*Ag*GPS Parallel Swathing Option

Manual

Part Number 34900-00

Revision D

January 1999

Trimble Navigation Limited
645 North Mary Avenue
P.O. Box 3642
Sunnyvale, CA 94088-3642
U.S.A.
1-800-827-8000 in North America
+1-408-481-8000 International
Fax: +1-408-481-7744
www.trimble.com

Trimble
Precision Agricultural Systems
9290 Bond Street, Suite 102
Overland Park, KS 66214
U.S.A.
+1-800-865-7438 in North America
+1-913-495-2700 International
FAX: +1-913-495-2750

Trimble Navigation Europe Limited
Trimble House, Meridian Office Park
Osborn Way, Hook
Hampshire RG27 9HX
ENGLAND
+44-1256-760-150
Fax: +44-1256-760-148
Voicemail: +44-1256-761-130

Trimble Navigation Singapore PTE Limited
79 Anson Road
 # 05-02
Singapore 079906
SINGAPORE
+65-325-5668
Fax: +65-225-9989
Voicemail: +65-325-5668

Trimble Japan K.K.
Sumitomo Hamamatsu-cho, Building 10F
1-18-16 Hamamatsu-cho Minato-ku
Tokyo 105
JAPAN
+81-3-5472-0880
Fax: +81-3-5472-2326

Trimble Navigation New Zealand Limited
11 Birmingham Drive
P.O. Box 8729 Riccarton
Christchurch
NEW ZEALAND
+64-3-339-1400
Fax: +64-3-339-1417

Copyright

Printed in the United States of America. Printed on recycled paper.

Release Notice

This is the January 1999 release (Revision D) of the *AgGPS Parallel Swathing Option Manual*, part number 34900-00.

Trademarks

Trimble and the Trimble logo are trademarks of Trimble Navigation Limited, registered in the United States and other countries. *Ag*GPS is a trademark of Trimble Navigation Limited.

Microsoft, MS-DOS, Windows, Windows 95, and Windows NT are registered trademarks or trademarks of Microsoft Corporation. LandStar is a trademark and a service mark of Racal NCS, Inc. Intel is a trademark of Intel Corporation. All other brand names are trademarks of their respective holders.

Disclaimer of Warranty

EXCEPT AS INDICATED IN "LIMITED WARRANTY" HEREIN, TRIMBLE HARDWARE, SOFTWARE, FIRMWARE AND DOCUMENTATION IS PROVIDED "AS IS" AND WITHOUT EXPRESS OR LIMITED WARRANTY OF ANY KIND BY EITHER TRIMBLE NAVIGATION LIMITED OR ANYONE WHO HAS BEEN INVOLVED IN ITS CREATION, PRODUCTION, OR DISTRIBUTION INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK, AS TO THE QUALITY AND PERFORMANCE OF THE TRIMBLE HARDWARE, SOFTWARE, FIRMWARE AND DOCUMENTATION, IS WITH YOU. SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

Limitation of Liability

IN NO EVENT WILL TRIMBLE NAVIGATION LIMITED OR ANY PERSON INVOLVED IN THE CREATION, PRODUCTION, OR DISTRIBUTION OF THE TRIMBLE SOFTWARE BE LIABLE TO YOU ON ACCOUNT OF ANY CLAIM FOR ANY DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR OTHER SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY DAMAGES ASSESSED AGAINST OR PAID BY YOU TO ANY THIRD PARTY, RISING OUT OF THE USE, LIABILITY TO USE, QUALITY OR PERFORMANCE OF SUCH TRIMBLE SOFTWARE AND DOCUMENTATION, EVEN IF TRIMBLE NAVIGATION LIMITED OR ANY SUCH PERSON OR ENTITY HAS BEEN ADVISED OF THE POSSIBILITY OF DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY. SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES SO, THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Software and Firmware Limited Warranty

Trimble Navigation Limited warrants that Software and Firmware products will substantially conform to the published specifications provided it is used with the Trimble products, computer products, and operating system for which it was designed. For a period of ninety (90) days, commencing thirty (30) days after shipment from Trimble, Trimble also warrants that the magnetic media on which Software and Firmware are distributed and the documentation are free from defects in materials and workmanship. During the ninety (90) day warranty period, Trimble will replace defective media or documentation, or correct substantial program errors at no charge. If Trimble is unable to replace defective media or documentation, or correct program errors, Trimble will refund the price paid for The Software. These are your sole remedies for any breach in warranty.

Hardware Limited Warranty

Trimble Navigation Limited products are warranted against defects in material and workmanship for a period of one year. The warranty period shall commence thirty (30) days after shipment from Trimble's factory. Warranty service will be provided at a designated Trimble Service Center. Trimble will at its option either repair or replace products that prove to be defective. The Customer shall pay all shipping charges for products returned to Trimble for warranty service. Trimble shall pay all shipping charges for the return of products to the Customer.

The above warranty shall not apply to defects resulting from:

1. Improper or inadequate maintenance by the buyer
2. Buyer-supplied software or interfacing
3. Unauthorized modification or misuse
4. Operation outside of the environmental specifications of the product
5. Improper installation, where applicable
6. Lightning or other electrical discharge
7. Fresh or salt water immersion or spray
8. Normal wear and tear on consumable parts (for example, batteries)

No other warranty is expressed or implied. Trimble Navigation Limited specifically disclaims the implied warranties of fitness for a particular purpose and merchantability.

Table of Contents

2 Getting Started

3 Using the Parallel Swathing Option

Index

List of Figures

List of Tables

About This Manual

Welcome to the *AgGPS Parallel Swathing Option Manual*. As part of your precision agriculture system, the Parallel Swathing Option provides accurate field guidance without the use of foam, disk markers, or other conventional guidance methods.

This manual describes how to install, configure and use the parallel swathing option. For technical information regarding the *Ag*GPS system, please refer to the appropriate *Ag*GPS receiver manual.

Scope and Audience

We recommend that you read this manual before attempting to use the *Ag*GPS™ Parallel Swathing Option. The following sections provide a guide to this manual, as well as to other documentation you may have received with this product.

Organization

This manual contains the following:

- Chapter 1, Installing the Parallel Swathing Option, contains instructions for installing the parallel swathing option.
- Chapter 2, Getting Started, gives instructions for operating the parallel swathing option.
- Chapter 3, Using the Parallel Swathing Option, details the settings that support the parallel swathing option.

Other Information

This section lists sources that provide other useful information.

World Wide Web (WWW) Site

For an interactive look at Trimble, visit our site on the World Wide Web (www.trimble.com).

File Transfer Protocol (FTP) Site

Use the Trimble FTP site to send files or to receive files such as software patches, utilities, and answers to frequently asked questions (FAQs). The address is ftp://ftp.trimble.com.

You can also access the FTP site from the Trimble World Wide Web site (www.trimble.com/support/support.htm).

Technical Assistance

If you have a problem and cannot find the information you need in the product documentation, ***contact your local dealer.***

If you need further assistance, contact the Overland Park, Kansas office by phone, fax, or email. A support technician can help determine the cause of the problem and provide technical assistance.

Phone: +1-800-865-7438 (North America)
+1-913-495-2700 (International)

(8:00 am to 5:00 pm Central Standard Time)

Fax: +1-913-495-2750

Email: precision_ag@trimble.com

After the hours listed above, you can contact the Trimble Technical Assistance Center (TAC) by phone, fax, or email. A support technician can help determine the cause of the problem and provide technical assistance.

To contact TAC:

Phone: +1-800-SOS-4TAC (North America)
+1-408-481-6940 (International)

(6:00 am to 5:30 pm Pacific Standard Time)

Fax: +1-408-481-6020

Email: trimble_support@trimble.com

When you contact TAC, provide the following information:

- The Trimble product name, any software or firmware version number(s), and if appropriate, the serial number.
- Your specific question or problem.

  Please detail background information, such as the configuration of your data logger or receiver, and the exact type, make, and configuration of your computer. If you have received error messages, please specify the exact wording.

If you need to send a data file with your inquiry, please compress the file using PKZIP software by PKWARE, Inc., and name the file with the extension .ZIP.

Use one of the following methods to send the file:

- Attach the file to your email inquiry.
- Put the file on the Trimble FTP site and include the file name in your email inquiry.

Reader Comment Form

Thank you for purchasing this product. We would appreciate feedback about the documentation. Use the reader comment form at the back of this manual or, if this is not available, send comments and suggestions to the address in the front. All comments and suggestions become the property of Trimble Navigation Limited.

Document Conventions

Italics identify software menus, menu commands, dialog boxes, and the dialog box fields.

SMALL CAPITALS identify DOS commands, directories, filenames, and filename extensions.

`Courier` represents what you see printed on the screen by the DOS system or program.

`Courier Bold` represents information that you must type in a software screen or window.

Return or Ctrl + C identifies a hardware function key or key combination that you must press on a PC.

Helvetica Bold represents a software command button.

`Screen Font` is used to show information displayed on the *Ag*GPS receiver LCD display.

↵, ^, v, and > are the buttons on the *Ag*GPS receiver front panel.

Warnings, Cautions, Notes, and Tips

Warnings, cautions, notes, and tips draw attention to important information and indicate its nature and purpose.

Warning – Warnings alert you to situations that could cause personal injury or unrecoverable data loss.

Caution – Cautions alert you to situations that could cause hardware damage or software error.

Note – Notes give additional significant information about the subject to increase your knowledge, or guide your actions.

Tip – Tips indicate a shortcut or other time- or labor-saving hint that can help you make better use of the product.

1 Installing the Parallel Swathing Option

This chapter shows you how to:

- Unpack and inspect the shipment
- Install the *Ag*GPS™ 21 Lightbar
- Install the *Ag*GPS™ External Keypad

1.1 Unpacking and Inspecting the Shipment

Inspect the shipping cartons for any signs of damage before unpacking the Parallel Swathing Option. Report any damage to the shipping carrier immediately.

1.1.1 Opening the Shipping Carton

Open the shipping cartons and make sure all of the components indicated in Table 1-1 are included.

Table 1-1 Parallel Swathing Option Components

Quantity	P/N	Description
1	34624-00	*Ag*GPS 21 Lightbar
1	35204	*Ag*GPS Parallel Swathing Option cable
1	35708-00	External Keypad
1	34900-00	*Ag*GPS Parallel Swathing Manual
1	37864	Sound Alarm
1	37864-01	Sound Alarm Baffle

1.1.2 Reporting Shipping Problems

Report any problems discovered after you unpack the shipping cartons to both Trimble Customer Support and the shipping carrier.

1.2 Installation Guidelines

The *Ag*GPS 21 Lightbar should be mounted on the cab dash or ceiling.

The *Ag*GPS External Keypad should be mounted within reach of the equipment operator. Possible mounting places include the arm rest and equipment control panel.

To mount the *Ag*GPS receiver, please refer to the *Ag*GPS receiver manual.

Note – When using the parallel swathing option, the *Ag*GPS antenna *must* be mounted on the vehicle's front-to-back centerline.

1.2.1 Mounting the Lightbar

The *Ag*GPS 21 Lightbar is designed for in-cab mounting. The Lightbar should be placed within the operator's peripheral vision. Holes in the bracket allow ceiling or dash mounting. Two adjustment screws on either side of the mount allow for tilt adjustment. Configuration settings allow text to be properly oriented relative to the equipment operator.

Figure 1-1 shows the lightbar mounted in the cab.

Figure 1-1 Lightbar Mounted In the Cab

1.2.2 Mounting the External Keypad

The External Keypad should be mounted inside the cab within comfortable reach of the operator. Possible mount locations include the window, control switch panel, and operator seat arm rest.

To mount the keypad:

1. Attach female velcro tape to the desired keypad mounting location.
2. Apply male velcro tape to the bottom of the keypad.
3. Attach the keypad to the fixed male velcro tape.

1.2.3 Mounting the Sound Alarm

The Sound Alarm should be mounted inside the cab. To mount the Sound Alarm:

1. Connect the white wire from cable 5, shown in Figure 1-2, to the (+) side of the sound alarm.
2. Connect the black wire from cable 5 (Figure 1-2) to the (-)side of the sound alarm.

1.2.4 Routing and Connecting the Parallel Swathing Option Cable

The Parallel Swathing Option cable (P/N 35204) powers the *Ag*GPS receiver, Lightbar and External Keypad.

To connect the Parallel Swathing Option cable as shown in Figure 1-2:

1. Connect the right angle conxall connector (number 1 in Figure 1-2) to the *Ag*GPS receiver port B.
2. Connect the right angle conxall connector (number 2 in Figure 1-2) to the *Ag*GPS 21 Lightbar.
3. Connect the right angle conxall connector (number 3 in Figure 1-2) to the External Keypad.

4. Connect the red and black power leads (number 4 in Figure 1-2) to system power.

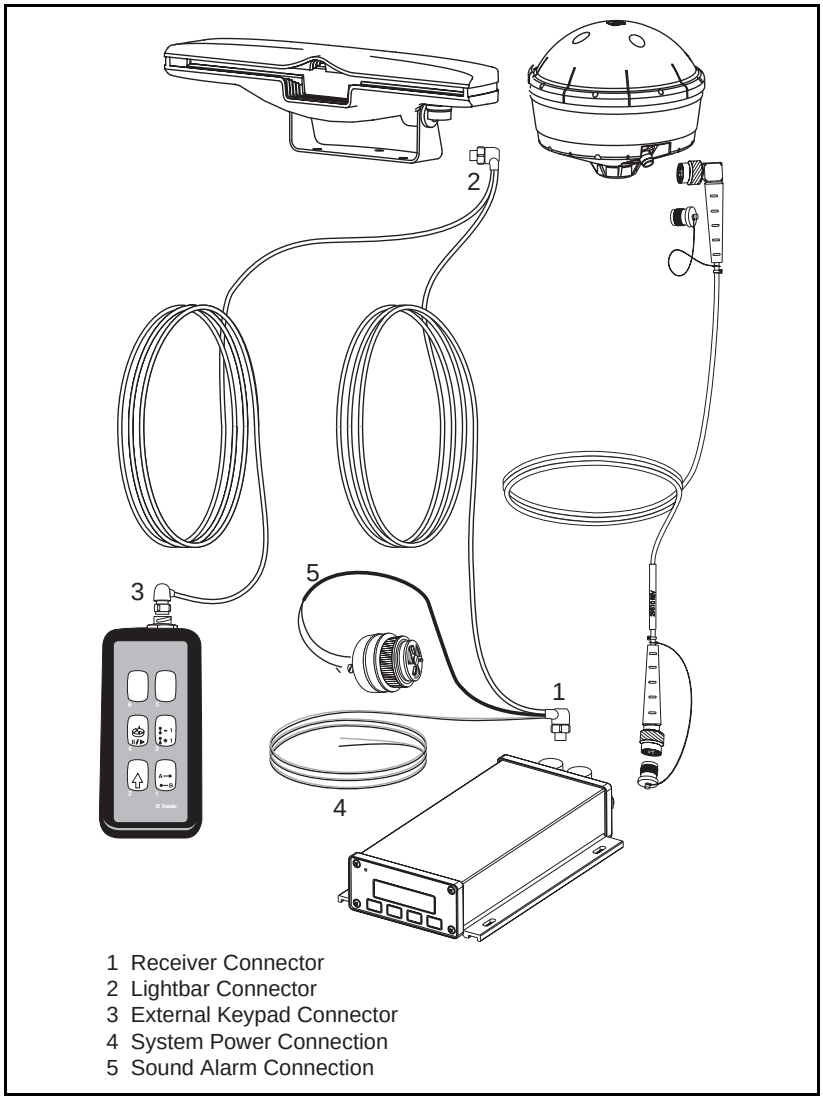


Figure 1-2 Parallel Swathing Option Cable Connections

1.2.5 Connecting to Other Precision Agricultural Equipment While Swathing

1. Connect the Parallel Swathing System as shown in Figure 1-2, Parallel Swathing Option Cable Connections.
2. Connect the Power/Data cable 12-pin conxall connector, P/N 30945 (as shown in the *Ag*GPS receiver operation manual), to the *Ag*GPS receiver Port A.

Note – Make sure Port A is configured to output the appropriate NMEA messages at the appropriate baud rate and protocol.

3. Connect the Power/Data cable 9-pin serial connector, P/N 30945, to the computer or controller.
4. Coil excess slack and secure the cable.

Note – Connect optional cables as shown in the *Ag*GPS receiver operation manual.

2 Getting Started

This chapter shows you how to:

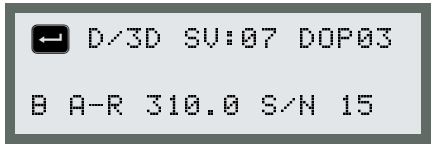
- Activate the Lightbar
- Configure the Lightbar
- Configure Guidance
- Use the External Keypad
- Use the Guidance screens

We recommend that you read through this chapter to learn operation basics before using the parallel swathing system.

2.1 Activating the Lightbar

Warning – Lightbar will not power up and parallel swathing configuration screens are not visible until LBAR is configured on the *Port Configuration* screen.

From the *Home* Screen:



1. Press > until the *Configuration* screen appears.

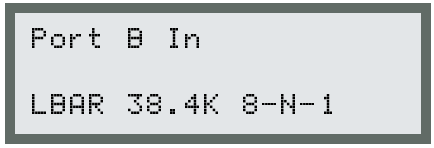
2. Press v until the *GPS Config* screen appears.

3. Press > until the *Port B Config* screen appears.

   (If the lightbar is connected to Port A, select the *Port A Config* screen.)

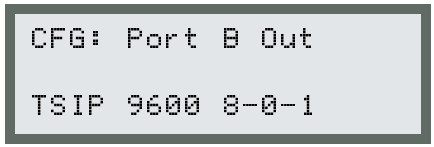
4. Press v until the *Port B In* screen appears.

5. Press > to activate the cursor and then press v until the LBAR message displays.



   Press ↵ to accept the setting.

6. Press ⌄ until the *Port B Out* screen appears.



Press > to activate the cursor and then press ⌄ until the LBAR message displays.

Press ↵ to accept the setting.

Note – Lightbar configuration screens only become visible when LBAR is set on the appropriate port.

2.2 Configuring the Lightbar

This section details the *Ag*GPS Parallel Swathing Option Lightbar configuration procedures. Each setting in this section is optional. Figure 2-1 illustrates the map for configuring the Lightbar.

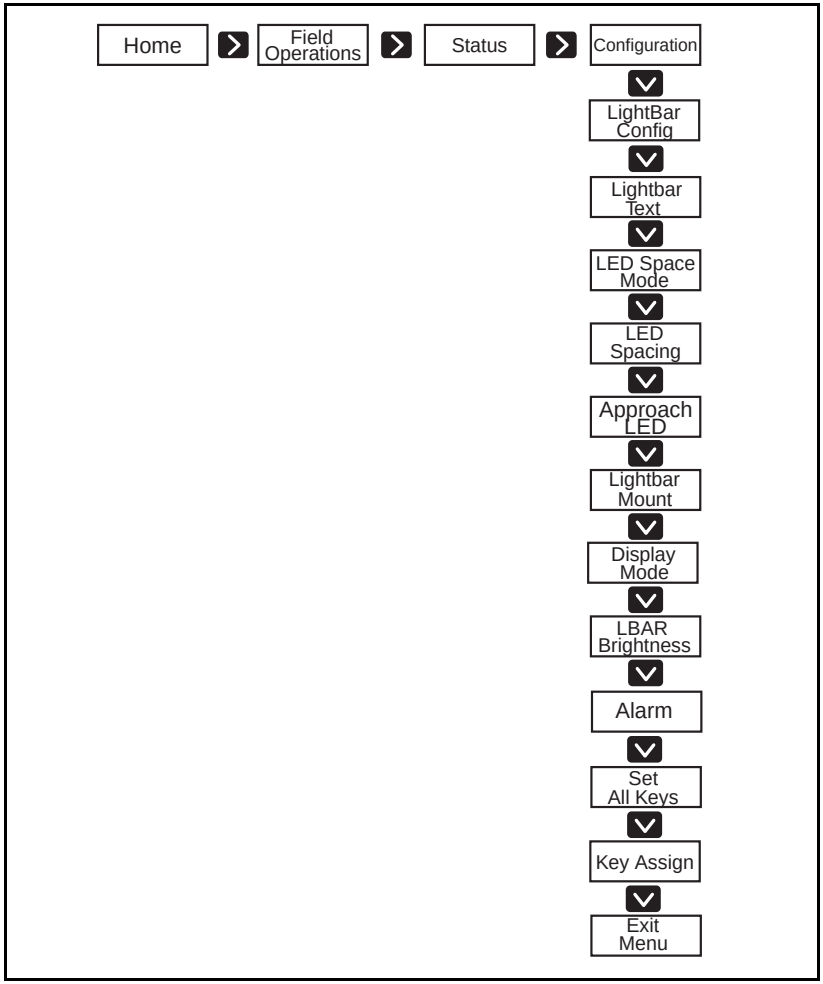


Figure 2-1 Screen Menu Map for Configuring the LightBar

From the *Home* screen:

1. Press > until the *Configuration* screen appears.

2. Press > until the *Lightbar Config* screen appears.

Warning – If the Lightbar is not activated, the *Lightbar Config* screen is unavailable.

3. Press ⌄ until the *LightBar Text* screen appears.

Note – *Lightbar Text* sets the illuminated text messages displayed on the lightbar, see Figure 2-2.

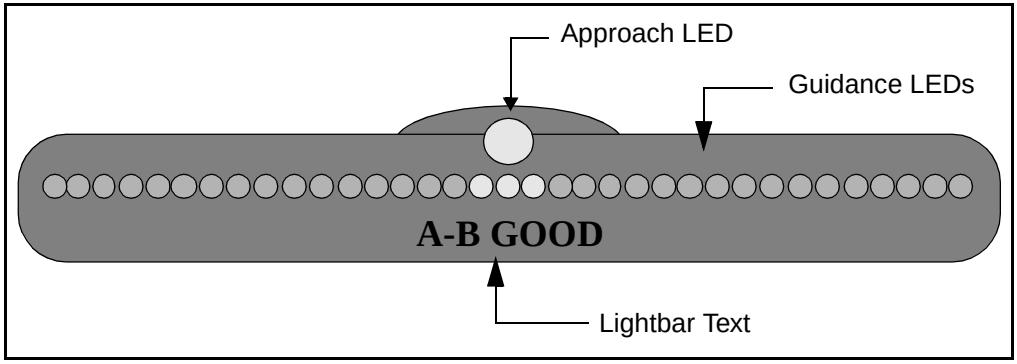


Figure 2-2 Lightbar

To change the current setting, press > to activate the cursor.

Press ^ or ⌄ to choose one of the text options listed in Table 2-1.

Table 2-1 Lightbar Text Options

Option	Function
Swath# & Xtrack	Displays swath number and the distance off line.
GPS Status	Displays GPS and Differential information on the text screen.
Current Swath#	Displays the current swath number only.
Start Line Dist.	Displays distance from the start of a pass (increasing).
End Line Dist.	Displays the distance from the end of a pass (decreasing).
True Heading	Displays true heading in degrees (referenced from true north).
Xtrack Error	Displays the error between current position and swath.
Heading Error	Displays the error between current heading and true heading.
Ground Speed	Displays ground speed in m.p.h. or km/h.
Swath# & Speed	Displays current swath number and ground speed.
Lightbar Demo	Demonstrates LED illumination
Curve Arrows	Displays arrows indicating the direction and magnitude of the correction, more arrows indicate a sharper turn.
No Lightbar Text	Blank text screen on the lightbar.

Press ↵ to save the setting once the desired text option has been selected.

4. Press ⌄ until the *LED Space Mode* screen appears.

Note – *LED Space Mode* sets the relationship between LED position and distance off-line.

To change the current setting, press > to activate the cursor.

Press ⌄ or ^ to choose one of the text options listed in Table 2-2

Table 2-2 LED Space Mode Options

Option	Function
Linear	Each LED represents a uniform distance interval off-line. (example: each LED equals 2 feet)
Scaled	LED lights 1-10 on each side of center represent a uniform distance interval. LED lights 11-17 represent a ramped distance interval off-line to the end LED setting.

Press ↵ to save once the desired setting has been selected.

5. Press ⌄ until the *LED Spacing* screen appears.

Note – *LED Spacing* sets the off-line distance that each light segment represents. A smaller LED spacing provides more precise guidance. A larger setting increases the distance off-line before the Lightbar indicates error.

To change the current setting, press > to activate the cursor.

Press ^ or ⌄ to adjust the LED distance interval.

Tip – If the LED Space Mode is set to Linear, the End LED distance is determined by the LED spacing.

If the *LED Space Mode* is set to Scaled, press >. Press ^ or ⌄ to set the End LED distance.

Press ↵ to save the setting.

6. Press ⌄ until the *Approach LED Sensitivity* screen appears.

Note – The *Approach LED* setting determines the distance from a pause point that the Approach LED turns from red to green. (See Figure 3-1, page 3-3.)

To change the current setting, press > to activate the cursor.

Press ^ or ⌄ to adjust the Approach LED Sensitivity.

Press ↵ to save the setting once the desired setting has been selected.

Tip – The Approach LED changes color when crossing a headland boundary. See Table 2-4, Headland Approach LED Action, for a visual explanation of the Approach LED Action.

7. Press ⌄ until the *Lightbar Mount* screen appears.

Note – The *Lightbar Mount* setting changes the orientation of the text displayed on the lightbar.

To change the current setting, press > to activate the cursor.

Use ^ or ⌄ to set the appropriate mode of operation, see Table 2-3.

Table 2-3 Lightbar Mount Options

Mode	Description
Dash Mounted	Lightbar mounted with bracket on the bottom.
Ceiling Mounted	Lightbar text is inverted from dash mounted mode.

Press ↵ to save the setting once the desired setting has been selected.

8. Press ⌄ until the *Display Mode* screen appears.

Note – *Display Mode* determines how the guidance information is conveyed to the operator.

To change the current setting, press > to activate the cursor.

Use ^ or ⌄ to toggle to the desired mode of operation, see Table 2-4.

Table 2-4 Display Mode Options

Mode	Description
Show Correction	Displays the magnitude and direction of the necessary correction to match the swath line. Steer vehicle by “chasing” lights left or right.
Show Error	Displays the magnitude and direction of the error between current position and swath line. Steer vehicle to “pull” lights back to center of lightbar.

Press ↵ to save the setting once the desired setting has been selected.

9. Press ⌄ until the *LBAR Bright* screen appears.

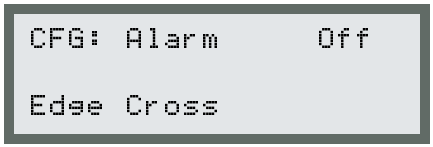
Note – LBAR Bright controls the lightbar LED illumination intensity.

To change the current setting, press > to activate the cursor.

Press ^ or ⌄ to change to the desired brightness level (5 = bright, 1 = dim).

Press ↵ to save the setting once the desired setting has been selected.

10. Press ⌄ until the *Alarm* screen appears.



Note – The *Alarm* screen controls the power to the external alarm leads used to drive an audible alarm. The alarm is used to mark specific events or control an electrical relay for an external on/off switch.

To change the current settings, press > to activate the cursor. Table 2-5 describes the alarm settings.

Table 2-5 Alarm Settings

Setting	Description
Swath Change	alarm beeps when swath number changes.
Switch Press	alarm beeps when pressing a keypad button.
Edge Cross	alarm beeps when crossing headland boundary.
Swath and Edge	alarm beeps when crossing headland and when swath number changes.
XTE (cross-track-error) limit	alarm beeps when vehicle is off-line more than the cross-track-error limit.

Press ^ or ⌄ to select the desired alarm setting:

Press > to highlight the On/Off setting.

Press ^ or ⌄ to select the appropriate setting.

Press > to move the cursor back to the Alarm option.

Repeat until all desired alarm options are configured.

Note – Multiple options can be active at the same time.

Press ↵ to save the setting once the desired setting has been selected.

11. Press ∨ until the *Set All Keys* screen appears.

Note – The *Set All Keys* screen enables you to set up a custom keypad layout.

Warning – The lightbar and keypad must be connected to change the keypad button layout.

To change the current setting, press > to activate the cursor.

Press ∧ or ∨ to change the remote keypad setting, see Table 2-6 for options.

Table 2-6 Keypad Modes

Setting	Description
Trimble Keypad	Default setting for keypad. Configures the external keypad to the default settings. See Table 2-11, page 2-30, for default settings. Default assignments intended for use with the Trimble Keypad.
Custom Assign	Enables key functions to be set by user. In custom mode, you create the external keypad layout in the key assign screen. When any key is reassigned using the *Key Assign* screen, the *Set Key Mode* screen displays `Custom Assign`. If you change from Custom Assign to Trimble Keypad, then back to custom assign, the custom settings are recalled.
Default External Switch	Enables pigtail functions to be set when using P/N 35406-00 and 35406-10. Option specific to the AgGPS FlightBar product. Outputs the default switch inputs to remote devices. This setting is intended for use when wiring user-supplied switches to the *Ag*GPS receiver in place of the External Keypad.

Press ↵ to save the setting once the desired setting has been selected.

12. Press ⌄ until the *Key Assign* screen appears.

Note – The *Key Assign* screen is used to define the function of each key on the external keypad.

Warning – Make sure the *Custom Assign* mode is selected in the *Set All Keys* screen.

Press ⌄ to enter the *Key Assign* menu.

Press > to activate cursor, then use ^ or ⌄ to toggle through the functions that can be assigned, see Table 2-7.

Table 2-7 Keypad Button Functions

Name	Description
Set Point A	Sets Point A, the beginning of the first swath.
Set Point B	Sets Point B, the end of the first swath.
Pause/Resume	Used to leave the field in mid swath. Press once to disable guidance. Leave the swath. The system guides back to the Pause location. Press again to resume swathing.
Set AB Pause/Res	Enables the same button to be used for three functions. The first press sets the A point. The second press sets the B point. After point B is set, the key enables the *Pause/Resume* function. Resetting guidance returns the key to Set A.
Increment Swath	Increments the swath number.
Decrement Swath	Decrements the swath number.

Table 2-7 Keypad Button Functions (Continued)

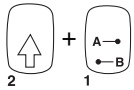
Name	Description
Reset Guidance	Resets Guidance to begin a new field. A-B, Headland, Boundary, and Area points are cleared.
Add Headland Pnt	Adds a point to the headland.
Del Headland Pnt	Deletes the last point entered from the headland.
Clear Headlands	Clears all headland points.
Add Area Point	Adds an area calculation point.
Del Area Point	Deletes the last entered area calculation point.
Clear Area	Clears all area calculation points.
Add Boundary Pnt	Adds a boundary point.
Del Boundary Pnt	Deletes the last boundary point.
Clear Boundary	Clears all boundary points.
Shift Key	Sets the button as the shift key.
Pattern Mode Sel	Toggles between the available patterns.
Single Btn Clear	Use to clear the current shift key. This is important if you do not want to include a shift key or want to change the shift key location.

With the cursor still flashing on a selected function, press the desired keystroke combination on the external keypad that will be used to activate the function.

The key combination entered on the keypad is displayed in the upper right corner of the *Ag*GPS screen.

Note – Each button contains a number (bottom left on keypad). The upper right corner of the receiver screen contains the button number assigned to each function.

For example:
Set point A S1 indicates that



sets point A.

Set point B 1 indicates that:

sets point B.

Tip – To add the shift key in combination with another key, press the shift key first and then press the desired key. To change the shift key location, use the *Single Btn Clear* function to clear the existing shift key and then reassign the shift key to the desired location.

13. Press ⌄.
14. Press ↵ to exit the Lightbar screens.

2.3 Configuring Guidance

This section details the *Ag*GPS Parallel Swathing Option Guidance Configuration. Figure 2-3 illustrates the map for configuring guidance.

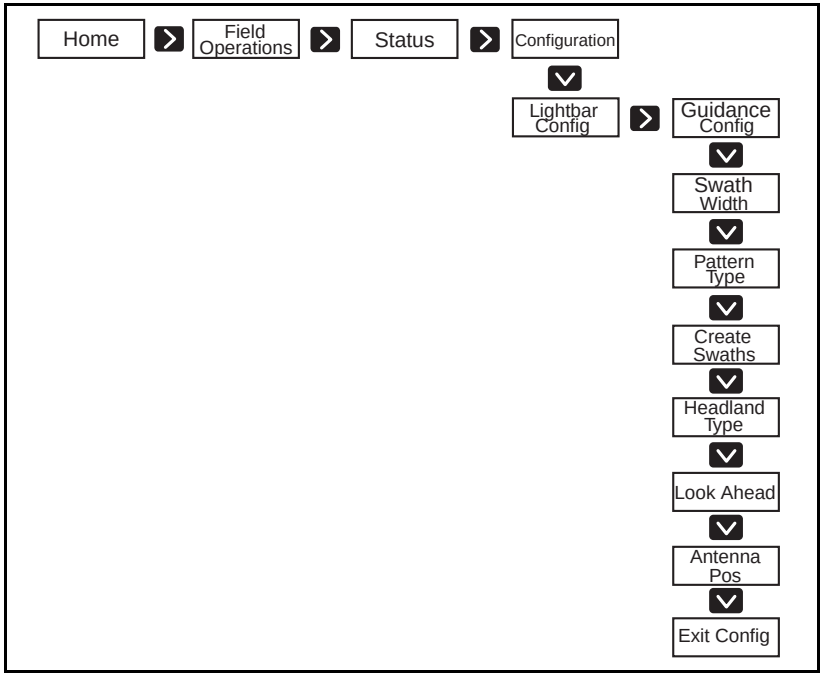
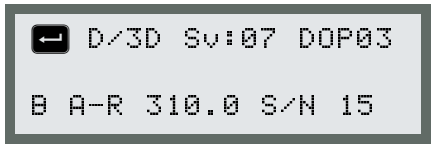


Figure 2-3 *Ag*GPS Screen Menu Map for Configuring Guidance

From the *Home* screen:



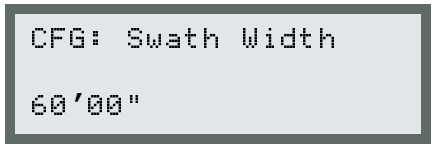
1. Press > until the *Configuration* screen appears.

2. Press v until the *Lightbar Config* screen appears.

Warning – If the lightbar is not activated, the *Lightbar Config* screen is not available.

3. Press > until the *Guidance Config* screen appears.

Press v until the *Swath Width* screen appears.



Note – The *Swath Width* setting enables a user-defined swath width.

Press > to activate the cursor and press ^ or v to adjust the swath width to the usable spray or broadcast width.

Press ↵ to save the setting once the desired setting has been selected.

Tip – Set the swath width to 1 foot less than the actual swath width to reduce skip and 1 foot more than the actual swath width to reduce overlap.

4. Press ⌄ until the *Pattern Type* screen appears.

Note – *Pattern Type* defines the guidance pattern type.

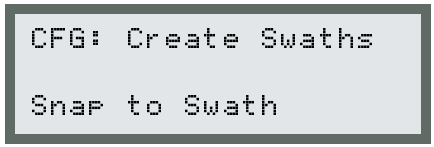
Press > to activate the cursor and press ⌄ to toggle to the desired pattern listed in Table 2-8.

Table 2-8 Swathing Patterns

Pattern	Description
None (Basic AB)	Provides straight line parallel guidance referenced from an original A-B line
Spiral Curve	Provides curve guidance in a spiral pattern working from either the outside in or the inside out.
Curve Following	Guidance is provided parallel to the previous swath, which can be curved, circular, or straight. While driving a swath, DGPS positions recording the swath's location are stored. When the swath is incremented, positions logged are offset in the turn direction. Guidance begins down the offset positions. Meanwhile, new positions are logged for the current swath. When the swath increments, the new positions are offset and guidance begins down the next swath. The cycle repeats until guidance is reset
Skip 'N'	Provides parallel guidance in a racetrack pattern with a user specified swath skip.

Press ↵ to save once the desired setting has been selected.

5. Press ⌄ until the *Create Swaths* screen appears.



Note – The *Create Swaths* setting defines the direction that swaths are generated in reference to the A-B line. It also enables automatic swath increment.

Press > to activate the cursor and use ⌄ to toggle to the desired option listed in Table 2-9.

Table 2-9 Swath Increment Settings

Option	Description
Snap to Swath	Automatically increments swath number to the closest swath. (Not available with Skip N or Curve Following.)
Auto Turn	Automatically increments one swath after 110° turn. (Not available with Skip N or Curve Following.)
Right of AB	Sets up swaths right of AB line that have to be manually incremented.
Left of AB	Sets up swaths left of AB line that have to be manually incremented.

Press ↵ to save the setting once the desired setting has been selected.

6. Press ⌄ until the *Headland Type* screen appears.

Note – The *Headland Type* screen defines the headland type.

Press > to activate the cursor and use ⌄ to toggle to the desired option listed in Table 2-10.

Table 2-10 Headland Types

Option	Description
A-B Endzones	Headlands are defined on either end of a rectangular field using the A and B points to reference the center of each headland respectively.
Follow Curve	Records headlands of any shape and can provide guidance on multiple headland passes. **Tip:** The Approach LED can be used for guidance when running parallel to a curved headland. The green to orange transition marks the edge covered by the curved headland pass. (See Figure 2-4, Headland Approach LED Action.)
Closed Circuit	Defines headlands with a series of user-entered points. The last point connects to the first point to form a closed loop.
None	No headlands defined.

Press ↵ to save the setting once the desired setting has been selected.

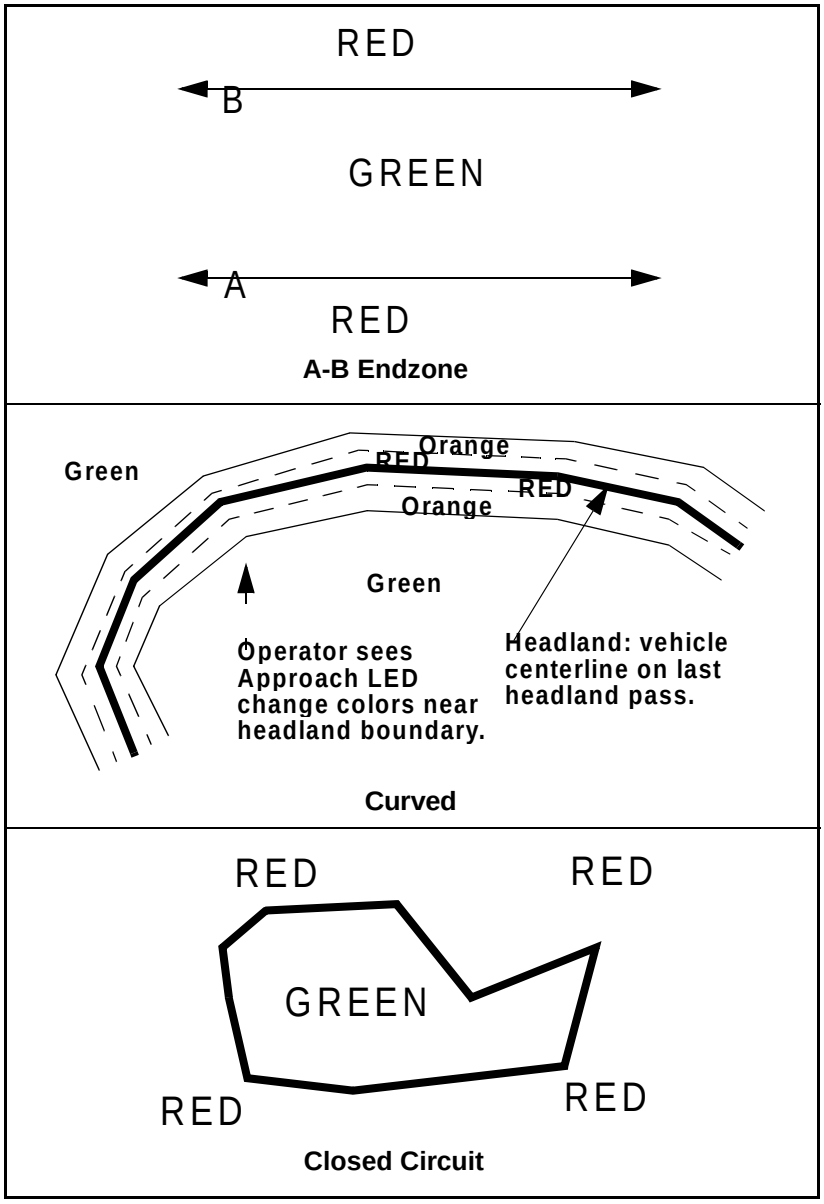


Figure 2-4 Headland Approach LED Action

7. Press ⌄ until the *Look Ahead* screen appears.

Note – The *Look Ahead* setting enables the receiver to predict a future position, based on current velocity and heading, by looking ahead to the number of seconds configured here. This provides smoother guidance.

Press > to activate the cursor and press ^ or ⌄ to adjust the look ahead time (1-2 seconds recommended for beginners).

Press ↵ to save the setting once the desired setting has been selected.

Tip – If the lightbar appears *jumpy*, reduce the look ahead time.

8. Press ⌄ until the *Antenna Pos* screen appears.

Note – The *Antenna Position* setting defines the antenna position ahead or behind the spray boom, etc., so that guidance information is referenced to the spaying boom rather than the antenna position. The antenna can ONLY be adjusted longitudinally and must be placed along the vehicle's centerline.

Press > to activate the cursor. Press ^ or ⌄ to set the antenna position.

Press ↵ to save the setting once the desired setting has been selected.

Warning – Changes in heading are magnified when using an antenna offset.

9. Press ↵ to exit the *Guidance Config* screens.

Tip – If Coast Guard beacons are being used for the differential, set the Beacon Mode to Manual Freq Mode and tune both channels to the same frequency.

Tip – Make sure the GPS antenna is positioned on the centerline of the vehicle.

2.4 Using the External Keypad

The External keypad allows you to set guidance points rapidly, without navigating through screens on the GPS receiver. The six-button keypad is shown in Figure 2-5.

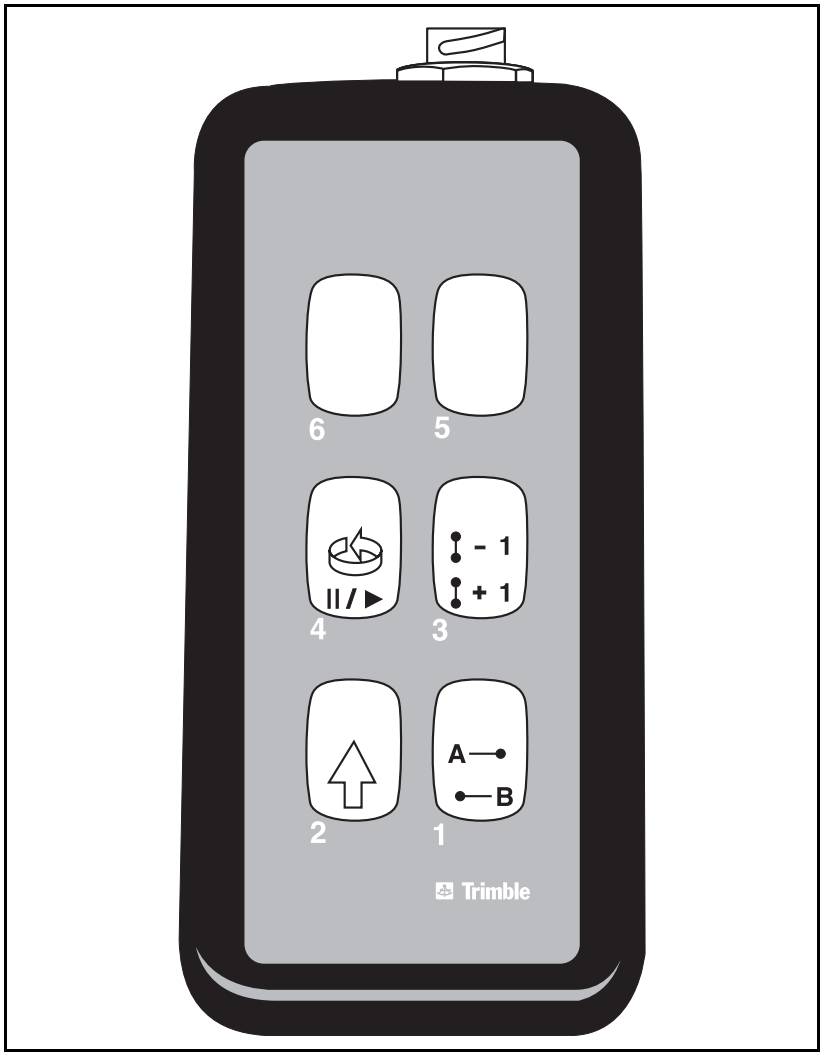


Figure 2-5 External Keypad

Tip – The top of each button provides a writing space. Add comments to help your swathing efforts.

The default function of each button or button combination is shown in Table 2-11.

Table 2-11 External Keypad Button Functions

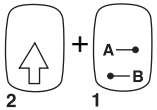
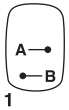
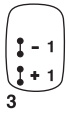
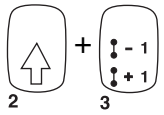
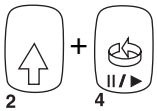
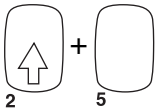
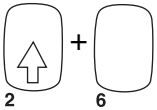
Button	Function
	Activates the top symbol on each button. When pressed, SHIFT appears on the lightbar text display. If pressed by mistake, simply press again to deactivate.
	Sets Point A. Complete this step at the beginning of the first swath.
	Sets Point B. Point B can only be set while on the first swath. When the current swath is not the original A-B line, Point B cannot be set without first setting a new Point A.
	Press to increase the swath number. In straight line A-B guidance mode, this button is not required if Auto Turn or Snap-to-Swath are configured. In curve guidance mode, this button begins a new swath and starts guidance parallel to the last swath.
	Press to decrease the swath number. In curve guidance mode, this button toggles between the current swath, the previous swath, and the swath offset to the opposite side of the previous swath.
	Press to pause parallel swathing. Press again to resume.

Table 2-11 External Keypad Button Functions

Button	Function
	Press to reset the guidance operation screens. These buttons are used when beginning a new field. A-B, Headland, and Area Calculation data are deleted.
	Reserved for user-specified operation. See page 2-15 for details. By default, this button adds a headland point.
	Reserved for user-specified operation. See page 2-15 for details. By default, this button deletes the last-entered headland point.
	Reserved for user-specified operation. See page 2-15 for details. By default, this button adds an area point.
	Reserved for user-specified operation. See page 2-15 for details. By default, this button deletes the last-entered area point.

2.5 Using Field Operations Screens

Figure 2-6 illustrates the map for using filed operations.

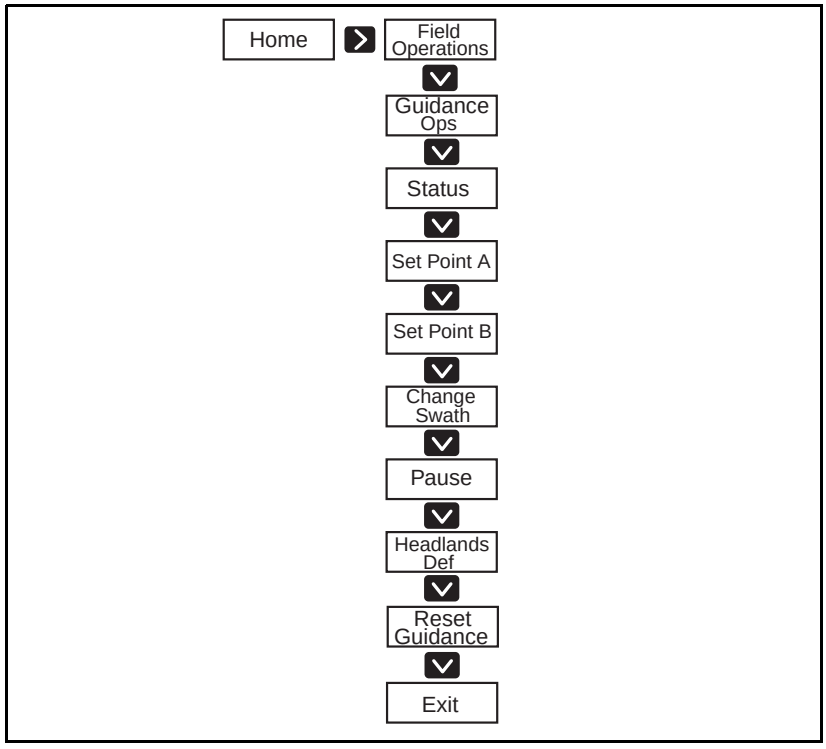
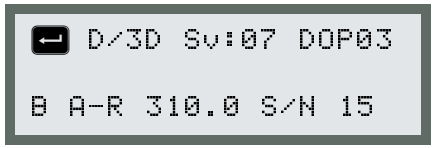


Figure 2-6 Screen Menu Map for Using Field Operations

☞ **Tip –** Trimble recommends that you use the external keypad when parallel swathing. Use the guidance screens only when the external keypad is not available.

To view the parallel swathing guidance screens:

From the *Home* screen:



1. Press > until the *Field Operations* screen appears.

2. Press to the *Guidance Ops* screen.

2.5.1 Home Guidance Screen

Leave the *Home Guidance* screen in view while parallel swathing. The following is a sample *Home Guidance* screen:

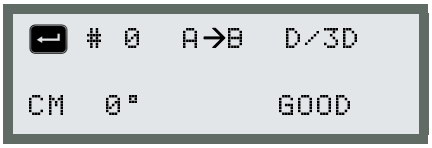


Figure 2-7 (on the following page) explains the sample *Home Guidance* screen.

Table 2-12 describes the display for each position type.

Table 2-12 Position Types

Display	Description
SRCH	Searching for satellites
TRCK	Tracking satellites
D/2D	Outputting 2-dimensional differential positions
D/3D	Outputting 3-dimensional differential positions
G/2D	Outputting 2-dimensional autonomous positions
G/3D	Outputting 3-dimensional autonomous positions

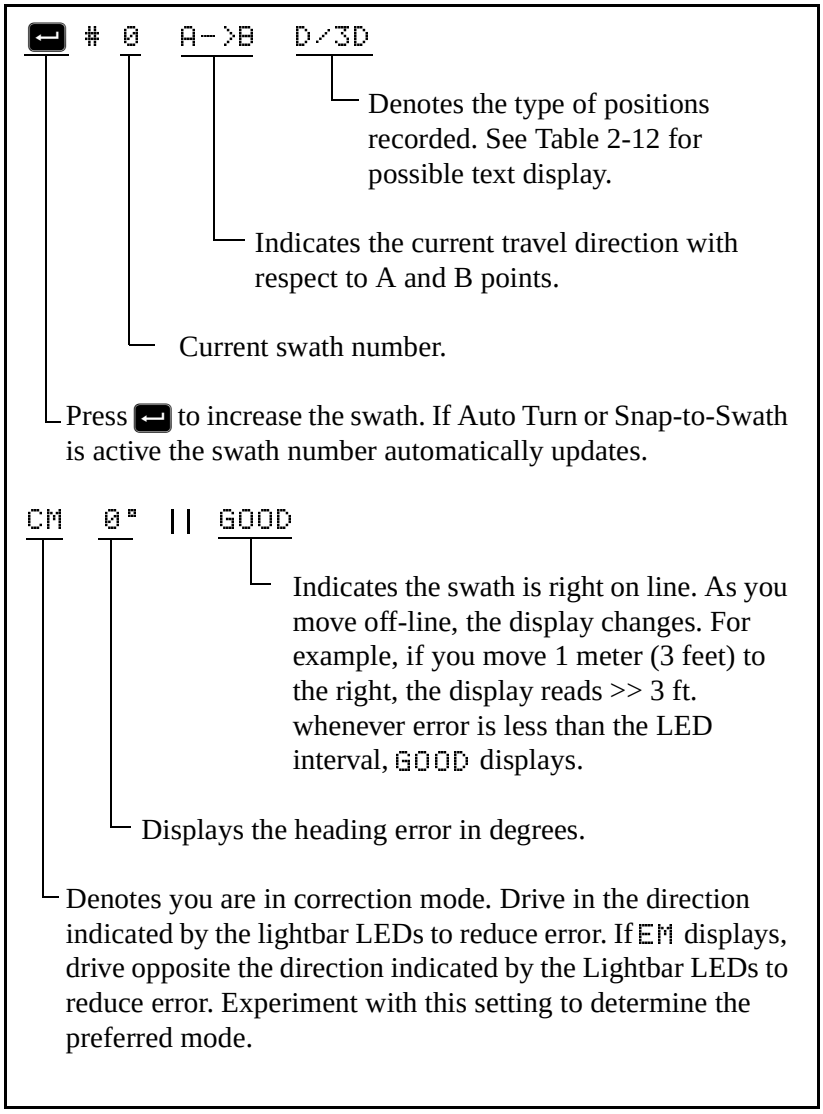


Figure 2-7 Home Guidance Screen Indicators

2.5.2 Set Point A

Use the *Set Point A* screen at the beginning of the first swath.

Press > to activate the *Set Point A* screen.

Press ↵ to set point A.

2.5.3 Set Point B

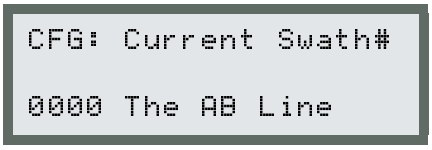
Use the *Set Point B* screen at the end of the first swath.

Press > to activate the *Set Point B* screen.

Press ↵ to set point B.

2.5.4 Current Swath

The *Current Swath* screen increments and decrements the swath number in A-B guidance mode. This screen is necessary when changing swath rows to the opposite side of the A-B line or fixing an accidental increment while maintaining the existing A-B line. In Curve Following mode, this screen is used to end logging on the current swath and begin logging on the next swath.



Tip – In Straight-line A-B mode, the swath number automatically increments when Auto Turn or Snap-to-Swath is selected in the swath increment configuration screen. The swath row can also be incremented by pressing ↵ on the *Home Guidance* Screen.

Note – After the swath is incremented, the lightbar indicates the turn direction.

2.5.5 Increment or Decrement the Swath When in Straight Line (A-B) Mode

To increment or decrement the swath:

1. Press >.

   The swath number cursor flashes.

2. Press ^ to increment or v to decrement the swath number.
3. Press ↵ to accept the change.

2.5.6 Pause

The *Pause* screen enables you to disable lightbar guidance in mid-swath, leave the current swath, navigate back to the work-stop location and resume swathing.

Press > to activate the *Pause* screen.

Press ↵ to pause.

While paused you can leave the current swath. When you restart, the Lightbar provides guidance to help align the vehicle with the swath that was active when guidance was paused.

1. Use the Lightbar to find the active swath.

Tip – While paused, the LEDs behave as when active, indicating error with respect to the active swath. If you drive off-field while paused, the LEDs pull to one side or the other. As you drive back to the active swath, the LEDs move toward the lightbar center. When close, turn down the active swath and bring the lights to center.

Note – When paused, distance to the pause location displays on the Lightbar text screen.

2. Once you are back on the active swath, use the center LED to find the pause location.

   The center LED illuminates green when the vehicle is within the approach LED sensitivity setting of the pause location.

3. Drive down the active swath.

   The approach LED changes from red to orange when you are getting close.

4. When the center LED turns green, press > to continue.

5. Press ↵ to begin.

Note – See Figure 3-1, page 3-3.

2.5.7 Headlands Definition

The *Headlands* screen adds, deletes, and clears points to the field headland. Before trying to use headland functionality, please review Table 2-10, page 2-25.

To add headland points:

Press ↵.

The screen reads `Hland Pt Added`.

To delete headland points:

1. Press >.

   The cursor begins flashing.

2. Press ^ or v until `Del` is visible.

3. Press ↵ to delete a headlands point.

   The screen reads `Hland Pt Deleted` and the last captured headland point is erased.

To clear headland points:

1. Press >.

   The cursor begins flashing.

2. Press ^ or v until `Clr` is visible.

3. Press ↵

   All points are cleared.

2.5.8 Guidance Reset

The *Reset Guidance* screen is used to begin swathing in a new field. The setting clears old headlands, area calculations, and A-B points. Lightbar and guidance configurations are not affected.

Press > to activate the *Reset Guidance* screen.

Press ↵ to reset guidance.

2.6 Utilities Screens

Figure 2-8 illustrates the map for using the utilities/

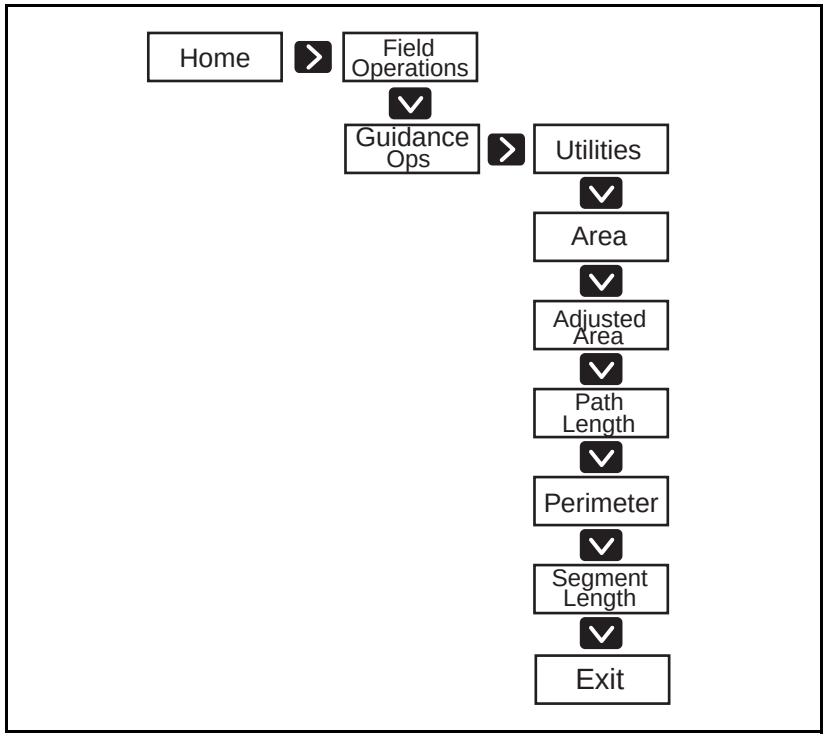


Figure 2-8 Screen Menu Map for using the Utilities

☞ **Tip –** Trimble recommends that you use the external keypad when parallel swathing. Use the guidance screens only when the external keypad is not available.

2.6.1 Area

See Calculating Area, page 3-4.

2.6.2 Line Length

Refer to the Line Length and Perimeter Measurement, page 3-10.

3 Using the Parallel Swathing Option

This chapter shows you how to use the *Ag*GPS receiver for parallel swathing, including how to:

- Use in-field guidance features
  - Pause/Resume
  - Area Calculation
  - Line Length Calculation
- Configure receiver for different swath patterns
  - A-B with No Headlands
  - A-B with A-B Endzone Headlands
  - A-B with Closed Circuit Headlands
  - A-B with Follow Curve Headlands (Pivot application)
  - Curve Following (Pivot application)
  - Curve Following with Follow Curve Headlands
  - Spiral
  - Skip N with No Headlands

We recommend you read through this chapter to learn the basics before using the Parallel Swathing Option.

3.1 Using In-Field Guidance Features

The *Ag*GPS Parallel Swathing Option performs several tasks to make guidance operations as convenient as possible.

3.1.1 Pause/Resume

The Pause/Resume feature disables lightbar guidance in mid-swath. You can leave the swath, navigate back to the work-stop location, and resume swathing.

1. To pause, press:

While paused you can leave the current swath. When restarting, the lightbar provides guidance to help align the vehicle with the swath that was active when guidance was paused.

2. Use the lightbar to find the active swath.

Tip – While paused, the LEDs behave as when active, indicating error with respect to the active swath. If you drive off-field while paused, the LEDs pull to one side or the other. As you drive back to the active swath, the LEDs move toward the lightbar center. When close, turn down the active swath and bring the lights to center.

The approach LED illuminates green when the vehicle is within the approach LED sensitivity setting of the pause location.

3. When the approach LED turns green, press:

to continue.

Figure 3-1 illustrates the Pause/Resume feature.

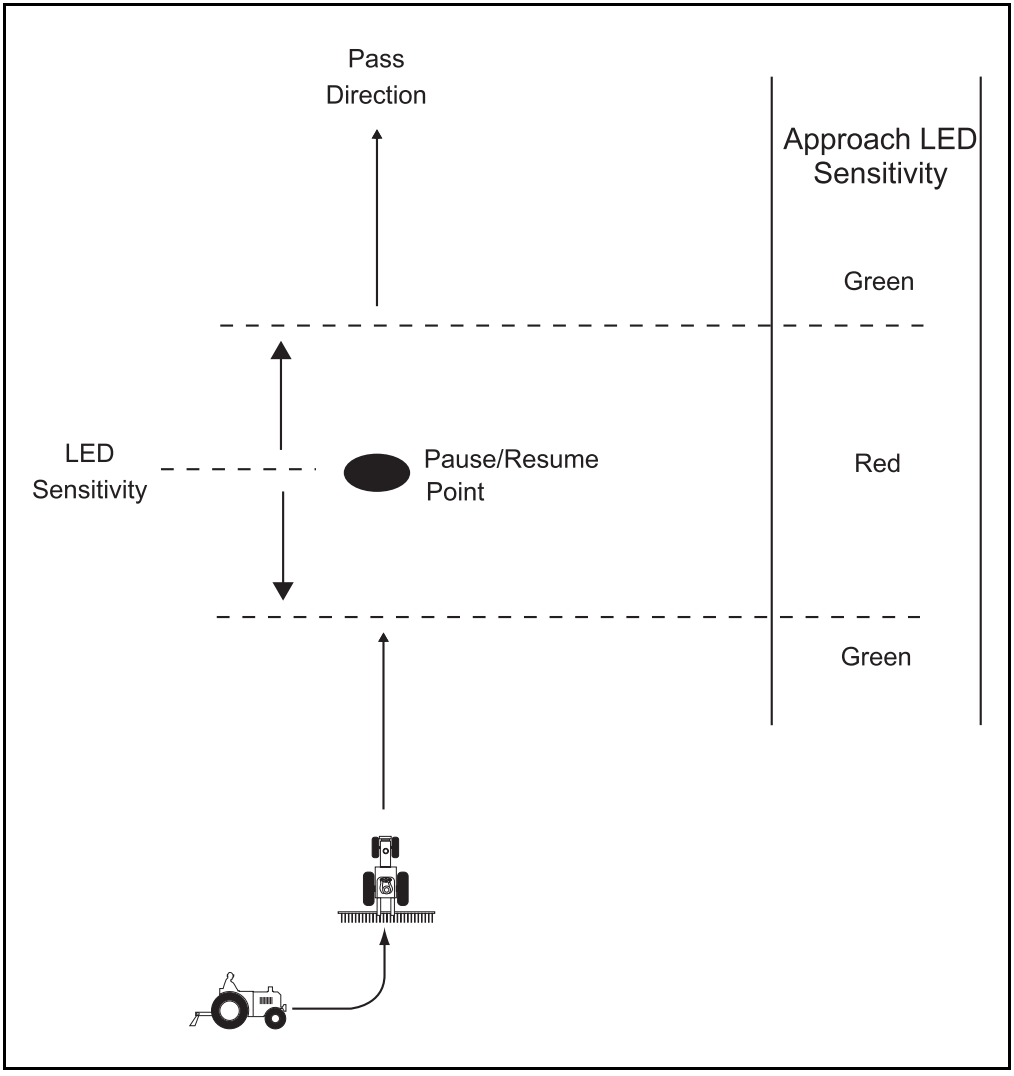


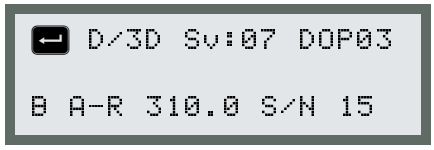
Figure 3-1 Approach LED Sensitivity with Pause/Resume Point

3.1.2 Calculating Area

You can calculate area using the menu screens or on the External Keypad.

Using the Menu Screens

1. Start at the *Home* screen.



2. Press > until the *Field Operations* screen appears.

3. Press v until the *Guidance Ops* screen appears.

4. Press > until the *Utilities* screen appears.

5. Press ⌄ until the *Area* screen appears.

6. Press > to activate the cursor and then press ⌄ until `Clr` appears.
7. Press ↵ to clear out all old area points and reset the area calculation.

Note – Trimble recommends that you clear out old area points before starting the area calculation procedure.

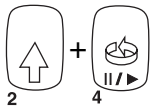
8. Press ↵ to enter area points at each corner or change in direction around the perimeter of the field as shown in Figure 3-2and Figure 3-3. If you want to remove the previous area point, press > to activate the cursor and then press ⌄ until `Del` appears. Press ↵ to remove the previous point.
   - The area as measured at the antenna location is shown in the *Area* screen and is updated each time a new area point is added.

- The area as measured by the swath width offset is shown in the *Adjusted Area* screen and is updated each time a new area point is added. To view the *Adjusted Area*, from the *Area* screen, press .

Note – After each area point is added, the adjusted area briefly flashes on the lightbar text.

On the External Keypad

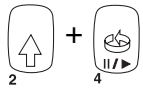
1. Press:



   to clear old area points.

Note – Trimble recommends that you clear out old area points before starting the area calculation procedure.

Warning – Pressing

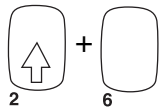


resets guidance, removing Headlands and A-B points. To remove area points only, follow the procedure that starts on page 3-5 (Step 7).

2. Press:

   to add area points at each corner or change in direction around the perimeter of the field as shown in Figure 3-2 and Figure 3-3.

3. If you want to remove the previous area point, press:



Tip – Each time an area point is added, the adjusted area briefly flashes on the lightbar. Area can also be viewed on the receiver screen by following the procedure outlined previously in this section.

When driving the field, store the area location as shown in Figure 3-2. Because of varying field shapes, the shaded areas are not added to the area calculation. The dashed perimeter line represents the area calculation. The solid perimeter line represents the adjusted area calculation.

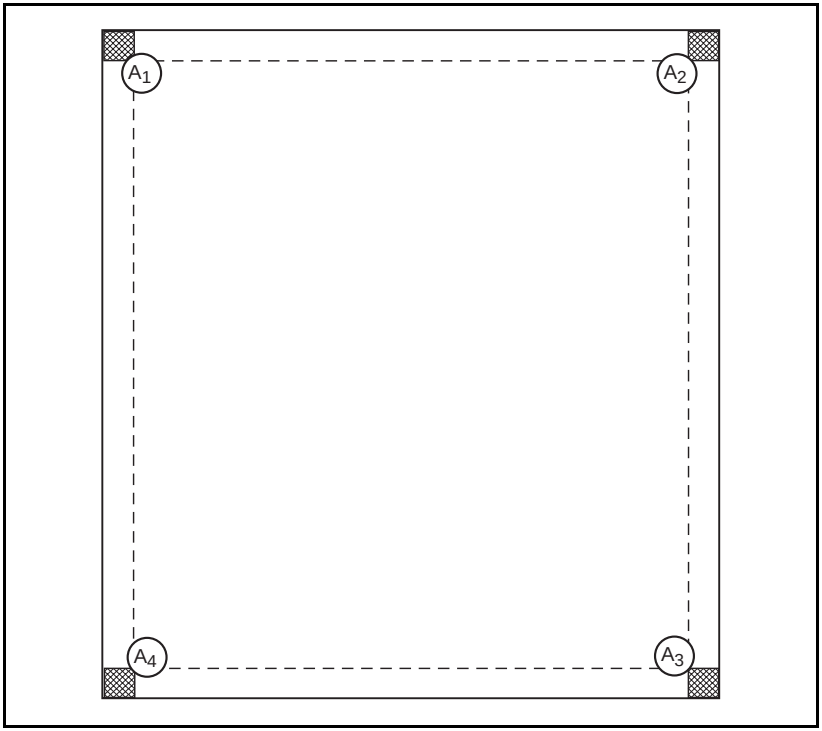


Figure 3-2 Square Field Area Calculation

Figure 3-3 shows another Area Calculation example. Store locations as shown. Because of varying field shapes, the shaded areas are not added to the adjusted field area calculation. The dashed perimeter line represents the area calculation. The solid perimeter line represents the adjusted area calculation.

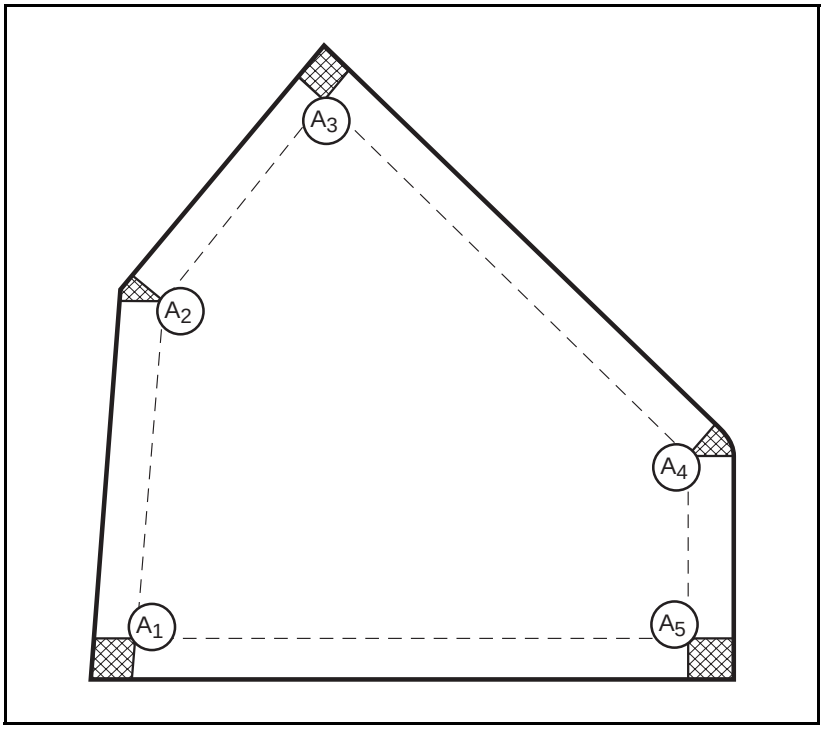


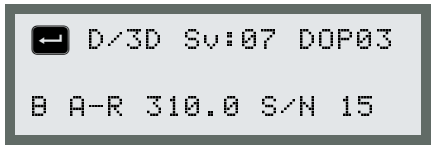
Figure 3-3 Odd-Shaped Field Area Calculation

3.1.3 Line Length and Perimeter Measurement

You can measure line length and perimeter using the menu screens or on the External Keypad.

Using the Menu Screens

1. Start at the *Home* screen.



2. Press > until the *Field Operations* screen appears.

3. Press until the *Guidance Ops* screen appears.

4. Press until the *Utility* screen appears.

5. Press ⌄ until the *Area* screen appears.

6. Press > to activate the cursor and then press ⌄ until `Clr` appears.
7. Press ↵ to clear out all old area points and reset the area calculation.

Note – Trimble recommends that you clear out old area points before starting the line length calculation procedure.

8. Press ↵ to enter area points at each field corner. If you want to remove the previous area point, press > to activate the cursor and then press ⌄ until `Del` appears. Press ↵ to remove the previous point.

   Line length is measured at the antenna location. The line length/segment and perimeter length is updated each time a new area point is added.

9. Press ⌄ to view the *Path Length* screen.

   The path length is the total length of all of the line segments. This feature can be used to calculate the length of roads on a farm or measure distances for tile lines, and so on.

10. Press ⌄ to view the *Perimeter* screen

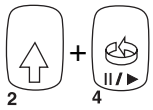
The perimeter length is calculated by connecting the first area point to the last area point to always form a closed polygon. The perimeter length around a square field is calculated by summing the measured line segments and adding the distance between the first area point set and the last area point set. This is useful when determining total length around a field boundary.

11. Press ⌄ to view the *Segment Length* screen.

The line segment length is shown in the *Segment Length* screen. The line segment length shows the distance between the last two area points recorded. This is useful when measuring distances or for calibration purposes.

On the External Keypad

1. Press



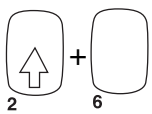
to clear old area points.

Note – Trimble recommends that you clear out old area points before starting the area calculation procedure.

2. Press

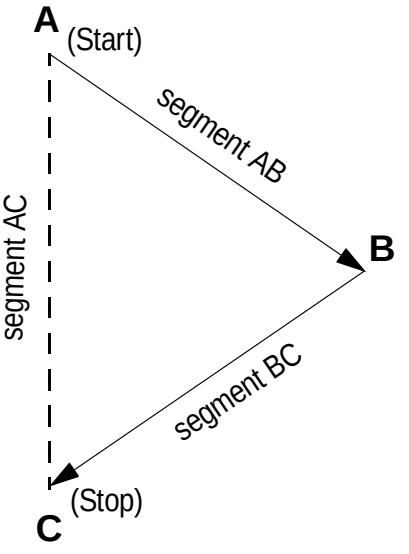
to add area points as shown in Figure 3-2 and Figure 3-3.

If you want to remove the previous area point, press:



Each time an area point is added, the path length, segment length and perimeter length are updated.

The diagram in Figure 3-4 shows how Path length, Perimeter, and Segment Length are determined.



Segment Lengths:	segment AB segment BC
Path Length:	segment AB + segment BC
Perimeter:	segment AB + segment BC + segment AC

Figure 3-4 Segment Length / Path Length / Perimeter

3.2 Using Patterns

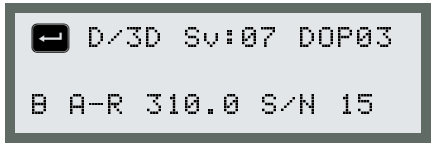
The following section explains when and how to use the available patterns.

3.2.1 A-B Parallel Swathing with No Headlands

This type of pattern is useful when no headlands are required and the field is going to be driven in a parallel swath pattern.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

5. Press ⌄ until the *Pattern Type* screen appears.

Press > to activate the cursor and press ⌄ until the screen reads `None (Basic A-B)`.

Press ↵ to save the setting.

6. Press ⌄ until the *Headland Type* screen appears.

Press > to activate the cursor and use ⌄ to toggle to `None`. Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-5 and Figure 3-6 to lay out the A-B line and begin parallel swathing.

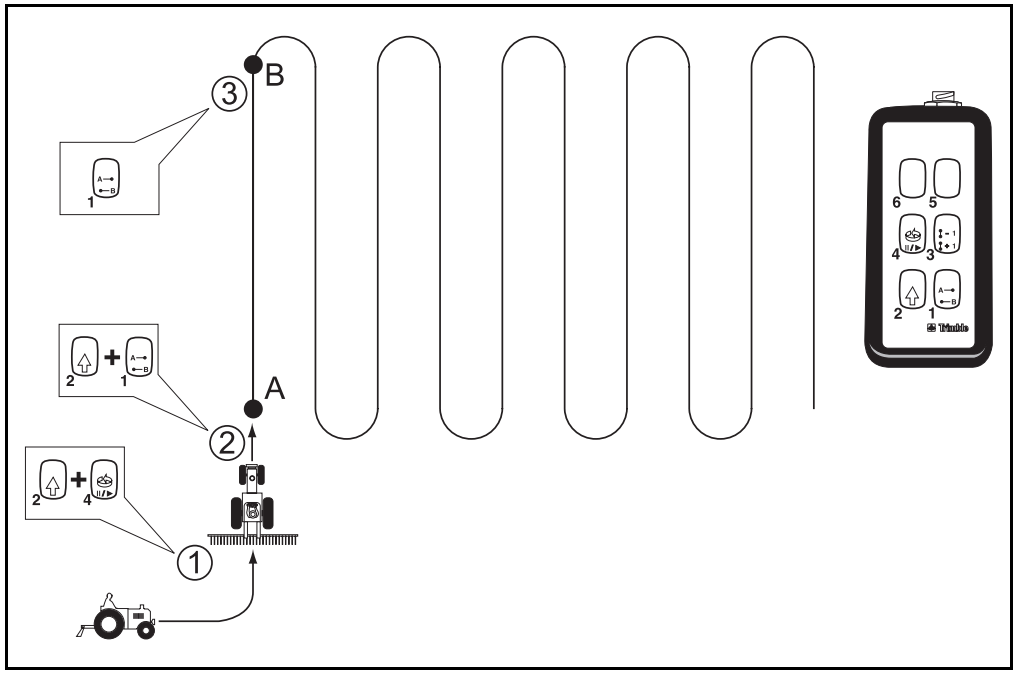


Figure 3-5 Basic A-B Parallel Swathing with Autoturn or Snap to Swath Increment

Figure 3-6 shows an alternate method using Manual Increment:

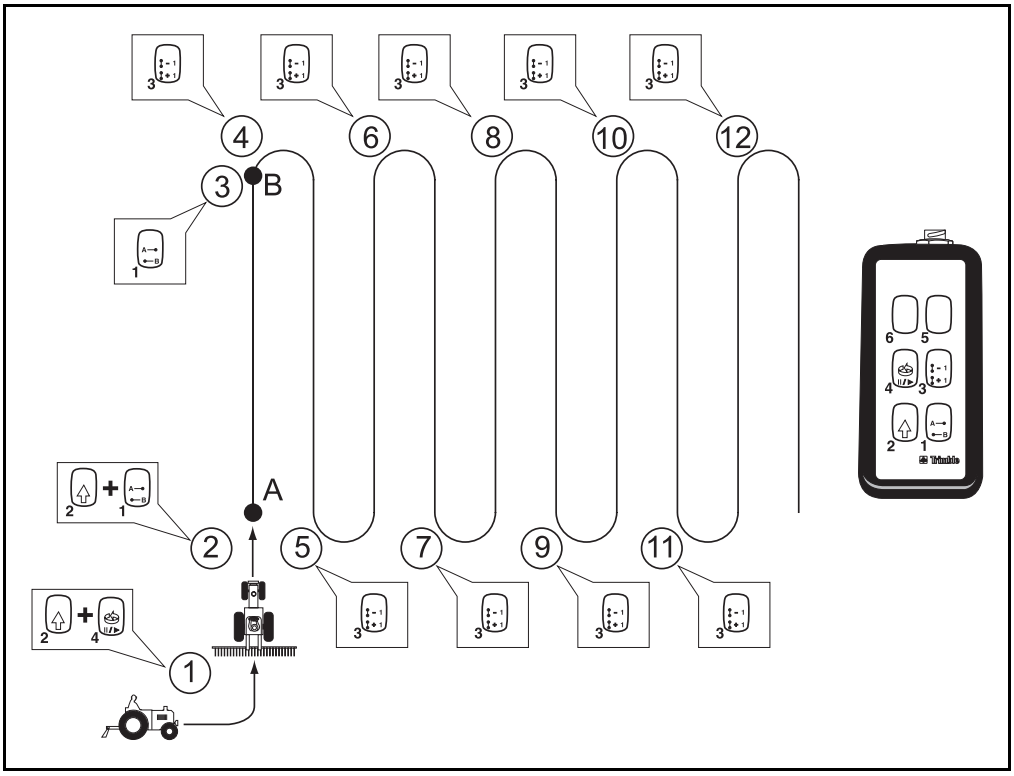
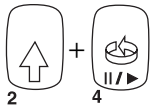


Figure 3-6 Basic A-B Parallel Swathing with Manual Increment

Note – After the swath is incremented, the lightbar indicates the turn direction.

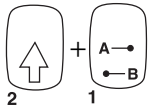
1. On the External Keypad, press:



to reset guidance.

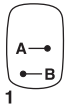
Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. Enter the field and press:



to set an A point for the swath line.

3. When the opposite end of the field is reached press:



to set point B, turn and begin spraying consecutive swaths.

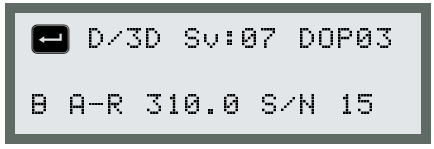
3.2.2 A-B Parallel Swathing with A-B Endzone Headlands

This pattern is useful when headlands are required at both ends of a rectangular field and the field is driven in a parallel swath pattern. Headland locations are determined by the A and B points on the A-B swathing line. Headlands are generated perpendicular to the A-B line at both ends of the field. The A and B points mark the center of the headlands at either end of the field.

The Approach LED illuminates green when the sprayer is inside the headland boundary. The Approach LED changes to red upon crossing the headland boundary.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.

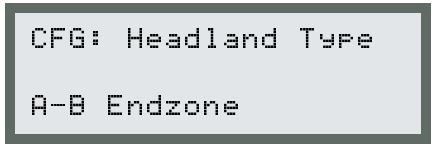
4. Press > until the *Config Guidance* screen appears.

5. Press v until the *Pattern Type* screen appears.

Press > to activate the cursor and press v to toggle to `None (Basic A-B)`.

Press ↵ to save the setting.

6. Press v until the *Headland Type* screen appears.



Press > to activate the cursor and use v to toggle to `A-B Endzones`.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-7 to lay out the headlands and begin parallel swathing.

Note – The pattern in Figure 3-7 assumes that *Create Swaths* is set to the default, *Snap to Swath.*

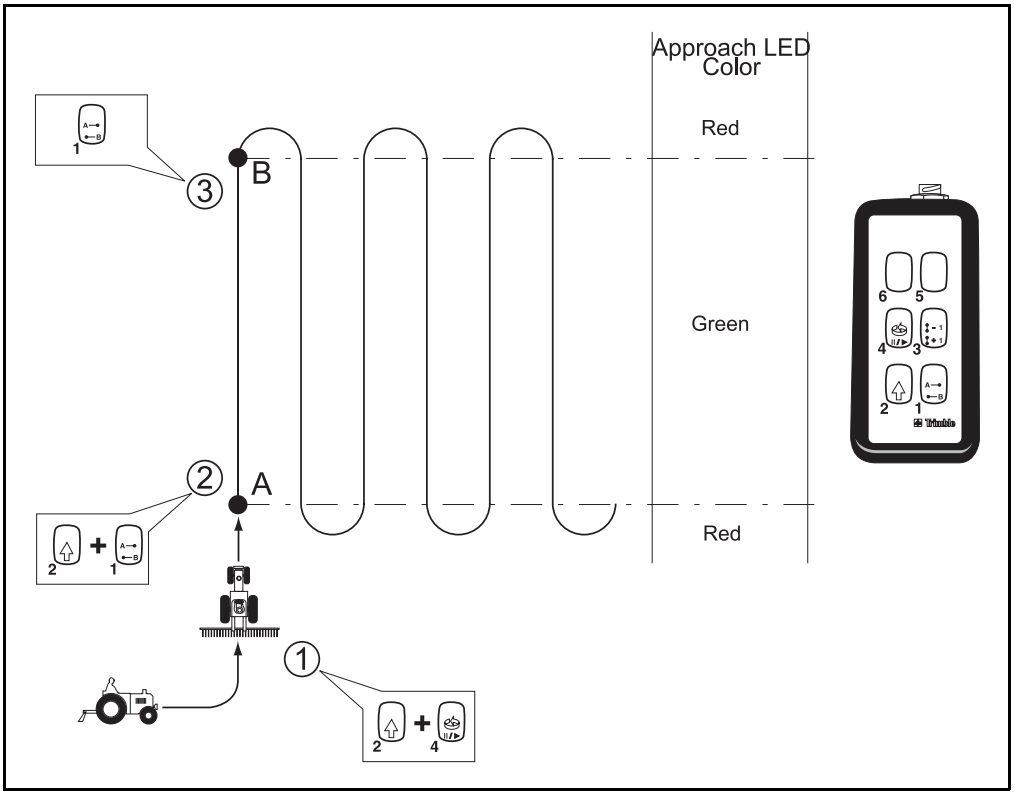
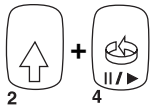


Figure 3-7 Basic A-B Parallel Swathing with A-B Endzones

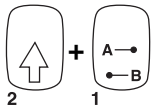
1. On the External Keypad, press:



to reset guidance.

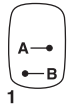
Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. Enter the field and press:



to set an A point for the swath line.

When the position for the next headland is reached, press:



to set point B, turn and begin spraying consecutive swaths.

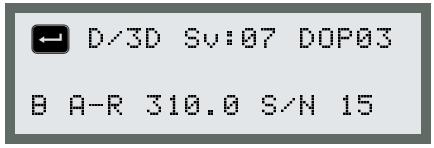
3.2.3 A-B Parallel Swathing with A-B Closed Circuit Headland

This pattern is used when headlands are required, the ends of the field are irregularly shaped, and the field is driven in a parallel swath pattern. The headland location is determined by the position of the headland points along the outside field boundary. Headlands are generated one swath width along the field boundary according to the manually entered headland points.

The Approach LED illuminates green when the sprayer is inside the headland boundary. The Approach LED changes to red upon crossing the headland boundary.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

Press v until the *Pattern Type* screen appears.

Press > to activate the cursor and press v to toggle to `None (Basic A-B)`.

Press ↵ to save the setting.

5. Press v until the *Headland Type* screen appears.

Press > to activate the cursor and use v to toggle to `Closed Circuit`.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-8 to lay out the headlands and begin parallel swathing.

Note – The pattern shown in Figure 3-8 assumes the *Create Swaths* mode is set to *Snap-to-Swath*.

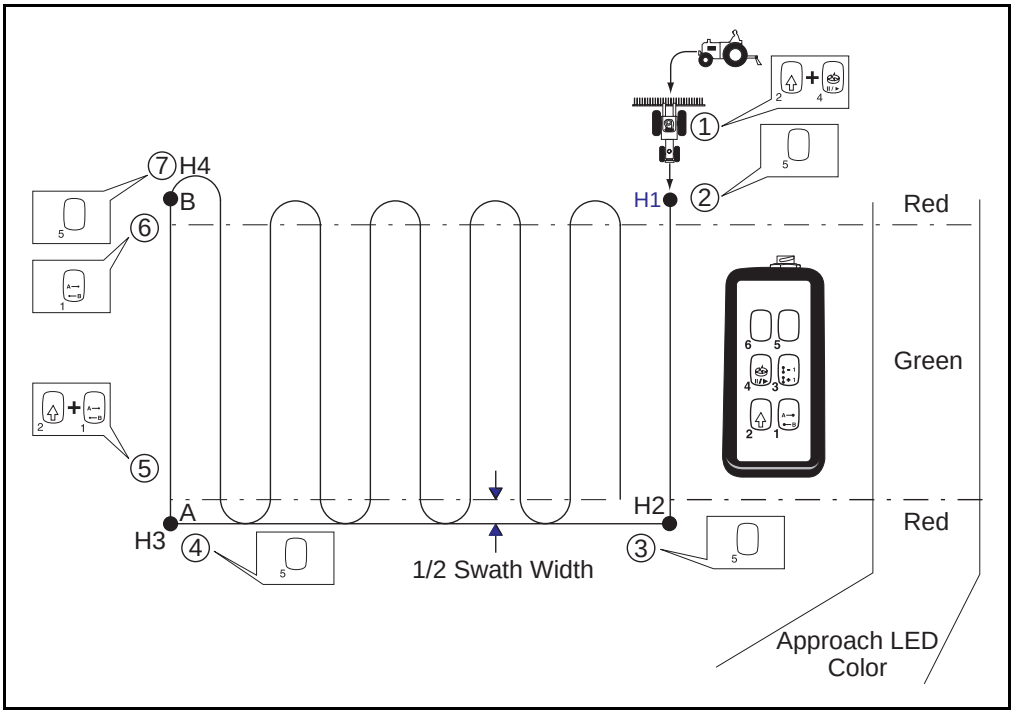
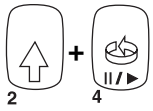


Figure 3-8 Basic A-B Parallel Swathing with Closed Circuit Headlands

1. On the External Keypad, press:



to reset guidance.

Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

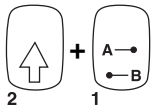
2. Enter the field and press:

to add a headland point at the first field corner.

3. Press:

to add a headland point at the second field corner.

4. Press:

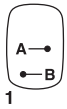


to add point A for start of parallel reference line.

5. Press:

to add a headland point at the third field corner.

6. Press:



to add point B for end of parallel reference line.

7. Press:

to add a headland point at the fourth field corner.

Repeat Step 7 until all necessary headland points are entered. The receiver automatically closes the headland/field boundary by connecting the last headland point to the beginning headland point.

☞ **Tip –** The A-B line can be set for guidance parallel to one side of the field at any time while driving the headland boundary.

☞ **Tip –** If driving an irregularly shaped field boundary, add headland points at intervals to match the field boundary (maximum of 99 points).

☞ **Tip –** If the headland requires two swath widths, headland points must be entered on the inner lap.

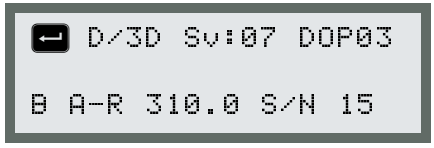
3.2.4 A-B Parallel Swathing with Curve Headlands

This type of pattern is useful in an irregularly shaped field that is still worked in a parallel A-B pattern. The irregularly shaped boundary can easily be recorded as a sprayed headland using curved headlands, so that the following parallel A-B passes can be made with minimal overlap into the headland zone.

The Approach LED illuminates green when the unit is inside the headland boundary. As the unit approaches the edge of the headland boundary the Approach LED changes to orange within 1/2 swath width of the sprayed headland edge and to red upon crossing the headland edge.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

5. Press v until the *Pattern Type* screen appears.

Press > to activate the cursor and press v to toggle to None (Basic A-B).

Press ↵ to save the setting.

6. Press v until the *Headland Type* screen appears.

Press > to activate the cursor and press v to toggle to Follow Curve.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-9 to lay out the headlands and begin parallel swathing.

Note – The pattern shown in Figure 3-9 assumes that *Create Swaths* is set to the default, *Snap to Swath*.

Figure 3-9 indicates the location and the color that the Approach LED illuminates in reference to the headland location.

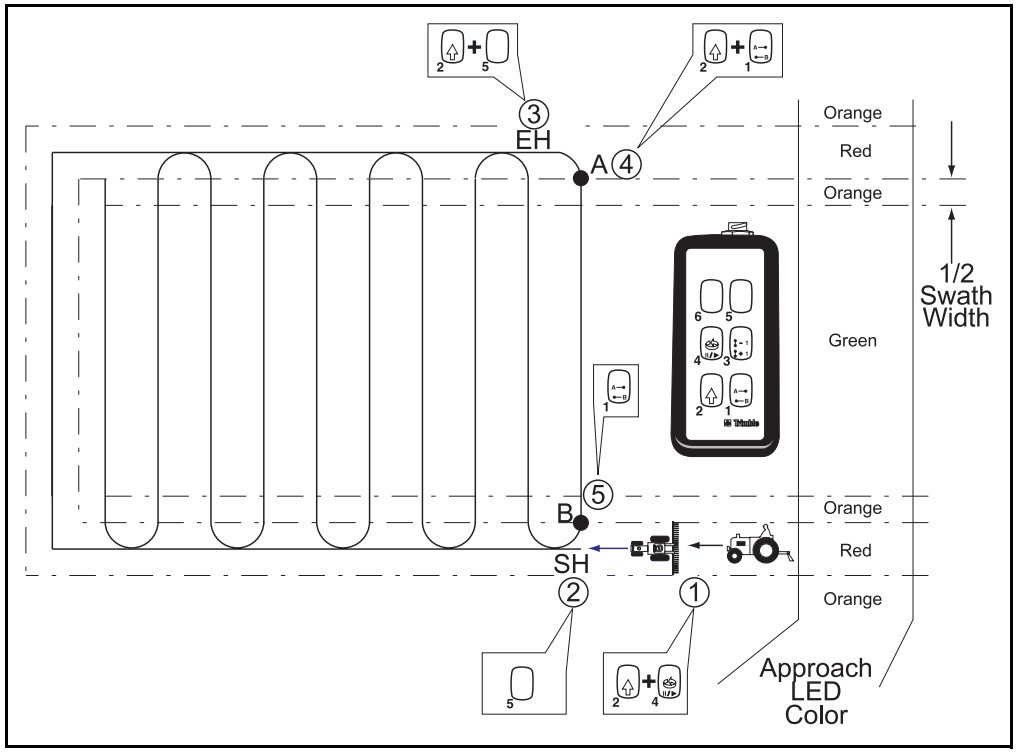
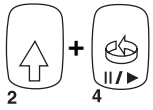


Figure 3-9 Basic A-B Parallel Swathing with Follow Curve Headlands

1. On the External Keypad, press:

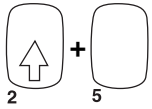


to reset guidance.

Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

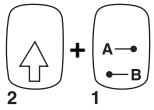
2. To begin recording headland points, press:

3. Drive the headlands. (Headlands points are automatically logged.) When complete, press:



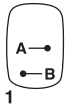
to stop recording headlands.

4. To begin swathing, press:



to set point A.

5. Proceed to the opposite edge of the field and press:



to set point B

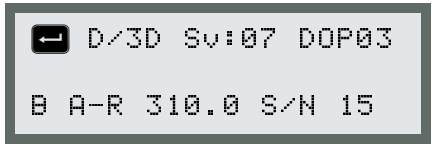
3.2.5 Parallel A-B on Center Pivots

This pattern is useful for spraying crops that are irrigated with a center pivot when only sections of the entire circle are to be sprayed or worked. This pattern is typically used where more than one type of crop is irrigated by one pivot and no (or minimal) furrows exist.

The Approach LED illuminates green when inside the headland boundary. When approaching the edge of headland boundary the Approach LED changes to orange within ½ swath width of the sprayed edge and to red upon crossing the headland edge.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

5. Press v until the *Pattern Type* screen appears.

Press > to activate the cursor and press v to toggle to None (Basic A-B).

Press ↵ to save the setting.

6. Press v until the *Headland Type* screen appears.

Press > to activate the cursor and use v to toggle to Follow Curve.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-10 to lay out the headlands and begin parallel swathing.

Note – The pattern shown in Figure 3-10 assumes that *Create Swaths* is set to the default, *Snap to Swath.*

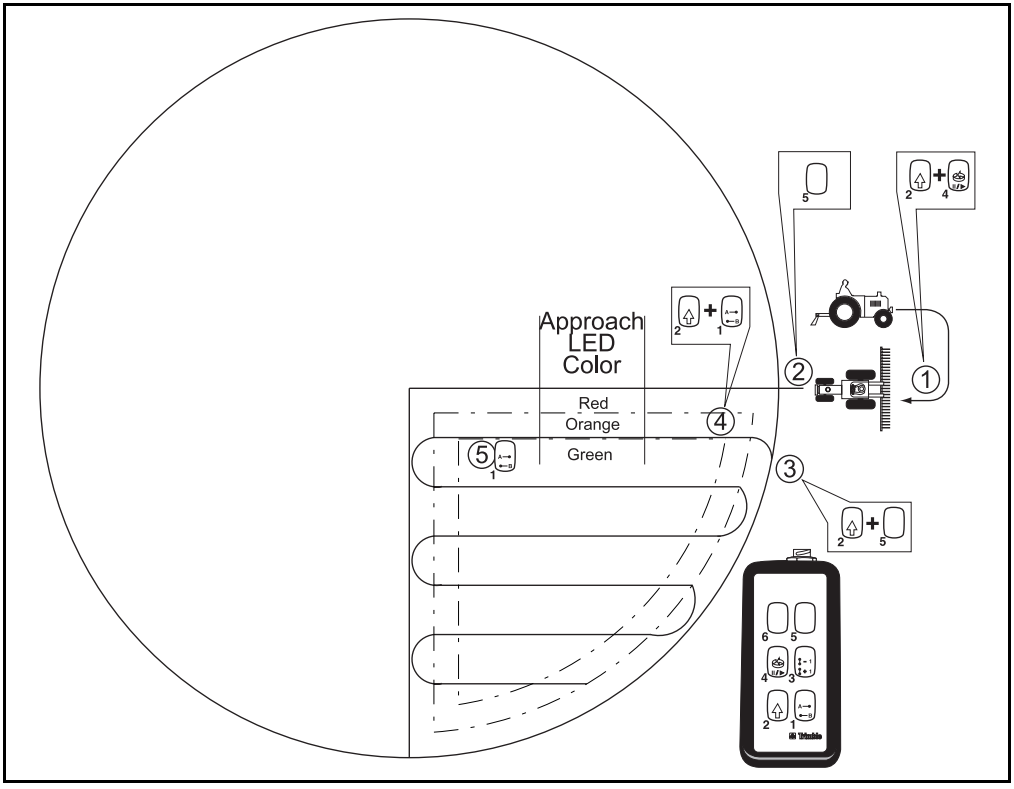
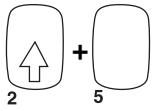


Figure 3-10 Parallel A-B with Follow Curve Headlands

1. On the External Keypad, press:



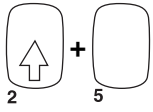
to reset guidance.

Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. Press:

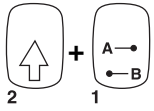
to add headland points and drive toward the inside of the pivot.

3. Once the outside edge of the circle completed, press:



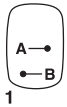
to stop adding headland points.

4. Press:



to set point A.

5. Follow the guidance to the center of the pivot, parallel to the last headland pass and press:



to set point B at the inside of the pivot section.

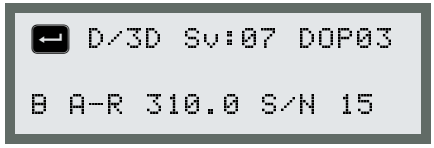
6. Turn toward the next pass and begin application in a parallel A-B pattern.

3.2.6 Curve Following

This pattern is useful when working an irregularly shaped field. Guidance in Curve Following mode is always based on the previous swath after the initial A-B line is established.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press v until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

5. Press ⌄ until the *Pattern Type* screen appears.

Press > to activate the cursor and press ⌄ to toggle to `Curve Following`.

Press ↵ to save the setting.

6. Press ⌄ until the *Headland Type* screen appears.

Press > to activate the cursor and press ⌄ to toggle to `Follow Curve`.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-11 to lay out the curved A-B line and begin swathing.

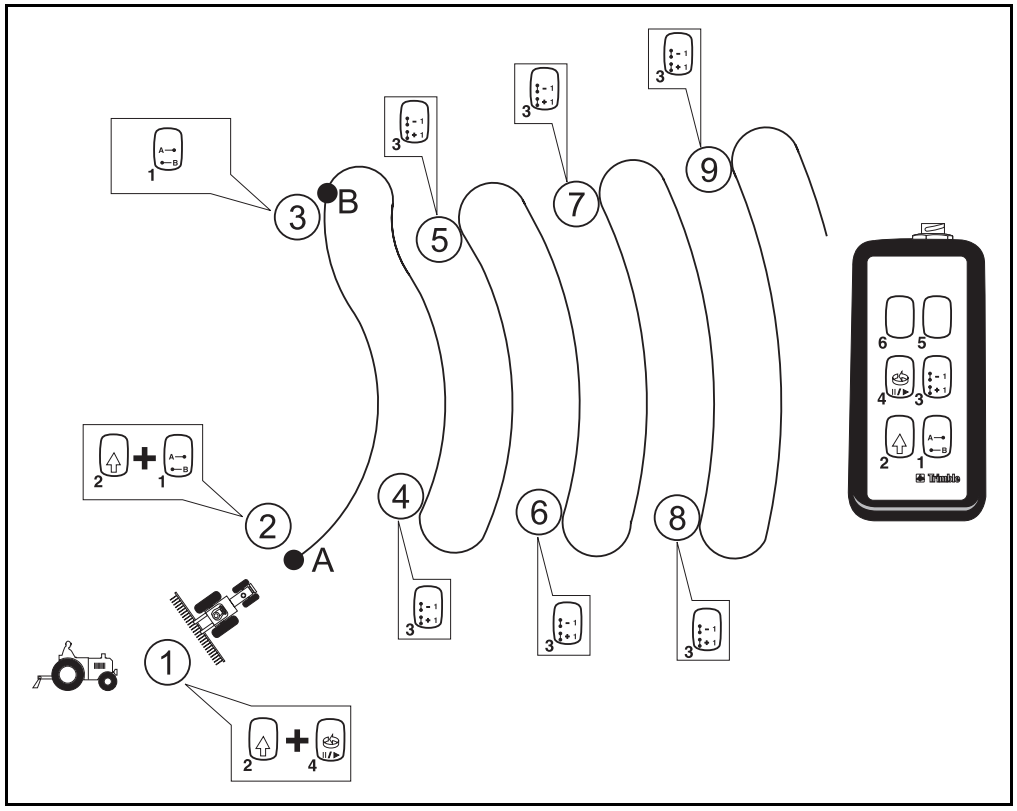
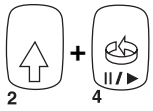


Figure 3-11 Curve Following

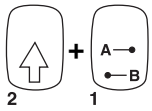
1. On the External Keypad, press:



to reset guidance.

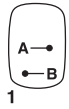
Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. Enter the field and press:



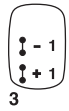
to set an A point for the swath line.

3. When the opposite end of the field is reached, press:



to set point B. Turn to begin the second swath.

4. Upon completing the second swath, press:



to increment guidance to the next swath and turn into the next swath.

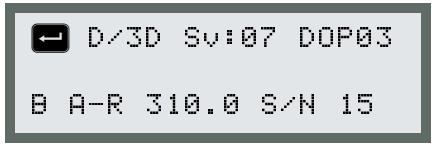
5. Repeat Step 4 across the remainder of the field.

3.2.7 Curve Following on Pivots

This pattern is useful for spraying crops that are irrigated with a center pivot. It is typically used on center pivots where crops irrigated by the pivot have furrows around the center of the circle or when the pivot tracks become difficult to navigate.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

5. Press ⌄ until the *Pattern Type* screen appears.

Press > to activate the cursor and press ⌄ to toggle to `Curve Following`.

Press ↵ to save the setting.

6. Press ⌄ until the *Headland Type* screen appears.

Press > to activate the cursor and use ⌄ to toggle to `None`.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-12 to begin parallel swathing using curve guidance.

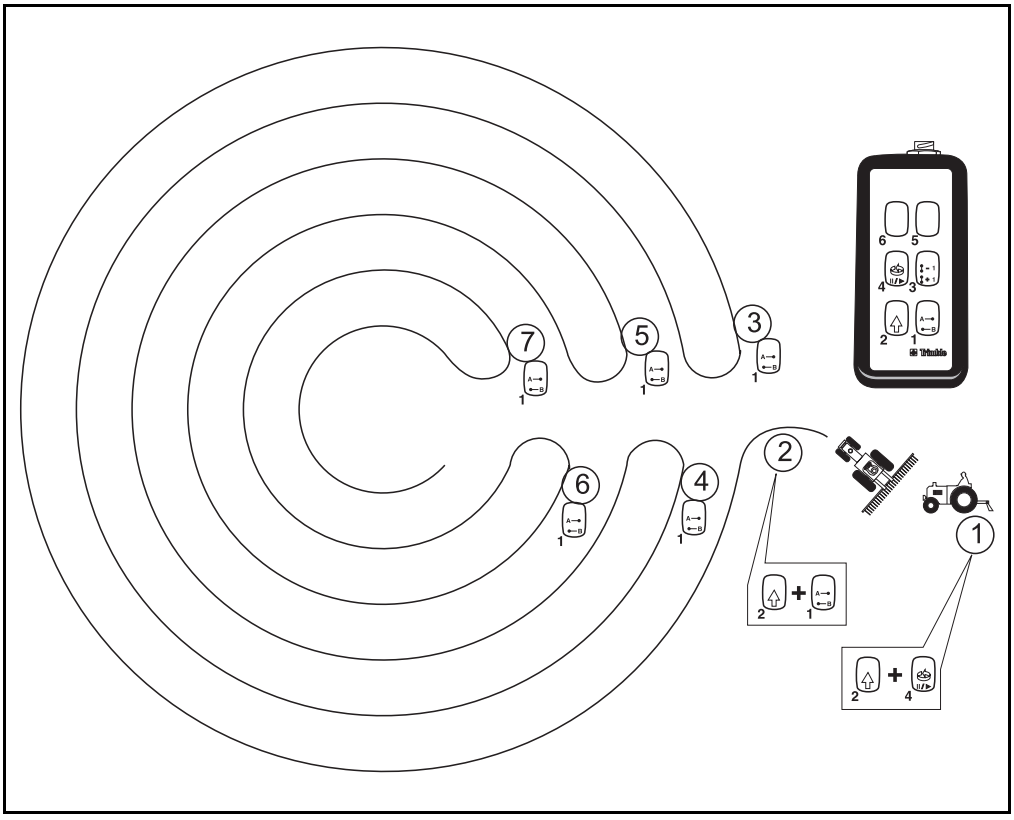
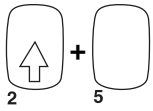


Figure 3-12 Curve Following - Center Pivot

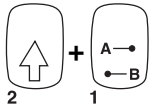
1. On the External Keypad, press:



to reset guidance.

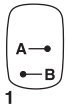
Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. Start where the center pivot tower is parked, press:



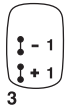
to set point A and drive the desired circuit around the field.

3. Upon reaching the opposite side of the pivot, press:



to set point B.

4. Turn toward the next pass and drive to the opposite side of the pivot, following guidance from the first pass. When complete, press:



to increment guidance to the next pass.

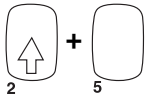
5. Repeat step 4 to complete the remainder of the field.

3.2.8 Curve Following with Curved Headlands

This pattern is useful when headlands are required on all sides of a field that is irregularly shaped. Double headland passes and curved swath lines can also be implemented in this mode. Guidance in Curve Following mode is always based on the previous swath after the initial A-B line is established.

The Approach LED illuminates green when inside the headland boundary. When approaching the edge of a headland boundary, the Approach LED changes to orange within ½ swath width of the sprayed edge and to red upon crossing the headland edge.

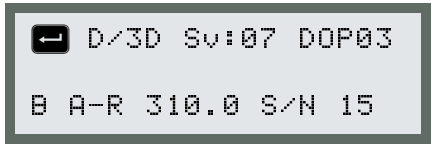
Tip – In Curve Following mode with Curved Headlands, press:



to stop the system from recording headland points and set an A point for the A-B swath line.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press ⌄ until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

5. Press ⌄ until the *Pattern Type* screen appears.

Press > to activate the cursor and press ⌄ to toggle to `Curve Following`.

Press ↵ to save the setting.

6. Press ⌄ until the *Headland Type* screen appears.

Press > to activate the cursor and press ⌄ to toggle to `Follow Curve`.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-13 to lay out the headlands and begin parallel swathing.

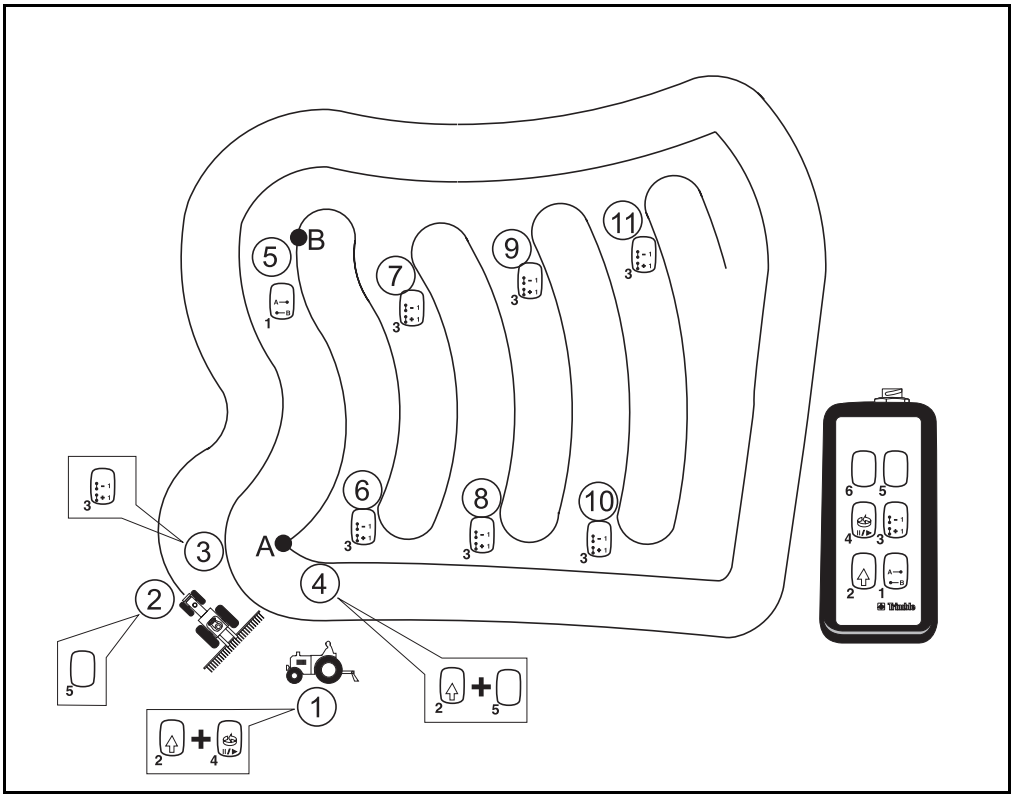
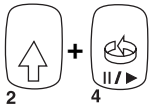


Figure 3-13 Curve Following with Follow Curve Headlands

1. On the External Keypad, press:



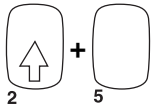
to reset guidance.

Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. To begin recording headland points, press:

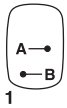
and drive the headlands.

3. When complete, press:



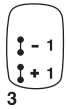
to stop recording headland points. This also sets point A for the initial A-B line.

4. Drive the A-B swath. When complete, press:



to set point B.

5. Turn and follow the guidance parallel to the original A-B line. Press:



to increment swaths.

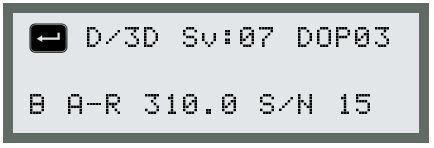
6. Repeat Step 5 across the remainder of the field.

3.2.9 Spiral

This pattern is useful when the operating pattern within a field dictates continuous application from the center out or outside in. Using the curved guidance spiral pattern, a field can be worked continuously and completely using no headlands.

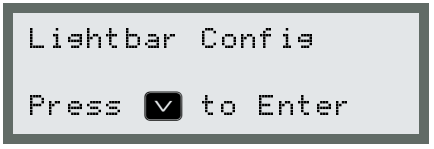
Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.



4. Press > until the *Guidance Config* screen appears.

5. Press ⌄ until the *Pattern Type* screen appears.

Press > to activate the cursor and press ⌄ to toggle to `Spiral`.

Press ↵ to save the setting.

6. Press ⌄ until the *Headland Type* screen appears.

Press > to activate the cursor and press ⌄ to toggle to `None`.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-14 to lay out the first pass and begin swathing.

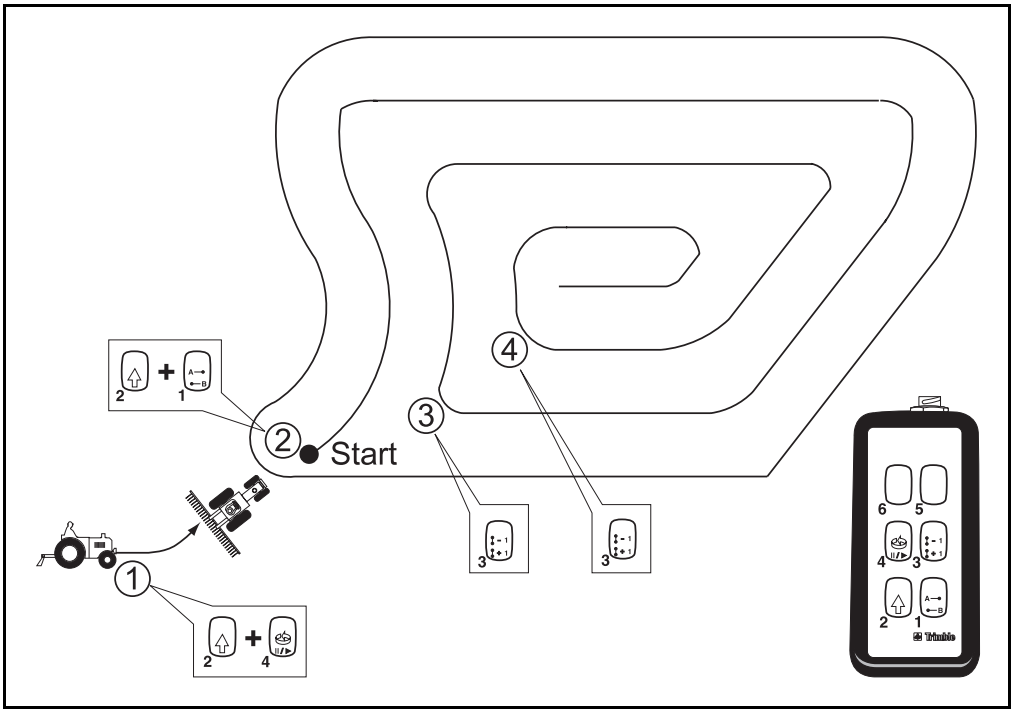
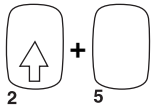


Figure 3-14 Curve Following Spiral

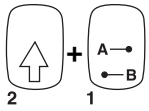
1. On the External Keypad, press:



to reset guidance.

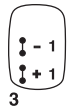
Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. Press:



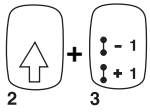
to set point A.
Next, drive around the field perimeter.

3. Upon completing the first pass around the field, press:



(increments right)

or



(increments left)

to increment guidance to the next swath.

4. Repeat Step 3 across the remainder of the field.

Tip – When using spiral pattern, always turn in the same direction when incrementing swaths.

Note – The Spiral pattern can also be implemented by starting in the middle of the field and working out.

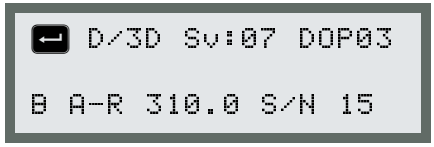
3.2.10 Skip ‘N’ with No Headlands

This pattern is useful when the equipment being used to work a field requires a larger turning radius than the standard parallel A-B pattern allows. Skip ‘N’ enables the operator to specify the number of swaths to skip between passes and provides racetrack guidance across the field accordingly.

Note – Headland patterns can be used with all Skip N patterns.

Configuring Guidance

1. Start at the *Home* screen.



2. Press > until the *Configuration* screen appears.

3. Press until the *Lightbar Config* screen appears.

4. Press > until the *Guidance Config* screen appears.

5. Press v until the *Pattern Type* screen appears.

Press > to activate the cursor and press v to toggle to `Skip N`. Press > and press ^ v to set 'N', the number of rows skipped.

Press ↵ to save the setting.

6. Press v until the *Headland Type* screen appears.

Press > to activate the cursor and press v to toggle to `None`.

Press ↵ to save the setting.

Follow the keystrokes shown in Figure 3-15 to lay out the first pass and begin parallel swathing.

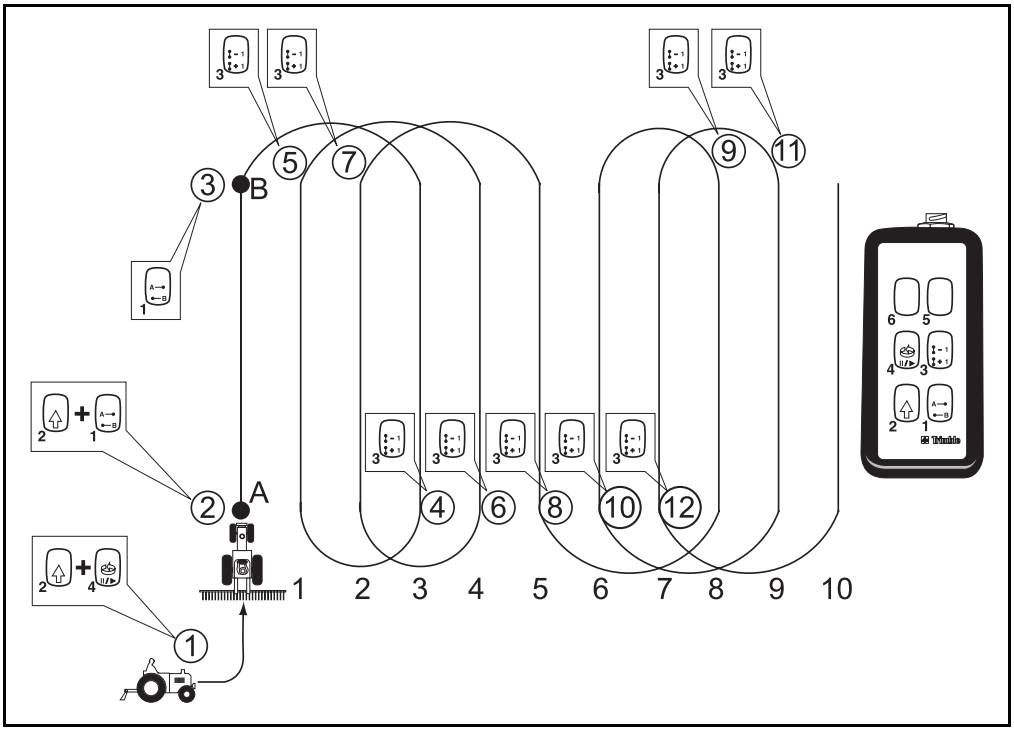
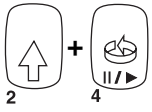


Figure 3-15 Skip N Parallel Swathing, N=2

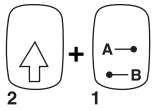
1. On the external keypad, press:



to reset guidance.

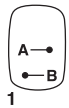
Note – Trimble recommends that you reset guidance before beginning a new field. Resetting guidance clears information from previous fields.

2. Press:



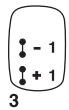
to set point A. Drive to the opposite side of the field.

3. Press:



to set point B. Turn toward the next pass. The system automatically snaps to the first pass after the A-B line is set.

4. Upon completing the second pass, press:



to increment guidance to the next swath.

5. Repeat step 4 across the remainder of the field. The system automatically keeps track of the correct pass based on the user-specified skip.

Warning – Automatic Turn and Snap-To-Swath are not operational with the Skip N pattern. The system automatically detects turn directions after the first swath but each swath thereafter must be manually incremented.

Index

G

H

I

K

L

M

N

O

P

R

S

T

U

W

Reader Comment Form

_Ag_GPS Parallel Swathing Option Manual **January 1999**
P/N 34900-00 **Revision D**

We appreciate your comments and suggestions for improving this publication. Contributors of particularly helpful evaluations will receive a thank-you gift.

I use the following Trimble product_____

for_____

Please circle a response for each of the statements below:

1 = Strongly Agree 2 = Agree 3 = Neutral 4 = Disagree 5 = Strongly Disagree					
The manual is well organized.	1	2	3	4	5
I can find the information I want.	1	2	3	4	5
The information in the manual is accurate.	1	2	3	4	5
I can easily understand the instructions.	1	2	3	4	5
The manual contains enough examples.	1	2	3	4	5
The examples are appropriate and helpful.	1	2	3	4	5
The layout and format are attractive and useful.	1	2	3	4	5
The illustrations are clear and helpful.	1	2	3	4	5
The manual is:	too long		just right	too short	

Please answer the following questions:

Which sections do you use the most? _____

What do you like best about the manual? _____

_____

What do you like least about the manual? _____

_____

Optional

Name _____

Company _____

Address_____

_____

Telephone_____ Fax _____

Please mail to the local office listed on the back cover or to Trimble Navigation Limited, Precision Agricultural Systems, 645 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94088-3642. All comments and suggestions become the property of Trimble Navigation Limited.