# Outback S2

## User Guide

Part No. 875-0172 Rev. C1

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference, that may cause undesired operation.

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Hemisphere GPS Precision GPS Applications



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## Notice to Customers

Contact your local dealer for technical assistance. To find the authorized dealer near you, call or write us at:

| | | |
|---|---|---|
| **Outback Guidance** | Telephone number: | (800) 247-3808 |
| Hemisphere GPS | Fax number: | (785) 742-4584 |
| 2207 Iowa Street | E-mail address: | outbacksales@outbackguidance.com |
| Hiawatha, KS 66434 | | www.hemispheregps.com |
| USA | | |

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# Warranty Notice

## Covered Products

This warranty covers all products manufactured by Hemisphere GPS (the “Products”).

## Hemisphere GPS Limited Warranty

Hemisphere GPS hereby warrants solely to the end purchaser of the Products, subject to the exclusions and procedures set forth herein below, that the Products sold to such end purchaser shall be free, under normal use and maintenance, from defects in material and workmanship for a period of 12 months from delivery to such end purchaser. Repairs and replacement components are warranted, subject to the exclusions and procedures set forth below, to be free, under normal use and maintenance, from defects in material and workmanship for 90 days from performance or delivery, or for the balance of the original warranty period, whichever is greater.

## Purchaser's Exclusive Remedy

The end purchaser's exclusive remedy under this warranty shall be limited to the repair or replacement, at the option of Hemisphere GPS, of any defective Products or components thereof. The end user shall notify Hemisphere GPS or a Hemisphere GPS approved service center immediately of any claimed defect. Repairs shall be made through a Hemisphere GPS approved service center only.

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- Specifications provided by the US Department of Defense for GPS Positioning, and
- DGPS service provider performance specifications.

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## Governing Legislation

To the greatest extent possible, this warranty shall be governed by the laws of the State of Arizona. In the event that any provision hereof is held to be invalid by a court of competent jurisdiction, such provision shall be severed from this warranty and the remaining provisions shall remain in full force and effect.

## Obtaining Warranty Service

In order to obtain warranty service, the end purchaser must bring the Product to a Hemisphere GPS approved service center along with the end purchaser's proof of purchase. For any questions regarding warranty service or to obtain information regarding the location of any of Hemisphere GPS' approved service centers, contact Hemisphere GPS at the following address:

Outback Guidance Technical Support
Hemisphere GPS
2207 Iowa Street
Hiawatha, Kansas 66434
USA
Phone 800.247.3808 Fax 785.742.4584
outbackcs@outbackguidance.com
www.hemispheregps.com

# Table of Contents

# 1: Overview

## Overview

The Outback S2 introduces the next generation of performance to the OUTBACK Guidance product family. The new design combines the market-proven Outback S simplicity together with the latest developments in Crescent GPS receiver technology. This powerful combination will be the platform for years of future upgrades and additions.

If you are a first time user of Outback products, please acquaint yourself with these simple step-by-step instructions. You will find many useful tips and suggestions to help you get the most from your investment.

If you are a seasoned Outback S user, you will find the new Outback S2 user interface very familiar. We have made numerous enhancements, however, and suggest you acquaint yourself with these new features.

The accuracy and functionality of the S2 is extended by using it in combination with the Outback eDriveTC GPS assisted steering system and the Outback BaseLineHD.

Once eDriveTC is engaged, it uses GPS technology to automatically steer the tractor. As a result it provides more uniform treatments, extends hours of operation, and requires less driver skill. Not only does eDriveTC steer more accurately than humanly possible, it now includes the Tilt Compensation (TC) feature. Tilt Compensation corrects for GPS position errors caused when driving on slopes in the terrain. This compensation is essential for precision applications.

Outback S2 and eDriveTC combined with BaselineHD provide repeatable four inch pass to pass accuracy. With BaseLineHD, the minimum guidance speed has now been lowered to 0.25 m.p.h. and the elevation is available as an option on the Outback S2 display screen.

## What's Included

The following equipment is included with the Outback S2:

- S2 Console Assembly
- Antenna Assembly
- Power Cable
- Antenna Cable
- Tie Straps
- Antenna Mounting Plate

## Parts Listing

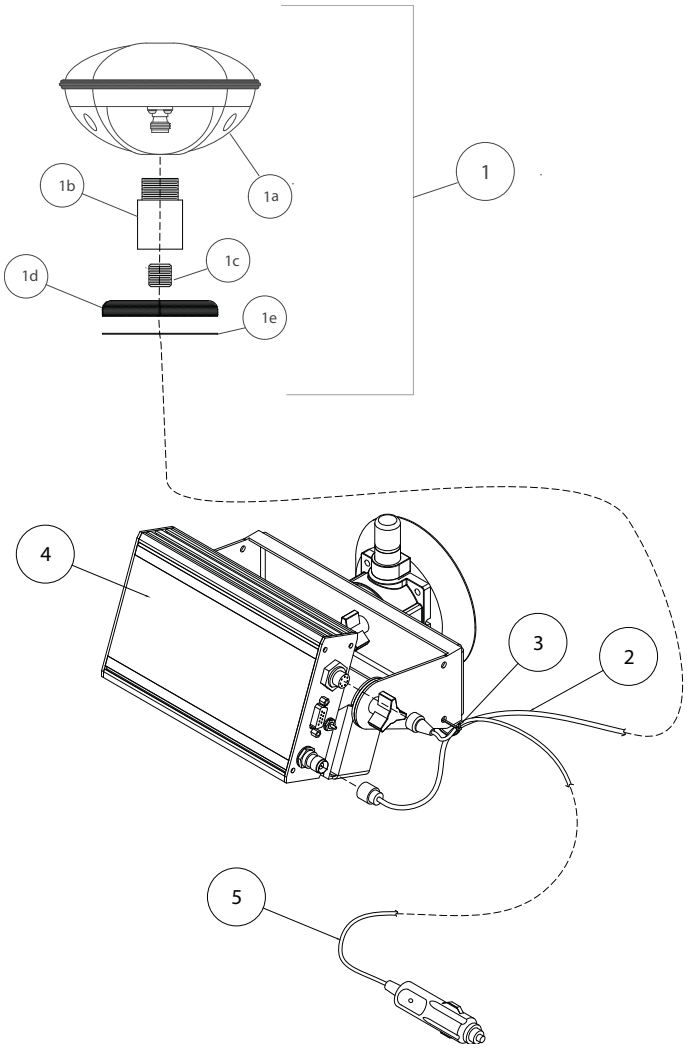


**Table 1-1: Outback S2 Guidance System**

| Diagram No. | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 726-1055-00A | ANTENNA, GPS N-TYPE, MODEL CDA-3 RTK | 1 |
| 1a | 804-0041-00A | ANT. GPS, CSA-3 RTK, N-TYPE | 1 |
| 1b | 478-0006-000 | BASE, MAG RND, 3.19OD, 5 8X11, BLK | 1 |
| 1c | 675-1022-000 | SCR, HEX, 5/8 - 11, 5/8", SSS, S | 1 |
| 1d | 676-0005-002 | NECK, MAGMNT, 1 - 14,5/8" - 11, PVC | 1 |
| 1e | 683-001-007 | TAPE INSULATION #5102.4300 | 1 |
| 2 | 050-0033-002 | ANTENNA CABLE, OBK-S/S2 - 26FT LG | 1 |
| 3 | 677-2002 | TIE STRAP, 7" - RELEASABLE | 6 |
| 4 | | CONSOLE ASSEMBLY (see Table 1-2) | 1 |
| 5 | 054-0025-005 | POWER CABLE, OBK-S/S2 - 15FT LG, CIG LIGHTER PLUG | 1 |

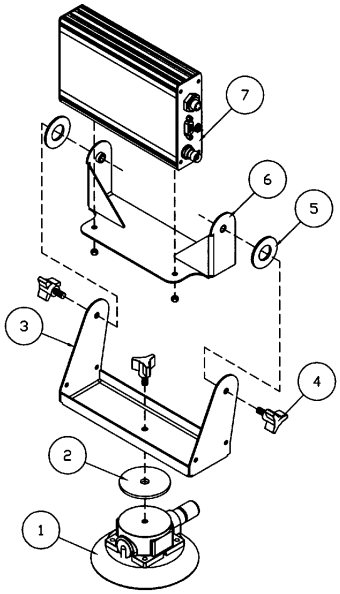



**Table 1-2: Console Mounting Details**

| Diagram No. | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 675-0076 | VACUUM CUP, 4-1/2" /w 1/4NC INSERT | 1 |
| 2 | 678-1057 | WASHER, RUBBER - 2-1/4OD x 3/8ID x 1/8T | 1 |
| 3 | 601-1132 | BASE, CONSOLE MOUNTING - OBK-S/S2 | 1 |
| 4 | 679-1007 | KNOB, 3-ARM - 1/4NC x 1/2 STUD, 1-1/8 DIA. | 3 |
| 5 | 678-1058 | WASHER, RUBBER - 1-1/2OD x 3/4ID x 3/32T | 2 |
| 6 | 601-1133 | FRAME, CONSOLE MOUNTING - OBK-S/S2 | 1 |
| 7 | 803-0035-04A | CONSOLE, OBK-S2 W/MOUNTING HAREDWARE | 1 |

# 2: Getting Started

## Overview

Before using the Outback S2 for the first time, the following tasks need to be addressed:

- Installing the Outback S2
- Powering the Unit
- Configuring the System

# Installing the Outback S2

## Mounting the Antenna

Ideally when mounting the antenna, it should be centered on the vehicle as high and as far forward as possible. This is usually along the front edge of the vehicle cab. Do not place the antenna within 2 feet of a transmitting radio antenna, for example: 2-way or business band radio. If the antenna cannot be place on the vehicle's centerline, the Swath Offset will need to be set in the Setup menu. See "Configuring the System" on page 17.

1. Clean and dry the surface where the antenna mounting plate will be attached.
2. Remove the paper backing from the adhesive strips on the back of the mounting plate.
3. Position the mounting plate and press down hard for good adhesion.
4. Place the magnetic mounted antenna on the plate and be sure it is on the exact centerline of the vehicle

### Mounting the Console

Normally, the display is located above and behind the center of the steering wheel just below the driver's line of sight. The easiest installation is on the front glass of the cab. If that's not possible, it can vacuum mount to any non-porous (metal) surface or the vacuum mount can be removed and the bracket mounted with bolts.

1. THOROUGHLY clean the inside cab window surface directly in front of the steering wheel.
2. Remove the red cover of the vacuum mount, press it to the window and pump the button located on the vacuum mount.
3. Pump until the red line is no longer visible on the button. (Check it periodically. If the red line becomes visible, pump it a little to maintain suction).
4. Adjust the display for proper viewing angle.

**NOTE**: Do not leave console unattended for extended periods of time. If possible, remove the unit from glass when not in use. Continued exposure to the elements (such as direct sunlight), can be harmful to the suction cup. To extend the life of the suction cup, clean it periodically with a product like Armor All®

### Routing the Antenna Cable

Remember to always turn off the unit when attaching or removing cables.

1. Securely attach one end of the cable to the antenna.
2. Route the cable to a cab opening where rubber protection exists to protect the cable. (A closed window works fine.)

**NOTE:** Do not bend the cable to a radius of less than 6 inches. Avoid routing it within 12 inches of radio wires, power generator wires, heat source or moving parts.

3. Attach the other end of the cable to the display unit.
4. Coil excess cable in a protected location and secure the installation with tie straps

### Installing the Power Cable

1. Connect the power cable to the display unit at the PWR/ CAN port.
2. Twist connector firmly until it snaps into place.
3. Use a 5-amp inline fuse on the red lead to protect the console and wiring.

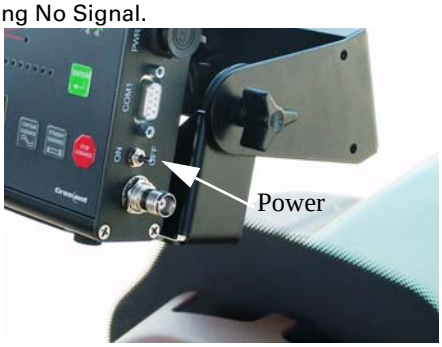
4. Connect the red lead to the positive and the black lead to the negative.
5. Coil excess cable in a protected location and secure the installation with tie straps.

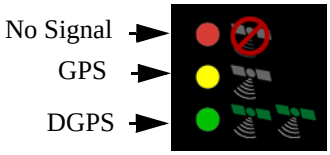
**NOTE**: Cigarette lighter sockets are notorious for intermittent power. For permanent installations, it is best to remove the cigarette lighter plug and hard-wire the leads to a reliable 12 volt power supply.

## Powering the Unit

### Powering up the S2

Toggle the power switch located on the right end of the display. The unit will do an LED self test. Then, the RED status light will illuminate, indicating No Signal.



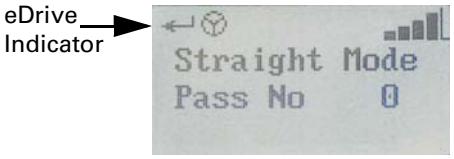

The unit automatically begins acquiring a DGPS signal. This process may take a few minutes. During this process, the vehicle can be moving or the operator can perform menu functions. Upon achieving a GPS signal, the YELLOW status light will illuminate. Finally, once the DGPS correction signal is acquired, a GREEN status light will illuminate. The GREEN DGPS light must be present for the Outback S2 to provide guidance.

**NOTE:** The antenna must have a clear view of the sky to acquire a DGPS signal.

### Powering up the S2 and the eDrive

Turn on the power switches of the S2 and the eDrive in any order. The eDrive will establish communication with the S2 and wait for the DGPS signal to be acquired. The S present light on the eDrive console indicates that communication has been established.


The S2's Main Run Screen Display will display the eDrive icon, indicating that the eDrive is active and may be engaged at any time.




**NOTE:** For more information on installing and configuring the eDrive, please see the eDrive User Guide.

### Powering up the S2 and the BaseLineHD

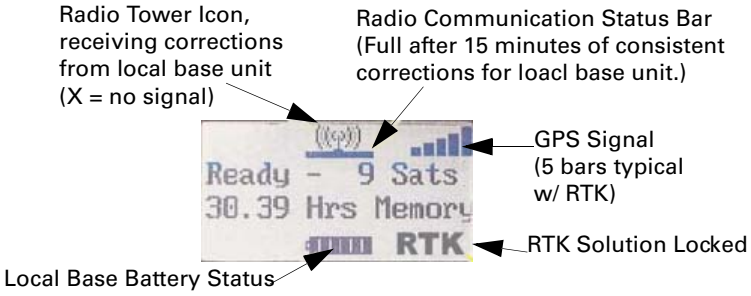
Turn on the S2 and the BaseLineHD rover radio power LED will illuminate, indicating connection.

**NOTE**: Make sure the Correction Type in the Diagnostics menu is set to LOCRTK.

Power on the BaselineHD base station. Toggle the power switch to the up position on the BaseLineHD base station to use the internal battery, or all the way down to use an external battery. The power status indicator LED on the base station turns red when it is powered up. The base station's green GPS/radio indicator flash when it is broadcasting GPS corrections.

**NOTE:** The rover radio must receive consistent corrections from the base station for up to 15 minutes to achieve RTK lock (maximum accuracy.) However, the vehicle can be moving during this time.

The S2 displays BaseLineHD status information as soon as radio communication has been established.

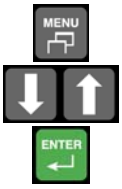


**NOTE:** For more information on installing and configuring the BaseLineHD, please see the BaseLineHD User Guide.

# Configuring the System

## Using the Menu

To access the menu, press the MENU button. Select an item by using the UP and DOWN ARROW buttons. The ">" character points to the active menu item. Press the ENTER button to select.



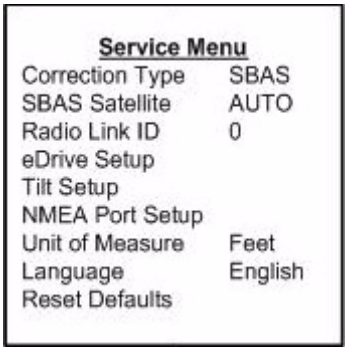

**Setup Menu**

| | |
|---|---|
| Brightness | 5 |
| Swath Width | 30.0 |
| Swath Offset | 0.0 |
| Shift A=B | 0.0 |
| Sensitivity | Medium |
| Headland Alert | On |
| Perimeter Setup | Right |
| Diagnostics > | |
| Service Menu > | |

## Setup Menu Options

| Menu Item | Display Sequence | Defaults | Description |
|---|---|---|---|
| Brightness | Brightness<br>> 5 | [1 to 10]<br>Default= 5 | Adjusts the display brightness. 1 is dim, 10 is bright. The LEDs will also brighten or dim as this setting is adjusted. |
| Swath Width | Swath Width<br>> 30.0 ft | [3.4 ft to 3280.67 ft]<br>Default= 30.0 ft | Adjust this number to equal the width of the implement or boom. |

| Menu Item | Display Sequence | Defaults | Description |
|---|---|---|---|
| Swath Offset | Swath Offset<br>> 0.0 ft Right | [X.X Feet Right/Left]<br>Default= 0.0 | Adjust this number to correct for an antenna that is NOT installed on the vehicle or implement centerline. Use the arrow keys to adjust the offset value to the right or left. The offset is equal to the distance between the GPS antenna centerline and the vehicle centerline. |
| Shift A=B | Shift A=B<br>> 0.0 ft Right | [X.X Feet Right/Left]<br>Default= 0.0 | Adjust straight guidance A=B line left or right (see “Adjusting the AB Line” on page 32). |
| Sensitivity | Sensitivity<br>>Medium | [Low, Medium, High]<br>Default= Medium | Adjust the manual guidance indicator sensitivity to LOW, MEDIUM or HIGH. |
| Headland Alert | Headland Alert<br>>On | [On, Off]<br>Default= On | Turn headland indicator on or off. |
| Perimeter Setup | Perimeter Setup<br>>Right | [Left, Center, Right]<br>Default= Right | Select RIGHT, CENTER, or LEFT edge of swath width for field perimeter area calculation (see “Calculating the Area of a Field” on page 36). |
| Diagnostics | See “Diagnostics” on page 54 | | |
| Service Menu | See“Service Menu Options” on page 19. | | |




### Service Menu Options

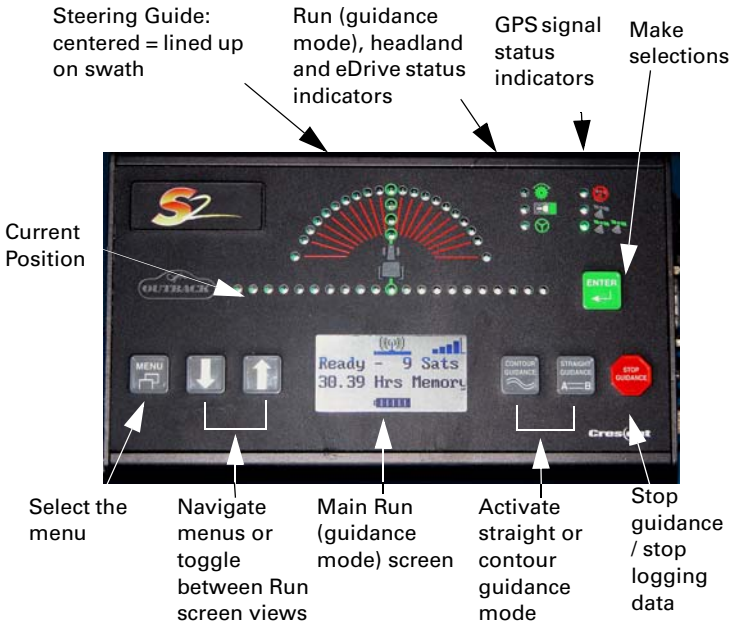
| Menu Item | Display Sequence | Defaults | Description |
|---|---|---|---|
| Correction Type | Correction Type >SBAS | [SBAS, LOCRTK, etc.]<br>Default= SBAS | (See "4: Differential Correction Types" on page 41) |
| SBAS Satellite | SBAS Satellite >AUTO | [AUTO, W122*, W134*, W135, W138 E120, E124, E126, E131]<br>Default= AUTO | Optional menu item appears only if SBAS is selected as the correction type.<br>*W122 and W134 are no longer active satellites. These selections are removed in future software updates. If the system is still displaying these satellites, please do not select them. |

| Menu Item | Display Sequence | Defaults | Description |
|---|---|---|---|
| Radio Link ID | Radio Link ID<br>> 0 | [0-9]<br>Default= 0 | Optional menu item appears only if LOCRTK is selected as the correction type. (See “4: Differential Correction Types” on page 41.) |
| eDrive Setup | Optional menu appears if eDrive is installed. See the eDrive manual. | | |
| Tilt Setup | Optional menu appears if Tilt Sensor is installed. See the eDrive manual. | | |
| NMEA Port Setup | (See “5: Communicating with Third-Party Applications” on page 49) | | |
| Unit of Measure | Unit of Measure<br>>Feet | [Feet, Meters]<br>Default= Feet | Choose desired unit of measure as feet or meters. |
| Language | Language<br>>English | [English, Italiano, Portuguese, Deutsch, Francais, Español, Dansk, Polski, Svenska, Cesky, Magyar, Russian, Suomi]<br>Default= English | Select desired language choice. Multiple languages are supported. |
| Reset Defaults | Reset Defaults<br>ENTER to Reset | | Select this option to reset factory defaults. |

# 3: Using Guidance Features

## Guidance Overview

Below is an at-a-glance overview of the Outback S2 console:




Outback S2 provides two main guidance options:


**Straight guidance** - predefined parallel passes. Passes may be driven in a linear or a circular fashion.


**Contour guidance** - freestyle guidance relative to any previous pass.

Table 3-1 on page 23 summarizes features available in Straight and Contour mode.

In addition to these two basic guidance options, the area of a field can be calculated in Contour mode.

**NOTE**: It's important to press STOP GUIDANCE button whenever the unit isn't guiding. During guidance, the Outback S2 records all movement. Choosing STOP GUIDANCE tells the unit not to guide and not to record movement.

**Table 3-1: Contour and Straight Guidance Summary**

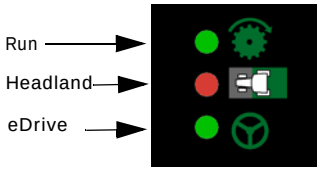
| Item | Contour Mode | Straight Mode |
|---|---|---|
| Mode Of Operation | Freestyle. Guide relative to any previous pass. | Predefined parallel and numbered passes. Passes may be straight or circular. |
| Work Recorded In Memory | Yes. In fact, the recorded pass defines where the next pass will be guided. | Yes. Although, recorded work in Straight mode is not used for guidance, it will be used if the operator switches to Contour mode and then wishes to make a pass along previous work. |
| A=B Points Required | No. Guidance is based on previous passes. | Yes. The A=B defines the first pass and then all other passes are laid out automatically.<br>Note: In A+ Dir, an A point is set and then a direction heading is entered for the point B. |
| Guides from Previous Pass | Yes. Once the Outback S2 "sees" another previous pass close by, it will automatically begin to guide on that pass. Wherever the previous pass goes will guide the next pass. | No. Straight guidance only looks at predefined parallel lines spaced by the width of the implement, as entered in the Swath Width menu. |

**Table 3-1: Contour and Straight Guidance Summary**

| Item | Contour Mode | Straight Mode |
|---|---|---|
| Numbered Passes | No | Yes. The first A=B line is pass #0. Passes to the right increment +1, +2, etc. and passes to the left decrement -1, -2, etc. |
| Swath Width Integrity Across The Field | No. Since guidance is always working from the last pass, driving errors add as the vehicle works across the field. Each pass redefines the next pass. | Yes. Since guidance is always looking at predetermined parallel lines, all passes will be in perfect multiples of the swath width. This works well when planting, harvesting, ditching and furrowing. |
| Switching Modes | Yes. The Outback S2 can switch guidance modes by pressing the STRAIGHT GUIDANCE or CONTOUR GUIDANCE buttons. When switching to Straight mode, the option is given to use a previously defined A=B line, or setting a new one. | Yes. It is possible to switch from Straight to Contour at anytime. Contour mode will recognize passes previously done in Straight mode. |
| Skip Passes? | If an area is skipped, the unit will recognize it as a new pass and continue logging. Guidance will be available again when the vehicle is within 1 1/2 swath widths from the new pass. | Yes. In Straight Guidance Mode, passes can be done in any order desired. They will still be uniformly spaced across the field. |

## Status Indicators

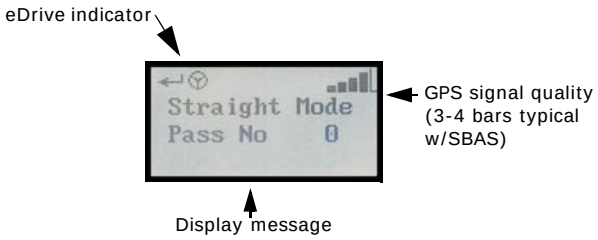
The Outback S2 has three operational status indicators.



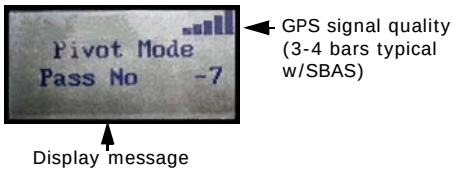

1. The Run indicator is on anytime that guidance logging is active.
2. The Headland indicator is on anytime that the antenna crosses into a previously applied area. The headland alert feature may be turned on or off from the setup menu.
3. The eDrive indicator is on anytime the optional eDrive system is installed and engaged. The indicator blinks when the Auto Engage feature is activated and will stop blinking when it is engaged and on line.

## Main Run Display Screens

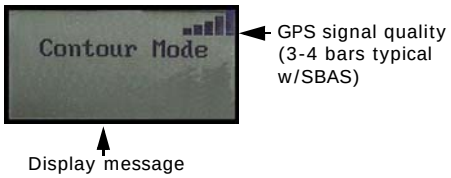
### Straight Guidance Mode




### Pivot Guidance Mode



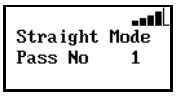

### Contour Guidance Mode



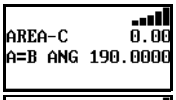
## Alternate Display Screens

While operating in either Contour or Straight guidance modes, the arrow keys will present alternate display screens. Repeated pressing of the DOWN ARROW button will display the following screens:

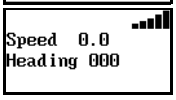
**Main Run Screen**



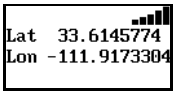

Perimeter Area/
A=B Angle Screen



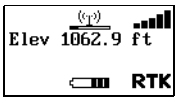

Ground Speed and Heading Screen



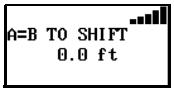

Latitude and Longitude Screen




Elevation Screen (RTK Only)

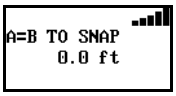



Shift A=B Screen



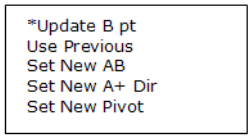

Snap A=B Screen

Repeated pressing of the UP ARROW will display the alternate screens in the reverse order.



## Using Straight Guidance

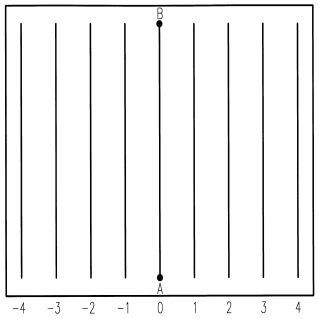
Choose Straight guidance to generate parallel paths for the unit to follow. The parallel paths may be **linear** or **circular (pivot)**. Upon pressing the STRAIGHT GUIDANCE button the following menu displays:


**NOTE**: The Update B Pt option only appears on Pass 0 while traveling in the direction of A to B, if A=B has previously been set.

### Linear Guidance

The first pass can either be established along a straight side of the field, or the first pass can divide the field with a straight swath working out each side. Either way, all passes will be perfectly and uniformly spaced across the field.

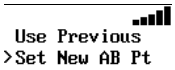


**Setting the A=B Line -** The A=B line is an imaginary line that passes through two points to define the first pass. All other passes are perfectly spaced on both sides of the first pass.

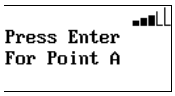
There are two ways to define the A=B line: by marking a Point A and a Point B, or marking a Point A and entering the desired heading.

**Marking Point A and Point B while driving -**

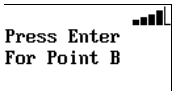
1. Position the vehicle at the beginning of the first pass.
2. Press the STRAIGHT GUDANCE button.
3. Select SET NEW AB on the display screen, and press the ENTER button.




4. Press the ENTER button to mark Point A.



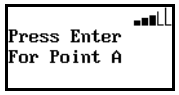

5. Drive the first pass.
6. At the end of the pass, press the ENTER button to mark Point B.



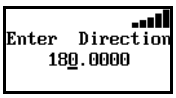

**Marking Point A and enter a heading manually -**

1. Position the vehicle at the beginning of the first pass.
2. Press the STRAIGHT GUDANCE button.
3. Select SET NEW A+ DIR from the displayed menu, and press the ENTER button.


4. Press the ENTER button to mark Point A.



5. Enter the desired heading. The default heading value is the direction of travel at the Point A entry.



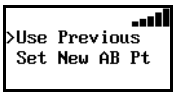

   a. To change the direction, use the UP and DOWN ARROW buttons to enter the desired number for each digit.

   b. Press the ENTER button to select a number and move one space to the right. Up to four decimal spaces may be used to define the direction.

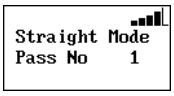
**Begin Straight Guidance -** After setting the A=B line, the unit automatically begins guiding.

1. Turn the steering wheel in the direction indicated by the Steering Guide lights to remain centered on the current pass.
2. At the end of the current pass, turn around. The unit will automatically detect the next pass and begin guiding.

**Switching Modes -** the Outback S2 can switch guidance modes by pressing the STRAIGHT GUIDANCE or CONTOUR GUIDANCE buttons. When switching to straight mode for the second time, the option is given of using the previous A=B line or setting a new one.

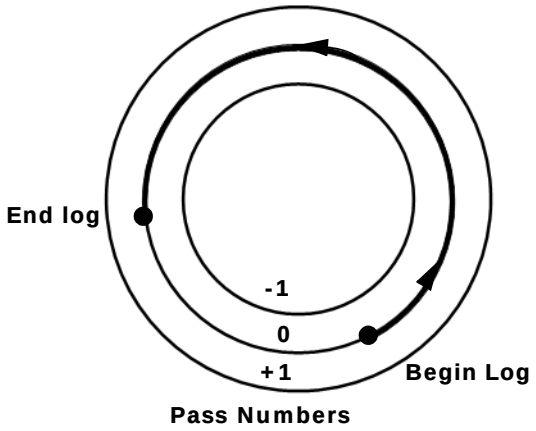




**Pass Numbering -** Once the A=B line is established, all passes will be numbered. While turning around at the headland, the nearest pass number is displayed. Passes may be worked in any order.



### Circular Guidance (Pivot Guidance)

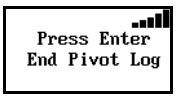
Circular guidance is similar to straight guidance, except that the circumference of a circle is defined rather than a straight line with A and B points. To do so, drive as much of the circumference of a representative circle as possible.




**NOTE**: The more complete the desired circle, the better the unit's accuracy. If not enough of the circle is defined for the unit to extrapolate the desired path, Outback S2 will provide an error message stating, "Not Enough Data. ENTER to Retry."

1. Press the STRAIGHT GUIDANCE button.
2. Select SET NEW PIVOT from the displayed menu.
3. Press the ENTER button to begin the pivot log.
4. Begin driving the circle.


5. Press the ENTER button a second time to end the pivot log.




**Begin Pivot Guidance -** After setting the Pivot Log, the unit automatically begins guiding.

1. Turn the steering wheel in the direction indicated by the Steering Guide lights to remain centered on the current pass.
2. When one pass is finished, just move to either the right or left of the original circle and the unit will automatically begin guiding the new pass.

**Pass Numbering -** Once the Pivot Log has been established, all passes will be numbered. Pass +1 will always be to the right of the original circle, and Pass -1 on the left. If the circle was driven counter-clockwise, Pass +1 will be on the outside. If it was driven clockwise, Pass +1 will be on the inside of the original circle. Passes may be worked in any order.


### Adjusting the AB Line

While operating in Straight guidance mode, the A=B line may be adjusted, on-the-go, without interrupting normal guidance operation. This feature is especially useful to correct for DGPS drift over time.

- **Snap to A=B**: The A=B line may be "snapped" to the vehicle's current location parallel to the original A=B line. The Snap A=B feature is best used to insert a desired gap between consecutive parallel swaths (for example a conservation barrier strip).
- **Shift A=B**: The A=B line may be shifted left or right, rather than re-establishing a new A=B line.

- **Update B Point**: If B point needs to be corrected, the A=B line may be adjusted by selecting UPDATE B PT on the initial pass.

**Snapping the A=B line to the current location -**

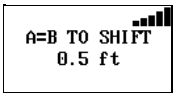
1. While in Straight Guidance mode, press the UP ARROW button once to display the SNAP TO A=B screen.


2. Press the STRAIGHT GUIDANCE button. This will cause the nearest A=B guide line to be aligned with the current vehicle position (snap A=B to here).
3. Press the DOWN ARROW button to return to the Straight Guidance screen.

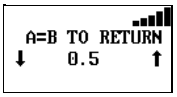
**Shifting the A=B line -**

1. In the Straight Guidance mode, press the UP ARROW button two times. The SHIFT TO A=B screen displays.


2. Press the STRAIGHT GUIDANCE button to show the SHIFT A=B ADJUSTMENT screen.




3. Press the DOWN ARROW or the UP ARROW buttons to nudge the A=B line left or right, relative to the direction of travel.



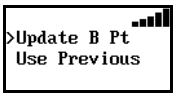

4. Press the STRAIGHT GUIDANCE button to exit the SHIFT A=B ADJUSTMENT screen.
5. Press the DOWN ARROW button twice to return to the main guidance display screen.

**NOTE**: On-the-go A=B line adjustments can only be made while operating in Straight guidance mode.

**NOTE**: The A=B line can be adjusted from the Setup Menu by selecting SHIFT A=B. Press the DOWN or UP ARROW buttons to adjust the amount of left or right shift as desired.

**Updating Point B -**

1. While in Straight Guidance mode, press the STRAIGHT GUIDANCE button.
2. Select the UPDATE B PT menu option to set a new Point B.

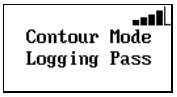



.

**NOTE**: Update B PT is only available when traveling on Pass 0 in the direction of A to B, and Points A and B have previously been set.

## Using Contour Guidance


Choose Contour guidance to follow previous passes. In this mode, the Outback S2 is either logging an initial pass or guiding from a previous pass. After choosing Contour guidance, proceed by making the initial pass. The Steering Guide lights are not active and cannot be used while logging the initial pass. Later, when attempting to follow a previous pass, the guidance will engage and the Steering Guide lights will reactivate. Contour guidance is generally used for working out borders, turn areas and contour following.




1. Press CONTOUR GUIDANCE before beginning initial pass. The display will read "LOGGING PASS".
2. Make the initial pass without using the Steering Guide.
3. At the end of the current pass, turn around and begin the next pass. The unit will automatically detect the previous pass and begin guiding.

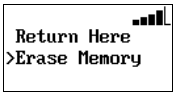
**Guiding On Subsequent Passes -** Anytime the vehicle is within a half a swath width of a previously logged pass, the Outback S2 will automatically begin to guide. In Contour mode, the Outback S2 can guide from any previous pass, even those made in Straight guidance mode.

**Making A New First Pass -** Occasionally a situation will arise in the middle of a job when a pass will need to be made that follows a different path than the previous passes. Simply drive the new path. Once it becomes obvious that a new pass is being defined, the unit will go into logging pass mode. Subsequent passes will be guided from this newly defined pass.

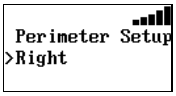
## Calculating the Area of a Field

At the beginning of each new field, the Outback S2 can be used to calculate the field perimeter area of the first contour pass around the field.

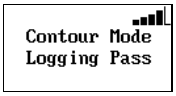
1. Press the STOP GUIDANCE button.
2. Press the DOWN ARROW button.
3. Select ERASE MEMORY from the display screen.



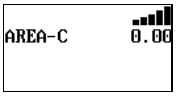

4. Press the ENTER button.
5. Press the MENU button.
6. Select PERIMETER SETUP from the display screen.
7. Press the ENTER button.
8. Select RIGHT, LEFT, or CENTER, to set which swath width position will be used to calculate the perimeter.




9. Press the ENTER button.
10. Press the CONTOUR GUIDANCE button.
11. Drive the vehicle around the outside edge of the field. The main guidance screen will display "LOGGING PASS".




12. Press the DOWN ARROW button to display the perimeter area calculations. The displayed AREA-"x" shows the current perimeter setup selection where "x" is L=left, C=center, or R=right.




The calculations will continue to update, until the vehicle is within one swath width of the starting point. Then the unit will automatically close the perimeter and display the final calculations.

**NOTE**: The units for the area calculation are Acres if the unit of measure is set to Feet, and Hectares if the unit of measure is set to Meters.

## Stopping Guidance


It's important to use the Stop Guidance feature whenever the unit isn't guiding.

During guidance, the Outback S2 records all movement. Pressing the STOP GUIDANCE button tells the unit not to guide and not to record movement. There are several additional features that can be used in conjunction with the Stop Guidance feature.

**Table 3-2: Stop Guidance Feature Summary**

| | |
|---|---|
| Hold | Stops logging. Use during turns or to relocate |
| RETURN HERE | Saves the job and the ending point for later return. |
| RTRN PREV PT | Starts guidance to take you back to a previously saved point. |
| UPDATE e-Dif | Optional menu item if the correction type is set to e-Dif. Resets e-Dif correction to match current position with previous return point. |
| ERASE MEMORY | Clears memory in preparation of a new job. |

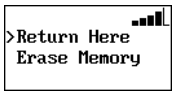
### Hold Logging Data/Guiding:

The Hold feature can be used to stop logging data during turns or to relocate to another section of the field.

1. Press the STOP GUIDANCE button. Do not choose any available menu items.
2. To resume guiding and logging data, press either the STRAIGHT or CONTOUR GUIDANCE button.
3. If Straight Guidance was selected, the system will prompt to use the previously defined A=B line. Press the ENTER button to continue on with the current job.

### Return Here:

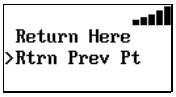
The Return Here function can be used to suspend application in order to reload or at the end the day. It saves the job and records the end point, allowing the unit to restart exactly where it left off.




1. Press the STOP GUIDANCE button.
2. Select RETURN HERE on the screen, and press ENTER.
3. Press either the STRAIGHT or CONTOUR GUIDANCE button.
4. If Straight Guidance was selected, the system will prompt to use the previously defined A=B line. Press the ENTER button to continue on with the current job.

### Return To Previous Point:

Using the Return to Previous Point function, the unit can guide back to a previously saved point.




1. Press the STOP GUIDANCE button.
2. Select RTRN PREV PT and press ENTER. The unit will guide to the saved point.
3. At the saved point, press either STRAIGHT or CONTOUR GUIDANCE button.
4. If Straight Guidance was selected, the system will prompt to use the previously defined A=B line. Press the ENTER button to continue on with the current job.

### Update e-Dif:

The Update e-Dif function is activated when the Correction Type is set to e-Dif. Any time field operations are suspended, for hours or days, the Update e-Dif function allows guidance to resume without interruption by resetting the e-Dif correction to match the current starting point with the previously recorded return point.

1. At the end of an application, create a return point using the steps for the Return Here function. In addition, establish a physical mark in the field corresponding to the ending position. The physical mark should be easy to drive back to at a future time.
2. When resuming the application, return to the ending position. The Return to Previous Point function (up to Step #4) may be used to get nearby, but it is important to return to the same physical location.
3. After returning to the ending position, press the STOP GUIDANCE button.
4. Select UPDATE e-DIF from the displayed menu.
5. Press the ENTER button.

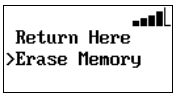
The system displays “UPDATE OK” if the corrections have reset properly. If the system encounters an error in resetting the corrections, it displays “NOT YET UPDATED”.

6. Resume guidance by pressing either the STRAIGHT GUIDANCE or CONTOUR GUIDANCE buttons.

### Erase Memory:

The Erase Memory function removes all recorded passes and points for the job, to prepare for a new job. This is normally done at the end of each field.

1. Press the STOP GUIDANCE button.
2. Select ERASE MEMORY.
3. Press the ENTER button.



4. The system will erase all data and return to the Menu.

**NOTE**: There are 30.56 hours of total memory available. If not erased between fields, it will fill up. If this happens, a "MEMORY FULL" message will display. Use the ERASE MEMORY function to clear the memory.

# 4: Differential Correction Types

## Overview

The differential correction type used by the Outback S2 is selected from the two GPS applications loaded into the receiver. The correction type can be changed from the CORRECTION TYPE item in the Service Menu (see ""Service Menu Options" on page 19). Choose SBAS, e-Dif, LOCRTK or other field installed correction option(s).

For North American distribution, SBAS (WAAS) and LOCRTK are the factory installed options. WAAS is free and is available throughout most of North America. Use of LOCRTK requires an Outback BaselineHD system.

For European distribution, SBAS (EGNOS) and LOCRTK are the factory installed options. EGNOS, like WAAS, is also free and is available throughout most of Europe. Use of LOCRTK requires an Outback BaselineHD system.

For all other locations which do not have access to SBAS (Space Based Augmentation System) corrections like WAAS or EGNOS, then e-Dif and LOCRTK are the factory installed options. Use of e-Dif requires no additional hardware. Use of LOCRTK requires an Outback BaselineHD system.

**NOTE**: LOCRTK, as factory installed, is not pre-activated. The use of LOCRTK requires an Outback BaseLineHD rover unit and base station. See the owner's manual provided with the Outback BaseLineHD for specific instructions on using the LOCRTK correction type. A one-time subscription code is required to use RTK.

**NOTE**: e-Dif, as factory installed, is pre-activated with a one-time primary subscription for use anywhere in the world. The use of e-Dif on OUTBACK Guidance equipment as a GPS differential correction is intended only for relative guidance applications and is not recommended for data recording and subsequent comparative analysis. Relative positional accuracy will typically drift at a rate of 1-2 meters (3-6.5 feet) per hour; however, absolute positional accuracy errors may approach ±10 meters (±33 feet).

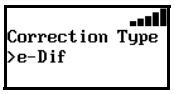
## Using e-Dif

The patented e-Dif correction method uses only the standard GPS satellites and does not require an external correction signal of any type.

e-Dif generates internal differential corrections based on the starting location. The differential corrections are modeled over time and applied to the GPS data in order to maintain a very consistent relative position. This technique is stable and accurate within short time frames, making it perfect for progressive pass-to-pass guidance. As long as each pass is within a few minutes of the last pass, the accuracy performance is very good.

### Selecting e-Dif

To use e-Dif with the Outback S2, simply select e-Dif as the correction type from the Service Menu.



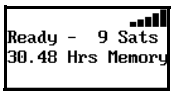

To use Outback S2 with e-Dif, follow the general directions in this manual with the following exceptions.

### Power On Initialization and DGPS Lock

After the power is turned on to the Outback S2, the system must track GPS satellites for about 10 minutes before differential corrections can be generated. The vehicle may be moving or stationary during this time. and the antenna should have a clear view of the sky.

While tracking, the Outback S2 will show the GPS light and will display the number of satellites being tracked and an estimate of how much longer it will take to start generating corrections.


Once the unit is finished tracking, the DGPS light will show and READY will be displayed.



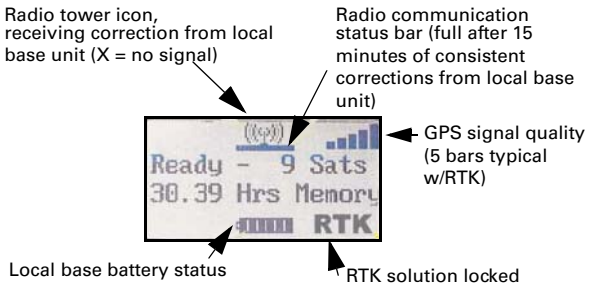

## Using RTK/BaseLineHD

Real-Time Kinematic (RTK) technology provides high levels of positional accuracy. RTK technology uses a base receiver on a site of known coordinates, and broadcasts corrections to a rover unit.

BaseLineHD is a Differential GPS (DGPS) that uses RTK technology. BaseLineHD uses a base station (stationary) to broadcast corrections over a wireless link to a rover radio (mobile) or multiple rover radios. The localized corrections from the base station are processed in the rover GPS system to achieve accuracy and repeatability that is not possible with SBAS, beacon, e-Dif or most other differential correction methods.

One of the advantages of using BaseLineHD is that one base station can be used with multiple rover radios.

### The S2 Display Using LOCRTK Corrections



### Using BaseLineHD

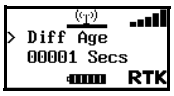
To achieve high levels of accuracy on a consistent basis, its best to keep the following issues in mind:

- Proper installation is very critical to achieving high accuracy. Carefully install the local base unit, rover radio, Outback S2 and GPS antenna according to their individual instructions.
- Ensure that the base unit radio and the rover radio are on the same channel.
    - Rover radio - Check the rover radio channel by selecting the Radio Link ID in the S2 Diagnostics Menu. If necessary, change the channel by selecting Radio Link ID in the Service Menu.


    - Local base unit - To change the local base unit radio channel consult the BaseLineHD User Guide. Make sure there are no other BaseLineHD local base units operating on the same channel in the area of operation. Multiple local base units operating on the same channel in close proximity will cause poor performance.

**NOTE**: When entering the Radio Link ID menu item in the Diagnostics or Service Menu, the S2 stops receiving corrections from the local base unit until the Radio Link ID selection is exited. Staying in the Radio Link ID field for an extended period of time will cause the accuracy of the system to temporarily degrade. Remain in these menus only as long as necessary.

- Maintain the Diff Age level below 5 seconds in all field areas during machine operation. To monitor the Diff Age, use the S2 Diagnostics Menu.




**NOTE**: In order to acquire RTK solution lock, Diff Age should remain below 5 seconds. Diff Age is highly dependent on how clear the line-of-sight is between the local base unit and the rover radio on the vehicle. Avoid obstructions such as thick trees, buildings, steep hills, or separation distances over 2.5 miles.

**NOTE**: If the Diff Age is allowed to climb above 5 seconds, the accuracy of the system will begin to degrade and the S2 may lose the RTK solution lock. The radio icon on the display will change from a radio tower to an “x” when Diff Age is greater than 10 seconds. Once the Diff Age returns to a low value, the accuracy will be restored rapidly as long as the Diff Age remained below 120 seconds. If Diff Age increased beyond 120 seconds, a new RTK solution must be acquired for maximum accuracy.

- Use the STDEV value in the S2 Diagnostics menu to monitor the GPS quality and accuracy.


**NOTE**: This value is only valid if the receiver is tracking 6 or more satellites.

- If using eDrive, ensure that the eDrive system is fine tuned and performing well with SBAS before adding the BaseLineHD correction. BaseLineHD can not compensate for machine control or implement trailing errors.

# 5: Communicating with Third-Party Applications

Available Applications

Changing Default Settings

## Available Applications

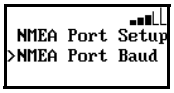
The DGPS signals of the Outback S2 can be shared with third-party mobile applications.

Any application designed to receive DGPS signals from an external receiver over an RS232 Serial Interface using either NMEA 0183 or RTCM messages will work with the Outback Guidance System. NMEA 2000 messages are also avaialble over the CAN bus. Various connecting cables and kits are available for specific applications such as yield monitors, rate controllers, laptops, PDAs, etc.

For successful communication, both the Outback S2 console and the external application must be configured to communicate in the same way. Many applications can use the default communication protocol, however, some applications may require alteration from the default settings.

## Changing Default Settings

The default communication settings can be changed from the NMEA PORT SETUP item in the Outback S2 Service Menu.




- To change the NMEA message, select NMEA PORT SETUP.
- To change the baud rate, select NMEA PORT BAUD.

The following options are available: (Default options are in bold)

1. NMEA PORT BAUD: 57600, 19200, 9600, **4800**.
2. GGA RATE: OFF,.2 Hz, **1 Hz**, 5 Hz, 10 Hz.
3. GLL RATE: **OFF**,.2 Hz, 1 Hz, 5 Hz.
4. VTG RATE: OFF,.2 Hz, **1 Hz**, 5 Hz.
5. GSV RATE: **OFF**,.2 Hz, 1 Hz.
6. RMC RATE: **OFF**,.2 Hz, 1 Hz, 5 Hz.
7. GSA RATE: **OFF**,.2 Hz, 1 Hz.
8. ZDA RATE: **OFF**,.2 Hz, 1 Hz, 5 Hz.
9. RTCM RATE: **OFF**, 1 Hz.
10. GST RATE: **OFF**,.2 Hz, 1 Hz, 5 Hz.
11. NMEA 2000: **OFF**, ON. (CAN output messages)

**NOTE**: If a higher output rate is selected (ex. 5 HZ or 10 HZ) then a faster NMEA PORT BAUD rate must also be selected (eg. 57600 or 19200) in order to facilitate proper communication.

# 6: Troubleshooting

Diagnostics
Troubleshooting
Frequently Asked Questions

## Diagnostics

This section provides helpful information for operating or troubleshooting the unit.


**Table 6-1: Diagnostic Messages**

| Item | Description |
|---|---|
| CORRECTION TYPE | Displays the type of differential correction being used. There are two GPS applications loaded into the receiver. SBAS and LOCRTK are the factory installed options for North America. Other types may be field installed. |
| SATS: TRK=08<br>USE IN CALC=08 | Tells the number of satellites currently visible in the sky. This is only GPS satellites and does not include the correction satellite(s). |
| STDEV | A pseudo-estimate of the DGPS solution accuracy determined as the RMS value of the positional residual errors. STDEV is valid only if 6 or more satellites are used in the solution calculation. Typical values for SBAS correction are 0.5 ft – 1.5 ft (0.15m – 0.45m). Typical values for RTK corrections are < 0.1 ft (3 cm). |
| HDOP | The Horizontal Dilution Of Precision indicates the influence of the current GPS satellite constellation geometry on the horizontal accuracy of the position solution. Lower values of HDOP indicate better geometry. Typical valves are 0.8 – 2.0. |
| DIFF AGE | This indicates the age of the corrections used in the DGPS calculation. For LOCRTK, optimal operating values are < 5 seconds. Values >120 seconds requires acquiring a new RTK lock. Values >10 seconds will cause the radio icon to appear as an "X". For SBAS, this is typically 6 - 10 seconds. |
| BIT ERROR RATE | This shows a number that measures the relative strength of the correction satellite(s). In the case of WAAS, two numbers are shown separated by a hyphen. The number can be from 0 to 500, with 0 being good and 500 being bad. See page 58 for a more detailed explanation. |

**Table 6-1: Diagnostic Messages**

| Item | Description |
|---|---|
| RADIO LINK ID | Only available in LOCRTK correction type. Displays the current radio link ID or frequency and the radio receiver signal strength. Remain in this menu only as long as necessary to avoid degrading performance. |
| BASE BATTERY | Only available in LOCRTK correction type. Displays the estimated remaining internal battery operating hours of the base unit and the current base unit operating voltage. |
| GPS SOFTWARE VER | GPS software version. |
| APP SOFTWARE VER | Application software version. |
| SERIAL NUMBER | This is the serial number of the reciever. It should match the number on the serial number tag on the back of the unit. |
| MEMORY | All passes are recorded in memory until erased at the end of each field. This shows how much memory (in hours) is left. To clear the memory, press the STOP GUIDANCE button and select the ERASE MEMORY menu item. |

# Troubleshooting

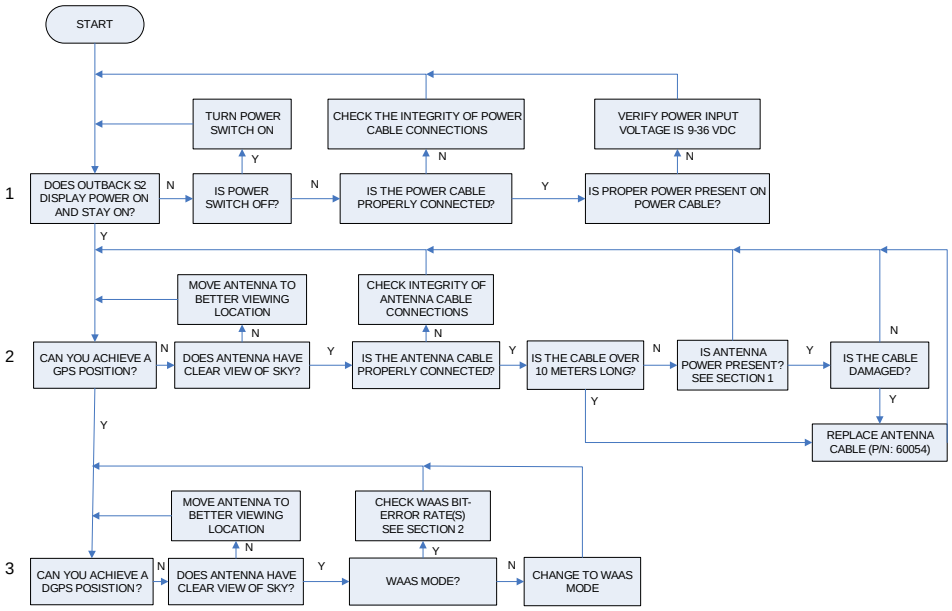



**Figure 6-1. Troubleshooting process.**

### 1) Check Power by Testing Antenna Voltage

The Outback antenna is an “Active” antenna that requires power to operate. This power is supplied to the antenna by way of the coaxial cable connecting it to the Outback console.

Testing the antenna voltage can:

- ensure the Outback receiver is supplying power to the antenna; and
- verify the antenna cable is not damaged.

### Procedure

1. Turn off the Outback console.
2. Disconnect the coaxial cable from the Outback Antenna.
3. Turn on the Outback console.
4. Using a voltmeter set to VDC, measure the voltage output across the coaxial cable. It should measure +5 VDC between the center conductor and exterior connector shell. If the measurement is +5 VDC across the coaxial cable, then neither the cable nor receiver are damaged.
   If the measurement is not +5 VDC across the coaxial cable, proceed to step 5.
5. Turn off the Outback console.
6. Disconnect the coaxial cable from Outback console.
7. Turn on the Outback console.
8. Using a voltmeter set to VDC, measure the voltage output across the antenna output on the console. the measurement should be +5 VDC between the center conductor and exterior housing. If the measurement is +5 VDC at the console connector, but not at the end of the coaxial cable, then the cable is damaged. Replace the coaxial cable and return to step 1.

9. If the measurement is not +5 VDC from the Outback console, contact Outback Customer Service to return the console for servicing.

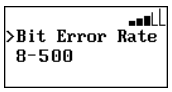
### 2) Check the Differential Signal in SBAS by Verifying the Bit Error Rate (BER)

The Bit-Error-Rate (or BER) can be viewed for the Outback receiver by navigating to the Diagnostics Menu. In the Diagnostics Menu, a screen is present which contains the BER.

The BER is a check of the quality of the SBAS correction signal reception. The Outback uses a scale of 0 to 500 to indicate the signal quality. BER values of less than 20 are ideal. If not, ensure the antenna has a clear view of the sky in order for it to properly find and track the correction satellites.

When using SBAS for the correction type, the Outback can track one or two correction satellites. Both of these sources will have a different BER and will be displayed with a hyphen separating the two values.

For example, a value of 8-500 means that the Outback has a very good signal on one satellite (8) and is not receiving corrections from the other satellite (500). Only one satellite must have a low BER value to provide differential corrections.



# Frequently Asked Questions

## About GPS Guidance

### Q: What is GPS?

A: GPS stands for Global Positioning System. It's a satellite based signal operated by the Department of Defense and is available to anyone to provide position information to receivers on the ground. Several satellites are used by the receiver to pinpoint the exact position. For more information, go to http://gps.faa.gov/GPSbasics/index.htm.

### Q: What is DGPS?

A: The D stands for Differential Correction. It just means that a second signal is used to correct inherent errors in the GPS signal making it even more precise. The Outback S2 can utilize SBAS, e-Dif, or RTK corrections.

### Q: What is WAAS?

A: WAAS stands for Wide Area Augmentation System. It is a satellite based correction signal operated by the U.S. Federal Aviation Administration and is free to those who use it. The service works throughout most of North America from Mexico north to the 55th parallel in Canada. WAAS is not available currently anywhere else in the world, though other SBAS sytems like EGNOS (Europe) and MSAS (Japan) are equivelent and can also be used.  For more information about WAAS contact the FAA at http://gps.faa.gov/

### Q: What is L-Dif?

A: L-Dif is a proprietary localized differential correction signal generated by an Outback Baseline system consisting of a stationary base station receiver which broadcasts the L-Dif corrections over a radio link to the moving rover receiver.

### Q: What is e-Dif?

A: e-Dif is a Hemisphere GPS patented technology capable of achieving GPS accuracies of a few feet without the need for a differential signal broadcast. e-Dif generates internal differential corrections based on the

starting location. The differential corrections are modeled over time and applied to the GPS data in order to maintain a very consistent relative position. The operator can use e-Dif over long time periods with minimal drift in accuracy or return to the starting location at any time to update the differential corrections.

**Q: How accurate is Outback S2 DGPS?**

A: Using SBAS corrections and operating under normal conditions (where each subsequent pass is being made within minutes of the last), swath to swath accuracy is just a few inches. The more lapsed time from one pass to the next may increase the chance for additional error.

**Q: What about Foam Markers and Disk Markers?**

A: The answer is … use them if they help. The best guidance is whatever works for the operator. The more visual indications to guide from the better. One thing is certain, GPS Guidance will be the primary guidance means and everything else will be secondary.

**Q: Can I plant using GPS Guidance?**

A: GPS guidance is a great planting aid. Especially for making the straightest rows possible. We recommend combining the use of Differential GPS (like RTK) giving the driver every possible advantage he could have.

**Q: How does weather affect the GPS signal?**

A: Weather normally does not affect the GPS signal. This includes rain, sleet, snow, thunderstorms and wind. Lightning isn't a problem unless it's a close strike. A direct lightning strike will damage the unit. Snow and ice accumulation on the antenna can also cause a problem.

**Q: How do power transmission lines affect the GPS signal?**

A: Normally, high voltage power transmission lines do not affect the GPS signal at all.

## About Outback S2

### Q: What's the difference between Steering Guide and Current Position?

A: The Steering Guide calculates the nose heading for the driver to steer in order to correctly follow the intended path. Current Position only reports the distance left or right of the intended path. The operator drives using the Steering Guide and checks results using Current Position.

### Q: Can I use the Outback S2 as a receiver for other uses?

A: Yes. Outback S2 accommodates both NMEA 0183 serial and NMEA 2000 CAN communication protocols. Contact the factory at any time to get the latest compatibility list.

### Q: How long does it take Outback S2 to attain a usable signal?

A: It normally takes 1 - 3 minutes. The GPS signal will be acquired first giving a yellow light. DGPS correction will then be acquired which gives a green light. For e-Dif, it takes 10 minutes to generate corrections. For RTK, it can take 15 minutes of consistent corrections to establish a RTK lock. The vehicle can be in motion during this process.

### Q: Does the Outback S2 have memory?

A: The Outback S2 records all movement as long as guidance is on. When the STOP GUIDANCE button is used to pause the job, movement is not being recorded. It also stops recording data while selections are being made in the menus. The S2 can record up to 30 hours of data. When the job is finished, the memory can be erased. If historical data needs to be collected and stored, another accessory (such as an Outback 360) is required to be plugged into the Outback S2 to perform that function.

### Q: How do I erase memory?

A: To erase the memory in the Outback S2, first press the STOP GUIDANCE button. Next, press the down arrow to place the pointer next to ERASE MEMORY. If ERASE MEMORY does not appear, simply press the down arrow until it does. Finally, press the ENTER button to select the function.

**Q: What's Straight Guidance?**

A: In straight guidance mode, the Outback S2 generates perfectly straight, parallel lines. The Outback S2 locks on the closest line based on the first A=B pass and the entered swath width. It then records in memory the actual movement over those lines while guiding. A new A=B line can be generated at any time with the Outback S2. Straight guidance can also be used to create circular (pivot) rows.

**Q: What's Contour Guidance?**

A: In contour guidance mode, all movement is recorded as the machine moves around, unless the STOP GUIDANCE button has been pressed or selections are being made in the menus. During the initial pass, no guidance is given. When the operator makes a second pass and subsequent passes, the Outback S2 begins to guide along the previous pass.

**Q: Can I switch from Straight to Contour in one job?**

A: The operator can switch back and forth between straight and contour. Since contour guidance follows other passes, it will attempt to follow any pass that was recorded in the current job no matter if that pass was done in straight or contour mode.

**Q: How do I perform headlands?**

A: This is very easy. Usually headlands are performed in contour mode. Make one pass and then use the guide on the second pass. Do this where ever turning will be done. The Headlands Alert LED lights up on the S2 display anytime the current pass (swath width) crosses a previously applied area.

**Q: How do I mark the A=B Line?**

A: When doing straight passes, the initial pass is defined by marking two points in the field. The Outback S2 will generate a line through the two points defining the first pass. Since passes can be worked in any order, the A=B line can be defined along the edge of the field, down the middle of the field, or at any point in between.  There are two ways to define the A=B line: by marking Point A at the beginning of the initial pass and marking Point B at the end, or by marking Point A at the beginning of the initial pass and entering a desired heading.

**Q: Can the Outback S2 store a waypoint?**

A: A waypoint can be stored so the operator can guide back to that point. It's used primarily when a job is paused. For example, when stopping for a refill the operator would pause the job, save the point and return back to that point to resume. (See ""Stopping Guidance" on page 37 for detailed instructions.)

**Q: How is the console mounted?**

A: The console is equipped with a vacuum mount that works very well on glass. The best location is directly in front of the operator, immediately above and behind the steering wheel. Wipe the glass with a damp cloth, attach the vacuum mount, then use the swivel and tilt adjustments to get the right viewing angle.

**Q: Does bright sunlight affect the display?**

A: The display is easily viewable with any ambient light situation. Brightness can be controlled in the menu primarily for dimming at night.

**Q: How is the antenna mounted?**

A: It's mounted along the front edge of the top of the cab, on the exact centerline of the vehicle. Avoid close proximity to a transmitting radio antenna. Do not drill holes in the cab roof. Use the adhesive plate provided for mounting. Additional plates are available for multiple vehicles.

**Q: How does the Outback S2 account for implement lag in turns?**

A: The Outback S2 does not account for implement lag. We assume turning lag will be about the same on each pass. As long as tractor spacing is right, implement spacing will follow. This also goes for side hills. Do not attempt to put the antenna on the implement to account for lag.

**Q: What electrical power do I need for the Outback S2?**

A: A standard DC power supply between 9 and 16 volts is required. Current is 1 Ampere at 12 VDC. The unit won't be damaged by reverse polarity (positive to negative), but it will not operate.

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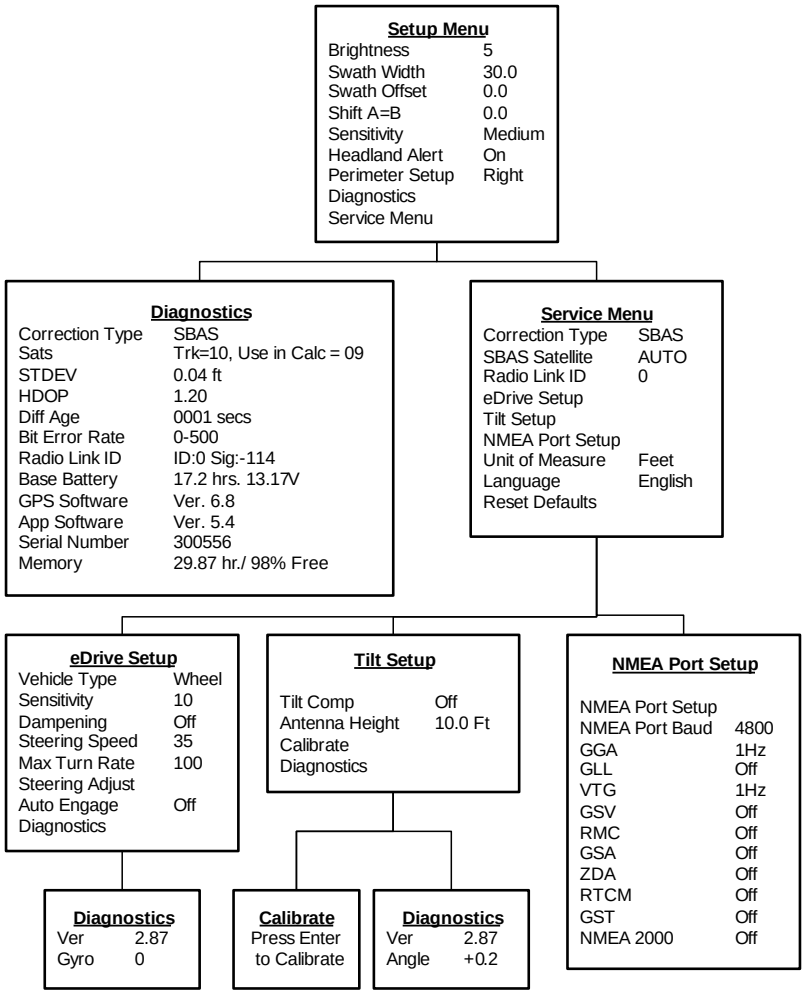
# Appendices

## A: Menu Map

Below is a list of all Outback S2 menu items. Access to various menu items is dependent upon the application and/or system components being used.



# B: Sales and Service Information

## Contacting the Factory

| U.S: | Canada: |
|---|---|
| Outback Guidance | Outback Canada |
| Hemisphere GPS | Hemisphere GPS, Inc. |
| 2207 Iowa Street | 3244 Portage Avenue |
| Hiawatha, KS 66434 | Winnipeg, MB R3K 0Y9 |
| USA | CANADA |

**ONLINE:** http://www.outbackguidance.com

**PHONE:** Monday Through Friday 8AM-5PM U.S. Central Time

- **U.S:** 1-800-247-3808 (Customer Service & Ordering)
- **Canada:** 1-866-888-4472 (Customer Service & Ordering)
- **From all other countries:** 01-785-742-2976

**E-MAIL:** 24 hours / 7 days a week, all inquiries will receive a response from one of our Customer Support Representatives within one business day.

- **Sales:** outbacksales@outbackguidance.com
- **Customer Service:** outbackcs@outbackguidance.com
- **Website Feedback:** outbackweb@outbackguidance.com

**FAX:** 24 hours / 7 days a week, all inquiries will receive a response from one of our Customer Support Representatives within one business day.

- 1-785-742-4584

**U.S. REGIONAL SALES OFFICES**:

- Outback Nebraska - Hastings, NE 1-877-777-6142
- Outback Texas - Hewitt, TX 1-866-857-4448
- Outback Dakotas - Watertown, SD 1-888-825-6031
- Outback Illinois- Jacksonville, IL 1-888-477-6070

## Outback S2 Extended Service Plan (ESP) Summary

U.S. and Canada Only

| Item | Standard Term | Extended Term |
|---|---|---|
| Price | Free | $299 |
| Term | 1 Year ESP | 3 Year ESP (Standard +2 Years) |
| Exchange Service | Yes | Yes |
| Software Revision Updates | No Charge | No Charge |
| Software Revision Installation | Provided by Customer or OGC™ | Provided by Customer or OGC™ |
| Damage During Shipments | Covered | Covered |
| Damage After Customer Receipt | Not Covered | Not Covered |
| Shipping, Outback to Customer | Outback Paid (Next Day Air & Saturday* Delivery) | Outback Paid (Next Day Air & Saturday* Delivery) |
| Shipping, Customer to Outback | Outback Paid (Ground Service) | Outback Paid (Ground Service) |

* Saturday delivery may not be available in all service areas.

### Limited Outback S2 Extended Service Plan

The Outback S2 ESP (U.S. and Canada only) applies only to the non-software portions of the electronic components of the product, including the console, antenna, and related cables. Coverage for the mechanical portions of the Outback S2 is described in the warranty notice. The limited plan term is one-year standard, or three-years extended if purchased at the time of the original order, beginning on the date of invoice to the original purchaser.

Damage caused by shipping the product(s) to the original purchaser is covered under this limited plan. Otherwise, this limited plan does not cover damage due to external causes, including accident, abuse, misuse, problems with electrical power, servicing not authorized by Hemisphere GPS, usage not in accordance with product instructions, failure to perform required preventive maintenance and problems caused by use of parts and components not supplied by Hemisphere GPS.

This limited plan does not cover any items that are in one or more of the following categories: software (except for Hemisphere GPS authorized revision updates), external devices (except as specifically noted), accessories or parts added to an Outback S2 system after the system is shipped from Hemisphere GPS, accessories or parts that are not installed in the Hemisphere GPS factory.

Hemisphere GPS will provide, on an exchange basis and subject to the Hemisphere GPS Exchange Policy in effect on the date of the exchange, replacement parts (up to and including a complete Outback S2 system) for the Outback S2 product(s) covered under this limited plan when parts require replacement. To request service, call Hemisphere GPS (U.S. 800-247-3808, Canada 866-888-4472) or go to www.outbackguidance.com for information, within the plan period. If replacement is required, Hemisphere GPS will issue a Return Material Authorization Number and will ship by UPS Next Day Air & Saturday Delivery the replacement part(s) within 1 business day. Ship by UPS Ground Service collect, the original product(s) back to Hemisphere GPS

in this packaging. For Canadian customers, Saturday delivery is not available and the shipping carrier is Purolator.

In any instance in which Hemisphere GPS issues a Return Material Authorization Number, Hemisphere GPS must receive the original part(s) prior to the expiration of the plan period in order for the replacement(s) to be covered by the limited plan. Failure to return original part(s), for which replacement(s) have been sent, within 30 days of initial shipment, will result in the issuance of an invoice for the cost of the sent part(s). Failure to pay the invoice, or return the part(s), will result in cancellation of this limited plan.

Hemisphere GPS owns all parts removed from repaired products. Hemisphere GPS uses new and reconditioned parts made by various manufacturers in performing service repairs and building replacement products. If Hemisphere GPS repairs or replaces a product, its plan term is the remainder of the limited plan term.

These provisions apply to the Limited Outback S2 Extended Service Plan only. Hemisphere GPS reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligation to owners of units previously sold. No one is authorized to alter, modify or enlarge this Limited Outback S2 Extended Service Plan nor the exclusions, limitations, and reservations.

Appendices


www.hemispheregps.com
e-mail: info@hemispheregps.com