COOK'S //AGPS LLC

//AGPS DIRT PRO
USER MANUAL

www.CooksAGPS.com

AGPS DIRT PRO

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Welcome

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

AGPS-Dirt Pro™ provides assistance in land moving operations. The program can import a completed design file (made using ezigrade™ or another third-party design program) and then control the machine or it can be used to design simple, complex or multi-slope projects in the field.

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

Basic Concepts

AGPS-Dirt Pro™ will load a design file (such as CAD), convert it to a cut/fill map (both 2-D and 3-D) and control the machine making the cut. It can also be used to design (either in the field or in the office) simple, complex or multi-slope projects.

* What should you ask for when requesting data?
1. An AutoCAD™ 2000 compatible DXF is the preferred method; text points or DWG may be acceptable as well.
2. This file must have a proposed surface in 3D (Northing Easting Elevation)
3. The surface must be one of the following "Triangles", "Lines forming Triangles", or "Lines, Arcs, and Points".
4. Any other features included on the drawing (boundaries, existing features etc.) must have an elevation that does not disrupt the proposed surface OR must have an elevation of 0. (a user can enter the lowest elevation of points to load, so a greater number than 0 could be used if the user is aware.) Other features intended for a "background drawing" or "blueprint" view could be provided in a separate DXF (elevations not important)
5. Coordinate system must be known when setting up the program. This may be Local Points, State Plane, or UTM. Any of these could use a Stretch K factor if required.
6. Control points (benchmarks) in the same coordinate system are needed as well as information about where the points are physically on the ground.
7. The overall goal is replicating a setup as if a surveyor was grade checking.

AGPS-Dirt 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 33.

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.

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Set the Job Name

The Job Name must be 4 to 16 characters long.
Use only letters and digits and underscore.

For example: EXAMPLE7 or SAMPLE12_SAMPLE3

Enter the Job Name :

JobNameHere

Enter a Description of the job :

Description Here

OK   CANCEL

svyfilejoba

Enter the Job Name :

_DEMO

1	2	3	4	5	6	7	8	9	0	CLR	<-BKSP
q	w	e	r	t	y	u	i	o	p	[	]
a	s	d	f	g	h	j	k	l	;	'	OK ✓
z	x	c	v	b	n	m	,	.	/	Up	-
Shift	Space Bar	\	Left	Down	Right	Cancel

Units of Measure

AGPS-Dirt 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.
Machine Control	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.

Control point (.ctl file)	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 44.
Data folder	All job file data opened and saved by the program is stored by default in C:\amw\data\
Device	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™ or a LaserTech™ 308 control module.
Instrument	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.
Local Point	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".
NEZ	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.
.nez file	A file that uses the following columns: "Name Northing(N) Easting(E) Elevation(Z) Description". (Description is optional)
Path	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
Plot	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 47.
Resetup mode	A toggled option to automatically start AGPS-Dirt and Resetup Program (same job), instead of going to the Main menu to select an application.
Rod (length)	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 31.
State Plane	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 54.
Odometer	The current distance from the start of the selected Path.
Status (GPS)	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.

	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

|	
Surface file (.fbg, .fb*)	A file that shows a proposed or existing ground. This file uses NEZ format points, and can be easily built from a "DXF" file exported from some "CAD" program. After the points are loaded a TIN is created automatically. See Surface Setup on page 21.
Survey File (.svy)	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.
UTM	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 54.

The Main Working Screen

The AGPS-Dirt 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 10

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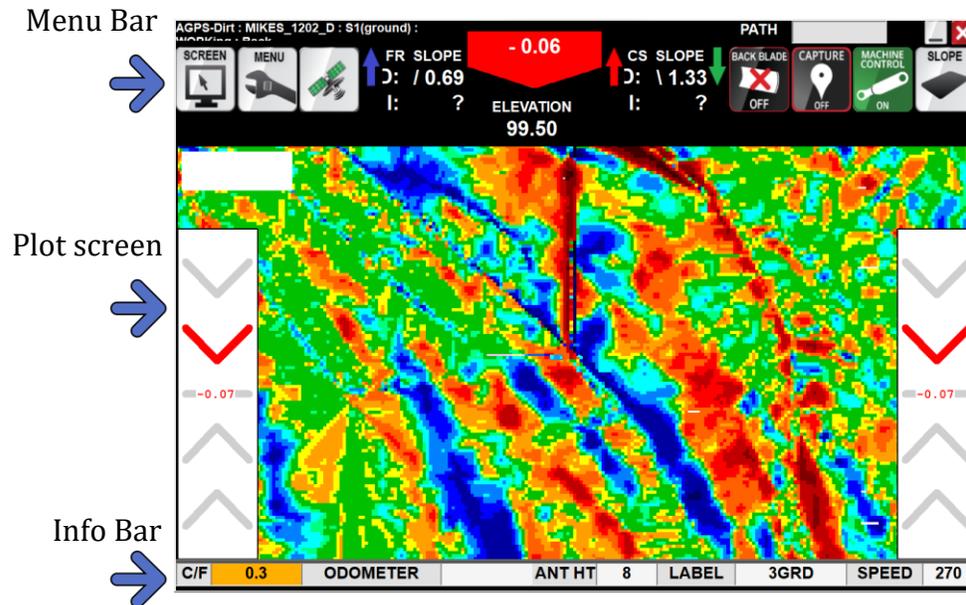
The Working Screen – Blade View
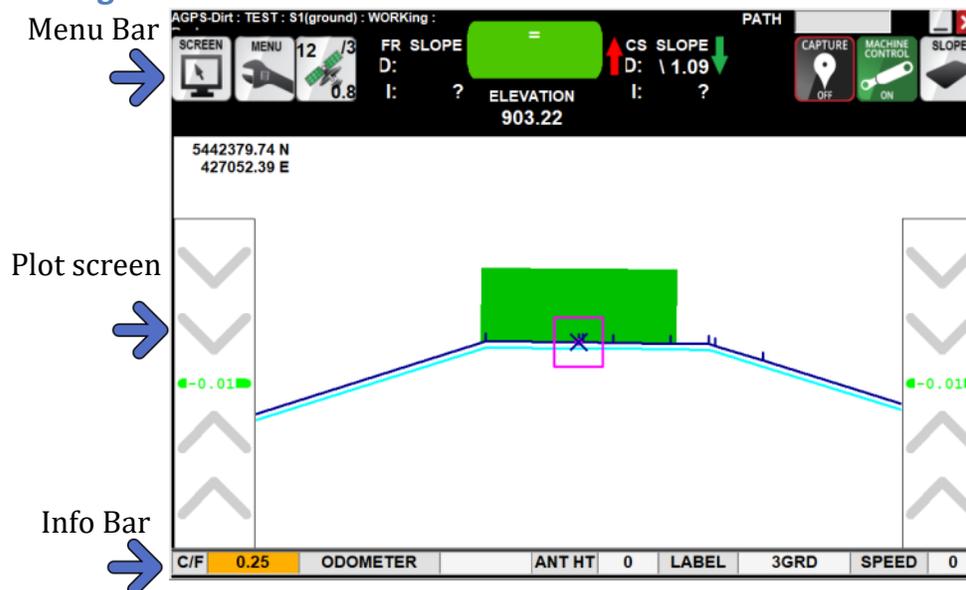
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The Working Screen – Menu Bar
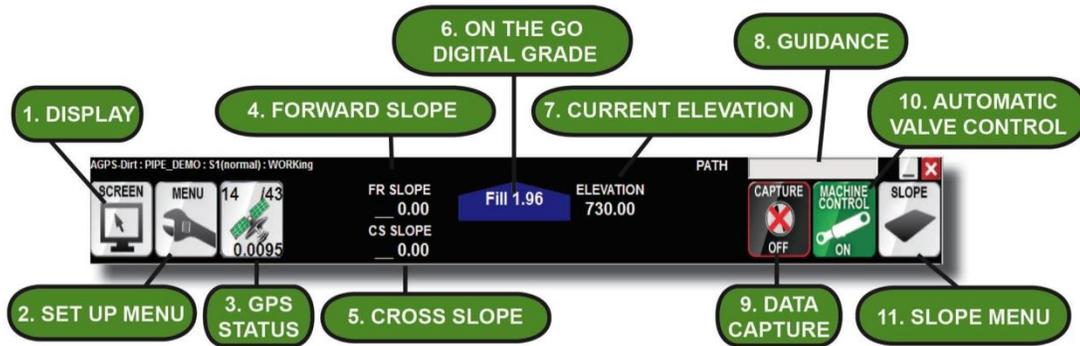
The majority of icons in the Menu Bar are touch active. Several also have a secondary function that can be accessed by pressing and holding the icon for 3 seconds.

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 32.
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.	GPS Status	Icon showing current GPS status. Must be green for the program to work. Touch to access the Instrument Menu see Instrument Menu on page 46. 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.

	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

4.	Forward Slope	Tells the Forward Slope (slope running parallel to the direction of flow)
5.	Cross Slope	Tells the Cross Slope (slope running perpendicular to the direction of flow)
6.	Digital Grade	Visual real-time indicator of the position of the blade in relation to designed grade. Cut will be displayed in Red, On Grade in Green and Fill in Blue
7.	Current Elevation	The current elevation of the blade. Can be in meters, feet-international or feet-survey. See Setting up the Program on page 11.
8.	Guidance	Distance from the set path. See Path and Offset Menu on page 29.
9.	Data Capture	Data Capture icon. Touch to capture the perimeter, random ground or reference point Green for On, black/red for Off.
10.	Valve Control	Automatic control of the machine. Green for On, black/red for Off. Press and Hold to access the Devices (machine control menu).
11.	Slope Menu	Opens the Path and Offset Menu. Touch to change path mode, or tipped plane commitments. See Path and Offset Menu on page 29.

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The Plot Screen –Overhead View

1.	Grade Correction Indicators	Tells you how far from grade you are.
2.	Profile Lines	Profile lines, or other features drawn in a Background Drawing. See Backgrounds on page 41.
3.	Adjustable Color Grid	Color grid can be set to display Cut/Fill amount, Deflection amount or Visits count. See Color Grid Menu on page 38.
4.	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.
5.	Current Position	Visual real-time indicator of the position of the machine. The upper left-hand corner of the icon is considered the 'true' position of the blade. 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.

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The Plot Screen – Blade View
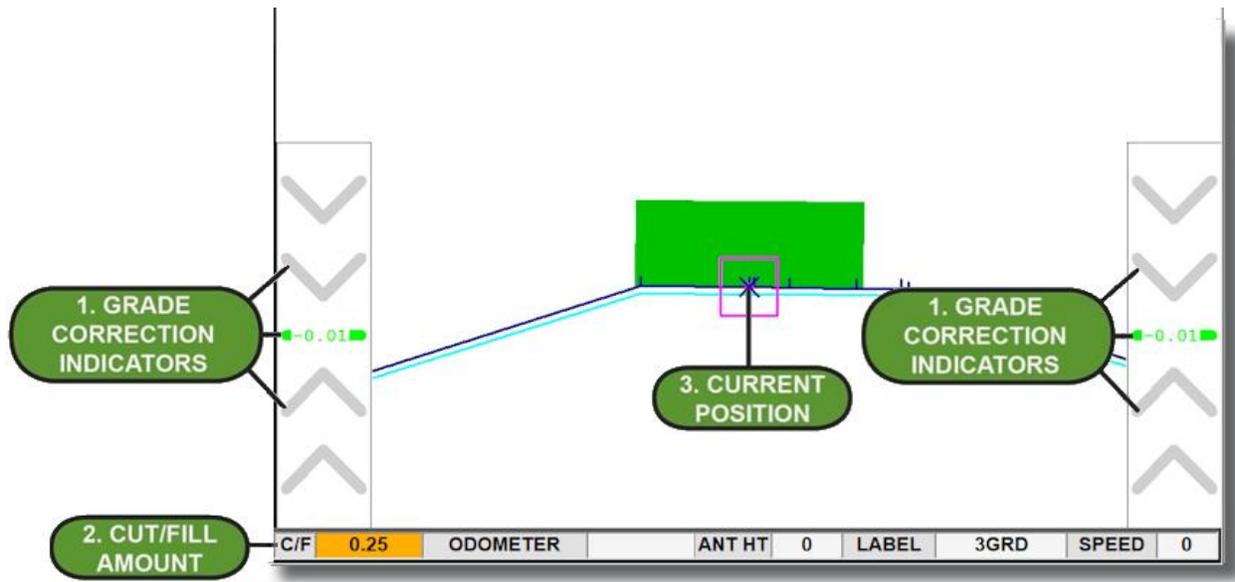
1.	Grade Correction Indicators	Real time Elevation guidance light bar. Visual indicator of how far off the Profile the blade is.
2.	Cut/Fill Amount	Amount the blade is offset above or below finish grade.
3.	Current Position	Visual real-time indicator of the vertical position of the blade. The X of the icon is considered the 'true' position of the blade. Can be offset if using a slope sensor to get a more 'true' position of the blade.

The Working Screen – Info Bar
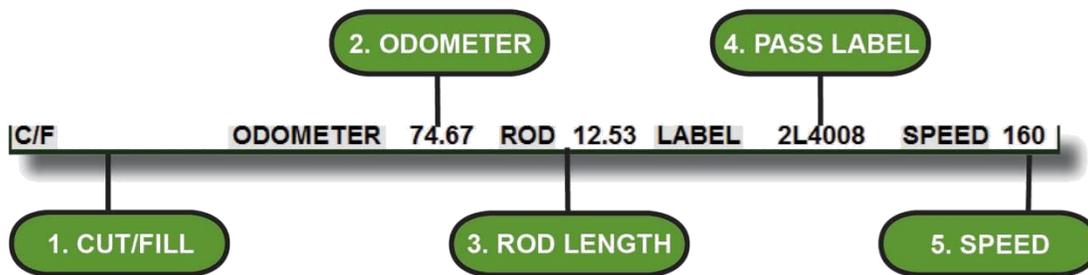
1.	Cut/Fill	The current amount above or below grade AGPS-Dirt Pro™ is controlling the blade. Touch to set a different Cut/Fill.
2.	Odometer	Real time odometer of the distance of the current pass
3.	Rod Length	The Current Rod Length. The rod length is defined as the distance from the measuring instrument (i.e. GPS globe) and the tip of the blade. See Rod Length on page 31
4.	Pass Label	Current point label. Touch to choose a different label. See Point Labels on page 43.
5.	Speed	Current speed in feet or meters per minute

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Setting up the program

Setting up the program for the first time:

Follow these procedures for the first time you set up AGPS-Dirt Pro™. If you have previously set up the program or an AGPS-Dirt 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-Dirt 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).
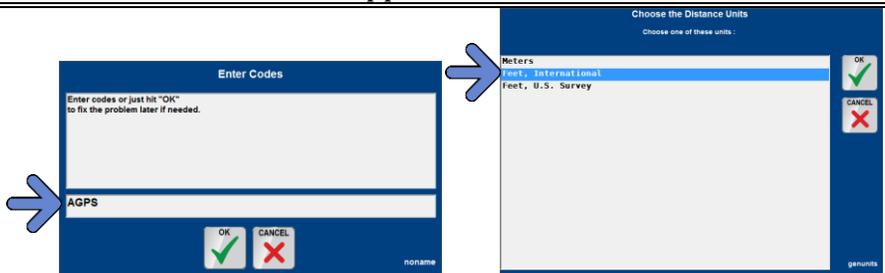
Select AGPS-Dirt Pro™ from the Dashboard's "Program" Dropdown menu.

For the first time, it is easiest to leave the **Job Name** on "**Sample**".
Press Start button.

Press Menu

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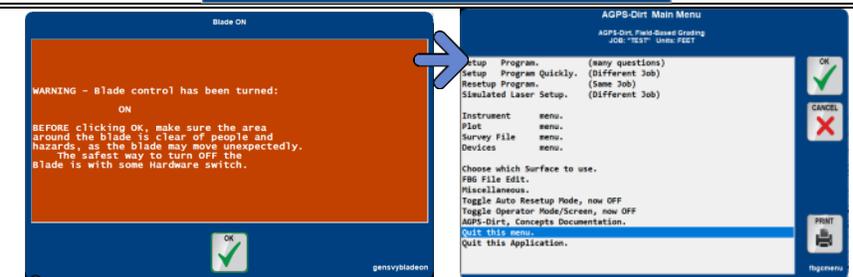
Select None, Make a New Job.
Enter the name of the job (i.e. the name of the field or the name of the customer). You may also enter a description of the job.

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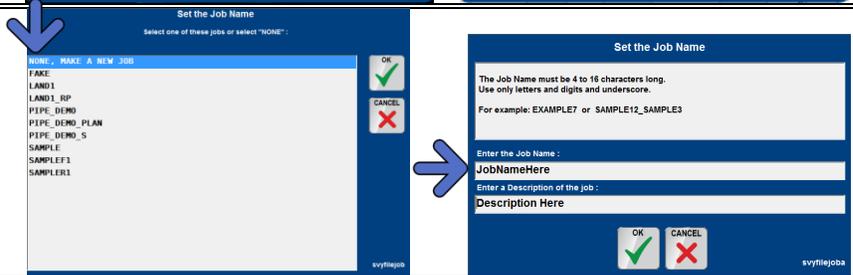
Setup your control points. If you have no control point for this job, select **Quit, No (further) Changes.** If you have control points (see Control Points on page 44) you can choose to **edit the control point file** and add the point.

```
                     Setup Control Points

              C:\AMW\DATA\JOBNAMEHERE.CTL
          (a good sample is in the file "SAMPLE.CTL")

Quit.  No (further) changes.
Append 1 line to the bottom of this file
Edit the file with "Notepad"(tm)   <<<<<
Edit the file with "Wordpad"(tm)
Replace this file with another file
Save this file somewhere
Append another file to the end of this file
                                                    OK ✓

                                                    CANCEL ✗

                                                    pointlis
```

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.

```
        Choose the Instrument reading method
           Choose one of these methods :

Ashtech(tm) PF Lite
Ashtech(tm) Z  GPS
Ashtech(tm) GG GPS
Criterion(tm) 300 Laser Gun
General GGA GPS
Geodimeter_600(tm)  ETS
Geodimeter_4000(tm) ETS
Geodimeter_ATS(tm)  ETS
Hemisphere Crescent L1 GPS
John Deere(tm) GPS
Leica(tm) TCA1100 ETS
Leica(tm) GPS System 300
Leica(tm) GPS System MC500
Leica(tm) GPS System MC1000
Leica(tm) GPS Redline
Nikon(tm) NPL-350 manual ETS
NovAtel(tm) OEM6 GPS and GLONASS
                                     OK ✓
                                     CANCEL ✗
                                     instkind
```

```
        Set the Communications Port Number
           Choose one of these COM ports :

COM1
COM2
COM3
COM4
COM5
COM6
COM7
COM8
COM9
COM10
COM11
COM12
COM13
COM14
COM15
COM16
COM17
                                     OK ✓
                                     CANCEL ✗
                                     instcompo
```

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

```
        Set/Show the Normal Rod Length



     The length of the Normal Rod
is needed so the program can visually show
when a special Rod is being used ...


                                OK ✓
                                nrodi1
```

```
             Choose a Rod Length
           Choose the Normal Rod Length

NONE    NONE OF THESE, CHANGE THE FILE ...
ADD1    APPEND 1 LINE ...
TEMP    NEW TEMPORARY ...
CALC    Calculate Length from a Triangle ...
MEAS    Measure Length using Z,Instrument...

    0     CURRENT TEMPORARY
  6.31    ATV
    0     Test
    8     high
   14     very high
  24.65   pipe machine
  4.51    short
                                     OK ✓
                                     CANCEL ✗
                                     rodlstchoose
```

Select Rod Tip Corrections. If you have a slope sensor, select it here.

```
                Rod Tip Correction Menu

              If the Rod will not be held nearly
            vertical, how should it be corrected ?

No Rod Tip Corrections (default).
    (Hold the Rod near vertical).
Dual Tip Sensors and Rake Angle Only.
    Dual Tip Correction Amounts
Cross Slope Only.
Cross and Forward Slope Only.
Design Slopes (FBGC and SBGC only ).
Measured Slope in Travel Direction
    (Don't use with blade control).
Cross Slope and Measured Slope in Travel Direction
Input-Only Slope Sensor Menu ...
Sparton(tm) SP3003D Compass/Sensor Menu ...
Garmin(tm) GPS for Direction ...

Display Current Values ...
---- Current Corrections are :
----    None
                                     OK ✓
                                     CANCEL ✗
                                     position
```
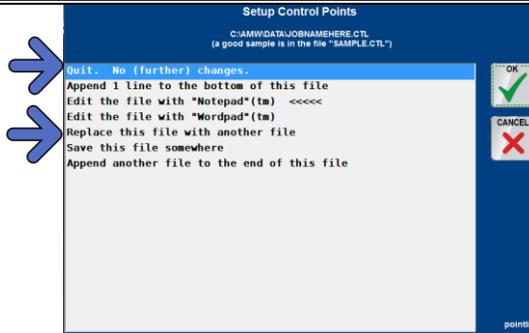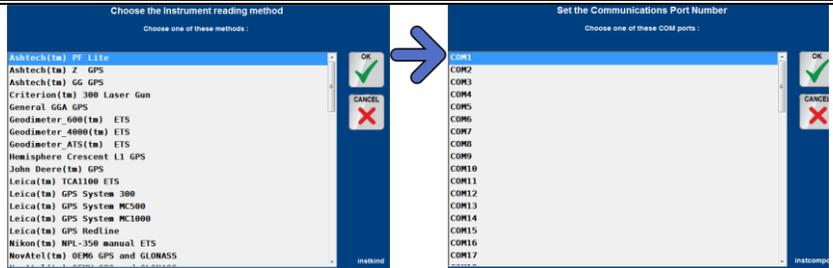
Set the Location-Instrument Position. If you use **UTM**, select UTM 0 point. If you do not know the UTM zone, select Unknown, Calculate. If you use **State Plane**, select **State Plane 0 point** and select the State Plane.

```
               Choose the Region
      Choose one of these UTM Regions :

Unknown, calculate it from live data ...
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
                                     OK ✓
                                     CANCEL ✗
                                     utmregion
```

or

```
               Choose the Region
      Choose one of these State Plane Regions :

Alabama East 0101
Alabama West 0102
Alaska 2 5002
Alaska 3 5003
Alaska 4 5004
Alaska 5 5005
Alaska 6 5006
Alaska 7 5007
Alaska 8 5008
Alaska 9 5009
Alaska 10
Arizona East    0201
Arizona Central 0202
Arizona West    0203
Arkansas North 0301
Arkansas South 0302
California 1 0401
                                     OK ✓
                                     CANCEL ✗
                                     stateplareg
```

Bitmap control option or
Background Drawing
You can load a bitmap image for a background drawing. See Loading Background Images on page 41.
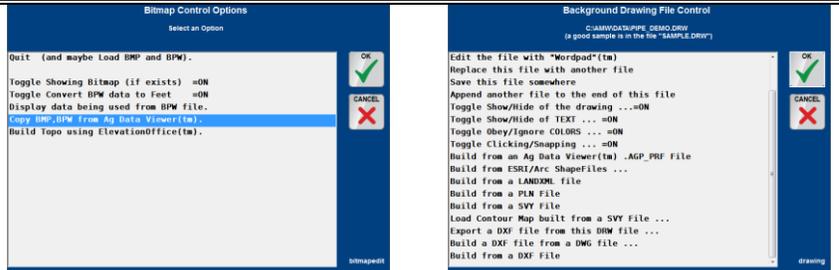
Surface Setup Kind
You can choose the type of Surface you want to use:
Surface File (previously designed file); Commitment to an Elevation (grading to a specific elevation); Commitment to a Tipped Plane (grading with a forward and/or cross slope); Commit to user's Slope (commit to a simple slope)
See Surface Setup on page 21.
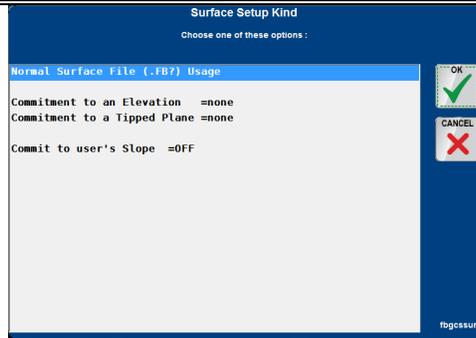
Color-Grid Type
Select and adjust the type of Color Grid you would like.
For more details, see Color Grid Menu on page 38.
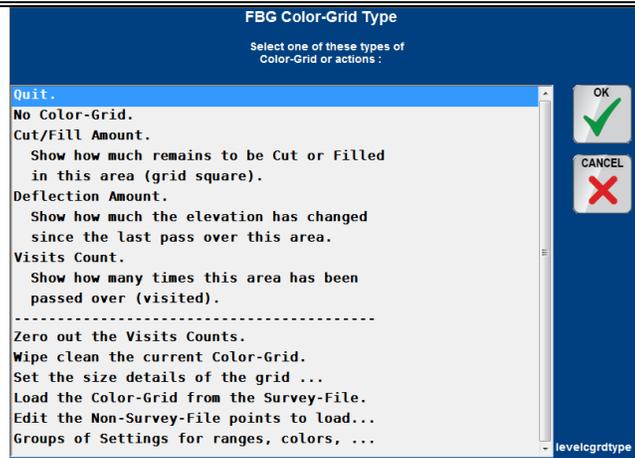
Device Menu. Select the type of auto-blade controller you have. Contact the Auto-Blade control manufactuerer for more details on setting up the device.
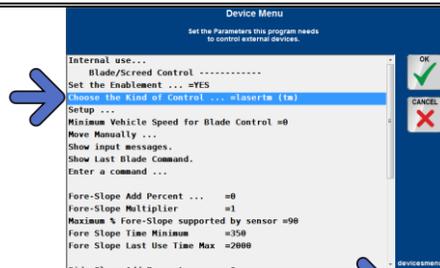
Typical controllers are the LaserTech™ with MultiPlexor or DAC 7000™ control. Then select the Com port the controller is plugged into.
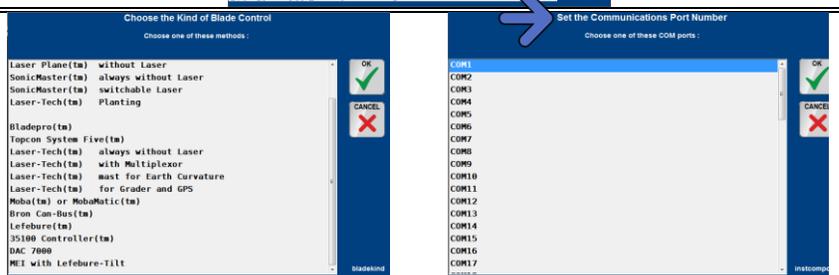
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The Main Working Screen will appear: You should be able to begin working.

 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 21.
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.

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Starting a New Job or Restarting a Current Job, via Dashboard:
Follow these procedures to each time to start AGPS-Dirt Pro™.
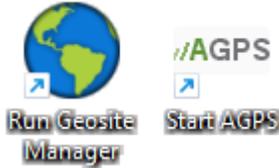
Start AGPS-Dirt Pro™	Run Geosite Manager ⊕ Start AGPS ⊕AGPS	If the program does not load on computer startup, locate & double tap the Start the AGPS icon on the desktop. A starting screen will briefly appear.
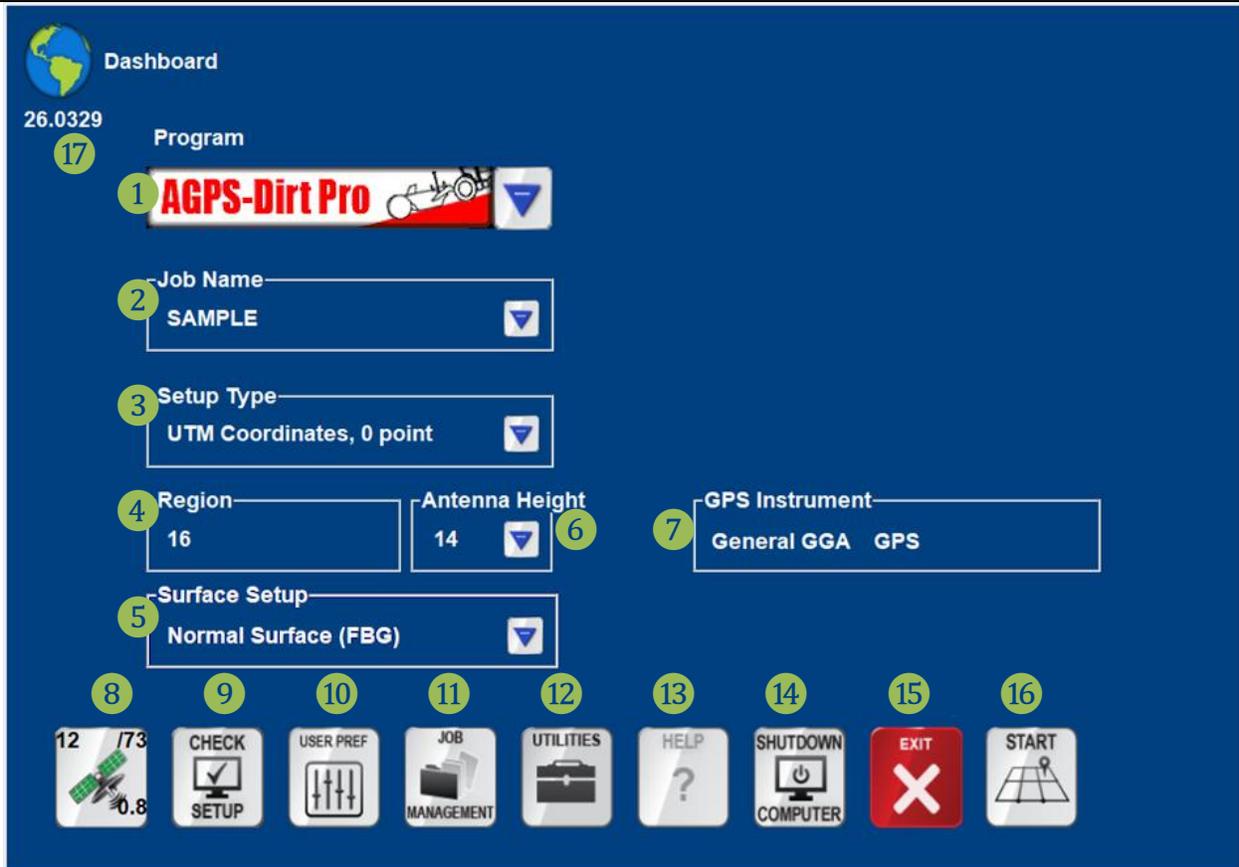
① **Program**	Select a program to open. It should say AGPS-Dirt Pro. Press the down arrow to show/select other programs purchased.
② **Job Name**	Select a Job Name from the dropdown list. For a New Job: Select **Make New Job**, at the top of the list. Job Management - Job Name: SAMPLE ➡ Make New Job ALBERTSOUTHB_T ALBERTSOUTHJ_T

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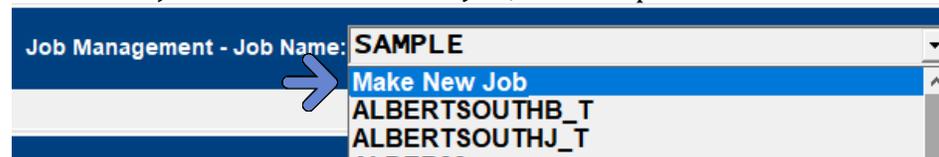|		
③ **Setup Type**	**Setup Type** Use Previous Setup **UTM Coordinates, 0 point** UTM Coordinates, 1 point 2 Local Points Setup State Plane, 0 point State Plane, 1 point TM Grid, 0 point TM Grid, 1 point 1 Local Point Setup (True North) 2 Local Points Setup with No Stretch	- If you have no control 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 **Surface Setup**	**Surface Setup** Normal Surface (FBG) Commit to Plane Commit to Elevation	See details starting on page 22 Load a Design surface file. Enter direction and slope plane. Enter an elevation for 0% slope.
⑥ **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.	
⑦ **GPS Instrument**	Displays the type of instrument, or simulator. This cannot be changed from the Dashboard, see Instrument Menu on page 46	
⑧ **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.	
⑨ **Check setup**	Not currently implemented.	
⑩ **User Pref**	Preferences menu that allows customization of menu colors/font, as well as a few menu behavior settings.	
⑪ **Job Management**	Various tabs to make changes to control points, design surface, background image, & more.	
⑫ **Utilities**	Miscellaneous Utilities. Change Distance units. Security Menu (Show or Set Capabilities)	
⑬ **Help**	Not currently implemented.	
⑭ **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)	
⑮ **Exit**	Exit the program, back to Windows desktop	
⑯ **Start**	Start the program, with the chosen settings.	
⑰ **Version**	Displays the version of the software currently installed.	

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Simulated Laser Setup

A Simulated Laser Setup is used for on the job setup of single or multi-slope leveling. You start at a drainage point, set a control point, and then drive to where you want the main slope (long slope) to drain. The program will calculate the real slope between the two points, which you can use or you can enter your own slope. You can also then enter a cross slope. After you have completed a Simulated Laser Setup, you can recall the entries in the Surface Setup Menu under Commitment to a Tipped Plane.

1. Start AGPS-Dirt 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.

2A. Make sure AGPS-Dirt Pro™ is selected from the Dashboard's "Program".
2B. Touch the dropdown for Surface Type
2C. (See right)
2D. Press Start button.
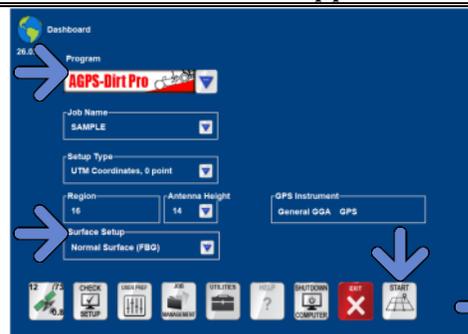
2C. Commit to Elevation. OK any number.

-Surface Setup-

Normal Surface (FBG)
Commit to Plane
Commit to Elevation
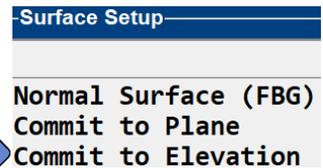
3. Press Menu

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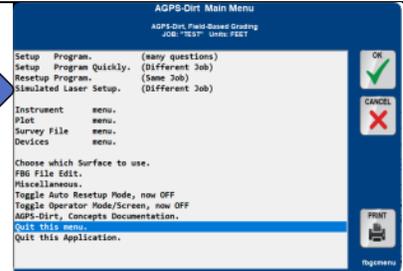
5. For a New Job:
Select None, Make a New Job.
Enter the name of the job
(i.e. the name of the field or the name of the customer). You may also enter a description of the job.

17

6. Stop at the first point

Stop at the first point that you want to read, put the blade on the ground and press ok. Typically this will be "on grade" elevation for the plane.

Simulated Laser Quick Setup

Now stop at the First Point.

It will be the first of 2 points used to determine the aiming of the simulated laser.

It will also be used to set a point above it with an elevation you choose as a point in the simulated laser plane.

OK

msetup1
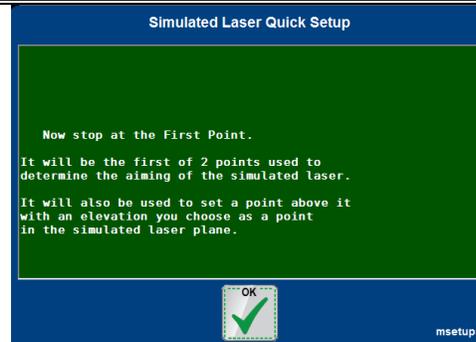
7. Read the Instrument at the First Point

You can adjust the instrument before reading if you need to. This read will also create a control point.

Simulated Laser Quick Setup
Interactive Instrument Reading

Read the Instrument now ...
Control the Instrument first ...
Pause before read amount =0 seconds ...
Tries # for averaging purposes =10
Quit without reading.

OK
CANCEL

instreadia

Check Setup

10 successful reads were performed.

The averaged results are :
Northing : 540772.302   RMS=0
Easting : 13044729.909 RMS=0
Elevation : 729.134   RMS=0

Raw : xyh(13044729.909,540772.30186,729.13378697)

OK   CANCEL

instctlcapr
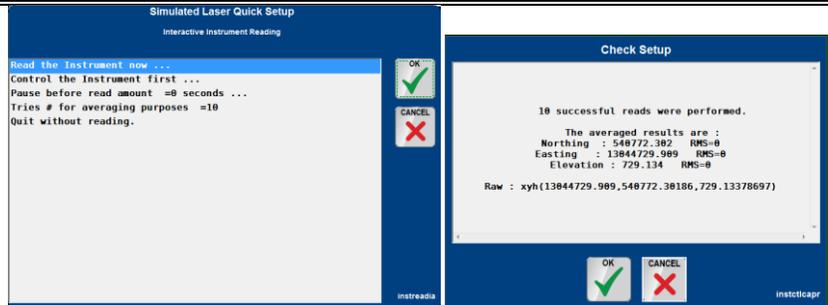
8. Set the elevation above the control point

Default is 100 (this will show the start point of the tip at 100 feet, avoiding negative numbers while you grade)

Simulated Laser Quick Setup

Enter the Elevation you want over the
Control Point being used for Point-in-Plane.
The Name of the Control Point is
    "lasim1".

The last measured Elevation was : 0

100

OK   CANCEL

fbgccp
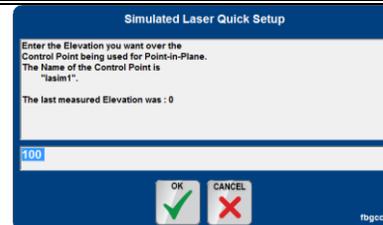
9. Drive to and Stop at the Second point

Stop at the second point that you want to read, put the blade on the ground and press ok.

Simulated Laser Quick Setup

Now stop at the Second Point.

It will be the second of 2 points used to determine the aiming of the simulated laser.

OK

msetup2
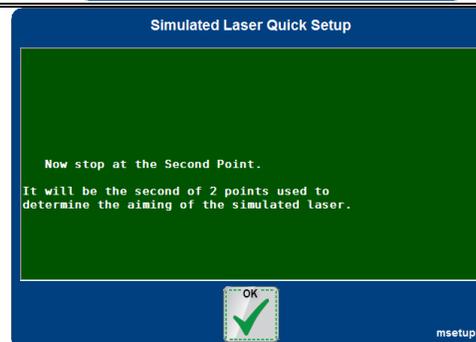
10. Read the Instrument at the Second Point

You can adjust the instrument before reading if you need to. This read will also create a control point.

Simulated Laser Quick Setup
Interactive Instrument Reading

Read the Instrument now ...
Control the Instrument first ...
Pause before read amount =0 seconds ...
Tries # for averaging purposes =10
Quit without reading.

OK
CANCEL

instreadia

Check Setup

10 successful reads were performed.

The averaged results are :
Northing : 540772.302   RMS=0
Easting : 13044729.909 RMS=0
Elevation : 729.134   RMS=0

Raw : xyh(13044729.909,540772.30186,729.13378697)

OK   CANCEL

instctlcapr
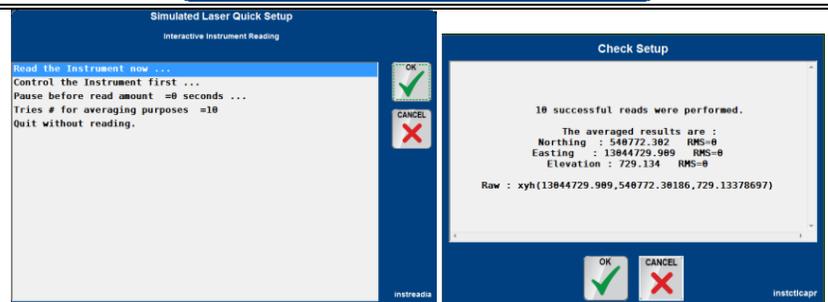
11. Set the Tipped amounts

- Specify the amount of the Long slope and the Cross slope. The actual long slope amount will be displayed.

Enter a negative number to reverse the tip amount. This is typical if your second point is downhill from your first point.

Simulated Laser Quick Setup

Specify the tip of the Plane as amount of rise in 100 feet.
Use a negative number to indicate fall.
E.g.,
0.1 is a rise of 0.1 in 100 feet.
-0.15 is a fall of 0.15 in 100 feet.
0.0   is flat.
Slope Actual=0.211 Horiz.Dist.=218.615

Tip Amount toward "lasim2" :
0

Tip Amount to the Right :
0

OK   CANCEL

fbgclastippt
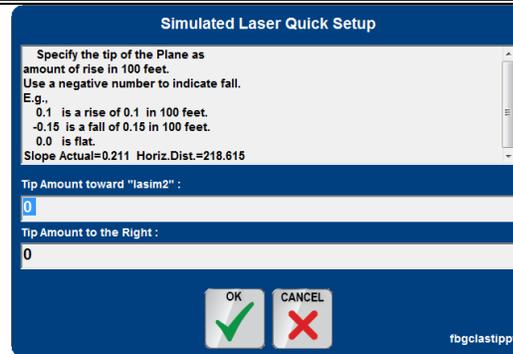
The Main Working Screen will appear: You should be able to begin working.
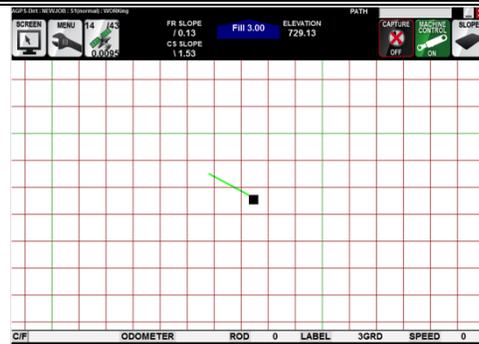
Working with RTK-GPS

AGPS-Dirt Pro™ is designed to be used with most high-grade RTK-GPS systems. The accuracy of AGPS-Dirt 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-Dirt 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-Dirt Pro™ Dealer or Technician for setup details. The Hz (update) rate and Baud rate must also be set in the AGPS-Dirt 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.

AGPS DIRT PRO

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-Dirt 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 page 19.
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-Dirt 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.

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 day-to-day operations. 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-Dirt Pro™ requires the use of Control Points in any pre-survey operation (such as designs created from previously collected data) 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	Capture a control point where you stop for the day (with the blade 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.

AGPS DIRT PRO

Surface Setup

The surface is how the job knows the proposed plan. The surface can be a series of previously designed files (for instance a final grade surface and an underlayment surface), a commitment to an elevation (for grading to a flat plane) or a commitment to a tipped plane (for dual-slope drainage)
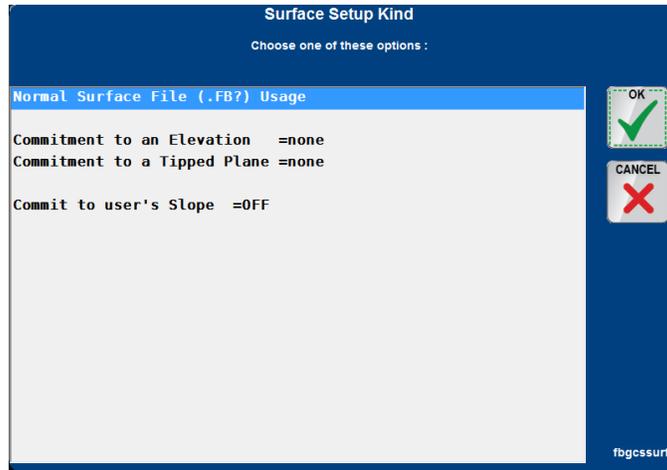
Normal Surface File (.FB?)	An FBG surface file is built from a design file. Almost always used for a job where that has been previously designed. You can import many different file types and they will be converted to an .fbg file. See Working with Designs and .FBG Files on page 22.
Commitment to an Elevation	Commits to an elevation. You can enter a known elevation that you would like to level to. See Commitment to an Elevation on page 26.
Commitment to a Tipped Plane	Commits to a tipped plane for multi-slope drainage. If you know the slopes you want to use, you can enter them; otherwise use the Simulated Laser Setup to design a dual-slope drainage solution.
Commit to user's Slope	Allows the user to enter a slope to commit to, for cross slope control.

Working with Designs and .FBG Files

To load a design file, select 'Normal Surface File (.FB?) Usage' in the Surface Setup Menu (appears when you start a new job or restart current job), or select 'Choose which Surface to use' from the Main Menu.	or
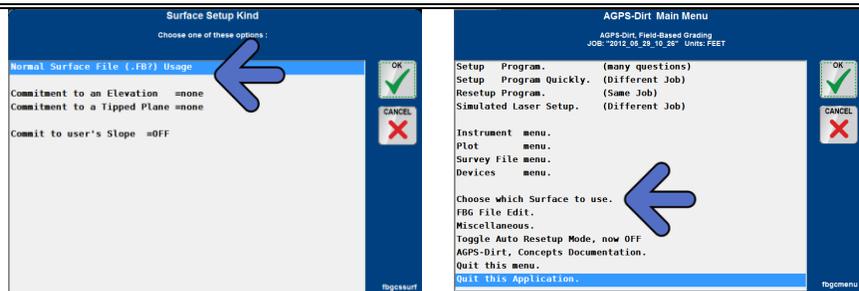
Select your surface. You can have multiple surfaces in the job. You can toggle between surfaces while you are working, but you must load the file for each surface.
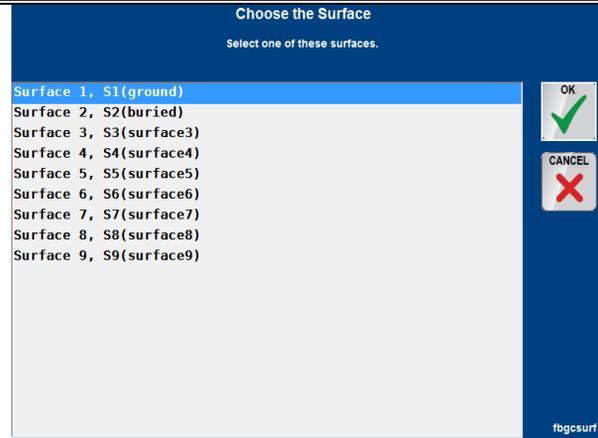
Select they type of file to load. Most often you will either Replace this file or Build from a different file.
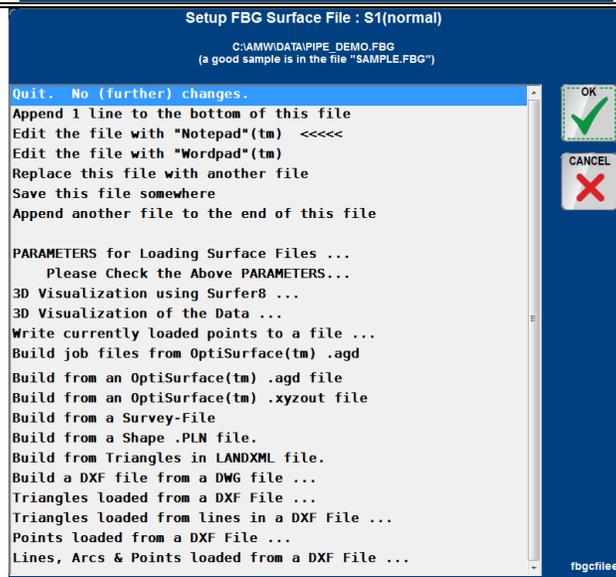
Append 1 line to the bottom of the file	Allows you to add a line of data to the bottom of the .fbg file once it has been loaded
Edit the file with 'Notepad'	Opens the .fbg file with Microsoft Notepad (if installed) for editing.
Edit the file with 'Wordpad'	Opens the .fbg file with Microsoft Worldpad (if installed) for editing.
Replace this file with another file	Allows you to choose a file to load as the .fbg file. Use this option if you have a text file in the correct format.
Save this file somewhere	Allows you to save the .FBG File to your hard drive (usefull if you have created the .FBG file in the AGPS-Dirt Pro™ program and want to save it to a flash drive)
Append another file to the end of this file	Allows you to add an addendum file to the .FBG file (if there is data to add)
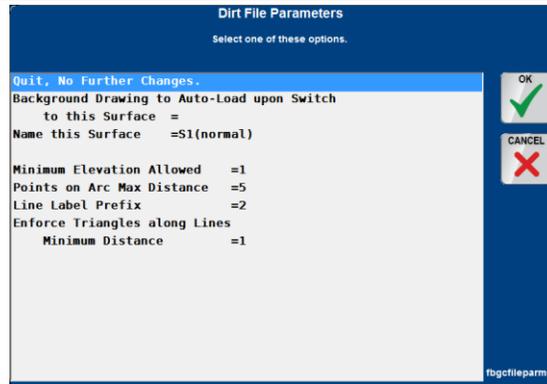
Parameters for loading surface files

Sets the parameters for loading file into AGPS-Dirt Pro™. Typically the defaults will be sufficent for most jobs.

Background Drawing to Auto-Load: Sets the background drawing that will be loaded when you select the surface. Will also be set if you load a.drw file. See Load Background Image on page 41.

Name this Surface: Can be used to rename the surface.

Minimum Elevation allowed: Default is 1, must be changed if working below sea-level

Points on Arc Max Distance: If loading an .dxf file and arcs are found, the maximum distance between points on those arcs.

Line Label Prefix: When a point-label is being loaded, the prefex that indicates the point is part of a line. Default is '2'.

Enforce Triangles along Lines minimum distance: When the program is loading an .fbg file that contains points and lines, sets the minimum distance that triangle edges can be along a line. Default is 1.

3D Visualization using Surfer8	Creates a 3D visualization of the .FBG data using Surfer8™, or newer (if installed.)
3D Visualization of the Data	Creates a 3D visualization of the .FBG data using an internal 3D visualization program.
Write currently loaded points to a file	Writes all of the points in loaded in a file to a .FBG file (useful if you collect topography data and want to add it to the .FBG file).
Build job files from OptiSurface™ .agd file	Builds and loads a .FBG file from an OptiSurface™ .agd file.
Build job files from OptiSurface™ .xyzout file	Builds and loads a .FBG file from an OptiSurface™ .xyzout file.
Build from a Survey-File	Builds and loads a .FBG file from an AGPS-Dirt Pro™ Survey-File
Build from a Shape .PLN File	Builds and loads a .FBG file from an AGPS-Shape Pro™ .PLN file.

Build from Triangles in LANDXML file	Builds and loads a .FBG file from the Triangles in an LANDXML file.
Build a .DXF File from a .DWG file	Creates a .dxf file from a .dwg (AutoCad™) file. This requires an additional converter, and is outdated (not recommended).
Triangles loaded from a .DXF file	Loads 3D traingles from a .dxf TIN file.
Triangles loaded from lines in a .DXF file	Creates and loads triangles from the lines in a .DXF file.
Points loaded from a .DXF file	Creates and loads points from a .DXF file.
Lines, Arcs and Points loaded from a .DXF file	Creates and loads Lines, Arcs and Points from a .DXF file.

After you select or create an .FBG File, the data will load and you will see the Field Date File Load completion screen. Check that the Min and Max Elevations are correct.	**Field Data File Load** From the file "C:\AMW\DATA\PIPE_DEMO.FBG", 4668 Points were loaded. 4668 Points were unique. 744.037 Is the MAXimum Elevation. 731.299 Is the MINimum Elevation. 0 Had less than the allowed Elevation. 0 Triangles were read directly, 0 of these were bad. OK ✓ filel
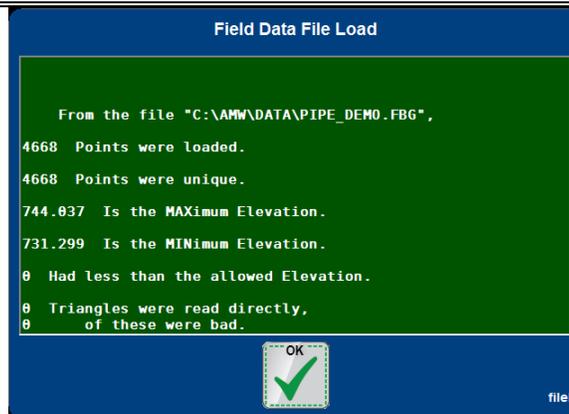
You can edit the .FBG file from the Main Menu at any time.

TroubleShooting Tips:

Red error screen appears: *"Unable to load data from the file : "C:\AMW\DATA\JOBNAME.FBG". Please check the parameters used :"*	• This is common on a new job, if you have not yet built or loaded the .FBG from another file. • Possibly the file used to build the .FBG is bad, or contained all "0 elevation" points. • Use "Edit the file with Notepad" to see what the loaded data looks like, or if the file is still empty.
Working screen flashes red *with message: "Not in Design Area"*	• Make sure you are within the job • Double check you have performed the correct coordinate setup for to match the job data. See Dashboard "Setup Type" on page 15. • Use the "Toggle Show Triangles=ON" to verify the extents of the design surface, from the Plot Menu on page 47.

AGPS DIRT PRO

Commitment to an Elevation

Committing to an Elevation is used when you simply want to level a piece of land to a certain elevation without a design file. If you want to know the cut/fill amounts, you will have to capture that data.

There are two different places you can enter this menu:

A. **From the AGPS Dashboard.**

   Touch the dropdown Surface Setup. Then Commit to Elevation

   See **Starting a New Job or Restarting a Current Job, via Dashboard** on page 15
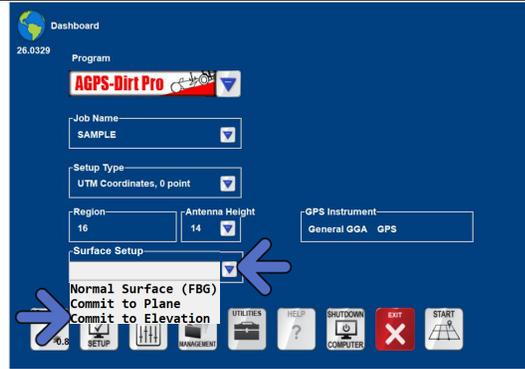
B. **From the "Slope" icon on Working Screen.**

   Choose Commitment to an Elevation.

   See **Path and Offset menu on page 29.**
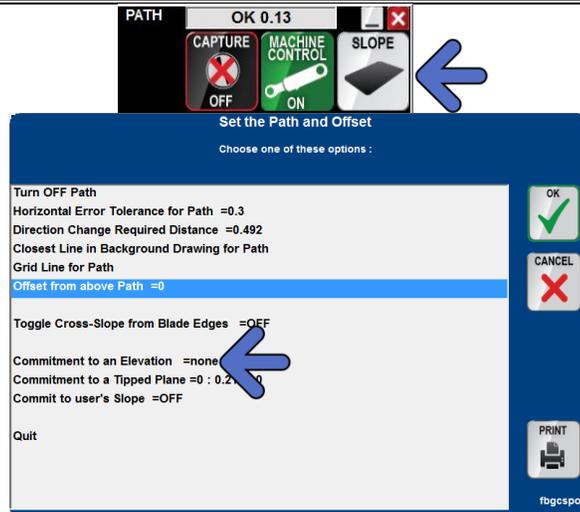
Choose Either 'Use the Previous Elevation' (setup complete) or 'I want to Enter an Elevation. (go to the next step)
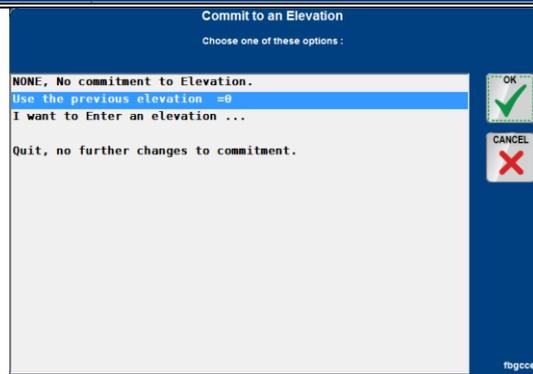
Enter the Elevation. If you know the elevation you want to commit to, enter it here. It also lists the last measured elevation (before you entered the menu).

The Working Screen will be displayed
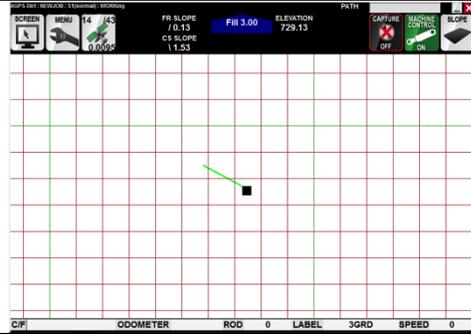
Commitment to a Tipped Plane

Committing to a Tipped Plane is used if you are doing single or multi-slope drainage without a previous design. Typically a Simulated Laser Setup is done previously, and a Commitment to a Tipped Plane is used to continue work at a later time. If you want to know the cut/fill amounts, you will have to capture that data.

There are two different places you can enter this menu:

A. **From the AGPS Dashboard.**

Touch the dropdown Surface Setup. Then Commit to Plane

See **Starting a New Job or Restarting a Current Job, via Dashboard** on page 15
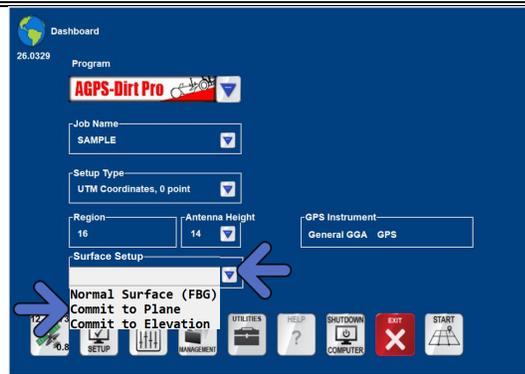
B. **From the "Slope" icon on Working Screen.**

Choose Commitment to a Tipped Plane

See **Path and Offset menu on page 29.**

//AGPS DIRT PRO
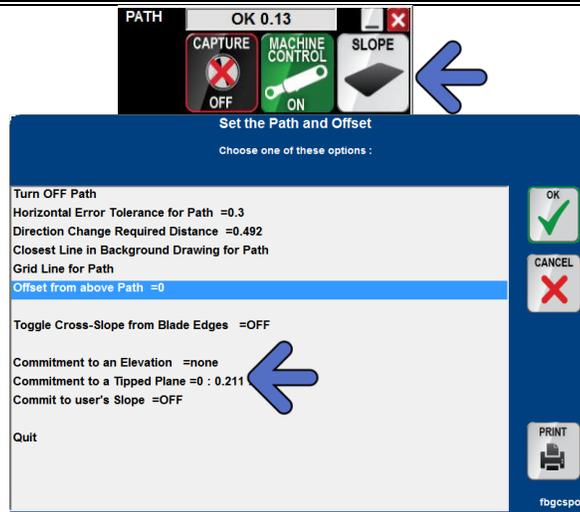
You can specify the direction and slope with two steps: **1. Direction and Slopes Specification** **2. Choose Control Point, Z for Point in Plane**	
1. Direction and Slopes Specification: Choose between Tip North and East or Tip between 2 control points.	
1A. Tip North and East: Enter the tip amount to the North (a negative number will tip to the South) and to the East (a negative number will tip to the West)	
1B. Tip between 2 Control Points: You will select 2 previously captured Control Points to tip between.	
2. Choose Control Point, Z for Point in Plane: With either method above you must still enter a desired elevation. If that is the same as the Control point, make a note when on the selection screen.	
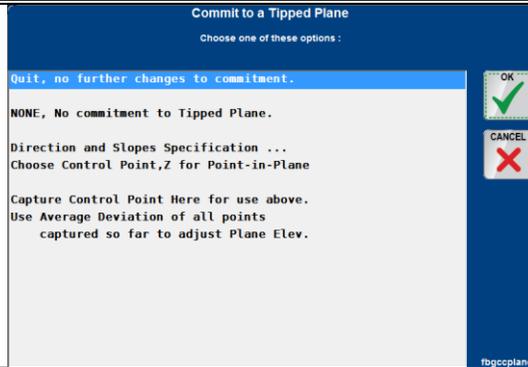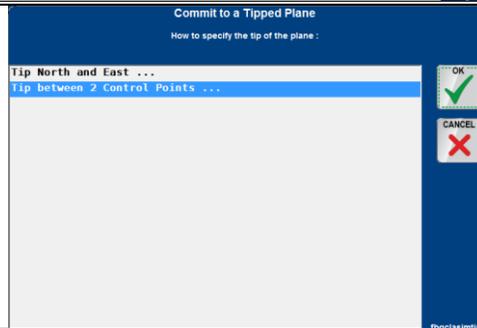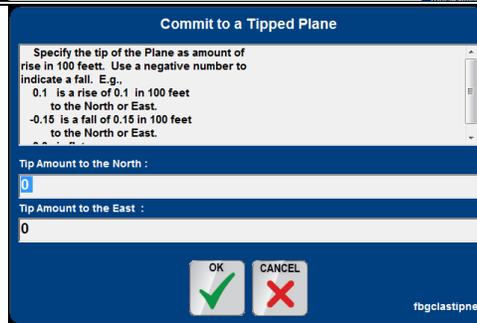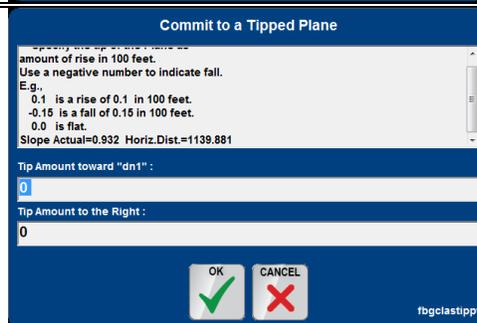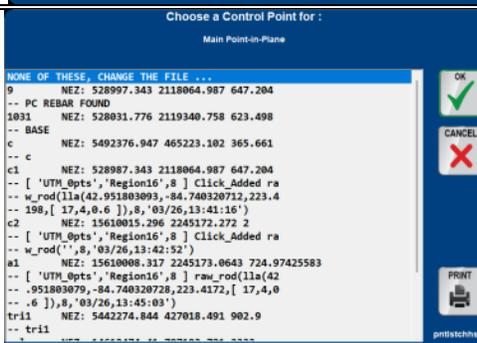
Path and Offset menu

The Path and Offset, or "Slope" menu will allow selecting a horizontal Path to follow. Also you can change your commitment to an elevation or tipped plane without needing to go through a program Setup again. To access this menu, touch the Slopes icon in the upper-right corner of the working screen.
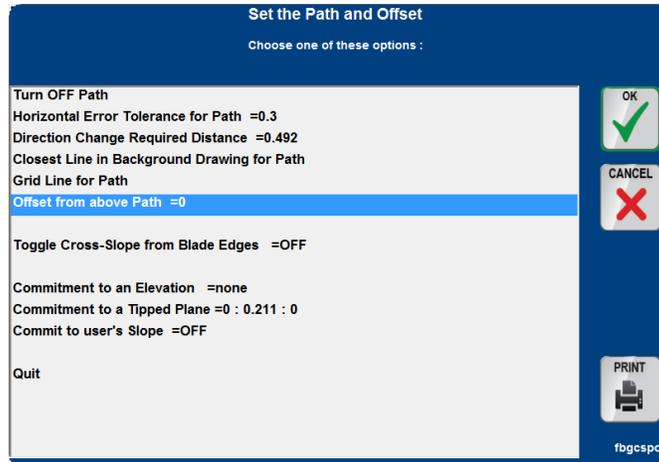
Turn OFF Path	Turns off any selected Path. The Path bar will then be blank.
Horizontal Error Tolerance for Path	The allowable distance off the Path line for the Guidance bar to say 'OK'.
Direction Change Required Distance	The distance travelled before the program shows a new direction heading.
Closest Line in Background Drawing for Path	Selects the nearest Background Drawing line to follow with the Guidance bar.
Grid Line for Path	Selects the nearest Grid Line to follow with the Guidance bar.
Offset from above Path =0	Enter a + or – Offset from the actual path.
Toggle Cross-Slope from Blade Edges	When this is ON, the program will calculate the desired Cross slope from the surface at the edges of the blade, rather than the location of the GPS antenna.
Commitment to an Elevation	Allows you to select or change commitment to a known elevation at 0%
Commitment to a Tipped Plane	Set or change commitment as shown on the previous page (of this manual.)
Commit to user's Slope =OFF	Use a specified cross slope % instead of the current design.

Commitment to Tipped Plane using AGPS-Level

AGPS-Level+ is included with AGPS-DirtPro. This program is a "thinned down" or "simplified" version of Dirt. This page will give a basic overview of the workflow of Level, but more detailed information is available in AGPS-Level_Level+_Manual.pdf

Select Level from the Dashboard's "Program" Dropdown menu.
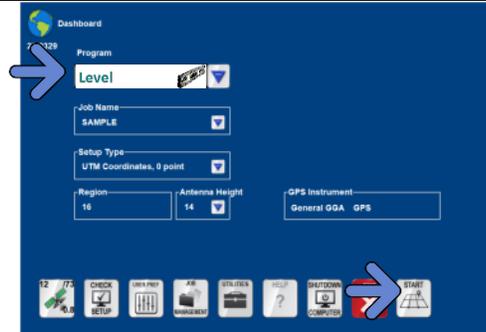
Press Start button.

Lower the blade to the elevation you would like to start Grade at. **Touch the Waterflow Indicator.**

Touch "Start A B" to capture your A Point. **Drive in the direction you want the Long Slope to be.** The Current Slope % will tell you the actual slope between your A point, and the blade now.
OR
"Set Heading & Slopes" is an alternative to an A-B Line. If you know what you want for these values, you start at an on-grade point, enter the numbers.
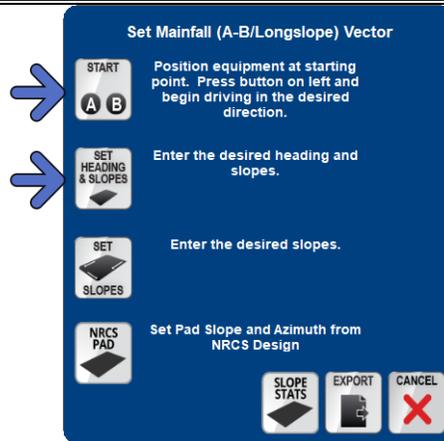
Your working screen should now show the Waterflow direction you selected, as well as the slope % number.

AGPS DIRT PRO

Rod Length (Antenna Height)

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

| C/F | ODOMETER | 74.67 | **ROD** | **12.53** | LABEL | 2L4008 | SPEED | 160 |

Choose a Rod Length

Choose the Normal Rod Length

```
NONE      NONE OF THESE, CHANGE THE FILE ...
ADD1      APPEND 1 LINE ...
TEMP      NEW TEMPORARY ...
CALC      Calculate Length from a Triangle ...
MEAS      Measure Length using Z,Instrument...

  0       CURRENT TEMPORARY
  6.31    ATV
  0       Test
  8       high
  14      very high
  24.65   pipe machine
  4.51    short
```

OK ✓

CANCEL ✗

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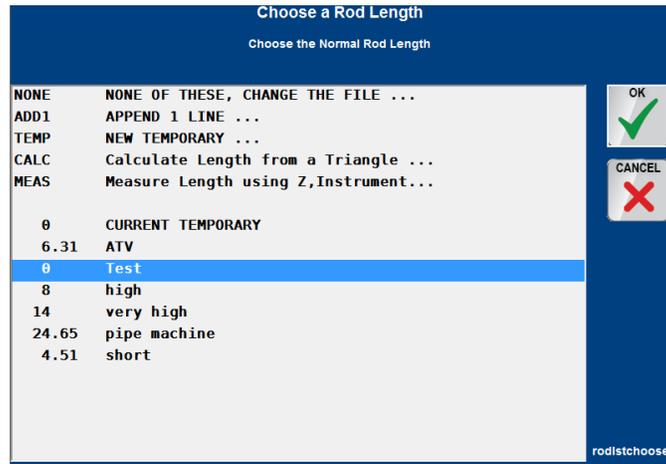
NONE	Allows you to change the entire rod length list, adding or deleting any lengths/descriptions you would like.
Add1	Adds a user-defined label to the Rod Length list.
Temp	Creates a new temporary length but does not add it to the permanent list.
CALC	Calculate the length from a triangle. Not used in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

AGPS DIRT PRO

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.
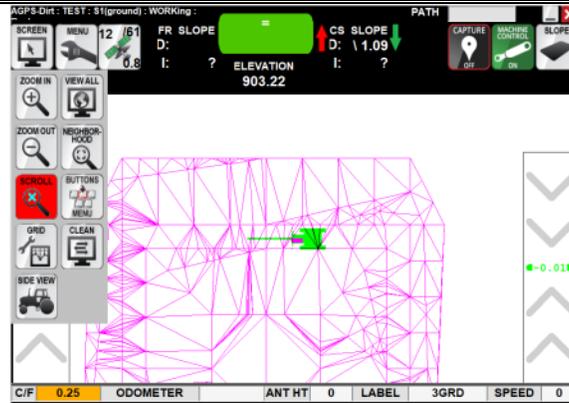
Icon	Name	Description
ZOOM IN	**Zoom In**	Pressing the Zoom In Icon will Zoom the view in, centered on your current position (either real or fake).
VIEW ALL	**View All**	Pressing the View All Icon will Zoom the screen to show all completed lines or the entire background image/drawing.
ZOOM OUT	**Zoom Out**	Pressing the Zoom Out icon will Zoom the view out, centered on your current position (either real or fake).
NEIGHBOR-HOOD	**Neighborhood**	The Neighborhood Icon will Zoom the screen into the neighborhood of your current position (either real or fake).
SIDE VIEW / TOP VIEW	**Side/Top View**	Toggles between a Side View (Topography) and Top View (Blade View).
BUTTONS MENU	**Buttons Menu**	Displays the Buttons Menu. The Buttons Menu has shortcuts with keyboard hotkeys for commonly used program functions.
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"
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.
GRID	**Grid**	Displays the Grid Menu.

AGPS DIRT PRO

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	Toggle Blade Riding/Working	*P*	Path Menu
PageUp	Move Blade Up	*Q*	Quit Menu
Page Down	Move Blade Down	*R*	Specify Radius to Show
ArrowUp	Half of PageUp	*S*	Show View from the Side
Arrow Down	Half of pageDown	*T*	Show View from the Top
SpaceBar	Toggle Auto Capture	*U*	Main Menu
Mouse Left Button	Click Menu	*V*	Toggle between Side/Top view
A	Show All Points	*W**	Show view from the West
B	Show Buttons Menu	*X*	Grid Menu
C	Find Closest Control Point	*Y*	Negative Blade Slope
D	Find Closest Data Point	*Z**	Show 3D View looking NNE
E*	Show View from the East	*0*	Toggle Machine Control On/Off
F	Cut/Fill Offset (subgrade)	*1*	Set Rod Length
G	Toggle stop/go mode	*2*	Set Point Label
I	Zoom In	*3**	Specify a 3D View
K	Mark Special Points	*4*	Set the next point number
L	Log a Stake	*6*	Control the Instrument
M	Manually capture a point	*7*	Capture a Note
N	Show Neighborhood of current position	*8*	Display/Plot Menu
O	Zoom out	*9*	Devices Menu
-	Switch Laser Light Planes	*=*	Switch Rod-Length Offset

*Only an option when Disable alternate viewing angles =OFF in the Plot Menu, on page 47.

∥AGPS DIRT PRO

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 working. You can toggle the Click Menu on and off in the Miscellaneous Actions Menu, on page 51
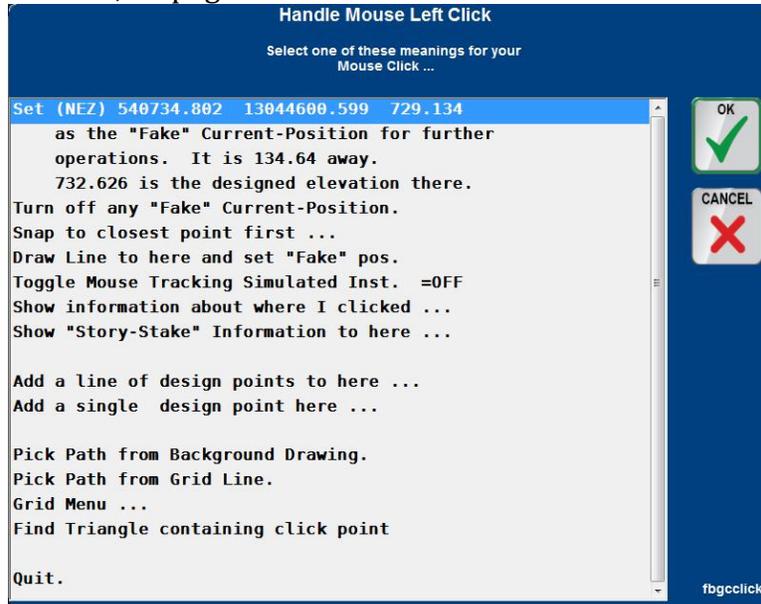
Set NEZ as 'fake position'	Sets the current NEZ (it will be displayed) as a 'fake position'. A 'fake position' will be used for any zoom, grid, and other functions, rather than your actual position.
Turn off any 'fake' current positions	Turns off any 'fake' positions. After using the scroll icon to move 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 Simulated Inst.	Used for GPS Simulators.
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).
Show 'Story-Stake' Information to here	Gives information for putting a line of grade stakes between your location and your click.
Add a line of design points to here	Design points will be added to the surface file, between your nearest point (or a fake position) and the point you clicked. You will be shown more information about these two points, and asked how far apart the new points should be.
Add a single design point here	Adds a design point to the surface file.
Pick Path from Background Drawing	Will choose the closest background line for guidance.
Pick Path from Grid Line	Will choose the closest grid line for guidance.
Grid Menu	Opens the Grid Menu. See Grid Menu on page 36.
Find Triangle containing click point.	Displays a single triangle from the Surface file.

AGPS DIRT PRO

The Light Bars

The Light Bars allow a visual indication of your vertical accuracy. The lightbar also acts as a blade offset. The lightbar menu is a part of the plot menu, details on page 47.
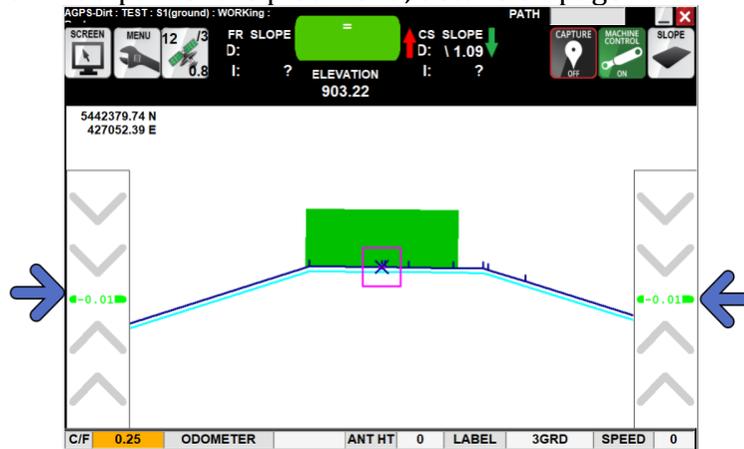
Vertical Lightbar

The Vertical lightbar will indicate how far from grade the machine is operating. If using a cross-slope sensor, it will tell you the tilt of the blade from grade. 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 Miscellaneous menu for "Distance blade moved by Pg Up,Pg Dn". To change this amount, see the Miscellaneous Menu, on page 51

The Light Bar Menu

Access this menu by Pressing the Menu Icon, and then Setup Icon. Highlight Plot Menu – OK, Light Bar Menu – OK.

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 (blade) view only.
Use Color Box Instead	When =ON, instead of showing arrows, the lightbar area will be filled with a solid color. The color is determined by the settings of the Color Grid, on page 38.
Width of each Bar	The % width of the Vertical Bar(s). Increase to make the Vertical Bar(s) wider.
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 .05 and -.05

35

The Grid

The Grid allows for a visual indication of distance. The grid can be set to any spacing and rotated to any angle. There is also a color grid option of 3 different sets of data: cut/fill amount; deflection amount; and visits count. If you are building your design in AGPS-Shape Pro™, importing an .fbg or building you field in Opti-surface, this data will often be included in the file. If you are designing in the field, you would need to capture this data.

Setting up the Grid

Press the Screen Icon
Select Grid
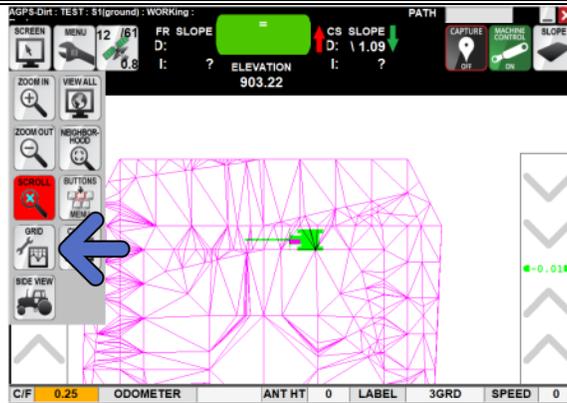
The grid menu is where you adjust the grid
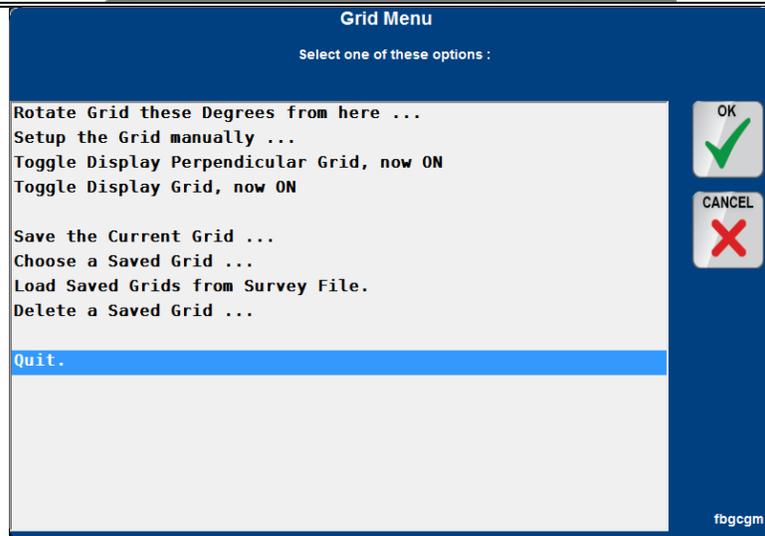
Rotate Grid these Degrees
Allows you to rotate the grid a number of degrees from its current angle.

AGPS DIRT PRO
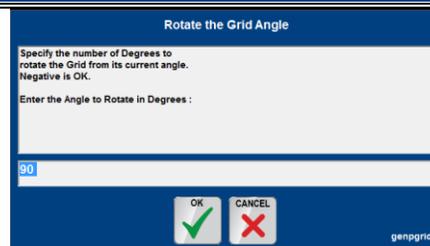
Setup Grid Manually Allows you to set the course and fine of the grid. Fine will be displayed in RED, course in GREEN. For instance, if your blade is 15 feet wide, you would set the course for 30 and the fine for 15, alternating the grid red and green every 15 feet.	**Plot Grid Sizes** Enter both the Coarse and Fine grid sizes. They should both be valid distances. They may both be the same size. Coarse 1000 Fine 100 OK CANCEL genplotgrids
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.	**Grid Offset** Enter the coordinates of a point that the grid will be relative to. You will probably either type all ZEROES here or will have picked other coordinates by clicking. Northing 0 Easting 0 Elevation 0 OK CANCEL genplotgrido
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 (parallel lines)
Toggle Display Grid	Toggle the entire grid On and OFF.
Save the Current Grid You can save and name your current grid to return to it later	**Name the Grid** You may want to enter a name for the current Grid, that you are saving, below: OK CANCEL gengridsave
Choose a Saved Grid Recall a saved grid	**Choose a Grid** Select one of these saved Grids to be the Current Grid ... 05/02,15:28:36.17 1000 x 100 Saved Grid 2 05/02,15:28:31.59 1000 x 100 Saved Grid 1 OK CANCEL gengridchoose
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.

Press the Menu Icon
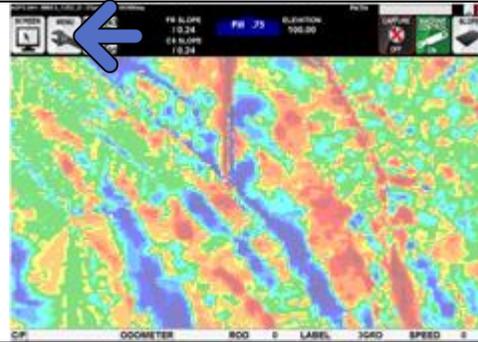
Select Plot Menu
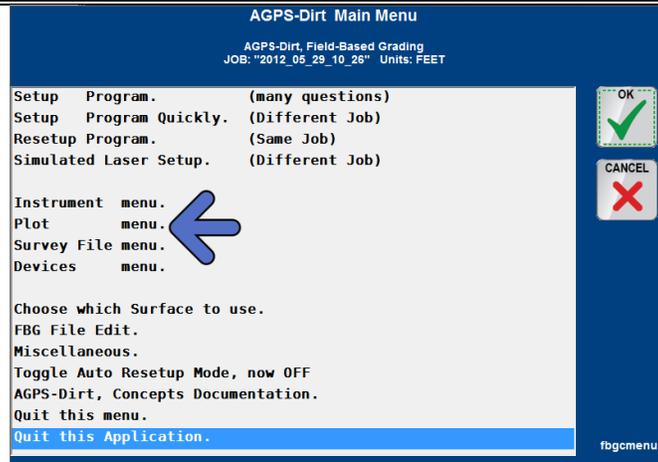
Select Color Grid Control

AGPS DIRT PRO
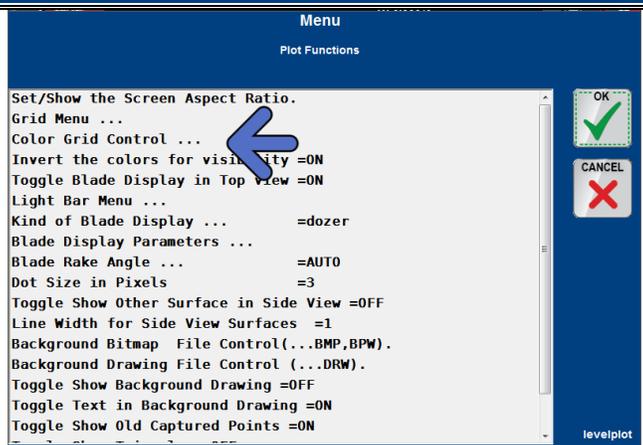
Color Grid Type
The menu for the Color Grid Type.
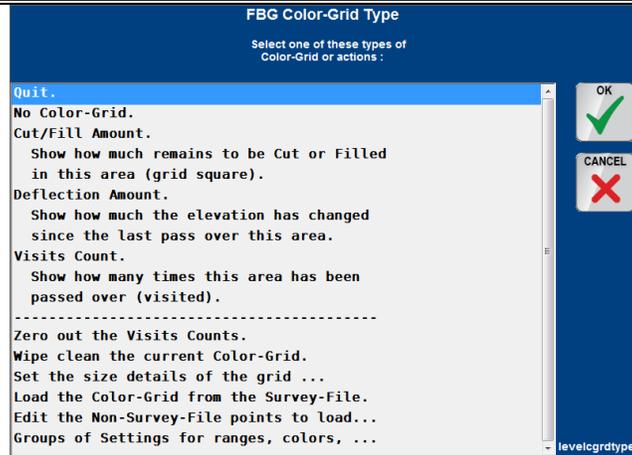
Cut/Fill Amount
This is the recommened selection.
Shows the amount to be cut/filled
for each grid section. After you
select the option you can change the
color for each zone (not
recommended).
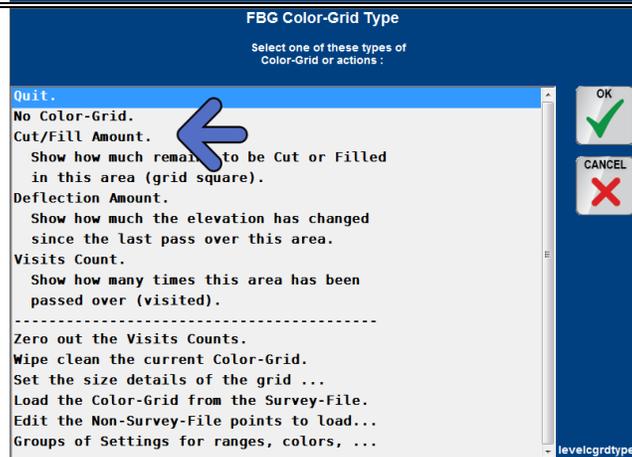
Deflection Amount
Shows how much the elevation has
changed (compacted) since the last
pass over the area. After you select
the option you can change the color
for each zone (not recommended).

FBG Color-Grid Type

Select one of these types of
Color-Grid or actions :

```
Quit.
No Color-Grid.
Cut/Fill Amount.
  Show how much remains to be Cut or Filled
  in this area (grid square).
Deflection Amount.
  Show how much the elevation has changed
  since the last pass over this area.
Visits Count.
  Show how many times this area has been
  passed over (visited).
----------------------------------------
Zero out the Visits Counts.
Wipe clean the current Color-Grid.
Set the size details of the grid ...
Load the Color-Grid from the Survey-File.
Edit the Non-Survey-File points to load...
Groups of Settings for ranges, colors, ...
```

OK ✓   CANCEL ✗   levelcgrdtype

Visits Amount

Shows how often you have visited an area of the grid. After you select the option you can change the color for each zone (not recommended).
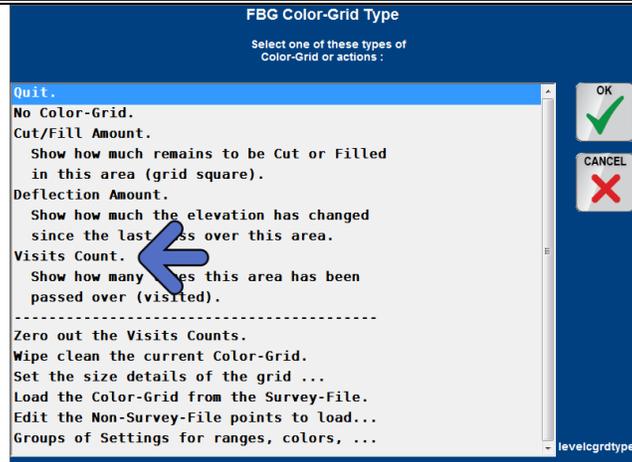
Zero out the Visits Count	Allows you to set the visit count to zero (cannot be undone)
Wipe clean the current color-grid	Removes the data for a given color-grid
Set the size details of the grid	Allows you to manually set the size of the grid (same as setting up the grid)
Load a Color-Grid from .SVY and .GPE	Reloads the Color-Grid information from the 2 files containing surface points.
Edit the GPE, non-survey-file points to load	Edit the .GPE points file. This file is similar to a .NEZ file, and should be loaded with topo points that are not in the .SVY
Groups of Settings for ranges, colors . . .	Allows you to save a group of settings for the color-grid (if you have created custom colors, etc)

Color Grid Key

			Alternate Groups	
Default			**Flat_land_level**	**Indicate**
99 > 2.01		rgb(64,0,0)	99 > 0.751	99 > 2.01
2.00 > 1.01		rgb(128,0,0)	0.75 > 0.501	2.00 > 1.01
1.00 > 0.501		rgb(192,0,0)	0.50 > 0.331	1.00 > 0.501
0.50 > 0.351		rgb(255,0,0)	0.33 > 0.201	0.50 > 0.401
0.35 > 0.201		rgb(255,96,0)	0.20 > 0.101	0.40 > 0.301
0.20 > 0.101		rgb(255,160,0)	0.10 > 0.051	0.30 > 0.201
0.10 > 0.051		rgb(255,255,0)	0.05 > 0.031	0.20 > 0.101
0.05 > -0.05		rgb(0,192,0)	0.03 > -0.03	0.10 > -0.10
-0.051 > -0.10		rgb(0,255,128)	-0.031 > -0.05	-0.101 > -0.20
-0.101 > -0.20		rgb(0,255,255)	-0.051 > -0.10	-0.201 > -0.30
-0.201 > -0.35		rgb(0,128,255)	-0.101 > -0.20	-0.301 > -0.40
-0.351 > -0.50		rgb(0,0,255)	-0.201 > -0.33	-0.401 > -0.50
-0.501 > -1.00		rgb(0,0,160)	-0.331 > -0.50	-0.501 > -1.00
-1.01 > -2.00		rgb(0,0,96)	-0.501 > -0.75	-1.01 > -2.00
-2.01 > -99		rgb(0,0,32)	-0.751 > -99	-2.01 > -99

AGPS DIRT PRO

Loading Background Images

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

Typically AGPS-Dirt Pro™ Supports Bitmap images in the .bmp format with a georeferencing .bpw file associated with it, or .drw polyline files. Consult your AGPS-Dirt 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 Bitmap (step 4) or **Background Drawing (Step 5)** A Bitmap image is a snapshot image (such as you would export from Ag Data Viewer™). A Background Drawing 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.	
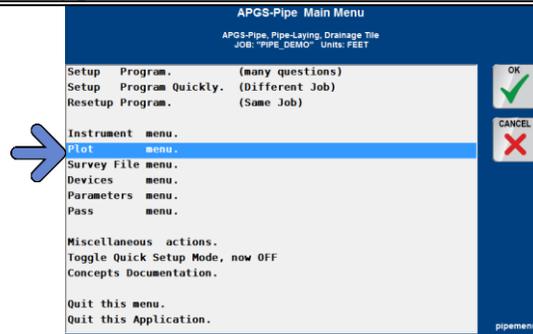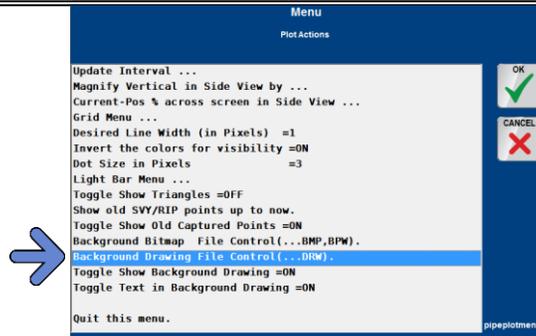
AGPS DIRT PRO

Background Drawing File Control

C:\AMW\DATA\pipe_demo.DRW
(a good sample is in the file "SAMPLE.DRW")

```
Quit.  No (further) changes.
Append 1 line to the bottom of this file
Edit the file with "Notepad"(tm)  <<<<<
Edit the file with "Wordpad"(tm)
Replace this file with another file
Save this file somewhere
Append another file to the end of this file
Toggle Show/Hide of the drawing ...=ON
Toggle Show/Hide of TEXT ... =ON
Toggle Obey/Ignore COLORS ... =ON
Toggle Clicking/Snapping ... =ON
Build from an OptiSurface(tm) .agd file
Build from an Ag Data Viewer(tm) .AGP_PRF File
Build from ESRI/Arc ShapeFiles ...
Build from KML/KMZ Files ...
Build from a LANDXML file
Build from a PLN File
Build from a SVY File
Contour Map built from a .SVY by Surfer(tm)
Contour Map built from a .SVY file ...
Contour Map built from a .NEZ file ...
Export a DXF file from this DRW file ...
Build a DXF file from a DWG file ...
Build from a DXF File
```

OK

CANCEL

PRINT

drawing

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.
See details in the table below.
Contact an AGPS Technician for help with other supported file types.
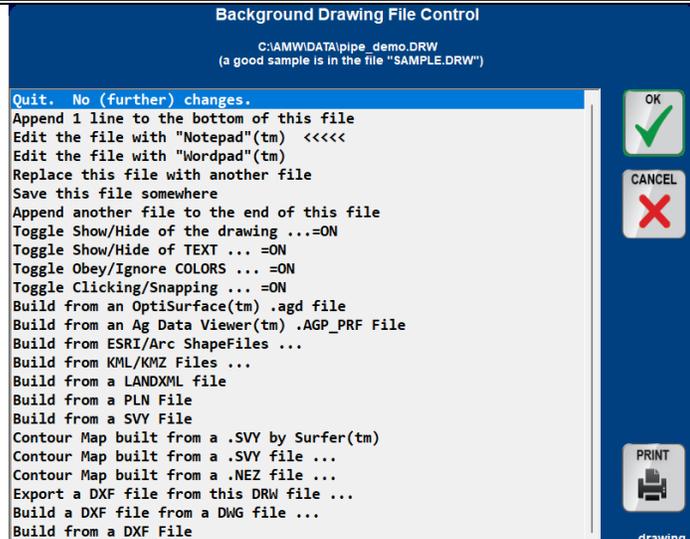
Edit file w/ "Notepad"™/"Wordpad"™	Open a text editor to view/edit the information.
Replace this file with another file	If you have a .drw file you would like to load.
Save this file somewhere	Copy the current .drw file to another name (like backup) or location.
Append another file to the end …	Add on 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 __ (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.

AGPS DIRT PRO

Collecting Field Data

Topography data and Point Labels

Point labels define the type of data you are collecting (Boundry Perimeter, Random Ground or Reference Point). If you are going to design in the field by using Opti-Surface/ezigrade, you must capture your topography data first.

Point Labels

There are several different types of data you can collect in AGPS-Dirt Pro™.

<table>
<tr>
<td>
To select the data you want
Press the Capture Icon.
To see what label is currently selected, look at the label portion of the bottom working bar
</td>
<td></td>
</tr>
</table>
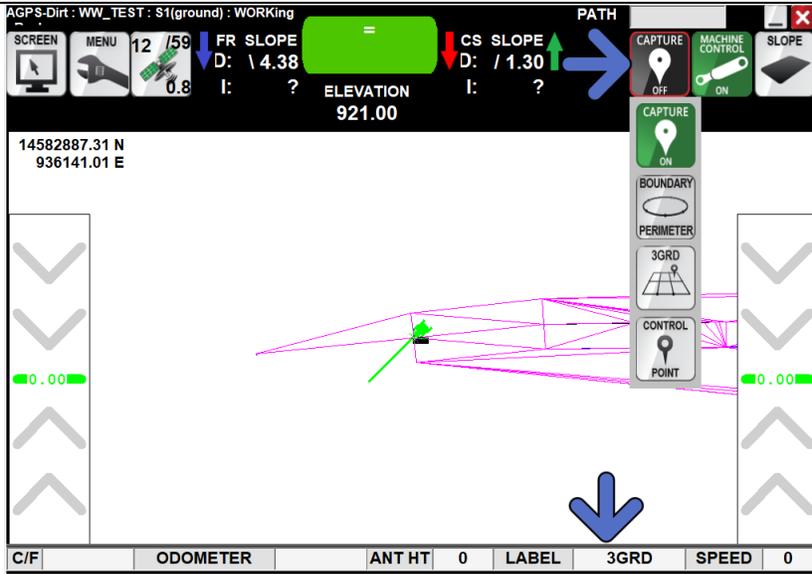
	Capture On/Off	Touch to toggle capturing data On/Off. Note that when there is a design loaded, Machine Control will control to grade regardless if Capture is turned On or Off.
	Boundry Perimeter	Select to set data collection to Boundry/Perimeter. This will tell the program where the edge of the job is. Its point label is 2PER.
	Random Ground	Select to set data collection of Random Ground. This is topography data collected throughout the field. Its point label is 3GRD.
	Reference	Select to collect a reference point (also known as a control point) somewhere in the field.
	Label Menu	You may also touch "Label" at the bottom of the screen to access the Label Menu to enter custom labels.
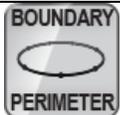
Collecting a Reference (Control) Point

Select your Rod Length
This may be the typical rod length of the machine or a different Rod Length (e.g. if you were taking the GPS globe off of the machine to reach a culvert)
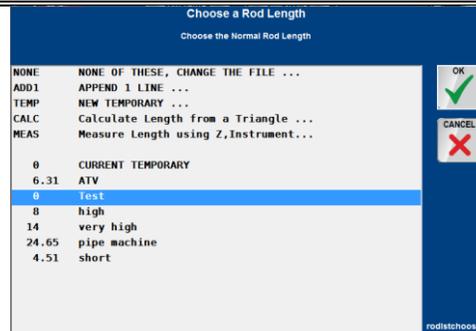
Read the Instrument
On this screen you may also
-Control the Instrument
-Pause before read (usually used if capturing a control point by yourself)
-Set the 'Tries' for averaging (10 is common, if you are in dense tree cover you may increase it to 20)
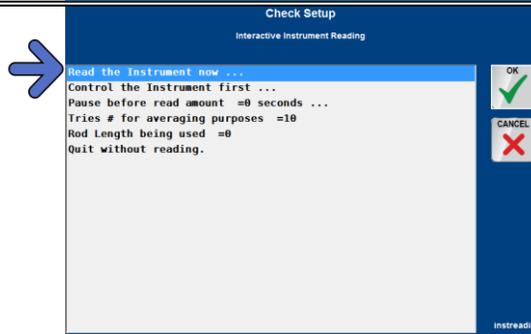
Name the Point
You will receive a confirmation that the reads were successful.
You can name the point and put a description. The default name is a1 (this number increases each time you capture a control point.)
The point name must be between 1 and 8 letters and/or numbers long.
Description can be any length.
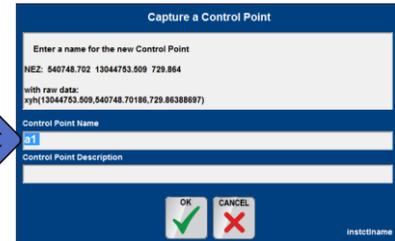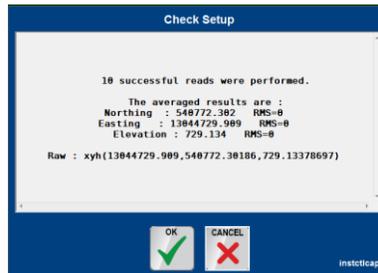
Set your Rod Length back
If you changed your Rod Length you can set it back.

//AGPS DIRT PRO
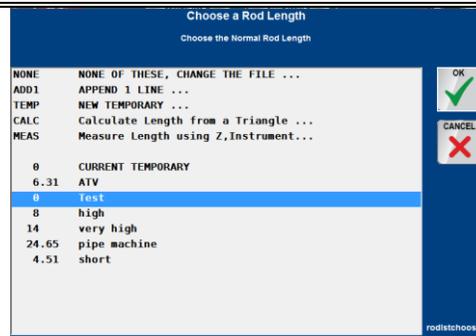
Menus

Main Menu

 Pressing the Menu Icon, and then Setup Icon will bring up the Main Menu. From here you can select the action you want to perform.
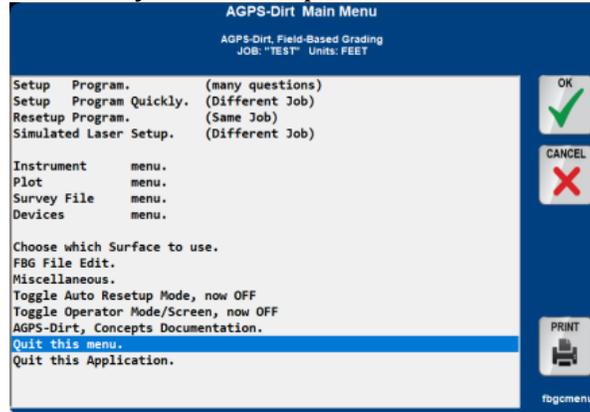
Setup Program (many questions)	Used to perform an initial set-up of the program (select GPS, machine control, etc.). See Setting up the Program for the first time on page 11
Setup Program Quickly	Used to start a new job or to select a previously created job. See Starting a New Job or Restarting a Current Job on page 15.
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 15.
Simulated Laser Setup	Used to start a new job with in the field designing. See Surface Setup 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 46.
Plot Menu	Controls how things are drawn/displayed on the Main Working Screen. See Plot Menu on page 47.
Survey File Menu	Control how the survey file is saved, export survey file, or edit the survey file. See Survey File on page 48.
Devices Menu	Set or adjust Machine Controls and/or slope sensors. See Devices Menu on page 49.
Choose which Surface to use	Select from different surfaces (for instance if using multiple .fbg files)
FBG File Edit	Edit the current .fbg file (if you need to add a data point, etc.)
Miscellaneous actions	Miscellaneous actions that can be performed. See Miscellaneous actions on page 51.
Toggle Auto ReSetup Mode	If Auto Resetup Mode is toggled ON, AGPS-Dirt Pro™ will skip the startup Dashboard and load directly to the AGPS-Dirt Pro™ Main Menu.
Toggle Operator Mode	When Operator Mode is ON, a lot of the setup/configuration related menus are hidden.
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 53.

Instrument Menu

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

```
Measuring-Instrument Menu

                      Measuring-Instrument

Choose the type of Instrument.
Position settings for the Instrument.
Control the Instrument.

======== Control Points ===========
Check Setup.
Capture a Control Point.
Edit the Control Point File.

======== Rod Settings =============
Normal Use Rod Length.
Current Rod Length.
Rod Tip Corrections ...
Rod Length offset for "=" key.

======== Behavior Setings =========
Min/Max Distances, Speed, Slope.
Offsetting Options ...
Tilted Plane Options ...
Toggle Earth Curvature Corrections ...
Direction Change Required Distance  =0.492
Velocity Delay for smooth speed     =2000
Parameter Value for Smoothing       =0
Reads to Skip after a read Error    =0
Toggle Asking for Localization      =OFF
Toggle Do Auto Check Setup          =ON
Toggle Do UTM setups only           =OFF
Toggle Show Position Setup Summary   =ON


Devices menu.
Quit this menu.                             instmenu
```

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 54.
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 44.
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 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.
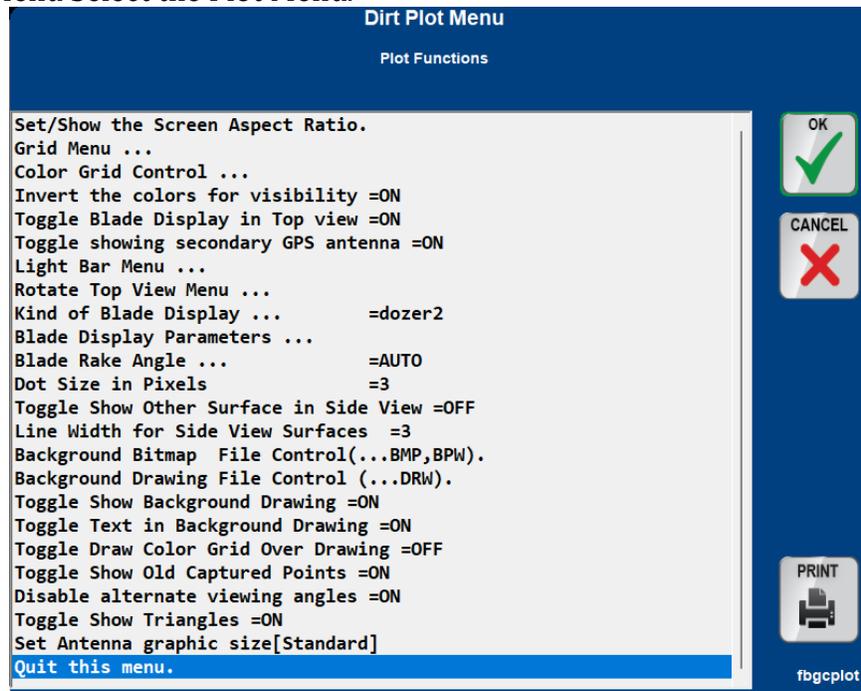
Set/Show the Screen Aspect Ratio	Set the current Screen Aspect Ratio.
Grid Menu	Takes you to the Grid Menu. See Grid Menu on page 36
Color Grid Control	Takes you to the Color Grid Control Menu. See Setting up the Color Grid on page 38
Invert the colors for Visibility	Toggle between a 'day' color palate and a 'night' color palate.
Toggle Blade Display in Top View	Toggle the scaling of the blade, based on "Blade Display Parameters" below.

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Toggle showing secondary GPS antenna	Toggle a second position box at the location of each GPS antenna, not only a single (center). Used only with Instrument options for Dual GPS.
Light Bar Menu	See The Light Bars on page 35
Rotate Top View Menu	Contains Toggle On/Off and settings to automatically rotate the top view screen based on direction of travel.
Kind of Blade Display	Icon to use in Blade Display. Options are T, Dozer, Grader, Dozer Solid, or Dozer Hollow.
Blade Display Parameters	Sets the Width, Height and Instrument Offset (all in chosen units like Feet) for the blade display in side view
Blade Rake Angle	Allows you to set the horizontal angle (in degrees) that the blade is rotated relative to the machine. If you have a blade controller that sends the rake angle, leave this on auto, otherwise set the blade rake angle here.
Dot size	Change the Pixel size for dots.
Toggle Show Other Surface in Side View	If multiple surfaces have been loaded, you can enable the display in the side view.
Line Width for Side View Surfaces	The width of a line in Side View (1 is default, 2 or 3 recommended for thicker).
Background Bitmap	See Loading Background Images on page 41
Background Drawing	See Loading Background Images on page 41
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
Toggle Show 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.
Toggle Show Triangles	Shows the triangles in the TIN. Useful to see if an imported data has sufficient data/triangles for accurate surface control. Usually turn this back =OFF.
Set antenna graphic size	Options for Standard or Large (Hi-Res) to increase the size of the position box.

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.

```
                          Menu
                     Survey File Actions

Backup the job to Ext.Dest.
Format the survey file to a NEZ file.                          OK
Format and edit a survey file report                          ✓
Format a DCA Fieldbook file on Ext.Dest.
Ext.Dest. (External Destination)  = D:                     CANCEL
                                                              ✗
Show Extreme values of points in survey file.
Shift the data in the survey file.
Set/Show the Job Name ( and survey file name).
Load the survey file from the hard disk.
Set the Description of the current job.

!! DANGER !! Options below may destroy work.
Copy Files from another Job to this Job.
Delete the survey file from the hard disk.                  PRINT
Edit the survey file.                                         🖶
Restore the survey file from Ext.Dest.
Edit any file (default is the NEZ file).

Quit this menu.                                          svyfilemenu
```

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.

```
                           Device Menu
                    Set the Parameters this program needs
                         to control external devices.

Internal use...                                      ┌──────┐
    Blade/Screed Control -----------                 │  OK  │
Set the Enablement ... =YES                          │  ✓   │
Choose the Kind of Control ... =lasertm (tm)         └──────┘
Setup ...                                            ┌──────┐
Minimum Vehicle Speed for Blade Control =0           │CANCEL│
Move Manually ...                                    │  ✗   │
Show input messages.                                 └──────┘
Show Last Blade Command.
Enter a command ...


Fore-Slope Add Percent ...    =0
Fore-Slope Multiplier         =1
Maximum % Fore-Slope supported by sensor =90
Fore Slope Time Minimum       =350
Maximum % Side-Slope supported by sensor =90
Side Slope Time Minimum       =350
Side Slope Last Use Time Max  =2000


Toggle use of UP/DOWN Response Below  =ON
UP   Response Definition
DOWN Response Definition
Groups of Settings ...


Quit this menu.                                      devicesmenu
```

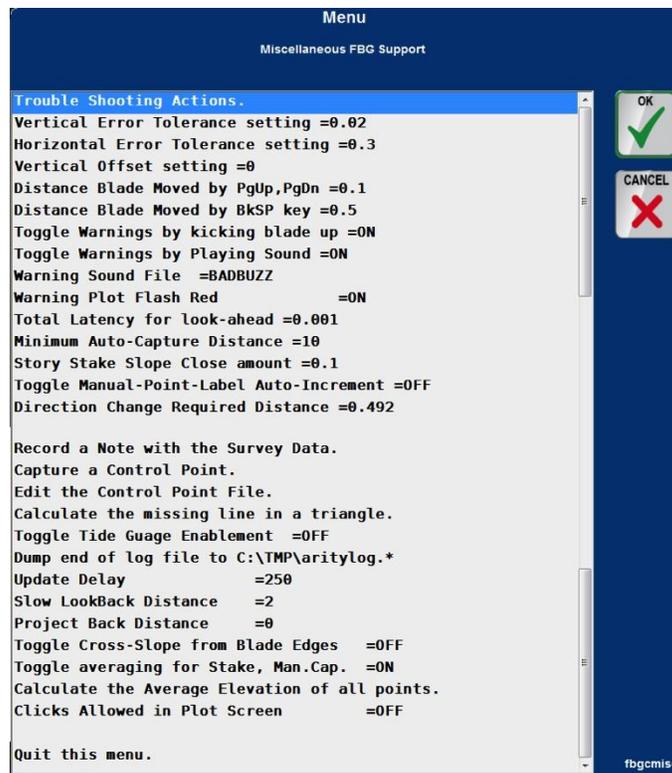| Set the Enablement	Sets Machine Control ON or OFF. Must be =YES for Machine Control to function.
Choose the Kind of Control	Choose the type of Machine Controller. Speak to the manufacturer of the Machine Controller with questions.
Setup	Setup the Machine Controller. Allows you to set COM port and other 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 (2 to 5) 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-Dirt 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 add percent	Additional percentage to add 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

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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.
Fore Slope Time	The minimum number of milliseconds between attempts to adjust the slope.
Maximum Percentage Side-Slope	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.
Side Slope Time Minimum	The minimum number of milliseconds between attempts to adjust the side-slope.
Side(Fore) Slope Last Use Time Max	This allows the program to stop using an old message if the slope sensor is not functioning. Set this value to the maximum number of milliseconds since the program received a reading from the Slope Sensor. Setting it at 0 will always use the last reading.
Toggle Use of Up/Down	Toggles the Up/Down settings ON or OFF
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	Allows you to save different groups of UP/DOWN Response Settings

Miscellaneous actions

Miscellaneous actions that can be performed.
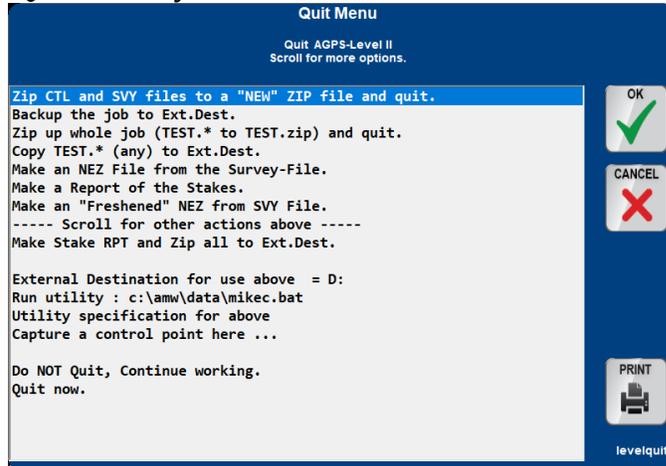From the Main Menu Select the Miscellaneous Actions.

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Trouble Shooting Actions	Opens the troubleshooting menu.
Vertical Error Tolerance	Sets the Vertical Difference where the program will show 'good'.
Horizontal Error Tolerance	Sets the Horizontal Difference where the program will show 'good'.
Vertical Offset Setting	Sets a Vertical 'Cut/Fill' Offset amount.
Distance Blade Moved by PgUp,PgDn	Sets the Cut/Fill offset amount added/subtracted by pressing Page Up or Page Down on the Keyboard or by pressing the chevrons on the Vertical Light Bar. NOTE: Up Arrow and Down Arrow or inner chevrons are half this value.
Distance Blade Moved by BkSP	Offsets the blade up into a "Riding Mode". Pressing Backspace again will put it back to "Working Mode" and the previous Cut/Fill Offset.
Toggle Warnings by kicking blade up	Automatically raises the blade when there is an error (i.e. bad GPS signal). This helps prevent over-cutting when automatic control stops.
Toggle Warnings by Playing Sound	Toggles a warning sound that plays if there is an error (i.e. bad GPS signal)
Warning Sound File	Change the warning sound file.
Warning Plot Flash Red	Toggles whether or not the screen will flash red if there is a warning.
Total Latency for look-ahead	How quick the Instrument (GPS) responds, so how far ahead the program looks. Most modern GPS systems have a 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
Story Stake Slope Close amount	The difference in slope percentage to consider in reporting as the same slope when making a stake report.
Toggle Manual-Point-Label Auto-Increment	Toggle manually or automatically incrementing the point number when capturing a point or stake.
Direction Change Required Distance	The distance that you need to move in 1 second for the program to recognize a change in direction in movement
Record a Note with the Survey Data	Record a Note that will be saved with the survey data
Capture a control point	Capture a Reference (Control) Point. See Capturing a Reference Point on page 44.
Edit the Control Point File	Edit or manually enter a Reference (Control) Point.
Calculate the Missing line of a triangle	If working with previous topo, will calculate a missing line from a triangle as close as mathematically possible.
Toggle Tide Gauge Enablement	(Not currently Implemented). The idea was to have a visual tilt icon, instead of number for fore slope at the top of the screen.
Dump end of log file	Saves the end of the program log for sending to a Tech for troubleshooting.
Update Delay	Set the Update Delay, which is the time in milliseconds before the working screen is updated because a lookup was performed.
Slow Look back Distance	A distance back to look when traveling very slowly. It affects how Fore-Slope is calculated.
Project Back Distance	A distance straight back from the GPS antenna you want to project (offset) to.
Toggle Cross Slope from Blade Edges	Toggle calculating slope at blade edges instead of directly under the GPS antenna.
Toggle averaging for Stake, Man.Cap	Toggles the prompt for using several averaged reads for capturing a stake or reference point.
Calculate Average Elevation of All Points	Calculates the average of all captured points.
Clicks Allowed in Plot Screen	Toggles allowing the Click Menu to be displayed when the screen is touched.

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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.
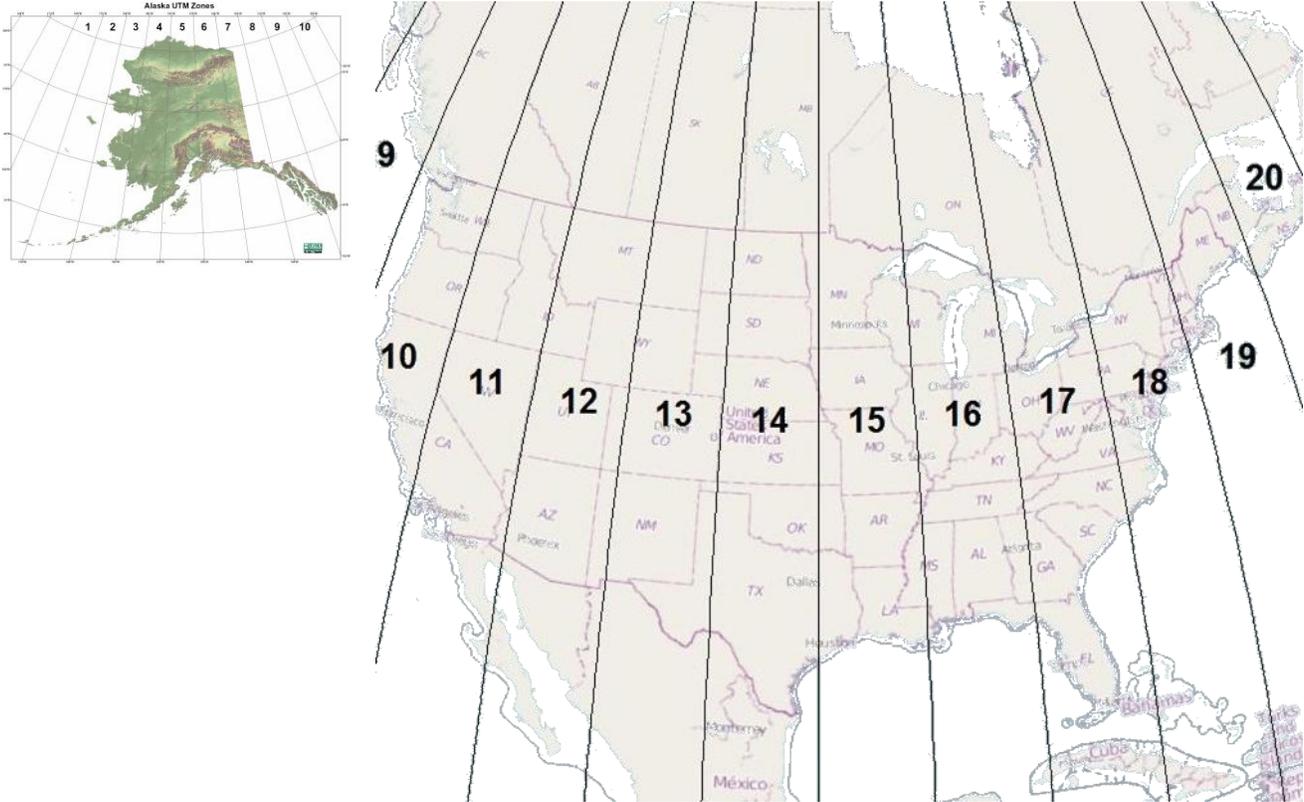
```
                         Quit Menu
                      Quit AGPS-Level II
                     Scroll for more options.

  Zip CTL and SVY files to a "NEW" ZIP file and quit.          OK
  Backup the job to Ext.Dest.                                  ✓
  Zip up whole job (TEST.* to TEST.zip) and quit.
  Copy TEST.* (any) to Ext.Dest.
  Make an NEZ File from the Survey-File.
  Make a Report of the Stakes.                               CANCEL
  Make an "Freshened" NEZ from SVY File.                       ✗
  ----- Scroll for other actions above -----
  Make Stake RPT and Zip all to Ext.Dest.

  External Destination for use above  = D:
  Run utility : c:\amw\data\mikec.bat
  Utility specification for above
  Capture a control point here ...
                                                              PRINT
  Do NOT Quit, Continue working.                               🖶
  Quit now.
                                                             levelquit
```

Backup the job to Ext.Dest	Creates a backup of the data and saves it to the external destination selected.
Zip up whole job	Creates a .zip directory of all of the files pertaining to the current job.
Copy (any) to external destination	Copies any files with the current job name to an external destination.
Make an NEZ file from the Survey-File	Creates a .NEZ (northing-easting-elevation) data file from the survey-file.
Make a Report of the Stakes	Generates a report of the staking done during work.
Make an 'Freshened' NEZ	Creates a .NEZ file with only the most recent points, ignoring older points within a certain radius.
Make Stake RPT and Zip all to Ext.Dest.	See above
Volume and Area Comparison	If you have Surfer™ installed, you can see a volume and area comparison.
External Destination for use above	Sets the drive letter of your external destination. (If there is no drive installed, defaults to the data directory of AGPS.)
Capture a Control Point here	The same steps as Collecting a Reference (Control) point, on page 44.
Do not quit, Continue Working	Returns to working Screen
Quit Now	Quits to the AGPS Main Menu.

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UTM Zones and State Plane

UTM Zone (Universal Transverse Mercator (UTM) geographic coordinate system) and State Planes are coordinate systems to help GPS signals be more accurate in the real world. UTM is a world-wide system that takes earth curvature into account, State Plane 'ignores' earth curvature.

UTM Zones

State Plane

SPC Zones - 2004