



DCY

SurfaceWater Pro

OPERATOR'S MANUAL SurfaceWater Pro OMPC21751 ISSUE J9 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

John Deere Ag Management Solutions
LITHO IN U.S.A.



OMPC21751

Introduction

Foreword

WELCOME TO GREENSTAR™ system offered by John Deere.

READ THIS MANUAL carefully to learn how to operate and service your system correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages. (See your John Deere dealer to order.)

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your system and should remain with the system when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction of forward travel.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Specification or Identification Numbers section.

GREENSTAR is a trademark of Deere & Company

Accurately record all the numbers to help in tracing the components should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

WARRANTY is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied.

OUO6050,0000AEC -19-31JUL08-1/1

StellarSupport.Deere.com

NOTE: Product functionality may not be fully represented in this document due to product changes occurring

after the time of printing. For up to date information, please visit StellarSupport.Deere.com.

OUO6050,0000FA5 -19-22OCT08-1/1

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Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

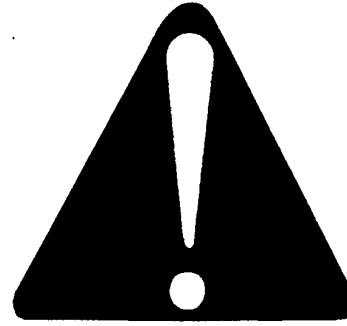
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Safety

Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



T81389 —UN—07DEC88

DX,ALERT -19-29SEP98-1/1

Understand Signal Words

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

 **DANGER**

 **WARNING**

 **CAUTION**

TS187 —19—30SEP88

DX,SIGNAL -19-03MAR93-1/1

Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.



TS201 —UN—23AUG88

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

DX,READ -19-16JUN09-1/1

Operate Guidance Systems Safely

Do not use AutoTrac system on roadways.

- Always turn off (Deactivate and Disable) AutoTrac system before entering a roadway.
- Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway.

The AutoTrac system is intended to aid operator in performing field operations more efficiently. Operator is always responsible for machine path. To prevent injury to operator and bystanders:

- Remain alert and pay attention to surrounding environment.
- Take control of steering wheel when necessary to avoid field hazards, bystanders, equipment, or other obstacles.
- Stop operation if poor visibility conditions impair your ability to operate the machine or identify people or obstacles in machine path.

OUC6050,0000EB4 -19-14OCT07-1/1

Use ATU on Approved Vehicles

Use AutoTrac Universal only on Approved Vehicles – see www.StellarSupport.com for list of approved vehicles

When seat switch is chosen the external seat switch must be plugged into the AutoTrac Universal wiring harness. Stay seated while vehicle is moving. If operator leaves the seat for more than 7 seconds AutoTrac is deactivated.

When activity monitor is chosen AutoTrac Universal requires operator activity every 7 minutes. Operator gets a time-out warning 15 seconds before AutoTrac is deactivate. Pressing resume resets the activity monitor timer.

OUC6050,0000EB5 -19-22JUL08-1/1

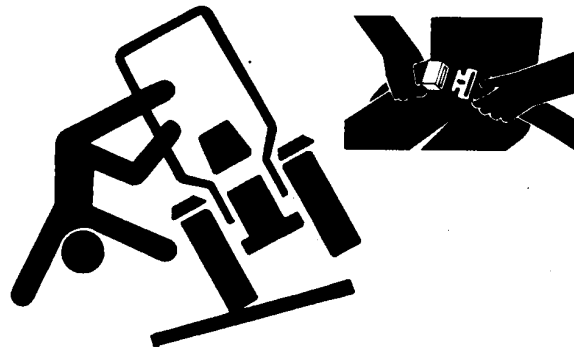
Use Seat Belt Properly

Use a seat belt when you operate with a roll-over protective structure (ROPS) or cab to minimize chance of injury from an accident such as an overturn.

Do not use a seat belt if operating without a ROPS or cab.

Replace entire seat belt if mounting hardware, buckle, belt, or retractor show signs of damage.

Inspect seat belt and mounting hardware at least once a year. Look for signs of loose hardware or belt damage, such as cuts, fraying, extreme or unusual wear, discoloration, or abrasion. Replace only with replacement parts approved for your machine. See your John Deere dealer.



TS205 —UN—23AUG88

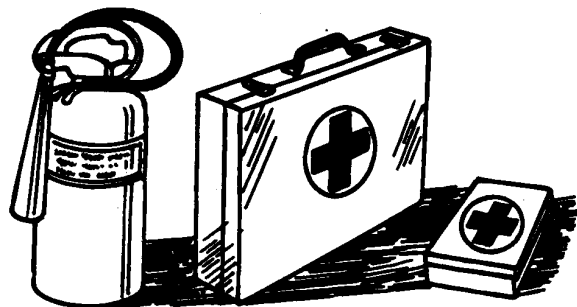
DX,ROPS1 -19-29OCT07-1/1

Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



TS291 —UN—23AUG88

DX,FIRE2 -19-03MAR93-1/1

Practice Safe Maintenance

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.



TS218 —UN—23AUG88

DX,SERV -19-17FEB99-1/1

Handle Global Positioning Receivers and Brackets Safely

Falling while installing or removing a global positioning receiver can cause serious injury. Use a ladder or platform to easily reach a mounting location.

Use sturdy and secure footholds and handholds. Do not install or remove the receiver in wet or icy conditions.

The receiver mast used on implements is heavy and can be awkward to handle. Two people are required when mounting locations are not accessible from the ground or from a service platform. Use proper lifting techniques and wear proper protective equipment.



TS249 —UN—23AUG88

DX,WW,RECEIVER -19-08JAN08-1/1

Theory of Operation

Theory of Operation

SurfaceWater Pro is a two modular program—basic and advanced. SurfaceWater Pro (basic program) is designed for users to create levees and develop basic ditches in their fields. SurfaceWater Pro Plus is an advanced ditching program that generates a “best fit drain”. SurfaceWater Pro Plus calculates the most effective drain in a field while moving the least amount of soil. This information is generated from vertical GPS signals calculated from the StarFire iTC receiver. SurfaceWater Pro Plus requires both a machine and implement receiver and cannot operate with just an implement receiver. Levee applications require John Deere RTK, and ditching requires either SF2 or RTK signal. For greater accuracy, we highly recommend the RTK solution.

NOTE: For best accuracy, recalibrate benchmark after power cycling the quick survey and absolute base station. When starting up the base station, the point of reference could shift slightly, so for the high-accuracy user, consider recalibrating.

Operating with an absolute survey base station reduces the need for benchmarking. In quick survey mode, anytime the base is moved or power is cycled, another calibration is required for high accuracy users.

John Deere implement mounts must be used because they reduce vibration and minimize hardware failures. Vibration mounts help minimize hardware failures over time, especially in ditching applications.

Record ditches from HIGH TO LOW elevation. Cut ditches in either direction.

To ensure that the highest amount of accuracy do not operate Surface Water Pro and Pro Plus outside a ONE MILE radius of the Base Station.

SurfaceWater Pro features available on the GS2 display and our Apex Desktop Software provide value by offering

ways to manage your topographic data better and ensure optimum water distribution for crop production. Apex SurfaceWater Pro features allow you to unload your GS2 survey data to generate Depression, Flow Direction, and Drainage maps utilizing GSDNet. You can also manage your Ditch and Levee Tracks from year to year by editing cut, slope, or drop of fall. Additionally, layering your ditch or levee tracks over your yield data displays your results from the work you completed. See your local John Deere Dealer or visit our website www.StellarSupport.com to learn more about these additional features for your SurfaceWater Pro program.

Reprogram receivers (SurfaceWater Pro Plus) at the vehicle receiver location. Each receiver must be updated individually every time a software update is available [3.20D or older]. You cannot have both receivers attached to the wiring harness when reprogramming.

IMPORTANT: SurfaceWater Pro WILL NOT operate with a StarFire Gen II receiver. A StarFire iTC receiver, or newer, is required for SurfaceWater Pro.

SurfaceWater Pro Plus does not support an Implement Receiver Only configuration. Do not run ditching with an implement receiver only—both a Machine & Implement receiver must be used to operate that software.

Surface Water Pro and Pro Plus Survey function is NOT compatible with Swath Control Pro. Do not use the survey function in conjunction with Swath Control Pro.

Surface Water Pro and Pro Plus is NOT compatible with iGuide Do not use in conjunction with iGuide

OUO6050,0000EF2 -19-26OCT08-1/1

Machine and Implement Setup

Setup

Machine must be GreenStar Ready

In order to run SurfaceWater Pro, operator needs:

- GreenStar Ready Machine
- Constant Power
- Front Extension Harness (3 m or 10 m)
- Implement Application
- Implement Receiver (if using SurfaceWater Pro Plus)

To make SurfaceWater Pro function, set up for the following:

- Machine
- Machine GPS receiver
- Implement (Optional for some functions)
- Implement GPS receiver (Optional)
- Guidance (Optional)
- Implement Harness (Optional)

With all the hardware components connected to the system, turn GS2 system on.

Receivers are used on both the machine and implement for some ditching applications. If two receivers are used, verify that both StarFire iTC softkeys (Machine and Implement) are shown on the display.

PC8663 —UN—05AUG05



MENU Softkey

PC9965 —UN—09FEB07



StarFire iTC Machine Softkey

PC9966 —UN—09FEB07



StarFire iTC Implement Softkey

OUC6050,0000E9F -19-14JUL08-1/1

Client, Farm, Field, and Task Setup

This is a required step for boundaries to run survey mode or to record ditch and levee tracks.

Select: MENU button >> GREENSTAR2 PRO button >> RESOURCES/CONDITIONS softkey >> RESOURCES tab

The documentation screen allows the setup of operations and specific details that are associated with those operations.

IMPORTANT: When setting up the display with vehicle key in the accessory position (power on, engine off), turn key to OFF position for 20 seconds **BEFORE** starting the vehicle. This ensures that the setup data is saved to the data card before operating.

If the vehicle is running during setup and programming, turn off the vehicle with key in the OFF position and wait 30 seconds before restarting. This ensures that all data is saved to the data card.

DO NOT turn the key to the start position directly from the accessory position. The reduction in voltage during the starting phase could result in a loss of all setup data.

Choose the correct information from CLIENT, FARM, FIELD, and TASK drop-down box or input new information. Task is required only if Documentation is used. It is not needed to set or AutoTrac ditch or levee tracks. Always setting tasks is a good standard practice though.

PC8663 —UN—05AUG05



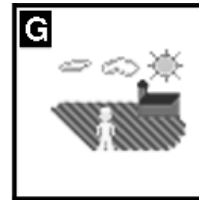
MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC8676 —UN—05AUG05



RESOURCES/CONDITIONS softkey

PC10857BV —UN—15JUL08



Resources tab

OUO6050,0000EBC -19-26OCT08-1/1

Machine Setup

Select: MENU button >> GREENSTAR2 PRO button >> EQUIPMENT softkey >> MACHINE tab

The GreenStar 2 Pro—Equipment pages are where all information regarding the vehicle and implement (scraper or ditcher) is entered. This setup is vital to overall system accuracy.

PC8663 —UN—05AUG05



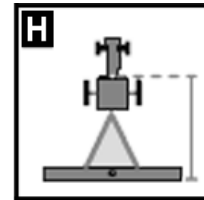
MENU Softkey

PC8661 —UN—02NOV05



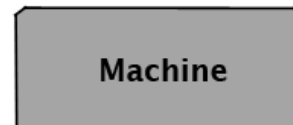
GREENSTAR2 PRO Softkey

PC8677 —UN—05AUG05



EQUIPMENT Softkey

PC10857BP —UN—15JUL08



Machine tab

Continued on next page

OUC6050,0000EA1 -19-26OCT08-1/2

GreenStar 2 Pro - Equipment

Machine A

Machine Type

Tractor C

Machine Model

8x30 D

Machine Name

8030 E

Connection Type

Rear Pivot Drawbar F

Machine Turn Radius

22.0 G (ft)

Turning Sensitivity

70 H

Implement B

Offsets

Change Offsets I

* Recording Source

J ▶

Documentation and Coverage

K

Enable Monitoring without GPS

L

Memory Used

A
F

B
C

C
H

D
I

1 2 3

10:48am

Home
Up

GreenStar2 Pro - Equipment, Machine tab

- | | | |
|--|---|--|
| <p>A—MACHINE tab</p> <p>B—BOOM or IMPLEMENT 1 tab</p> <p>C—MACHINE TYPE drop-down box</p> | <p>D—MACHINE MODEL drop-down box</p> <p>E—MACHINE NAME drop-down box</p> <p>F—CONNECTION POINT drop-down box</p> | <p>G—MACHINE TURN RADIUS input box</p> <p>H—TURNING SENSITIVITY input box</p> <p>I—CHANGE OFFSETS button</p> <p>J—RECORDING SOURCE drop-down box</p> <p>K—DOCUMENTATION AND COVERAGE Record or Pause button</p> <p>N—MEMORY USED</p> |
|--|---|--|

NOTE: When setting up SurfaceWater Pro for the first time, it is recommended that operators create a machine name for the vehicle. All dimensions and parameters set for this vehicle are used for SurfaceWater Pro operations.

NOTE: All items and changes are saved under the current machine name.

The Machine and Implement tabs are required to be populated with equipment information such as:

- Machine Type
- Machine Model
- Machine Name
- Machine Offsets
- Verify that proper dimensions correspond to the machine selected.
- Connection Point—defines how the implement is attached to the machine.

- Rear Rigid Three-Point
- Rear Pivot Two-Point
- Rear Pivot Drawbar
- Rear Pivot Wagon Hitch
- Front Rigid Three-Point

NOTE: Ensure the GS2 display has software version 2.0 or later.

Machine Type—Vehicle type being used (for example, Tractor, Combine, Sprayer). **Machine Model**—Model number of the vehicle being used. For John Deere vehicles, model numbers are available from the drop-down list. **Machine Name**—Allows the operator to save vehicle-specific dimensions and settings. Select the implement connection type used for SurfaceWater Pro operation. This setting changes when implements are changed.

OUO6050,0000EA1 -19-26OCT08-2/2

PC10857CM—UN—21JUL08

Machine Offsets

The screenshot shows the 'Machine Offsets' screen. On the left, there are two diagrams: a top-down view of a machine with a GPS receiver (indicated by a dot) and a side view of a tractor. Dimensions A, B, C, and D are labeled on these diagrams. A is the lateral distance from the center-line to the GPS receiver. B is the in-line distance from the non-steering axle to the GPS receiver. C is the in-line distance from the non-steering axle to the connection point. D is the vertical distance from the GPS receiver to the ground. On the right, there are four input fields for these dimensions, each with a unit of inches (in). The values are: A = 0.0, B = 71.7, C = 46.9, and D = 0.0. Below the diagrams, there is a 'Non-Steering Location' dropdown menu set to 'Rear Axle'. At the bottom right, there is a time display showing '4:38pm' and two buttons: a home button and a back button.

Machine Offsets

A—Lateral distance from center-line of machine to GPS receiver. This will usually be 0.0.

B—In-Line distance from non-steering axle to GPS receiver.

C—In-Line distance from non-steering axle to implement connection pivot point.

D—Vertical distance from the GPS receiver to the ground.

Select: MENU button >> GREENSTAR2 PRO button >> EQUIPMENT softkey >> MACHINE tab >> CHANGE OFFSET button

Enter machine offsets.

Keep a paper copy of these measurements for future reference.

In-Line distance from non-steering axle to GPS receiver is the rear axle for most machines.

Offset toggle button toggles the receiver from the left side of machine to the right side, or center line.

Verify that the correct connection point is selected. Measure from the center of non-steering axle to the center of connection point (for example, center of drawbar pin—the pivot point of the scraper hitch, or lower links, except in the case of a 2-point mount—measure to the pivot point of the implement).

IMPORTANT: Values must be accurate to calculate the track and vertical position for SurfaceWater Pro.

OUC6050,0000EA2 -19-26OCT08-1/1

PC10857CN—UN—21JUL08

Implement Setup

Select: MENU button >> GREENSTAR2 PRO button >> EQUIPMENT softkey >> IMPLEMENT tab

NOTE: Verify the implement setup before operating SurfaceWater Pro Plus. Be sure that hydraulic hookups are in the proper location and no other changes to the implement have been made that could cause unexpected behavior or a change in vertical receiver position.

PC8663 —UN—05AUG05



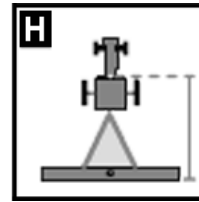
MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO Softkey

PC8677 —UN—05AUG05



EQUIPMENT Softkey

PC10857BQ —UN—15JUL08



Implement tab

Continued on next page

OUO6050,0000EA3 -19-26OCT08-1/2

GreenStar 2 Pro - Equipment

A Machine **B** Implement 1 **C** Implement 2

D Implement Type
Scraper

E Implement Model

F Implement Name

Physical Width 30.000 (ft)

* Implement Width 30.0 (ft)

Track Spacing 30.000 (ft)

G Change Offsets **H** GPS Offsets

I Change Widths

Offsets: 0.0 (in), 0.0 (ft), 0.0 (ft), 0.0 (ft)

Widths: 30.0

A **B** **C** **D** **E** **F** **G** **H** **I** **J**

10:47am

GreenStar2 Pro - Equipment, Implement 1 tab

A—MACHINE tab
B—IMPLEMENT 1 tab
C—IMPLEMENT 2 tab

D—IMPLEMENT TYPE drop-down box
E—IMPLEMENT MODEL drop-down box
F—IMPLEMENT NAME drop-down box
G—CHANGE OFFSETS button
H—GPS OFFSETS button
I—CHANGE WIDTHS buttons

Press IMPLEMENT 1 tab to get to the implement setup page.

NOTE: When using SurfaceWater Pro Plus for the first time, it is necessary to define a name for the implement being used. All dimensions and parameters including GPS offsets on the implement is stored to this name.

The name is also the base for transferring data to the desktop software (if supported).

For the implement setup, the following tabs are required to be populated:

- Implement Type
- Implement Model
- Implement Name—information is stored in relation to this name

Verify or Enter implement: Type, Model, and Name in drop-down boxes.

Implement name allows operator to save implement dimensions.

NOTE: Select the correct name before changing any offset dimensions.

Implement Type is required to be selected. Implement Names are filtered by the type when Implement Model is selected. For example, scraper or rotary ditcher.

Press CHANGE OFFSET button and proceed to following Implement Offsets section.

CHANGE WIDTHS button—IMPLEMENT WIDTHS is used to calculate CUT VOLUME on the EDIT DRAIN screen. For example, Implement Width is entered as the cutting blade width for the scraper.

OOU6050,0000EA3 -19-26OCT08-2/2

PC10857CO—UN—21JUL08

Implement Offsets

Implement 1 GPS Offsets

A 16.0 (ft)

B 4.0 (in)

C 90.00 (in)

D 96.00 (in)

Verify implement fore/aft and height offsets in the StarFire setup pages

A In-line distance from connection point to GPS receiver

B Lateral distance from implement center to GPS receiver

C Vertical distance from the GPS receiver to the cutting edge

D Distance from receiver to the ground with the implement in fully raised position.

1:56pm

A—In-line distance from connection point to GPS receiver.

B—Lateral distance from implement center to GPS receiver.

C—Vertical distance from the GPS receiver to the cutting edge.

D—Distance from receiver to the ground with the implement in fully raised position.

Select: MENU button >> GREENSTAR2 PRO button >> EQUIPMENT softkey >> IMPLEMENT tab >> CHANGE OFFSET button

IMPORTANT: Distance (D) is measured when the implement is in the **FULLY RAISED** position. This dimension is critical for accurate ditch designs

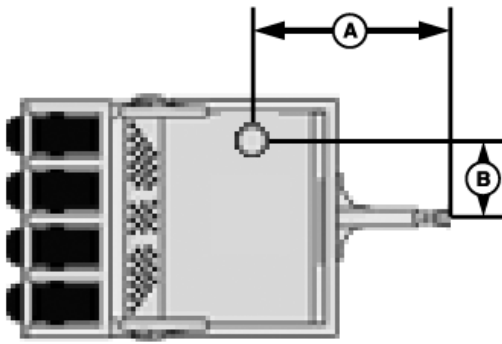
Remember: Always measure to the exact same place on the receiver when measuring (that is, top, middle, and others.).

Implement Offsets are used to define the location of receiver relative to implement.

Continued on next page

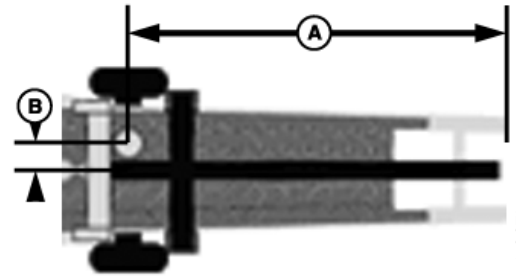
OUO6050,0000EA4 -19-26OCT08-1/2

PC10328C —UN—28MAY08



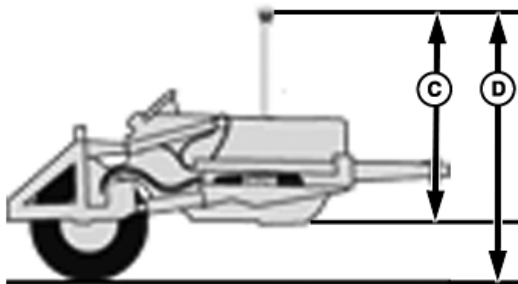
Scrapper Overhead

PC10376—UN—13OCT07



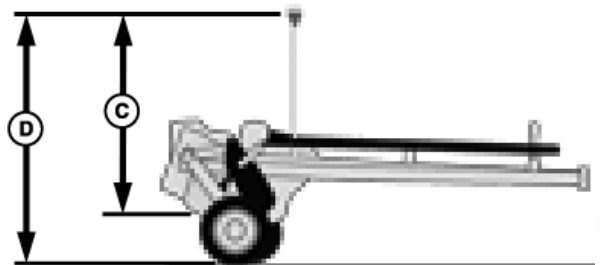
Rotary Ditcher Overhead

PC10378A—UN—14OCT07



Scrapper Profile

PC10375A—UN—14OCT07



Pull Type Rotary Ditcher Profile

PC10377—UN—13OCT07

A—In-line distance from connection pivot point to GPS receiver.

B—Lateral distance from implement center to GPS receiver.

C—Vertical distance from the GPS receiver to the cutting edge.

D—Vertical distance from the GPS receiver to the ground in the fully raised position.

IMPORTANT: Make sure that the vertical distance (D) is measured from the GPS receiver to the ground when the implement is in the FULLY RAISED position.

Remember: Always measure to the exact same place on the receiver when measuring (that is, top, middle, and others.).

NOTE: For a rotary ditcher, dimension (C) is referring to the distance from the receiver to the cutting edge. On a rotary ditcher the cutting edge is the bottom of the paddle wheel, since this contacts the soil first. This dimension could be adjusted depending on individual requirements.

OOU6050,0000EA4 -19-26OCT08-2/2

Machine GPS Receiver Setup

Select: MENU button >> STARFIRE ITC MACHINE button >> SETUP tab

This screen allows access to StarFire iTC setup pages.

See the StarFire iTC operator's manual to set up the receiver for the machine.

NOTE: To ensure that the highest amount of accuracy do not operate Surface Water Pro and Pro Plus outside a 1.6 km (ONE MILE) radius of the Base Station.

If your RTK kit came with a 7.5 cm (3 in.) antenna extension it is suggested to discard the extension and use either the 23 or 30 cm (9 or 12 in.) one-piece antenna. Use of the 7.5 cm (3 in.) extension on the implement receiver could result in the loss of the antenna due severe vibration created by some implements.

A—iTC Receiver Pointing Forward on Cab

B—Front Side of Cab



PC9956 —UN—08FEB07

iTC Receiver

PC8663 —UN—05AUG05



MENU Softkey

PC9965 —UN—09FEB07



StarFire iTC Machine Softkey

PC10857BR —UN—15JUL08



Setup tab

OQ06050,0000EA8 -19-15JUL08-1/1

Implement GPS Receiver Setup

IMPORTANT: SurfaceWater Pro Plus does not support an Implement Receiver Only configuration. Do not run ditching with an implement receiver only—both a Machine & Implement receiver must be used to operate that software.

Select: MENU button >> STARFIRE ITC IMPLEMENT button >> SETUP tab

This screen allows access to StarFire iTC setup on the implement.

If an original StarFire receiver is used on the machine, it is listed on the Original GreenStar Monitor.

NOTE: If using a two receiver solution, Original StarFire receivers cannot be used on the implement, or the machine. This is due to the address arbitration between the two at start-up.

The number below the text on the StarFire iTC Softkey shows the serial number of the receiver.

On the StarFire Main page, the receiver definition (Machine or Implement) is shown in the headline.

NOTE: Mount the receiver directly over the cutting edge of the implement or a position with 1:1 vertical movement of the receiver and cutting edge.

PC8663 —UN—05AUG05



MENU Softkey

PC9966 —UN—09FEB07



StarFire iTC Implement Softkey

PC10857BR —UN—15JUL08



Setup tab

NOTE: For future reference, mark the two receivers so it is clear which receiver is mounted on the machine and which receiver is mounted on the implement.

Continued on next page

OUC6050,0000EA7 -19-26OCT08-1/3

StarFire iTC Implement - Main

StarFire iTC Implement - Main, Setup tab

A—INFO tab
 B—SETUP tab
 C—ACTIVATIONS tab
 D—SERIAL PORT tab

E—CORRECTION MODE
 drop-down box
 F—DEFAULT check box
 G—MOUNT DIRECTION
 drop-down box
 H—FORE/AFT input box

I— HEIGHT input box
 JK—ENABLE QUICKSTART input
 box
 K—HOURS ON AFTER
 SHUTDOWN drop-down
 box
 L—TCM On

M—TCM OFF
 N—TCM On and Off Toggle button
 O—TCM Calibrate button

Select the implement receiver softkey and verify that its receiver location is set to implement.

Reconnect the machine receiver if it was disconnected before continuing. Select Correction Mode to match the desired correction mode. Ditching requires both receivers to have the same differential correction level and subscription.

Select the correct mounting direction. The preferred mounting direction for the implement is forward. Adjust Receiver bracket on Implement to match that if possible.

NOTE: Only SF2 and RTK can be used for ditching. Only RTK can be used for levee work.

Height (I) is the same as machine or implement D offset.

Continued on next page

OUO6050,0000EA7 -19-26OCT08-2/3

Enter the correct receiver height above the ground:
 Dimension D—fully raise the implement and measure from the ground to the middle of the receiver (inches).
 Dimension C—measure from the middle of the receiver to the cutting edge.

IMPORTANT: Always measure to the exact same place on the receiver when measuring.

Enter 0 for the For and Aft dimension for the implement receiver if the receiver is mounted over the cutting edge—this space is reserved for future enhancement.

For optimized performance make the Hours On After Shutdown the same value as on the machine receiver (24 is recommended).

NOTE: When performing a TCM calibration on the implement receiver, the wheels of the main frame to which the implement receiver is mounted need to be in the same location after turning implement around, so that the right-hand wheels are in the same place as where the left-hand wheels were. A smooth level surface is recommended while performing a TCM calibration.

NOTE: Perform a TCM calibration each time the receiver is moved to a different implement or vehicle. The implement TCM is used for determining vertical position of the blade.



iTC Receiver

For more information refer to your StarFire iTC operators manual.

PC9237A —UN—03JAN07

OUO6050,0000EA7 -19-26OCT08-3/3

SurfaceWater Pro Setup

Setup tab

Select: MENU button >> GREENSTAR2 PRO button >>
SurfaceWater PRO softkey >> SETUP tab

PC8663 —UN—05AUG05



MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC10379 —UN—14OCT07



SurfaceWater PRO softkey

PC10857BR —UN—15JUL08



Setup tab

Continued on next page

OUC6050,0000B96 -19-26OCT08-1/2

GreenStar 2 Pro - Water Management

Survey Levee Ditch Setup

Survey Mode
 Time Based Survey Interval (sec) 2

Survey Receiver Source
 Machine Benchmark Settings

Vertical Accuracy Bar Step Size (in) 2.0 **Auto-Name Ditch Tracks** ☐

Map Settings

10:11am

Home Up

Icons:
 A: Map icon
 B: Survey icon
 C: Ditch icon
 D: Levee icon
 E: GreenStar 2 Pro logo
 F: Survey icon
 G: Ditch icon
 H: Levee icon
 I: Survey icon
 J: Ditch icon

Set SURVEY MODE drop-down box and SURVEY INTERVAL input box

- Distance—feet. Points are determined by feet traveled. This method compensates for speed changes.
- Time—seconds. Points are determined every x seconds. This method does not compensate for changes in vehicle speed.

Set SURVEY RECEIVER SOURCE drop-down box—Machine or Implement

BENCHMARK SETTINGS button—the operator can define a benchmark and calibrate a differential. This is primarily used in quick survey base setups. A benchmark is not needed when a permanent base is used.

AUTO-NAME DITCH TRACKS check box—when checked, automatically generates ditch track names by

numbers, starting at 1 and increment each time a new ditch is created, assuming that the next number has not already been used as a name. When unchecked, the operator is required to name new ditch tracks.

VERTICAL ACCURACY BAR STEP input box (SurfaceWater Pro Plus)—enter the step size for the vertical accuracy bar. The Vertical Accuracy Bar Step is used to specify the vertical distance that triggers the vertical lightbar arrows (the difference between drain design height and the cutting blade height) For example, if the Vertical accuracy Step Bar size is set to 1 in. and the cutting edge is 3 in. above the desired height, three arrows are highlighted.

MAP SETTINGS button—selecting this button displays a MAP SETTINGS screen where the operator can edit the map settings.

OUC6050,0000B96 -19-26OCT08-2/2

PC10379A —UN—28FEB08

Benchmark Settings

Calibrating to a Benchmark Control Point allows the Quick-Survey user to achieve repeatability accuracy equivalent to the permanent base station.

Select: MENU button >> GREENSTAR2 PRO button >> SURFACEWATER PRO softkey >> SETUP tab >> BENCHMARK SETTINGS button

This screen allows the operator to define one control point and calibrate a differential on a per field basis.

CONTROL POINT drop-down box shows existing control point for the field and "New" which allows the operator to create a control point. Changing the selection updates the displayed position data:

SET POINT button—sets the position for the selected control point.

MAST HEIGHT input box—enter the mast height. If the implement receiver is used to set the control point, the height dimension on a scraper is equal to Implement Dimension C .

CALIBRATE button—calculates the difference between the current GPS reading and the GPS position of the selected control point and store that value as the differential for the field.

- enabled only when a valid control point is selected in the CONTROL POINT drop-down box
- disabled if GPS is not available
- enabled only when the operator has entered a valid mast height

CLEAR button—clears the differential setting

Finished or Enter button—save changes and return to the previous page.

NOTE: Place a flag or marker down to identify benchmark location for later calibration. Do not mark such places as public roadways or bridges because it is hazardous to other drivers. Document Control Point location for later use.

OUO6050,0000B97 -19-06OCT09-1/1

Creating a Benchmark Control Point

1. Position receiver on the control point.

NOTE: The StarFire iTC receiver CAN NOT be moved during the creation of a Benchmark Control Point. Any movement causes the Benchmark to be inaccurate

2. From Control Point drop down box, select NEW.
3. Type in name of control point.
4. Enter mast height in the MAST HEIGHT input box. If the implement receiver is used to set the control point, the height dimension on a scraper is equal to Implement Dimension C if blade is lowered to the ground or Implement Dimension D if blade is fully raised.
5. Press SET POINT button.
6. Press the Enter button.

The screenshot shows the 'Benchmark Settings' screen. At the top is a 'Control Point' dropdown menu with a right arrow button. To its right is a 'Set Point' button. Below these are fields for 'Latitude', 'Longitude', 'Elevation (ft)', and 'Date', each followed by a right arrow button. Further down are fields for 'Latitude Differential', 'Longitude Differential', 'Differential Control Point', 'Elevation Differential (ft)', and 'Calibration Date', each followed by a right arrow button. At the bottom left is a 'Mast Height (in.)' input box. To its right are 'Calibrate' and 'Clear' buttons. At the bottom right is a large right arrow button.

PC10316—UN—23OCT08

OUO6050,0000F78 -19-26OCT08-1/1

Calibrating to a Control Point

1. Position receiver on the control point.

NOTE: The StarFire iTC receiver CAN NOT be moved during the calibration of a Benchmark Control Point. Any movement causes the Calibration to be inaccurate

2. Enter mast height if it is at a different height than when benchmark was set.
3. Press CALIBRATE button.
4. Press Enter button.

This screenshot is identical to the one above, showing the 'Benchmark Settings' screen with the same fields and buttons.

PC10316—UN—23OCT08

OUO6050,0000F79 -19-04AUG08-1/1

Boundary and Tracking Setup

Record an External Boundary

Select: MENU button >> GREENSTAR 2 PRO button >>
MAPPING softkey >> BOUNDARIES tab

PC8663 —UN—05AUG05



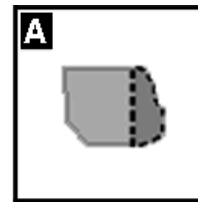
MENU Softkey

PC8661 —UN—02NOV05



GREENSTAR2 PRO Softkey

PC8672 —UN—05AUG05



MAPPING Softkey

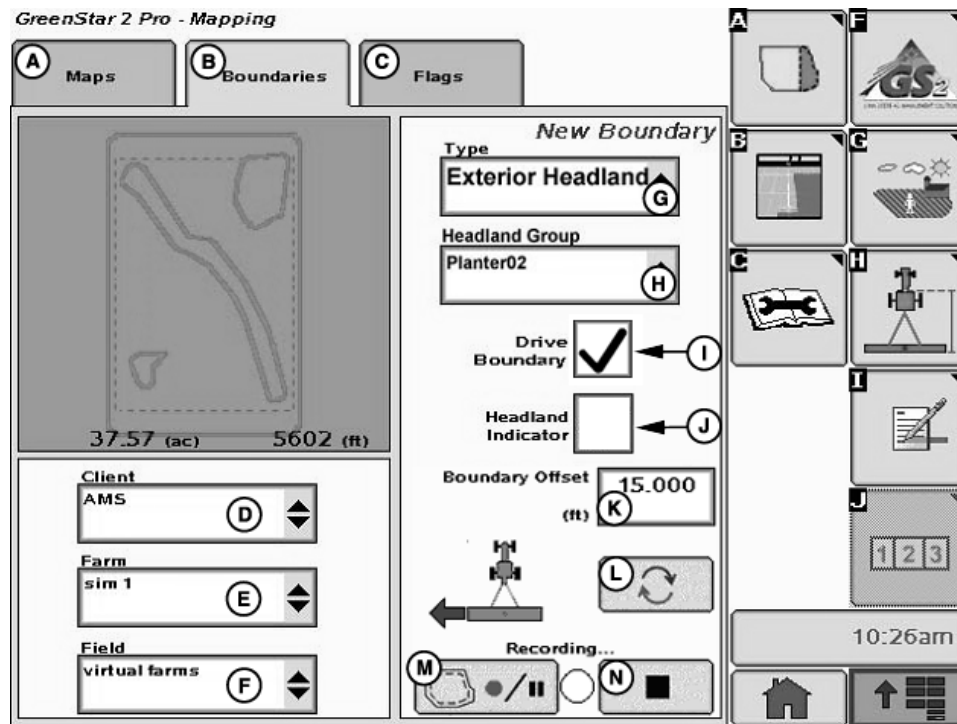
PC10632 —UN—15JUL08



Boundaries tab

Continued on next page

OUC6050,0000EBE -19-06OCT09-1/2



Boundaries with Driven Exterior Headland Boundary

A—MAPS tab
B—BOUNDARIES tab
C—FLAGS tab
D—CLIENT drop-down box

E—FARM drop-down box
F—FIELD drop-down box
G—TYPE drop-down box
H—HEADLAND GROUP drop-down box

I— DRIVE BOUNDARY check box
J— HEADLAND INDICATOR check box
K—BOUNDARY OFFSET input box
L— Boundary Offset toggle

M—Record or Pause button
N—Stop Recording button

IMPORTANT: Accurate boundaries are necessary for the system to execute functions accurately on the ground.

The BOUNDARIES tab allows you to record exterior field boundaries. Boundaries are saved on the data card.

A client, farm, and field is required before setting up boundaries is possible.

It is highly recommended to have boundaries but they are not required for ditch or levee tracks.

Survey function on the SurfaceWater Pro softkey requires an exterior field boundary. In order to create an elevation map as a background layer, you must have an exterior field boundary, either from the GS2 display or from APEX.

OUO6050,0000EBE -19-06OCT09-2/2

PC10499 —UN—10SEP07

Satellite Information

SATELLITE INFORMATION softkey

Press: MENU button >> STARFIRE ITC button >> SATELLITE INFORMATION softkey.

The StarFire iTC - Satellite Information screen contains SKY PLOT , GRAPH, and Predictor tabs.

PC8663 —UN—05AUG05



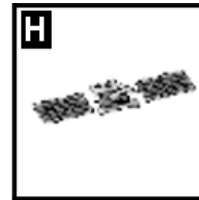
MENU button

PC8659 —UN—05AUG05



STARFIRE ITC button

PC8682 —UN—05AUG05

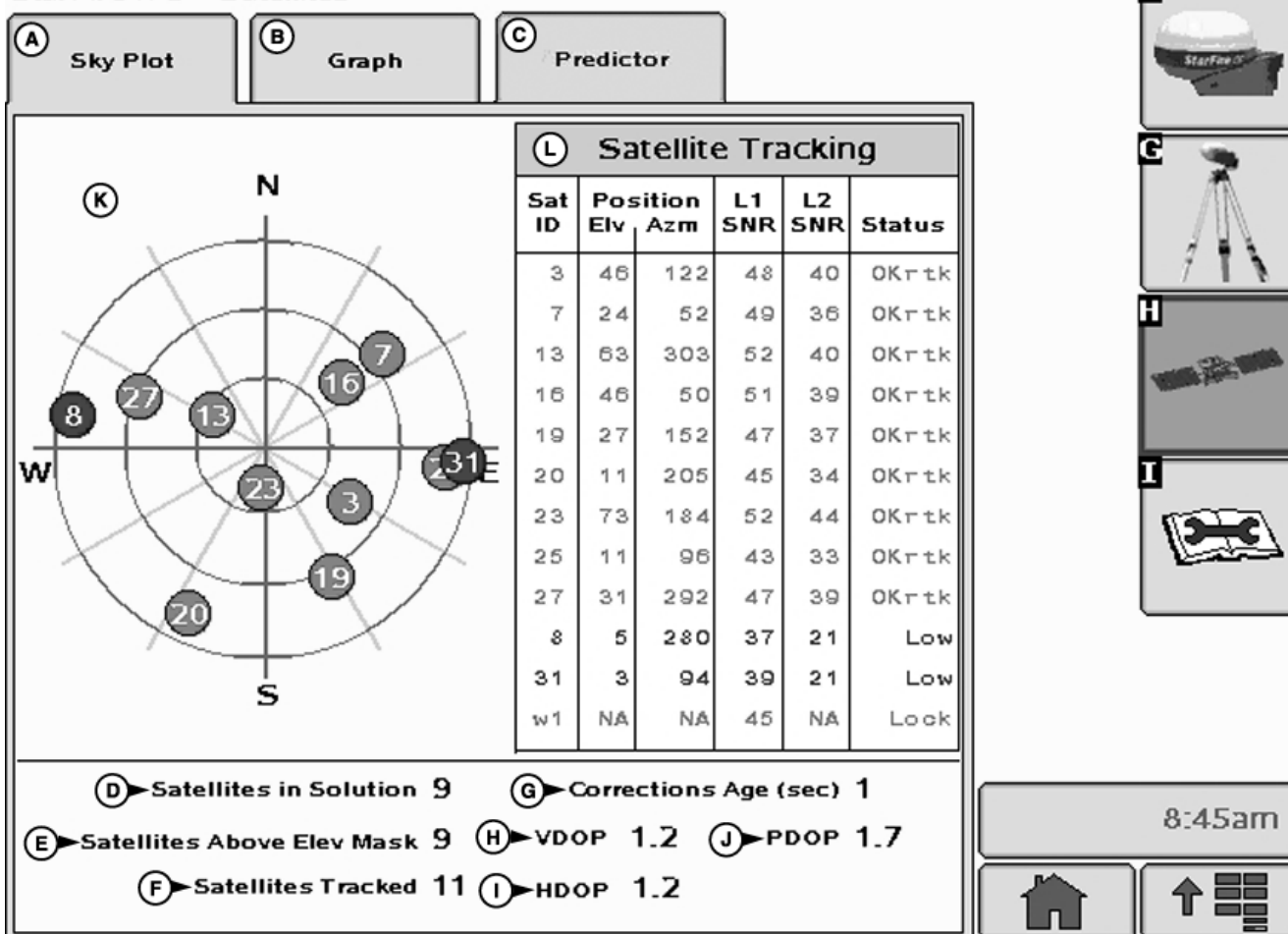


SATELLITE INFORMATION softkey

Continued on next page

OOU6050,0000F65 -19-26OCT08-1/4

StarFire iTC - Satellites



A—Sky Plot tab
B—Graph tab
C—Predictor

D—Satellites in Solution
E—Satellites Above Elevation Mask
F—Satellites Tracked

G—Corrections Age
H—VDOP
I—HDOP

J—PDOP
K—Satellites on Sky Plot
L—Satellite Tracking

SKY PLOT tab

The Sky Plot tab shows where the satellites are in relation to the vehicle's receiver, allowing the operator to look at satellite geometry.

Reading Satellite Sky Plot

- Sky Plot is fixed so that North is always at top.
- Satellites are displayed as their satellite ID number that correspond to Satellite Tracking Chart located right of Sky Plot
 - Red – indicates satellite is in search mode
 - Blue – indicates satellite is being tracked
 - Green – indicates satellite is OK (being used for corrections)
- Sky Plot consists of 3 concentric rings depicting 0, 30, and 60 degrees of elevation with directional crossbar intersection representing 90 degrees of elevation.

- Gray radial lines extending from center of Sky Plot represent azimuth. They are spaced 30 degrees apart and represent 30 and 60 degrees.
- Directional crossbar representing North, South, East, and West also represent azimuth at 0, 90, 180, and 270 degrees.
- W1 and W2 (WAAS or EGNOS) satellites and inmarsat satellites are not shown in Sky Plot.

Satellite Tracking Chart

- SAT ID – (Satellite Identification Number) Identification number for GPS Satellite.
- ELV – (Position Elevation) Elevation in degrees above horizon for GPS satellite position
- AZM – (Position Azimuth) Azimuth in degrees from true North for GPS satellite
- L1 SNR – (L1 Signal to Noise Ratio) Signal strength for L1 GPS signal (signal to noise ratio)
- L2 SNR – (L2 Signal to Noise Ratio) Signal strength for L2 GPS signal (signal to noise ratio)
- Status – (GPS Signal Status) Status of GPS signal

Continued on next page

OUO6050,0000F65-19-26OCT08-2/4

- Search – searching for satellite signal
- Track – tracking satellite signal and using it for positioning
- OK – tracking satellite signal and using it for positioning
- OK SF1 – Tracking satellite signal and using it for positioning with StarFire single frequency
- OK SF2 – Tracking satellite signal and using it for positioning with StarFire dual frequency

Satellite Tracking Information

Satellite Tracking information is displayed at bottom of SKY PLOT and GRAPH tabs.

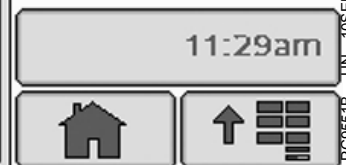
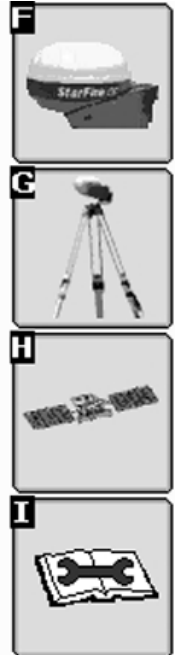
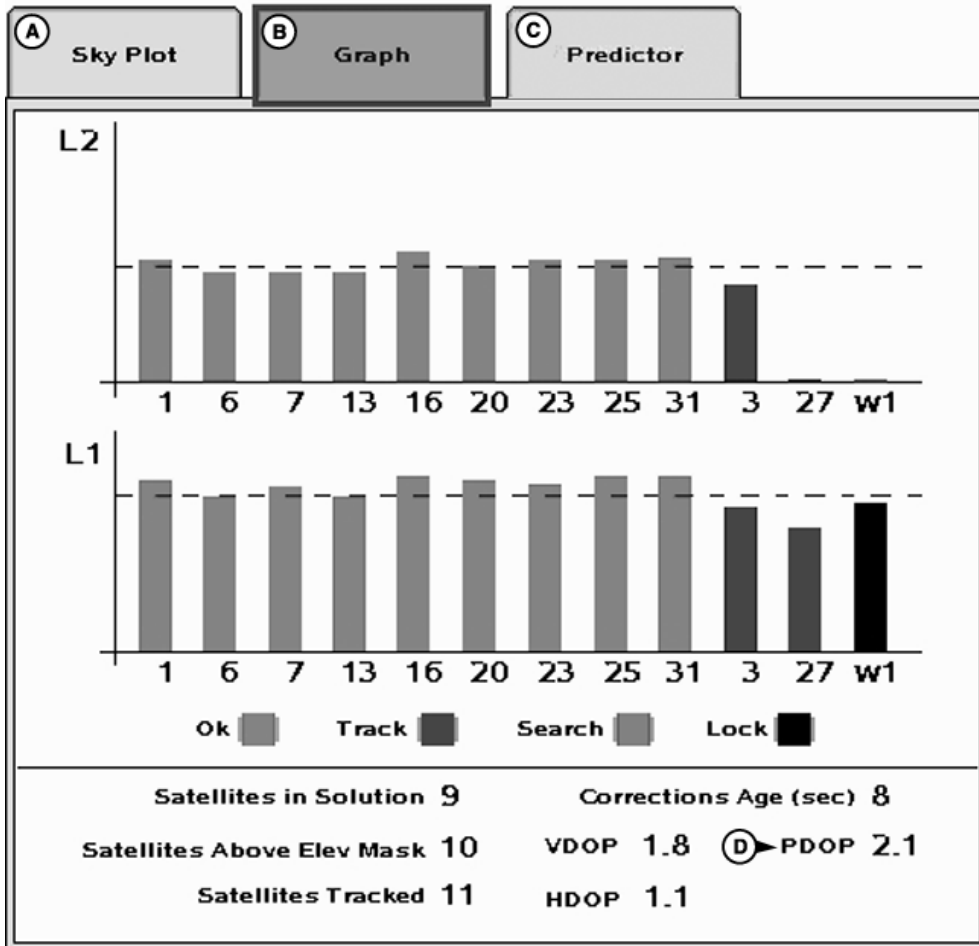
- Satellites in Solution – number of satellites used to compute position.
- Satellites Above Elevation Mask – total number of GPS satellites available to receiver that are above seven degree elevation mask.

- Satellites Tracked – total number of GPS satellites tracked by receiver.
- Corrections Age (sec.) – age of differential correction signal to GPS (normally less than 10 seconds)
- VDOP – Vertical Dilution of Precision
 - below 2.0 optimal
 - 2.0—2.5 desirable
 - 2.5 or greater can indicate poor vertical accuracy performance. IVS does not recommend operating above this value.
- HDOP – Horizontal Dilution of Precision
- PDOP – Positional Dilution of Precision is an indicator of GPS satellite geometry as viewed by receiver. A lower PDOP indicates better satellite geometry for calculating both horizontal and vertical position.

Continued on next page

OUO6050,0000F65 -19-26OCT08-3/4

StarFire iTC - Satellites



A—SkyPlot

B—Graph

C—Predictor

D—PDOP

Graph

A graph illustrating L1 and L2 SNR values.

- Bars are colored to satellites current status.
- SNR values (colored bar) should be above dashed line that runs horizontally across bar graph.

NOTE: ONLY GREEN bars are used in calculation of PDOP, VDOP, AND HDOP. SNR's are considered good if above dashed line.

OUO6050,0000F65 -19-26OCT08-4/4

Survey

How to Survey a Field

SurfaceWater Pro provides a Survey tab for the purpose of performing a field survey. When a survey is performed, the RCD (GS2) creates a survey file for the field that contains a collection of data points. Each point represents a specific latitude and longitude position within the field for which an elevation value is stored.

The data collected can be valuable to create informational maps. Any maps created from this data is only as good as the quality of the data that creates it. In order to create quality maps from your field survey data, be sure to perform your field survey to the highest quality. As a start, please observe the following guidelines as a minimum for performing a field survey.

1. Use the correct differential correction for your application. It is recommended an RTK correction be used for the highest accuracy and quality survey data. An SF2 correction is allowed for surveying your fields, but only after consulting your dealer to see if it is right for your application. An RTK correction is always utilized for flat to rolling field terrain. Using an inappropriate differential correction for collecting elevation data leads to inaccurate maps.
2. Make the first pass very close to the exterior field boundary, when collecting survey data, to ensure sufficient data around the perimeter of the field. Make the second pass around the field boundary but slightly offset inward from the first pass. Offset the second pass approximately 50 ft.
3. **Conducting a thorough survey can be done by setting up straight track lines and parallel tracking off them through the field. Set up straight track lines with intervals depending on the field being surveyed.**

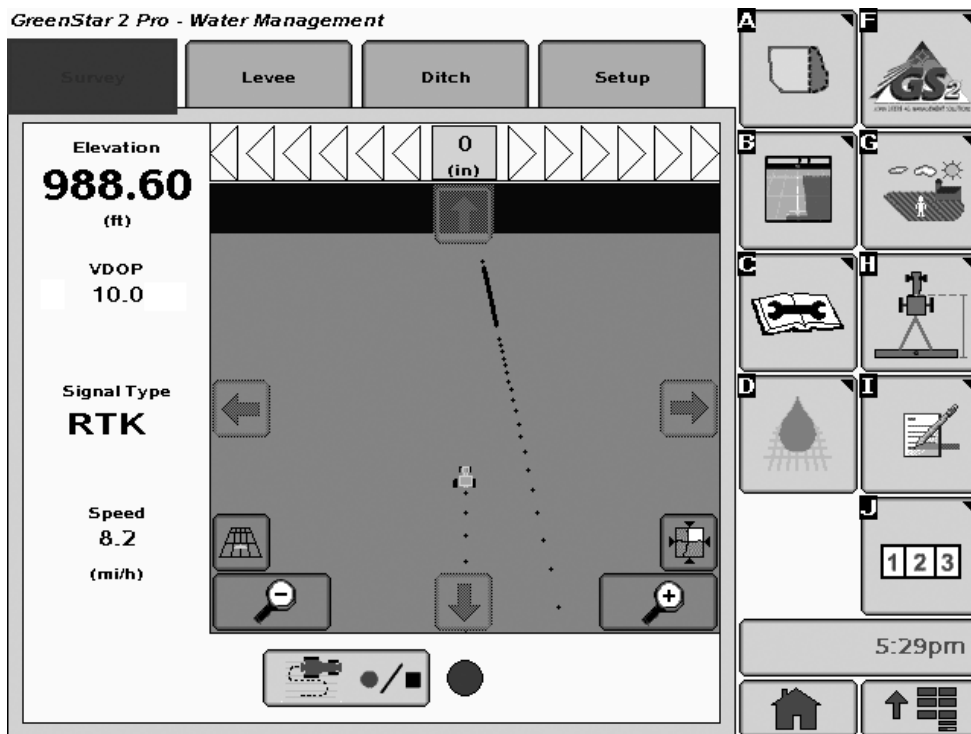
- Fields with significant elevation changes and slopes — track spacing of 7.5—15 m (25—50 ft.) is recommended.
- Flatter fields — a track spacing of 15 m (50 ft.) is recommended.
- Flat to precision leveled ground — a track spacing of 15—30 m (50—100 ft.)

Do not exceed 50 m (100 ft.) track spacing for surveying purposes.

4. There are two forms of Survey recording types available
 - Distance Base—ideal for low speed surveys and consistently spaced at user-defined distances
 - Time Based—suited to higher speed surveying and the distance between the points varies with the speed at which the survey is recorded
5. Ensure that the entire field has been covered. Do not skip parts of the field because they are inaccessible due to wet or muddy conditions; you are in a hurry; you think you do not have time to finish properly. This has a negative impact on the quality of your maps generated from your collected data. It is important to cover the entire field.
6. It is also a good idea to survey the bottom of existing ditches within the field, and at a minimum ditches with measurable width and depth. Utilizing parallel tracking with straight track can cause the user to miss areas of interest for surveying, for example the bottom of a main ditch which can have measurable width and depth.

Continued on next page

OUC6050,0000B86 -19-27OCT09-1/2



GreenStar2 Pro - Water Management, Survey tab

PC8663 —UN—05AUG05

Survey Mode is designed to allow an operator to collect elevation and position data as a separate operation. From this data, topographical information can be created and displayed. The accuracy level while surveying determines the accuracy of the topographical maps. Elevation data points can also be obtained for log files created while performing field operations such as planting and combining.

NOTE: Survey Mode is not allowed with SwathControl Pro.

Select: MENU button >> GREENSTAR2 PRO button >> SURFACEWATER PRO softkey >> SURVEY tab

1. Record an external boundary for the field. (Required)
2. Set up straight track for your survey pattern (optional). Set survey mode and interval on Setup tab.
3. Select Record button (Survey tab).

NOTE: Light begins blinking red to signify recording status as ON.

4. To stop surveying select the Record button again.

NOTE: Light blinks rapidly until all data is saved to the storage device.

Background layer cannot be changed during survey recording. To change the background layer, stop survey recording, change background layer, and then restart survey recording.



MENU button

PC8661 —UN—02NOV05



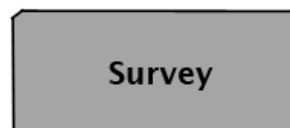
GREENSTAR2 PRO button

PC10379 —UN—14OCT07



SURFACEWATER PRO softkey

PC10857BW —UN—15JUL08



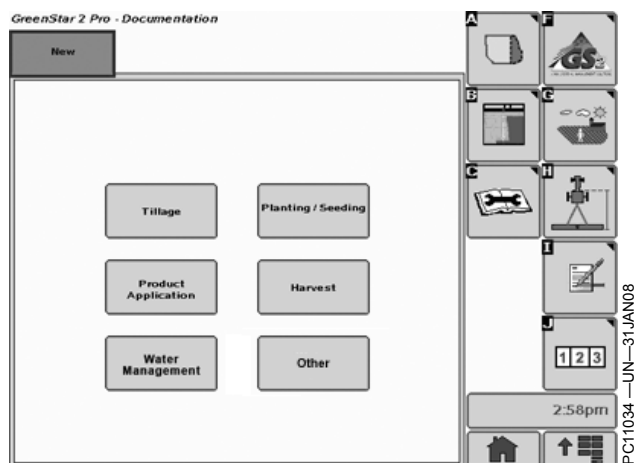
Survey tab

OUO6050,0000B86 -19-27OCT09-2/2

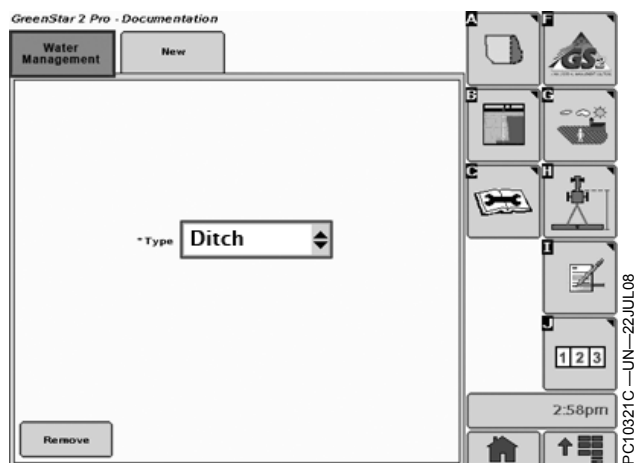
PC10857CP —UN—23OCT08

Ditch

Setup Operation



GreenStar2 Pro - Documentation, New tab



GreenStar2 Pro - Documentation, Water Management tab

Select: MENU button >> GREENSTAR2 PRO button >> DOCUMENTATION softkey >> NEW tab

Select Water Management button and type.

IMPORTANT: SurfaceWater Pro Plus does not support an Implement Receiver Only configuration. Do not run ditching with an implement receiver only—both a Machine & Implement receiver must be used to operate that software.

PC8663 —UN—05AUG05



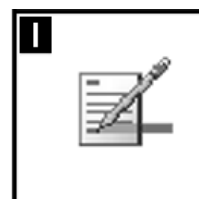
MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC8678 —UN—05AUG05



DOCUMENTATION softkey

PC10857BT —UN—15JUL08



New tab

OQO6050,0000EBD -19-14JUL08-1/1

Set Tracking Mode to Ditch Track

NOTE: Ditches must be recorded from high to low, but can be cut in either direction. If the track is not recorded from high to low, the drain design software in SurfaceWater Pro Plus does not function correctly.

Select: MENU button >> GREENSTAR2 PRO button >> GUIDANCE softkey >> GUIDANCE SETTINGS tab

Select DITCH TRACK in TRACKING MODE drop-down box.

NOTE: Selecting Ditch Mode can be found in the GS2 Guidance area, not in the SurfaceWater Pro area.

PC8663 —UN—05AUG05



MENU button

PC8661 —UN—02NOV05



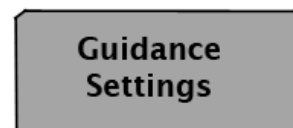
GREENSTAR2 PRO button

PC8673 —UN—14OCT07

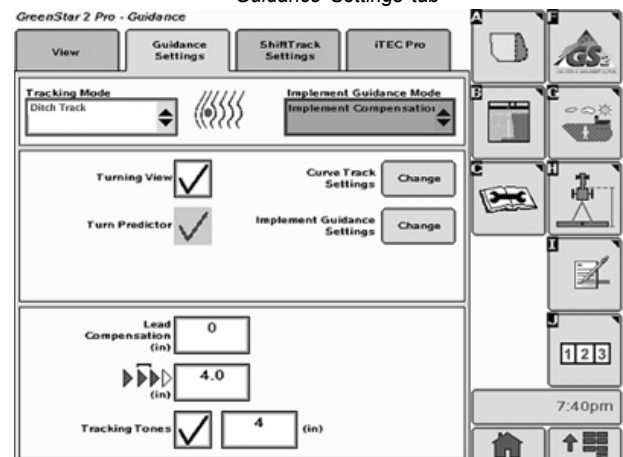


GUIDANCE softkey

PC10857BU —UN—15JUL08



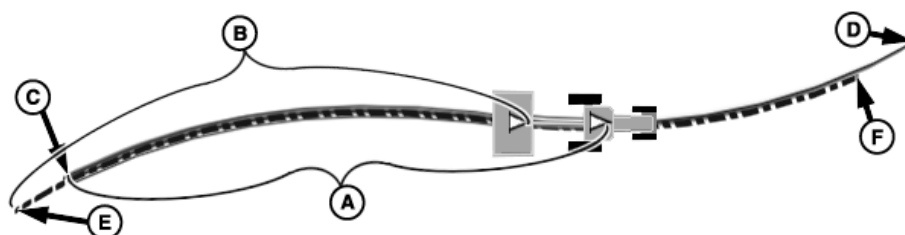
Guidance Settings tab



OUO6050,0000EAA -19-04AUG08-1/1

PC9959C —UN—14OCT07

Recorded Path for Ditching



A—Path Recorded by Tractor for AutoTrac
B—Path Recorded by Implement for Ditch Track

C—Start of recorded Tractor Path
D—End of recorded Tractor Path

E—Start of recorded Implement Path
F—End of recorded Implement Path

If an implement receiver is used to record elevation data for ditch track, the resulting path differs from the AutoTrac path. AutoTrac is always based off of the receiver on the tractor. The AutoTrac and Ditch Track paths have different starting and stopping points. Although the tractor may

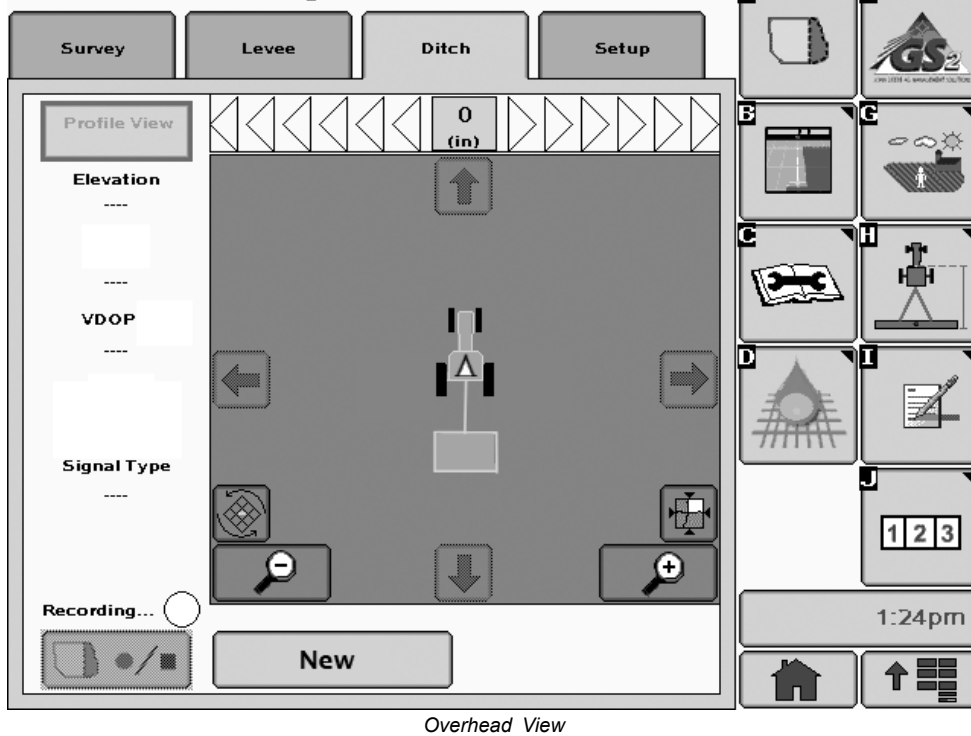
be driving on the ditch path, ditching guidance does not become active until the implement receiver is on the cut line path. The cut line is updated when the implement receiver is over the recorded ditch.

OUO6050,0000F9B -19-26OCT08-1/1

PC10857DW —UN—07OCT08

Record Ditch Track

GreenStar 2 Pro - Water Management



Select: MENU button >> GREENSTAR2 PRO button
>> SURFACEWATER PRO softkey >> DITCH tab >>
OVERHEAD VIEW button

1. Drive to the **HIGH POINT** of the desired area for the Ditch Track.
2. Place selected survey receiver on beginning position for Ditch Track a. (See SETUP tab for SURVEY RECEIVER SOURCE.)
3. Select NEW button.
4. Enter desired name for ditch track and press the Accept button unless AutoName has been selected.
5. Select SET A to begin recording ditch track.
6. Drive the ditch track.
7. Stop the survey receiver in the position where drain water exits.
8. Select B to stop recording the ditch track .

PC8663 —UN—05AUG05



MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC10379 —UN—14OCT07



SURFACEWATER PRO softkey

PC10857BS —UN—15JUL08



Ditch tab

OUO6050,0000EB1 -19-06OCT08-1/1

PC10381A —UN—23OCT08

Modify Ditch Track

- Cancel button—allows operator to return to the previous page without an action being taken.
- REPLACE button—existing ditch track is removed and a new ditch track with the same name can be recorded immediately to that track.
- REMOVE button—Existing ditch track is removed.

If Remove button is selected, the operator must verify removal of the existing ditch track. If a track is removed and AutoName is selected on the SETUP page, the numbered track names are not adjusted down. For example, if ditch tracks 1, 2, 3, 4, and 5 have been created, and track 3 is removed, the remaining tracks are: 1, 2, 4, and 5. The tracks do NOT adjust to: 1, 2, 3, and 4.

- Cancel button—ditch track is not deleted.
- Enter button—ditch track is deleted.

Modify Ditch Track

Do you want to Replace or Remove the selected track?



Replace

Remove

Modify Ditch Track

Remove Ditch Track

The following track is about to be removed. Continue?

Ditch Track: 1





Remove Ditch Track

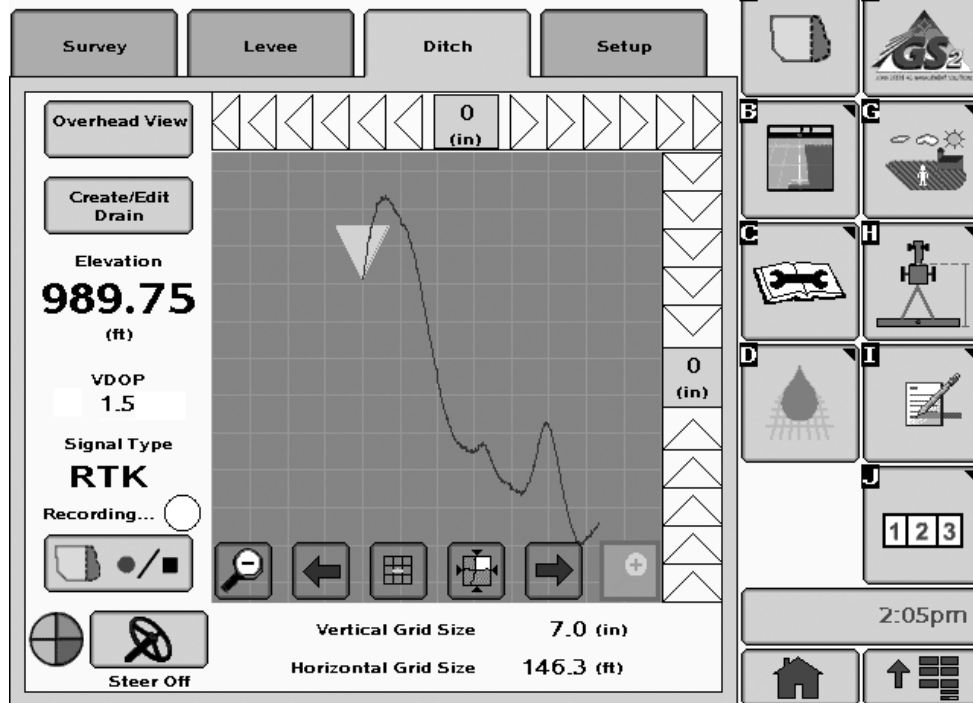
PC10312 —UN—29AUG07

PC10313 —UN—29AUG07

OUO6050,0000B93 -19-28MAY08-1/1

View Drain Profile

GreenStar 2 Pro - Water Management



NOTE: The Edit Drain button is not available until a valid SurfaceWater Pro Plus activation number is entered.

Select: MENU button >> GREENSTAR2 PRO button
>> SURFACEWATER PRO softkey >> DITCH tab >> PROFILE VIEW button

View the recorded drain profile of the drain by utilizing the zoom functions. This view is a side "cutaway" view of the drain itself (existing topography).

PC8663 —UN—05AUG05



MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC10379 —UN—14OCT07



SURFACEWATER PRO softkey

PC10857BS —UN—15JUL08



Ditch tab

OUO6050,0000EB2 -19-14JUL08-1/1

PC10380B —UN—23OCT08

Create Linear Drain Design

Create or Edit Drain

SurfaceWater Pro Plus

Select: MENU button >> GREENSTAR2 PRO button >> SURFACEWATER PRO softkey >> DITCH tab >> PROFILE VIEW button >> EDIT DRAIN button

The CREATE/EDIT DRAIN screen provides the ability for an operator to create or edit a drain design associated with a ditch track.

The map shows the portion of the survey elevation that is highlighted on the Full-View Map.

The Edit and Full-View Map is updated to reflect the new design of the Linear Drain.

NOTE: The drain design generated is a black line.

Cut Volume is calculated based on Implement Width. Check before designing drains.

1. Select Drain Type—Linear.

2. Select GENERATE DRAIN button. A black line is displayed. Zoom out to see the entire drain or press Accept to return to profile view.
3. Adjust the slope of the linear design by using the Slope + or - buttons or by selecting the slope text box and entering the desired slope. Each increase or decrease adjusts the up or down by + or - 0.01%.
4. Select GENERATE DRAIN again, if necessary, or adjust offset.
5. Adjust offset up or down by selecting the Offset + or - buttons or by selecting the offset text box and entering the desired offset.
6. Select GENERATE DRAIN again to view updated design (black line).
7. Cut volume is updated after each GENERATE DRAIN.

OUO6050,0000EB3 -19-26OCT08-1/1

PC10857CQ —UN—23OCT08

Create Best Fit Drain Design

Create/Edit Drain

Drain Type: Best Fit

Cut Volume: 243.9 (yd³)

Min Slope: 0.02 (%)

Max Slope: 6.00 (%)

Min Cut: 0.00 (in.)

Max Cut: 24.00 (in.)

Generate Drain

10:48am

SurfaceWater Pro Plus

Select: MENU button >> GREENSTAR2 PRO button >> SURFACEWATER PRO softkey >> DITCH tab >> PROFILE VIEW button >> EDIT DRAIN button

The CREATE/EDIT DRAIN screen provides the ability for an operator to create or edit a drain design associated with a ditch track.

The map shows the portion of the survey elevation that is highlighted on the Full-View Map.

NOTE: The drain generated is a black line.

Cut Volume is calculated based on Implement Width. Check before designing drains.

Best fit drain provides the operator with the ability to create a drain design that utilizes existing ditch track vertical

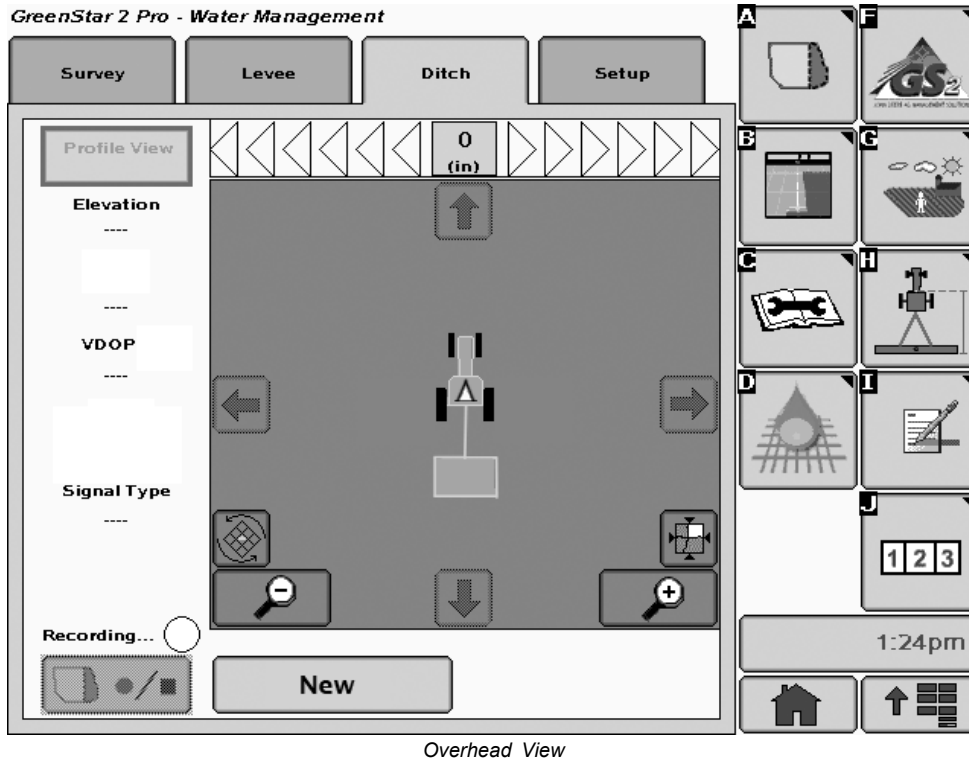
profile while minimizing the amount of soil moved. This is dependent upon the input parameters. It is possible to get a NO SOLUTION with this feature. If software fails to create a drain design, update image and adjust parameters in Step 2 to produce a valid drain design.

1. Select drain type—Best Fit.
2. Input: MIN Slope (%), MAX Slope (%), MIN Cut (in.), MAX Cut (in.).
3. Select GENERATE DRAIN button. A black line is displayed.
4. Drain design, visible by black line, is updated.
5. Cut Volume is updated.
6. Repeat steps 2 and 3 until desired drain is created.

OUC6050,0000F52 -19-26OCT08-1/1

PC10314A—UN—23OCT08

Cut or Clean Ditch Track



Overhead View

Select: MENU button >> GREENSTAR2 PRO button
>> SURFACEWATER PRO softkey >> DITCH tab >>
OVERHEAD VIEW button

1. Turn machine and scraper around and return to the ditch and begin cutting.
2. Acquire Ditch Track with AT guidance system
3. Engage AT system (Resume button)

NOTE: At times, it is necessary to toggle between overhead and profile view during reacquisition of the track.

PC8663 —UN—05AUG05



MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC10379 —UN—14OCT07



SURFACEWATER PRO softkey

PC10857BS —UN—15JUL08

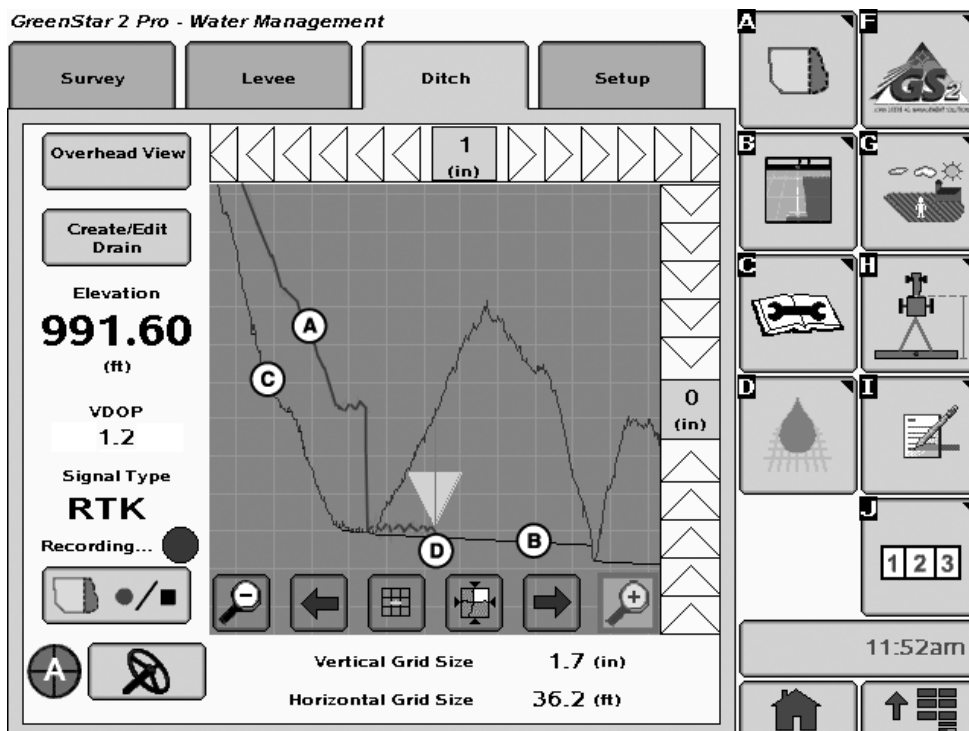


Ditch tab

Continued on next page

OUO6050,0000EC9 -19-26OCT08-1/2

PC10381A —UN—23OCT08



4. Select: MENU button >> GREENSTAR2 PRO button >> SURFACEWATER PRO softkey >> DITCH tab >> PROFILE VIEW button

PC8663 —UN—05AUG05

5. Begin ditching operation by manipulating cutting blade with hydraulic controls

NOTE: If there is a second receiver on the implement, the system displays the current position of the blade by drawing a red profile on the screen. The blue and optional black drain design line is not removed, as they are there for reference.

(A) Red line — the actual location of the blade after making the cut. Ideally the red line follows the black line when ditching is complete.

(B) Black line — the desired location of the cut created by pressing "Generate Drain" button on Edit Drain screen.

(C) Blue line — the existing drain profile saved at the time of track recording.

(D) Green Triangle — lower point references the blade of the scraper. As you raise and lower the scraper, this triangle moves up and down appropriately.

NOTE: Zoom levels and view can be adjusted for optimal cutting.

A—Location of Blade after making Cut (red)	C—Drain Profile Recorded (blue)
B—Desired Location of Cut (black)	D—Blade of Scraper



MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC10379 —UN—14OCT07



SURFACEWATER PRO softkey

PC10857BS —UN—15JUL08



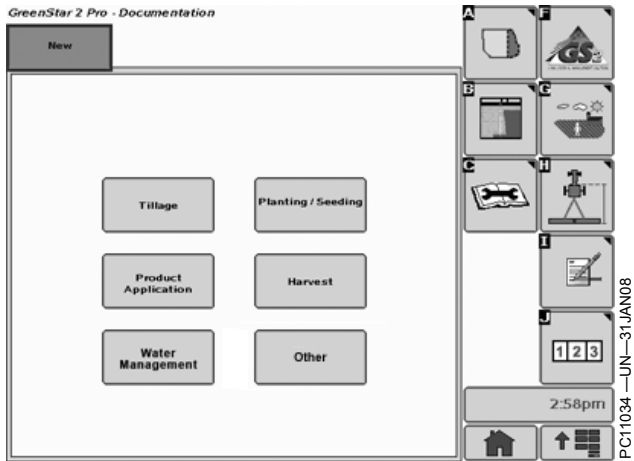
Ditch tab

OUO6050,0000EC9 -19-26OCT08-2/2

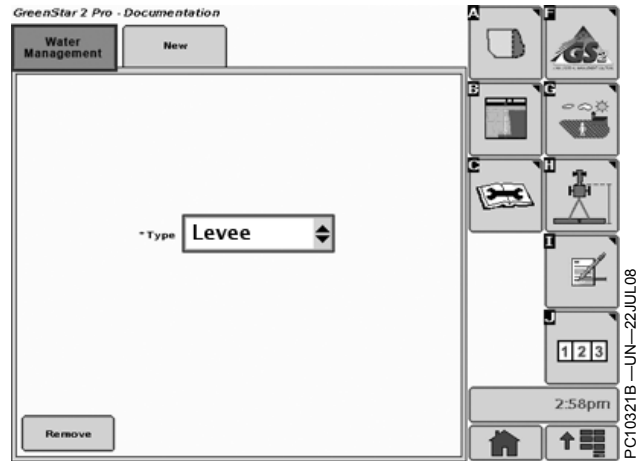
PC10380C —UN—23OCT08

Levee

Set Operation to Levee



GreenStar2 Pro - Documentation



GreenStar2 Pro - Documentation

Select: MENU button >> GREENSTAR2 PRO button >> DOCUMENTATION softkey >> NEW tab

Select Water Management button and then LEVEE for type.

PC8663 —UN—05AUG05



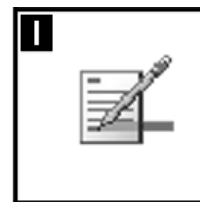
MENU button

PC8661 —UN—02NOV05



GREENSTAR2 PRO button

PC8678 —UN—05AUG05



DOCUMENTATION softkey

PC10857BT —UN—15JUL08



New tab

O06050,0000F24 -19-29MAY08-1/1

Set to Levee Track

Select: MENU button >> GREENSTAR2 PRO button >> GUIDANCE softkey >> GUIDANCE SETTINGS tab

Select LEVEE TRACK in TRACKING MODE drop-down box.

NOTE: Selecting Levee Mode can be found in the GS2 Guidance area, not in the SurfaceWater Pro area.

PC8663 —UN—05AUG05



MENU button

PC8661 —UN—02NOV05



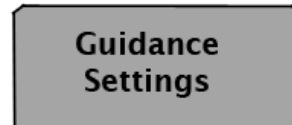
GREENSTAR2 PRO button

PC8673 —UN—14OCT07

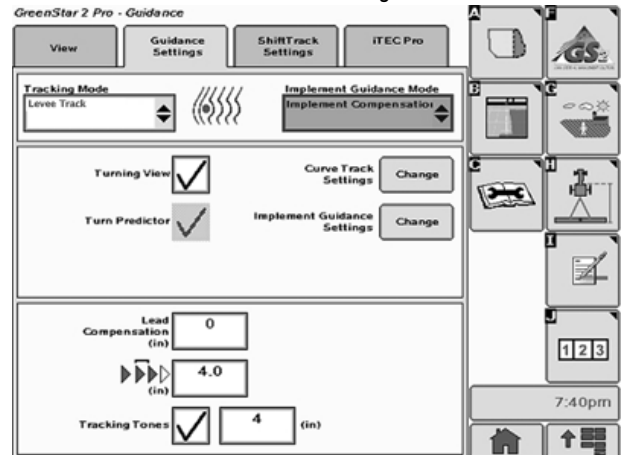


GUIDANCE softkey

PC10857BU —UN—15JUL08



Guidance Settings tab



PC9959D —UN—28FEB08

OUO6050,0000F1D -19-04AUG08-1/1

Mark Path (Drive Dial)

GreenStar 2 Pro - Water Management

Survey	Levee	Ditch	Setup
Map View VDOP 2.0 Signal Type RTK Speed 0.0 (mi/h) Steer On	+ 0.50 + 0.38 + 0.25 + 0.13 0 - 0.13 - 0.25 - 0.38 - 0.50	Starting Elevation 1000.76 (ft) Target Elevation 999.96 (ft) Elevation 999.93 (ft)	Set Elevation Elevation Drop 1.00 (ft)
Levee Track Name 1 New Modify			10:40am

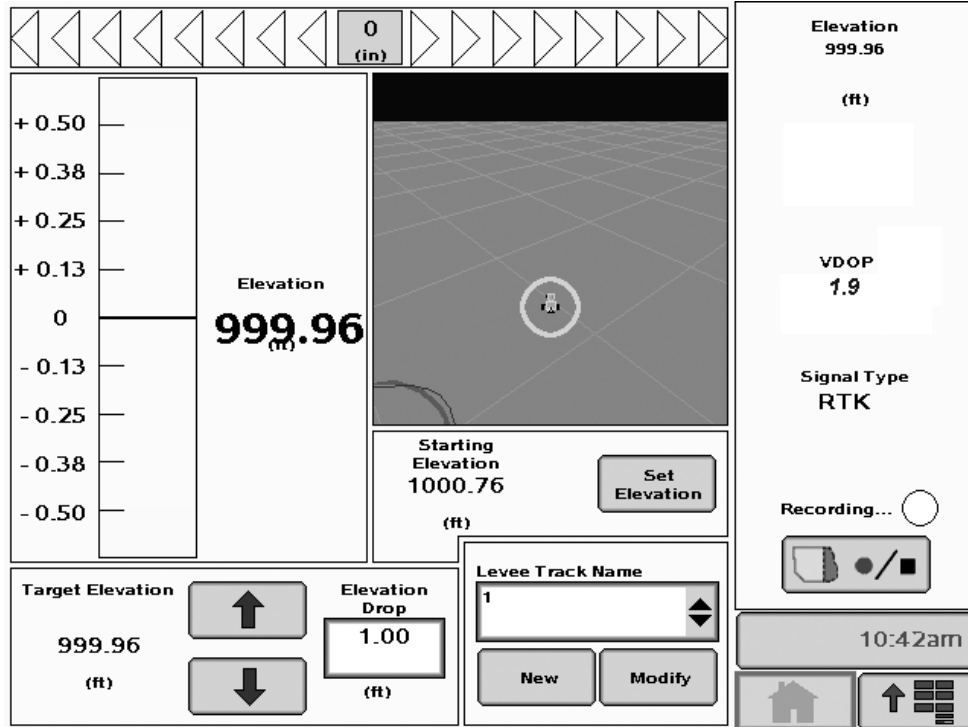
1. Set the desired amount of elevation drop between levees in the ELEVATION DROP input box. Select the box and keypad appears for entering the desired amount of elevation.
2. Drive to the starting location for marking levees or the high point to SET ELEVATION. If you are beginning a new field and need to mark the high point or beginning elevation from which levees are marked off of use the SET ELEVATION button to begin. If you are simply continuing to mark levees from a previously known elevation such as a prior levee, then proceed to the next step.
3. Increase or decrease ELEVATION DROP to adjust your target elevation.
4. Proceed up or down slope to the target elevation. Be careful driving down headlands. Avoid driving on large obstacles.
5. The target elevation has been reached when the vertical dial is centered on the 0 (zero).
6. Proceed to mark the levee location by traversing through the field at a constant elevation. Keep the dial at the zero position as much as possible for that particular levee.

NOTE: If returning to field to mark more levees and using a quick-start base (no permanent base), set receiver on previous levee and set elevation button before setting next target elevation.

Continued on next page

OUC6050,0000F1E -19-26OCT08-1/2

PC10379H—UN—23OCT08



HomePage set up to show Dial and Map view

CAUTION: While using elevation dial, remain alert and pay attention to surrounding environment.

Drive along and mark a constant elevation line using elevation dial (Driving the Dial).

After the levee has been marked for that elevation, select either up or down arrow to set target elevation for the next levee at either a higher (up arrow) or lower (down arrow) elevation.

OUC6050,0000F1E -19-26OCT08-2/2

Record a Levee Track

After making the levee with the dial, turn the vehicle around.

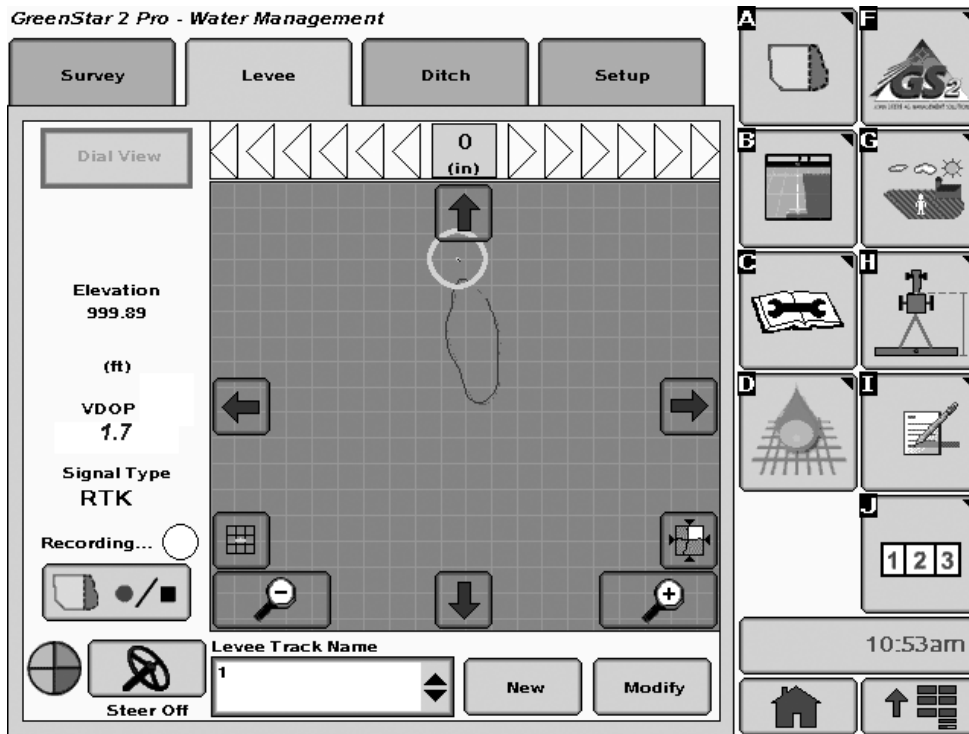
1. Select NEW. The system auto-increments the names by numbers beginning at 1.
2. Set A.

3. Record the levee track by driving back over your wheel tracks in the soil that you created with the dial.
4. At the end of the track, select B.
5. The name appears in the list.

OUC6050,0000F54 -19-29MAY08-1/1

PC103791 —UN—23OCT08

Set A - B Lines



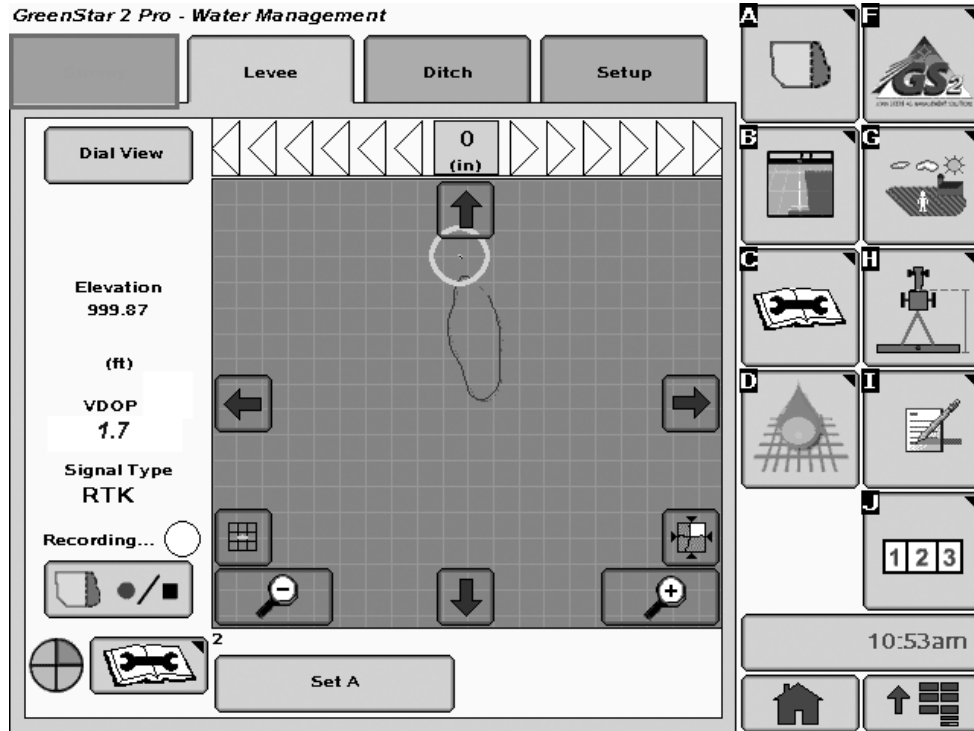
Select NEW button at the bottom of the page.

NOTE: Levee tracks are automatically named. If a track is deleted, the other tracks retain the number that was given to them for a name.

Continued on next page

OU06050,0000F1F -19-26OCT08-1/3

PC10379M —UN—23OCT08

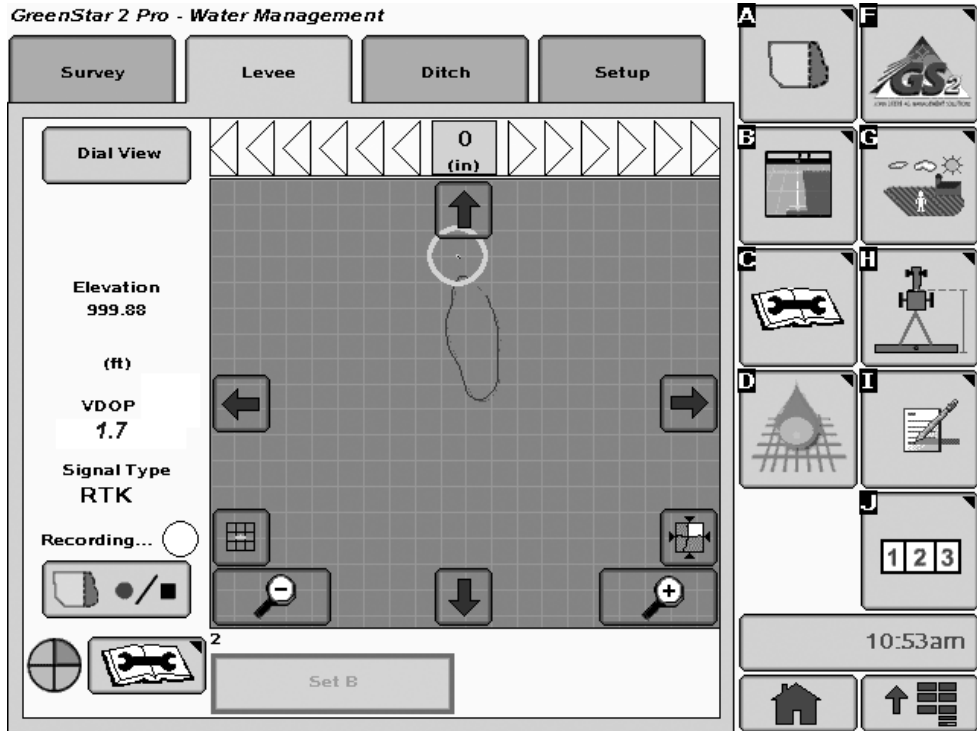


Select SET A button at the bottom of the page and drive path currently marked out.

Continued on next page

OUC6050,0000F1F -19-26OCT08-2/3

PC10379N—UN—23OCT08



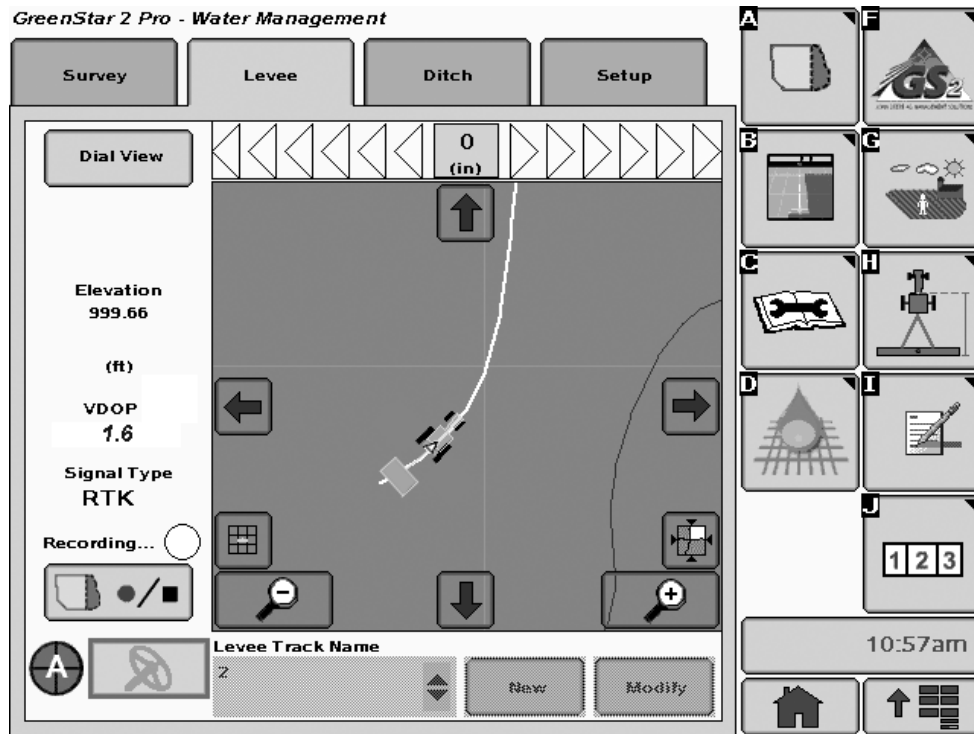
Select SET B button at the bottom of the page when at the end of the path.

IMPORTANT: The path cannot cross over itself.

OUO6050,0000F1F -19-26OCT08-3/3

PC103790 —UN—23OCT08

Pull Levee



Use AutoTrac to retrace levee line and pull up levee.

OUO6050,0000F20 -19-28FEB08-1/1

PC10379R—UN—23OCT08

Troubleshooting and Diagnostics

Diagnostic Page One

MENU Softkey >> GREENSTAR2 PRO Softkey >>
DIAGNOSTICS Softkey >> Then choose SurfaceWater
Pro from the View drop-down menu

GreenStar 2 Pro - Diagnostic Readings

Information	Range	Current	Status
Current Field	N/A	West 80	OK
Exterior Boundary Defined	N/A	N/A	OK
Machine Receiver Differential Mode	SF2 or RTK	RTK	OK
Implement 1 Receiver Differential Mode	SF2 or RTK	RTK	OK
Machine Receiver Vertical Offset (m)	> 0.0	5	OK
Implement 1 Receiver Vertical Offset (m)	> 0.0	7	OK
VDOP	< 4.5	1.2	OK
Rover Distance to Base (km)	< 3.0	2.1	OK

1/3

This screen lists information required to be met for SurfaceWater Pro tools to fully function.

- Current Field
- Exterior Boundary Defined
- Machine Receiver Differential Mode
- Implement 1 Receiver Differential Mode
- Machine Receiver Vertical Offset
- Implement 1 Receiver Vertical Offset
- VDOP
- Rover Distance to Base

PC8663 —UN—05AUG05



MENU Softkey

PC8661 —UN—02NOV05



GREENSTAR2 PRO Softkey

PC9936 —UN—31JAN07



DIAGNOSTIC READINGS Softkey

OJ06050,0000B9B -19-26OCT08-1/1

PC11036 —UN—31JAN08

Diagnostic Page Two

GreenStar 2 Pro - Diagnostic Readings

Readings
Tests

View Water Management

Survey Recording	Current	Status
Survey Mode	Distance-Based	OK
Survey Interval (m)	6	OK
Differential Latitude	0.00000001	OK
Differential Longitude	0.00000002	OK
Differential Elevation (m)	0.3	OK
Survey Receiver Source	Implement 1	OK

2/3

A

B

C

D

E

F

G

H

I

J

1 2 3

9:45pm

OOU6050,0000B9A -19-04SEP07-1/1

PC10318—UN—01SEP07

Diagnostic Page Three

GreenStar 2 Pro - Diagnostic Readings

Readings
Tests

View Water Management

Information	Current	Status
Tracking Mode	Levee Track	N/A
<u>Levee Tools</u>		
Levee Elevation Drop (m)	0.3	OK
<u>Ditch Tools</u>		
Ditch Track Selected	1	OK

3/3

A

B

C

D

E

F

G

H

I

J

1 2 3

9:45pm

OOU6050,0000B9D -19-01SEP07-1/1

PC10319—UN—01SEP07

Troubleshooting

Blade height is incorrect.

Symptom	Problem	Solution
Displayed blade height does not match actual blade height.	Offset C or D had an incorrect measurement during ditch track recording.	Measure all offsets as per Operators Manual instructions
Ditch or levee depth or height does not match desired height/depth.	Offset C should be the exact height of the receiver when implement is in the fully raised position.	Ensure that offsets are measured according to how the machine is used. for example if ditch track is recorded with scraper blade skimming the ground, set up offset measurements to reflect that in offsets C = offset D
	Offset D should be the height of the blade when the implement is in the fully raised position.	Can correct error, for example, if blade (cutting edge) is on the ground, but Profile View shows it as 2 in. above the ground, increase Implement GPS Offsets C (vertical distance from receiver to ground) by 2 in.
	Offset C and D were measured with the implement in the fully raised position but ditch track was recorded with implement skimming the ground.	
	Machine receiver was used to record ditch track and machine receiver height measurement is incorrect.	

Cannot record Ditch Track

Symptom	Problem	Solution
Ditch track not showing up on map.	Operator has not selected correct "client, farm, field".	Ensure correct "client, farm, and field are selected.
GS2 does not let operator record ditch track.	Operator has not selected correct tracking mode.	Ensure that correct tracking mode has been selected from the Guidance page—from the Guidance settings tab select ditch track or levee track mode.
	Guidance lines on map have been turned off.	Ensure that guidance lines are turned on—from the maps page select map settings and then check the guidance lines checkbox

GS2 shows Machine travel direction reversed.

Symptom	Problem	Solution
GS2 shows machine direction of travel reversed.	Direction of travel has been changed on the Guidance page.	Under the StarFire softkey choose to change the mount direction of the receiver to match actual receiver direction on machine.
SWP does not let operator record.	Some applications require mounting the StarFire Receiver backward.	
When in survey mode using a pick-up or ATV GS2 shows direction of vehicle travel to be reversed.		Under the Guidance page select View tab. On the View page select direction of travel, change to match actual travel direction.

Continued on next page

OUO6050,0000F9A -19-29OCT09-1/3

Cannot get a valid solution from Best Fit Drain

Symptom	Problem	Solution
Best Fit Drain does not return a valid solution for a drain design.	Minimum and Maximum slope are not set low and high enough respectively, in other words the range is not wide enough. The ditch track may have been recorded from low elevation to high elevation, and best fit drain is looking for a solution to make water run uphill.	Set Minimum and Maximum slope to lowest and highest allowable levels to widen the range of cut depths. Re-run best fit drain. If ditch track was recorded from low elevation to high elevation best fit drain is attempting to find a solution to make water run uphill. Record ditch from the highest elevation to lowest elevation.

Drain Map shows and upward swale(vertical) at end of drain track.

Symptom	Problem	Solution
Recorded drain design has a vertical rise or uplift at the end of the ditch track.	Ditch track stop point was recorded while receiver was not at the lowest point of elevation on the ditch track.	When ending at ditch track at a point where the water drains, ensure that the implement receiver is stopped and recording is finalized with the receiver at the lowest point of the ditch track. In other words, if the ditch track is recorded traveling downhill finalize recording BEFORE proceeding up any incline from the ditch drain.

Vertical guidance appears after Machine starts to AutoTrac. Implement is still active after AutoTrac shuts off at the end of a track.

Symptom	Problem	Solution
Vertical guidance bar does not shows correction at same time or position that AutoTrac is engaged. While implement is still active or engaged AutoTrac guidance is lost. AutoTrac is engaged and AutoTrac guidance is present before the implement height guidance is available.	Ditch track was recorded in one direction and Ditch was cut in the opposite direction. AutoTrac guidance is based on location of the Machine receiver and Implement height Guidance is based on the location of the Implement Receiver. If track was recorded driving one direction and cut in the opposite, the distance between the receivers is the distance driven without guidance from either AutoTrac or Implement height depending on direction of travel in relation to the direction of the recorded pass. Ditch track was recorded using machine receiver as source. Implement height guidance is active when the implement receiver is over the track recorded by the machine receiver.	Cut the ditch track in the same direction that the track was recorded in. If it is not feasible or practical to record and cut or pull in the same direction, machine begins to AutoTrac before implement requires ground engagement, and Autotrac guidance is lost before the end of the track or before the implement height guidance ends. Machine begins to AutoTrac before implement requires ground engagement, and Autotrac guidance is lost before the end of the track or before the implement height guidance ends.

Guidance does not show track right away.

Continued on next page

OUC6050,0000F9A -19-29OCT09-2/3

Symptom	Problem	Solution
When recording straight sections of a ditch or levee track, guidance recorded track does not show up as quickly as when recording curve sections of track.	Guidance does not need to update the track as often for straight sections of track, and will therefore take longer to display the recorded track.	Allow more time for straight sections of track to show on screen. Zoom out—track may be displayed outside of viewed area.
Symptom	Problem	Solution
Scraper or Ditcher icon will not show up when selected from Implement Type Drop down Menu	Files on the Data Card contain a set-up error and will not allow the icons to be shown	Insert a BLANK data card into GS2 and select Scraper or Ditcher from Implement Type drop-down Menu
Symptom	Problem	Solution
GPS offsets do not contain offset "D" or The vertical distance from the GPS receiver to the ground with the implement in the fully raised position	Scraper or ditcher has not been selected as the implement type	Select Scraper or Ditcher from Implement Type drop-down menu
	The implement receiver is not connected	Connect an implement receiver to the system
	The data on data card contains a set-up error and will not allow a scraper or rotary ditcher to be set up	Insert a blank data card into GS2

OUO6050,0000F9A -19-29OCT09-3/3

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John Deere Service Literature Available

Technical Information

Technical information can be purchased from John Deere. Some of this information is available in electronic media, such as CD-ROM disks, and in printed form. There are many ways to order. Contact your John Deere dealer. Call **1-800-522-7448** to order using a credit card. Search online from <http://www.JohnDeere.com>. Please have available the model number, serial number, and name of the product.

Available information includes:

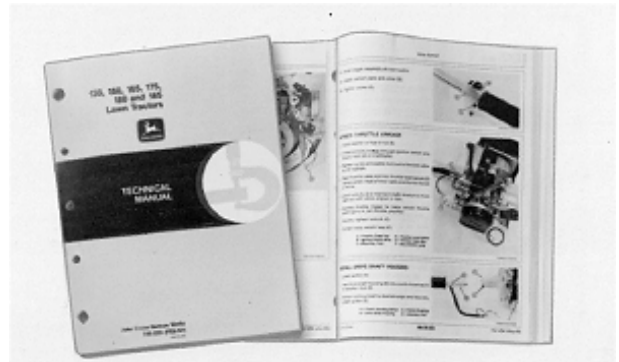
- **PARTS CATALOGS** list service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.
- **OPERATOR'S MANUALS** providing safety, operating, maintenance, and service information. These manuals and safety signs on your machine may also be available in other languages.
- **OPERATOR'S VIDEO TAPES** showing highlights of safety, operating, maintenance, and service information. These tapes may be available in multiple languages and formats.
- **TECHNICAL MANUALS** outlining service information for your machine. Included are specifications, illustrated assembly and disassembly procedures, hydraulic oil flow diagrams, and wiring diagrams. Some products have separate manuals for repair and diagnostic information. Some components, such as engines, are available in separate component technical manuals
- **FUNDAMENTAL MANUALS** detailing basic information regardless of manufacturer:
 - Agricultural Primer series covers technology in farming and ranching, featuring subjects like computers, the Internet, and precision farming.
 - Farm Business Management series examines "real-world" problems and offers practical solutions in the areas of marketing, financing, equipment selection, and compliance.
 - Fundamentals of Services manuals show you how to repair and maintain off-road equipment.
 - Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.



TS189 —UN—17JAN89



TS191 —UN—02DEC88



TS224 —UN—17JAN89



TS1663 —UN—10OCT97

DX,SERVLIT -19-31,JUL03-1/1

John Deere Service Keeps You on The Job

John Deere Is At Your Service

CUSTOMER SATISFACTION is important to John Deere.

Our dealers strive to provide you with prompt, efficient parts and service:

- Maintenance and service parts to support your equipment.
- Trained service technicians and the necessary diagnostic and repair tools to service your equipment.



TS201 —UN—23AUG88

CUSTOMER SATISFACTION PROBLEM RESOLUTION PROCESS

Your John Deere dealer is dedicated to supporting your equipment and resolving any problem you may experience.

1. When contacting your dealer, be prepared with the following information:

- Machine model and product identification number
- Date of purchase

–Nature of problem

2. Discuss problem with dealer service manager.
3. If unable to resolve, explain problem to dealership manager and request assistance.
4. If you have a persistent problem your dealership is unable to resolve, ask your dealer to contact John Deere for assistance. Or contact the Ag Customer Assistance Center at 1-866-99DEERE (866-993-3373) or e-mail us at www.deere.com/en_US/ag/contactus/.

DX,IBC,2 -19-01MAR06-1/1

