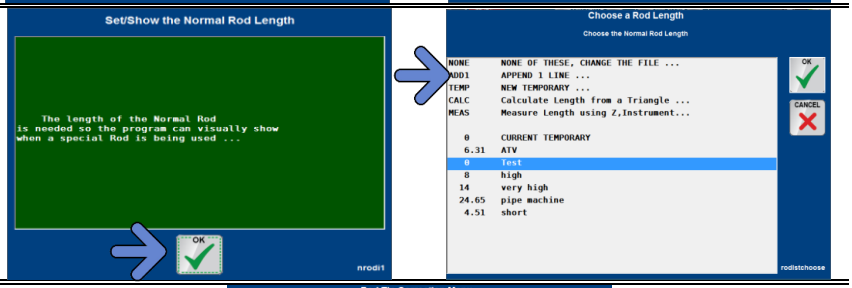
Choose the Instrument (GPS).

The GPS instrument must be configured to output the correct message type. Cousult the GPS manufacturer for specifics.
Then **Choose the Com Port** the GPS is outputting messages to.



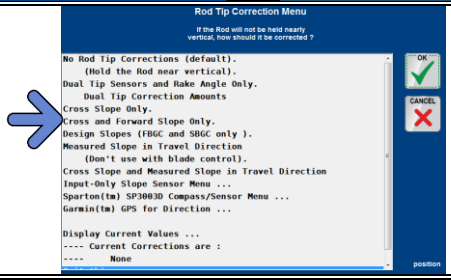
Select the Normal Rod Length.

The Normal Rod is the typical rod length.
To add your rod length, select **Add1.**



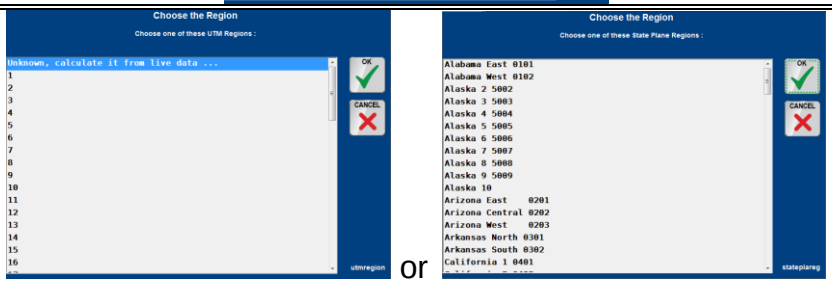
Select Rod Tip Corrections.

If you have a slope sensor, select it here. Without a slope sensor select '**Cross and Forward Slope Only'**. The program will attempt to mathematically compensate for steep grades. (You must set the correct Rod Length for this to work properly)

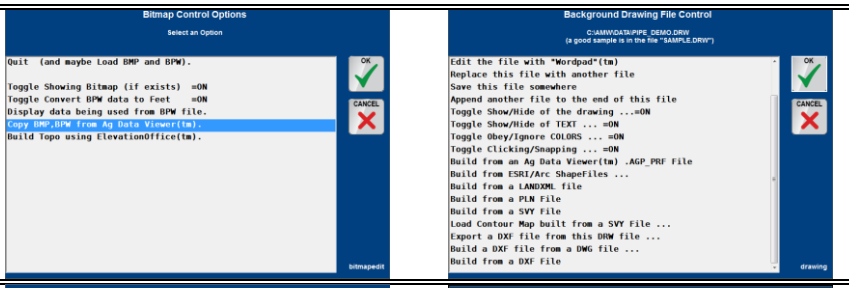


Set the Location-Instrument Position.

If you use **UTM**, select UTM 0 point. If you do not know the UTM zone, select Unknown, Calculate. If you use **State Plane**, select **State Plane 0 point** and select the State Plane.

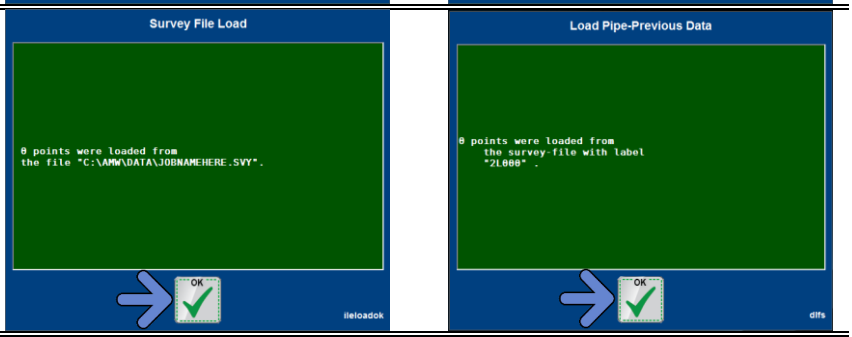


Bitmap control option or **Background Drawing**
You can load a bitmap image for a background drawing. See Loading Background Images on page 29.



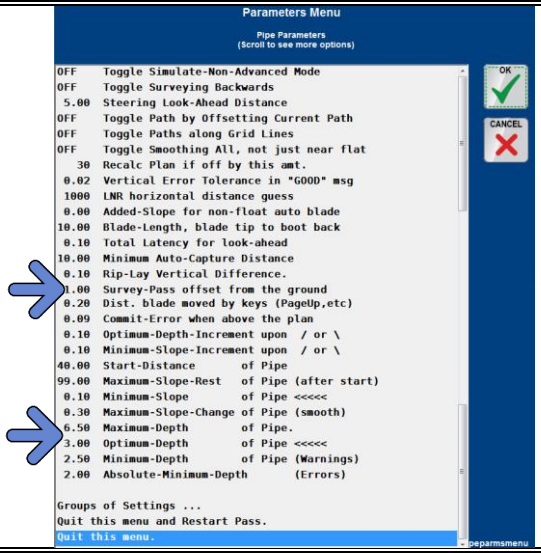
Survey load and Pipe-Previous

You will see two status screens that tell you if any points were loaded (new jobs should have 0 points loaded).
Select OK on each screen.

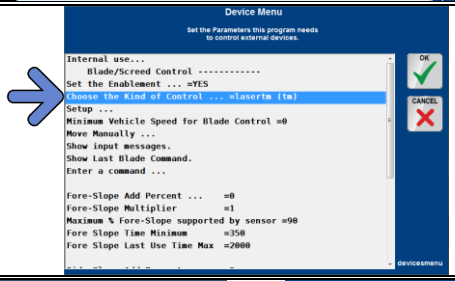


Parameters Menu

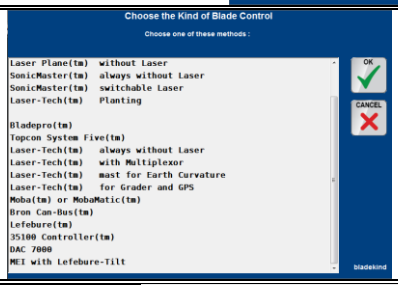
Adjust the parameters to your preferred settings. Select an option to see a more detailed description.
Be sure to adjust the **Survey-Pass offest.** This is how high the blade is held above the ground when you survey. You must survey with the blade in the same place each time (typically all the way up).
Also adjust the **Blade-length, Optimum Depth and Maximum Depth.**
For more details, reference the section on the Parameters Menu on page 56

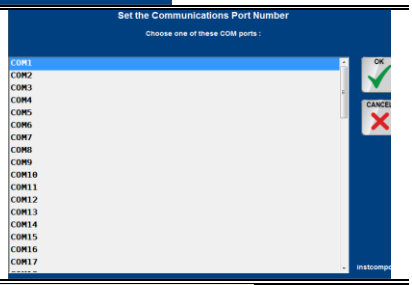


Device Menu. Select the type of auto-blade controller you have. Contact the Auto-Blade control manufactuerer for more details on setting up the device.

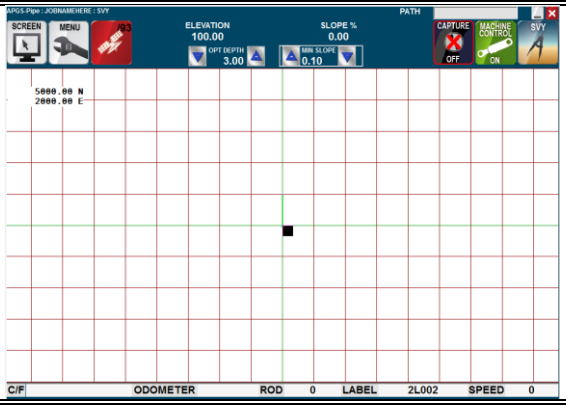


Typical controllers are the LaserTech™ with MultiPlexor, DAC 7000™ or Bron Can-Bus™ control. Then select the Com port the controller is plugged into.





The Main Working Screen will appear: You should be able to begin working.



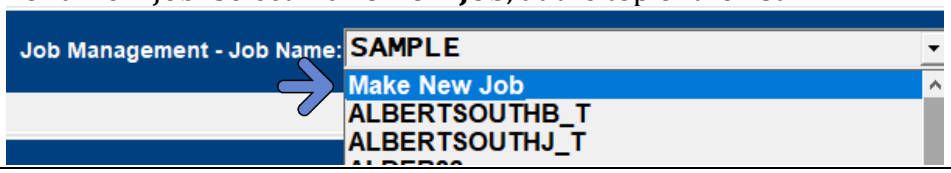
TroubleShooting Tips:

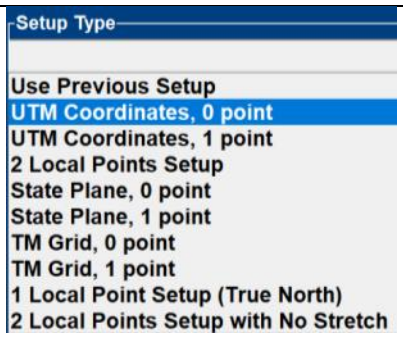
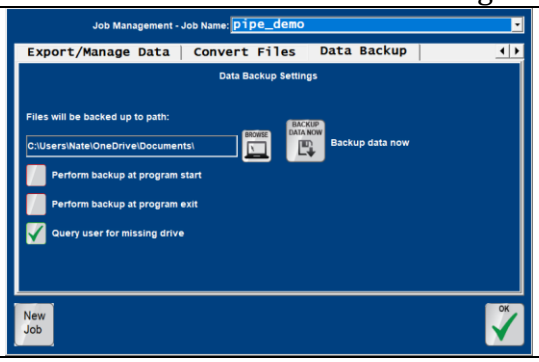
I finished the setup, but the screen flashes red	This is typically related to the GPS signal. See Troubleshooting My GPS on page 20.
I missed/mess up a step	You can go through the setup process again from the Main Menu. Press the Menu Icon on the Working Screen.

Starting a New Job or Restarting a Current Job, via Dashboard:

Follow these procedures to each time to start AGPS-Pipe Pro™.

Start AGPS-Pipe Pro™		If the program does not load on computer startup, locate & double tap the Start the AGPS icon on the desktop. A starting screen will briefly appear.

① **Program**	Select a program to open. It should say AGPS-Pipe Pro. Press the down arrow to show/select other programs purchased.
② **Job Name**	Select a Job Name from the dropdown list. For a New Job: Select **Make New Job**, at the top of the list. 

③ **Setup Type**	 - If you have no control point, like starting a new job, Select **UTM, 0 point** or **State Plane, 0 point**. See Zones on the last 2 pages of this manual. - If you have a control point, Select **UTM, 1 point** or **State Plane, 1 point**. - If you are re-setting up on the same job and nothing has changed, select: **Use Previous Setup**. *2 Local Points, 1 Local Point, and TM Grid should only be used when trying to use surveyor's coordinates.
④ **Region**	(also called zone) displays the region selected in #3 above.
⑤ **Antenna Height**	Also called Rod Length, is the distance from the GPS Antenna to the tip of the blade on a plow or the bottom of the wheel on a trencher.
⑥ **GPS Instrument**	Displays the type of instrument, or simulator. This cannot be changed from the Dashboard, see Instrument Menu on page 51
⑦ **GPS status**	Displays the same information as on working screen, on page 8. If there is an error, that is labeled below the icon. Touching the icon will open the "Control the Instrument" menu with some settings options that vary with each type of instrument.
⑧ **Check setup**	Not currently implemented.
⑨ **User Pref**	Preferences menu that allows customization of menu colors/font, as well as a few menu behavior settings.
⑩ **Job Management**	 Various tabs to make changes to control points, design surface, background image, & more. "**Data Backup**" tab allows copying all files from \data folder to another folder on start/exit. Useful for cloud backup.
⑪ **Utilities**	Miscellaneous Utilities. Change Distance units. Security Menu (Show or Set Capabilities)
⑫ **Help**	Not currently implemented.
⑬ **Shutdown Computer**	Close the program, and safely Shutdown the Computer. (every 10th time will ask if you want to save a backup of program setting database)
⑭ **Exit**	Exit the program, back to Windows desktop
⑮ **Start**	Start the program, with the chosen settings.
⑯ **Version**	Displays the version of the software currently installed.

Start/Restart a Job, via menus:

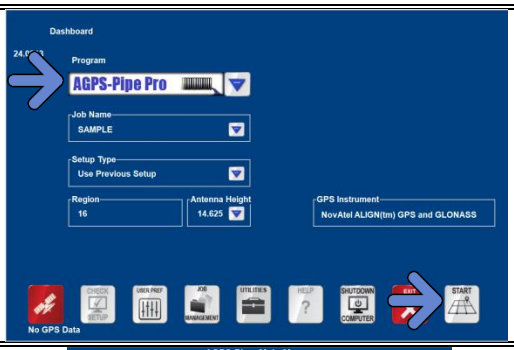
Follow these procedures to use the Legacy method to start AGPS-Pipe Pro™.

1. **Start AGPS-Pipe Pro™**

If the program does not load on computer startup, locate and double tap the Start AGPS icon on the desktop. A starting screen will briefly appear.

2. Select AGPS-Pipe Pro™ from the Dashboard's "Program" Dropdown menu.

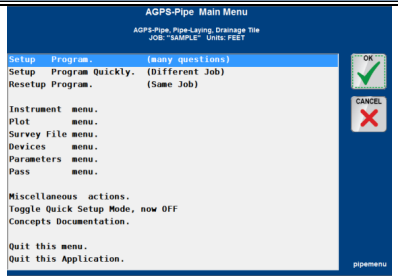
3. Press Start button.



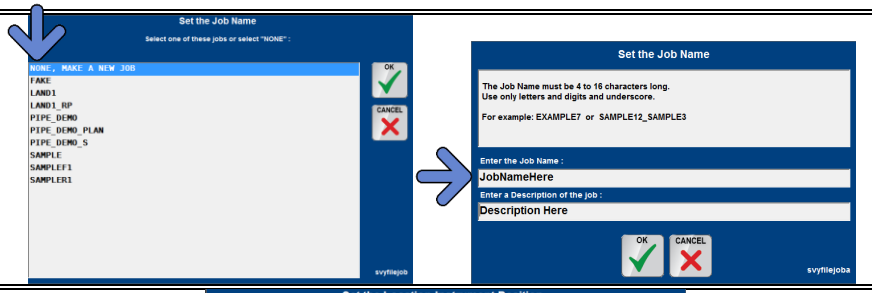
4. From the Working Screen,

Press Menu 

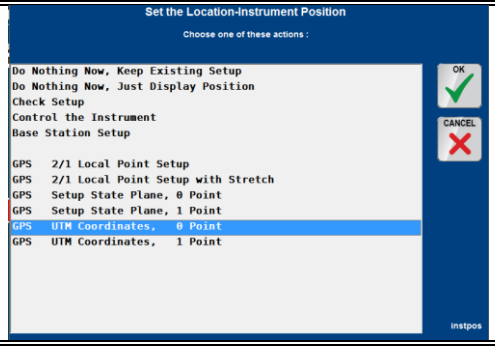
5. Select Setup Program (Different Job) for a new job or **Resetup Program** for the job you're currently working on (skip to step 7)



6. For a New Job:
Select None, Make a New Job.
Enter the name of the job
(i.e. the name of the field or the name of the customer). You may also enter a description of the job.

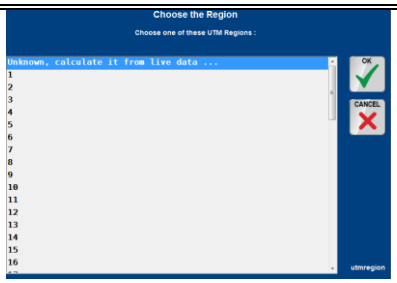


7. Setup the Location Instrument
- If you have a control point, Select **UTM 1 point or State Plane 1 point**.
- If no control point, Select **UTM 0 point or State Plane 0 point**
- If you are re-setting up a job and nothing has changed, select **Do nothing now, keep existing setup** and skip to step 11.

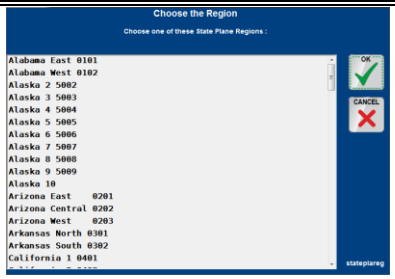


8. Set the Location- Instrument Position.

Select your UTM Zone or your State Plane Region. If you do not have a control point, skip to step 11.

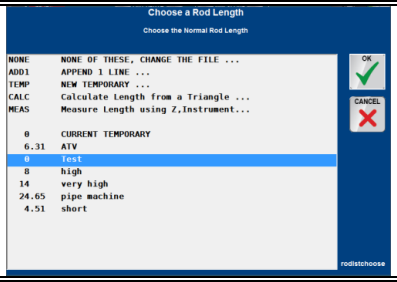


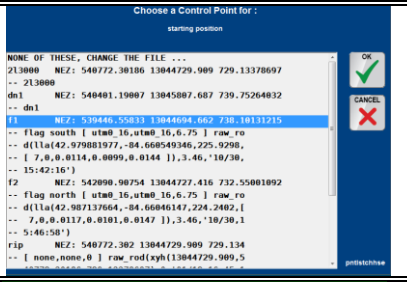
or



9. Load a Control Point

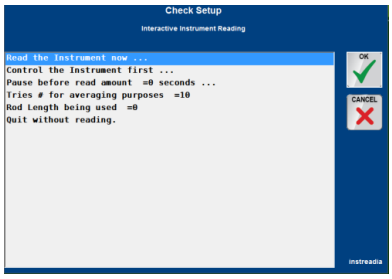
- Select the Rod Length you are going to use to read the instrument
- Select the Control Point you want to read (if you have a control point but it is not loaded into the program, choose None of These, Change the File)

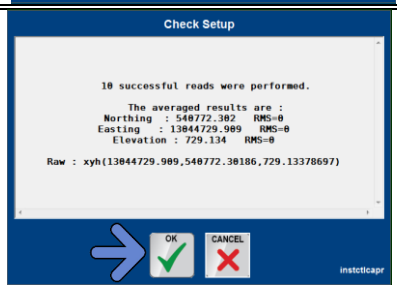




10. Read the Instrument

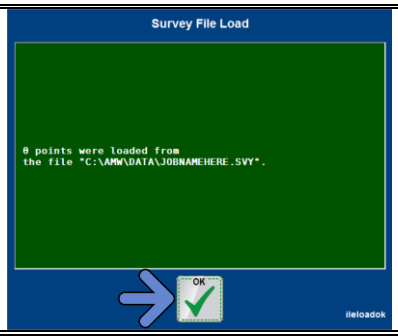
- Read the Instrument after you have set the pause amount and # of tries (see Control Points on page 45 for more detail)
- Check the Setup: The program will tell you how many reads were successful and what the averages were. Press OK

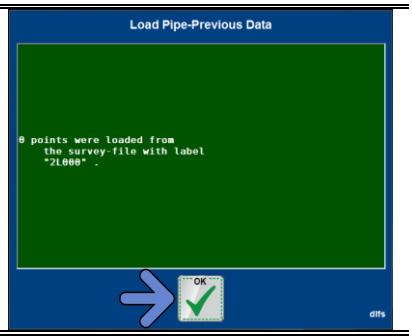




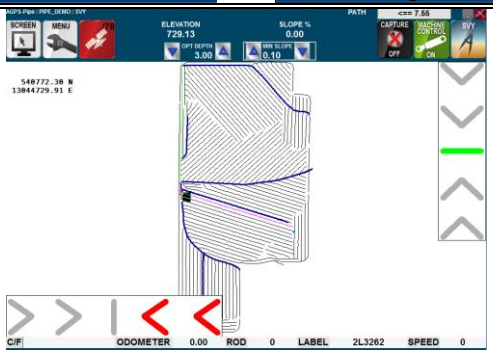
11. Survey load and Pipe-Previous

You will see two status screens that tell you if any points were loaded (new jobs should have 0 points loaded). Select OK on each screen.





The Main Working Screen will appear: You should be able to begin working.



Working with RTK-GPS

AGPS-Pipe Pro™ is designed to be used with most high-grade RTK-GPS systems. The accuracy of AGPS-Pipe Pro™ is directly related to the accuracy of the RTK-GPS system that you utilize. Not all RTK-GPS systems are the same and offer the same accuracy and repeatability. Contact your AGPS-Pipe Pro™ dealer for recommendations on current RTK-GPS systems.

Configuring my GPS

The following tables list the output options that should be enabled on common brands of GPS systems. If your GPS system does not appear on this list, please contact your AGPS-Pipe Pro™ Dealer or Technician for setup details. The Hz (update) rate and Baud rate must also be set in the AGPS-Pipe Pro™ program. To set these, press the Menu icon, select Instrument Menu, Control the Instrument and adjust both the Hz and Baud rates.

	Ashtech	***TopCon***	***JD ITC***	***JD 3000***
Msg type	GGA	GGA	GGA	GGA
HZ rate	10	10	5	10
BAUD rate	57600	57600	38400	57600

	NovAtel	***300/ 410***	***Trimble (older)***	***Trimble (newer)***
Msg type	BestPos	BestPos	GGK	GGA
HZ rate	10	10	10 & ASAP	10
BAUD rate	57600	57600	38400	57600

GPS Status

Each individual RTK-GPS system will have it's own standard for being in 'fix' and the type of data/degree of precision it returns.

Common GPS Systems data:

	RTK Fixed	RTK Float	No RTK base	Precision
GGA (Most manufacturers)	4	5	1	HDOP
John Deere™	4	3=extend 5=float.	1	HDOP
NovAtel™ (Raven™/AgLeader™)	50	49/48/34/17	16	Alt. Std. Deviation
Topcon™ (Javad™ GGA)	4	5	1	HDOP
Trimble™ (GGK)	3	2	1	PDOP

A Note on 'DOP':

HDOP, VDOP, and PDOP are respectively Horizontal, Vertical, and Positional (3D) Dilution of Precision. The precision of multiple satellites in view of a receiver combine according to the relative position of the satellites to determine the level of precision in each dimension of the receiver measurement. When visible GPS satellites are close together in the sky, the geometry is said to be weak and the DOP value is high; when far apart, the geometry is strong and the DOP value is low. Thus a low DOP value represents a better GPS positional precision due to the wider angular separation between the satellites used to calculate a GPS unit's position. Other factors that can increase the effective DOP are obstructions such as nearby mountains or buildings.

DOP Value	Rating	Description
<1	Ideal	This is the highest possible confidence level to be used for applications demanding the highest possible precision at all times.
1-2	Excellent	At this confidence level, positional measurements are considered accurate enough to meet all but the most sensitive applications.
2-3	Good	Represents a level that marks the minimum appropriate for making business decisions. Positional measurements could be used to make reliable in-route navigation suggestions to the user.
>3	Poor	Should be used only to indicate a very rough estimate of the current location.

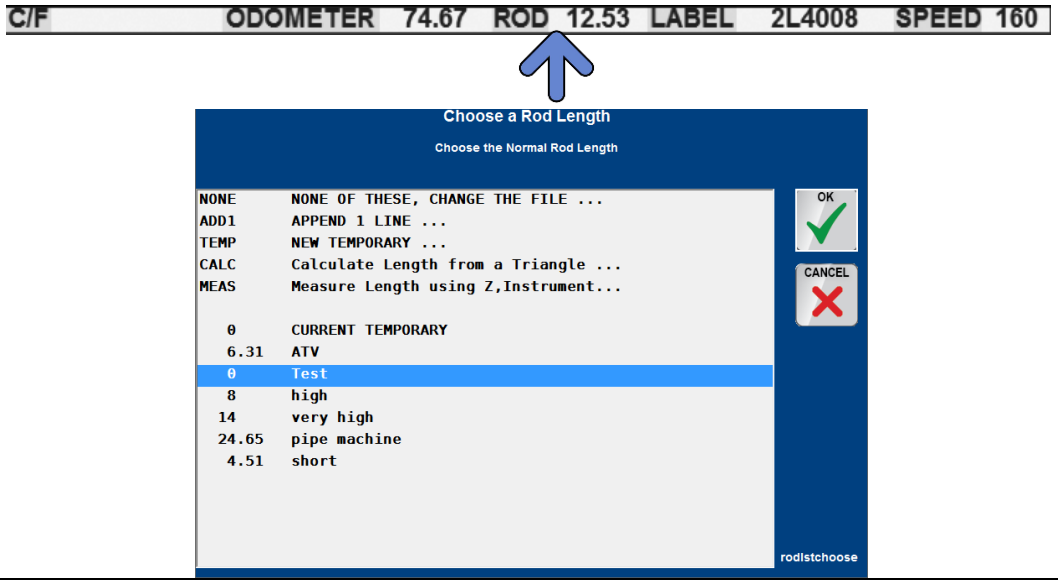
Troubleshooting my GPS

	TroubleShooting Tips:
COM Port already in use	The Communications Port that the GPS is plugged into is being used by another program or is closed for some reason. 1. Verify that the GPS is plugged into the correct COM port. 2. Unplug the GPS from the COM port, power-cycling the computer, restarting AGPS-Pipe Pro™ and then re-plugging the GPS.
No GPS Data	The GPS is sending no signal, or the computer is receiving nothing. 1. Verify the GPS is powered on. 2. Verify the GPS is plugged into the COM port. 3. Verify the GPS is sending the configured correctly as described in Configuring my GPS on the previous page.
Bad Data	The GPS is sending bad or incorrect data 1. Verify the GPS is plugged into the correct COM port 2. Verify the GPS is configured correctly 3. Verify AGPS-Pipe Pro™ is configured to the correct instrument and to the correct incoming Baud and Update rate.
Bad Position Type X (#) Where X is the type, see table under "GPS Status"	The GPS is not seeing the base station 1. Verify the base station is powered on. 2. Verify the base station is within the manufacturer guidelines for distance. 3. Verify the rover is configured to read the base station. 4. Double check radio antennas and cable connections.
Goes in and out of fix	The GPS going in and out of fix can be a symptom of several different problems: • Poor line-of-site with the base. • Poor Satellite visibility. • Damaged GPS Rover Antenna.

Rod Length and Survey Pass Offset

Rod Length (Antenna Height)

The rod length is the distance from the GPS Antenna to the tip of the blade on a plow or the bottom of the wheel on a trencher. This number may change. To adjust your Rod Length, press the "ROD" or "ANT HT" on the bottom Info Bar.



NONE	Allows you to change the entire rod length list, adding or deleting any lengths/descriptions you would like.
Add1	Adds a user-defined label to the Rod Length list.
Temp	Creates a new temporary length but does not add it to the permanent list.
CALC	Calculate the length from a triangle. Not used in AGPS-Pipe Pro™
MEAS	Measures the length using Z and the Instrument. Not often used.
The remainders are the rod lengths saved in the program.	

Survey Pass Offset

The Survey Pass Offset is the distance that you will hold the bottom of the plow or trencher above the ground while you survey. This number is a constant and cannot be changed after you survey a line. It can be changed in the Advanced parameters menu, see page 57.

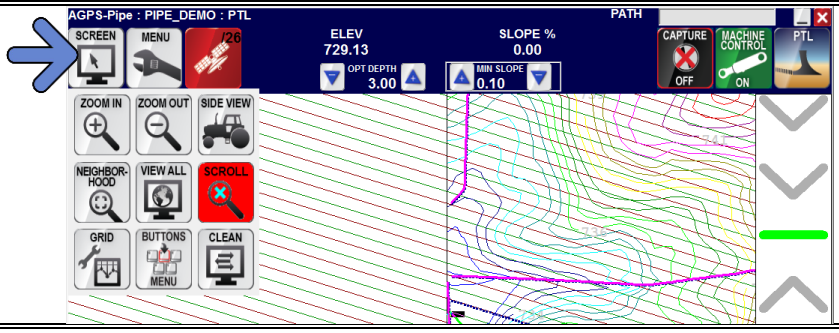
Rip-Lay Vertical Distance

The Rip-Lay Vertical Distance is the amount *below* a Rip pass you want the optimum depth of the tile to be. For instance, if you Rip at a constant depth of 2' and want the optimum depth of the tile to be 3', you would set the Rip-Lay Vertical Distance for 1'. It can be changed in the Advanced parameters menu, see page 57.

Working with the Program

Adjusting the view

To adjust the view in the Working Screen
Press the Screen Icon
Note: When in Overhead View, the Side View Icon will be visible, and when in Side View, the Topography Icon.



ZOOM IN	**Zoom In**	Pressing the Zoom In Icon will Zoom the view in, centered on your current position (either real or fake).
ZOOM OUT	**Zoom Out**	Pressing the Zoom Out icon will Zoom the view out, centered on your current position (either real or fake).
SIDE VIEW / TOP VIEW	**Side/Top View**	Toggles between a Side View (Topography) and Top View (Drainage Path).
NEIGHBOR-HOOD	**Neighborhood**	The Neighborhood Icon will Zoom the screen into the neighborhood of your current position (either real or fake).
VIEW ALL	**View All**	Pressing the View All Icon will Zoom the screen to show all completed lines or the entire background image/drawing.
SCROLL	**Scroll**	Pressing the Scroll Icon allows you to recenter the view where you touch the screen by placing a 'fake' position where you touch. To shut off scroll view, press the scroll icon and then select "Turn off any Fake Current Position"
GRID	**Grid**	Displays the Grid Menu. Details on page 27.
BUTTONS MENU	**Buttons Menu**	Displays the Buttons Menu. The Buttons Menu has shortcuts with keyboard hotkeys for commonly used program functions.
CLEAN	**Clean**	Locks the screen for 45 seconds, allowing you to wipe the screen clean. With a keyboard, you may press Esc to exit early.

The Buttons Menu

The Buttons Menu will display all of the keyboard 'hotkeys' for the program. You can also select the option in the Buttons Menu to do that action.

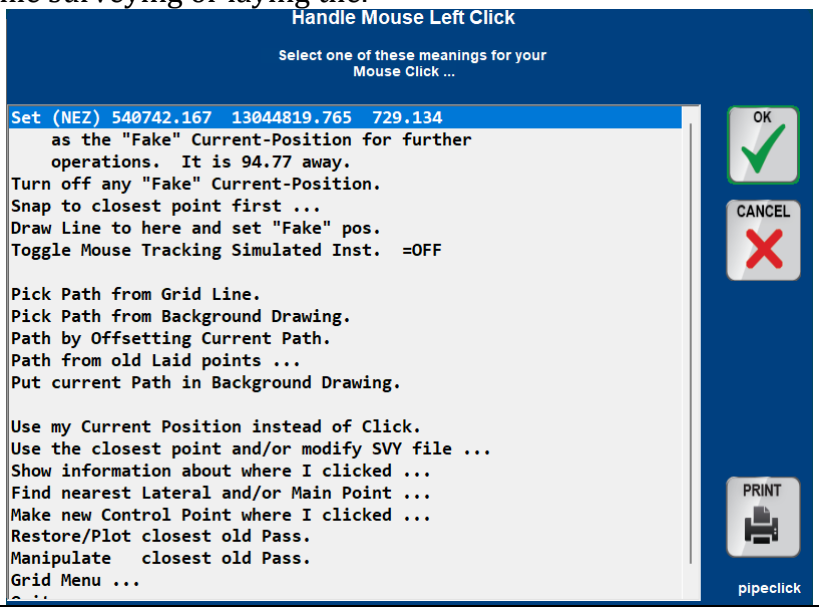
BackSpace	Switch Pass
Page Up	Move Blade Up
Page Down	Move Blade Down
Arrow Up	Half of Page Up
Arrow Down	Half of Page Down
SpaceBar	Toggle Auto Capture
Mouse Left Button	Click Menu
A	Show All Points
B	Show Buttons Menu
C	Find Closest Control Point
D	Find Closest Data Point+Main
E*	Show View from the East
F	Cut/Fill Offset (subgrade)
G	Toggle stop/go mode
I	Zoom In
K	Mark Special Points
L	Draw Line Between Points
M	Manually capture a point
N	Show Neighborhood of current position
O	Zoom out
P	Pass Menu
Q	Quit Menu
R	Specify Radius to Show

S	Show View from the Side
T	Show View from the Top
U	Main Menu
V	Toggle between Side/Top view
W*	Show view from the West
X	Grid Menu
Z*	Show 3D View looking NNE
0	Toggle Machine Control On/Off
1	Set Rod Length
2	Set Point Label
3*	Specify a 3D View
4	Set the next point number
6	Control the Instrument
7	Capture a Note
8	Display/Plot Menu
9	Devices Menu
=	Switch Rod-Length Offset
/	(fore slash) - Increase MinSlope/OptDepth
\	(back slash) - Decrease Min Slope/Opt Depth
`	(back quote) - Toggle Slope Control
;	(semicolon) - Toggle Up/Down Control
'	(single quote) - Toggle Steering Control

*Only an option when Disable alternate viewing angles =OFF in the Plot Menu, on page 53.

The Click Menu

When you touch the screen you will see the click menu. This menu has many operations that you may want to do while surveying or laying tile.

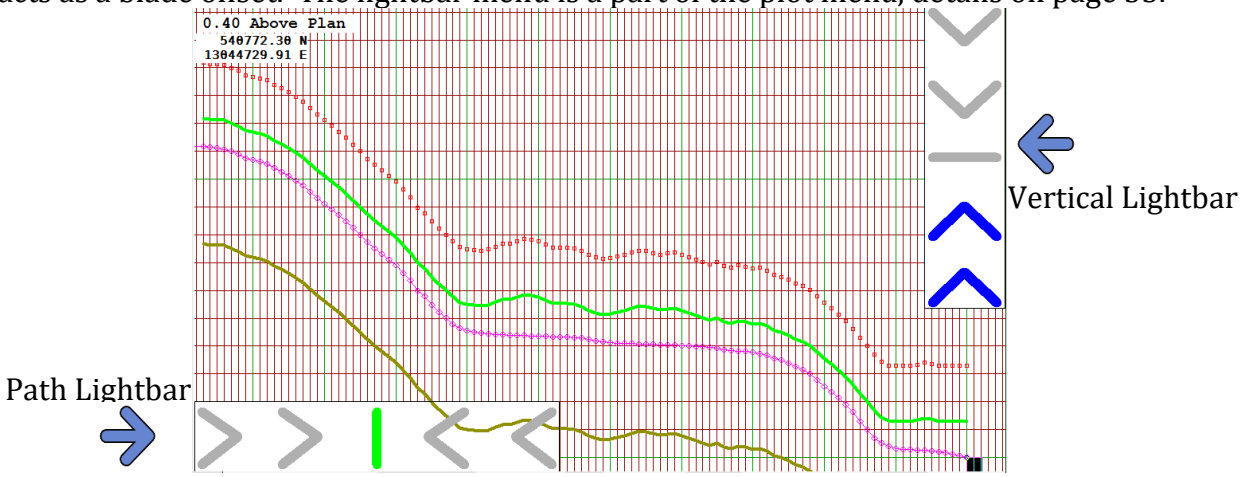


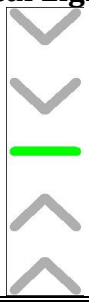
Set NEZ as 'fake position'	Sets the clicked NEZ coordinates displayed as 'fake position'. A 'fake position' will be used for any zoom, grid, and other functions, rather than your actual position.
Turn off any 'fake' current position	Turns off any 'fake' positions. After using the scroll icon to move around the screen, you must turn off any 'fake' positions to re-center the screen on the real current position.
Snap to closest point	Will snap to the closest captured point for the NEZ point to be used instead of the clicked point.
Draw Line to here	Will draw a line between the current position and where you clicked (or snapped to closest point)
Toggle Mouse Tracking	Used for GPS Simulators.
Pick Path from Grid	Will choose the closest Grid line as the path for guidance.
Pick Path from Background	Will choose the closest background line from .DRW as the path for guidance.
Path by Offsetting Current Path	Will offset your current path the amount you enter and set it as the new path for guidance.
Path from old Laid Points	Will select the current path from the closest previously laid tile line. You will often use this option first, and then offset the current path in order to tile a line parallel to a previously laid tile line.
Put current Path in Background drawing	Places the current path in the background drawing (will create a background drawing if you have not loaded one).
Use my current position Instead of click	Sets the current GPS NEZ at the top of the click menu, so that your next action is relative to your position, not where you touched the screen.
Use the closest point and/or modify SVY file	Used to change a pass label on an already laid path. See Pass Labels on page 32.
Show information about where I clicked	Will show information about where you clicked, including it's NEZ (if a previously captured topo is loaded or if you clicked a known point), it's distance from the current position, slope distance and angle (very useful for rotating a grid to a known point).
Find nearest Lateral/Main Point	Show information about closest Data point & closest Main point. Same as letter "D" on keyboard & Buttons menu.

Make new control point where I clicked	Creates a control point based on your clicked position, with some options for elevation. See Control Points on page 45.
Restore/Plot closest old Pass	Near your click, loads captured points from .svy file and profile pink line from .pln file. *Note, this does not show ground/depth. To add that, next use "**Manipulate closest old Pass**" and "**Restore this line from the ".PLN" File**"
Manipulate closest old Pass	Various options to load/change attributes of the nearest line in the .PLN file.
Grid Menu	Opens the Grid Menu. See Grid Menu on page 27.

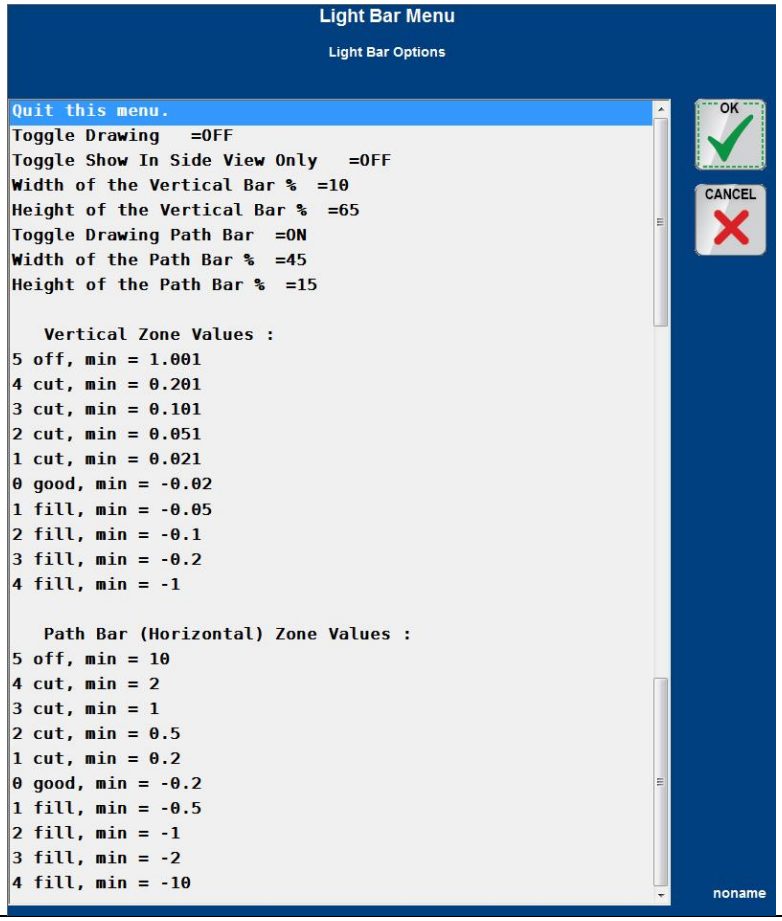
The Light Bars

The Light Bars allow a visual indication of your path and vertical accuracy. The vertical lightbar also acts as a blade offset. The lightbar menu is a part of the plot menu, details on page 53.



Path lightbar 	The Path lightbar will indicate either the path to drive for surveying or the path to drive for laying tile. The path lightbar will automatically show the path to drive after surveying or ripping a line. If you choose a path to drive (typically from the grid or a background drawing) it will display that path.
Vertical Lightbar 	The Vertical lightbar will indicate how far from grade the machine is operating. It also acts as a blade offset. By pressing the down or up chevrons, the program will offset the blade the amount set in the parameters menu for blade offset by keys. To change this amount, see the Parameters Menu on page 56.

The Light Bar Menu



Toggle Drawing	Toggles between the light bars being ON or OFF. Must =ON to see the light bars.
Toggle show in Side View Only	Toggles showing the light bars in the side (drainage path) view only.
Width of the Vertical Bar	The % width of the Vertical Bar. Increase to make the Vertical Bar wider.
Height of the Vertical Bar	The % height of the Vertical Bar. Increase to make the Vertical Bar taller.
Toggle Drawing Path Bar	Toggles between the path bar being ON or OFF. Must =ON to see the path light bar.
Width of the Path Bar	The % width of the Path Bar. Increase to make the Path Bar wider.
Height of the Path Bar	The % height of the Path Bar. Increase to make the Path Bar wider.
Vertical Zone Values	The value(s) at which the Vertical Light Bar will display the given correction. The Default values are shown. In the defaults shown, the Vertical Bar will display Green for good between .02 and -.02
Path Bar Zone Values	The value(s) at which the Path Light Bar will display the given correction. The Default values are shown. In the defaults shown, the Path Bar will display Green for good between .2 and -.2

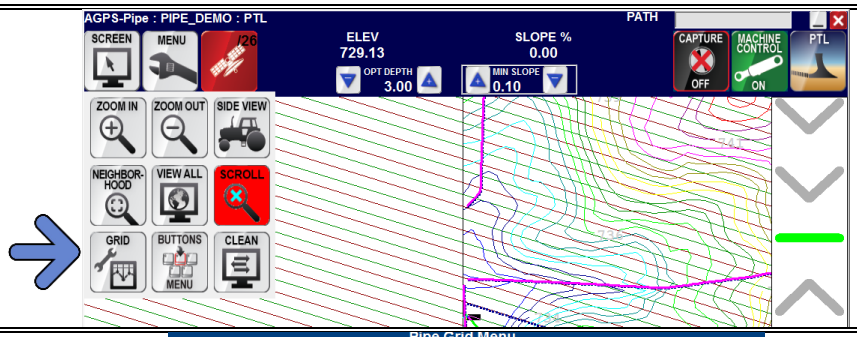
The Grid

The Grid allows for exact placement of tile. You can snap the path of your survey passes to the grid for straight lines and snap your PTL up and down hill passes to the grid. The grid can be adjusted to whatever pattern you need and saved. You can load commonly used grid patterns across jobs.

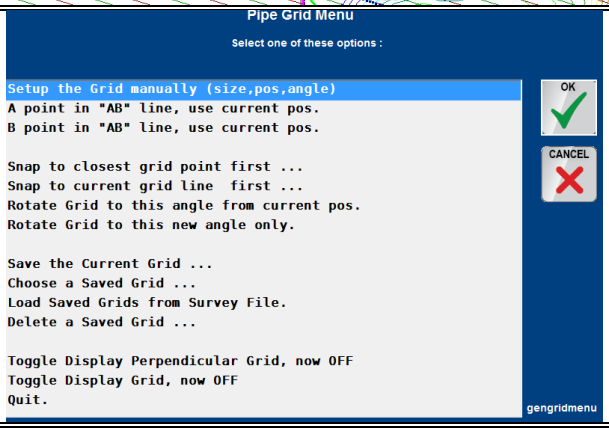
The grid can be adjusted in several fashions. You can manually rotate to some angle, snap an A – B line, snap to an existing line.

Setting up the Grid

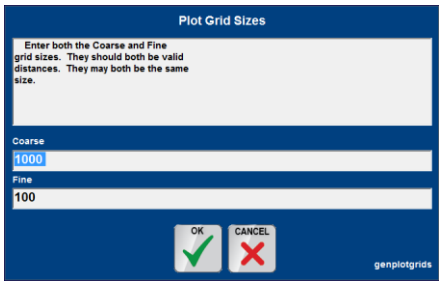
Press the Screen Icon
Select Grid



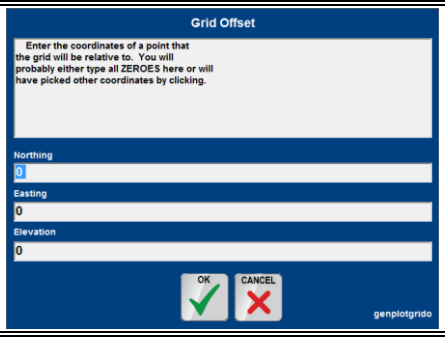
The grid menu is where you adjust the grid



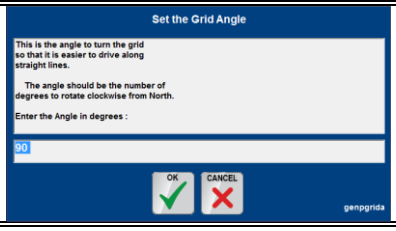
Setup Grid Manually
Allows you to set the course and fine of the grid. Fine will be displayed in RED, course in GREEN. For instance, if you were tiling every 35 feet, you would set the course for 70 and the fine for 35, alternating the grid red and green every 35 feet.



Setup Grid Manually
Grid Offset
Allows you to offset the grid some amount N (north) and E (east) and Z (elevation – uncommon)
For instance, if you wanted to offset the grid 10 feet NorthWest from your current grid, you would add 10 feet to N and subtract 10 feet from E.

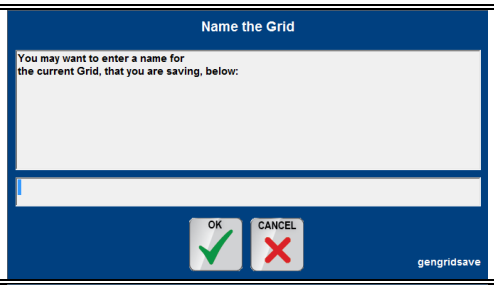


Setup Grid Manually
Set Grid Angle
Rotate some degree based on the Coordinates on the previous screen.

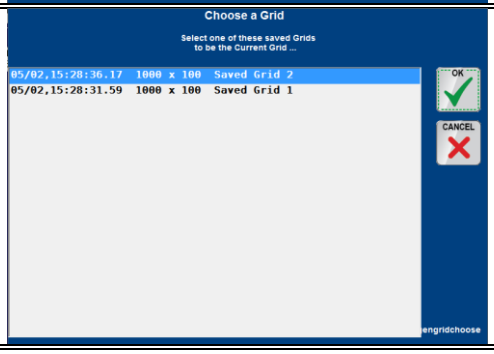


A point in AB Line **B point in AB Line**	Snaps the grid to an A – B point (like a lightbar system.) To snap along your first lateral while surveying, set the A point at the high point, drive the line, then set the B point.
Snap to closest grid point **Snap to closest grid line**	Snap to the closest grid point or line. Useful in setting your path or rotating the grid to a new position relative to the old grid
Rotate Grid to this angle from current pos.	If you click on the screen, then select this option, it will snap the grid from your current position to where you clicked
Rotate Grid to this new angle only	Keeps grid Northing and Easting as set in Setup Grid Manually, but changes the angle of the grid from that point to where you clicked.

Save the Current Grid
You can save and name your current grid to return to it later



Choose a Saved Grid
Recall a saved grid



Load Saved Grids From Survey File	Selecting this option will allow you to pick from grids saved across different jobs. After selecting it, Choose a Saved Grid.

Delete a Saved Grid	Delete a grid you have saved.
Toggle Display Perpendicular Grid	When the perpendicular grid is ON, there will be two grids meeting at right angles. Turning it OFF goes to a Single Grid (like parallel tile lines)
Toggle Display Grid	Toggle the entire grid On and OFF.

Using the Grid

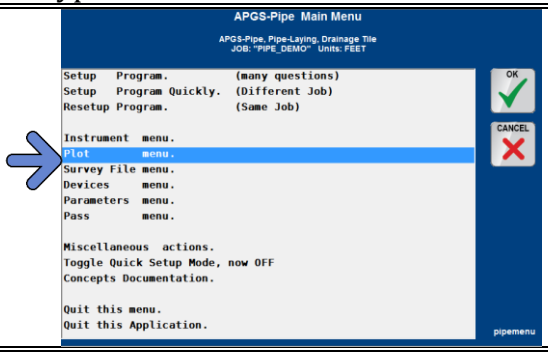
Once you have set up the grid, you can use the grid for several features. Simply touch or click the screen on the grid line you want to use to pull up the click menu.
A typical way to use the grid is for guidance using the Path or horizontal lightbar. To automatically highlight the nearest gridline, see "Toggle Paths along Gridlines" in the Parameters Menu on page 56.

Loading Background Images

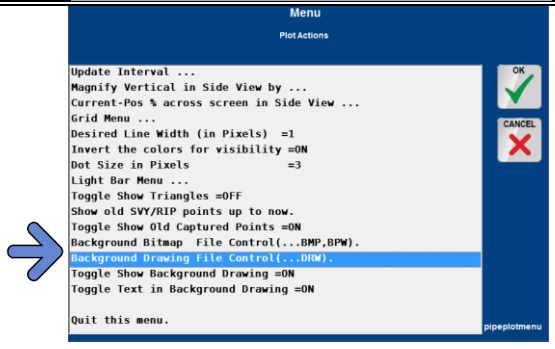
Background Images can range from 3-D polylines that are selectable to a bitmap image to a topography map.

Typically AGPS-Pipe Pro™ Supports Bitmap images in the .bmp format with a georeferencing .bpw file associated with it or .drw polyline files. Consult your AGPS-Pipe Pro™ Technician with any questions about these file types.

1. Press the Menu Icon
2. Select Plot Menu
The Plot menu controls how things are displayed on the Working Screen

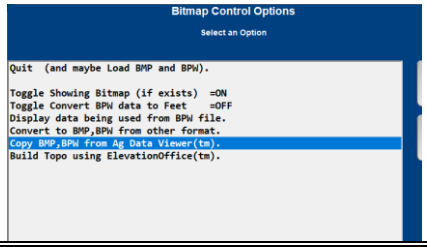


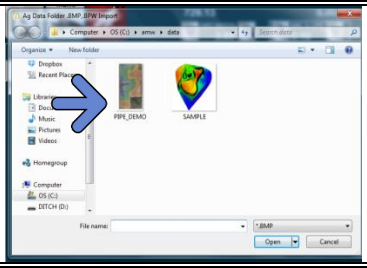
3. Select Background <u>Bitmap</u> (step 4) or
Background <u>Drawing</u> (Step 5)
A Bitmap <u>image</u> is a snapshot image (such as you would export from Ag Data Viewer™).
A Background <u>Drawing</u> is a 3-D object with polylines that the program can 'read' (such as you would export from Auto-CAD or other 3-D design program)



4. Load Bitmap
Select Copy BMP, BPW.
Select the Bitmap Image

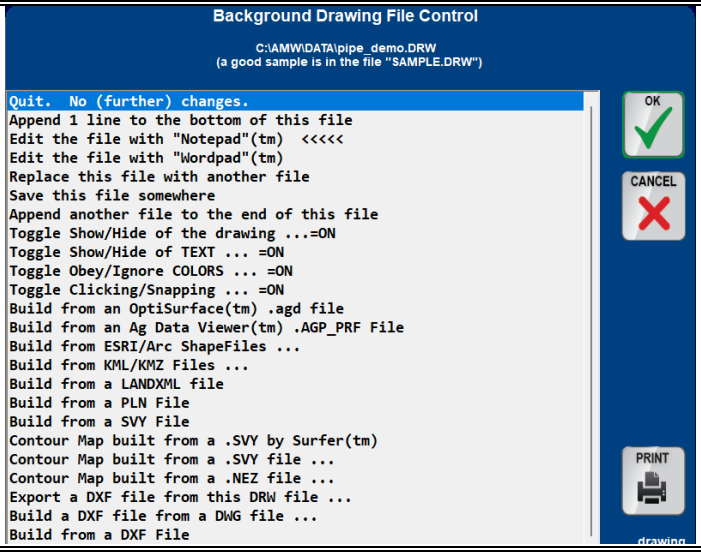
You must have a .bpw file in the same directory. Or use "Convert BMP,BPW from other format" if you have JPG+JGW. Confirm Show Bitmap = ON.





5. Load Backgound Drawing

The Load Background Drawing Menu has multiple options for loading or creating a drawing file.
Your file type will depend on what type of information you are trying to load. Contact an AGPS-Pipe Pro™ Technician for help with other supported file types.



Edit file w/ "Notepad"™/"Wordpad"™	Open a text editor to view/edit the information.
Replace this file with another file	If you have a .drw file you would like to load.
Save this file somewhere	Copy the current .drw file to another name (like backup) or location.
Append another file to the end …	Add on to the existing .drw by copying a different .drw
Toggle Show/Hide of the drawing	**=ON** to show. =OFF to Hide the whole .DRW
Toggle Show/Hide of TEXT	**=ON** to show. =OFF to Hide any Text
Toggle Obey/Ignore COLORS	**=ON** shows colors. =OFF will show all features pale grey.
Toggle Clicking/Snapping	**=ON** by default. =OFF to ignore .DRW for things like 'snap to closest'
Build from an OptiSurface™ .agd	Section, boundary, and other feature lines
Build from an Ag Data Viewer™	.AGP_PRF File with lines
Build from ESRI/Arc ShapeFiles …	Requires .shp, .shx, and .dbf in the same folder. Lat/Lon is converted
Build from KML/KMZ Files …	Google Earth™ lines/placemarks
Build from a LANDXML file	A file format for civil engineering design, lines, points, or triangles.
Build from a PLN File	A proprietary file for designed PLaN lines
Build from a SVY File	Lines/points captured with AGPS.
Contour Map from .SVY by Surfer™	Requires 3rd party Surfer™ software installed.
Contour Map built from a .SVY file …	If you have a .SVY from AGPS-Topo
Contour Map built from a .NEZ file …	If you have a .NEZ or other TXT
Export a DXF file from this DRW file …	Save the .drw lines to .dxf that can be read by many CAD viewers
Build a DXF file from a DWG file …	Requires c:\amwmisc\dwg.zip to convert some older dwg to dxf
Build from a DXF File	CAD lines, points, and text

Additional Tips: To combine multiple files into a single .drw:

1. Build from X (whichever type) for the 1st file. Note "build from…" will overwrite anything previously there.
2. "Save this file somewhere" (call it backup) 3. Build from X. 4. "Append another file to the end…", pick backup.

Laying Tile

Pass Labels

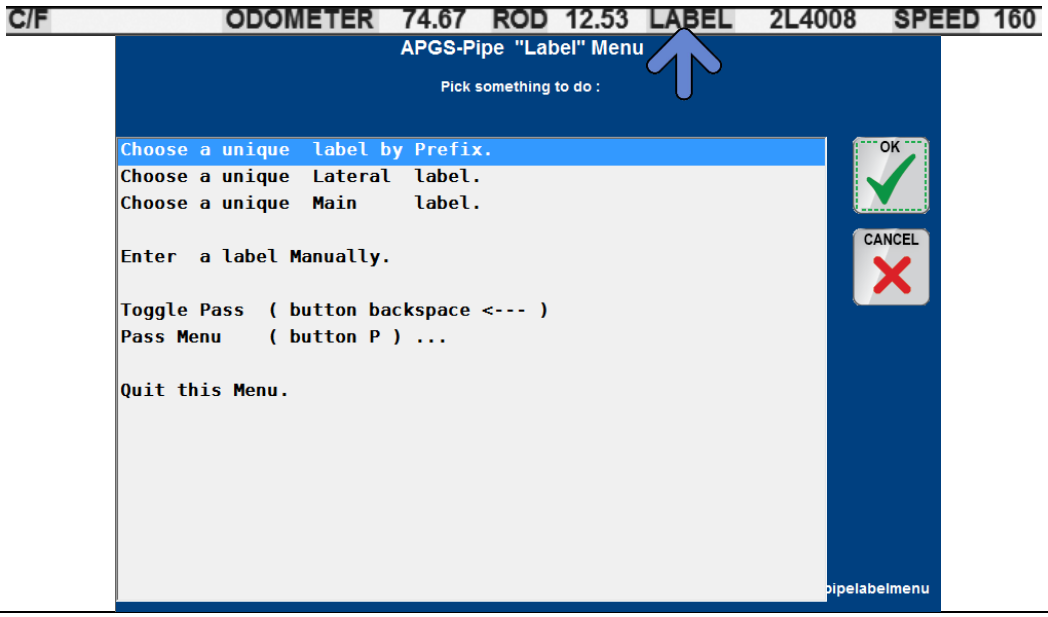
Pass labels define the type (lateral or main) and size of the tile line. Labels are necessary for accurate reporting, and if you are utilizing the Previous Topo Lay pass type.

Reading a pass label

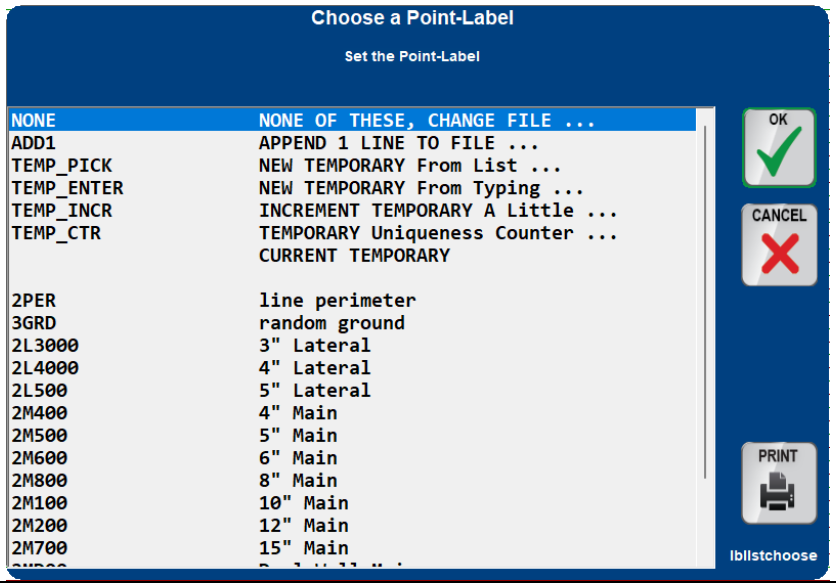
Pass labels will be an alpha-numeric label such as '2L4023', where 2 is a check-digit that will always be a part of the label, 'L' means Lateral (it would have an M for Main or ME for Existing Main), '4' is the tile size and '023' is the pass number (increases automatically after each pass).

Selecting a Pass Label

To select a pass label, press 'Label' in the info bar on the main working screen.



Choose a unique label by Prefix	Opens the Choose a Point-Label menu, see below. This is the most common choice in this menu.
Choose a unique Lateral Label	Selects a lateral label that is unique
Choose a unique Main Label	Selects a main label that is unique.
Enter a label Manually	Works the same as Choose a Unique label by prefix.
Toggle Pass	Same as if you pressed the Pass Icon
Pass Menu	Opens the Pass Menu

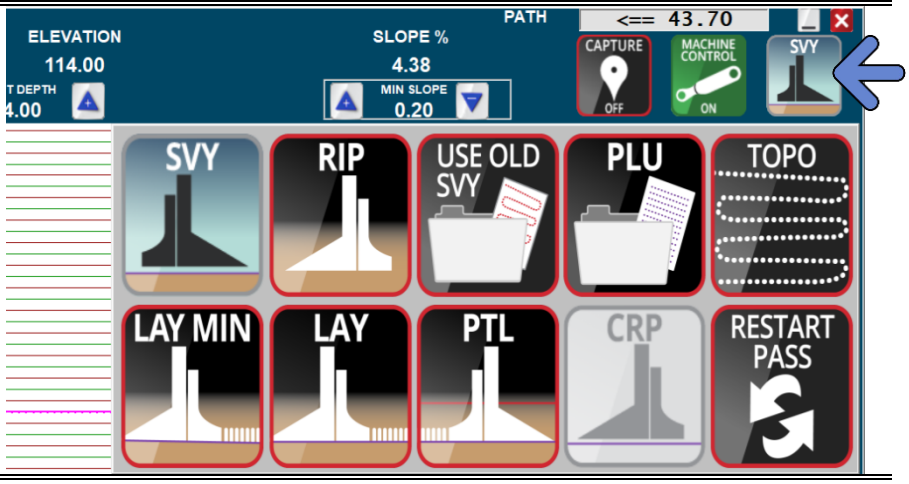


Add1	Adds a user-defined label to the Point Label list. For proper reporting Labels must begin with the number 2 and contain no spaces. For instance, if you were going to add a label for a tile size of 18" main, the label would read '2M180'
Temp	Creates a new temporary label but does not add it to the permanent list. For proper reporting Labels must begin with the number 2 and contain no spaces. For instance, if you were going to add a label for a specialty tile size of 21" main, the label would read '2M210'
TEMP_INCR	Increases the TEMP pass number by 1
1STAKE	The Current Temporary. 1STAKE is as a label for putting a stake or other note into the job.
2PER	If you were capturing Topography, it would define the perimeter of the job.
3GRD	Ground elevation points. If you were capturing Topography, it would capture points as you drove and label them as ground points.
The remaining options are different tile sizes. If the size you are using is not in this list, select ADD1 and add the label you need.	

Pass Types

There are several types of passes in AGPS-Pipe Pro™

To select the pass you want **Press and Hold the Pass Icon**



	**Survey**	A pass to survey the tile line. The survey is done with the plow at a constant height above the ground. The program subtracts the height from the collected data points. Followed by a Lay Pass. The Menu Bar is colored Light Blue when in Survey Mode.
	**Rip**	A pass to survey the tile line. The survey is done with the plow at a constant depth in the ground. Followed by a Lay Pass. The Menu Bar is colored Purple in Rip Mode.
	**Use old SVY**	Recall a previously recorded Survey or Rip pass for a Lay pass
	**PLan Use**	Recall the nearest previously designed profile, from .PLN file. Note: LAY/PTL passes will save to PLN, and re-write when ReCalculated.
	**Topo**	Capture Topography points like you were tiling a line but without a survey or lay pass. Usefull for capturing previously laid tile lines. The Menu Bar is colored Brown in Topo Mode.
	**Lay Minimum**	A Lay pass done with no survey. Tile is placed at Minimum Slope regardless of ground topography. The Menu Bar is colored Brown in Lay Minimum Mode.
	**Lay**	A pass done where tile is placed in the ground. Requires a Survey, Rip, or Previous Topo pass first. The Menu Bar is colored Green in Lay Mode.
	**Previous Topo Lay**	A Lay pass done with previously captured topography data. Eliminates Survey passes. Also allows tile to be laid both up and down hill. The Menu Bar is colored Dark Blue in PTL Mode.
	**Controlled Rip Pass**	 Grey/disabled until a Tile Design is calculated/shown. Allows Machine Control to follow the profile to Rip at an offset above the plan, but not actually Capturing points.
	**Restart Pass**	Clears the Tile Design. Press Capture to redesign the current run.

Survey Pass

The Survey Pass is accomplished by holding the GPS Instrument a constant height above the ground while the intended tile run is driven from the high point to the outlet/connection point.

Creating a Survey Pass

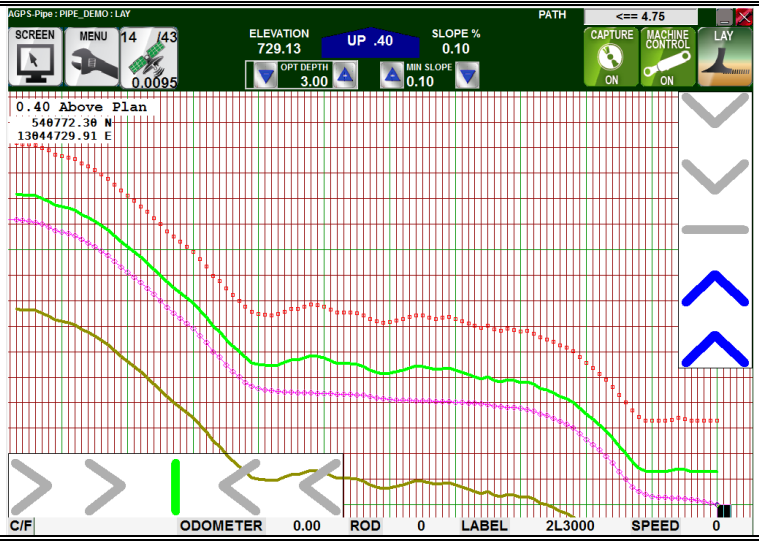
Start at the *high point* of the run you want to tile *with the Plow raised up; Verify* you are set to the correct *Pass Label.*

1. Press capture
It will turn green

2. Drive the Run
3. Press SVY
It will change to LAY

4. Lower the Blade to Starting Depth / Grade and Press Capture
The run will be designed

Verify the Survey Design



5. If Machine Control is not green, press it. Toggle Machine Control ON in your machine.
Lay the Run

6. Press Lay to repeat

1→ *Start* at the **High Point** of the **run** with the **plow** raised **up**

2→ *Press* 

and *Drive* to **Low Point** (outlet) of the **run**

3→ *Press* 

and *lower* the **plow** to **starting grade**

4→ *Press* 

to **design** the **run**

5→ *Toggle* **Machine Control** on the machine and **lay** the **run**

6→ *Press* 

when *done* to **start** a new **run**

TroubleShooting Tips:

The designed line is deeper/shallower than in the real world	Check the Survey-Pass Offset in the Parameters Menu.
I get a Minimum Depth error	The starting hole is either too shallow or there isn't enough grade to tile the line at the Minimum Slope. Adjust either as possible.
I accidentally erased the design	Follow the steps on page 37 to recreate the tile line

Rip Pass

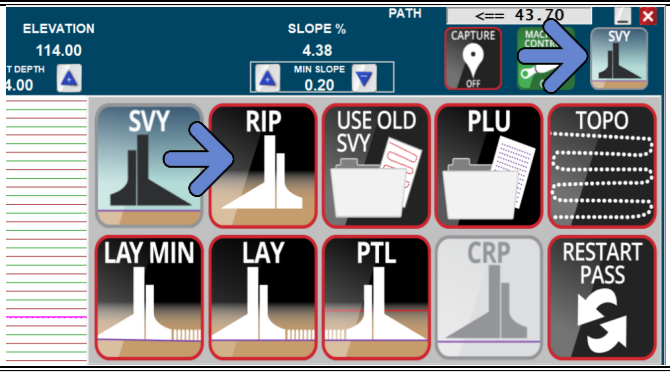
The Rip Pass is accomplished by pre-ripping at a constant depth while the intended tile run is driven from the high point to the outlet/connection point. The Rip Pass prevents the plow from tiling into pre-ripped ground.

The design will be created by Subtracting the Rip-Lay Vertical Distance that is set in the Parameters menu. So, for instance, if the Rip-Lay Vertical Distance is set at 1', and you pre-rip at a constant of 2', AGPS-Pipe Pro™ will attempt to place the tile at an optimum of 3' deep.

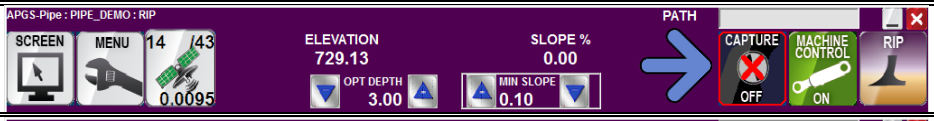
Creating a Rip Pass

Start at the *high point* of the run you want to tile *with the Plow at the Rip Depth; Verify* you are set to the correct *Pass Label.*

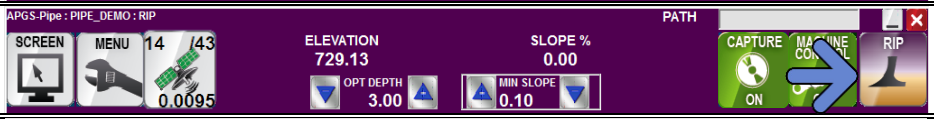
Press and Hold the Pass Icon and select Rip Pass



1. Press capture
It will turn green



2. Drive the Run
3. Press RIP
It will change to LAY



4. Lower the Blade to Starting Depth / Grade and Press Capture
The run will be designed

Verify the Rip Design

Note there are no Ground points. Instead there are blue/green pre-rip points.

5. If Machine Control is not green, press it. Toggle Machine Control ON in your machine.

Lay the Run

6. Press Lay to repeat

1→ ***Start*** at the **High Point** of the **run** with the **plow** at **rip depth***

2→ ***Press*** and ***hold*** SVY to open the ***Pass Menu*** and ***Select*** RIP

3→ ***Press*** CAPTURE OFF → CAPTURE ON and ***Drive*** to **Low Point** (outlet) of the **run**

4→ ***Press*** RIP → LAY and ***lower*** the **plow** to **starting grade**

5→ ***Press*** CAPTURE OFF → CAPTURE ON to **design** the **run**

6→ ***Toggle*** **Machine Control** on your tractor and **lay** the **tile**

7→ ***Press*** LAY to **start** a different **rip pass tile line**

*Rip depth = Optimum depth - RIP/Lay difference. Adjust RIP/Lay difference in Paramaters Menu

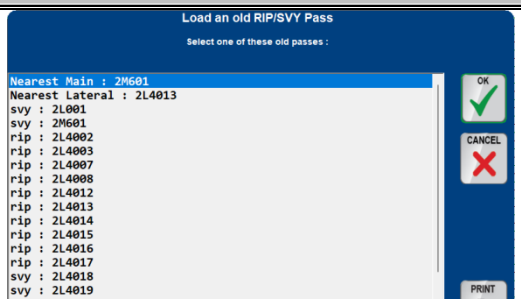
Recalling a Previously Captured Survey or Rip Pass

Survey and Rip Passes can be done previous to when the tile is being laid.
Also use this process if you need to resume tiling a line you've already surveyed or ripped.
Take note of the Pass Label for any Survey or Rip Pass that you want to come back to.
IMPORTANT: If Surveying or Ripping is done beforehand, make sure that a Control Point is utilized to ensure correct GPS data.

Start at the point where you want to begin tiling (e.g. where you left off or the outlet)

1. Press and Hold the Pass Icon
2a. Select PLU to Recall the nearest previously designed profile. LAY/PTL passes will save to PLN, and re-write when ReCalculated
Skip to Step 4 below
OR
2b. Select Use Old SVY

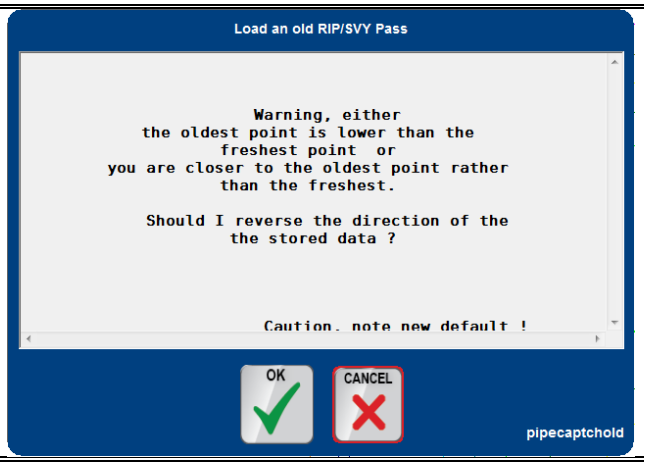
3. Select the SVY or RIP pass
Nearest Main or Lateral are options at the top.
The rest of the list order is most recent at the bottom.



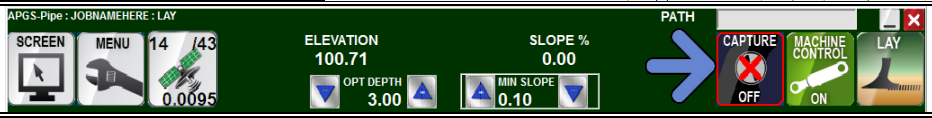
IF you get a Warning about the data:
One of the conditions in the description applies.
If you surveyed from High to Low, you want to select **Cancel.**
If you surveyed backwards (low to high), select **OK.**

Oldest point=first captured
Freshest point=last capt.

Cancel=No, keep existing
OK=Yes, reverse the data



4. Press Capture



Lay-Minimum Pass

The Lay Minimum Pass installs tile at the Minimum Slope, regardless of ground topography, and does not require any pre-survey.

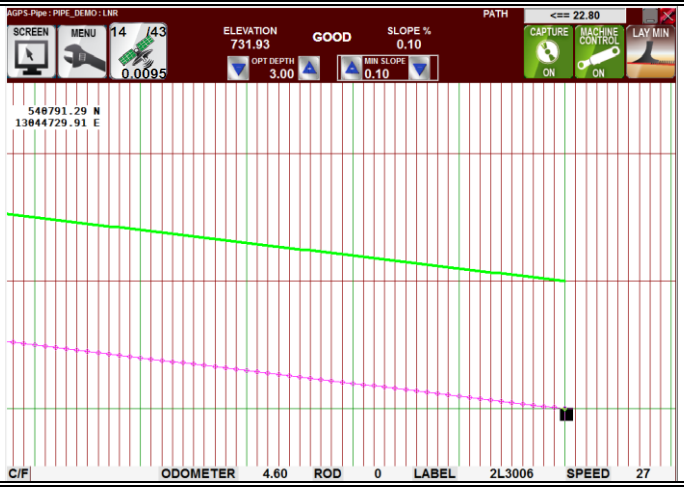
Creating a Lay Minimum Pass

Start at the *outlet point* of the run you want to tile *with the Plow at Starting Depth / Grade;* Verify you are set to the correct *Pass Label.*

Press and Hold the Pass Icon and select Lay Min Pass

1. Press capture
It will turn green

2. Drive Forward at least 1' to design Lay Minimum
Note all the profile lines are parallel at minimum slope %. Depth is not known.



3. If Machine Control is not green, press it. Toggle Machine Control ON in your machine.

Lay the Run

4. Press Lay Min to repeat

1→ ***Drive*** to where you want the **tile line** and **lower** the **plow** to **grade**

2→ ***Press*** and ***hold*** 

to open the ***Pass Menu***

3→ ***Select*** 

LAY MIN (Lay pass with minimum slope)

4→ ***Press*** 

to **set** the **grade**

5→ ***Toggle*** **Machine Control** on your tractor and **lay** the **tile**

Adjust the **slope** with the **min slope buttons** 

6→ ***Press*** 

to **start** a different **tile line**

Topography Pass

The Topography Pass logs the path you drive as if you were installing tile.

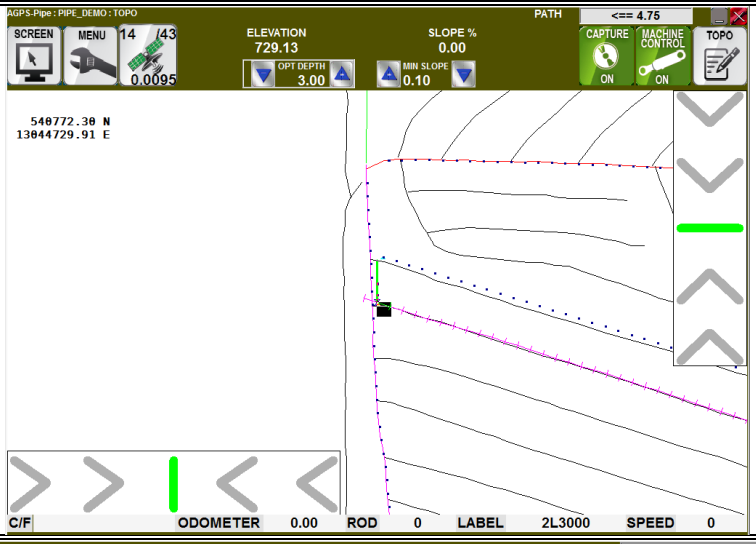
Collecting a Topo Pass

Start at the *either point* of the run you want to log *with the Plow raised up;* Verify you are set to the correct *Pass Label.*

Press and Hold the Pass Icon and select Topo Pass

1. Press capture
It will turn green

Topo Pass
The program will drop data points as you drive



3. Press Topo to increment label num.

Previous Topo Lay Pass

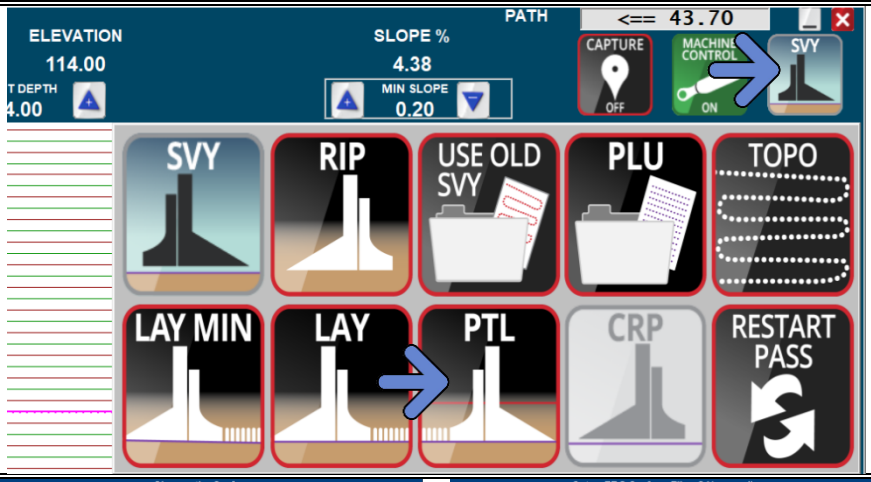
Previous Topo Lay (PTL) allows you to utilize previously captured topography data to greatly speed up in the field tiling. It eliminates Survey passes and allows you to tile both up and down hill

IMPORTANT: Working with previously captured topography requires precise topography data collection and repeatable control points. **AGPS recommends you use AGPS Topo™ with a RTK-GPS system to assure accuracy and correct data transfer.** If you use a different topography collection system, please speak with an AGPS technical support expert to insure that you have accurate data, proper control points and transfer that data correctly into AGPS.

Creating a Previous Topo Lay Pass

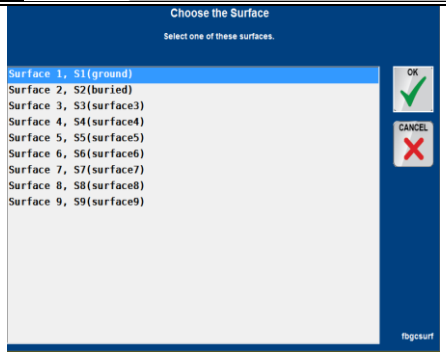
Up-hill: Start at the *outlet point* of the run *with the Plow at starting depth / grade*
Down-hill: Start at the *high point* of the run you want to tile *with the Plow at the Rip Depth.*

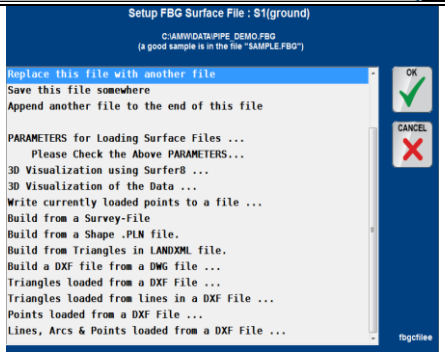
Press and Hold the Pass Icon and select PTL Pass



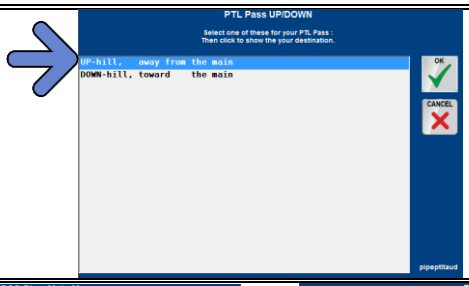
1. Select Surface
see 'working with surfaces', below.

2. Select .FBG file
The .fbg file is the topography data point file.
Typically, Build from a Survey-File.
If using a topography collection program other than AGPS Topo™, please contact an AGPS Technician for assistance.

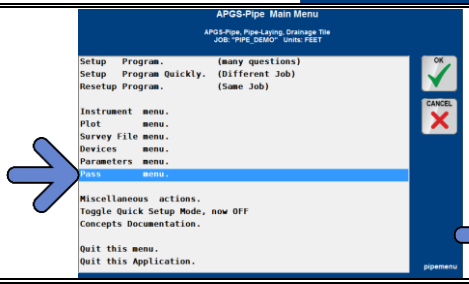


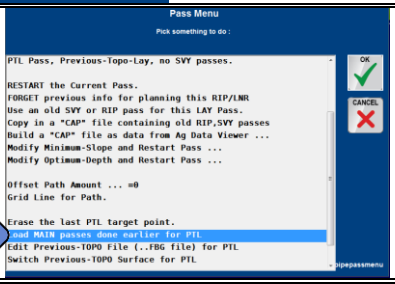


3. Select Up or Down Hill



4. Load Main Passes
This will color any passes labeled as 'Main' pink.
Press the Menu Icon
Select Pass Menu
Select Load MAIN Passes





5. Add PTL Target(s)

Touch/click the screen where you want to add the target

Add along a Grid line

-When adding a target along a grid uphill, the designed line will stop where you touch/click

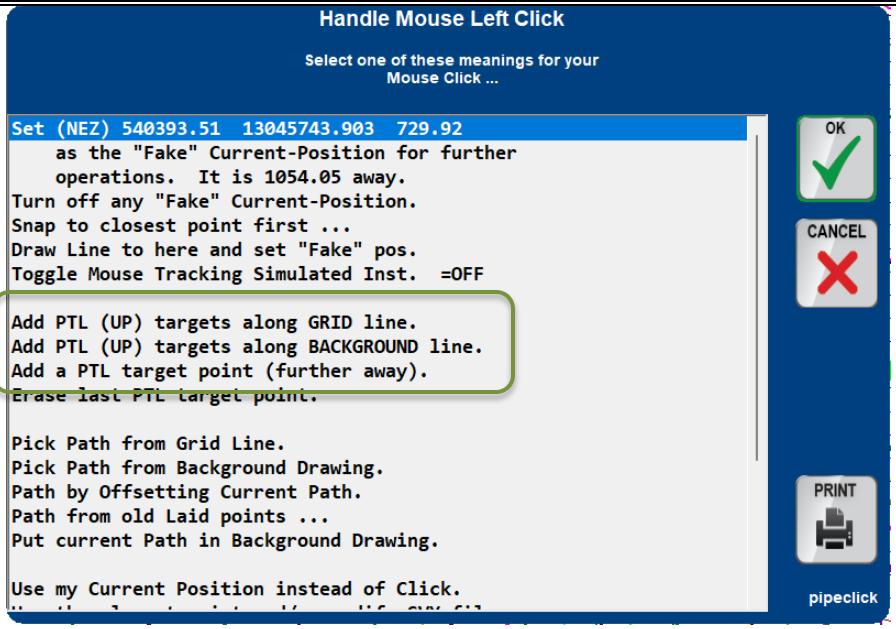
-When adding a target along a grid going downhill, the line will automatically snap to the main

Add along Background line

-Background Drawings must include polylines, bitmap / Jpeg images will not work

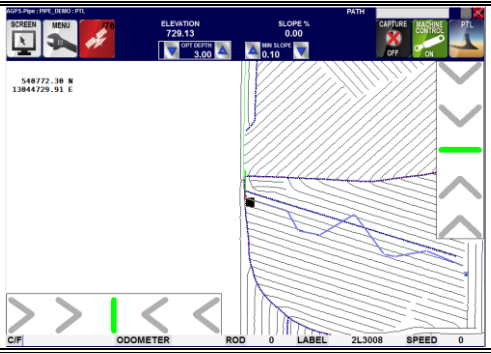
Add a PTL target point

-Used for Freehand lines. You can repeat this step as many times as you need.



The PTL Target line will shade in a light blue.

You can erase a PTL Target by touching the screen and selecting 'Erase last PTL target point'



6. Press capture

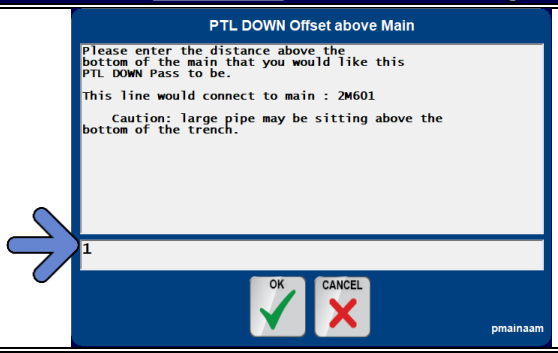
It will turn green

Up-hill, go to step 8.

7. Set PTL Down Offset

If tiling downhill, this offset will appear. This is the amount ABOVE the flow line of the main you wish to tile. This cannot be less than 0.

NOTE: Account for the width of the main tile when inputting the offset.



Verify the Design
In PTL Downhill, the program prevents the tile from being placed below the offset amount.

8. If Machine Control is not green, press it. Toggle Machine Control ON in your machine.

Lay the Run

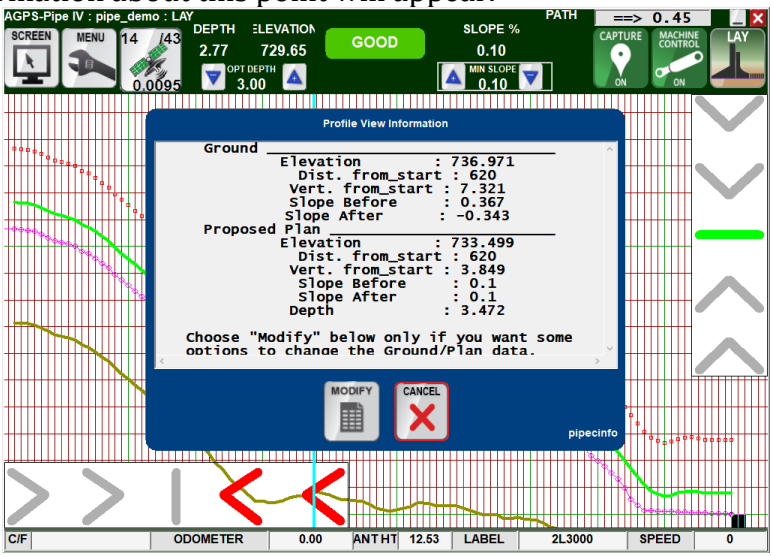
9. Press PTL to repeat

Surfaces in Previous Topo Lay

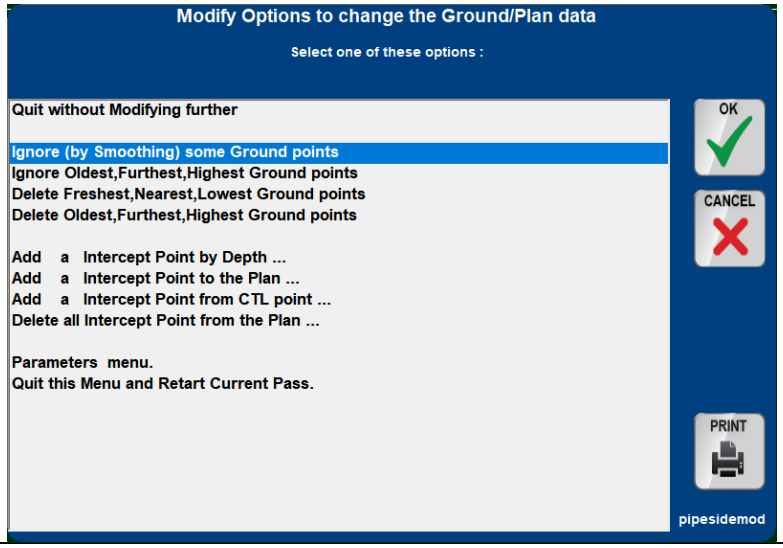
Previous-Topo-Lay allows you to have multiple 'surfaces' to work from. This would allow you to have a ground surface that is the topography data, and a below-ground surface that are 3D polylines of a design. Typically a 2nd surface would be created in a program such as AGREM SDS™, LanDrain™, or AutoCAD™. 3D below ground polylines are loaded into the program and followed exactly. If you have or are interested in learning more about working with multiple surfaces, please speak to your AGPS-Pipe Pro™ Dealer or Technician.

Design Info Screen and Modifying Points in a Design

AGPS-Pipe Pro™ has a Design Information feature. Simply touch (or click) anywhere on a design profile to see information about that design. A blue line will be drawn where you touch and a screen with the information about this point will appear.

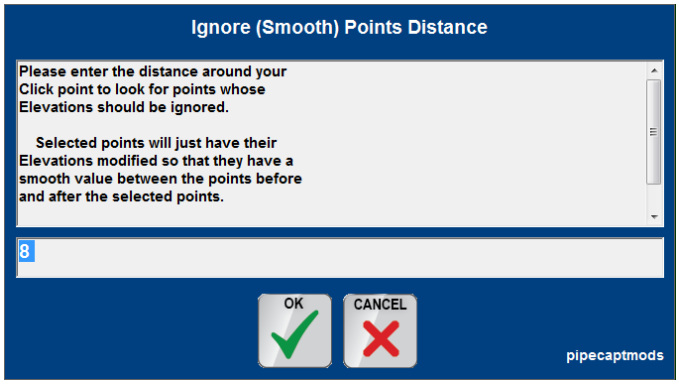


From this design information screen you can select to 'Modify' the points of the design.



Ignore (by smoothing)	Smooths the points around where you clicked. Useful in eliminating a hill or depression that appears in the design that you want to ignore or that were a mistake in surveying.
Ignore Oldest, Furthest, Highest	Smooths the points at the high point of the run.
Delete Freshest, Nearest	Deletes the points at the low point of the run.
Delete Oldest, Furthest	Deletes the points at the high point of the run.
Add a Intercept Point by Depth	Enter Depth and Distance (from start) for a point for the plan profile to try to cross through.
Add a Intercept Point to the Plan	Enter Elevation and Distance (from start) for a point for the plan profile to try to cross through.
Add a Intercept Point from CTL point	Choose a previously captured CTL point, and enter distance below (or 0) for a point for the plan profile to try to cross through.
Delete all Intercept Point from the Plan.	Delete all points, in case there is a mistake. There is not an option to only delete 1.
Parameters Menu	Shortcut to the Parameters Menu, on page 56.
Quit this Menu and Restart Current Pass.	Restart/Recalculate the Pass after you made changes with other options above.

After choosing one of the ignore/delete options, you will see a menu to input a distance to modify.



This will allow you to input the radius (each direction from the selected point) how much distance you want to smooth or delete.

Above Plan Commit-To Error

AGPS-Pipe Pro™ has an Above Plan Commit-to Error for accurate tile placement. Whenever the blade comes Above Plan a set amount (this is set in the parameters menu), the program automatically 'commits' to that new depth while keeping the tile at minimum slope. So, for instance, if you were tiling at a .1 minimum slope at 3' deep and you hit a rock that forced the blade up 3", the program would automatically adjust to the current depth (instead of pushing the blade down to the original depth, thereby putting a hump in the tile) and continue at the minimum slope until it can 'give up' the new depth (typically when there is more slope than minimum.)

Control Points (.ctl file)

A Control Point (sometimes referred to as a Benchmark) is a known location in the real world that has associated coordinate data and can be accessed at a later date.

Control points allow for exact repeatability from topography collection to tiling. They assure that the GPS correction data is correct from day-to-day, month-to-month and year-to-year, independent of a base station or repeater system.

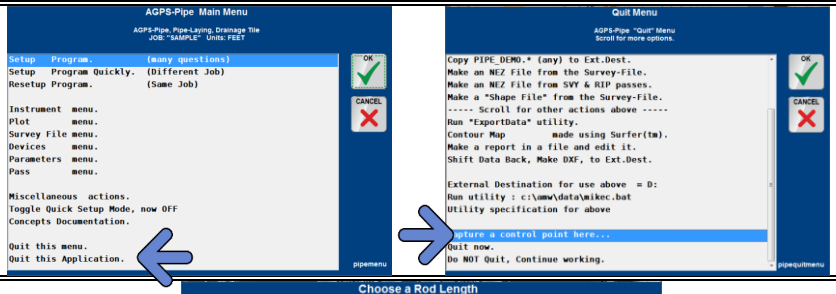
AGPS-Pipe Pro™ requires the use of Control Points in any pre-survey operation (such as topography collection for Previous-Topo-Lay (PTL) operation) and recommends the use of control points in day-to-day operations.

TroubleShooting Tips:

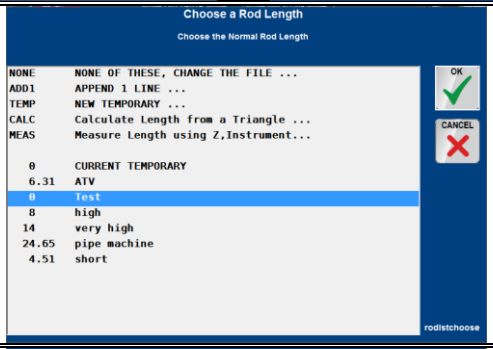
Where should I set the control point?	A location that isn't likely to change and that you can easily re-locate and access in the future (e.g. culvert, fence-post)
What's the best way to capture/load control points from day-to-day	Simply capture a control point where you stop for the day (with the plow raised up to avoid settling) and load the control point before moving the next day.
My RTK Base station has an internal memory; do I still need control points?	We highly recommend using them. Base stations can lose their memory; people can steal the tripod you left in the field.

Collecting a Control Point

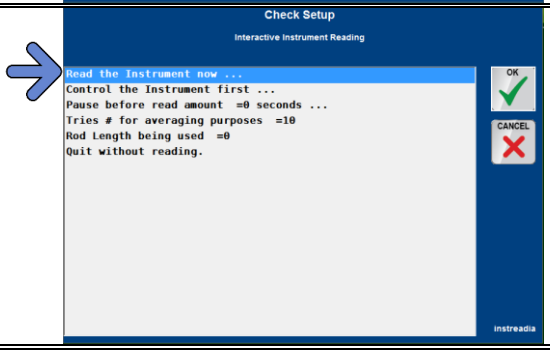
1. Press the Menu Icon
2. Select Quit this Application
3. Select Capture a Control Point Here



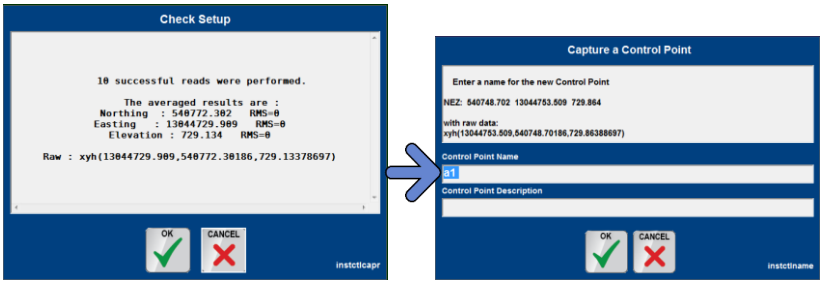
4. Select your Rod Length
This may be the typical rod length of the plow or a different Rod Length (e.g. if you were taking the GPS globe off of the machine to reach a culvert)



5. Read the Instrument
On this screen you may also
-Control the Instrument
-Pause before read (usually used if capturing a control point by yourself)
-Set the 'Tries' for averaging (10 is common, if you are in dense tree cover you may increase it to 20)



6. Name the Point
You will receive a confirmation that the reads were successful.
You can name the point and put a description. The default name is a1 (this number increases each time you capture a control point.)
The point name must be between 1 and 8 letters and/or numbers long. Description can be any length.

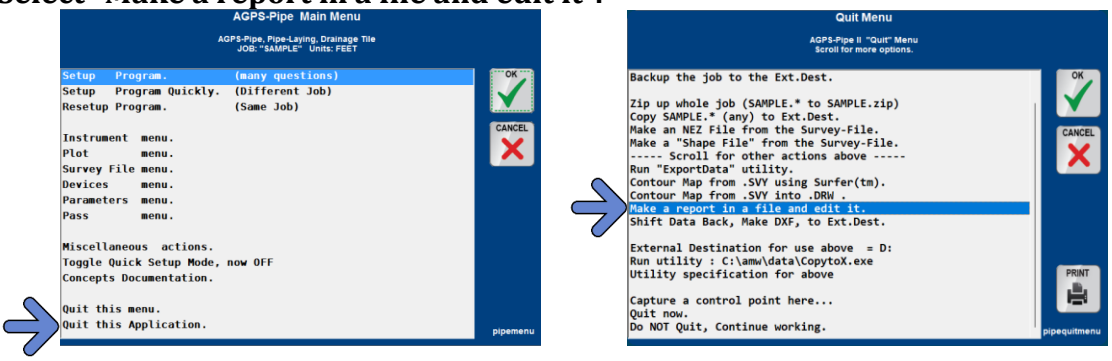


Finishing a Job

When you have finished a job there are typically two things you will want to do: Create a report and Export the data.

Creating Reports

1. Press the Menu Icon
2. Select Quit this Application
3. Select "Make a report in a file and edit it".



AGPS-Pipe Pro™ will automatically calculate the amount of tile laid, separate it by tile size and list it in the order the tile was laid, total the tile by date and overall.

A portion of an example report:

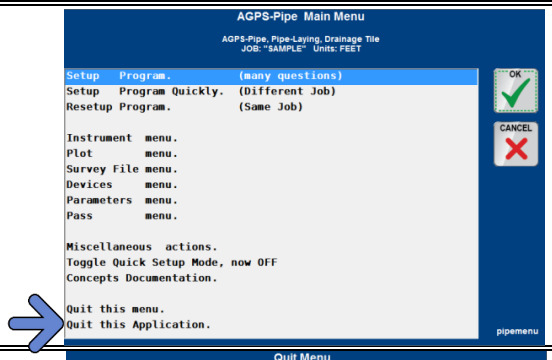
```
04/15   Total Distance Laterals :        27433.71
04/15   Total Distance Main :               0.00

04/18   2L4150                             153.89
04/18   2L4151                             574.81
04/18   2L4152                             489.45
04/18   2L4153                            1161.99
04/18   2M401                              262.26
04/18   2M603                              953.43
04/18   2M604                             1319.86
04/18   2M606                              121.09

04/18   Total Distance Laterals :        29679.69
04/18   Total Distance Main :             2656.64



        Total Distance Group:  2L4        69599
        Total Distance Group:  2M4          262
        Total Distance Group:  2M6         4157

        Total Distance Laterals :         69599
        Total Distance Main :              4420
        Total Unique Laterals :             140
```

The distance report is in a .rpt format that can be opened by most word processors (such as Microsoft Word™ or even Wordpad). Once generated, it will be copied when you Export Data (see below).

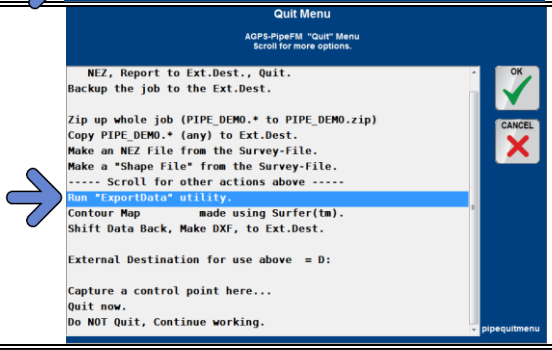
Exporting Data

AGPS-Pipe Pro™ can export your data in most common data types.

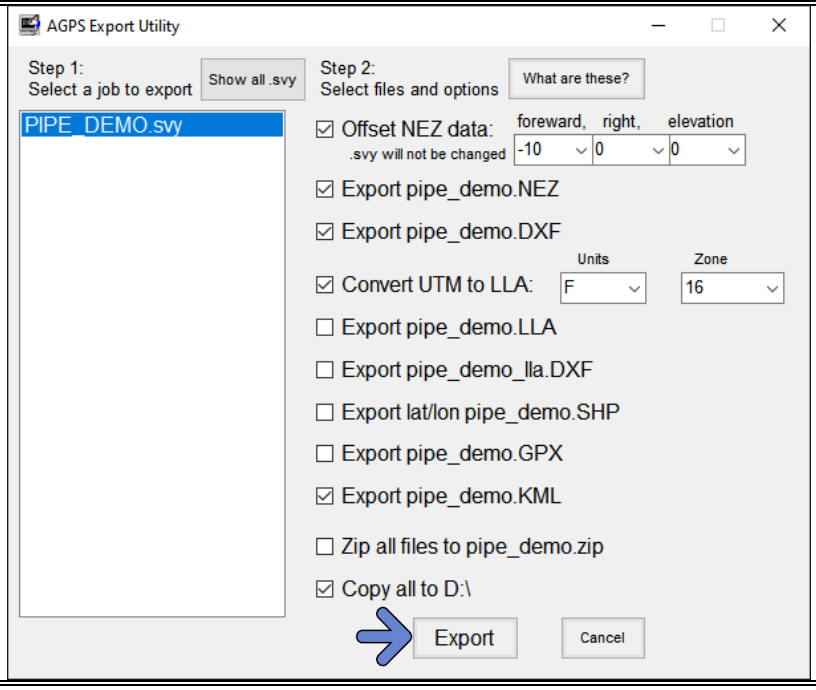
1. Press the Menu Icon
2. Select Quit this Application



3. Select 'Run "ExportData" Utility



4. Select options
see Export Data Options (below) for details
5. Click Export



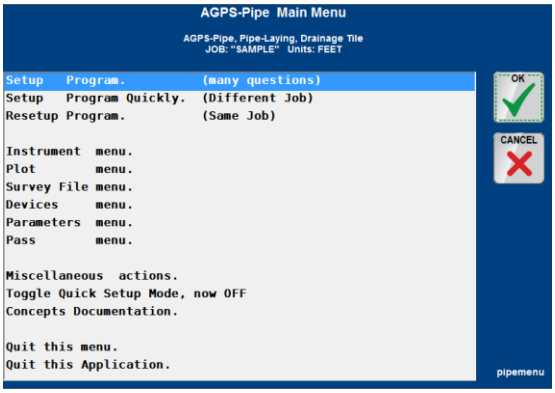
Export Data Options

Select a job to export	The job you are working in will be the selected job. If you press the 'Show all .svy' button, all of the jobs saved will appear on the list.
Offset NEZ Data	This is the amount that the data will be 'offset'. The blade length option from the parameters menu will automatically populate the amount forward it will offset the data.
Export *.NEZ	Exports a N(orthing) E(asting) Z(elevation) file.
Export *.DXF	Exports a .dxf file used in design programs such as AutoCAD™
Convert UTM to LLA	Converts the UTM data to Latitude-Longitude-Altitude data. Select your Units F=Feet I=International Feet M=Meters, and UTM Zone.
Export *.LLA	Exports a Latitude-Longitude-Altitude file
Export *_lla.dxf	Exports a .dxf file using Latitude-Longitude-Altitude.
Export *.SHP	Exports a "shape" file, which is 3 parts: .shp + .shx + .dbf. Used in Ag Data Viewer™, Apex™, FarmWorks™ and others.
Export *.GPX	Exports a .gpx file. Used in GPS devices and Google Earth™ (old format)
Export *.KML	Exports a .kml file. Used in Google Earth™(preferred format)
Zip all Files	Places all of the exported files into a .zip file and exports.
Copy all to D:	Copies to the external destination (typically a USB drive).

Menus

Main Menu

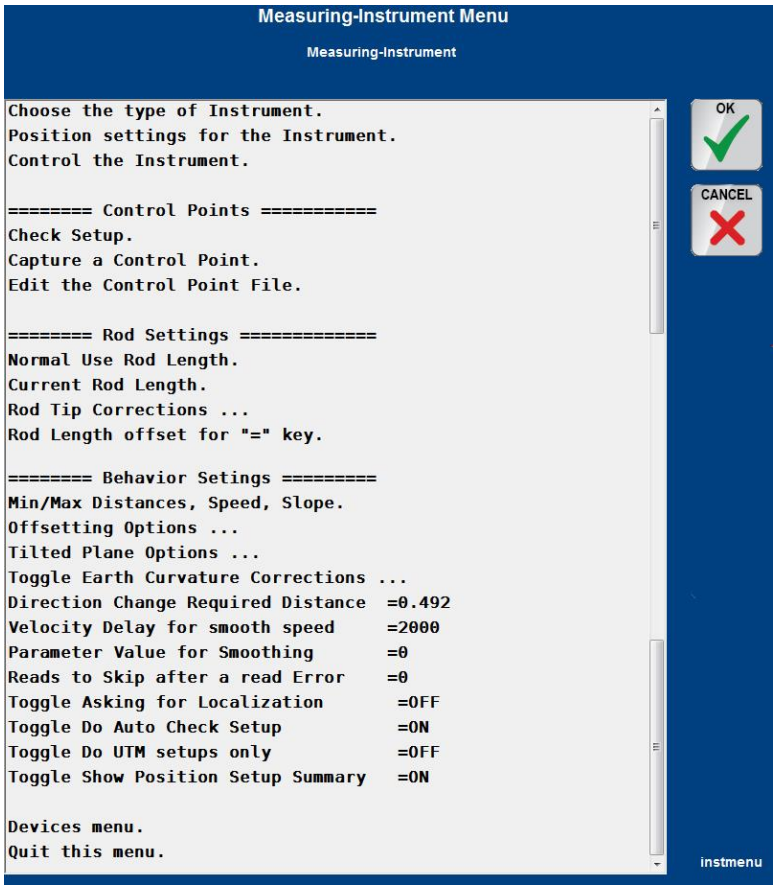
Pressing the Menu Icon will bring up the Main Menu. From here you can select the action you want to perform.



Setup Program (many questions)	Used to perform an initial set-up of the program (select GPS, machine control, etc.). See Setting up the Program for the first time on page 11
Setup Program Quickly	Used to start a new job or to select a previously created job. See Starting a New Job or Restarting a Current Job on page 17.
Resetup Program	Used to continue in the job you are currently working on. See Starting a New Job or Restarting a Current Job on page 17.
Instrument Menu	Control the GPS and the GPS Settings as well as Control Point settings and Rod settings. See Instrument Menu on page 51.
Plot Menu	Controls how things are drawn/displayed on the Main Working Screen. See Plot Menu on page 53.
Survey File Menu	Control how the survey file is saved, export survey file, and edit the survey file. See Survey File on page 54.
Devices Menu	Set or adjust Machine Controls and/or slope sensors. See Devices Menu on page 55.
Parameters Menu	Control how the tile line is designed. See Parameters Menu on page 56.
Pass Menu	Control the type of pass (survey, lay, rip, topo, lay-minimum, ptl). See Pass Menu on page 59.
Miscellaneous actions	Miscellaneous actions that can be performed. See Miscellaneous actions on page 60.
Toggle Quick Setup Mode	If Quick Setup Mode is toggled ON, AGPS-Pipe Pro™ will skip asking you to choose the program you want to run on startup and load directly to the AGPS-Pipe Pro™ Main Menu.
Concepts Documentation	Brings up a digital copy of this Menu.
Quit this Menu	Closes the current menu
Quit this Application	Brings up the Quit Menu, which will allow you to quit the program as well as export data or capture a control point. See Quit this Application Menu on page 61.

Instrument Menu

The Instrument Menu controls the GPS and other forms of measurement
From the Main Menu Select the Instrument Menu.

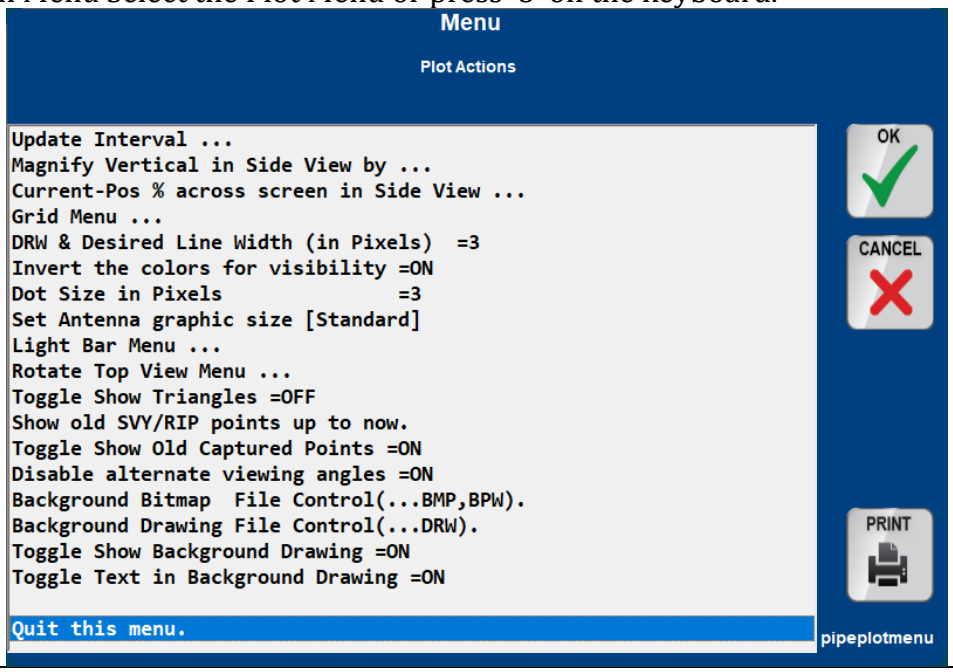


Choose the Type of Instrument	Choose the brand/type of GPS or GPS Simulator the program will use.
Position Settings	Set up the UTM or State Plane of the Instrument. See UTM/State Plane on page 62.
Control the Instrument	Allows you to setup/adjust/troubleshoot the GPS. Please Note: The settings, capabilities and types of data can vary widely between different brands of GPS. Please speak to your GPS Manufacturer with any questions.
Check Setup	Check the setup of the current control point.
Capture a control point	Allows you to capture a control point. See Control Points on page 46.
Edit the control point file	Allows you to edit/adjust the control point file (.ctl). Useful if you need to enter a control point or delete a bad control point.
Normal use Rod Length	Set the 'Normal Use' rod length. The Normal Use rod length will cause the 'current location' icon on the main working screen to display as a square. Using a rod length different than the 'normal use' will display a rectangle.
Current Rod Length	Change the current Rod Length. See Rod Length on page 21
Rod Tip Corrections	Change/adjust the current Rod Tip Corrections.
Rod Length offset	Adjust the amount the rod length is adjusted by pressing the = key.

Min/Max settings	Set Minimum and Maximum distance, speed and slope for the GPS instrument to function.
Offsetting options	Set how the instrument is offset in relation to the blade point.
Tilted Plane Options	Not recommended for use except in rare scenarios benching into a tilted job.
Toggle Earth Curvature	Toggle correction for Earth Curvature.
Direction Change Required	How much direction change must be experienced before the instrument shows a change in direction
Velocity Delay for Smooth	A setting for how the program determines speed.
Parameter value smoothing	Smooths elevation input. Do not use without advice from a AGPS-Pipe Pro™ Technician first.
Reads to skip after a read error	Allows you to set how many 'reads' are skipped after the instrument sends an error message.
Toggle Asking for Localization	Toggle ON or OFF the program asking you to set special local stretch.
Toggle Do Auto Check	Toggles between asking or not asking you to check a control point after every startup.
Toggle Do UTM only	Toggles between showing or not showing State Plane/Local options in the Instrument-Localization setup screen.
Toggle Show Position Setup	Toggle between showing or not showing the results of a position setup.

Plot Menu

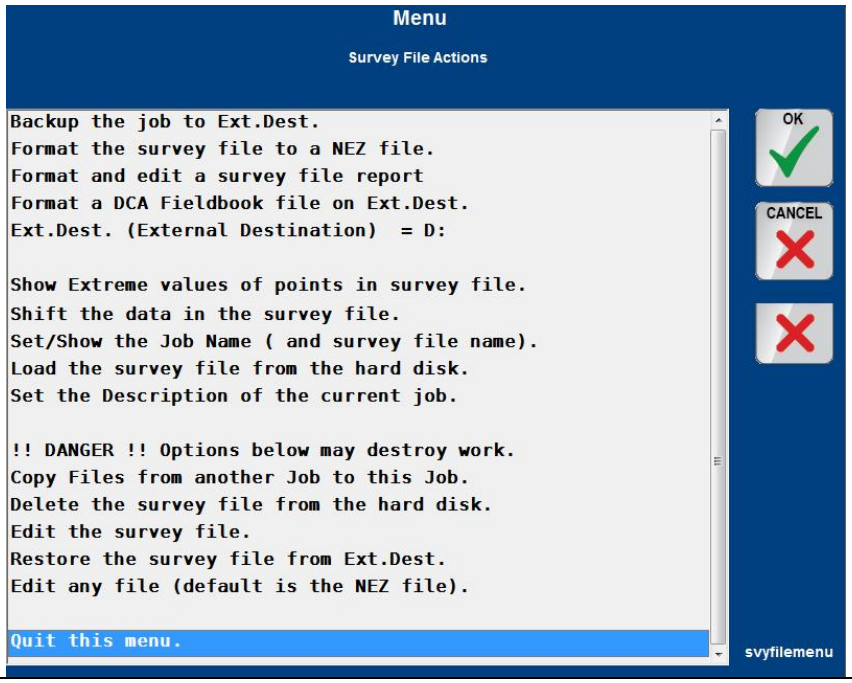
The Plot Menu controls how things are drawn/displayed on the Main Working Screen
From the Main Menu Select the Plot Menu or press '8' on the keyboard.



Update Interval	Affects how often the main working screen updates.
Magnify Vertical in Side View	Sets the default amount that the program zooms when not viewing 'all'.
Current-Pos % across screen in side View	Sets how from the edge of the screen the 'current position' is put when drawing the side view.
Grid Menu	Takes you to the Grid Menu. See Grid Menu on page 27
DRW & Desired Line Width	Change the Pixel amount for line width. New in ver 26.1231 this increases width of Background DRW lines. Default =1 use a value 2 or 3 for thicker.
Invert the colors for Visibility	Toggle between a 'day' color palate and a 'night' color palate.
Dot size	Change the Pixel size for captured point dots.
Set Antenna graphic	Standard or Large size setting for the Square/Rectangle representing antenna pos
Light Bar Menu	See The Light Bars on page 25
Rotate Top View Menu	Contains Toggle On/Off and settings to automatically rotate the top view screen based on direction of travel.
Toggle Show Triangles	When in PTL mode, shows triangles between topo points. Useful to see if an imported topo has sufficient data/triangles for accurate PTL passes.
Show Old SVY/RIP	Shows all of the old survey or rip points captured as a magenta color.
Old Captured Points	Toggle showing old captured points ON or OFF.
Disable alternate viewing angles	Toggle ability to view East, West, or 3D views from the keyboard/buttons menu.
Background Bitmap	See Loading Background Images on page 29
Background Drawing	See Loading Background Images on page 29
Toggle Show Background Drawing	Toggle ON or OFF showing a Background Drawing (.DRW file).
Toggle Show Background Text	Toggle ON or OFF showing Text in a Background Drawing

Survey File Menu

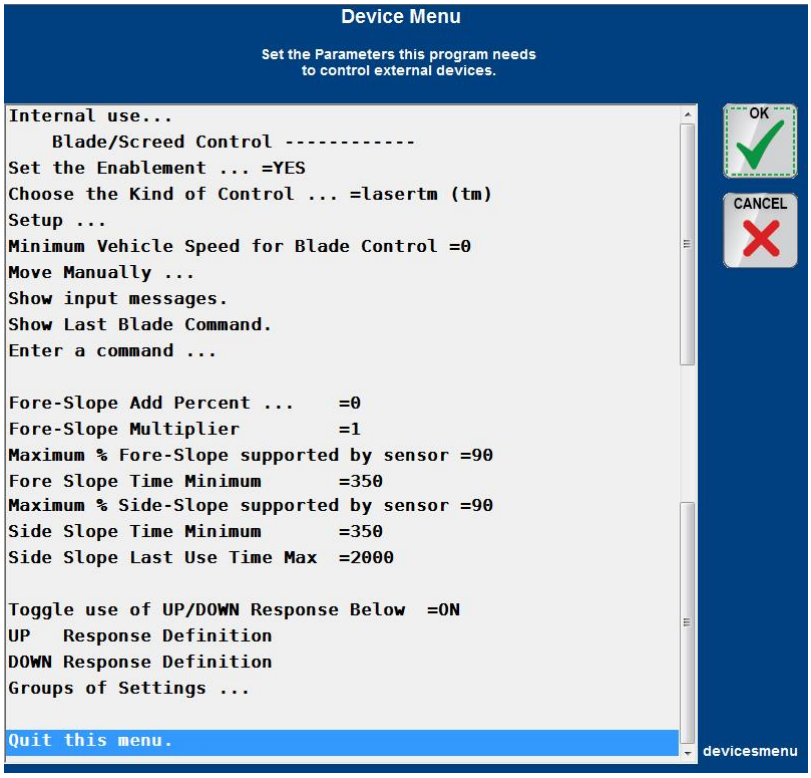
The Survey File Menu controls how the survey file is saved, export survey file, edit the survey file. From the Main Menu Select the Survey File Menu.



Backup the Job	Backup the current job to the external destination (Typically USB drive).
Format the survey file to a NEZ file	Turns the .svy file into a .nez file and exports it.
Format and edit a survey file report	Turns the .svy file into a .prt file and allows you to edit it.
Format a DCA Fieldbook file	Turns the .svy file into a .dca file
Ext.Dest	External destination (Typically USB Port) used for copying/backing up data.
Show extreme values of points	See a Minimum and Maximum for the survey file.
Shift the Data	Shift the Survey File. Typically used if your control point was slightly off of a known world location.
Set/Show the Job Name	Change the Job Name
Load the Survey File	Reloads the survey file if you have made changes below
Set the Description	Change the description of the current job.
Copy Files	Copy the survey file of a different job to the current job (for instance, if you brought a second machine into a job and wanted to load the data that had been captured to that point)
Delete the Survey File	Deletes the survey file (but keeps the job).
Edit the Survey File	Edit the survey file like a text file (i.e. you had a known point you couldn't reach with the machine you wanted to add to a line).
Restore the Survey File	If you backed the survey file to a USB drive and wanted to load it into the computer (usually after a computer failure).
Edit any file	Allows you to choose and edit a file.

Devices Menu

The Devices Menu configures the blade control/machine control device.
Press and Hold the Machine Control Icon or from the Main Menu Select the Devices Menu or press '9' on the keyboard.



Internal Use	Used to send a command-line to the device or software.
Set the Enablement	Sets Machine Control ON or OFF. Must be =YES for Machine Control to function.
Choose the Kind of Control	Choose the type of Machine Controller. Speak to the manufacturer of the Machine Controller with questions.
Setup	Setup the Machine Controller. Allows you to set COM port and other options. Speak to the manufacturer of the Machine Controller with questions.
Minimum Vehicle Speed	The minimum speed (in feet or meters per minute) the machine must be travelling for Machine Control to function. Often set to a low number so Machine Control will automatically stop when the Machine is motionless.
Move Manually	Used to manually activate the Machine Control. Useful for testing/troubleshooting the Machine Control.
Show Input Messages	Shows the current message strings from the Machine Controller. Useful for testing/troubleshooting.
Show Last Blade Command	Shows the immediately previous command sent from AGPS-Pipe Pro™ to the Machine Controller. Useful for testing/troubleshooting.
Enter a Command	Allows you to enter a command to send to the Machine Controller. Command must be in the data-string type used by the Machine Controller. Useful for testing/troubleshooting.
Fore-Slope adder	Additional percentage to add/subtract to Fore-Slope. Useful for adjusting level.

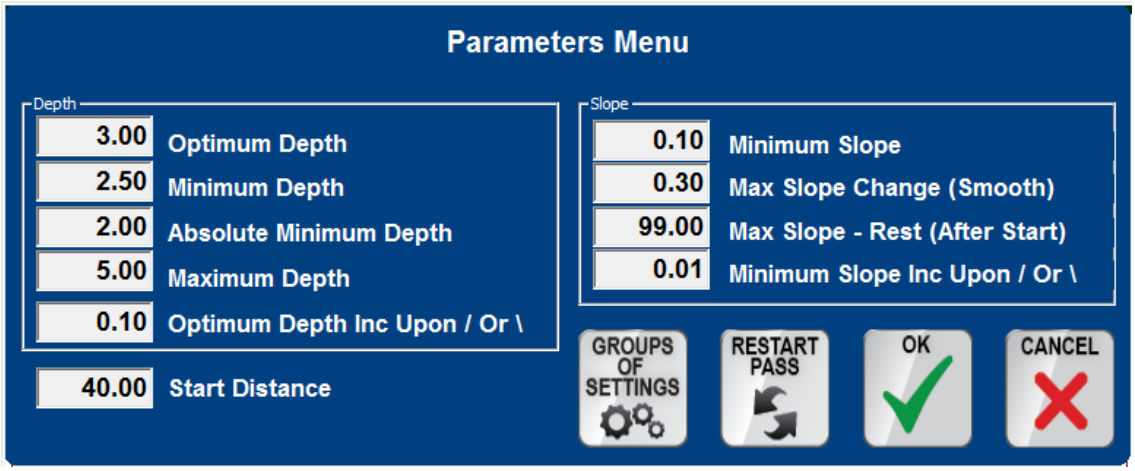
Fore-Slope Multiplier	Allows you to 'reverse' the slope that the program sends out. 1 is normal, -1 is reversed
Fore-Slope Zero Sensor	When the plow has been moved flat by measuring with a level, press OK to set Zero.
Maximum Percentage	Maximum percentage-slope allowed by the Slope Sensor. Set this at the limit of the slope sensor – anything over this number will be treated as an error and will cause no action.
Run DACCFG Utility	(If using DAC7000/8000) Will launch the Configuration program.
UP Response Settings	Allows you to adjust the UP response settings of the Machine Control. Please speak to an AGPS Technical Specialist before changing these settings.
DOWN Response Settings	Allows you to adjust the DOWN response settings of the Machine Control. Please speak to an AGPS Technical Specialist before changing these settings.
Groups of Settings	Enters a menu where you may Save (and name) the current group of UP/DOWN responses, or Fetch one previously saved.

Parameters Menu

The Parameters Menu is where you adjust how the profile is designed. There are two Parameters Menus: An Essentials menu useful during operation and an advanced menu useful during setup or for more complex operations.

Essentials Parameters menu:

Press and Hold the Menu Icon and select 'Parameters'.

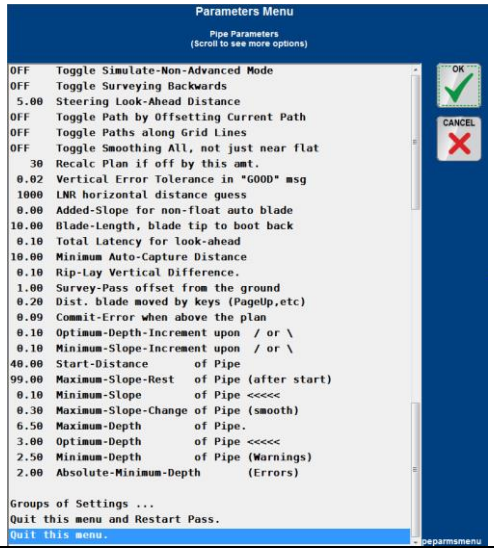


Optimum Depth	The Depth you wish the tile could be placed at.
Minimum Depth	The depth at which the program will display a warning that the pipe is getting too shallow. The program MIGHT violate Minimum depth.
Absolute Minimum Depth	The depth at which the program will display an error that the pipe is too shallow. Also controls the green Minimum Depth line on the Profile View Working Screen.
Maximum Depth	The Maximum Depth of the tile run. The program will never go beyond this value. Usually set to the maximum depth of the plow.
Optimum Depth Increment	How much the Optimum Depth will be changed by pressing the optimum depth adjustment buttons or using / or \ on the keyboard.

Start Distance	How far after the start point of the run the program will meet optimum depth. This helps stop the tile from rapidly coming up to grade when there is a very deep starting hole. Default is 40 feet.
Minimum Slope	The minimum slope you want for the tile run. The program will never violate Minimum Slope.
Maximum Slope Change	The Maximum Slope the profile will be allowed to change at each point. Default is 2.0%
Maximum Slope Rest	The Maximum Slope of pipe after the Start Distance. A lower number will keep the slope more constant, but may then affect the depth of the pipe.
Minimum Slope Increment	How much the Minimum Slope will be changed by pressing the minimum slope adjustment buttons or using / or \ on the keyboard.
Groups of Settings	Enters a menu where you may Save (and name) the current group of Parameters, or Fetch one previously saved.
Restart Pass	Quits the menu and recalculates the current LAY Pass with the new parameters, and current starting position.

Advanced Parameters Menu

From the Main Menu Select the Parameters Menu.

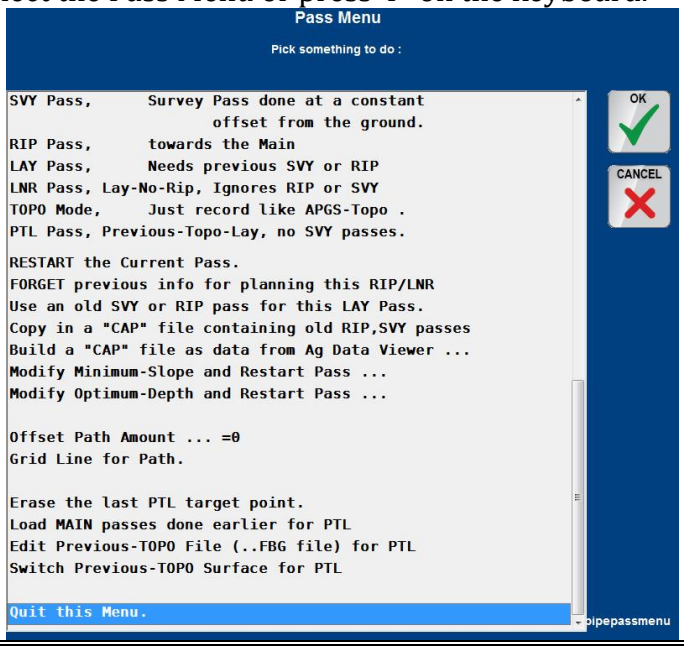


Toggle Simulate-Non-Advanced Mode	Turning this on will make AGPS-Pipe Pro™ simulate AGPS Pipe-FM™, which reduces menu/feature options.
Toggle Swapping DualGPS Antennas on SVY passes.	Turn on only if using Dual GPS, with a front antenna accurate for elevation. Typically used when the rear/primary antenna is difficult to maintain a constant height during SVY pass.
Toggle Surveying Backwards	Turn on if the tile plow drives backwards (Reverse) to survey.
Toggle Control Steering on SVY, RIP passes.	Turn on for Auto Steer on SVY/RIP.
Steering Look-Ahead	How far the program projects ahead for guidance.
Toggle Path by Offsetting Current Path	When on, the program will create a new path parallel (but offset) to the path just finished (adjust the grid to change how much it offsets).
Toggle Paths along Grid Lines	When on, the program will always snap the path to the nearest grid line. ("Toggle Path by Offsetting Current Path" must be off, it will override this).
Recalc plan if off…	How far away from the original path before the program attempts to redesign the plan.
Vertical Error Tolerance	How far from 'On Grade' before the program tells you UP/DN.

LNR Horizontal Distance	How long a LNR (Lay Minimum) pass will calculate. Default is 1000 feet.
Added-Slope for non-float	Additional slope to help control a non-float, slope controlled plow. Default =0
Blade-Length	The length of the blade, from tip to back. When the program exports a map, it adjusts all of the lines by this amount. Default is 10 feet.
Total Latency for look-ahead	How quick the Instrument (GPS) reads, so how far ahead the program looks. Most modern GPS systems have a very low latency (10 Hz). Default is 0.1
Minimum Auto-Capture Distance	How often the program will capture a point. A lower number means that the program will capture a point more often. Default is 10
Rip-Lay Vertical Difference	The distance below a Rip pass a Lay pass will be designed. Default is 0.1
CRP Offset at start	The CRP Offset above the design plan will be set to this value at the start of a Controlled Rip Pass. User then controls CRP Offset with the light bar or keyboard controls
Minimum Offset for CRP	The controlled rip pass cut will not be allowed to adjust closer to the design.
Survey-Pass offset	How high above the ground the blade is held for a survey pass. Typically the distance of the blade-tip to the ground when the plow blade is raised all the way up.
Dist. Blade moved by Keys	How much the page-up/page-down keyboard buttons or the vertical lightbar chevrons offset the blade when pressed. Default is 0.2. Note that the up/down keyboard arrows and inner chevrons are always half of this value.
Commit-Error	How far above grade the plow must travel before the program commits to the new depth. Default is 0.09
Optimum-Depth-Increment	How much the Optimum Depth will be changed by pressing the optimum depth adjustment buttons or using / or \ on the keyboard.
Minimum-Slope-Increment	How much the Minimum Slope will be changed by pressing the minimum slope adjustment buttons or using / or \ on the keyboard.
Start Distance	How far after the start point of the run the program will meet optimum depth. This helps stop the tile from rapidly coming up to grade when there is a very deep starting hole. Default is 40 feet.
Maximum Slope Rest	The Maximum Slope of pipe after the Start Distance. A lower number will limit the slope, which may then increase the depth of the pipe.
Minimum Slope	The minimum slope you want for the tile run. The program will never go underneath this value.
Maximum Slope Change	The Maximum Slope the profile will be allowed to change at each point. Default is 2.0%
Maximum Depth	The Maximum Depth of the tile run. The program will never go beyond this value. Usually set to the maximum depth of the plow.
Optimum Depth	The Depth you wish the tile could be placed at.
Minimum Depth (warnings)	The depth at which the program will display a warning that the pipe is getting too shallow. The program MIGHT, however, violate Minimum depth.
Absolute Minimum Depth (error)	The depth at which the program will display an error that the pipe is too shallow. Also controls the green Minimum Depth line on the Profile View Working Screen.
Groups of Settings	Enters a menu where you may Save (and name) the current group of Parameters, or Fetch one previously saved.
Quit menu and Restart pass	Quits the menu and recalculates the current LAY Pass with the new parameters.

Pass Menu

The Pass Menu controls the pass type.
From the Main Menu Select the Pass Menu or press 'P' on the keyboard.

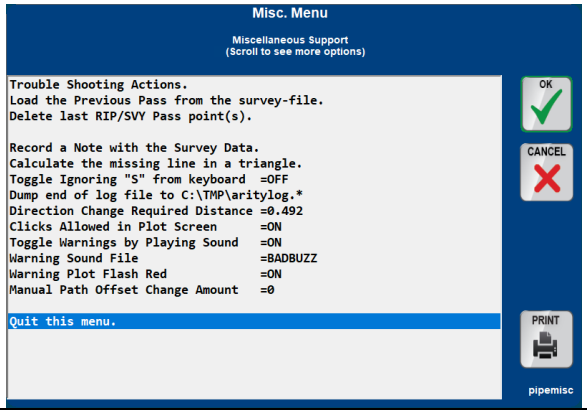


	**Survey**	A pass to survey the tile line. The survey is done with the plow at a constant height above the ground. The program subtracts the height from the collected data points. Followed by a Lay Pass. The Menu Bar is colored Light Blue when in Survey Mode.
	**Rip**	A pass to survey the tile line. The survey is done with the plow at a constant depth in the ground. Followed by a Lay Pass. The Menu Bar is colored Purple in Rip Mode.
	**Lay**	A pass done where tile is placed in the ground. Requires a Survey, Rip, or Previous Topo pass first. The Menu Bar is colored Green in Lay Mode.
	**LNR (Lay Min)**	Also called Lay-No-Rip. A Lay pass done with no survey. Tile is placed at Minimum Slope regardless of ground topography. The Menu Bar is colored Brown in Lay Minimum Mode.
	**Topo**	Capture Topography points like you were tiling a line but without a survey or lay pass. Usefull for capturing previously laid tile lines. The Menu Bar is colored Brown in Topo Mode.
	**Previous Topo Lay**	A Lay pass done with previously captured topography data. Eliminates Survey passes. Also allows tile to be laid both up and down hill. The Menu Bar is colored Dark Blue in PTL Mode.
	PLU Pass, Plan Use	Recall the nearest previously designed profile, from PLN file. Note: LAY/PTL passes will save to PLN, and re-write when ReCalculated.
	Start CRP Pass : Controlled Rip	(Only visible after a Tile Design is calculated/shown.) Allows Machine Control to follow profile to Rip at an offset above the plan, but not Capturing points.
	**Restart Pass**	Clears the Tile Design. Press Capture to redesign the current run.
Forget Previous Info		Forget the previous info for planning, allowing you to have a fresh design

Use old SVY	Recall a previously recorded Survey or Rip pass for a Lay pass
Copy in a CAP File	Load another file containing SVY or RIP passes.
Build a CAP File	Build a Captured Data File from Ag Data Viewer. Contact your Ag Data Viewer Technician for questions.
Modify Minimum Slope	Change the Minimum Slope and restart the pass.
Modify Optimum Depth	Change the Optimum Depth and restart the pass.
Offset Path Amount	Offset the path of the machine (useful if the GPS Antenna is not centered).
Grid Line for Path	Select the closest grid line as the survey path.
Erase the last PTL Target Point	Erase the last PTL Target point when in PTL Mode. See Previous Topo Lay Pass on page 40.
Load MAIN passes	Colors the Main passes for PTL mode. See Previous Topo Lay Pass on page 40.
Edit Previous Topo File	Edit the topo .FBG file for PTL Mode. See Previous Topo Lay Pass on page 40.
Switch Previous Topo Surface	Switch to antother surface file for PTL. See Previous Topo Lay Pass on page 40.
Manipulate Old Passes	Lists passes in the .pln file, allowing you restore/plot a profile line. Also possible by touching the line on the top view.

Miscellaneous actions

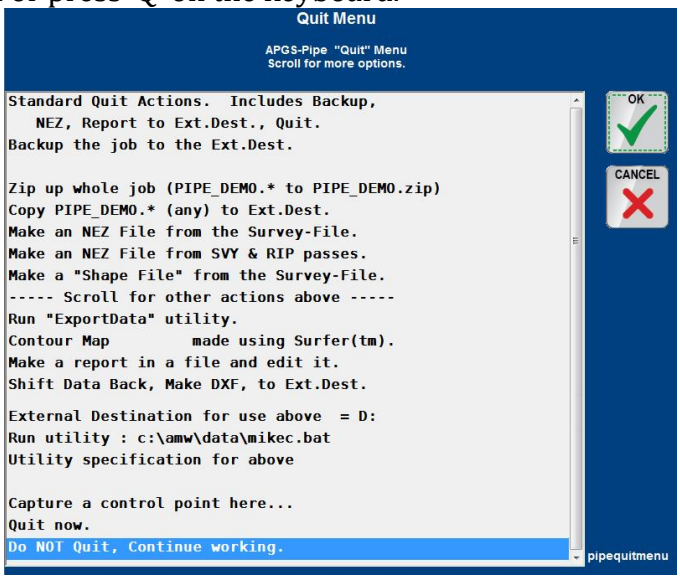
From the Main Menu Select Miscellaneous Actions.



Load the Previous Pass	Loads the previous pass that was done.
Delete the last RIP/SVY pass point	Deletes the last RIP/SVY pass point (i.e. you accidentally lowered the GPS antenna during a run and want to delete the bad point)
Record a Note	Records a note that goes with the survey file.
Calculate the missing line	If working with previous topo, will calculate a missing line from a triangle as close as mathematically possible.
Toggle Ignoring "S"	Toggle ON to ignore the "S" key. Some tablet's software send keys for events.
Dump end of log file	Saves the end of the program log for sending to a Tech for troubleshooting.
Direction Change	Distance travelled before heading direction changes.
Clicks Allowed in Plot	Toggle OFF to ignore touch/click in the plot window. (Accidental touch)
Toggle Warnings	Toggles a warning sound that plays if there is an error (i.e. bad GPS signal)
Warning Sound	Change the warning sound file.
Warning Plot Flash Red	Toggle OFF to stop red flash (for photosensitive epilepsy)
Manual Path Offset	Specify the Horizontal distance to offset the Path when the Horizontal Light Bar arrows are touched, or 0 to disable.

Quit this Application

All of the actions that can be performed before quitting the program.
Press the Red X in the upper right corner of the program or select 'Quit this Application' from the Main Menu or press 'Q' on the keyboard.

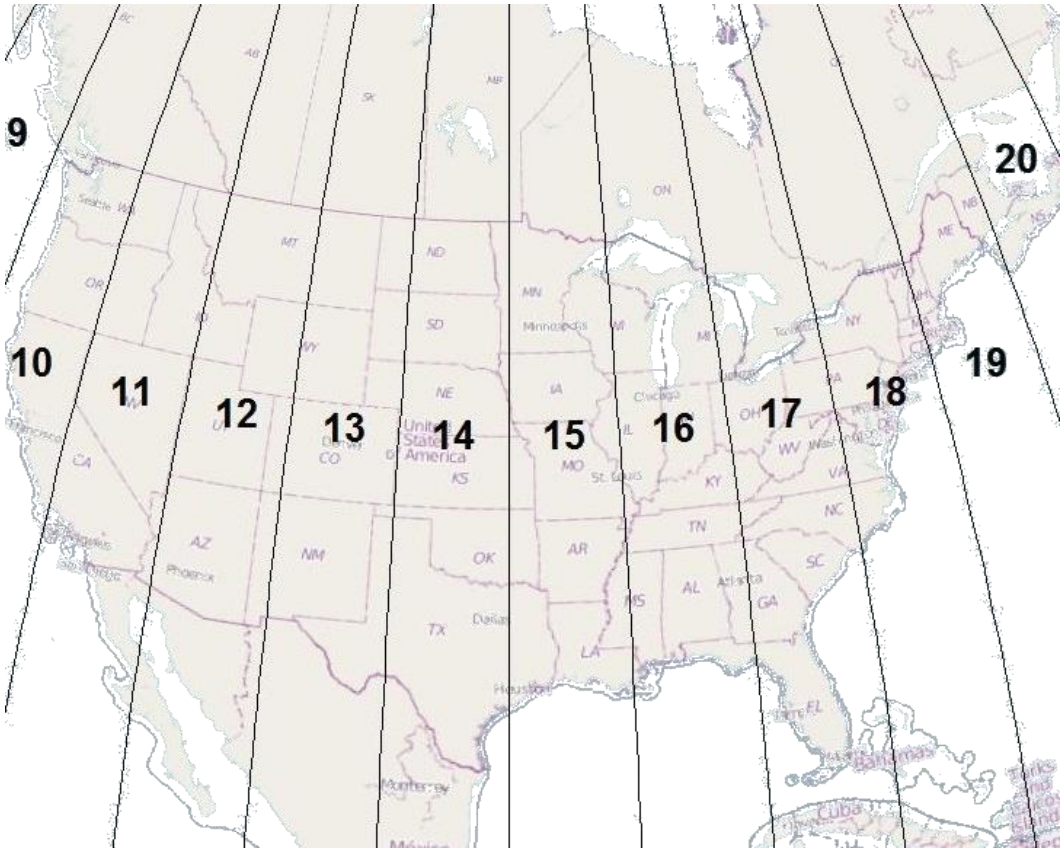


Standard Quit Actions	Creates a backup, NEZ, distance report of the job, exports it to the external destination (typically USB Drive) and quits the program
Backup Job	Creates a Backup of the job to the external destination (typically USB Drive).
Zip up whole job	Creates a .zip file to the external destination (typically USB Drive).
Copy JOBNAME	Copies any file with the jobname (e.g. JOBNAME.svy; JOBNAME.ctl; etc.) to the external destination (typically USB Drive).
Make an NEZ File	Creates a Northing-Easting-Elevation (NEZ) file out of the survey file.
Make an NEZ File from SVY and RIP passes	Creates a Northing-Easting-Elevation (NEZ) file out of the SVY and RIP data.
Make a 'Shape File'	Creates a .shp file out of the survey file.
Run Export Data	Runs the Export Data Utility. See Exporting Data on page 48.
Contour Map	Create a Contour Map out of the topography information (Requires Surfer™ software)
Make a report	Creates a report. See Creating Reports on page 47.
Shift Data Back	Shifts the data back the offset amounts, creates a .dxf file (Auto CAD™ file type) and exports it to the external destination.
External Destination	Defines the drive letter for the External Destination (typically USB Drive).
Run Utility	Runs the defined utility. The utility may automate the steps you want to do to quit a job.
Utility Specification	Specifies the Utility to be used in the 'Run Utility' command.
Capture a Control Point	Captures a control point. See Collecting a Control Point on page 46.
Quit Now	Quits AGPS-Pipe Pro™ and takes you to the AGPS Main Menu.
DO Not Quit	Takes you back to the AGPS-Pipe Pro™ Working Screen.

UTM Zones and State Plane

UTM Zone (Universal Transverse Mercator (UTM) geographic coordinate system) and State Plane are coordinate systems to help GPS coordinates be more relative (feet or meters). UTM is a world-wide system, State Plane zones are smaller, and minimizes distortion.

UTM Zones



State Plane