OUTBACK® 360 OWNER'S MANUAL

Congratulations on your purchase of an OUTBACK® 360 Mapping unit. We at RHS wish to thank you for your patronage and appreciate your confidence in OUTBACK® equipment. Your OUTBACK® 360 Mapping unit has been carefully designed and ruggedly built to provide many years of dependable service in return for your investment.

This manual has been prepared to assist you in the operation and maintenance of your OUTBACK® 360 Mapping unit and to provide the necessary part numbers to keep it in near original condition.

Outback® 360 Serial Number_____

Footnotes: OUTBACK® and OUTBACK Guidance® are registered trademarks of RHS, Inc. OUTBACK Guidance Center™, Steering Guide™, and Field Notes™ are proprietary trademarks of RHS, Inc. The OUTBACK®S has patents pending.

WHAT'S INCLUDED

All items shown in color are included. Please check packaging to make sure you have everything. The Outback® 360 will not work without being attached to an Outback® S. A PC running Windows is required to derive the benefits of the Field Notes™ software.

What's Included.

Outback® S

Field Notes™ Notepad

Outback® 360

Foot Switch

Card Reader

Your PC
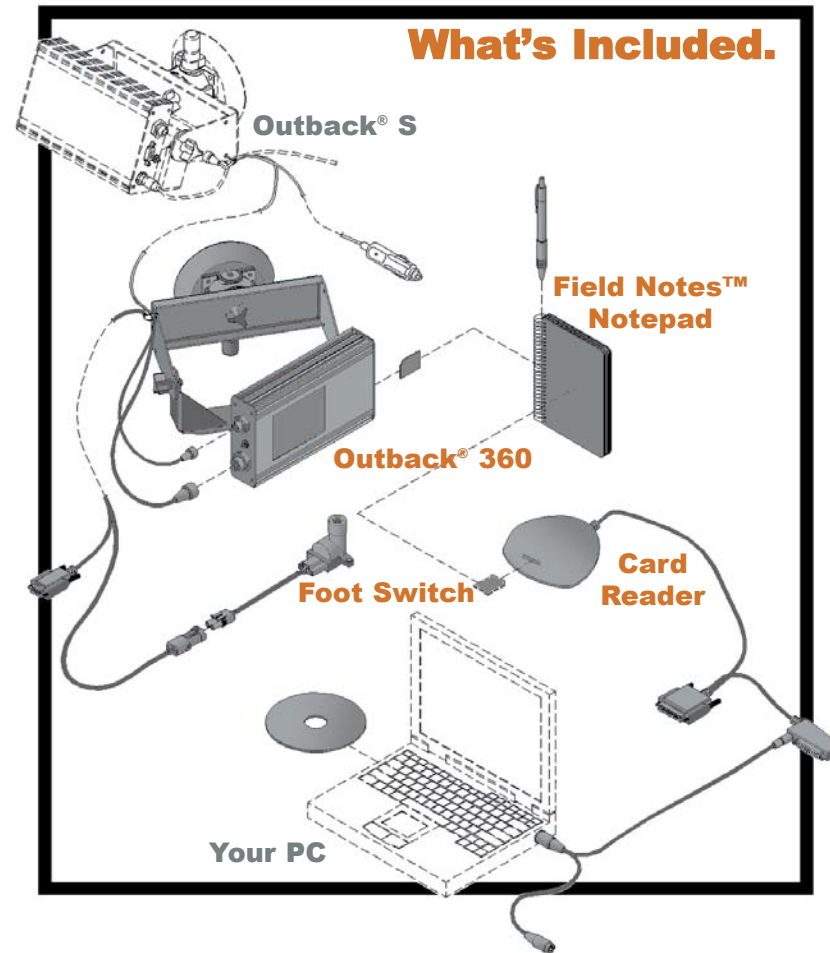
IMPORTANT INFORMATION

(Please Read Before Beginning)

The Outback® 360 will open the door to a wide array of Job management capabilities. While great care has been taken to make it easy to use, the following information will provide a better understanding.

1. Outback® S Operation: The S is still your primary guidance device. It mounts on the front glass and guides as always. When connected to a 360 that's powered up, the S buttons do not work. The 360 takes control of the S which becomes only a display.   Please consult the Outback® S owner's manual for operating instructions.

2. Outback® 360 Operation: The Outback® 360 is primarily a mapping device, displaying all activity on the screen and recording information on a memory card. But it also controls the Outback® S. It's important to remember that mapping and guidance are two separate functions operating simultaneously within the same console.

3. Outback® JOBS: All Outback® work is organized into Jobs. Each Job has a number and the operator should normally start a new Job prior to beginning each field. A Job file will consist of an application map, perimeter information and mark flags if used. Incomplete Jobs may be left on the memory card until time to finish them. Up to 180 hours of completed Jobs may be left on the card until time to transfer to the PC when they can be deleted from the card.

4. Field Notes™ Notepad and PC Software: It's important to keep good field notes when using the 360. If you wish to transfer Jobs to the PC for printing and archiving, the notes you keep on the notepad will be later typed into the PC.

5. Maximum JOB Size: The Outback S memory will reach its maximum in about 6 hours on any one Job. The 360, however, has a 180 hour memory card. The S memory must be erased when either the 6 hour limit is reached or when a Job is left to do another Job. When the S memory is erased and the Job isn't finished, straight guidance can continue unchanged, but if guiding in contour mode, a new beginning pass will be required. The 360 will continue to record job data up to the 180 hour memory card size, however, only the last 17 hours is displayed on screen.

6. North-Up Display: To avoid confusion, all map views on the display are oriented with North being up as you would view any map.

INSTALLATION

1. Exchange Power Cable: Install the S using the instruction booklet provided with it. Do not use the power cable provided with it. Locate the Power/CAN cable in the 360 package. It has 2 connectors and a cigarette lighter plug. Install the connector with two cables coming out into the S Power/CAN port as shown. Twist connector firmly until it locks into place.

2. Rotate Suction Cup: Remove the 360 from it's package, loosen the center adjusting bolt on the suction cup so the cup can be rotated 180 degrees. This puts the pump button on top for easy access.

3. Mount Display Unit: The 360 can be mounted on either side of the cab, for left or right handed installation. Find a desirable mounting location inside the cab and THOROUGHLY clean the glass. Remove the red cap from the vacuum mount, press it to the window and pump the button located on the vacuum mount. Pump until the red line is no longer visible on the button. (Check unit periodically, if red line becomes visible, you may have to pump it a little to maintain suction).

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.*

4. Adjust For Best Viewing: Using the tilt and rotation adjustments on the mounting bracket, orient the display to minimize glare. Fine-tune the adjustment by using the side-tilt feature. Loosen the center thumbscrew under the console, adjust the side tilt until the screen is oriented toward the operator. Then retighten the thumbscrew. If this is a left side installation, the adjustment plate can be flipped over.

5. Install Power Cable: Install the remaining Power/CAN connector (marked "TO 360") to the upper Power/CAN port on the 360. Twist connector firmly until it locks into place. Now, for permanent installations, we recommend removal of the cigarette lighter plug and hard wiring the leads to a reliable 12-volt power supply. Red goes to positive and black to negative.

Note: *Cigarette lighter sockets are notorious for intermittent power. For maximum portability, install a female cigarette lighter receptacle wired directly to the battery for each application. For permanent installation, we recommend wiring directly to the battery.*

6. Install Run/Hold Cable: Locate the other main cable in the 360 packaging. Install the connector marked "TO 360" in the lower port of the 360. Twist connector firmly until it locks into place.   This cable provides two outputs, one for an external RS-232 and the other is a two-pin run/hold connector.

7. Install Floor Switch: Attach the floor switch to the two-pin run/hold connector and locate the switch on the floor where it is easily accessible. This floor switch turns mapping on and off. For automatic run/hold, you may purchase an implement raise/lower whisker switch or a 12-volt controller switch. Installation instructions for those switches are included with them.

8. Connect RS-232 To Outback®S: Connect the RS-232 connector to the S as shown to allow the 360 to upgrade the Outback® S BIOS to support version 2.0 or higher. This cable can be removed after the S is initialized the first time by the 360.

Note: *This step isn't necessary if your S has Version 2.0 or higher already installed.*
*If you're not sure, turn on the S, go to MENU/DIAG-NOSTICS/APP SOFTWARE VER.*

GET ACQUAINTED WITH THE CONTROLS

CHOICE BUTTONS — MENU — MACHINE(VIEW) — FIELD(VIEW) — MARK(FLAG) — PERIMETER AREA

CHOICE BUTTONS (4): Press one of these buttons to control the Outback® S or when making a choice in a menu selection.

MENU: Press MENU first to show the top-level menu and statistics of the current Job. When already in a menu, press MENU to back up one step. When at the top-level menu, pressing MENU again will exit the menu.

MACHINE (VIEW): Turns on view mode to show the Job in the vicinity of the machine. Press once for the standard view; press again to zoom closer, press again to return to standard view. If you leave this view to do something else, pressing once will return you to the zoom setting you had been using.

FIELD (VIEW): Five zoom and pan buttons are provided to view the Job from afar or up close as needed. Press the FIELD button once to get a view of the entire Job on the screen. Each successive press of the button zooms closer. The four triangular PAN buttons can be used to move the view in four directions. Tip: Pan area of interest to the center of display before zooming for faster results.
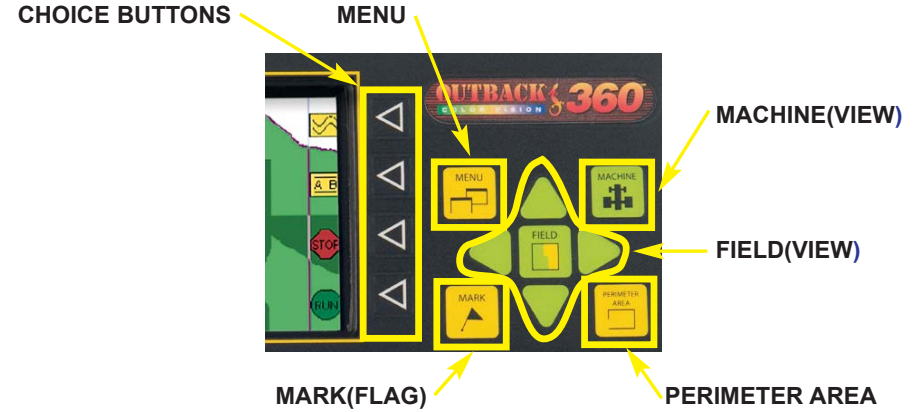
MARK (FLAG): Press MARK to drop a flag. A flag can be used to mark a spot or feature. Or it can be used to create sub-areas within the Job, that is an area before the flag and an area after the flag.

PERIMETER AREA: Press PERIMETER AREA to create a perimeter of the field. Press the button when you begin and you'll be asked if the perimeter line will be on the RIGHT, LEFT or CENTER of the machine. Then begin driving around the outside of the area. You can close the perimeter at any time by pressing PERIMETER AREA a second time. You are then asked if this is an INCLUDED area or an EXCLUDED area.

POWERING UP AND DOWN

1. Power up both units: Turn on the power switches of the S and 360 in any order. The S will boot up and begin acquiring a DGPS signal. The 360 will establish communication with the S and prompt you to select NEW JOB or OLD JOB.   When both units are powered on, the 360 takes control of the S so the buttons on the S don't work.

2. Power up S only: Turn the power switch of the S on and leave the 360 off. This causes the S to operate on it's own. Use the buttons on the S to operate guidance functions. Refer to the Outback® S Manual for operation.

3. Power down: Press the MENU button on the 360, then press SHUTDOWN, then SHUTDOWN again, when the message 'IT IS NOW SAFE TO TURN OFF POWER' comes on, turn the switches off on both units.

Outback® 360 Power Switch

Outback® S Power Switch

MENU FUNCTIONS

NEW JOB
Resets both the S and 360 to begin a new Job. A new JOB ID number is assigned and displayed in the upper left-hand corner. The S will clear its memory, set guidance mode to READY, and run/hold status to HOLD. Be sure that run/hold status remains in HOLD while driving to the starting point. While guidance mode is READY, switching to RUN will automatically select CONTOUR mode.

OLD JOB
Allows you to restart or delete a previous Job. Press UP and DOWN to scroll through all the Jobs located on the memory card. As you scroll, the statistics of the highlighted Job will be displayed on the left. Press OPEN to restore the highlighted Job to the 360 screen. This may take a couple minutes. Press DELETE to remove the highlighted Job from the memory card.

| SETUP : MACHINE SETUP		
Menu Item	Purpose	Instructions
MACHINE WIDTH	This is the working width of the machine. Do not fudge this number. For planters and drills, enter the number of rows times the spacing.	Press UP and DOWN to adjust the number. Then press SELECT. Press CANCEL to leave width unchanged.
INTENTIONAL OVERLAP/SKIP	Use this option to force intentional skip or overlap. For example, if you want to avoid skips at all cost, program a small intentional overlap to provide room for driving error.	Press UP to increase the amount of intentional OVERLAP. Press DOWN below zero to increase the amount of intentional SKIP. Then press SELECT. Press CANCEL to leave unchanged.

SETUP : SETTINGS		
Menu Item	Purpose	Instructions
ANTENNA OFFSET	It's important to know where the working part of the machine is relative to the antenna. Measure the distance forward or back from the antenna to the working part of the machine. (i.e. spray boom, planter units, tillage points, etc.)	Press UP to increase the distance antenna is AHEAD of the machine. Press DOWN below zero to increase the distance antenna is BEHIND the machine. Then press SELECT. Press CANCEL to leave unchanged.
OBK-360 BRIGHTNESS	Reduces the brightness of the 360 screen for night operation.	Press UP and DOWN to adjust the brightness from 1 to 10 with 10 being the brightest. Then press SELECT. Press CANCEL to leave unchanged.
OBK-S BRIGHTNESS	Reduces the brightness of the S guidance lights.	Press UP and DOWN to adjust the brightness from 1 to 10 with 10 being the brightest. Then press SELECT. Press CANCEL to leave unchanged.
OBK-S SENSITIVITY	Changes the guidance sensitivity of the S.	Press button repeatedly to toggle through choices of LOW, MEDIUM and HIGH. Press MENU or MORE to save.

Menu Item	Purpose	Instructions
ERASE OBK-S MEMORY	On Jobs over 6 hours, the S memory may fill up with guidance data making it unable to continue with CONTOUR guidance. Use this feature to clear the memory. You'll then drive another FIRST PASS to continue the Job. Note: Erasing the S memory will not effect the Job stored on the 360 memory card.	Press the button and then choose ERASE OK to remove the old guidance data from the S memory. Press CANCEL ERASE to leave S memory intact.
OBK-S BAUD RATE	This allows Baud Rate setting to be changed when outputting GPS data to an external application.	Press button repeatedly to toggle through choices of 4800, 9600 and 19,200. Press MENU or MORE to save.
OBK-S MESSAGES	This allows message types to be changed when outputting GPS data to an external application.	Press the button to see a list of message types. Change message type status by pressing button repeatedly to toggle through choices of OFF, 1 HZ and 5 HZ. Set all types according to the needs of the external application. Press MENU or MORE to save choices.
SET TIME	This tells the unit which time zone you are in. The S must be ON with the DGPS green light on to set this. The actual time comes from the satellite.	Press UP and DOWN to adjust the displayed hour to the current local time. Observe that AM and PM is correct. Press SELECT to save or CANCEL to exit without saving.

Menu Item	Purpose	Instructions
LINES	You may choose to show A-B guidelines or gridlines on the screen while guiding. Refer to the USING GRIDLINES for more information.	Press button repeatedly to toggle between OFF, A-B or GRID. Press MENU or MORE to save.
GRID SPACING	Grid is a handy tool for soil sampling. It allows you to set up a grid of any dimension needed. You can guide then from point to point on the grid.	Press UP and DOWN to adjust the grid spacing. Press SELECT to save or CANCEL to exit without saving.
UNITS	Allows the user to select which units of measure are used by the 360 and S.	Press button repeatedly to toggle through the choices of FEET / SQ.FEET, METERS / HECTARES, METERS / SQ.METERS, and FEET / ACRES. Press MENU or MORE to save selection.
LOAD OBK-S BIOS VIA SERIAL PORT	This utility is for use when connecting the 360 to an older version S. The new S bios must be stored on the memory card and the RS-232 cable must be connected to the S.	Press this button to load the new bios to the old version S. Wait until messages indicate the process is finished.
SETUP : DIAGNOSTICS		
Selecting this item provides helpful diagnostic information. The information provided is self-explanatory. If you have questions, please call Outback Customer Service.		
SHUTDOWN		
Select SHUTDOWN before turning off the 360. It ensures that all data is safely stored on the memory card.		

VIEW BUTTONS

FIELD View: The Field view is represented by the button labeled FIELD and includes the 4 triangular pan buttons surrounding it. Press FIELD once at any time to see a view of the entire Job. Continue to push FIELD to zoom closer to the work. The zoom percentage is displayed on the lower part of the display. To shift the view left, right, up or down, use the four pan buttons. To zoom out, continue pressing FIELD until the percentage returns to 100%. Tip: Always PAN until the area of interest is in the middle of the screen before using ZOOM.
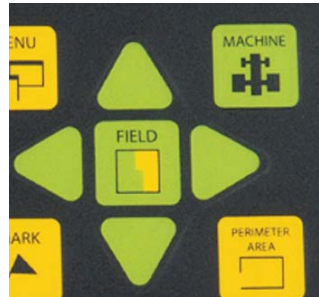
Green buttons are for View Selections.

MACHINE View: The purpose of Machine view is to "follow" the machine while work is in progress. The machine will track across the screen until it gets close to the edge at which point, a new view will be shown. Two zoom levels are available in Machine mode. To operate, simply press MACHINE once. To see the other zoom level, press MACHINE again.

PAN Buttons: The PAN buttons can be used at any time in FIELD view. They can be used when stopped in MACHINE view.

North Up: All Outback views are shown with North up.

MARK (Flag) FUNCTION

The MARK function is a powerful tool when creating a map. The most useful of the MARK is to create sub-areas before and after any change. For example, let's say you're applying a treatment and it will require several refills. Drop a flag between each refill and you will later be able to create separate maps of each load. Another example, say you are planting and desire to change seed depth half way through the Job. Drop a flag when the change is made and the two separate areas can later be analyzed for yield difference. Your imagination is the only limit to utilizing sub-areas.
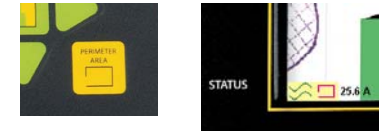
You may also, of course, use MARK to record a single point. Say for example, you want to mark the position of a particular weed patch. Simply drop a flag and record what it is in the Notepad.

Press the MARK button, then choose which color flag showing on the screen. The current location will be saved and identified by the color and by a number. Flags are numbered in the order they are dropped which is helpful for later identification.

Be sure and note all MARKS and any other pertinent information about the Job in the Field Notes™ Notepad. You will later transfer that information to the PC using Field Notes™ PC software.

PERIMETER FUNCTION

The purpose of PERIMETER is to record the outside edge of the field. Once a perimeter is saved, the area within the perimeter is displayed. Normally, perimeters are done on the fly during the first operational round around the field. But you can choose to do field perimeters before hand, transfer them into Field Notes™ PC software where Job templates can be used for future operations. That way perimeter information remains constant from Job to Job.

Multiple perimeters can be included in a single Job. So if a field is divided naturally into multiple areas, the perimeters will be added together for the Job acreage.

Exclude perimeters are also possible. For example, let's say there is a pond in the middle of the field that shouldn't be included in the acreage amount. Use the same perimeter function, except choose EXCLUDE THIS AREA. The resulting excluded area will be deducted from the Job acreage.

To perform the perimeter function, first drive to the starting position of the field, then press the PERIMETER AREA button. Then choose among LEFT SIDE, CENTER or RIGHT SIDE. Drive around the outside of the field as accurately as possible. A magenta line beginning with an X will show on the screen to show the line representing the perimeter. An approximate acreage will show up at the bottom of the screen as the perimeter is being recorded. To close the perimeter at any time (preferably at the time the machine returns close to the starting point), simply press the PERIMETER AREA button again. Then choose between INCLUDE THIS AREA or EXCLUDE THIS AREA. Choose ABORT AREA if you wish to discard the perimeter information just recorded.

STATUS INDICATORS

The Outback® 360 displays current operational status along the bottom edge of the screen. Status indicators are as follows:

🚫	No Communication with Outback® S
READY	Communication Established
〰	Guidance Operating in Contour Mode
=	Guidance Operating in Straight Mode
⊕	Guidance Operating in Return Mode
▢	Perimeter Recording Active
RUN	Applied Area Recording Active
HOLD	Applied Area Recording Inactive

RUN/HOLD and AREA CALCULATIONS

Correct Run/Hold status tells the 360 where work begins and ends.   The applied area estimate shown on the statistics screen is dependent upon proper RUN/HOLD usage. Later analysis by Field Notes™ PC software will calculate the applied, overlapped and unapplied areas as long as RUN/HOLD was used properly.   Always switch to HOLD when turning on the ends or moving to another part of the field.

RUN/HOLD METHODS	
Method	Description
ON CONSOLE	Press the button next to the RUN/HOLD icon in the lower right of the screen. This button may be used to override any other run/hold method used at any time.
FLOOR SWITCH	Included as standard equipment with the 360 and can be used universally for all operations. Pressing the floor switch toggles between RUN and HOLD.
IMPLEMENT SWITCH	Optional equipment. (P/N OBK-360-IRH) This is a whisker switch kit that is mounted on any implement by magnet. Set the whisker so that when the implement is lowered, it engages the whisker switch. This plugs into the same harness as the floor switch above.
SPRAYER RUN/HOLD SWITCH	Optional equipment. (P/N OBK-360-SRH) Use this kit to sense the presence of 12 V to cause RUN. This works well with spray controllers such as the Raven.
DUAL RUN/HOLD SWITCH	Optional equipment. (P/N OBK-360-DRH) Provides RUN/HOLD for both the spray controller and the 360 simultaneously. The floor switch or any other switch closure device can drive both using this kit. Works well with Mid-Tech, Micro-Trak and Spraying Systems Controllers.

USING GRIDLINES

Gridlines provide a regular pattern over an area. With the Outback S, you can guide from point to point on the grid in successive order. This is helpful for things like soil sampling, tree planting or staking out regular areas.

Grid areas are defined by the normal A-B pass lines going in one direction, and 90 degree grid lines in a crossing pattern. If GRIDLINES are turned on, the A-B line establishes the direction of the pass lines and the "A" point establishes the first 'crossing' point. The spacing between the pass lines is equal to the swath width and the distance between grid lines is set in the GRID MENU.

To set up a GRID pattern use the following steps.
1. Go to SETUP-MACHINE SETTINGS and enter the MACHINE WIDTH to the distance between guidelines to use. Set INTENTIONAL OVERLAP/SKIP to zero.
2. Go to SETUP-SETTINGS-LINES and choose [GRID]. Then select GRID SPACING and set the distance between grid lines.
3. Record the PERIMETER of the field.
4. Set an A-B line in the desired direction, with A

where the first grid point should be.
5. To use this pattern again in the future, create a template of it in Field Notes™ PC Software.
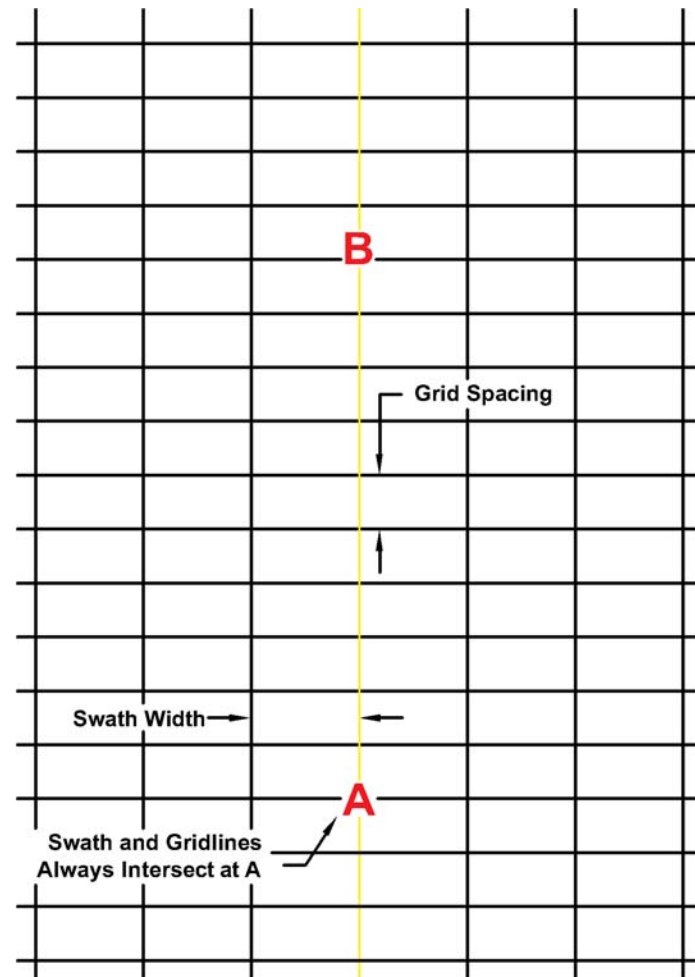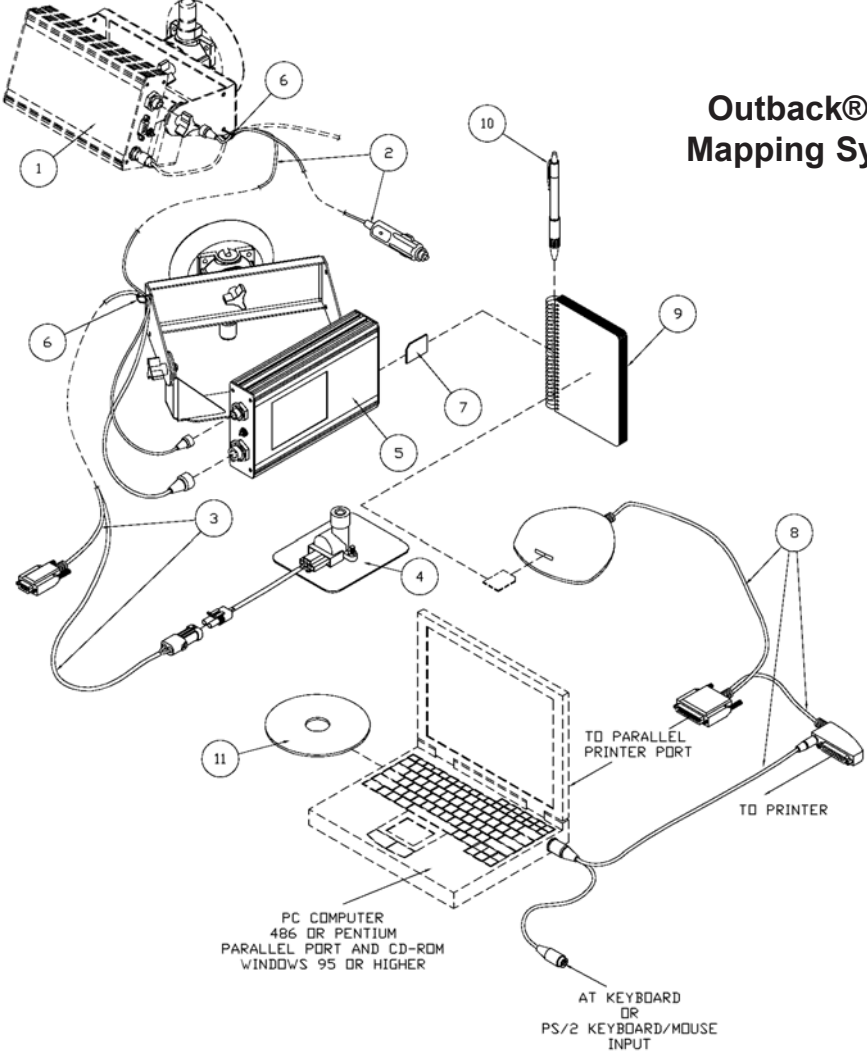
ERROR MESSAGES

In the event of an operational error, the Outback® 360 displays a popup window describing the error and required user action. Following is a list of all popup error messages that may be displayed along with an explanation of the possible cause.

Popup Window Message	Description
ERROR INITIALIZING DATA CARD **Please turn off power and restart.**	Displayed during initialization of the system if there is a problem setting up communications with the MMC data card. Make sure memory card is correctly inserted.
WARNING! **Outback S low memory!** **Save Job and erase Outback S memory.**	Displayed when estimated remaining guidance logging time on the Outback S falls below 10 minutes.
NOTE: Perform SHUTDOWN and restart Outback 360 for Time Zone to take effect.	Displayed when the Time Zone offset has been changed.
NO GPS GUIDANCE **Please Wait.**	Displayed if attempting to enter CONTOUR or STRAIGHT guidance without having valid GPS guidance (DGPS).
INVALID GPS POSITION!	Displayed if attempting to set a RETURN point without having valid GPS guidance (DGPS).
NO RETURN POINT STORED!	Displayed if attempting to Return to Previous without having a valid RETURN point stored.

| Popup Window Message	Description
ERROR! **COULD NOT OPEN LOG FILE** **<xxxx>**	An internal error was encountered while creating a new log file. Turn off power, check that the card is correctly inserted, and restart. Delete all unneeded old jobs. If problem persists, try using a new memory card.
LOG <xxxx> ERROR <xx>! **> CLOSING LOG FILE! <** **Turn off power, check that the card is correctly inserted, and restart.**	An internal error was encountered while writing data to the log file. Turn off power, check that the card is correctly inserted, and restart. Delete all unneeded old jobs. If problem persists, try using a new memory card.
<Procedure name> **MEMORY ERROR** **<additional text>**	An internal MEMORY ERROR message is generated in the event that a certain amount of RAM was needed, but could not be allocated even after discarding the earliest displayed spray blocks. The internal source code <Procedure name> and <additional text> are displayed for support purposes.

PARTS LISTING

**Outback® 360
Mapping System**

TO PARALLEL
PRINTER PORT

TO PRINTER

PC COMPUTER
486 OR PENTIUM
PARALLEL PORT AND CD-ROM
WINDOWS 95 OR HIGHER

AT KEYBOARD
OR
PS/2 KEYBOARD/MOUSE
INPUT

Outback® 360 Mapping System

REF.	P/N	DESCRIPTION	QTY.
1	OBK-S	See Outback® S Guidance System	
2	60081	CAN/Power Cable, OBK-360 - 10ft Lg/15ft Lg, CLA	1
3	60082	COM/Run-Hold Cable, OBK-360 - 5ft Lg/10ft Lg	1
4	AB446	Assy, Run/Hold Foot Switch - OBK-360	1
5		Console Mounting Details, see page 26	
6	TS-7R	Tie Strap, 7" - Releaseable	6
7	60087	Multimedia Card, 16Meg - 180 Hour Data Log	1
8	60089	Multimedia Card Reader - PC/Win, Parallel Port	1
9	60090	Field Notes Pad, OBK-360	1
10	60092	Field Notes Pen, OBK-360	1
11	60093	Field Notes Software, OBK-360 - PC/Win, CD-ROM	1
	DOM-OBK02	Owner's Manual, OBK-360	1
	60094	First Job Sample Card, OBK-360	1

**Console
Mounting Details**
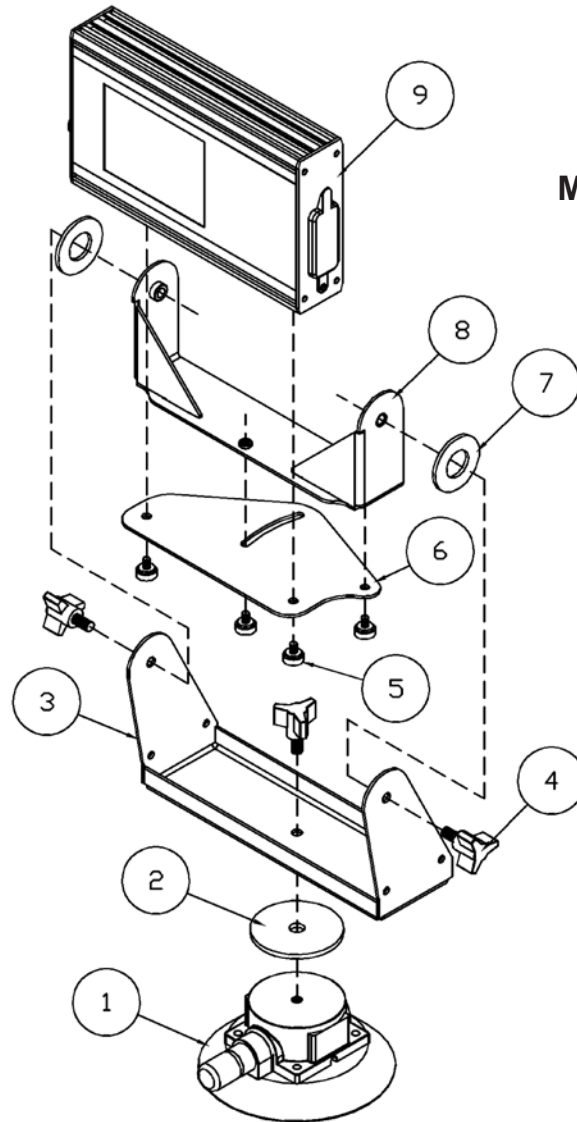
Console Mounting Details

REF.	P/N	DESCRIPTION	QTY.
1	60066	Vacuum Cup, 4-1/2" w/ 1/4NC Insert	1
2	60063	Washer, Rubber - 2-1/4OD x 3/8ID x 1/8T	1
3	AB440	Base, Console Mounting - OBK-S/360	1
4	60065	Knob, 3-Arm - 1/4NC x 1/2 Stud, 1-1/8 Dia.	3
5	60068	Knob, Thumbscrew - #8-32 x 1/4" Stud	4
6	AB438	Slide Plate, Console Mounting - OBK-360	1
7	60064	Washer, Rubber - 1-1/2OD x 3/4ID x 3/32T	2
8	AB439	Frame, Console Mounting - OBK-360	1
9	60080	Console, OBK-360 w/ Mounting Hardware	1
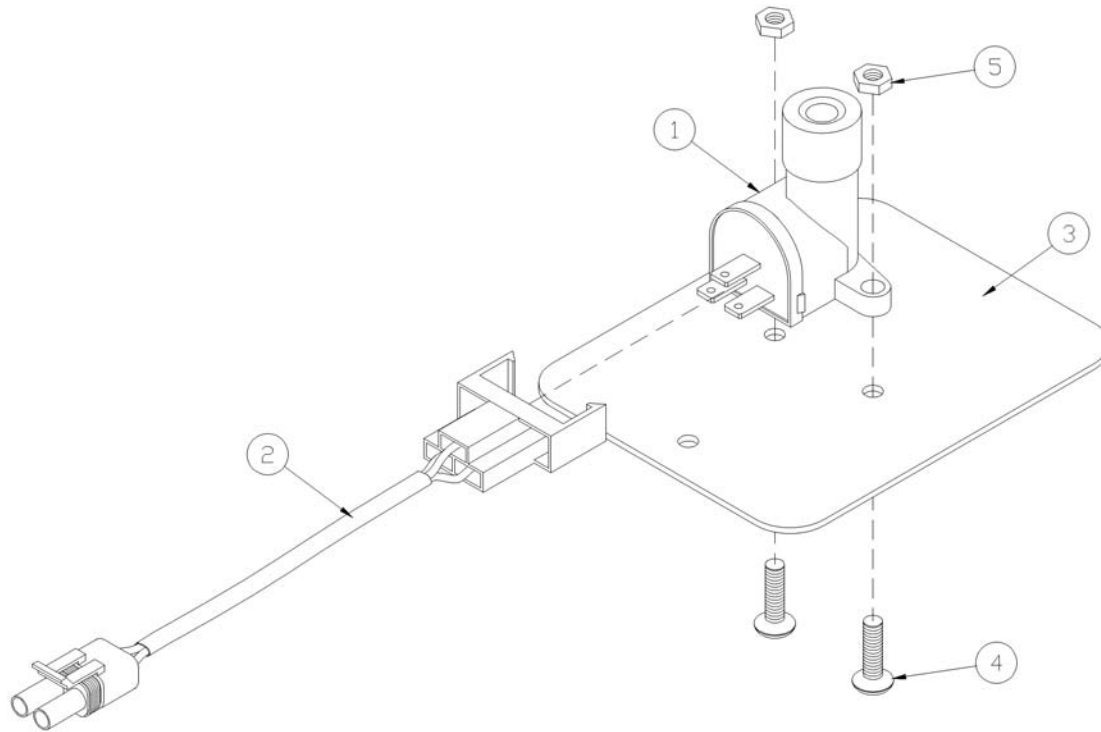
Run/Hold Foot Switch Assembly

REF.	P/N	DESCRIPTION	QTY.
1	60074	Switch, Dimmer - GM Automotive, 15 Amp	1
2	AB445	Wire Harness, Run/Hold Dimmer Switch - OBK-360	1
3	AB437	Plate, Floor Switch Mounting - OBK-360	1
4	B#10.34TRSS-OBK	Bolt, #10-24 x 3/4 SS Phil Truss Head	2
5	LN#10K-OBK	Nut, Keeper Lock - #10-24	2