

GREENSTAR™ 2100 & 2600 Display

OPERATOR'S MANUAL GREENSTAR™ 2100 & 2600 Display OMPC20467 Issue A6 (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.

Introduction

Foreword

WARRANTY: Please reference your purchase agreement for warranty statement. John Deere products are designed and tested to meet the requirements of agricultural environments. Like all electronic products, touch screens are vulnerable to damage, either deliberate or through neglect. Damage due to neglect is not covered under John Deere product warranty. It is important to follow proper use guidelines with the GSD2600 touch screen. Under no circumstance should you contact the touch screen with an object harder or sharper than a fingertip (pen, pencil point, or any metal objects). Heavy pressure can also damage underlying components and void the touch screen warranty. Light amounts of pressure, if exerted continuously, can degrade touch screen reliability. The GSD2600 should be stored near room temperature during the off season and in the original shipping container with no items contacting the touchscreen surface.

INTENDED USE: This system is designed solely for use in customary agriculture or similar operations. Use in any other way is considered as contrary to intended use. Manufacturer accepts no liability for damage or injury resulting from misuse, and these risks must be borne solely by user. Compliance with and strict adherence to conditions of operation, service and repair as specified by manufacturer also constitute essential elements for intended use.

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 the system 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 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 direction of forward travel.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in Specification or Identification Numbers section. Accurately record all numbers to help in tracing system should it be stolen. Your dealer also needs these numbers when you order parts. File identification numbers in a secure place off machine.

THIS SYSTEM SHOULD BE OPERATED, serviced and repaired only by persons familiar with all its particular characteristics and acquainted with relevant safety rules (accident prevention). Accident prevention regulations, all other generally recognized regulations on safety and occupational medicine and road traffic regulations must be observed at all times. Any arbitrary modifications carried out on this system will relieve manufacturer of all liability for any resulting damage or injury.

OUO6050,0001500 -19-09JAN06-1/1

Contents

	Page		Page
Safety	05-1	GreenStar General	
Updating Software		GREENSTAR2 PRO softkey	40-1
GS2 Live Update	10-1	RESOURCES/CONDITIONS softkey	40-2
Loading Software	10-1	EQUIPMENT softkey	40-3
General Information		MACHINE tab	40-3
Theory of Operation	15-1	IMPLEMENT 1 tab	40-6
Front of Display	15-3	IMPLEMENT 2 and IMPLEMENT 3 tab	40-12
Back of Display	15-4	MAPPING softkey	40-13
Display Control	15-4	Mapping Harvest	40-14
Display Secondary Navigation	15-5	MAPS tab	40-15
Data Card	15-6	BOUNDARIES tab	40-17
Screen Layout	15-8	FLAGS tab	40-18
Display Navigation		Guidance	
Power Up	20-1	GUIDANCE softkey	45-1
Selecting a Desired Input Field with Display		VIEW tab	45-3
Control	20-2	GUIDANCE SETTINGS tab	45-8
Input Fields	20-2	Turning View	45-8
softkeys and Icons		Turn Predictor	45-9
ISO Standard Icons	25-1	Recording Turn Points	45-9
Performance Monitor	25-1	Predicting Turn Points	45-10
Message Center	25-2	Lead Compensation	45-12
Display	25-4	SHIFT TRACK SETTINGS tab	45-12
StarFire iTC	25-6	Track 0 Setup	
GreenStar2 Pro	25-8	Straight Track Mode	45-14
Display Setup		Curve Track Mode	45-15
Display Software Activations	30-1	Circle Track Mode	45-16
OBTAINING ACTIVATION CODE &		Row Finder Mode	45-17
ACTIVATING SOFTWARE IN DISPLAY	30-2	AutoTrac System	45-17
Display		AutoTrac Status Pie	45-18
Display Soft-key (F)	30-3	Steering Sensitivity	45-21
Settings Soft-key (G)	30-6	AutoTrac Tractors	
Auxiliary Controls Soft-key (H)	30-7	Enabling System	45-23
Diagnostics Soft-key (I)	30-8	Activating System	45-24
Home Page Layout		Deactivating System	45-25
Home Page Layout	35-1	AutoTrac Sprayers	
Harvest Home Page Layout Options	35-4	Enabling System	45-26
		Activating System	45-27
		Deactivating System	45-28
		AutoTrac Combines	
		Enabling System	45-28

Continued on next page

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.

COPYRIGHT © 2006
DEERE & COMPANY
Moline, Illinois
All rights reserved
A John Deere ILLUSTRATION® Manual

Page	Page
Activating System	45-29
Deactivating System	45-30
AutoTrac Universal	
Accuracy	45-30
General Information	45-31
Start-Up Screen	45-32
Setup	45-33
Enabling System	45-34
Activating System	45-35
Deactivating System	45-36
Information	45-36
Circle Track	45-37
Curve Track	45-40
AutoTrac Accuracy	45-43
Documentation	
Turning Documentation On/Off	50-1
How Documentation Organizes Data	50-1
DOCUMENTATION softkey	50-2
Operations	50-3
Harvest Setup	50-4
Changing Harvest Settings	50-5
Task Notes	50-7
Controllers	50-8
TOTALS softkey	50-9
Harvest Totals	50-10
Using Documentation with John Deere	
Air Carts	50-12
Required and Optional Items For	
Documentation	50-12
Map Based Prescriptions	50-13
Coverage Map	50-15
Connecting Non-Deere Controllers	50-16
Swath Control Pro—Enabling	50-17
Swath Control Pro—Setup	50-22
Swath Control Pro—Coverage Map	50-26
Original GreenStar Monitor	
Compatible Systems	55-1
Operating Original GreenStar Monitor	55-1
Harvest Monitor—Combine	
Original GreenStar Monitor	60-1
Combine	
Starting	60-1
Defining Header	60-2
Calibration	60-3
Low Flow Compensation	
Procedure--Optional	60-5
Manually Adjusting Calibration Factor	60-6
SETUP - MOISTURE CORRECTION	60-6
Moisture Correction	60-7
Moisture Alarm	60-8
Moisture Curve	60-8
Selection Recording	60-9
Setting Yield/Area Units	60-9
Harvest Monitor—Picker	
Original GreenStar Monitor	65-1
Picker	
Flow Chart	65-1
Setting Yield Units	65-2
Setting Area Units	65-2
Setting Rows and Spacing	65-2
Calibration	65-5
Row Compensation	65-6
Quick Calibration	65-6
Standard Calibration	65-7
Manual Adjustment of Calibration Factor	65-8
Recording	65-9
Performance Monitor	
Setup Performance Monitor	70-1
StarFire iTC Receiver	
STARFIRE ITC softkey	75-1
INFO tab	75-2
SETUP tab	75-3
Correction Mode	75-3
Correction Frequency	75-3
Mount Direction	75-4
Fore/Aft	75-5
Height	75-6
QuickStart	75-6
Hours On After Shutdown	75-7
TCM Calibration	75-7
ACTIVATIONS tab	75-10
SERIAL PORT tab	75-11
RTK softkey	75-11
Vehicle	75-13
Vehicle Repeater	75-14
Quick Survey Mode	75-15
Absolute Base Mode	75-16
RTK Network Configuration	75-17
SATELLITE INFORMATION softkey	75-19
DIAGNOSTIC softkey	75-21
Connecting RS-232 GPS Receivers	
Connecting RS-232 GPS Receivers	80-1
ISO Implements	
ISO Implements	85-1
Operating ISO Implement	85-2

Continued on next page

Page

Troubleshooting and Diagnostics

Message Center	90-1
Resetting Display	90-6
Warning Screens	90-7
Diagnostic Addresses	90-8
Guidance Warnings	90-11
Trouble Code Pop-Up Boxes—Platform	
Core Software	90-13
Trouble Code Pop-Up Boxes—Guidance	
Software	90-15
Trouble Code Pop-Up Boxes—	
Documentation Software	90-17
AutoTrac Universal	90-19
AutoTrac Universal Stop Codes	90-21
GreenStar Diagnostics	90-22
Fault Codes—StarFire iTC	90-22
Diagnostic Trouble Codes—StarFire iTC	90-25

Specifications

Metric Bolt and Screw Torque Values	95-1
Unified Inch Bolt and Screw Torque Values	95-2

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.



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

TS1389 -UN-07DEC88

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.



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

TS187 -19-30SEP88

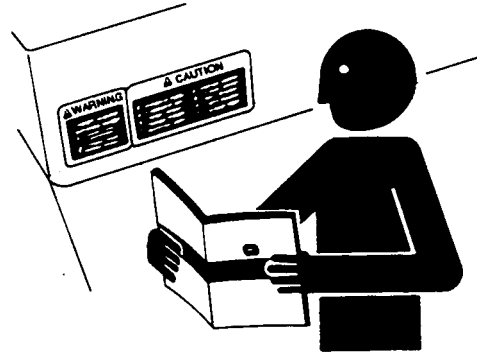
Follow Safety Instructions

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.

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.

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



TS201 -UN-23AUG88

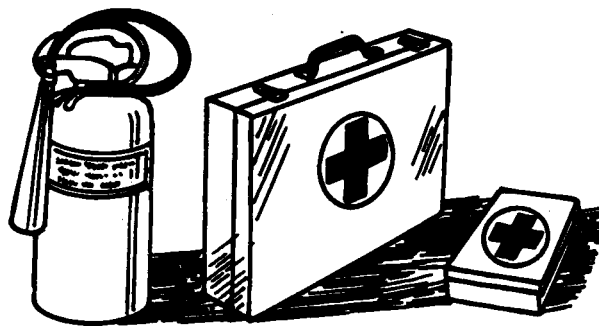
DX,READ -19-03MAR93-1/1

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 ground. Stop engine, remove key, and set parking brake. 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.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.



TS218 -UN-23AUG88

OUO6050,0001494 -19-20OCT05-1/1

Read Operator Manuals for ISOBUS Implements

In addition to GreenStar Applications, this display can be used as a display device for any implement that meets ISO 11783 standard. This includes capability to control ISOBUS implements. When used in this manner, information and implement control functions placed on the display are provided by the implement

and are the responsibility of the implement manufacturer. Some of these implement functions could provide a hazard either to the Operator or a bystander. Read the operator manual provided by the implement manufacturer and observe all safety messages in manual and on implement prior to use.

OUO6050,0001495 -19-17NOV05-1/1

Updating Software

GS2 Live Update

John Deere AMS periodically develops software updates to your GreenStar 2 system to deliver new system enhancements, or performance improvements. This could include updated software for your GS2 display, as well as many other components.

The GS2 Live Update is a desktop software application that will automatically alert you of recent updates to

your GS2 system, and walk you through the downloading process. To install the GS2 Live Update, insert the CD into your CD ROM drive and follow the on screen prompts. If no prompts appear, double click on My Computer, and find the drive associated with your CD ROM drive. Run the program labeled "GS2LiveUpdateSetup.exe".

OUO6050,0001752 -19-18JAN06-1/1

Loading Software

IMPORTANT: IMPORTANT: If changes are made while machine is in auxiliary mode, turn key off and wait for display's power light to turn off before starting the ignition. This allows display to shut down and save data.

IMPORTANT: Do not turn off power or remove data card while display is reprogramming. Doing so can damage display and put software in an irrecoverable state.

Verify that display has the latest software available. To acquire the latest software visit www.StellarSupport.com or contact a John Deere dealer.

After new software has been downloaded to data card, simply insert data card in display and system will show a screen prompting operator to reprogram display. If operator does not choose to reprogram system, reprogramming alarm will appear during every power-up cycle if the data card is still inserted.

To install this software update, press the button to continue:

Updating software - Warning: Do not power down display or remove card.

The update was successfully installed. Press the button to continue. - Please cycle power.

The system is restarting, please wait...

If software update was unsuccessful this message will be given: The software update was unsuccessfully. See the message center.

To manually load a different software version to a component:

- Choose component from list on Message Center - Reprogram Device Screen
- Push REPROGRAM DEVICE button
- Choose software version from the drop-down box and press enter.

OUO6050,0001753 -19-18JAN06-1/1

General Information

Theory of Operation

IMPORTANT: It is important to follow proper use guidelines with the GSD2600 touch screen. Under no circumstance should you contact the touch screen with an object harder or sharper than a fingertip (pen, pencil point, or any metal objects). Heavy pressure can also damage underlying components and void the touch screen warranty. Light amounts of pressure, if exerted continuously, can degrade touch screen reliability. The GSD2600 should be stored near room temperature during the off season and in the original shipping container with no items contacting the touchscreen surface.

The 2100 & 2600 GreenStar displays are primarily used as an operator interface for guidance and documentation applications.

The 2600 GreenStar display's primary navigational point is the touchscreen which allows the operator to input information by touching the screen. The 2600 can also use the display control which allows use of input buttons and thumb wheel.

The 2100 GreenStar display's primary navigational point is the display control which allows the operator to input information using buttons and a thumb wheel. Selected field, button, or softkey will appear with a highlighted border.

GreenStar Basics Software

The 2100 and 2600 display come standard with a basic software feature set, including:

- Manual Guidance
- Documentation (field and harvest)
- On-Screen Mapping
- Prescriptions

When connected to a GPS receiver, the system allows the operator to manually drive vehicle with the aid of GPS. When combined with an optional AutoTrac activation, and vehicle steering kit, system can automatically guide machine through the field.

Documentation can be used to record data tied to GPS coordinates. On some machines, rates, yield, implement width, or other information will be recorded from the vehicle CAN bus. The displays can also be connected to certain 3rd party controllers to record rate information. This data is collected on the compact flash card and can be downloaded into desktop software to produce maps and reports of field activities.

On-screen mapping uses GPS, and a recording source to create real time maps of field activities. Operators will be able to see the areas of the field they have covered.

Original GreenStar Monitor function can be used to operate selected John Deere implements as they would normally be used with the original GreenStar display. The 2100 and 2600 may also be mounted in tandem with an original GreenStar display. In this configuration, John Deere machine specific information will display on the original GreenStar display, and GS2 Basics applications will be shown on the 2100 or 2600.

The 2100 and 2600 displays have an integrated performance monitor that can be used to record area and other data based on implement width and ground speed.

Continued on next page

OUO6050,00016EA -19-17JAN06-1/2

Display can also be used for machines and systems that conform to implementation level 2 of International Organization for Standardization (ISO) 11783. The purpose of ISO 11783 is to enable electronic units to communicate with each other providing a standardized system that is easy to read and understand. Utilizing straight-forward customizable controls that are separate from the display itself, the operator can use the display as a tractor performance monitor and a monitor for an ISO 11783 compliant implement.

From time to time, John Deere AMS publishes software updates to the GS2 system over the internet at www.StellarSupport.com. Each display also comes with a GS2 Live Update CD. Live Update can be installed on an internet connected PC and alert the user when updates to the display are available. It will then walk the user through the downloading process. The download can be stored on a data card, and inserted into the display to complete the update.

OUO6050,00016EA -19-17JAN06-2/2

Front of Display

IMPORTANT: Do not remove 12 volt power from display until the LED light is black. Prematurely removing power (green or orange light status) may cause loss of data and/or the display to lose functionality. It may take up to 20 seconds after removing key power for the LED light to completely go black. The data card should not be removed during this period also.

Display (A) is located in cab and allows operator to view instantaneous information from seat while operating vehicle.

Power light (B) will indicate power mode of display:

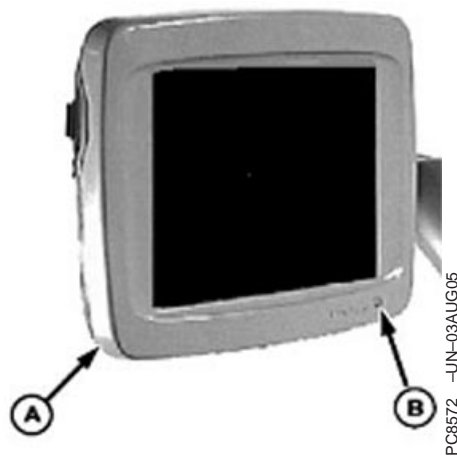
- green—display on and cold boot up
- flashing green—warm boot-up
- orange—standby
- off—shutdown

Cold boot-up occurs when display has been powered down for over 24 hours and takes 20-25 seconds to power up.

Warm boot-up occurs when display has been operating in the last 24 hours and takes 1-3 seconds to power up.

IMPORTANT: Always clean screen on 2600 display with power off. Cleaning screen while operating could result in unintended button presses.

To clean display, power down and wipe screen with a soft cloth sprayed with a non-ammonia based cleaner such as John Deere glass or multipurpose cleaner.



Display

A—Display
B—Power Light (reference only)

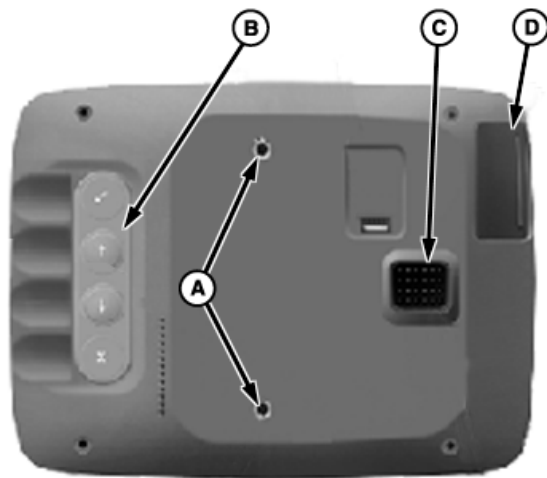
Back of Display

Backside of Display contains:

- Display Mounting Holes—attach to bracket on machine
- Secondary Navigational point—provides backup navigation with display
- Data Card Door/Slot—houses data card used for data collection and saving selected display and implement settings.
- Display Connector—connects vehicle wiring harness plugs with display for system power and communication.

NOTE: Backside of display will all have label with display model and serial number on it.

- A—Display Mounting Holes
 B—Secondary Navigation
 C—Display Connector
 D—Compact Flash Door



Backside of Display

PC8863 -UN-02NOV05

OUO6050,00016EC -19-08DEC05-1/1

Display Control

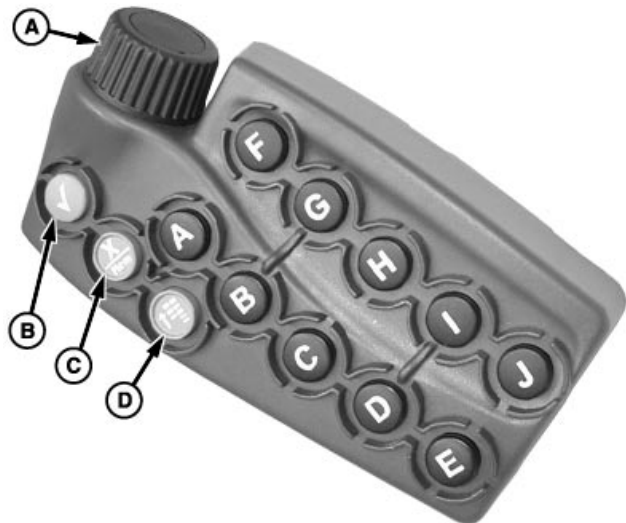


CAUTION: Do not mount display control on the side of dual displays (2100/2600 and GSD4). This blocks the operator's view and overloads the bracket. Mount the display control elsewhere.

The display control is the primary navigational point on the GreenStar Display 2100 (and 2600 if equipped).

The display control contains 10 available short-cut softkeys A-J, Thumb Wheel (A), ENTER button (B), CANCEL button (C), and MENU button (D).

- A—Thumb Wheel
 B—ENTER button
 C—CANCEL button
 D—MENU button



Display Control

PC8864 -UN-03JAN06

OUO6050,00016ED -19-08DEC05-1/1

Display Secondary Navigation

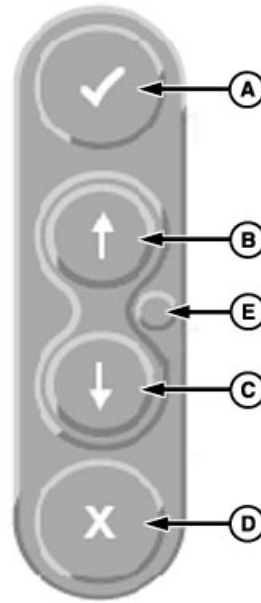
Secondary display controls consist of five buttons located on backside of display. They provide backup navigation in the event that the primary display controls are not communicating with display.

ENTER button (A) and CANCEL button (D) operate the same as they do on the primary display controls.

Up Arrow (B) and Down Arrow (C) simulate thumb wheel operation on display control.

DISPLAY RESET button (E) resets display without cycling power on vehicle. Hold for 3 seconds to reboot.

- A—Enter
- B—Up Arrow
- C—Down Arrow
- D—Cancel
- E—Display Reset



Display Secondary Navigation

PC8580 -UN-17AUG05

OUO6050,00016EE -19-08DEC05-1/1

Data Card

IMPORTANT: Do not remove 12 volt power from display until the LED light is black. Prematurely removing power (green or orange light status) may cause loss of data and/or the display to lose functionality. It may take up to 20 seconds after removing key power for the LED light to completely go black. The data card should not be removed during this period also.

IMPORTANT: Data card must be in display during operation or system functionality will deteriorate.

IMPORTANT: Do not remove data card while display is reprogramming. Doing so can damage display and put software in an irrecoverable state.

Any time machine configuration changes are made, the power must be cycled on the display to allow changes to take place.

After configuring machine and implement setup, make sure key power is turned off and LED light is able to go to black before operating in the field. This will allow all setup information to be saved to the data card.



Data Card in Display

A—Data Card

Steps for Data Card Insertion

1. Open the card slot door by pressing forward on the door latch tab, and continue to press forward until the door springs open.
2. Wait for message stating that Data Card can be ejected.
3. The side of the data card that has the ridge along the bottom edge should be facing the operator as it is inserted. It cannot be inserted with the opposite side facing the operator.

Continued on next page

OUC6050,00016EF -19-19JAN06-1/2

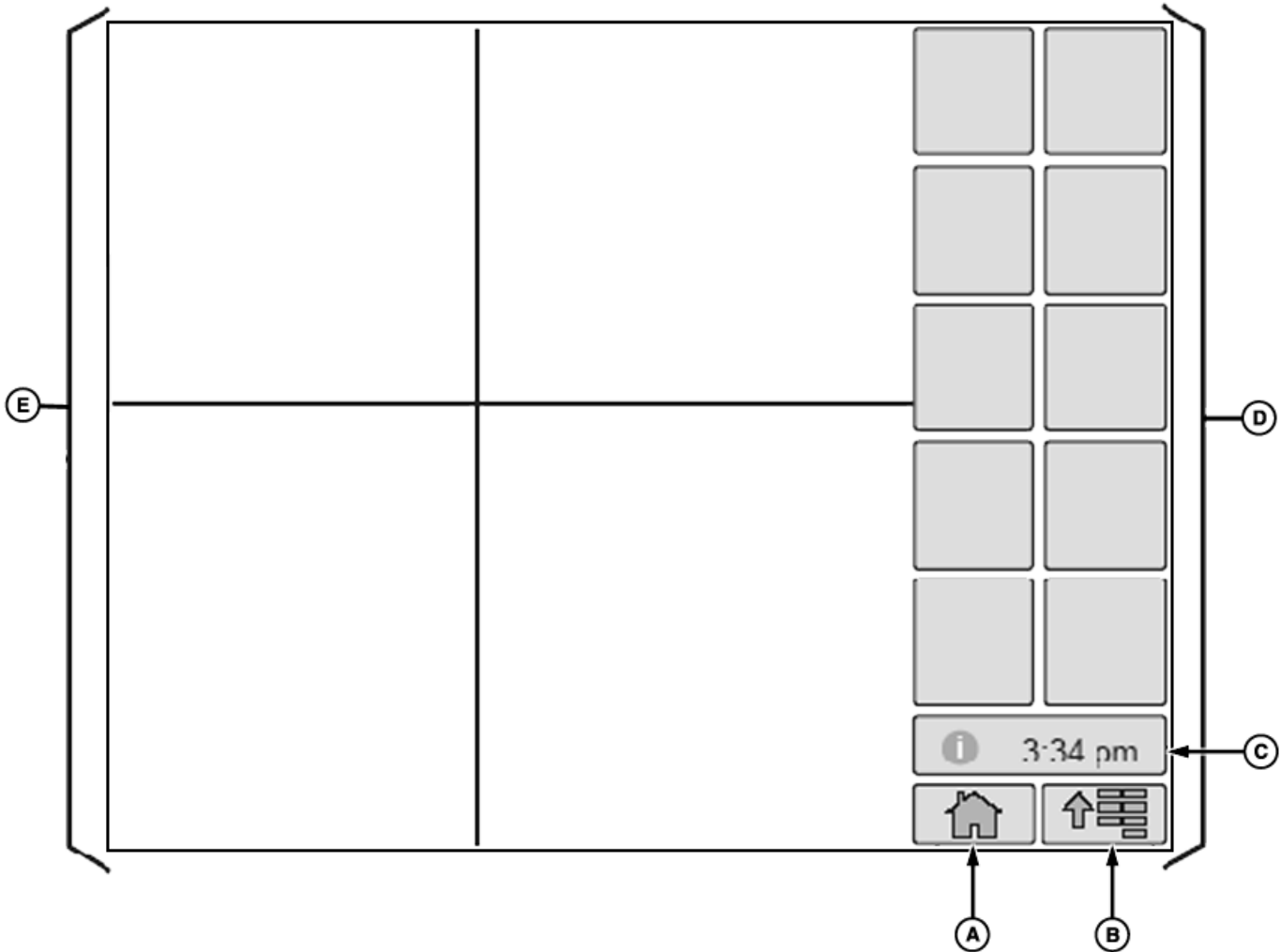
4. Press the data card into the slot until it clicks into place and pushes the eject button all the way out. It has a similar feel to inserting a PCMCIA card into a Mobile Processor.
5. Close the card slot door.

Steps for Data Card Removal

1. Open the card slot door.
2. Press the eject button located directly below the card slot inside the card slot door. This is very similar to removing a PCMCIA card from a Mobile Processor.
3. The data card will pop out enough to grab it with your fingers and remove it from the card slot.

OUO6050,00016EF -19-19JAN06-2/2

Screen Layout



Screen Layout

A—Home
B—Menu

C—Message Center

D—softkeys

E—Application Info Area

NOTE: Display screen illustrated on following pages are provided for reference only. Actual screens may appear differently due to connection of optional devices and/or software versions.

Home (A), Menu (B) and Message Center (C) selections will be on every screen.

- Home selection—allows operator to view Home Page.

- Menu selection—allows operator to view a list of available applications.
- Message Center selection—allows operator to view cautions, warning messages, diagnostic information. (See SETUP MESSAGE CENTER in Display Message Center section.)

Selecting one of the softkeys (D) will cause a new page to appear or a process to be started.

PC8577 -JUN-02NOV05

Display Navigation

Power Up

IMPORTANT: Do not remove 12 volt power from display until the LED light is black. Prematurely removing power (green or orange light status) may cause loss of data and/or the display to lose functionality. It may take up to 20 seconds after removing key power for the LED light to completely go black. The data card should not be removed during this period also.

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 will ensure the setup data is saved to the data card prior to operating.

If the vehicle is running during setup and programming, turn the vehicle off 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.

IMPORTANT: If changes are made while machine is in auxiliary mode, turn key off and wait for display's power light to turn off before starting the ignition. This allows display to shut down and save data.

IMPORTANT: Data card must be in display during operation or system functionality will deteriorate.

During power up of display, a start-up screen will show a status bar that indicates display is powering up. Once the display has powered up, if no implement is connected, a default performance monitor screen will be shown. If an ISO implement is connected, that implement's information will be shown in application info area along with 10 softkeys.

OUO6050,00016F1 -19-09JAN06-1/1

Selecting a Desired Input Field with Display Control

NOTE: The 2600 GreenStar Display's primary navigational point is the touchscreen which allows the operator to input information by touching the screen.

THUMB WHEEL (A)—move highlight or focus

ENTER (B)—allows operator to select input fields, buttons, or softkeys.

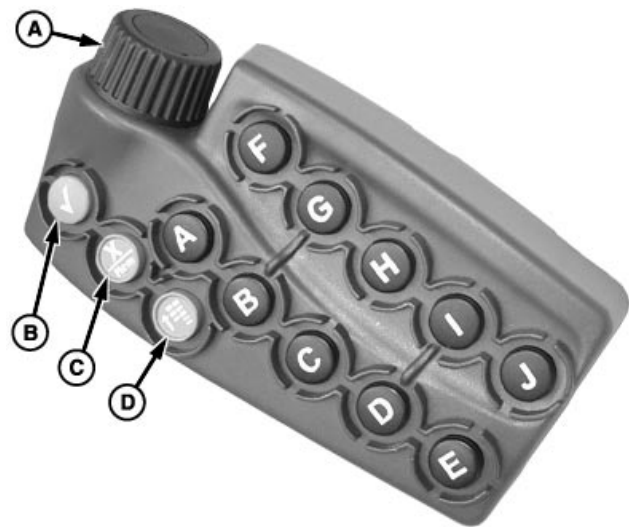
CANCEL (C)—cancels operator's selection or exits from selection process.

MENU (D)—displays menu list

Short-Cut Buttons A-J—allow operator to activate an associated input field, button, or softkey with the letter corresponding to the short-cut button pressed.

NOTE: Only input fields or softkeys will show a Highlight/focus around it.

To activate and select an input field, move highlight/focus with thumb wheel to desired function and press ENTER button.



Display Control

A—Thumb Wheel
B—ENTER button
C—CANCEL button
D—MENU button

PC8864 -UN-09JAN06

OUO6050,00016F2 -19-08DEC05-1/1

Input Fields

There are a variety of input fields and buttons that allow the operator to navigate through the screens on the display and input values:

- Drop-Down Box
- Input Box
- Check Box
- Button

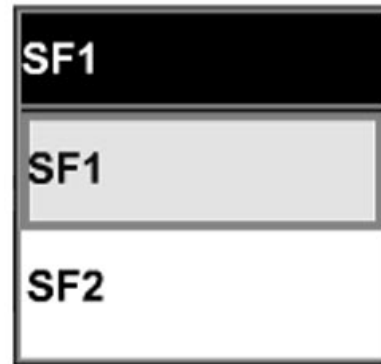
2100 Display—fields are highlighted and can be scrolled through using wheel on display control.

2600 Display—fields are selected by touching screen. Key pad will appear to input alpha/numeric data.

Continued on next page

OUO6050,00016F3 -19-08DEC05-1/5

PC8845 –UN-30OCT05



PC8846 –UN-30OCT05

Drop-Down Box

A drop-down box has a border with a numeric or text value and up/down arrows on the right side that allow operator to select a prepopulated item pre-populated in a list.

To open, highlight drop-down box and press ENTER button. List will appear. Rotating thumb wheel will

allow operator to move highlight focus through list to desired input value. Pressing ENTER button will select new value.

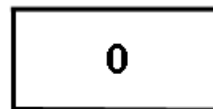
To close the drop-down box without making a selection, press CANCEL button. List will close and original value will remain.

Continued on next page

OUC6050,00016F3 –19-08DEC05-2/5

Input Box

An Input box has a border with a numeric value or text. This allows the operator to select and enter new values or text.



NOTE: The faster rotary wheel is spun, the faster values will incrementally change.

To change a value, highlight Input box and press ENTER button. Colors change inside box to indicate that the thumb wheel can be rotated to change current value to desired value. When finished, press Enter to accept new value. To cancel out of an input box, press CANCEL button to keep the original value.

If the input box is a number with a small range of values, then the number can be changed by pressing the ENTER button followed by spinning the rotary wheel. As the wheel is spun faster, the number will change faster.

If there is a large range of values, a numeric key pad will appear, allowing selection of each digit.

2600 GreenStar Display—If display is not equipped with a display control no highlight will appear. Display uses a pop-up keyboard to enter values.

OUO6050,00016F3 -19-08DEC05-3/5

Check Box

A check box is a square with a border. A check mark in the box indicates that the box is activated.



To activate a check box, highlight empty check box and press ENTER button. A check will appear inside box activating item. To deactivate a check box, highlight check box and press ENTER button to remove the check.

Continued on next page

OUO6050,00016F3 -19-08DEC05-4/5

PC8650 -UN-01NOV05



ENTER



GOTO

Button

A Button is an icon or text with a border. Activating a button will perform that icon's function.

To activate a function, highlight the button and press enter.

OUO6050,00016F3 -19-08DEC05-5/5

softkeys and Icons

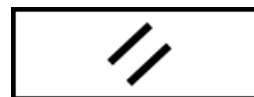
ISO Standard Icons

The buttons shown are ISO standard icons that are used throughout various display applications.

PC8688 -UN-01NOV05



CANCEL



CLEAR

PC8689 -UN-01NOV05



ENTER



GOTO

PC8652 -UN-01NOV05



CALIBRATION



RETURN

OUO6050,00016F4 -19-08DEC05-1/1

Performance Monitor

- PERFORMANCE MONITOR softkey
- SETTINGS softkey
- TOTALS softkey

PC8658 -UN-05AUG05



PERFORMANCE MONITOR button

OUO6050,00016F5 -19-08DEC05-1/4

PERFORMANCE MONITOR softkey—Ground Speed, Engine Speed, Area Covered, Wheel Slip, Recording Source

PC8791 -UN-18OCT05



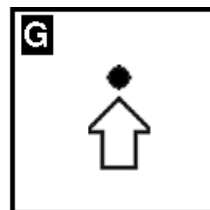
PERFORMANCE MONITOR softkey

Continued on next page

OUO6050,00016F5 -19-08DEC05-2/4

SETTINGS softkey

PC8792 -UN-18OCT05

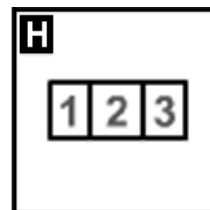


SETTINGS softkey

OUO6050,00016F5 -19-08DEC05-3/4

TOTALS softkey—Distance, Area, Area/Hour, Fuel/Hour, Fuel/Area, Hours

PC8793 -UN-18OCT05



TOTALS softkey

OUO6050,00016F5 -19-08DEC05-4/4

Message Center

- REPROGRAM DEVICE softkey
- ABOUT softkey
- MESSAGE CENTER softkey
- DIAGNOSTIC ADDRESSES softkey
- TROUBLE CODES softkey
- ELECTRONIC CONTROL UNIT INFO softkey
- BUS INFO softkey

PC8655 -UN-05AUG05

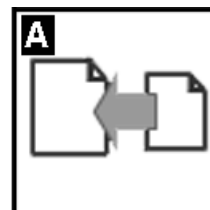


MESSAGE CENTER button

OUO6050,00016F6 -19-08DEC05-1/8

REPROGRAMMING softkey—Components and Software Version

PC8665 -UN-05AUG05



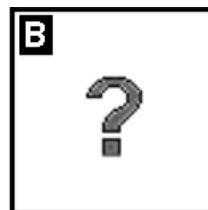
REPROGRAMMING softkey

Continued on next page

OUO6050,00016F6 -19-08DEC05-2/8

PC8666 -UN-05AUG05

ABOUT softkey—Software Copyrights, Build Initiated,
Build Machine, P/N, S/N and CPLD

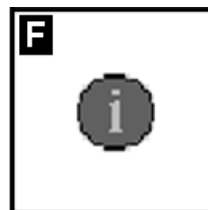


ABOUT softkey

OUO6050,00016F6 -19-08DEC05-3/8

PC8667 -UN-05AUG05

MESSAGE CENTER softkey—Messages to Display

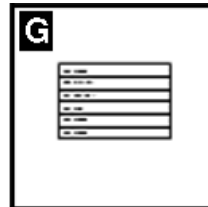


MESSAGE CENTER softkey

OUO6050,00016F6 -19-08DEC05-4/8

PC8668 -UN-05AUG05

DIAGNOSTIC ADDRESSES softkey—Device Information



DIAGNOSTIC ADDRESSES softkey

OUO6050,00016F6 -19-08DEC05-5/8

PC8669 -UN-05AUG05

TROUBLE CODES softkey—Trouble Codes



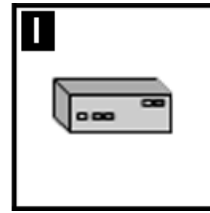
TROUBLE CODES softkey

OUO6050,00016F6 -19-08DEC05-6/8

Continued on next page

PC8670 -UN-05AUG05

ELECTRONIC CONTROL UNIT INFO softkey—Electronic Control Unit Info

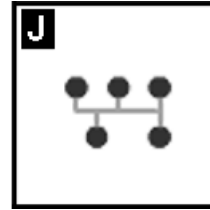


ELECTRONIC CONTROL UNIT INFO softkey

OUC6050,00016F6 -19-08DEC05-7/8

PC8671 -UN-05AUG05

BUS INFO softkey—Bus Info



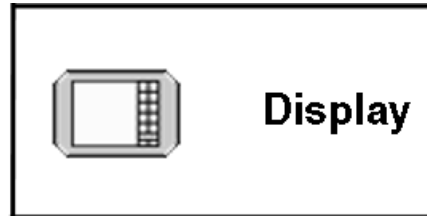
BUS INFO softkey

OUC6050,00016F6 -19-08DEC05-8/8

PC8654 -UN-05AUG05

Display

- DISPLAY softkey
- SETTINGS softkey
 - REGIONAL tab
 - TIME/DATE tab
 - UNITS OF MEASURE tab
- AUXILIARY CONTROLS softkey
- DIAGNOSTICS softkey
 - READINGS tab
 - TESTS tab
 - ABOUT tab



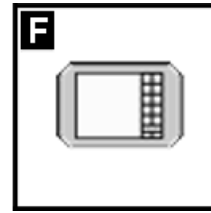
DISPLAY button

Continued on next page

OUC6050,00016F7 -19-08DEC05-1/5

PC8689 -UN-09AUG05

DISPLAY —Dim, Sync with Cab, Contrast, Day/Night, Volume, Highlight Color



DISPLAY softkey

OUO6050,00016F7 -19-08DEC05-2/5

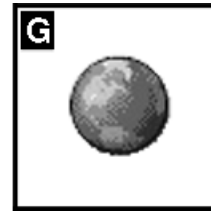
PC8690 -UN-09AUG05

SETTINGS softkey

REGIONAL tab—Country, Language, Numeric Format, Units

TIME/DATE tab—Date, Date Format, Time, GPS Time Sync, 24 Hour Clock

UNITS OF MEASURE tab—Distance, Area, Volume, Mass, Temperature, Pressure, Force



SETTINGS softkey

OUO6050,00016F7 -19-08DEC05-3/5

PC8691 -UN-09AUG05

AUXILIARY CONTROLS softkey—Input Device, Input, Assigned, Function, Implement



AUXILIARY CONTROLS softkey

Continued on next page

OUO6050,00016F7 -19-08DEC05-4/5

PC8683 -UN-05AUG05

DIAGNOSTICS softkey

READING tab—Unswitched Voltage, Switched Voltage, CAN High Voltage (Vehicle Bus), CAN Low Voltage (Vehicle Bus), CAN High Voltage (Implement Bus), CAN Low Voltage (Implement Bus), Operation Hours, Radar Sensor Input, Implement Switch Status, Card Door Status, Card Present, CCD Status, RS232 #1 Status, RS232 #2 Status, Speed Source, Software Part Number, Software Version Number, Hardware Part Number, Hardware Serial Number

TEST tab—Color Test, Touchscreen Test, Touchscreen Calibration

ABOUT tab—Copyright information, Build Initiated, Build Machine, Application Software Build, P/N, S/N, CPLD



DIAGNOSTICS softkey

OUC6050,00016F7 -19-08DEC05-5/5

PC8659 -UN-05AUG05

StarFire iTC

- STARFIRE ITC softkey
 - INFO tab
 - SETUP tab
 - ACTIVATIONS tab
 - SERIAL PORT tab
- RTK softkey
- SATELLITES softkey
 - SKY PLOT tab
 - GRAPH tab
- DIAGNOSTICS softkey
 - READINGS tab
 - DATA LOGS tab



STARFIRE ITC button

Continued on next page

OUC6050,00016F8 -19-08DEC05-1/5

PC8680 -UN-05AUG05

STARFIRE ITC softkey

INFO tab—Position Mode, Differential Mode, Lat, Lon, Altitude, GPS Course, GPS Speed, Roll Angle, Accuracy, GPS Signal, Diff Signal, Yaw Rate

SETUP tab—Correction Mode, Correction Freq., Mount Direction, Fore/Aft, Height, Enable QuickStart, Hours On After Shutdown, TCM On/Off, TCM Calibrate

ACTIVATIONS tab—Activation Code Enter, SF2 License, SF2 End Date, StarFire SN. Activation/License Status Window, Grace Periods Available

SERIAL PORT tab—Baud Rate, Output Rate, GGA, RMC, ZDA, GSA, VTG



STARFIRE ITC softkey

OUC6050,00016F8 -19-08DEC05-2/5

PC8681 -UN-05AUG05

RTK softkey—Operating Mode, Radio Channel, Network ID, Repeater Configure, BaseStation: Status, Sat. Corrections, Location#, Distance, Direction, Base Battery Voltage, Radio Data Received, Noise Level



RTK softkey

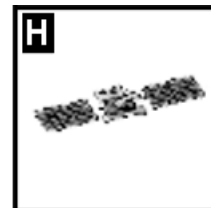
OUC6050,00016F8 -19-08DEC05-3/5

PC8682 -UN-05AUG05

SATELLITES softkey

SKY PLOT tab—Satellites in Solution, Above Elevation Mask, Tracked, VDOP, HDOP, PDOP, Correction Age. Sat ID, Elevation, Azimuth, L1 SNR, L2 SNR Status

GRAPH tab—Sat ID, OK, Track, Search, Lock



SATELLITES softkey

Continued on next page

OUC6050,00016F8 -19-08DEC05-4/5

PC8683 -UN-05AUG05

DIAGNOSTICS softkey

READINGS tab—Unswitched Voltage, Switched Voltage, CAN High Voltage (Vehicle Bus), CAN Low Voltage (Vehicle Bus), Software Part Number, Software Version Number, Hardware Part Number, Hardware Serial Number, Receiver Hours, RTK Software Version Number, RTK Serial Number, RTK Status, RTK Search Time, RTK Satellites in Search

DATA LOGS tab—GPS Accuracy, PDOP, Satellites Used, GPS Signal Quality, Diff Signal Quality, Nav Mode, Differential Mode



OUC6050,00016F8 -19-08DEC05-5/5

PC8661 -UN-02NOV05

GreenStar2 Pro

- MAPPING softkey
 - MAPS tab
 - BOUNDARIES tab
 - FLAGS tab
- GUIDANCE softkey
 - VIEW tab
 - GUIDANCE SETTINGS tab
 - SHIFT TRACK SETTINGS tab
- DIAGNOSTIC READINGS softkey
- GREENSTAR2 PRO softkey
 - VIEW tab
 - SUMMARY tab
 - ACTIVATIONS tab
 - MEMORY tab
- RESOURCES/CONDITIONS softkey
 - RESOURCES tab
 - CONDITIONS tab
- EQUIPMENT softkey
 - MACHINE tab
 - IMPLEMENT 1 tab
 - IMPLEMENT 2 (Optional) tab
 - IMPLEMENT 3 (Optional) tab
- DOCUMENTATION softkey
- REPORTS AND TOTALS softkey



GREENSTAR2 PRO button

Continued on next page

OUC6050,00016F9 -19-08DEC05-1/9

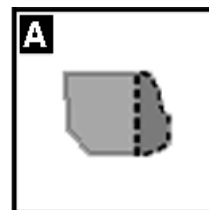
PC8672 -UN-05AUG05

MAPPING softkey

MAPS tab—Map, Map Settings

BOUNDARIES tab—Client, Farm, Field, Boundary Type, Boundary Offset, Recording

FLAGS tab—Button, Name, Mode



MAPPING softkey

OUO6050,00016F9 -19-08DEC05-2/9

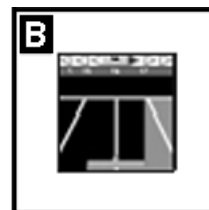
PC8673 -UN-05AUG05

GUIDANCE softkey

VIEW tab—View, Shift Track, Set Track 0, AutoTrac Stage, Signal Level, Steer Sensitivity

GUIDANCE SETTINGS tab—Tracking Mode, Tones, Turning View, Turn Predictor, Deactivation Message, Lead Compensation, Accuracy Bar Step Size

SHIFT TRACK SETTINGS tab—Off, Small Shifts, Large Shifts, Clear All Shifts

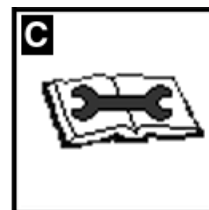


GUIDANCE softkey

OUO6050,00016F9 -19-08DEC05-3/9

PC8837 -UN-27OCT05

DIAGNOSTIC READINGS softkey—Latitude, Longitude, Course, Speed, Altitude, Position Mode, GPS Quality, PDOP, HDOP, VDOP, Number of Satellites, Satellite ID's



DIAGNOSTIC READINGS softkey

Continued on next page

OUO6050,00016F9 -19-08DEC05-4/9

PC8675 -UN-14OCT05

GREENSTAR2 PRO softkey

VIEW tab—View, Variety, Rates, Area

SUMMARY tab—Client, Farm, Field, Task, Operator, Machine, Implement, Implement Width, Job, Operation, Product Name, Product Type, Prescription, Wind Speed, Wind Direction, Temperature, Track Mode, A-B Line

ACTIVATIONS tab—Component, Status

MEMORY tab—Copy Card, Memory Used, Estimated Recording Time Left, Prepare Card for Removal, Clear all Memory/Restore Factory Defaults



GREENSTAR2 PRO softkey

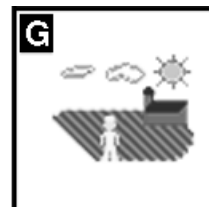
OUO6050,00016F9 -19-08DEC05-5/9

PC8676 -UN-05AUG05

RESOURCES/CONDITIONS softkey

RESOURCES tab—Client, Farm, Field, Task, Operator, License Number, Area, Task Notes

CONDITIONS tab—Temperature, Wind Speed, Wind Direction, Sky Condition, Humidity, Crop Growth Stage, Soil Moisture, Soil Temperature



RESOURCES/CONDITIONS softkey

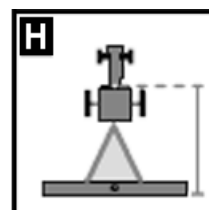
OUO6050,00016F9 -19-08DEC05-6/9

PC8677 -UN-05AUG05

EQUIPMENT softkey

MACHINE tab—Machine, Model, Hitch Type, Recording Source, Recording Hours Remaining, Receiver Offset

IMPLEMENT tab—Implement, Model, Lateral Offset, Inline Offset, Implement Width, Track Spacing, Overlap



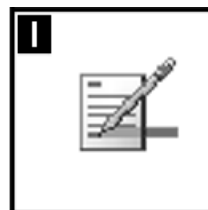
EQUIPMENT softkey

Continued on next page

OUO6050,00016F9 -19-08DEC05-7/9

PC8678 -UN-05AUG05

DOCUMENTATION softkey—Tillage, Planting/Seeding,
Product Application, Harvest, Other

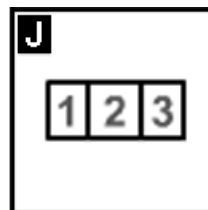


DOCUMENTATION softkey

OUO6050,00016F9 -19-08DEC05-8/9

PC8679 -UN-05AUG05

REPORTS AND TOTALS softkey—Job, Client, Farm,
Field, Task, Operation, Product Type, Load, Area,
Average Rate, Total Amount, Hours, Time to Finish, Area
Remaining, Average Productivity, Fuel Used, Date



REPORTS AND TOTALS softkey

OUO6050,00016F9 -19-08DEC05-9/9

Display Setup

Display Software Activations

The display comes preloaded and activated with GreenStar Basics Software which includes:

Documentation

- Guidance
 - Parallel Tracking
- Documentation
 - Harvest Doc
 - Map Based Prescriptions
 - Field Doc including (Field Doc Sprayer, Field Doc Planter, Field Doc Air Cart, and Field Doc Connect)

Software activations are required to operate AutoTrac and can be purchased from your local John Deere Dealer.

Items REQUIRED to Activate AutoTrac

- Display Serial Number (Found in display)

- Display Challenge Code (Found in display)
- Comar order number (from dealer once order is placed)
- Visit www.stellarsupport.com or call 888-GRN-STAR to obtain 26 digit activation code.

Current Purchased Software Activation options are as follows:

- SF1 AutoTrac — +/- 33 cm (+/- 13 in.) at receiver
- SF2 AutoTrac— +/- 10 cm (+/- 4 in.) at receiver
- SF1 to SF2 AutoTrac upgrade
- Pivot Pro (AutoTrac Circle operation for center pivots, requires an AutoTrac activation first)

The display software activations (Pro-Modules) are 26 digit pin numbers that are separate from the StarFire 24 digit GPS activation number. The display software is only activated once for the life of the display and requires no other fees.

OUO6050,00016FA -19-08DEC05-1/1

OBTAINING ACTIVATION CODE & ACTIVATING SOFTWARE IN DISPLAY

NOTE: The display Serial Number and Challenge Code are found at MENU >> GREENSTAR2 PRO button >> GS2 softkey >> ACTIVATIONS tab

Once you have obtained the 6 digit Comar order number from your dealer for the GS2 Pro package you have purchased (AutoTrac, PivotPro, SwathControl Pro), you are ready obtain the 26 digit code from www.stellarsupport.com or call 1 888-GRN-STAR. You will need your display Serial Number as well as the Display Challenge Code prior to visiting Stellar Support or contacting 888-GRN-STAR.

Once at www.stellarsupport.com please select the Activations and Subscriptions option. Once there, select GreenStar2 >> Activate AutoTrac and follow the GreenStar2 Software Activation prompts to obtain the 26 digit code. The 26 digit code will be split into 1-9, 10-17, and 18-26 digits.

After obtaining the 26 digit code go to: MENU >> GREENSTAR2 PRO button >> GREENSTAR2 PRO softkey >> ACTIVATIONS

Input the activation code. You will now see Activated in the Pro Module area. This completes the Display Software Activation Process. Keep in mind if you have purchased SF2 level AutoTrac, you will be required to also activate the StarFire receiver to an SF2 level.

PC8663 -UN-05AUG05



MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

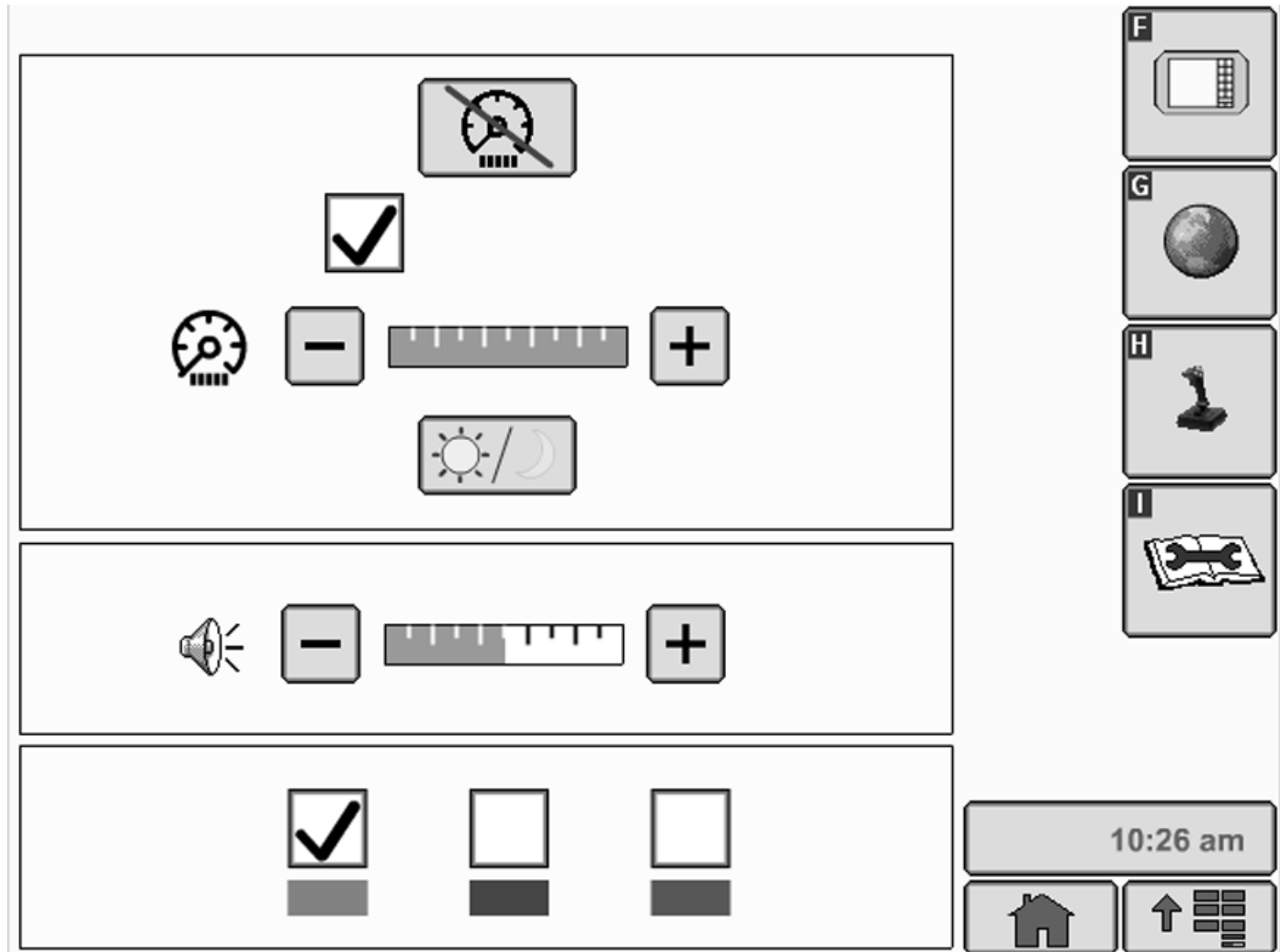
PC8675 -UN-14OCT05



GREENSTAR2 PRO softkey

OUO6050,00016FB -19-08DEC05-1/1

DISPLAY softkey



Display - Main

When display is initially installed in a vehicle, it will have a default setting for all features. Operators have the ability to change these settings to fit their needs.

Once these settings are changed, they will be saved and retained through each power cycle.

Continued on next page

OUC6050,00016FC -19-08DEC05-1/8

PC8841 -UN-30OCT05

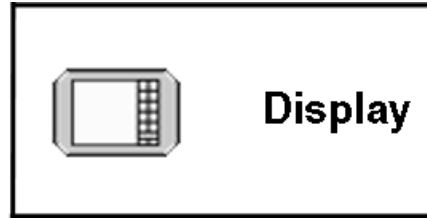
Go to MENU >> DISPLAY button >> DISPLAY softkey

PC8663 -UN-05AUG05



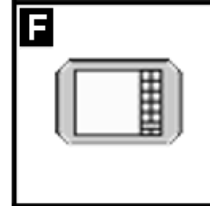
MENU button

PC8654 -UN-05AUG05



DISPLAY button

PC8689 -UN-09AUG05



DISPLAY softkey

OUO6050,00016FC -19-08DEC05-2/8

PANEL DIM button allows operator to quickly darken screen with one button push. When the operator engages the panel dim feature the screen temporarily darkens in order to reduce glare. Screen will resume normal brightness when an alarm condition exists or when operator touches screen (2600 only) or activates any button on display control.

PC8684 -UN-09AUG05



PANEL DIM button

OUO6050,00016FC -19-08DEC05-3/8

NOTE: To exit Panel Dim, press any button on display control or turn thumb wheel.

BRIGHTNESS can be changed by selecting PLUS or MINUS button.

PC8685 -UN-09AUG05



BRIGHTNESS button

Continued on next page

OUO6050,00016FC -19-08DEC05-4/8

PC8686 -UN-09AUG05

NOTE: *Sync with Cab feature only functions on selected vehicles.*

Sync with Cab check box , when activated, allows display to control all lights within vehicle cab. Deselecting check box will allow only display to lighting to change with no effect on other cab displays and lights.



Sync With Cab Check box

OUO6050,00016FC -19-08DEC05-5/8

PC8693 -UN-09AUG05

DAYLIGHT/NIGHTLIGHT button allows operator to quickly change screen with one button push. control.



DAYLIGHT/NIGHTLIGHT button

OUO6050,00016FC -19-08DEC05-6/8

PC8687 -UN-09AUG05

Volume can be changed by selecting either + or - button.



VOLUME button

OUO6050,00016FC -19-08DEC05-7/8

PC8686 -UN-09AUG05

NOTE: *Highlight color is defaulted to red at initial power-up of display.*

Highlight/Focus Color can be changed by selecting desired color (red, blue, green).



Highlight/Focus Color

OUO6050,00016FC -19-08DEC05-8/8

SETTINGS softkey

IMPORTANT: To reprogram to another language, language being selected needs to be on data card. If language file does not load properly, reload software to data card.

NOTE: If vehicle loses battery power or if display is disconnected from vehicle Time and Date Settings will have to be reset.

The Settings screen contains three tabs:

REGIONAL tab

Country, Language, Numeric Format and Units can be selected. Use drop-down boxes and select desired measurements to be displayed on screen.

TIME AND DATE tab

Date and time can be changed, as well as time format. GPS Sync can be selected to automatically set the time using the time data coming from GPS receiver. When this is selected, user should choose proper time offset, which adjusted the GPS time data to correspond to your time zone, to ensure correct local time. Time Sync will not occur until GPS signal is acquired.

UNITS OF MEASURE tab

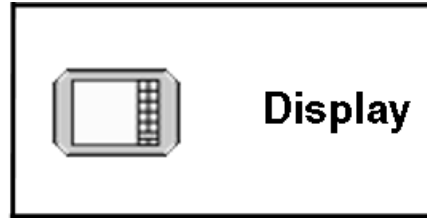
Users can customize units for a mix of metric and imperial units.

PC8663 -UN-05AUG05



MENU button

PC8654 -UN-05AUG05



DISPLAY button

PC8690 -UN-09AUG05



SETTINGS softkey

OUO6050,00016FD -19-08DEC05-1/1

AUXILIARY CONTROLS softkey

This screen allows mapping of ISO compliant implement functions to ISO compliant auxiliary controls.

Example:

The display has been set up in a tractor that is attached to a sprayer.

A switch box has been installed in the tractor containing two switches: Switch 1 and Switch 2.

The sprayer has two functions that can be controlled by the switch box: turning the pump on and off, and turning the nozzles on and off.

The operator can choose which switch will turn the pump on and off and which switch will turn the nozzles on and off.

The tractor could be attached to a different implement and the switches could be assigned to control functions of that implement.

Also, a different input device, such as a joystick, could be installed and that device could be assigned control over the sprayer's functions.

To assign an input function to an implement function using the Auxiliary screen:

1. Choose the implement and implement function.
2. Choose an input device from the drop-down box.
3. Choose an input device function from the second drop-down box.

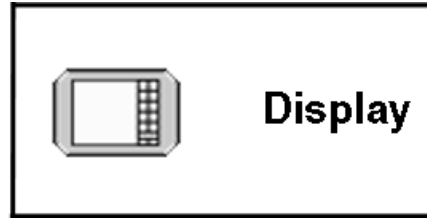
Device function is assigned to auxiliary control function.

PC8663 -UN-05AUG05



MENU button

PC8654 -UN-05AUG05



DISPLAY button

PC8691 -UN-09AUG05



AUXILIARY CONTROLS softkey

OUO6050,00016FE -19-08DEC05-1/1

DIAGNOSTICS softkey

The Diagnostics screen contains three tabs:

READINGS tab

This tab will display operating voltages, part numbers, and hours of operation.

TESTS tab

This tab will allow the user to perform 3 different screen calibrations—Color Test, Touchscreen Test, Touchscreen Calibration.

ABOUT tab

This tab is basic display background display information

TESTS tab

The main function under the tests tab will be Touchscreen calibration. Touchscreen calibration will be required when the screen icon does not align with the area depressed. This may be caused by normal wear and tear, age, certain weather conditions, and contaminants on the screen (chemicals, solvents, etc.).

Touchscreen Calibration:

1. Under the Touchscreen Calibration button a new screen will appear with an X in the upper right corner.
2. Press the screen at the X and continue to follow the X's around the screen. Always press the screen directly at the center of the X.
3. Several X's will show up at various locations on the screen.
4. Continue to press at the center of the X until complete.

Reset Touchscreen calibration will abort any saved calibrations and allow the user to start over and perform a new calibration.

Color Test:

PC8663 -UN-05AUG05



MENU button

PC8654 -UN-05AUG05



DISPLAY button

PC8683 -UN-05AUG05



DIAGNOSTICS softkey

Under the Test button, select the color test. The color test will display 3 distinct colors on the display for approximately 5 seconds. If you do not see 3 distinct colors, contact your John Deere Dealer for service.

Touchscreen Test:

Under the Test button, select the Touchscreen Test. This test will allow the user to identify a pixel problem on the screen.

1. As you touch the screen, a sighting target will show up on the area touched.
2. Continue to touch the screen around the area of suspected pixel malfunction and see if the sighting target appears.

If sighting target does not appear, contact your John Deere Dealer.

OUO6050,00016FF -19-08DEC05-2/2

Home Page Layout

Home Page Layout

The home page can be configured and customized to match information needed by operators in a variety of operations. Templates in layout manager offer several options for guidance, documentation and mapping.

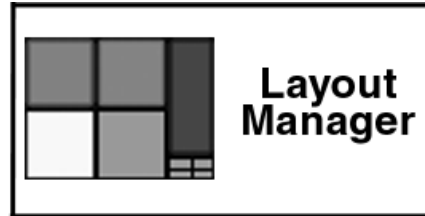
softkeys on right side of screen can also be mapped to show other than the full application.

PC8663 -UN-05AUG05



MENU button

PC8656 -UN-17NOV05



Continued on next page

OUO6050,0001700 -19-08DEC05-1/5

NOTE: The original GreenStar Monitor is only viewable as a full screen.

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 will ensure the setup data is saved to the data card prior to operating.

If the vehicle is running during setup and programming, turn the vehicle off 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.

Layout Manager

The home page of the GS2 display can be configured and customized to match information needed by operators in a variety of operations. Templates in layout manager offer several options for guidance, documentation, and mapping, as well as the Original GreenStar Monitor function and performance monitor.

To configure the home page:

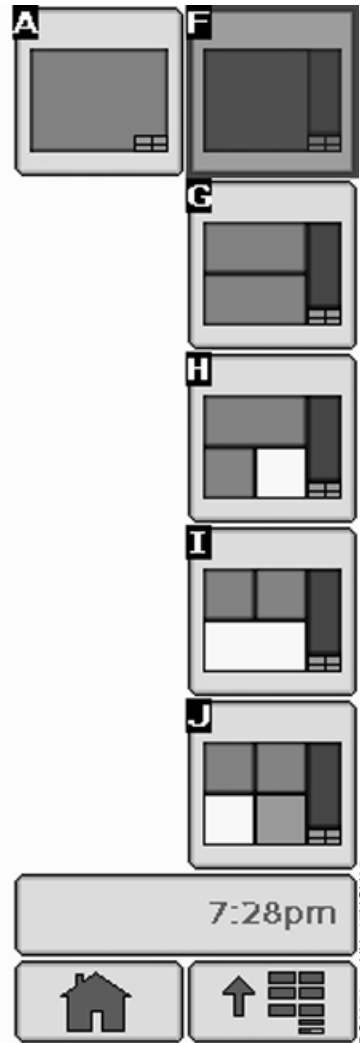
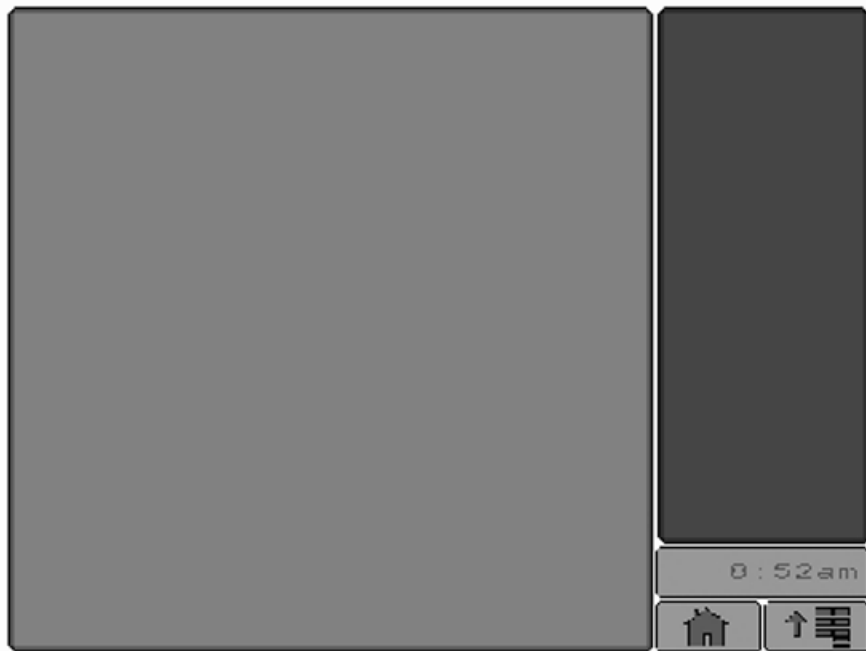
Press MENU >> LAYOUT MANGER BUTTON

Select the desired configuration

- (A) Entire Application
- (F) Full Screen with softkey Region
- (G) Two Half Screens with softkey Region
- (H) One Half Screen and Two Quarter Screens with softkey Region
- (I) One Half Screen and Two Quarter Screens with softkey Region
- (J) Four Quarter Screens with softkey Region



PC8870 -JUN-17NOV05



NOTE: The Original GreenStar Monitor function is only available as a full screen.

Select one of the areas you want to configure.

Choose the source of the information.

Follow on-screen prompts.

OUO6050,0001700 -19-08DEC05-3/5

Page to the selection of your choice using the arrow keys.

Choose the image you want for this portion of the screen.

Repeat this process until all areas are filled in.

PC8872 -UN-17NOV05



Continued on next page

OUO6050,0001700 -19-08DEC05-4/5

PC8649 -UN-01NOV05

Press Enter Button.



ENTER

OUC6050,0001700 -19-08DEC05-5/5

Harvest Home Page Layout Options

- Full
- Half
- Quarter
- Softkey

OUC6050,000178D -19-07JAN06-1/1

GreenStar General

GREENSTAR2 PRO softkey

The GREENSTAR2 PRO - MAIN screen contains four tabs:

VIEW tab

Shows an operational summary with views of guidance and documentation information. This screen can be used to operate from when home page is being used by another application.

SUMMARY tab

Shows a summary of the current settings for guidance and documentation. Shown information can be changed on this screen. This page can be useful to verify setup information is correct when changing fields.

ACTIVATIONS tab

View available software and enter code to activate.

MEMORY tab

COPY CARD button—copies data card showing memory used and estimated recording time left

BEGIN button—Prepares data card for removal

CLEAR button—Clears memory and restores factory defaults

PC8663 -UN-05AUG05



MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8675 -UN-14OCT05



GREENSTAR2 PRO softkey

OUO6050,0001701 -19-08DEC05-1/1

RESOURCES/CONDITIONS softkey

Settings in RESOURCES/CONDITIONS screen are used for guidance, documentation and mapping and are recorded to data card and unloaded to John Deere desktop software.

NOTE: If warnings occur indicating memory space is full, desktop software can be utilized to remove unused items.

The GREENSTAR2 PRO - RESOURCES/CONDITIONS screen contains two tabs:

RESOURCES tab

- Client- Used to separate data from different clients, typically used by custom/commercial operators. Allows data to be unloaded for a specific client.
- Farm- Used to separate data from different farms/landowners.
- Field- Used to separate data from different fields within a farm.
- Task- Used to separate data from different field tasks like planting, spraying, etc. This can be set to 'Documentation Off' for operators who only use guidance and do not want to document field operation data.
- Operator- Used to separate data from different operators.
- License- Used to document applicator license for operator.

CONDITIONS tab

- Temperature
- Wind Speed
- Wind Direction
- Sky Condition
- Humidity
- Crop Growth Stage
- Soil Moisture
- Soil Temperature

PC8663 -UN-05AUG05



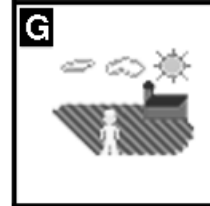
MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8676 -UN-05AUG05



RESOURCE/CONDITIONS softkey

EQUIPMENT softkey

The equipment screen is used to record data by machine to document total area and hours. Equipment settings are also used for inputs on implement size, GPS receiver location, etc. Track spacing is used for machine guidance and coverage maps.

The GREENSTAR2 PRO - EQUIPMENT screen can contain up to four tabs:

MACHINE tab

IMPLEMENT 1 tab

IMPLEMENT 2 tab (optional)

IMPLEMENT 3 tab (optional)

PC8663 -UN-05AUG05



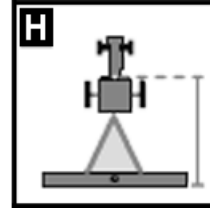
MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8677 -UN-05AUG05



EQUIPMENT softkey

OUO6050,0001703 -19-08DEC05-1/1

MACHINE tab

MACHINE tab allows setup of the following:

- Machine- Used to select machine type.
- Model- Used to distinguish between different models or multiple machines of same model.
- Hitch Type- Drawbar or 3-point hitch.
- Recording Source- Used to determine when recording turns on/off.
- Receiver Offset- Used to eliminate skips or overlaps due to an offset receiver.

Continued on next page

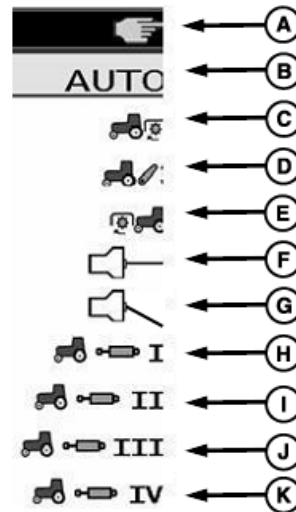
OUO6050,0001704 -19-08DEC05-1/3

NOTE: Not all recording sources are available for all machines.

Recording Source

The following controllers can be used with AUTO to automatically communicate when system should turn recording on/off:

- John Deere Harvest Monitor
- John Deere SeedStar for Air Carts
- John Deere SeedStar Gen 2 Monitor or Variable Rate Drive for Planters
- John Deere SprayStar Gen 4
- Raven 440, 450, 460, 660
- Rawson Accu-Rate and Accu-Plant
- New Leader Mark III Mark IV
- Dickey-john Seed Manager
- Vanguard PIC Seed Monitor



Recording Source

- A—Manual Recording On/Off
- B—Automatic (from controller)
- C—Rear PTO
- D—3-point Hitch
- E—Front PTO
- F—Implement Switch Open
- G—Implement Switch Closed
- H—SCV 1
- I—SCV 2
- J—SCV 3
- K—SCV 4

PC8770 –UN-11OCT05

Continued on next page

OUO6050,0001704 –19-08DEC05-2/3

NOTE: *Dual Variety Function can not be used with a three motor VRT planter*

NOTE: *PTO, Hitch, and SCV can be used as a recording source on certain vehicles only.*

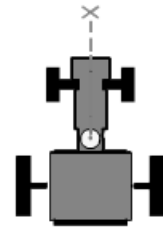
Receiver Offset

Used to eliminate skips or overlaps due to an offset receiver.

To enter receiver offset:

- Select input box
- Enter amount of offset in cm/in. using numeric keypad and select enter button
- Select the Receiver button to move the offset to the right or left of cab center

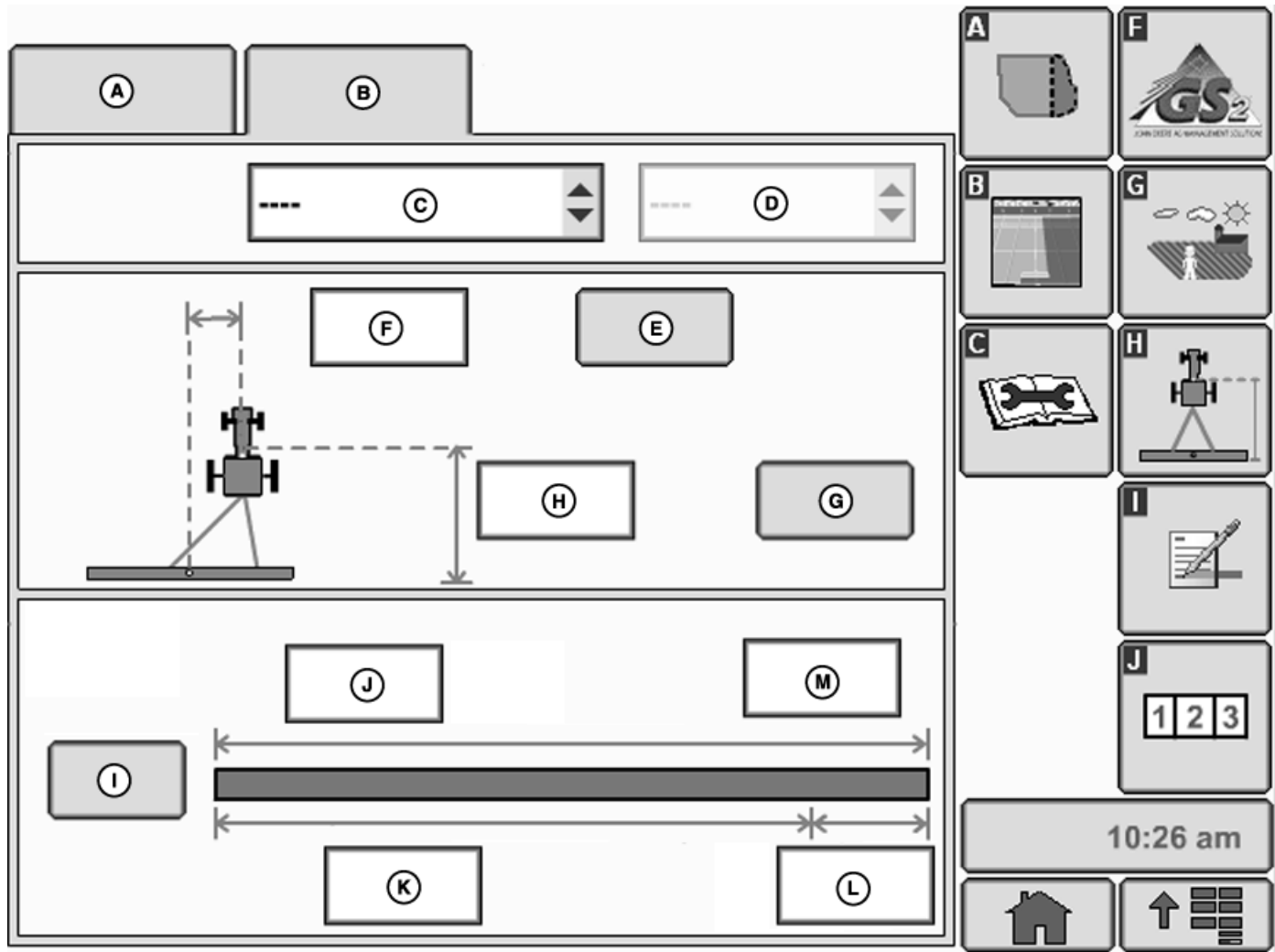
If no receiver offset is required, then RECEIVER OFFSET input box should read 0.



Receiver Offset

PC8842 -UN-30OCT05

OUO6050,0001704 -19-08DEC05-3/3

IMPLEMENT 1 tab

GREENSTAR2 PRO - EQUIPMENT—IMPLEMENT tab

- | | | | |
|--------------------------------|----------------------------|-----------------------------|---------------------------|
| A—MACHINE tab | E—LATERAL OFFSET button | H—INLINE OFFSET input box | K—TRACK SPACING input box |
| B—IMPLEMENT 1 tab | F—LATERAL OFFSET input box | I—FT/ROWS button | L—OVERLAP input box |
| C—IMPLEMENT TYPE drop-down box | G—INLINE OFFSET button | J—IMPLEMENT WIDTH input box | M—Row Width |
| D—MODEL drop-down box | | | |

IMPLEMENT tab allows setup of following:

- Implement- Used to select implement type.
- Model- Used to distinguish between different models or multiple machines of the same model.
- Implement Offsets- Used to define the difference between the location of the receiver and the location of the implement for turning recording on/off.

Continued on next page

OUO6050,0001705 -19-11JAN06-1/6

NOTE: Distance measured from GPS receiver to implement (rear, center or front of vehicle). Measure to point of action on implement (i.e. non-SeedStar planter - point of seed being dropped, tillage implement - first point of ground breakage). Adjustment of measurement or position of implement switch (if used) may be required for desired map appearance.

- Widths— used to enter implement width and track spacing for guidance. This value is also used to calculate total area. Change implement width and track spacing when changing implements. Implement width and track spacing are independent of each other.

NOTE: IMPLEMENT tab will show HEADER for Combines, ROW UNITS for Cotton Pickers, and BOOM for Sprayer.

NOTE: Implement width may come from controller on select controllers.

NOTE: A higher degree of precision can be achieved for track spacing when track spacing is entered in by rows instead of feet. More decimal places are used in the track spacing calculation when entered in by rows versus the three decimal places allowed when entered by feet.

Defining Implement Width and Track Spacing

Implement width and Track spacing can be defined two ways:

- Rows – enter number of rows and row width
- Width – enter total implement and desired track spacing

Continued on next page

OUC6050,0001705 –19–11JAN06–2/6

Offsets

There are two different types of implement offsets: Inline and Lateral.

Inline Offset – used to define the difference between the location of the receiver and the location of the implement for turning recording on/off in documentation or for a coverage map.

Lateral Offset – used to eliminate skips or overlaps due to an offset implement or an implement that does not track directly behind machine.

Entering Offsets:

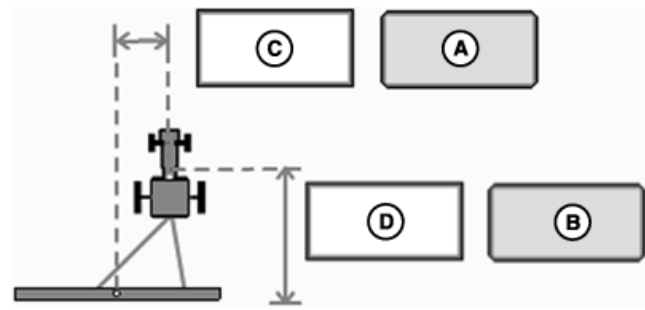
Select the “Lateral” button (A) to move the direction of the offset between left or right.

Select the “Inline” button (B) to move direction of the offset between front or back.

To enter offset: Select the inbox, lateral offset (C) or inline offset (D), and enter amount of offset.

If no offset is required, box should read 0.

There are two scenarios where implement offset is used.



- A—Lateral Offset Button
- B—Inline Offset Button
- C—Lateral Offset Input Box
- D—Inline Offset Input Box

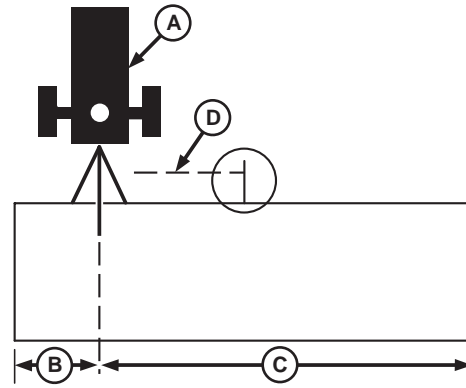
Continued on next page

OOU6050,0001705 -19-11JAN06-3/6

Scenario 1 Offset Implement: When an offset implement is used (such as an offset disk), enter distance required to move position of receiver (A) to center of implement. For example, if you are using a 6.1 m (20 ft) offset disc with 3.7 m (12 ft) to right of hitch and 2.4 m (8 ft) to left of hitch, enter 61 cm (24 in.) in “Lateral” offset input box. Select “Lateral” button until implement is displayed to right side of machine icon. This will position receiver 61 cm (24 in.) to right, so it is in center of implement.

The following steps are used to set implement offset.

1. Measure total width of implement and enter this in Implement Width input box.
2. Measure distance from center of hitch to left-end of implement (B).
3. Measure distance from center of hitch to right-end of implement (C).
4. Subtract smaller number from larger number and divide by 2. This is the amount of offset (D) that needs to be entered in the lateral offset input box.
5. Select lateral offset input box and enter amount from step 4 in cm/in..
6. Select “Lateral” offset button to toggle implement icon to larger side of implement offset. Example: If larger part of implement is to left-hand side of tow vehicle, implement icon must be toggled to left-hand side.
7. Set Track 0 (See Set Track 0).



A—Position Receiver
 B—Distance to Left-End of Implement
 C—Distance to Right-End of Implement
 D—Amount of Offset

PC7369 -UN-06NOV03

Continued on next page

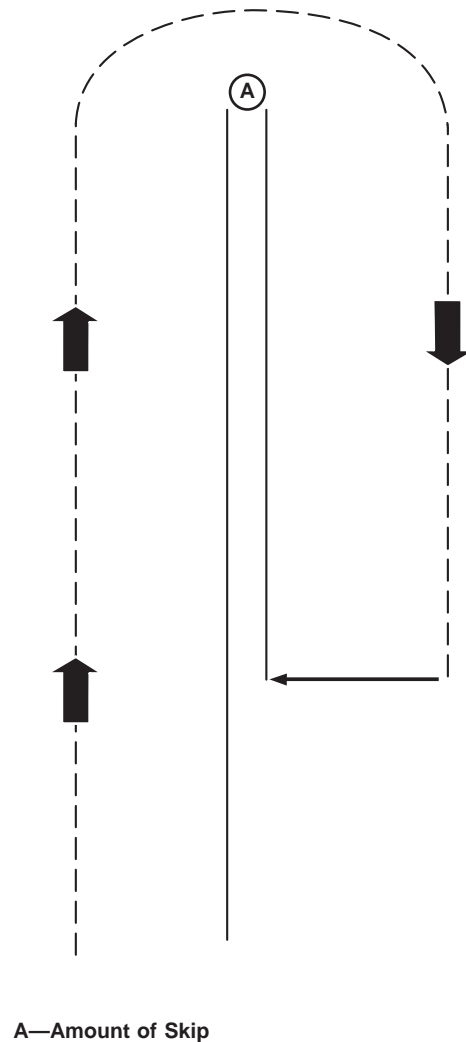
OQO6050,0001705 -19-11JAN06-4/6

Scenario 2 Implement always pulls to one side (right or left) during field operation: This scenario typically results from improper implement setup or operation. Check implement operator's manual to ensure implement is setup and operating correctly. Before setting implement offset make sure appropriate track spacing is entered in MENU button>> IMPLEMENT softkey >> IMPLEMENT tab. If there still is skip or overlap then use following procedures. This may help eliminate or lessen effect of skips or overlaps.

NOTE: Implement offset will not compensate for side draft resulting from operating on sloped or uneven terrain.

To determine how much and which direction to set implement offset, use following procedures.

1. Set lateral offset to 0 (unless operating an offset implement as described in Scenario 1).
2. Set track spacing and Track 0 (See Track 0 section).
3. Make a complete pass up one track and back down a consecutive track. Stop before completing second pass. There are three possible results:
 1. One pass overlapping other.
 2. The two passes do not meet resulting in a skip.
 3. No overlap or skip (no further action required).
4. Measure amount of overlap or skip (A) and divide by 2. This is the amount of offset that needs to be entered in lateral offset input box.
5. Select the lateral offset input box and enter the amount of offset in cm/in.
6. Select "Lateral" offset button to move direction of offset. (See next page for examples.)
 - a. If passes result in an overlap, select "Lateral" offset button to move implement icon towards overlap.
 - If overlap is on the right side of the implement, select button until icon is to the right.



PC7370 -UN-28OCT02

Continued on next page

OUC6050,0001705 -19-11JAN06-5/6

- If overlap in on the left side of the implement, select button until icon is to the left.
- b. If two passes result in a skip, Select “Lateral” button to move implement icon away from skip.
 - If skip is on the right side of the implement, select button until icon is to the left.
 - If skip is on the left side of the implement, select button until icon is to the right.

OUO6050,0001705 –19–11JAN06–6/6

IMPLEMENT 2 and IMPLEMENT 3 tab

IMPLEMENT 2 tab

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

D—IMPLEMENT TYPE
 drop-down box

E—MODEL drop-down box
 F—Implement Width

G—Track Spacing
 H—Overlap

The IMPLEMENT 2 and IMPLEMENT 3 tabs are primarily used for logging hours against the equipment.

For IMPLEMENT 2 tab to appear:

- Tractor or Other is selected from MACHINE drop-down box in MACHINE tab
- Implement and model are selected in IMPLEMENT 1 tab

IMPLEMENT 2 tab allows setup of following:

- Implement – Used to select implement type
- Model – Used to distinguish between different models or multiple machines or the same model
- Widths – Used to view the implement width and track spacing for the implement 1 type

NOTE: Implement widths or offsets can not be defined for Implement 2.

For IMPLEMENT 3 tab to appear:

a. Implement and model are selected in IMPLEMENT 2 tab

- Widths – Used to view the implement width and track spacing for the implement 1 type

IMPLEMENT 3 tab allows setup of the following:

NOTE: Implement widths or offsets can not be defined for Implement 3.

- Implement – Used to select implement type
- Model – Used to distinguish between different models or multiple machines or the same model

OUO6050,0001706 –19-08DEC05-2/2

MAPPING softkey

Settings in Mapping are used to determine what information is displayed on maps and which map options are active.

The GREENSTAR2 PRO - MAPPING screen contains three tabs:

MAPS tab

BOUNDARIES tab

FLAGS tab

PC8663 –UN-05AUG05



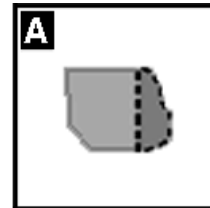
MENU button

PC8661 –UN-02NOV05



GREENSTAR2 PRO button

PC8672 –UN-05AUG05



MAPPING softkey

OUO6050,0001707 –19-08DEC05-1/1

Mapping Harvest

Background

- Variety Map

Foreground

- As harvested (Yield) Map
- As harvested (Moisture) Map

Choose moving map or fixed map.

PC8663 -UN-05AUG05



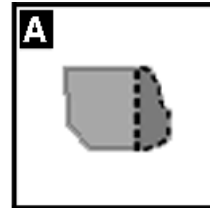
MENU button

PC8661 -UN-02NOV05



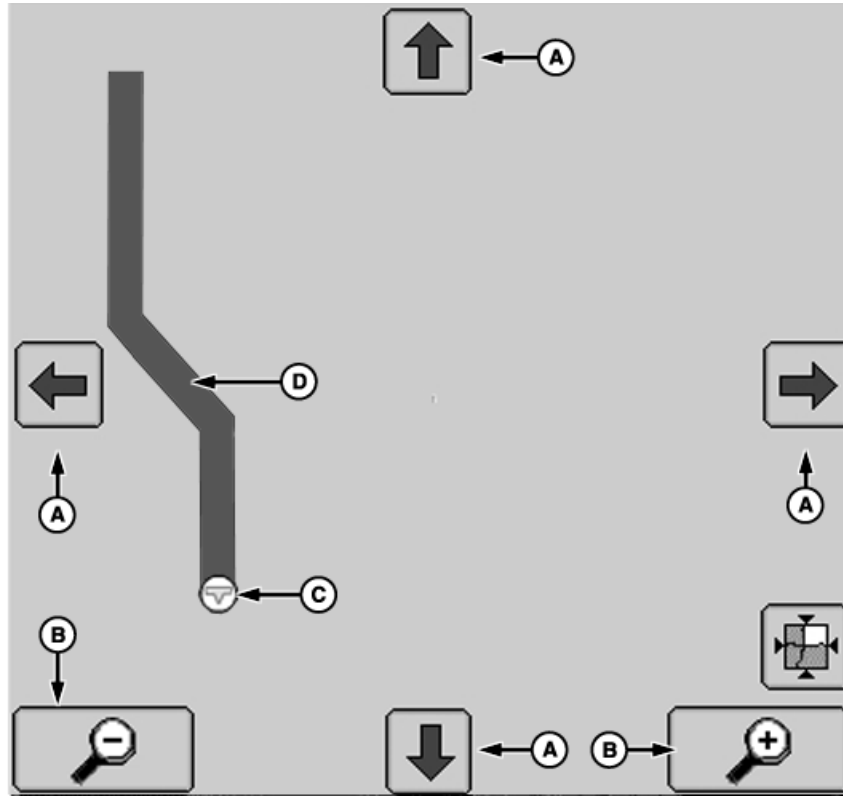
GREENSTAR2 PRO button

PC8672 -UN-05AUG05



MAPPING softkey

OUC6050,000178E -19-07JAN06-1/1

MAPS tab

GREENSTAR2 PRO - MAPPING screen

A—Pan Buttons
B—Zoom Buttons

C—Vehicle Icon

D—Coverage Path

E—View Toggle

The MAPS tab allows viewing of an on-screen map. GPS is used to show coverage or as-applied data to represent areas of the field that have been covered.

- Use the arrow keys (A) to pan left, right, up, or down
- Use the magnifying glass keys (B) to increase or decrease the zoom level

Continued on next page

OUO6050,0001708 -19-08DEC05-1/2

PC8854 -LIN-17NOV05

PC8855 -UN-31OCT05

Under the MAP SETTINGS button:

- Background: Choose available layer to show as the background of the map view.
- Foreground: Choose between coverage or as-applied if available.
- View Toggle: Choose Fixed Field View or Moving Map View.
- A/B Lines Toggle: Choose whether A/B lines will be visible on the map. Tracking lines will not be available in Curve Track mode.
- Clear Field Map Data: Erases coverage or as-applied data from the map.

Coverage maps are retained through power cycles and will remain until the CLEAR FIELD MAP button is selected from the map settings pop-up.

NOTE: When "Field" is changed in the *RESOURCES/CONDITIONS* softkey, coverage will disappear from the map. Coverage will reappear by changing back to the associated field.



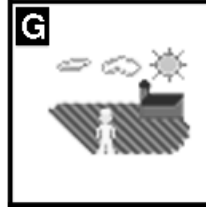
View Toggle

PC8856 -UN-31OCT05



A/B Lines Toggle

PC8676 -UN-05AUG05



RESOURCES/CONDITIONS softkey

OUO6050,0001708 -19-08DEC05-2/2

BOUNDARIES tab

The BOUNDARIES tab allows you to record exterior field boundaries as well as headland boundaries for fields. Boundaries calculate acreage and are saved on the data card to be unloaded in desktop software.

Creating an Exterior Boundary

1. Go to MAPPING softkey >> BOUNDARIES tab.
2. Select the Client, Farm, and Field from the drop-down boxes.
3. In the TYPE drop-down box, choose EXTERIOR.
4. Enter a boundary offset for the approximate distance from the receiver to the edge of the field.
5. Choose whether the boundary will be to the right or left of the receiver by pressing the right/left toggle button.
6. Press the Record/Pause button and drive around the perimeter of the field. Record light should blink red and pink when recording is on. If you need to pause recording to drive around an obstacle, press the Record/Pause button. Record light will show solid red. When Record/Pause button is pressed again, recording will resume. The boundary will show a straight line from where recording was paused and when it was resumed.
7. When boundary is complete or near complete, press the Stop button. This will complete the boundary.

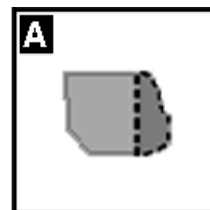
NOTE: A boundary cannot intersect itself. If this happens, you will see an error message asking whether you want GS2 to fix the boundary. Fixing the boundary will automatically make the intersected boundary valid.

Creating a Headland Boundary

A headland boundary can be recorded to show where the headlands exist in maps and perspective views.

1. An Exterior boundary must exist for the field.

PC8672 -UN-05AUG05



GREENSTAR2 PRO button >> MAPPING softkey

PC8904 -UN-19JAN06



Record/Pause Button

PC8857 -UN-31OCT05



Right/Left Button

PC8859 -UN-31OCT05



Stop Button

PC8860 -UN-31OCT05



Record Light

2. Choose HEADLAND from the TYPE drop-down box
3. Enter the name of the headland boundary in the NAME drop-down box. You can save several headland boundaries for a field for different implement widths.
4. In the HEADLAND BOUNDARY input box indicate the distance from the exterior boundary. This will be the width of the headland.
5. In the HEADLAND INDICATOR check box, mark whether you want the indicator on or off.

OUO6050,0001709 -19-08DEC05-2/2

FLAGS tab

FLAGS tab allows setup of flags for guidance and documentation.

There are three types of flags: line, point and area.

- Line flags marks tile lines. When a LINE FLAG button is pressed, FLAG ON button will flash, indicating flag is active and map will indicate flag lines. Pressing FLAG button again will de-activate flag.
- Point flags mark a specific point in a field like a rock, tree stump, or where machine ran out of seed or spray. Point flags can also be used to indicate locations for soil sampling and field scouting. When a POINT FLAG button is selected, a flag will be marked for that location. Multiple point flags can be selected for a particular field.

- Area flags are used to mark an area of interest such as a patch of weeds, a low spot in a field, or a tile line. Width of an area flag is equal to implement width in Equipment settings. When an AREA FLAG button is pressed, FLAG ON button will flash, indicating flag is active and map will indicate flag area. Pressing FLAG button again will de-activate flag

Up to six flags can be configured. Select button to setup from drop-down box, then indicate a name and flag mode.

Flags can only be removed using desktop software.

OUO6050,000170A -19-08DEC05-1/1

Guidance

GUIDANCE softkey

The GREENSTAR2 PRO - GUIDANCE screen contains three tabs:

VIEW tab

GUIDANCE SETTINGS tab

SHIFT TRACK SETTINGS tab

IMPORTANT: If changes are made while machine is in auxiliary mode, turn key off and wait for display's power light to turn off before starting the ignition. This allows display to shut down and save data.

IMPORTANT: Data card must be in display during operation or guidance will not work.

To turn guidance on:

—Go to GUIDANCE softkey >> GUIDANCE SETTINGS tab >> TRACK MODE

—Select a tracking mode other than GUIDANCE OFF

To turn guidance off:

—Select GUIDANCE softkey >> GUIDANCE SETTINGS tab >> TRACK MODE drop-down box >> GUIDANCE OFF

The GUIDANCE softkey consists of three tabs which allow the operator to setup and view settings for Parallel Tracking and AutoTrac.

GUIDANCE screen tabs:

The following items are required for guidance to function:

- Tracking mode set to Straight Track, Curve Track, Circle Track (only available with optional PivotPro module) or Row Finder
- Track spacing (See equipment section of GreenStar Basics/Pro General Setup)
- Track 0 (except Curve Track and Row Finder)
- GPS signal (StarFire signal required)

PC8663 -UN-05AUG05



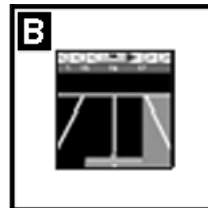
MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8673 -UN-05AUG05



GUIDANCE softkey

Continued on next page

OUC6050,000170B -19-16JAN06-1/2

The following items are optional when operating guidance:

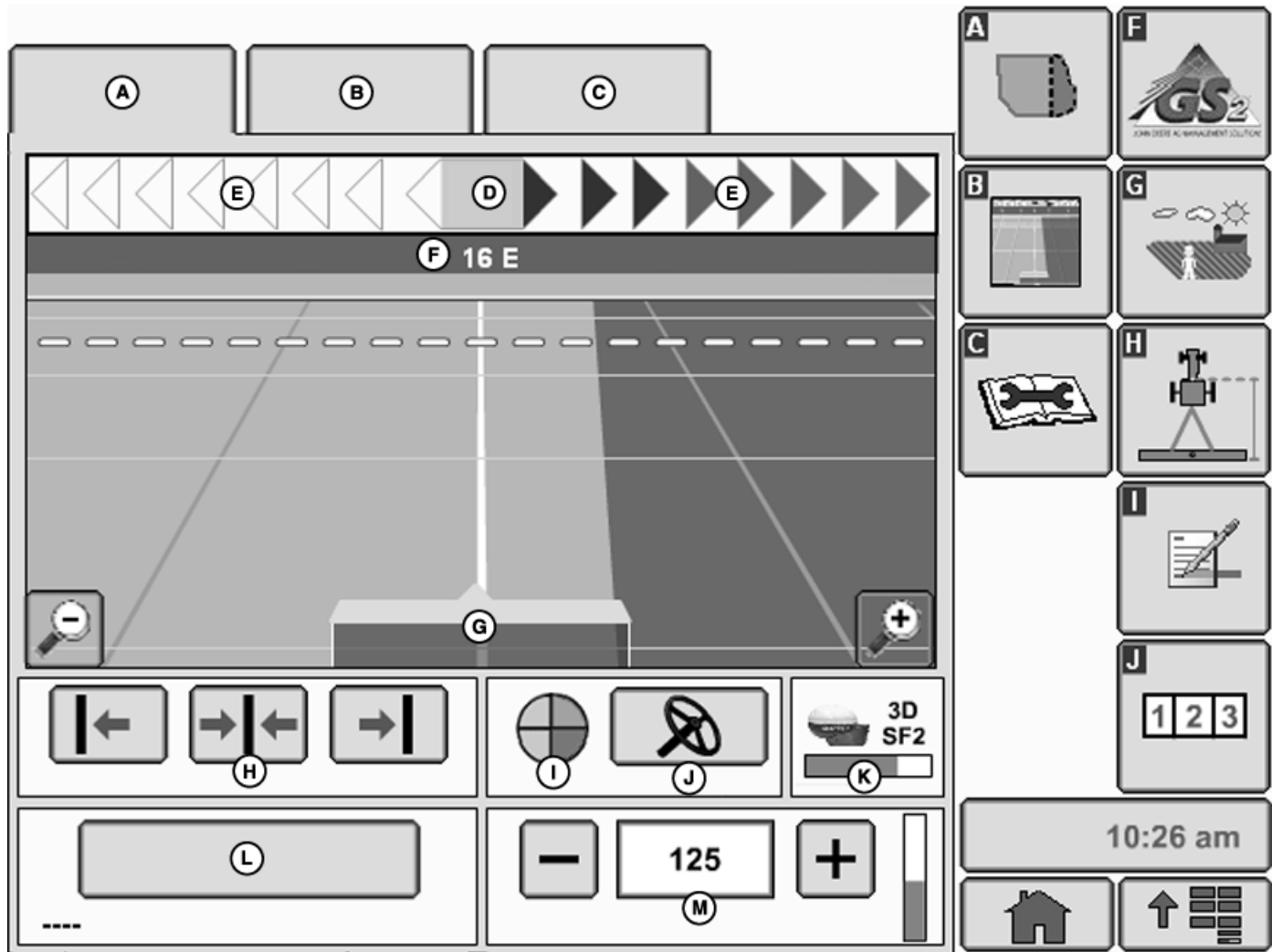
NOTE: If a client, farm, and field are selected only the Track 0's for that field will be displayed.

- Client, Farm, and Field (if not selected, all Track 0's are saved to - - - Client, Farm, and Field)
- Documenting field operational data (See setting Documentation Off in Documentation setup)
- Field Boundaries (Field Boundaries are required to create a headland boundary and enable headland boundary warnings. See Setup Mapping for more information.)
- Flags
- Coverage Map

NOTE: It is important that the system be setup properly. Read and follow each procedure in this section to assure proper setup and operation of the guidance system.

OUC6050,000170B -19-16JAN06-2/2

VIEW tab



GREENSTAR2 PRO - GUIDANCE—VIEW tab

A—VIEW tab	D—Off-track Error	H—Shift Track Buttons	K—GPS Indicator
B—GUIDANCE SETTINGS tab	E—Path Accuracy Indicator	I—AutoTrac Status	L—SET TRACK 0 button
C—SHIFT TRACK SETTINGS tab	F—Track Number	J—Steer On/Off	M—Steering Sensitivity
	G—Guidance Icon		

The VIEW tab allows the operator to view and/or change the following:

- Path Accuracy Indicator
- Off-track error
- Track number and direction
- AutoTrac deactivation messages
- Turn predictor or Headland warning
- Guidance Icon
- Shift Track buttons
- AutoTrac Status Pie
- Steer on/off button
- GPS indicator
- Set Track 0 (set circle, record)
- Track 0 name
- Track spacing
- Steering Sensitivity

Continued on next page

OUO6050,000170C -19-19JAN06-1/6

Path Accuracy Indicator – Is a visual indicator of off-track error. The indicator consists of eight arrows on each side of the off-track error box. The arrows will light up indicating the direction the vehicle must be steered to get back on the A-B line. Each arrow represents a distance. This distance is defined in the GUIDANCE SETTINGS tab under Accuracy Bar Step Size.

Example: The bar step size has been set to 10 cm (4 in.). This means that each arrow that lights up represents 10 cm (4 in.) of off-track error. If two arrows are lit up on the left side of the Path Accuracy Indicator it would represent the vehicle being 20 cm (8 in.) to the right of the desired A-B line. Thus the operator must steer the vehicle 20 cm (8 in.) to the left to get to the desired A-B line.

Off-track error – Total off-track error is numerically displayed in the box. Off-track error will be displayed in inches up to 99 cm (35 in.) of off-track error. If off-track error exceeds 99 cm (35 in.) the distance displayed will change to meters (feet).

Track number – Represents the track number the vehicle is guiding off of. It also tells which direction the track is located from the original Track 0 set for the field.

AutoTrac deactivation message – Each time AutoTrac is deactivated text is displayed indicating the reason why AutoTrac deactivated. Messages are also displayed as to why AutoTrac did not activate. The deactivation messages display for 3 seconds and then disappear.

Continued on next page

OQO6050,000170C –19–19JAN06–2/6

AutoTrac Deactivation Messages	
Deactivation Message	Description
Steering wheel moved	Operator turned steering wheel
Speed too slow	Vehicle speed is below minimum required speed
Speed too fast	Vehicle speed is above maximum allowed speed
Invalid gear	Vehicle operating in an invalid gear
Track number changed	Track number changed
Invalid GPS signal	SF1, SF2, or RTK signal was lost
SSU fault	See John Deere dealer
Invalid display messages	Check display settings
Invalid display settings	Check guidance settings and Track 0 setup
No AutoTrac Activation	No AutoTrac Activation on GS2
Heading error too large	Vehicle is at an angle greater than 45 degrees from track
Off-track error too large	Vehicle not within 40% of track spacing
Out of seat	Out of seat too long
Oil temp too cold	Hydraulic oil not above minimum required temperature
No TCM corrections	Make sure TCM is turned on
Invalid SSU activation	Need SSU activation code. See John Deere dealer.
SSU in diagnostic mode	Fuse is in diagnostic slot in vehicle fuse box – remove fuse.
Header off	Header was turned off
Road mode	In transport gear
Invalid SSU voltage	See John Deere dealer
Reverse timeout	In reverse gear for more than 45 seconds
Vehicle too slow	AutoTrac below minimum speed
Curve too sharp	Maximum curvature has been exceeded
Vehicle not moving in a forward direction	Vehicle must be in forward gear to activate
Vehicle shutting down	Vehicle is shutting down
Gear data error	See John Deere dealer
Resume switch error	See John Deere dealer
Keyswitch error	See John Deere dealer
SPFH AutoTrac switch is not on	Make sure SPFH AutoTrac switch is turned on
SPFH Quick Stop switch is on	Make sure SPFH Quick Stop switch is turned off

Turn Predictor/Headland Warning – A visual indicator is displayed 10 seconds before approaching a predicted turning point or headland (must be defined). When the system detects a predicted turning point or headland, the distance to that turning point or headland will be displayed and will count down the intersection to that turning point or headland. The visual indication is accompanied by tones.

NOTE: *If a headland boundary is defined and headland indicator is selected it will be displayed instead of turn predictor.*

Guidance Icon – The icon represents the implement and the pointer on the icon represents the center of the implement. The icon changes length based upon the entered implement width.

NOTE: *AutoTrac SF1 must have a GPS accuracy level of SF1 and AutoTrac SF2 must have a GPS accuracy of SF2 or RTK.*

GPS Indicator – Indicates what level of accuracy the StarFire receiver is currently operating at (3D, SF2, SF1, RTK). If using a GPS receiver other than a StarFire, the text 3D GPS will be displayed but the indicator bar will not fill..

Steer On/Off - The Steer On/Off button transitions AutoTrac from being disabled to an enabled mode.

Shift Track - Shift track is used to adjust position of machine left, center or right of set track. Shift track can be used to compensate for GPS drift. Drift is inherent to any satellite-based, differentially corrected GPS system.

OUO6050,000170C -19-19JAN06-4/6

AutoTrac Status Pie Allows AutoTrac user to view the stage that AutoTrac is in.

- **INSTALLED** (1/4 of pie)—AutoTrac SSU and all other hardware necessary for use are installed.
- **CONFIGURED** (2/4 of pie)—Valid AutoTrac Activation, Tracking Mode has been determined and a valid Track 0 has been established. Correct StarFire signal level for AutoTrac Activation is selected. Vehicle conditions met.
- **ENABLED** (3/4 of pie)—Steer Icon has been pressed and “Steer On” is displayed.
- **ACTIVATED** (4/4 of pie with “A”)—Resume switch has been pressed and AutoTrac is steering the vehicle.

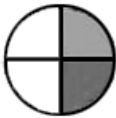
(See AutoTrac Status Pie in this section for more information.)

PC8832 -UN-25OCT05



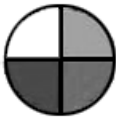
Stage 1—INSTALLED

PC8833 -UN-25OCT05



Stage 2—CONFIGURED

PC8834 -UN-25OCT05



Stage 3—ENABLED

PC8835 -UN-25OCT05

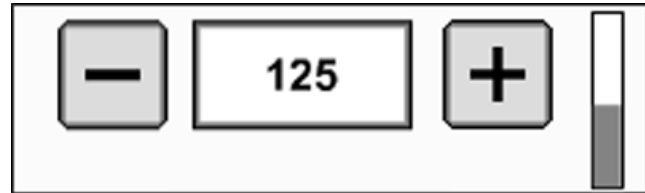


Stage 4—ACTIVATED

Continued on next page

OUO6050,000170C -19-19JAN06-5/6

PC8852 -UN-30OCT05

*Steer Sensitivity*

Steering Sensitivity – Allows AutoTrac users to adjust the vehicles steering sensitivity. To adjust steering sensitivity select the input box and enter the desired steering sensitivity value via numeric keypad and select the enter button. The sensitivity can also be adjusted up or down by selecting the + or – buttons on either side of the steer sensitivity input box. Note: Valid range for steer sensitivity is 50-200 with 200 being the most aggressive setting.

Set Track 0 button- Allows the operator to set Track 0, in the following modes, using the following methods:

Straight Track Mode

- Set Track 0 button

Circle Track Mode (only available with Pivot Pro Module)

- Set Circle button

Curve Track Mode

- Record button

Row Finder Mode

- Set Row button

OUO6050,000170C -19-19JAN06-6/6

GUIDANCE SETTINGS tab

The GUIDANCE SETTINGS tab allows setup of the following:

- **Guidance Mode** - allows operator to select between:
 - Guidance Off- For use when only documentation is needed.
 - Straight Track- Uses straight line parallel passes.
 - Curve Track- Uses a manually driven initial pass, then guides off of previous pass.
 - Circle Track (only available with optional PivotPro module) Uses a center pivot center point location to define concentric circles (tracks).
 - Row Finder- Used in standing row crop applications to mark end of a pass and guide operator to next pass.
- **Tracking Tones** - can be turned on and off and be set to alert operator at a specified off-track distance. To change distance at which tracking tones are activated, select input field and enter a value between 10—60 cm (4—24 in.). Tracking tones can be used as an audible indication of steering direction. If track is right of machine, two low beeps will sound, if left of machine a single high beep will sound. Alarm will repeat twice a second until off-track error between machine and desired track is less than value entered.
- **Turning View** - can assist operators to guide vehicle from one pass to the next by showing an overhead view of the field instead of the perspective view while turning around. This feature can be turned on or off by selecting or deselecting TURNING VIEW check box.
- **Turn Predictor** - alerts operator by predicting the end of pass. This feature can be turned on or off by selecting or deselecting Turn Predictor check box.
- **AutoTrac Deactivation Message** - shows operator why AutoTrac deactivated.
- **Lead Compensation** - shows how far down current track guidance looks to for such things as turns. Used with Parallel Tracking only.
- **Accuracy Bar Step Size** - used to set the value of off-track distance each arrow on the Path Accuracy Indicator represents.

OUO6050,000170D -19-08DEC05-1/1

Turning View

NOTE: *Track 0 must be established for turning view to be active.*

Select the check box next to Turning View to set turning view on or off.

Turning view provides a visual indicator of machine relationship to closest track as machine turns. This view can be used as a guide when turning into next track.

Turning View will appear in Straight Track, Curve Track, Circle Track, and Row Finder modes once

vehicle has turned more than 45 degrees from track heading. The Screen will revert back to perspective view once vehicle is within approximately 5 degrees of track.

The operator has the ability to cancel the Turning View once the screen transitions into turning view with a cancel button that appears in the top left corner of the guidance view. Once the cancel button is selected the screen will switch back to the perspective view.

OUO6050,000170E -19-08DEC05-1/1

Turn Predictor

Turn predictor is intended to only predict turn point of a vehicle using Parallel Tracking or AutoTrac. It is NOT a headland warning. Because actual field boundary is unknown, turn predictions are based solely on previous turn behavior of vehicle. Turn predictions will not coincide with field boundary if field boundary is not linear and continuous, or if operator makes turns before or after field boundary.

NOTE: Turn predictor can not be turned off if no seat switch is present on the vehicle.

Parallel Tracking will default to ON. To turn off go to MENU >> GREENSTAR2 PRO button >> GUIDANCE softkey >> GUIDANCE SETTINGS tab. Deselect the check box. Once turned OFF, it will remain off through power cycles until manually turned back on by operator. Turn OFF will be displayed on guidance screen when turn predictor is turned off.

AutoTrac will default to ON after every power cycle or after every seat switch timeout. To turn off go to

Menu >> GREENSTAR2 PRO button>> GUIDANCE softkey >> GUIDANCE SETTINGS tab. Deselect the check box. Turn Predictor can not be turned off on vehicles with out an operator presence switch tied to CAN line. Once turned OFF, it will remain off only until next power cycle, seat switch timeout, or if manually turned back on by operator. Turn OFF will be displayed on guidance screen when turn predictor is turned off.

Whenever Display resets Turn Predictor back to ON after a seat switch timeout (operator out of seat for 7 seconds on tractors, 5 seconds on combines and sprayers), it will display a caution message to operator indicating that Turn Predictor has been reset to ON due to operator leaving seat. There will be an option allowing the operator to turn it back off again directly from the caution message.

OUO6050,000170F -19-08DEC05-1/1

Recording Turn Points

For a new turn point to be recorded for current track, vehicle must travel along track for more than 10 seconds, at a speed greater than 0.5 mph. A turn point

will be recorded at point at which AutoTrac is deactivated or point in which heading error exceeds 45 degrees.

OUO6050,0001710 -19-08DEC05-1/1

Predicting Turn Points

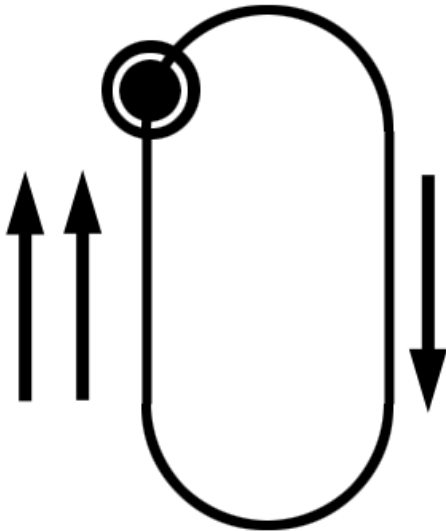
To predict a turn, display must have at least one stored turn point that is within 8 tracks of current track and on same end of field that vehicle is moving towards. Turn XXXX ft. (M) will be displayed on Perspective View screen as soon as predicted turn point has been calculated for a newly acquired track. An advance notification, both audible (beep) and visual (Turn text changing to yellow from green), will

annunciate at approximately 10 seconds prior to actual predicted turn. A turn notification, both audible (two beeps) and visual (Turn text changing to red), shall annunciate when GPS position crosses predicted turn point.

The following are examples of how turns are predicted.

OOU6050,0001711 -19-16JAN06-1/5

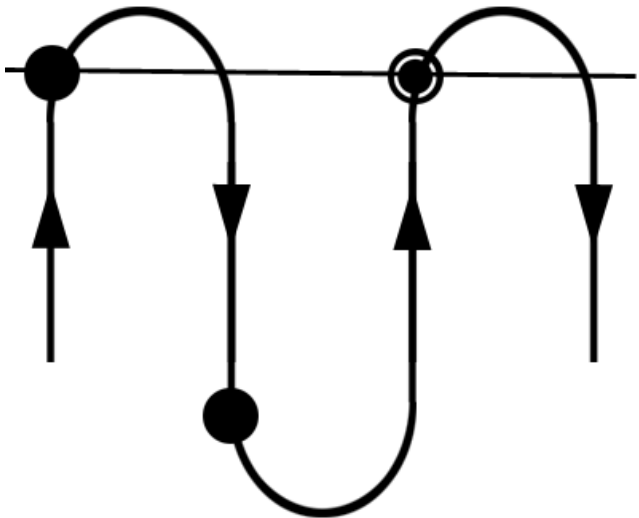
1. The end-point of current track if one exists.



PC8216 -UN-28MAY04

OOU6050,0001711 -19-16JAN06-2/5

2. The intersection of current track and a perpendicular line through 1 stored turn point, if only 1 stored point exists within 8 closest tracks.



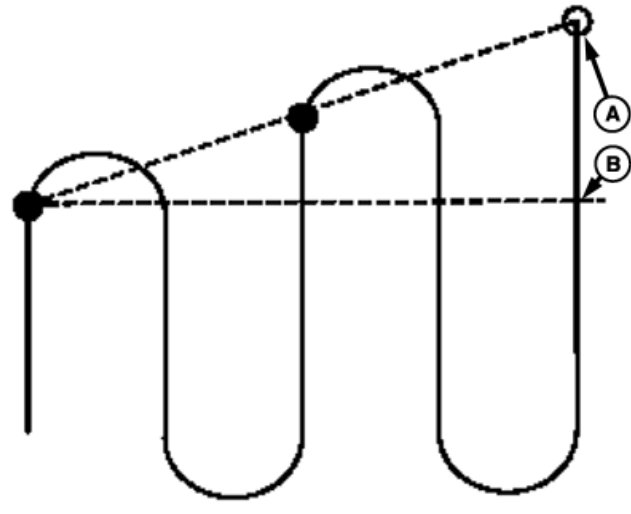
PC8217 -UN-28MAY04

Continued on next page

OOU6050,0001711 -19-16JAN06-3/5

3. The intersection of current track and line through 2 closest stored turn points, if 2 or more stored points exist within 8 closest tracks.

A—Point of Turn Prediction
B—NOT Point of Turn Prediction

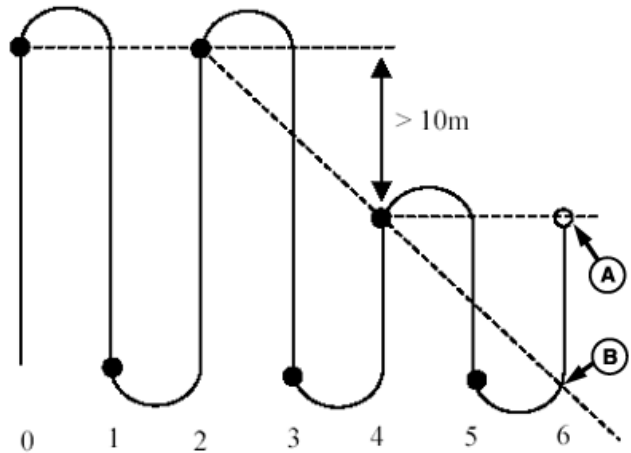


PC8218 -UN-27MAY04

OOU6050,0001711 -19-16JAN06-4/5

4. If 3 or more stored points exist within 8 closest tracks, closest point will be checked to make sure it falls within 10 meters of projected line through 2nd and 3rd closest points. If closest point is not within this distance, then turn prediction will be based only on perpendicular line through closest point.

A—Point of Turn Prediction
B—NOT Point of Turn Prediction



PC8219 -UN-27MAY04

OOU6050,0001711 -19-16JAN06-5/5

Lead Compensation

NOTE: This feature is disabled when working in Curve Track or AutoTrac modes.

Tracking lead compensation is used to calculate a position in front of receiver more closely associated with front of machine. Tracking lead compensation helps minimize over steering when lining up with a track and position delays observed when making a turn. Value entered will depend on speed of travel, type of machine, and user preference. Default setting for lead compensation is 127 cm (50 in.) Settings range from 0-250 cm (0-100 in.).

Recommended Tracking Lead Compensation	
Machine Type	Lead Compensation
Sprayer	183 cm (72 in.)
Combines	183 cm (72 in.)
Row Crop Tractor	71 cm (28 in.)
4WD Tractor	203 cm (80 in.)
Track Tractors	127 cm (50 in.)

OUO6050,0001712 -19-08DEC05-1/1

SHIFT TRACK SETTINGS tab

SHIFT TRACK SETTING tab allows setup of the following:

- Shift On/Off - shift track feature can be turned on/off by selecting or deselecting SHIFTS ON/OFF.
- Small Shifts Settings - Range 1—30 cm (0.4—12 in.) Small shifts are active while AutoTrac is active.
- Large Shifts Settings - Range 30—406 cm (12—160 in.).

NOTE: Large Shifts are disabled when AutoTrac is active or when operating in Curve Track mode.

- Clear All Shifts - Used to clear all shifts for entire field, restoring original position of Track 0, and consequently adjusting position of all tracks in field.

NOTE: AutoTrac has to be deactivated to use this feature.

Available in Straight Track mode only.

Continued on next page

OUO6050,0001713 -19-18JAN06-1/2

PC8706 -UN-22AUG05

Shift Track

Shift track is used to adjust position of machine left, center or right of set track. Shift track can be used to compensate for GPS drift. Drift is inherent to any satellite-based, differentially corrected GPS system.

Shift Track shifts track 0, and all AB lines associated with this track, right or left the pre-specified distance. An operator may also "re-center" displayed line on Guidance icon.

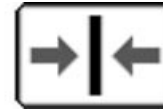
To move line to left, select SHIFT LEFT button. To move line to right, select SHIFT RIGHT button. Each time button is pressed, line will move the amount defined in the SHIFT TRACK SETTINGS tab. The amount is displayed under the Shift Track buttons. To re-center line on vehicle's current location select RE-CENTER button.

PC8707 -UN-22AUG05

PC8708 -UN-22AUG05



Shift Left



Re-Center



Shift Right

IMPORTANT: When using SF2 or SF1 Differential Correction (or when using RTK Quick Survey Mode) the track may drift over time or at power cycles. Shift Track can be used to compensate for GPS drift.

NOTE: RTK Absolute Base Mode is highly recommended in high accuracy applications when repeatability is needed. Only RTK Absolute Base Mode provides consistent repeatability and accuracy.

OUO6050,0001713 -19-18JAN06-2/2

TRACK 0 SETUP

Straight Track Mode

NOTE: Track 0 and A-B lines are two terms used interchangeably, we will use term Track 0.

Track 0 is the reference point from which all parallel passes in field are based. Use the following procedures to setup Track 0 and Track Spacing.

1. GUIDANCE SETTINGS tab—Select STRAIGHT TRACK mode.
2. VIEW tab—Press SET TRACK 0.
3. Press NEW button below the CURRENT TRACK 0 drop-down box.
4. Enter a name for Track 0 using the alpha/numeric keypad
5. Press ENTER button.
6. Select method to define Track 0 from METHOD drop-down box.
 - A + B
 - A + Heading
 - Auto B
 - Lat/Lon

Methods of defining Track 0 are explained later in this section.

7. Set Track Spacing

Track spacing can be defined two different ways:

- Select track spacing button from Set Track 0 dialog box
 - Enter implement width
 - Enter desired track spacing

NOTE: A higher degree of precision can be achieved for track spacing when track spacing is entered in by rows instead of feet. More decimal places are used in the track spacing calculation when entered in by rows versus the three decimal places allowed when entered by

feet. Select (ft)/(rows) button to change to rows.

- Set track spacing from EQUIPMENT softkey >> IMPLEMENT 1 tab >> (See EQUIPMENT softkey section.)

A + B

1. Drive to desired location in the field.
2. Press SET A button.
3. Drive vehicle to desired point B

NOTE: It is required to drive a longer distance than 3 m (10 ft) to set point B.

4. Press SET B button.

NOTE: The ENTER button will be disabled until both the Set A and Set B points have been defined.

5. Press ENTER button.

A + Heading

1. Drive to desired location in the field.
2. Press SET A button.
3. Select the HEADING input box and enter a heading with the numeric keypad.

NOTE: 0.000 indicates North, 90.000 East, 180.000 South, and 270.000 West. Save value by pressing ENTER button on keypad.

NOTE: The ENTER button will be disabled until both the Set A and Set B points have been defined.

4. Press ENTER button.

Auto B

1. Drive to desired location in the field.

2. Press SET A button.

3. Drive vehicle in desired direction across field.

NOTE: A distance of 15 m (45 ft) or longer has to be driven before point B can be defined. This method calculates point B from the last five data points taken from the 15 m (45 ft) driven and runs a best fit line through the points to determine a heading.

4. The B-point will automatically be saved after traveling 15 m (45 ft).

5. Press ENTER button.

Lat/Lon

NOTE: The Latitude and Longitude coordinates have to be entered in decimal degrees.

1. Enter latitude and longitude for point A.

2. Enter latitude and longitude for point B.

3. Press ENTER button.

OUO6050,0001714 -19-11JAN06-2/2

Curve Track Mode

PC8902 -UN-19JAN06

NOTE: Track Spacing must be set for operation of this mode. Set track spacing in EQUIPMENT softkey >> IMPLEMENT tab.

1. GUIDANCE SETTINGS tab >> TRACKING MODE drop-down box—Select CURVE TRACK.

2. Drive to desired location in the field for start of Track 0.

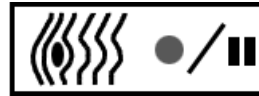
3. VIEW tab—Press RECORD button.

4. A red light by RECORD button indicates path is being recorded.

5. Drive vehicle along desired path.

6. Turn vehicle at the end of first pass and the curve path will be saved.

NOTE: Curve Track recorded data is saved to Client, Farm, Field that is defined in the RESOURCES/CONDITIONS softkey >> RESOURCES tab.



Curve Track Record Button

OUO6050,0001715 -19-08DEC05-1/1

Circle Track Mode

NOTE: Only available with Pivot Pro Module

1. GUIDANCE SETTINGS tab >> TRACKING MODE drop-down box >> CIRCLE TRACK. Circle Center and Track Spacing must be set for operation of this mode.
2. VIEW tab—Select SET CIRCLE.
3. Select NEW button below the CURRENT CIRCLE drop-down box.
4. Enter name using the alpha/numeric keypad.
5. Select ENTER button.
6. Select method to define Circle Center from METHOD drop-down box.
 - Drive Circle
 - Lat/Lon

Methods of defining Circle center are explained later in this section.

7. Set Track Spacing

Track spacing can be defined two different ways:

- Select track spacing button from Set Circle dialog box
 - Enter implement width
 - Enter desired track spacing

NOTE: A higher degree of precision can be achieved for track spacing when track spacing is entered in by rows instead of feet. More decimal places are used in the track spacing calculation when entered in by rows versus the three decimal places allowed when entered by feet. Select (ft)/(rows) button to change to rows.

- Set track spacing from EQUIPMENT softkey >> IMPLEMENT 1 tab >> (See EQUIPMENT softkey section.)

Drive Circle:

1. Drive machine to desired starting location in field.
2. Press record button and “Recording Circle” will display.
3. Drive desired circle.

NOTE: It is required to drive over 10% of the circle before you can calculate the center. The more of the circle you drive the more accurate the circle center will be. It is recommended to drive the entire circle for optimum circle center calculation.

4. Press the record button again when the button is no longer grayed out to complete the circle track. This calculates the circle center. From this circle center concentric circles are displayed based on track spacing.

5. Press Enter button.

Lat/Lon:

1. Select the LATITUDE (LAT) input box and enter the center point latitude coordinates.
2. Select the LONGITUDE (LON) input box and enter the center point longitude coordinates.

NOTE: The Latitude and Longitude coordinates have to be entered in decimal degrees.

3. Press ENTER button. This enters the circle center, and shows concentric tracks based upon the track spacing.

Row Finder Mode

NOTE: Only Parallel Tracking will operate in Row Finder Mode.

Track Spacing must be set for operation of this mode.
Set track spacing in EQUIPMENT softkey >>
IMPLEMENT tab.

OUO6050,0001717 -19-08DEC05-1/1

AutoTrac System

General Information

IMPORTANT: AutoTrac system is intended to aid operator to perform field operations more efficiently. Operator is always responsible for machine path and must continue to pay attention to surrounding environment while operating machine. Stop operation if poor visibility conditions impair operator's ability to identify people or obstacles in machine path.

Always operate tractor from seat.

Not for use on roadways. Verify system is deactivated before traveling on roadways.

AutoTrac system relies on GPS system operated by the United States government, which is solely responsible for its accuracy and maintenance. System is subject to changes that could affect accuracy and performance of all GPS equipment.

Operator must maintain responsibility for machine and must turn at end of each track. This system will not turn at end of a track.

AutoTrac basic system is intended to be used as an assistance tool to mechanical markers. Operator must evaluate overall system accuracy to determine specific field operations where assisted steering may be used. This evaluation is necessary because accuracy required for various field operations may differ depending on farming operation. Because AutoTrac uses STARFIRE differential correction network along with Global Positioning System (GPS), slight shifts in position may occur over time.

AutoTrac Accuracy—The overall AutoTrac system accuracy is dependent upon many variables. The equation looks like:

AutoTrac System Accuracy = Signal accuracy + Vehicle Setup + Implement Setup + Field/Soil Conditions.

It is very important to remember:

- Receiver has to go through a warm-up period after starting.
- Vehicle is setup properly (ballasted according to vehicle operator manual, etc.)
- Implement is setup to run properly (wear parts such as shanks, shovels, and sweeps are in good working condition and correctly spaced).
- Understand how field/soil conditions affect system (loose soil requires more steering than firm soil, but firm soil can cause uneven draft loads).

OUO6050,0001718 -19-08DEC05-1/1

AutoTrac Status Pie

IMPORTANT: Although AutoTrac system can be activated when SF2 (or SF1 if using AutoTrac SF1 activation) correction signal is confirmed, system accuracy may continue to increase after powering up system.

AutoTrac SF2 activation will operate on SF1, SF2, or RTK signal.

AutoTrac SF1 activation will operate on SF1 signal only.

NOTE: The status pie and steer icon will not be displayed if no SSU or AutoTrac Activation is detected.

AutoTrac icon has four stages as shown in the **AutoTrac Status Pie**

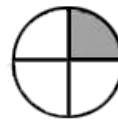
- INSTALLED
- CONFIGURED
- ENABLED
- ACTIVATED

OUO6050,0001719 -19-18JAN06-1/7

PC8832 -UN-25OCT05

Stage 1 INSTALLED (1/4 of pie)—SSU and all other hardware necessary for use are installed.

- SSU is detected



Stage 1—INSTALLED

Continued on next page

OUO6050,0001719 -19-18JAN06-2/7

PC8833 -UN-25OCT05

Stage 2 CONFIGURED (2/4 of pie)—Tracking Mode has been determined. A valid Track 0 has been established. Correct StarFire signal level for AutoTrac activation is selected. Vehicle conditions met.



Stage 2—CONFIGURED

- Guidance system has been turned ON in the display
- Guidance Track 0 has been defined
- AutoTrac Activation detected.
- StarFire signal is present
- SSU has no active faults pertaining to the steering function
- Hydraulic oil warmer than minimum temperature
- Speed is less than maximum
- TCM message is currently available and valid
- In proper operating gear

OUO6050,0001719 -19-18JAN06-3/7

PC8836 -UN-25OCT05

Steer On/Off – Press the steer on/off button to move AutoTrac from the CONFIGURED stage to the ENABLED stage.

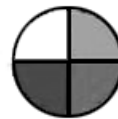


Steer On/Off

OUO6050,0001719 -19-18JAN06-4/7

PC8834 -UN-25OCT05

Stage 3 ENABLED (3/4 of pie)—Steer Icon has been pressed. All conditions are met for AutoTrac to operate and system is ready to be activated.



Stage 3—ENABLED

- Select Steer On/Off button once to turn “Steer On”

OUO6050,0001719 -19-18JAN06-5/7

PC8835 -UN-25OCT05

Stage 4 ACTIVATED (4/4 of pie with “A”)—Resume switch has been pressed and AutoTrac is steering the vehicle.



Stage 4—ACTIVATED

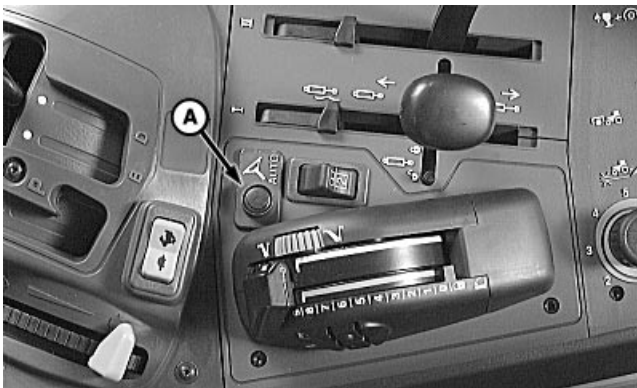
- Press Resume Switch—AutoTrac has been activated

Continued on next page

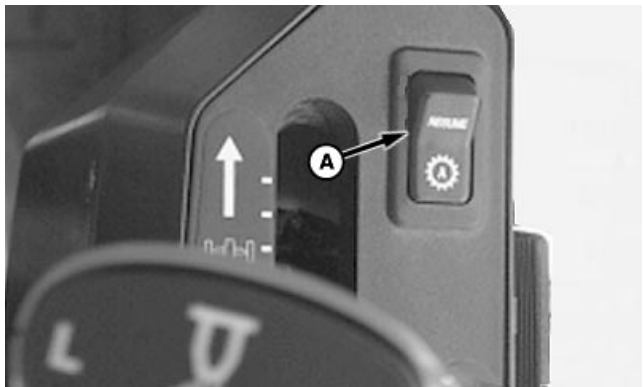
OUO6050,0001719 -19-18JAN06-6/7



Tractors



Tractors

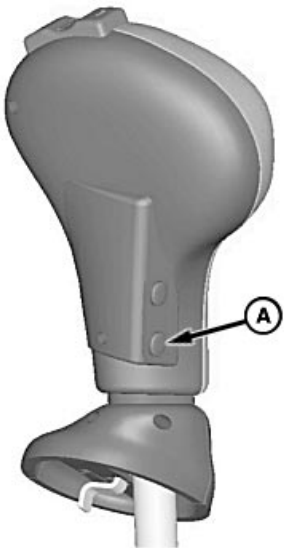


4700 and 4710 Sprayers

IMPORTANT: In Curve Track mode the Steer On/Off button is not used. Pie pieces 2 and 3 will automatically fill in once initial pass is recorded or when vehicle turns around and a new path is propagated on screen.

Resume Switch – Press the Resume Switch to move AutoTrac from the ENABLED stage to the ACTIVATED stage. Pictures show where Resume Switch can be found on tractors, sprayers, and combines. Combines use button 2 or 3 on multi-function handle.

A—Resume Switch



4720 and 4920 Sprayers

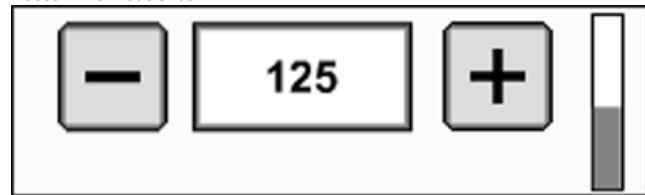


Combines

PC8852 -UN-30OCT05

Steering Sensitivity

To adjust steering sensitivity select the input box and enter the desired steering sensitivity value via numeric keypad and select the enter button. The sensitivity can also be adjusted up or down by selecting the + or – buttons on either side of the steer sensitivity input box.

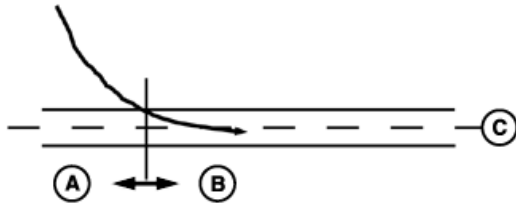
*Steer Sensitivity*

NOTE: Valid range for steer sensitivity is 50-200 with 200 being the most aggressive setting.

User Adjustable Steering Sensitivity - steering sensitivity is aggressiveness of AutoTrac steering system. A high steering sensitivity setting is more aggressive to allow system to handle tough manual steering conditions such as integral implements with a heavy draft load. A low steering sensitivity setting is less aggressive to allow system to handle lighter draft loads and higher speeds.

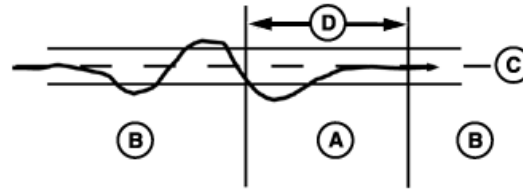
Continued on next page

OUO6050,000171A -19-08DEC05-1/3



PC8848 -UN-30OCT05

Figure A



PC8849 -UN-30OCT05

Figure B

A—Default Gain

B—Entered Steering Gain

C—Track

D—2.5 seconds

The acquire sensitivity is applied only after machine is within 0.5 M (1.6 ft) of track FIGURE A. Therefore, adjusting steering sensitivity does not change line acquisition performance.

The steering sensitivity is momentarily reduced if tractor front wheel and heading oscillations become too large. This event may be observed when implement is raised at start or end of row transitions. If this event is observed while implement is engaged, sensitivity level is too high (see Steering Sensitivity).

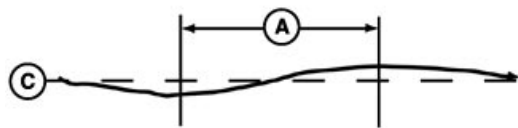
Adjusting Steering Sensitivity Level

The steering sensitivity must be adjusted to accommodate field conditions and tractor/implement

configuration. Steering sensitivity should always be evaluated when implement is engaged. In general, soft soil requires a higher steering sensitivity level than firm ground and an integral implement requires a higher steering sensitivity than a similar drawn implement. Finally, steering sensitivity will not address condition where front wheels are not able to turn tractor. Always make sure front axle load with implement engaged is sufficient for steering before adjusting steering sensitivity level.

Continued on next page

OUO6050,000171A -19-08DEC05-2/3



PC8850 -UN-30OCT05

Figure A

A—10 second

B—1 second



PC8851 -UN-30OCT05

Figure B

C—Track

Too Low—If steering sensitivity is too low, a slow wandering track error pattern can be observed on display. This track error pattern takes approximately 10 seconds to go from side to side as is shown in FIGURE A. If excessive track error is occurring, increase steering sensitivity by small increments until desired accuracy is achieved.

NOTE: It is normal to see a momentary track error when encountering a large rut, furrow, or implement load change. With steering sensitivity properly adjusted, slower speed applications typically achieve a track accuracy of 0.2 ft or less.

Too High—Setting steering sensitivity to highest level will not result in maximum tracking accuracy. If steering sensitivity is too high, excessive front wheel motion will be observed which reduces accuracy and causes unnecessary front axle component wear. At extreme high levels, machine motion will become large enough to cause steering sensitivity to be momentarily changed to default level. Wheel motion to watch for when determining if aggressiveness is too high occurs at an interval of approximately 1 second from side to side as shown in FIGURE B. If excessive wheel motion is observed, lower steering sensitivity by small increments until desired performance is achieved.

OUO6050,000171A -19-08DEC05-3/3

Enabling System—AutoTrac Tractors

The following criteria must be met for AutoTrac to be enabled:

- Vehicle has an AutoTrac capable steering controller (SSU)

- Hydraulic oil temp is above 20°C (68°F)
- AutoTrac license activated (26-digit Activation Code)
- Track 0 has been set up
- GPS signal status is present
- TCM turned on

OUO6050,000171B -19-08DEC05-1/1

Activating System—AutoTrac Tractors

After system has been ENABLED, operator must manually change system to ACTIVATED status when steering assistance is desired.

NOTE: Activating AutoTrac will activate automatic power shift if it has been set. In 8020T and 9020T tractors, automatic power shift (APS) must be set up after enabling AutoTrac. If AutoTrac is enabled after automatic power shift has been set, APS must be reset.

APS can be set either before or after enabling AutoTrac in 8010T tractors.

OUO6050,000171C -19-08DEC05-1/3

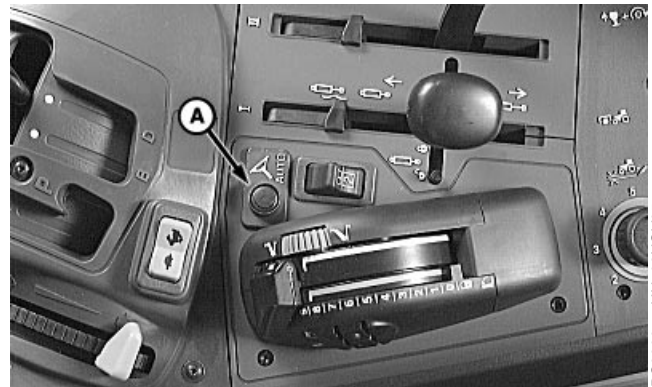
NOTE: Resume switch location may vary depending on vehicle type, model, and year.

Press resume switch (A) to activate AutoTrac. This will initiate assisted steering. A-Resume Switch

A—Resume Switch



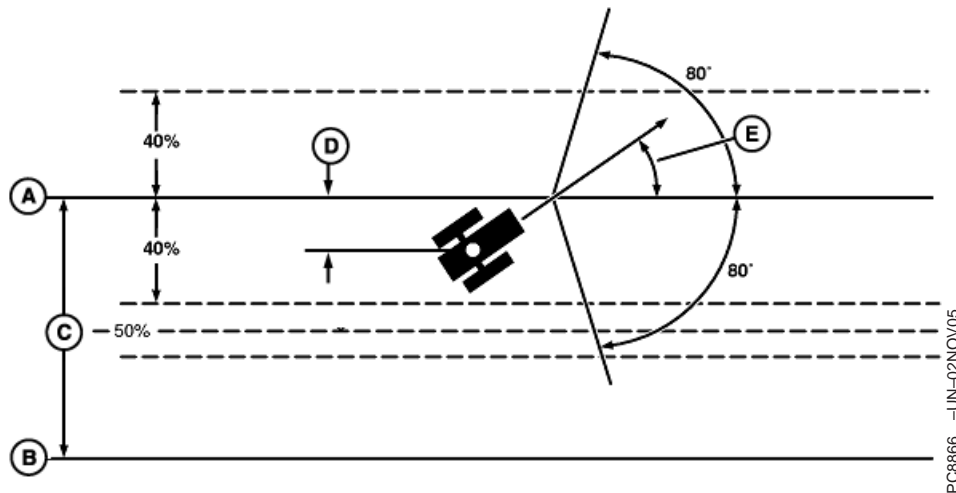
PC88629 -UN-03AUG05



PC8868 -UN-02NOV05

Continued on next page

OUO6050,000171C -19-08DEC05-2/3



A—Track 0
B—Track 1 South

C—Track Spacing

D—Off-Track Lateral Error

E—Track Heading Error

Track number changes at 50% of row spacing.

Once tractor is at end of row operator must turn system to next pass. By turning steering wheel, AutoTrac is deactivated. operator must turn onto next track.

AutoTrac can be activated by pressing resume switch only after following conditions are met:

- Forward vehicle speed is less than 30 km/h (18.6 mph)

- Reverse speed is less than 10 km/h (6 mph)
- Vehicle heading within 80° of desired track
- The machine is within 40% of track spacing
- Operator is seated.
- TCM is on.
- In reverse AutoTrac will remain activated for 45 seconds. After 45 seconds the machine must be put in a forward gear before reverse will activate again.

OUO6050,000171C -19-08DEC05-3/3

Deactivating System—AutoTrac Tractors



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

Deactivating System

AutoTrac system can be made DEACTIVE by the following methods:

- Turning steering wheel more than 10 degrees.
- Exceeding speed of 30 km/h (18.6 mph).
- Degradation of differential correction signal from SF2 or RTK to WAAS/EGNOS for longer than 3 minutes.
- Pressing STEER ON/OFF button.
- Operator out of seat for more than 7 seconds.
- Engaged in neutral longer than 30 seconds.
- In reverse for longer than 45 seconds.
- Reverse speed exceeds 9.6 km/h (6 mph).

OUO6050,000171D -19-18JAN06-1/1

Enabling System—AutoTrac Sprayers

Press STEER ON/OFF button to toggle between enable/disable AutoTrac.

To enable system, all of the following criteria must be met:

- AutoTrac activation is detected.
- Track 0 has been setup.
- Tracking mode selected.
- SSU is in normal operating mode.

- 4700 Series Sprayer is in 1st, 2nd, or 3rd range.
4900 Series Sprayer is in Field Mode
- Hydraulic oil is warmed to minimum specification.

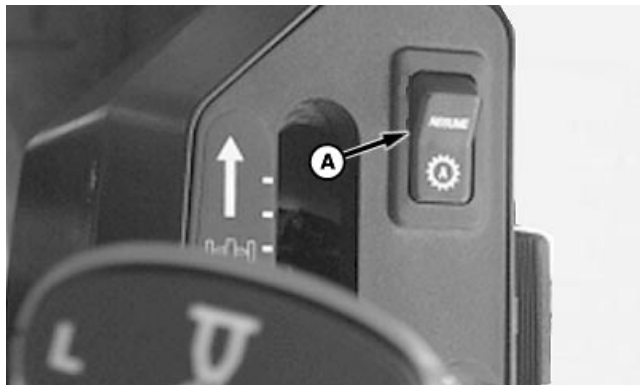
Specification

Hydraulic Oil Minimum
Temperature—Temperature 10 °C
(50 °F)

- TCM must be installed and turned on.

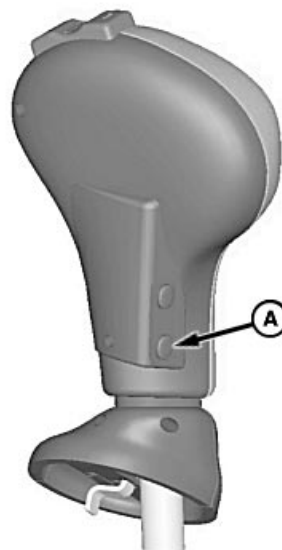
OUO6050,000171E -19-08DEC05-1/1

Activating System—AutoTrac Sprayers



4700 and 4710 Sprayer Resume Switch

N63532 -UN-07AUG03



4720 and 4920 Sprayer Resume Switch

PC7989 -UN-04NOV03

A—Resume Switch

CAUTION: While AutoTrac is activated, operator is responsible for steering at end of path and collision avoidance.

After system has been ENABLED, operator must manually change system to ACTIVATED status when steering assistance is desired.

Press resume switch (A) to activate AutoTrac. This will initiate assisted steering.

NOTE: 4700 and 4710 have resume switch on consul. 4720 and 4920 have 2 buttons on hydro handle.

In order to activate system the following criteria must be met:

- Sprayer hydro handle is out of park.
- 4700 Series Sprayer is in 1st, 2nd, or 3rd range.

- 4900 Series Sprayer is in field gears.
- Vehicle speed is less than 37 km/h (23 mph).
- Vehicle heading is within 45 degrees of desired track above 11.3 km/h (7 mph); Vehicle heading is within 80° of desired track below 11.3 km/h (7 mph).
- Off track error is within 40% of track spacing.
- Operator is seated.
- TCM is on.
- In reverse, AutoTrac will remain activated for 45 seconds. After 45 seconds, the machine must be put in forward gear before reverse will activate again.

CAUTION: Always turn off (Deactivate) AutoTrac system before entering a roadway. Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway. To turn off AutoTrac from GUIDANCE VIEW tab, toggle STEER ON/OFF button until STEER OFF is displayed.

OUC6050,000171F -19-18JAN06-1/1

Deactivating System—AutoTrac Sprayers



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

AutoTrac system can be made DEACTIVE by following methods:

- Turning steering wheel more than 10 degrees for longer than 30 seconds.
- By placing hydro handle in neutral.
- Slowing to speeds less than 1.0 km/h (0.6 mph).
- Exceeding speed of 37 km/h (23 mph).
- In reverse longer than 45 seconds.
- Shifting speed to 4th range on 4700 Series Sprayers, shifting to transport mode in 4900 Series Sprayers.
- Toggle STEER ON/OFF button until STEER OFF is displayed in GUIDANCE VIEW tab.
- Operator out of seat for more than 5 seconds.

OUO6050,0001720 -19-08DEC05-1/1

Enabling System—AutoTrac Combines

Press STEER ON/OFF button to toggle between enable/disable AutoTrac.

To enable system, all of the following criteria must be met:

- AutoTrac activation is detected.
- Track 0 has been setup.
- Tracking mode selected.
- SSU is in normal operating mode.
- TCM must be installed and turned on.
- Header On

OUO6050,0001721 -19-08DEC05-1/1

Activating System—AutoTrac Combines



CAUTION: While AutoTrac is activated, operator is responsible for steering at end of path and collision avoidance.

After system has been ENABLED, operator must manually change system to ACTIVATED status when steering assistance is desired.

Press button 2 or 3 on multi-function handle to activate AutoTrac. This will initiate assisted steering.

In order to activate system following criteria must be met:

- Road Transport Switch is in field position.
- Header is engaged.
- Multi-function handle is forward.
- Vehicle speed is less than 22 km/h (13.6 mph).
- Vehicle heading is within 45 degrees of desired track.
- Off track error is within 40 % of track spacing.
- Operator is seated.
- TCM is on.



CAUTION: Always turn off (Deactivate) AutoTrac system before entering a roadway. Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway. To turn off AutoTrac from GUIDANCE VIEW tab, toggle STEER ON/OFF button until STEER OFF is displayed.



PC7925 -JN-14OCT03

OUO6050,0001722 -19-18JAN06-1/1

Deactivating System—AutoTrac Combines



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

AutoTrac system can be made DEACTIVE by following methods:

- Disengaging header

- Turning steering wheel more than 10 degrees
- Slowing to speeds less than 1.0 km/h (0.6 mph)
- Exceeding speed of 22 km/h (13.6 mph)
- Toggle STEER ON/OFF button until STEER OFF is displayed in GUIDANCE VIEW tab.
- Operator out of seat for more than 5 seconds.
- Track number is changed.
- In reverse longer than 45 seconds.

OUO6050,0001723 -19-08DEC05-1/1

Accuracy—AutoTrac Universal

The overall AutoTrac system accuracy is dependent upon many variables. Equation looks like: AutoTrac System Accuracy = Signal accuracy + Vehicle Setup + Implement Setup + Field/Soil Conditions. Therefore, it is very important that receiver has gone through warm-up period upon start-up; vehicle is setup properly (ballasted according to vehicle operators manual, etc.),

implement is setup to run properly (wear parts such as shanks, shovels, and sweeps are in good working condition) and that you understand how field/soil conditions affect system (loose soil requires more steering than firm soil, but firm soil can cause uneven draft loads).

OUO6050,0001724 -19-08DEC05-1/1

General Information—AutoTrac Universal



CAUTION: Do not use AutoTrac system on roadways. Always turn off (Deactivate) AutoTrac system before entering a roadway. Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway.

When system is activated remain alert and pay attention to surrounding environment. Take control of steering when necessary to avoid field hazards, bystanders, equipment or other obstacles. Stop operation if poor visibility conditions impair your ability to safely operate and steer machine.

IMPORTANT: The AutoTrac system is intended to aid operator in performing field operations more efficiently. Operator is always responsible for machine path and must continue to pay attention to surrounding environment while operating machine. Stop operation if poor visibility conditions impair your ability to identify people or obstacles in machine path.

Always operate machine from operator's seat. If provided, always use seat belt.

The AutoTrac system relies on GPS system operated by government of United States, which is solely responsible for its accuracy and maintenance. System is subject to changes that could affect accuracy and performance of all GPS equipment.

All operators must be familiar with AutoTrac system and operating characteristics prior to operation. The following is a suggested procedure for operator to become familiar with system:

1. Read and understand Operators Manual for GreenStar2 Guidance - Parallel Tracking and AutoTrac Assisted Steering Systems.
2. Choose an open area free of hazards (ditches, buildings, etc.).
3. Set Track Spacing to 92.0 meters (300 ft).
4. Set a Track 0 (A—B Line).

NOTE: Operate vehicle at a speed you are comfortable, recommend less than 8 km/h (5 mph).

5. Enable AutoTrac on display by turning Steer ON.
6. Press Resume switch to activate AutoTrac. (See Activating system later in this section).
7. After driving a short distance, then turn steering wheel to turn vehicle off track to deactivate AutoTrac. (See Deactivating System later in this section).
8. Practice Activating AutoTrac at different distances before and after crossing track and at different angles. Increase and decrease speeds to simulate different operating conditions.
9. Reduce Track Spacing to acquire multiple tracks and continue practicing activating AutoTrac at different angles and varying speeds to understand how AutoTrac behaves under different conditions.

Always be prepared to resume manual control if AutoTrac does not perform expected maneuvers or machine course must be changed to avoid injury or property damage. Operator can regain manual steering by turning steering wheel or Disabling AutoTrac by turning Steer off on display. It is recommended practice to be as close as possible to desired track prior to activating AutoTrac. This will ensure correct track and direction are acquired.

The AutoTrac basic system is intended to be used as an assistance tool to mechanical markers on planters. Operator must evaluate overall system accuracy to determine specific field operations where assisted steering may be used. This evaluation is necessary because accuracy required for various field operations may differ depending on farming operation. Because AutoTrac uses StarFire differential correction network along with Global Positioning System (GPS), slight shifts in position may occur over time.

To operate AutoTrac operator must set track 0 (similar to parallel tracking) and all tracks are drawn parallel to track 0 using track spacing.

The AutoTrac system operating status can exist at four levels: INSTALLED, CONFIGURED, ENABLED, and ACTIVATED.

After enabling AutoTrac (see Enabling AutoTrac), AutoTrac is activated by pressing resume switch on armrest (see Activating AutoTrac). To return to manual steering, operator must deactivate system (see Deactivating System).

If required track can be shifted left, right or centered using shift track feature on display. (See Shift Track).

OUO6050,0001725 -19-08DEC05-2/2

Start-Up Screen—AutoTrac Universal

Each time a machine equipped with AutoTrac is started, this screen will appear as a reminder of operator responsibilities when using AutoTrac steering system. To clear this screen press I AGREE.

**screen is not displayed, update
AutoTrac software through
www.stellarsupport.com or
1-888-GRNSTAR.**

**IMPORTANT: When starting machine with
AutoTrac installed and this startup**

OUO6050,0001726 -19-08DEC05-1/1

PC8663 -UN-05AUG05

Setup—AutoTrac Universal

AutoTrac Universal is configured through Original GreenStar Monitor

Press MENU >> ORIGINAL GREENSTAR MONITOR >> SETUP >>AUTOTRAC

- **Vehicle Type** - The first cell is where the user chooses which platform he has installed the kit onto. Press the A button to scroll through the platforms.
- **StarFire Height (in)** – Enter the height of the StarFire receiver. Height is measured from the ground to the top of the dome. This will automatically change the height value on the StarFire/TCM Setup page or TCM Setup on Original StarFire.

NOTE: Changing height value in StarFire iTC/TCM or TCM Setup page will not change the height value in the AutoTrac Setup.

- **StarFire Fore-Aft (in)** – Enter the Fore-Aft measurement. This is the distance the receiver is from the fixed axle of the vehicle. This is the rear axle of a row crop or the front axle on a 4 wheel drive.

NOTE: The operator is not allowed to change this value in the StarFire iTC/TCM or TCM Setup page.

- **Steer Wheel Speed** – This value determines how fast the steering wheel turns to make corrections.
- **Acquire Sensitivity** – This value determines how aggressively the vehicle acquires the next track.
- **Line Sensitivity** – This value determines how aggressively the vehicle stays on the line once the track has been acquired.
- **Operator Presence** - This allows the user to input whether they are on a vehicle that will use the seat switch or the operator activity monitor.



PC8657 -UN-05AUG05



ORIGINAL GREENSTAR MONITOR button

Continued on next page

OUO6050,0001727 -19-08DEC05-1/2

IMPORTANT: It is important that the operator stay seated while vehicle is moving.

When seat switch is chosen the external seat switch will need to be plugged into the AutoTrac Universal wiring harness. If operator leaves the seat for more than 7 seconds AutoTrac will be disengaged.

When activity monitor is chosen AutoTrac Universal will look for operator activity every 7 minutes. Operator will get a time out warning 15 seconds before AutoTrac will disengage. Pressing resume will reset activity monitor timer.

There are now three different Sensitivities that can be set to optimize the performance of the AutoTrac Universal kit. The changing of Steer Wheel Speed and Acquire Sensitivity will affect the vehicles ability to stay on the line. Line Sensitivity will need to be adjusted accordingly to increase line retention performance. Find the combination of values that works best for the application you are doing. It is to start by tuning steering wheel speed, next acquire sensitivity and then line sensitivity.

OUO6050,0001727 -19-08DEC05-2/2

Enabling System—AutoTrac Universal

Press STEER ON/OFF button to toggle between enable/disable AutoTrac.

To enable system, all of the following criteria must be met:

- AutoTrac activation is detected.

- Track 0 has been setup.
- Tracking mode selected.
- Proper operator presence mode selected.
- TCM must be installed and turned on.
- AutoTrac Universal Steering Kit is plugged in.

OUO6050,0001728 -19-08DEC05-1/1

Activating System—AutoTrac Universal

CAUTION: While AutoTrac is activated, operator is responsible for steering at end of path and collision avoidance.

After system has been ENABLED, operator must manually change system to ACTIVATED status when steering assistance is desired.

Press resume switch (A). This will initiate assisted steering.

In order to activate system following criteria must be met:

- Vehicle speed is greater than 0.5 km/h (0.3 mph).
- Forward vehicle speed is less than
Tractor - 30 km/h (18.6 mph)
Sprayer - 37 km/h (23 mph)
Combine - 20 km/h (12.4 mph)
- Reverse vehicle speed is less than 10 km/h (6.0 mph).
- Vehicle within 45 degrees of desired track.
- Operator is seated.
- TCM is on.
- In reverse AutoTrac will remain activated for 45 seconds. After 45 seconds the machine must be put in a forward gear before reverse will activate again.



A—Resume Switch

PC8700 -UN-11AUG05

CAUTION: Always turn off (Deactivate) AutoTrac system before entering a roadway. Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway. To turn off AutoTrac from GUIDANCE VIEW tab, toggle STEER ON/OFF button until STEER OFF is displayed.

OUC6050,0001729 -19-18JAN06-1/1

Deactivating System—AutoTrac Universal



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

AutoTrac system can be made DEACTIVE by following methods:

- Turning steering wheel more than 6 degrees.
- Slowing to speeds less than 0.5 km/h (0.3 mph).

- Exceeding forward speed of
Tractor - 30 km/h (18.6 mph)
Sprayer - 37 km/h (23 mph)
Combine - 20 km/h (12.4 mph)
- Exceeding reverse speed of 10 km/h (6.0 mph).
- Toggle STEER ON/OFF button until STEER OFF is displayed in GUIDANCE VIEW tab.
- Operator out of seat for more than 5 seconds if using seat switch or no activity detected by operator presence monitor for 7 minutes.

OUO6050,000172A -19-08DEC05-1/1

Information—AutoTrac Universal

- **Software Version** - Version of AutoTrac Universal software
- **Hardware P/N** - Hardware Part Number
- **S/N** - Serial number of the AutoTrac Universal
- **Mode** - Status of AutoTrac: Disabled, Enabled, Active
- **Total Hours** - Hours the system has been powered up
- **AutoTrac Hours** - Number of hours AutoTrac has been engaged
- **Resume Switch** - Shows Resume Switch state. It will change from OFF to ON when resume switch is pressed.
- **Encoder** - Represents the location of the steering wheel.

IMPORTANT: Encoder should be within +/- 500 when front wheels are straight ahead for proper performance. If wheels are straight and encoder is outside this range, operator should drive straight until encoder is within these settings.

- **Direction** - Indicated vehicle direction determined by AutoTrac Universal.

IMPORTANT: Operator must drive at least 1 mph and turn steering wheel 45 degrees in one direction with at least SF1 signal. Direction should be determined within 3 seconds.

- **Stop code** - Indicates why the system is not working or why AutoTrac disengaged.
- **Test Motor Left** - By pressing the TEST MOTOR LEFT button, the AutoTrac Universal motor will turn the steering wheel to the left. Used to test the motor to make sure it is working.
- **Test Motor Right** - By pressing the TEST MOTOR RIGHT button, the AutoTrac Universal motor will turn the steering wheel to the right. Used to test the motor to make sure it is working.

OUO6050,000172B -19-18JAN06-1/1

Circle Track

IMPORTANT: Circle Track must be selected in order to operate Circle Track Guidance.

- GUIDANCE SETTINGS tab >> TRACKING MODE drop-down box >> CIRCLE TRACK
- EQUIPMENT softkey >> IMPLEMENT 1 tab >> enter implement width and desired track spacing. minimum—0.5 m (2 ft), default—9 m (30 ft), maximum—304.8 m (1000 ft)

CIRCLE CENTER INFORMATION

Circle Center information (Latitude and Longitude coordinates) is named (occurs during Set Circle procedure) and assigned to a Field Name where it can be recalled for future use. Farm and Field names are setup and changed in the RESOURCES/CONDITIONS softkey >RESOURCES tab. See Resources/Conditions section of manual to setup farm and field names. The circle center information is stored on the data card and can be taken to another GSD2100/2600 and recalled for circle track operation. Desktop software can also download circle center information and save the information to additional data cards.

NOTE: If farm and field names are not created, circle center information will be saved to the “- - -” farm and field.

If operator desires to perform multiple passes in same field throughout year (or years) and follow exact same passes, then they would recall corresponding circle center information from that farm and field. For example, during planting, operator sets up a Circle Center and names it Pass 1 for River Farm >East Field. When operator came back to spray field a month later, they would select River Farm >East Field from RESOURCES tab and select PASS 1 from CURRENT CIRCLE drop-down box and the Circle Center information that was setup during planting would be recalled. Repeat the same steps for subsequent return trips to that field.

Circle Track Setup

NOTE: Circle Center and Track Spacing must be set for operation of this mode

1. Name Circle Center:
 - a. Press VIEW tab >> SET CIRCLE button >> NEW button.
 - b. Enter name for the circle center using the alphanumeric keypad.
 - c. Press ENTER button.

2. Select the method to define Circle Center from METHOD drop-down box.

3. Set Track Spacing

Track spacing can be defined two different ways:

- Select track spacing button from Set Circle dialog box
 - Enter implement width
 - Enter desired track spacing

NOTE: A higher degree of precision can be achieved for track spacing when track spacing is entered in by rows instead of feet. More decimal places are used in the track spacing calculation when entered in by rows versus the three decimal places allowed when entered by feet. Select (ft)/(rows) button to change to rows.

- Set track spacing from EQUIPMENT softkey >> IMPLEMENT 1 tab >> (See EQUIPMENT softkey section.)

4. Calculating Circle Center using the following instructions for DRIVE CIRCLE or LAT/LON.

Drive Circle:

1. Drive machine to desired starting location in field.

2. Press record button and "Recording Circle" will display.

3. Drive desired circle.

NOTE: It is required to drive over 10% of the circle before you can calculate the center. The more of the circle you drive the more accurate the circle center will be. It is recommended to drive the entire circle for optimum circle center calculation.

4. Press the record button again when the button is no longer grayed out to complete the circle track. This calculates the circle center. From this circle center concentric circles are displayed based on track spacing.

5. Press Enter button.

Lat/Lon:

1. Select the LATITUDE (LAT) input box and enter the center point latitude coordinates.

2. Select the LONGITUDE (LON) input box and enter the center point longitude coordinates.

NOTE: The Latitude and Longitude coordinates have to be entered in decimal degrees

3. Press ENTER button. This enters the circle center, and shows concentric tracks based upon the track spacing.

Operating Circle Track

When operating Circle Track it is not necessary to drive tracks in a specific order. Depending on your

zoom level all tracks that can be displayed will show up on the screen with the closest Track designated by a thicker line. The track number is displayed below the path accuracy indicator and is automatically updated by system as a new track is approached. Track number changes when machine is half way between two tracks.

Off Track error distance is shown in the path accuracy indicator. This number shows how far from closest track machine is. Error number will count up until machine reaches point halfway between two tracks. After reaching mid-point error number will count down as machine approaches next track.

Distance to end of pass utilizing Turn Predictor is shown in the top right portion of the guidance view. Distance will count down to predicted turn and tones will sound when machine is 10 seconds from intersecting turn point and again when predicted turn point has been reached.

NOTE: Track spacing may require adjustment due to operator and/or GPS error.

EXAMPLE: An operator may want to enter a slightly smaller width by adding an overlap to decrease implement width, than actual implement width to account for operator error while steering or GPS error. Shift Track When in Circle Track Mode, Shift Track is used to shift the tracks radially closer or further from the center point. Shift Track does not move the center point itself. This method of Shift Track allows the operator to use various implement widths, account for different lengths of center pivot towers or to account for stretching/shrinking of the center pivot irrigation sections.

Continued on next page

OUC6050,000172C -19-11JAN06-2/3

IMPORTANT: When using SF2 or SF1 Differential Correction (or when using RTK Quick Survey Mode) the Circle Center may drift over time or at power cycles. In Circles Track Mode, Shift Track does not compensate for GPS drift. In order to achieve accuracy and repeatability when using SF1 or SF2 Differential Correction, the center point must be recalculated by manually driving the circle on a daily basis (see Calculating Circle Center).

NOTE: RTK Absolute Base Mode is highly recommended in high accuracy applications when using Circle Track. Only RTK Absolute Base Mode provides consistent repeatability and accuracy in Circle Track.

Example 1: Operator makes first pass through the field saving Circle Center information to PASS 1 and RIVER FARM >EAST FIELD pulling a 4.6 m (15 ft) implement. Operator returns for second pass in same field with 9.1 m (30 ft) implement. If operator desires to follow same track stored, operator recalls saved circle center PASS 1, line up on desired track and use a one time shift track to allow for difference in implement widths.

Example 2: Operator is using SF2 and defines a circle center point by manually driving the circle. The following day, the operator returns to the field and finds that the AutoTrac is not lining up properly with the previous day's path due to GPS drift. The operator must re-drive the circle to find the Circle Center Point.

Shift Track Operation

To move line to left, press left shift track button. To move line to right, press right shift track button. Each time the left or right button is pressed, line will move the amount defined in the SHIFT TRACK SETTINGS tab. To re-center line on vehicle's current location press the center shift track button.

General Information

AutoTrac Accuracy - The overall AutoTrac system accuracy is dependent upon many variables. Equation looks like:

AutoTrac System Accuracy = Signal accuracy + Vehicle Setup + Implement Setup + Field/Soil Conditions.

It is very important to remember:

- Receiver has to go through a warm-up period upon start-up.
- Vehicle is setup properly (ballasted according to vehicle operator manual, etc.)
- Implement is setup to run properly (wear parts such as shanks, shovels, and sweeps are in good working condition and correctly spaced).
- Understand how field/soil conditions affect system (loose soil requires more steering than firm soil, but firm soil can cause uneven draft loads).

Accuracy in Slope Conditions:

Circle Track was designed for center pivot operation on ground with less than 2% slope. Customers who use circle track on slopes greater than 2% need to be aware of the performance of circle track in these conditions and why circle track performs they way that it does.

In operating Circle Track in some slope conditions there are cases where the circle track spacing and the center pivot tower track will not match in tower tracks away from the center pivot. This is due to the difference between distance traveled over a hill and on a level plane. AutoTrac draws the circle spacing as if the plane were level. The tower tracks obviously go over the hill terrain. This difference in distance will increase as slope increases.

Curve Track

IMPORTANT: Curve Track must be selected in order to operate Curve Track Guidance.

Track Spacing must be set for operation of this mode.

- GUIDANCE SETTINGS tab >> TRACKING MODE drop-down box >> CURVE TRACK
- EQUIPMENT softkey >> IMPLEMENT 1 tab >> enter implement width and desired track spacing.

Saving Curve Track Data

The stored Curve Track data is assigned to a Client, Farm, Field name that is setup in the RESOURCES/CONDITIONS softkey >> RESOURCES tab.

NOTE: Setup of Client, Farm, and Field is not required for Curve Track operation but is required for the track to be saved and repeated.

The recorded Curve Track data is saved to the data card. This data can be transferred into desktop software and saved to the data card or additional data cards for use in future field applications. The data card can also be taken from one GSD2100/2600 to another and recall the Curve Track data for use.

IMPORTANT: If it is desired to have repeatability with saved Curve Track data, it is required that the initial Curve Track data and subsequent trips across the field be made using StarFire RTK (Real Time Kinematics) accuracy. RTK base station should be operating in Absolute Base mode.

Recalling Saved Curve Data

NOTE: Recalled Curve Track data is available for the same width implement the data was recorded with. If a different implement width is used, new data must be recorded.

IMPORTANT: Make sure the data card contains the Curve Track data for this field.

- RESOURCES/CONDITIONS softkey >> RESOURCES tab (Select the Client, Farm, Field name to which the stored Curve Track data was assigned.)
- GUIDANCE SETTINGS tab >> TRACKING drop-down box >> CURVE TRACK
- EQUIPMENT softkey >> IMPLEMENT tab >> enter implement width/track spacing.

Clear Curve Track Data

If Curve Track data has been recorded previously for this field and operator does not want to use it or the data card is full due to stored Curve Track data, the Curve Track data can be removed from the data card.

To clear:

GUIDANCE SETTINGS tab >> TRACKING MODE drop-down box >> CURVE TRACK >> CLEAR DATA button (located to the right of TRACKING MODE drop-down box).

There are two options for clearing Curve Track data

- **For this field only** – clears Curve Track data for current field only on data card
- **For all fields** – clears Curve Track data for all fields stored on data card

Theory of Operation:

Continued on next page

OUC6050,000172D -19-09JAN06-1/3

Curve Track allows the operator to record a manually driven curved path (Similar to an A-B Line). Once the first curved pass has been recorded and machine is turned around, the operator can Parallel Track or activate AutoTrac once the propagated path appears. The vehicle will be guided along subsequent passes, based off of the previous recorded pass. Each pass is generated from the original driven pass to ensure that steering errors are not propagated through the entire field. The passes are not identical copies of the original pass. The curvature of the pass changes to maintain pass to pass error. When necessary, the operator can change the curve path anywhere in the field by simply steering the machine off the propagated path.

NOTE: Skip pass is not available in Curve Track mode.

Operating Curve Track

IMPORTANT: RTK Absolute Base Mode is required in high accuracy applications when repeatability is needed. Only RTK Absolute Base Mode provides consistent repeatability and accuracy in Curve Track.

To start using Curve Track:

GUIDANCE softkey >> VIEW tab—Select RECORD button

IMPORTANT: Recording has to be on to record initial pass and to propagate and record all subsequent passes.

Recording only needs to be turned off if machine is driven outside of normal field pattern (i.e. refill sprayer, planter) or if customer does not want to record turns at end of field or in headlands. Turning recording on/off must be done manually. Recording can be left on when turning at end of each pass if desired.

Drive initial pass.

NOTE: No navigation line will appear until end of pass is reached and machine is turned around. Once machine is turned around, system will begin searching through recorded line segments to determine path to guide on. System locates a line segment that is parallel and within 1/2 to 1-1/2 implement widths. The predicted path will appear from which the operator can navigate from.

Shift Track will only shift the recorded line segments in one direction based off of the orientation of the line segment you are currently on.

Record and Repeat

This feature allows the operator to recall saved Curve Track data (paths) for a field and guide on the recorded passes.

NOTE: Implement widths must be the same for all passes.

The operator can also manually drive an entire field or defined pattern with record button on and then repeat the recorded paths.

Example:

- Record each pass in a field that had drip tape installed without an automatic guidance system with varying guess rows.
- Follow beds from previous season to record all passes in field.

IMPORTANT: RTK Absolute Base Mode is required in high accuracy applications when repeatability is needed. Only RTK Absolute Base Mode provides consistent repeatability and accuracy in Curve Track.

Using Record and Repeat

- RESOURCES/CONDITIONS softkey >> RESOURCES tab (Select the Client, Farm, Field name to which the stored Curve Track data was assigned.)
- GUIDANCE SETTINGS tab >> TRACKING MODE drop-down box >> CURVE TRACK
- EQUIPMENT softkey >> IMPLEMENT tab >> enter implement width/track spacing.

Drive into field where first pass is located.

When the path the machine is to guide off of is highlighted, press resume switch (AutoTrac only) and machine will automatically steer on that pass. In Parallel Tracking (manual guidance) the operator will be guided off of the highlighted pass.

IMPORTANT: Do not turn the Record button on. Record and Repeat does not require the Record button be on unless the operator is redefining a path.

Guiding around Obstacles in Field

When operating Curve Track in a field and an obstacle is encountered such as a well head, telephone pole, or power line, the operator must drive around these obstacles.

Recording ON:

If recording is left on while driving around an obstacle that deviation to the propagated path will be recorded and become a part of the path. On the next pass when you approach the area in the field the propagated path for the pass that the machine is on will have incorporated that deviation and the machine will steer along that deviation. To straighten out that deviation,

the operator must take over manual steering of the machine and straighten out that deviation. Once the operator have driven past the deviation in the field and reacquired the intended path the resume switch may be engaged and AutoTrac will take over machine steering.

Recording OFF:

If recording is turned off when the obstacle is approached and steered around and then recording turned back on once the obstacle has been navigated around and AutoTrac engaged to finish the pass, there will be a gap in the recorded path where the obstacle is. On the next path when the machine approaches the gap the operator must take over manual steering of machine and navigate through the gap. Once the gap has been navigated and the propagated path is reacquired, AutoTrac can be engage and the gap will not appear in subsequent passes.

Guidance Patterns capable with Curve Track

The method of searching all line segments allows an operator to drive and be guided along a variety of field patterns:

- Simple Curve
- S-Curve
- Boxed
- Race Track
- Spiral

Shift Track Operation

The use of shift track is not recommended when using Curve Track. Shift track will not compensate for inherent GPS drift in Curve Track mode.

OUO6050,000172D -19-09JAN06-3/3

AutoTrac Accuracy

The overall AutoTrac system accuracy is dependent upon many variables.

Equation looks like:

AutoTrac System Accuracy = Signal accuracy + Vehicle Setup + Implement Setup + Field/Soil Conditions.

It is very important to remember:

- Receiver has to go through a warm-up period upon start-up.
- Vehicle is setup properly (ballasted according to vehicle operator manual, etc.)
- Implement is setup to run properly (wear parts such as shanks, shovels, and sweeps are in good working condition and correctly spaced).
- Understand how field/soil conditions affect system (loose soil requires more steering than firm soil, but firm soil can cause uneven draft loads).

OUO6050,000172E -19-08DEC05-1/1

Documentation

Turning Documentation On/Off

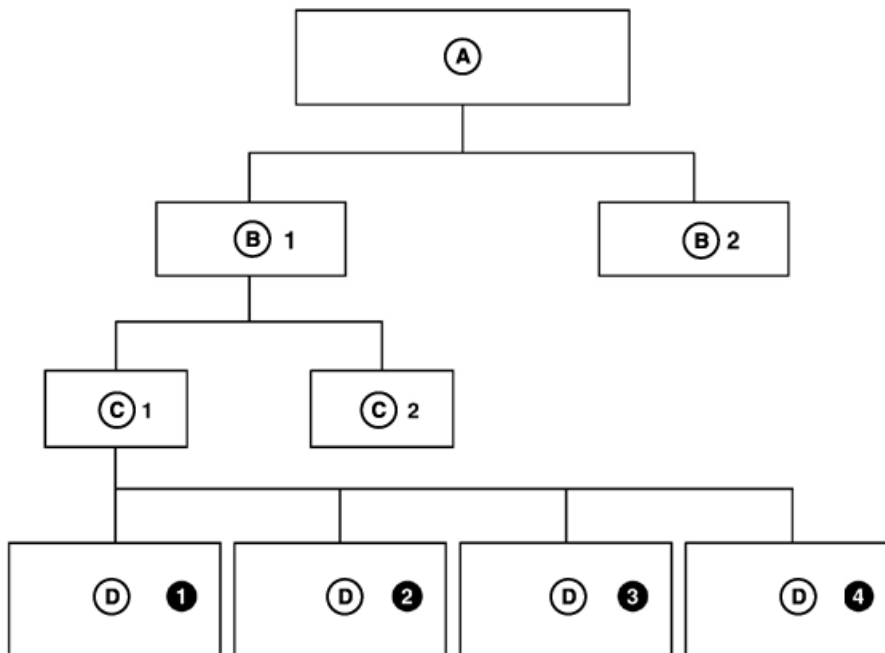
NOTE: Totals listed under TOTALS button are only calculated when documentation is turned on.

(See DOCUMENTATION softkey in this section to turn documentation on.)

To turn documentation off, for guidance only, go to RESOURCES/CONDITIONS softkey >> RESOURCES tab >> TASK. Change TASK to DOCUMENTATION OFF. This allows all guidance screens and features to be functional while recording no documentation data.

OUO6050,000172F -19-08DEC05-1/1

How Documentation Organizes Data



PC8867 -UN-02NOV05

A—FARM NAME

B—Field 1 and Field 2

C—Task 1 and Task 2

D—Operation 1-4

Data Organization

GreenStar Basics/Pro Documentation system organizes operation data as shown in chart. Each farm can have multiple fields, with each field there are multiple tasks and each task can have multiple

operations. A task is any trip over field to perform a specific function. Each defined task can contain up to four operation choices. Available operation types are defined later in this section. Each operation is defined by: product type, product name, rate of application and depth/height of application.

OUO6050,0001730 -19-08DEC05-1/1

DOCUMENTATION softkey

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 will ensure the setup data is saved to the data card prior to operating.

If the vehicle is running during setup and programming, turn the vehicle off 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.

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

Client, Farm, Field, and Task Setup

NOTE: See GreenStar 2 Basics/Pro General Setup, RESOURCES/CONDITIONS softkey for more information on setting up Client, Farm and Field.

1. Press RESOURCE/CONDITIONS softkey.
2. Select or Enter Client, Farm, Field, and Task.
3. Press DOCUMENTATION softkey.
4. Choose the type of operation and the details of each operation.
5. Press EQUIPMENT softkey.
6. Setup recording source and implement width.

PC8663 -UN-05AUG05



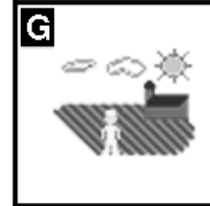
MENU button

PC8661 -UN-02NOV05



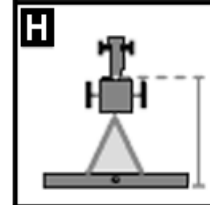
GREENSTAR2 PRO button

PC8676 -UN-05AUG05



RESOURCES/CONDITIONS softkey

PC8677 -UN-05AUG05



EQUIPMENT softkey

PC8678 -UN-05AUG05



DOCUMENTATION softkey

Operations

The user is allowed up to four operations per task. Below are available operations and details that can be setup within those operations.

Tillage

- Type
- Depth

Planting/Seeding

- Seed Type
- Single Variety
- Dual Variety*
- Seed Brand
- Variety
- Target Rate**
- Rate Units
- Application Method
- Depth
- Tillage Practice
- Lot Number

*split planter, dual motor planters only

**rate may come from controller on selected controllers

Product Application

- Product(s)/Product Rate
- Carrier/Carrier Rate*
- Tank Mix Name (Optional)
- Application Method
- Height

*rate may come from controller on selected controllers

Harvest

- Crop Type
- Seed Brand
- Variety
- Load Type
- Load Number
- Load Warning On/Off
- Load Cart
- Load Destination
- Residue management

Other

- Type
- Name

Automatically Generated Operations

Some operations will be automatically created when the display is connected to certain machines and a client, farm, field, and task are defined.

Example: When a SeedStar Gen II planter is connected to the display (and a client, farm, field, and task are defined) a seeding operation will automatically be created. The details of the operation will still need to be defined.

Limited Availability of Operations

Some operations WILL NOT be available when display is attached to certain machines and implements.

Example: When a John Deere 60 Series Combine is connected to the display only the harvest operation will be available.

OUO6050,0001732 -19-08DEC05-1/1

PC8663 -UN-05AUG05

Harvest Setup

MENU button >> GREENSTAR2 PRO button >>
DOCUMENTATION softkey >> HARVEST tab

This screen allows operator to setup and change following items:

HARVEST tab	
Grain	Cotton
Crop Type (* required)	Crop Type (* required)
Seed Brand	Seed Brand
Variety	Variety
Load Type	Different types
Load Number	Load Number
Load Warning On/Off	Load Warning On/Off
Load Cart	Load Cart
Load Destination	Module ID
Residue management	Gin Turnout %

NOTE: *Client, Farms, Fields, Task, have to be setup under RESOURCE/CONDITIONS Softkey before the harvest operation can be accessed.*

Save to a PC card before starting Harvest, otherwise it can be setup in cab as a new Names (see SETUP – R/C section).



MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8678 -UN-05AUG05



DOCUMENTATION softkey

OUO6050,0001789 -19-06JAN06-1/1

Changing Harvest Settings

NOTE: Operations can be setup using desktop software and saved to a PC card.

MENU button >> GREENSTAR2 PRO button >> DOCUMENTATION softkey >> HARVEST tab

Press CHANGE HARVEST SETTINGS button

The first screen allows operator to define:

- Crop Type
- Brand
- Variety

Crop Type—

Brand—

Variety—

The second screen allows operator to define:

- Load Type
- Load number
- Load cart
- Load Destination or Module ID
- Residue management or Gin Turnout%

Load Type—PRESS: ENTER/NEXT button

NOTE: Contractor and Contract # can only be setup with desktop software and saved to a PC card.

This screen allows a operator to view/change:

- Load Type (Grain = Tank/Truck/Field/Custom) (Cotton = Basket/Module/Field/Custom)
- Load Number (Increment to next load)
- Load Cart
- Load Destination or Module ID
- Residue Management or Gin Turnout %

Press letter button next to LOAD TYPE to toggle to desired selection:

PC8663 -UN-05AUG05



MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8678 -UN-05AUG05



DOCUMENTATION softkey

Continued on next page

OOU6050,000178A -19-11JAN06-1/3

- Tank - Auto increment when unloading auger is engaged then disengaged
- Basket- Operator manuals increment loads by pressing letter button next to NEXT LOAD on RUN PAGE screen (any size can be used for Cotton)
- Truck - Operator manuals increment loads by pressing letter button next to NEXT LOAD on RUN PAGE screen (any size can be used)
- Module - Operator manuals increment loads by pressing letter button next to NEXT LOAD on RUN PAGE screen (any size can be used Cotton)
- Field - Increments to next load when new field is Selected
- Custom – Allows operator to increment and define load with alpha/numeric text

Press LOAD DESTINATION button.

Select desired destination of load.

NOTE: Load destination can be setup with desktop software and saved to a PC card or custom named.

Press MODULE ID button.

Select desired MODULE ID.

NOTE: MODULE ID can be setup with desktop software and saved to a PC card or custom named.

Defining Residue Management

Press RESIDUE MANAGEMENT button.on SETUP - OPERATION screen and SETUP - RESIDUE MANAGEMENT screen will appear.

Select desired residue management:

- Chop
- Spread
- Chop and Spread
- Windrow
- Undefined (non-specified)

Defining Gin Turnout %

NOTE: Ensure that 1st Operations tab is set to Harvest.

Three other operations will be available for selection, but not needed.

Defining Header Width and Header Offset

Screen: Main Menu – GreenStar2 – EQUIPMENT

Press: MACHINE tab>> Machine list box

NOTE: Select COMBINE or COTTON PICKER if not detected automatically

Define model in list box to right of machine. (This not required)

Press: HEADER tab>> HEADER list box

Enter header model if desire. (not required)

Header Width is setup in Harvest Monitor, see Section on Original GreenStar Monitor for procedures.

Verify the proper width has been sent from Harvest Monitor and show in this tab.

This screen allows operator to define:

- Header Name
- Header Width comes from Harvest Monitor (see Original GreenStar Monitor)
- Header Offset

NOTE: Header Offset is used for operators using a offset head (i.e. draper).

OUO6050,000178A –19–11JAN06–3/3

Task Notes

Task notes can be used to provide detailed information to field operators, logging notes while in field, or gathering and reporting other information like soil sampling and field scouting. Task notes are organized

by task and notes for a particular task are common across all clients, farms and fields. Task notes are synchronized with desktop software, so note can be transferred from office to field and field to office.

OUO6050,0001733 –19–08DEC05–1/1

Controllers

When connected to controllers below, recording on/off will be controlled automatically:

- John Deere Harvest Monitor
- John Deere SeedStar for Air Carts
- John Deere SeedStar Gen 2 Monitor or Variable Rate Drive for Planters
- John Deere SprayStar Gen 4
- Raven 440, 450, 460, 660
- Rawson Accu-Rate and Accu-Plant
- New Leader Mark III Mark IV
- Dickey-john Seed Manager
- Vanguard PIC Seed Monitor

NOTE: Dual Variety Function can not be used with a three motor VRT planter

Once setup properly, the only operational changes needed for documentation are turning recording on/off, changing details within the operation, and changing Client/Farm/Field as needed.

If product details change while operating, go to DOCUMENTATION softkey and select tab for affected operation.

To remove a controller, you must select the remove button from the 3rd party controller setup page.

OUO6050,0001734 -19-09JAN06-1/1

TOTALS softkey

PC8663 –UN–05AUG05



MENU button

Totals

Totals screen allows operators to view a variety of operational information including:

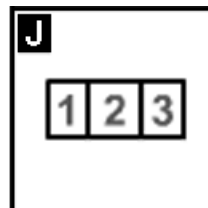
- Area
- Average Rate
- Total Amount
- Hours
- Time to Finish (estimated from implement width, ground speed and area remaining; assumes 100% efficiency)
- Area Remaining
- Average Productivity
- Fuel Used
- Date

PC8661 –UN–02NOV05



GREENSTAR2 PRO button

PC8679 –UN–05AUG05



TOTALS softkey

This information can be filtered by:

- Client
- Farm
- Field
- Task
- Operation
- Product Type
- Load

To filter totals, select criteria desired, and press enter.

To clear totals press and hold 0 button.

OUO6050,0001735 –19–08DEC05–1/1

PC8663 -UN-05AUG05

Harvest Totals

Totals

Totals for Harvest Totals screen allows operators to view a variety of operational information including:

By Crop and Client Caliber Harvest - Combine	Harvest - Cotton Picker
Brand	Brand
Variety	Variety
Area	Area (ha or ac)
Yield (dry)	Yield (ba/ac) avg Seed
Moisture (%)	Yield (ba/ac) avg Lint
Wet Mass	Min Lint Yield (ba/ac)
Yield (wet)	Max Lint Yield (ba/ac)
Dry Mass	Totals Seed (lbs)
Length of Time	Total Lint (lbs)
Estimated Time to Finish	Total Bales
Area Remaining	Length of Time
Productivity (bu/hr)	Productivity (ac/hr)
Productivity (ac/hr)	Productivity (ba/hr)
Total Fuel Used	Total Fuel Used (l or gal)
Date	Estimated Time to Finish
	Area Remaining
	Date

By Crop and Field

If the user selects a Client, Farm, Field, Task, Operation, and Crop while leaving all other fields as "----", the user will be able to view all totals for the selected Crop in the selected Field. These shall be termed "Field Totals". The attributes shown will be identical to the Crop Totals with the addition of "Estimated Time to Finish" and "Area Remaining" for all operations except for "Other" operations.

By Load (For Harvest operations only)

If the user selects a Client, Farm, Field, Task, Operation (= Harvest), Crop, and Load, the user will be able to view all totals for the selected Load. These totals will have the same information as the Crop Totals and will also show:



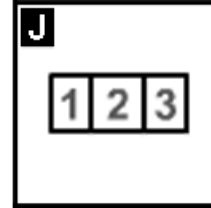
MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8679 -UN-05AUG05



TOTALS softkey

Continued on next page

OUO6050,000178B -19-11JAN06-1/2

Load Information		
Harvest - Combine	Harvest - Cotton Picker	Harvest - SPFH
Operator	Operator	Operator
Destination	Module ID	Destination
Load #	Load #	Load #
Load Type	Load Type	Load Type
Residue Management	Gin Turnout	

In addition, the totals will be filtered on the Load level. If Harvest is not selected in the Operation list box, the Load list box should be disabled.

This information can be filtered by:

- Crop Totals
- Field Totals (default)
- Load Totals

To filter totals, select criteria desired, and press enter.

To clear totals press and hold 0 button.

Interaction with Harvest Monitor

***NOTE:** Today with the GSD4 when Harvest Doc is on the bus with Harvest Monitor, the user cannot see totals on the Harvest Monitor. The same shall be with Documentation on the 2x00. The user shall not be able to see Harvest Monitor totals, either through the Original GreenStar Monitor emulation or through an auxiliary GSD4.*

Using Documentation with John Deere Air Carts

NOTE: Before setting up Documentations ensure SeedStar Air Cart is setup, See SeedStar Air Cart Operator's Manual for procedures.

When using a John Deere Air Cart, each tank will be represented by an operation. The far left tab will always represent the front tank. The second tab will represent the middle tank on a three tank cart, or the rear tank on a two tank cart. A third tab will appear for the rear tank of a three tank cart.

Whether the automatic operations are planting/seeding or product application is dependent upon the product chosen in SETUP/Air Cart/Configure Tanks.

Example: If barley is chosen as the product in SETUP/Air Cart/Configure Tanks/Front Tank, then the far left tab in documentation will be plant/seed.

Fill out each operation for each tank even if applying the same product from two or more tanks.

All aircart tanks will be represented by an operation tab, even if they are turned off. The target rate will be displayed as 0 for tanks that are turned off.

OUO6050,0001736 -19-08DEC05-1/1

Required and Optional Items For Documentation

The following items are required for documentation to function:

- Client, Farm and Field
- Task
- Operation
- Operation Details
- Recording Source
- Implement Width/Offsets
- Controller Setup (when using non-Deere controllers)
- Variety

- Operator
- Task Notes
- Weather Conditions
- Field Conditions
- Machine and Implement details
- Operation Advanced Settings
- Application method
- Lot #
- License #

The following items are optional when operating documentation:

OUO6050,0001737 -19-08DEC05-1/1

Map Based Prescriptions

Prescriptions

Application Plans from desktop software can be applied using selected implement controllers.

Map-based prescriptions are compatible with the following equipment:

- SeedStar Generation II (gray Boxes on planter frame) (1900 carts PIN 690101 and higher, and all 1910 carts) with Variable Rate Drives. Application Plans can be in seeds per hectare (acre).
- Air Cart must have Variable Rate Drives. Compatible with Gen2 1900 and 1910 model air carts with variable rate drives. Application Plans must be

kilograms/hectare (lbs/acre) for fertilizer or seed. (Application plans cannot be in liquid form.) Multiple prescriptions can be applied simultaneously by creating an operation for each tank.

- Sprayers and SprayStar Gen IV
- Non-Deere Controllers: Ensure accurate data is recorded by setting controller rate units equal to Application Plans. Non-Deere Controllers compatible with the following list of variable rate controllers:
 - Raven 440, 450, 460, 660
 - Rawson Accu-Rate and Accu-Plant
 - New Leader Mark III and Mark IV
 - LH Technologies

NOTE: Depending on capability of controller; seed, dry product and liquid can be applied.

Continued on next page

OJ06050,0001738 –19–16JAN06–1/3

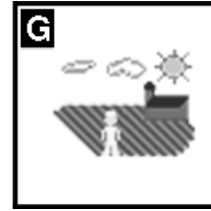
PC8676 -UN-05AUG05

Setup Prescriptions

Client, Farm, Field, and Task Setup

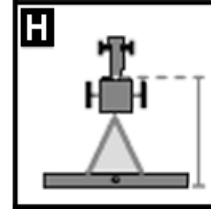
NOTE: See GreenStar 2 Basics/Pro General Setup, RESOURCES/CONDITIONS softkey for more information on setting up Client, Farm and Field.

1. Press RESOURCE/CONDITIONS softkey.
2. Select or Enter Client, Farm, Field, and Task.
3. Press EQUIPMENT softkey.
4. Setup recording source and implement width.
5. Press DOCUMENTATION softkey.
6. Choose an operation type. Example seeding or product application.
7. Press PRESCRIPTIONS button.
8. Select the PRESCRIPTION from the PRESCRIPTION drop-down box.



RESOURCE/CONDITIONS softkey

PC8677 -UN-05AUG05



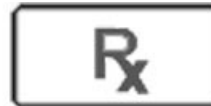
EQUIPMENT softkey

PC8678 -UN-05AUG05



DOCUMENTATION softkey

PC8704 -UN-17AUG05



PRESCRIPTIONS button

Prescription Multiplier

IMPORTANT: If using John Deere sprayer, rate knob must be set to AUX.

If using John Deere AirCart or Planter set JDOFFICE or JDMAP as Active Rate.

If using third party controller, see controller's operator's manual.

If applying multiple prescriptions, operator must choose a prescription for each operation. Example—air cart with a prescription for each tank.

If applying the same product from two of more tanks, operator will need a prescription for each tank.

Prescription Override

Select a rate to override the prescription.

Continued on next page

OUO6050,0001738 -19-16JAN06-2/3

You may increase or decrease the prescription rate by 15%. This will adjust all rates in the prescription by that amount.

Press Enter

OUO6050,0001738 -19-16JAN06-3/3

Coverage Map

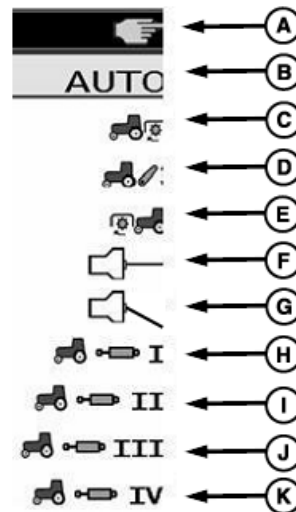
The coverage map is used to show where the vehicle has been in the field. The coverage map can be turned on and off in a number of different ways. To turn coverage map on/off the operator selects a recording source from:

MENU >> GREENSTAR2 PRO button >> EQUIPMENT soft key>> MACHINE tab >> RECORDING SOURCE drop-down box

(See EQUIPMENT softkey in the GreenStar General section for more details on which controllers can be used with AUTO to automatically communicate when the system should turn the coverage map on/off.)

NOTE: If manual mode is selected, operator must push record button to turn coverage map on and off.

Not all recording sources are available on all machines.



Recording Source

- A—Manual Recording On/Off
- B—Automatic (from controller)
- C—Rear PTO
- D—3-point Hitch
- E—Front PTO
- F—Implement Switch Open
- G—Implement Switch Closed
- H—SCV 1
- I—SCV 2
- J—SCV 3
- K—SCV 4

PC8770 -JUN-11OCT05

OUO6050,0001739 -19-08DEC05-1/1

Connecting Non-Deere Controllers

IMPORTANT: When connecting with a Rawson controller, turn main switch to OFF before leaving vehicle or performing maintenance.

Data from Non-Deere controllers can be recorded directly from the following controllers:

- Raven 440, 450, 460, 660
- Rawson Accu-Rate and Accu-Plant
- New Leader Mark III Mark IV
- Dickey-John Seed Manager

- Vanguard PIC Seed Monitor

System will record Actual Rate, Implement Width, and GPS Recording Status (implement switch not required) directly from controller.

Rawson, Raven, and New Leader Controllers are also capable of accepting prescriptions from the GS2 display. (See the Setup Prescriptions section for more information.)

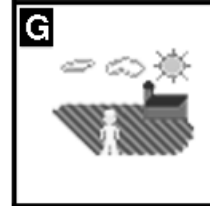
To setup a controller:

OUO6050,000173A -19-08DEC05-1/5

NOTE: You must purchase the harness PF90363 and follow the included instructions for connecting the controller to the display **NOTE:** Only one non-Deere controller can be connected to the display at a time.

1. Choose a Client, Farm, Field and Task in the RESOURCES softkey.

PC8676 -UN-05AUG05



RESOURCES softkey

OUO6050,000173A -19-08DEC05-2/5

2. Press the DOCUMENTATION softkey.
3. Choose either a Planting/Seeding or Product Application operation.
4. Press the Controller button.
5. Select manufacturer, model, and Comm Port. Communication Status will show active when data is being sent on selected Communication Port, and inactive when controller is disconnected or not communicating.

PC8678 -UN-05AUG05



DOCUMENTATION softkey

Continued on next page

OUO6050,000173A -19-08DEC05-3/5

6. Press NEXT button.

PC8872 -UN-17NOV05



NEXT

7. If using a Rawson or New Leader Controller, operator must also enter Mid-point and Step Size.

OUO6050,000173A -19-08DEC05-4/5

8. Press ENTER button to finish.

PC8649 -UN-01NOV05



ENTER button

OUO6050,000173A -19-08DEC05-5/5

Swath Control Pro—Enabling

IMPORTANT: Remember this will only function on a 4X20 series spray with compatible spraystar software. More platforms are planned for future releases.

Swath Control Pro is an optional activation on the display that when activated, will allow a 20 series John Deere sprayer to automatically turn off boom sections in sequence to avoid double coverage.

To view available software and enter code to activate Swath Control Pro see OBTAINING ACTIVATION CODE & ACTIVATING SOFTWARE IN DISPLAY in the Display Setup section.

NOTE: A 15 hour demo code is available on every display out of the box. The 15 hours count down when Swath Control Pro is checked, and the master spray switch on the sprayer is on. When the demo period is over, Swath Control Pro will be unavailable until the activation code is purchased through a John Deere Dealer, and entered into the display

IMPORTANT: Swath Control Pro system is intended to aid operator to perform field operations more efficiently. Operator is always responsible for machine path and must continue to

pay attention to surrounding environment while operating machine. Stop operation if poor visibility conditions impair operator's ability to identify people or obstacles in machine's path. Always operate tractor from seat. Not for use on roadways. Verify system is deactivated before traveling on roadways. Swath Control Pro system relies on GPS system operated by the United States government, which is solely responsible for its accuracy and maintenance. System is subject to changes that could affect accuracy and performance of all GPS equipment.

Swath Control Pro system is intended to be used as an assistance tool to manual section on/off. Operator must evaluate overall system accuracy to determine specific field operations where assisted swath control may be used. This evaluation is necessary because accuracy required for various field operations may differ depending on farming operation. Because Swath Control uses differential correction network along with Global Positioning System (GPS), slight shifts in position may occur over time.

Continued on next page

OUO6050,00017EF -19-19JAN06-1/7



CAUTION: Do not use Swath Control Pro system on roadways. Always turn off (Deactivate) Swath Control Pro system before entering a roadway. Do not attempt to turn on (Activate) Swath Control Pro system while transporting on a roadway. When system is activated remain alert and pay attention to surrounding environment. Take control of spraying when necessary to avoid field hazards, bystanders, equipment or other obstacles. Stop operation if poor conditions impair your ability to safely operate and steer machine.

IMPORTANT: The Swath Control Pro system is intended to aid operator in performing field operations more efficiently. Operator is always responsible for machine path and must continue to pay attention to surrounding environment while operating machine. Stop operation if poor conditions impair your ability to identify people or obstacles in machine path. Always operate machine from operator's seat. If provided, always use seat belt. The Swath Control Pro system relies on GPS system operated by government of United States, which is solely responsible for its accuracy and maintenance. System is subject to changes that could affect accuracy and performance of all GPS equipment.

All operators must be familiar with Swath Control Pro system and operating characteristics prior to operation. The following is a suggested procedure for operator to become familiar with system:

1. Read and understand Operator's Manual for GreenStar2 Swath Control Pro Systems.
2. Choose an open area free of hazards (ditches, buildings, etc.).

3. Run water in tank.
4. Operate vehicle at a speed you are comfortable with.
5. Enable Swath Control Pro on display by turning sections ON.
6. Press master spray switch to activate Swath Control Pro. (See Activating system later in this section).
7. After driving a short distance, then turn master spray switch to deactivate Swath Control Pro. (See Deactivating System later in this section).
8. Practice Activating Swath Control Pro at different distances before and after crossing boundaries, applied areas and at different angles, increase and decrease speeds to simulate different operating conditions.
9. Acquire multiple tracks and continue practicing activating Swath Control Pro at different angles and varying speeds to understand how Swath Control Pro behaves under different conditions. Always be prepared to resume manual control if Swath Control Pro does not perform expected maneuvers or machine course must be changed to avoid injury or property damage. Operator can regain manual section control by turning master spray switch off or unchecking (Disabling) Swath Control Pro. It is recommended practice to be as close as possible to desired path prior to activating Swath Control Pro. This will ensure correct path and direction are acquired.

Coverage Map

The coverage map is used to show where the vehicle has been and what sections have been applied in the field. The coverage map can be turned on and off in a number of different ways. The coverage map will be turned on/off automatically with recording source.

NOTE: If manual mode is selected, operator must push record button to turn coverage map on and off. Not all recording sources are available on all machines.

The following items are optional when operating Swath Control Pro:

NOTE: If a client, farm, and field are selected only the coverage or as-applied map for that field will be displayed.

- Client, Farm, and Field (if not selected, all coverage maps are saved to undefined Client, Farm, and Field)
- Documenting field operational data
- Field Boundaries (Field Boundaries are not required to create, but would be very useful.)
- As- Applied Map
- Prescription

NOTE: It is important that the system be setup properly. Read and follow each procedure in

this section to assure proper setup and operation of the swath control system.

Swath Control Pro Accuracy

The overall Swath Control Pro system accuracy is dependent upon many variables.

Swath Control Pro System Accuracy = Signal Accuracy + Vehicle Setup + Boom Setup + Field Conditions + Product Rate.

It is very important to remember:

- Receiver has to go through a warm-up period upon start-up.
- Vehicle is setup properly (according to vehicle operator manual).
- Boom is setup to run properly (wear parts are in good working condition and correctly spaced).
- Understand how field conditions and product rate to be applied can affect system.

Continued on next page

OUO6050,00017EF -19-19JAN06-3/7

Clearing Coverage Map

Press MAP SETTINGS button >> CLEAR COVERAGE MAP button

There are two options available:

- Current field
- All Maps

It is recommended to clear maps when field is finished. This does not clear as-applied maps only coverage maps on display.

Returning to a partially sprayed field will prompt the user to clear map or continue field task.

PC8663 -UN-05AUG05



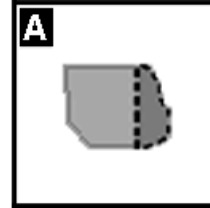
MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8672 -UN-05AUG05



MAPPING softkey

OUC6050,00017EF -19-19JAN06-4/7

Running a field boundary or interior BOUNDARIES section.

IMPORTANT: The Client, Farm, and Field must be defined.

The exterior boundary and interior boundaries can be ran from this page if desired. They can also be ran from the homepage if layout is setup that way. The homepage layout has a softkey option for these boundary controls to be functional from the homepage.

As-applied map will disappear from the homepage when the boundary recording is on. The as-applied map will be logging in the background and will show all of the as-applied map when boundary recording is finished.

- Exterior boundary- only one exterior boundary can be defined for a field.
- Interior boundaries - multiple interior boundaries can be define and named for a field.

PC8663 -UN-05AUG05



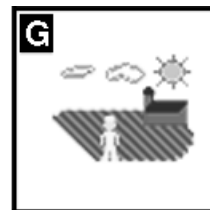
MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

PC8676 -UN-05AUG05



RESOURCES/CONDITIONS softkey

PC8903 -UN-19JAN06



MAPPING Softkey

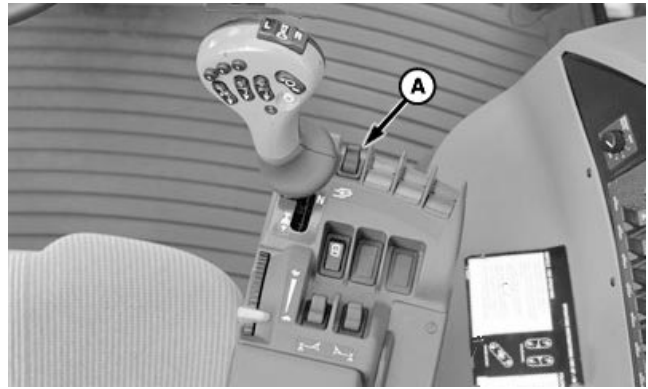
Continued on next page

OUC6050,00017EF -19-19JAN06-5/7

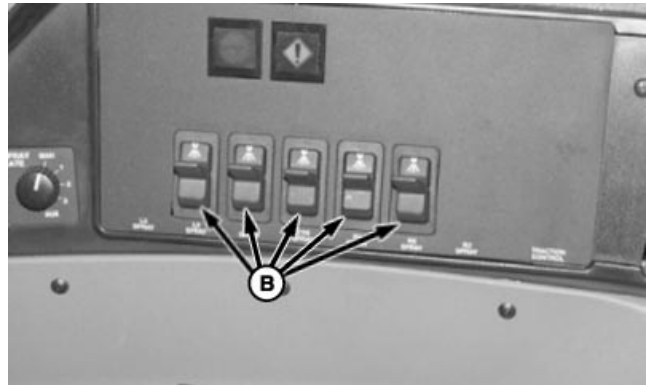
Activating system

- Solution Pump is on.
- Boom Section Switches are on.
- Master Spray Switch is on.
- Swath Control ON: is checked.
- Speed is greater than 0.8 km/h (0.5 mph).

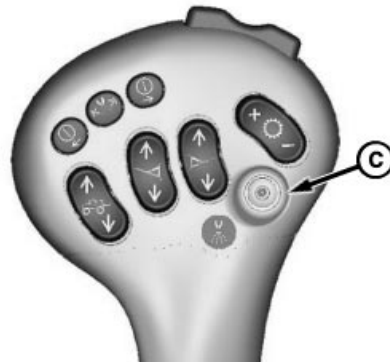
A—Solution Pump
 B—Boom Section Switches
 C—Master Spray Switch

*Solution Pump*

N66744 -UN-27JUL04

*Boom Section Switches*

N67614 -UN-16SEP04

*Master Spray Switch*

PC8910 -UN-19JAN06

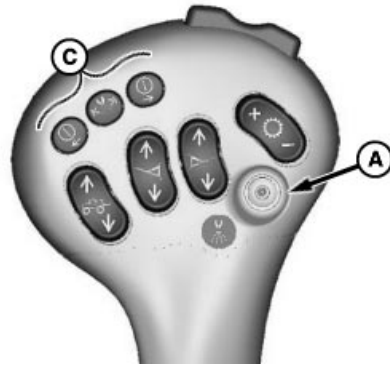
Continued on next page

OUO6050,00017EF -19-19JAN06-6/7

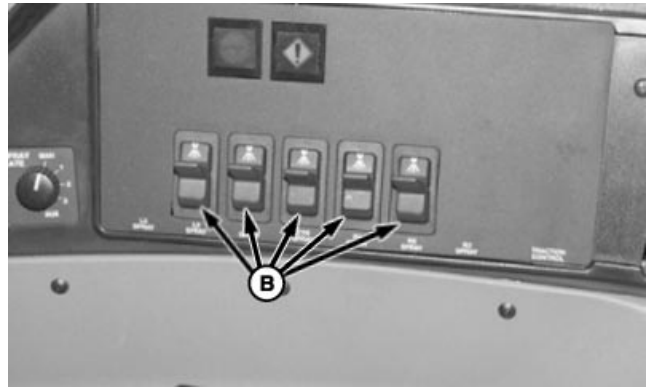
Deactivating system

- Master Spray Switch is pushed.
- Any Boom Section Switch is off.
- An IBS button is pushed.
- Swath Control ON: is unchecked.

A—Master Spray Switch
B—Boom Section Switches
C—IBS buttons



Master Spray Switch and IBS buttons



Boom Section Switches

OUC6050,00017EF -19-19JAN06-7/7

PC8911 -UN-19JAN06

N67614 -UN-16SEP04

Swath Control Pro—Setup

Swath Control Pro uses the GREENSTAR2 PRO - EQUIPMENT screen to record equipment settings required for setup.

This screen contains three tabs:

- MACHINE tab
- BOOM tab
- SWATH CONTROL tab

PC8663 -UN-05AUG05



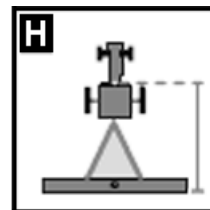
MENU button

PC8661 -UN-02NOV05



GREENSTAR2 PRO button

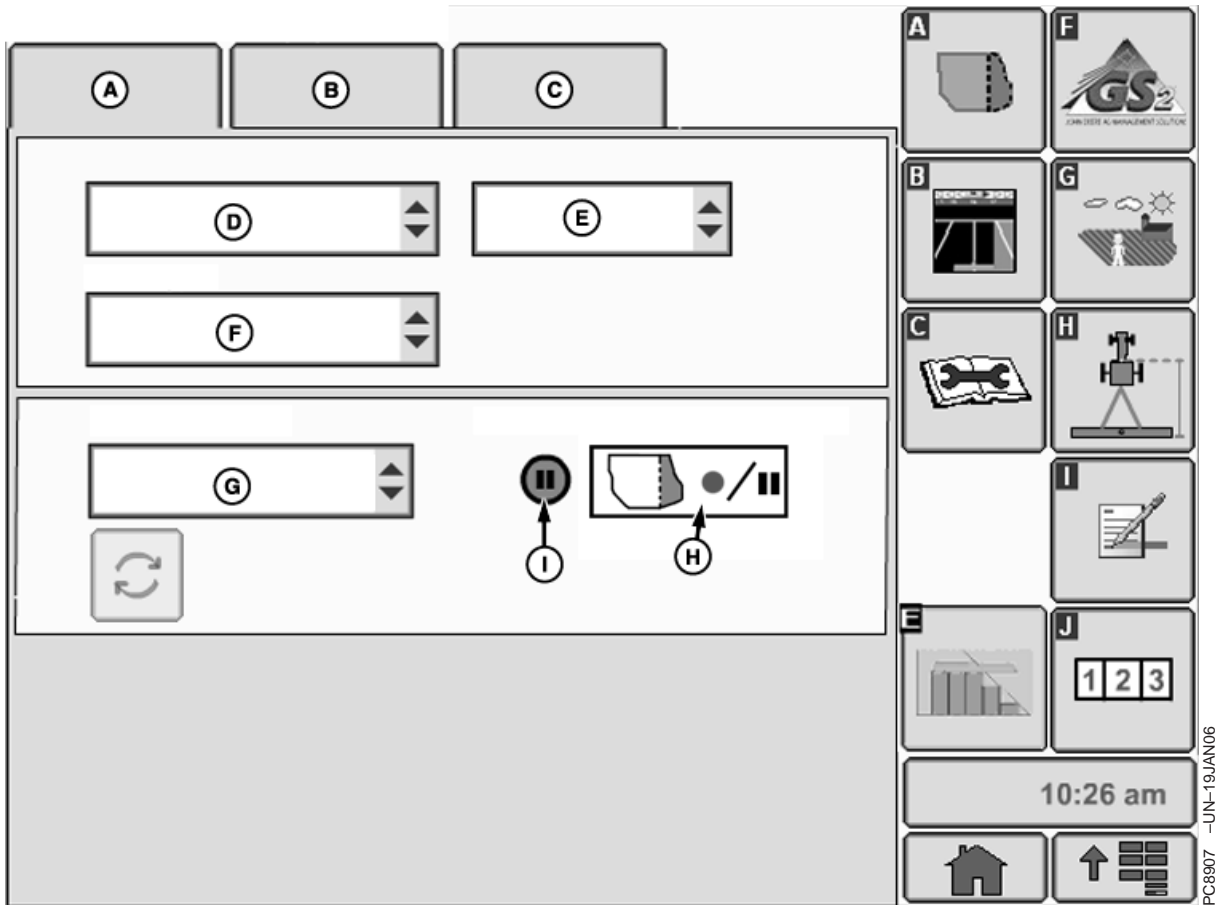
PC8677 -UN-05AUG05



EQUIPMENT softkey

Continued on next page

OUC6050,00017EE -19-19JAN06-1/4



MACHINE tab

A—Machine
B—Boom
C—Swath Control

D—Machine
E—Model

F—Hitch Type
G—Recording Source

H—Recording Button
I—Recording Status

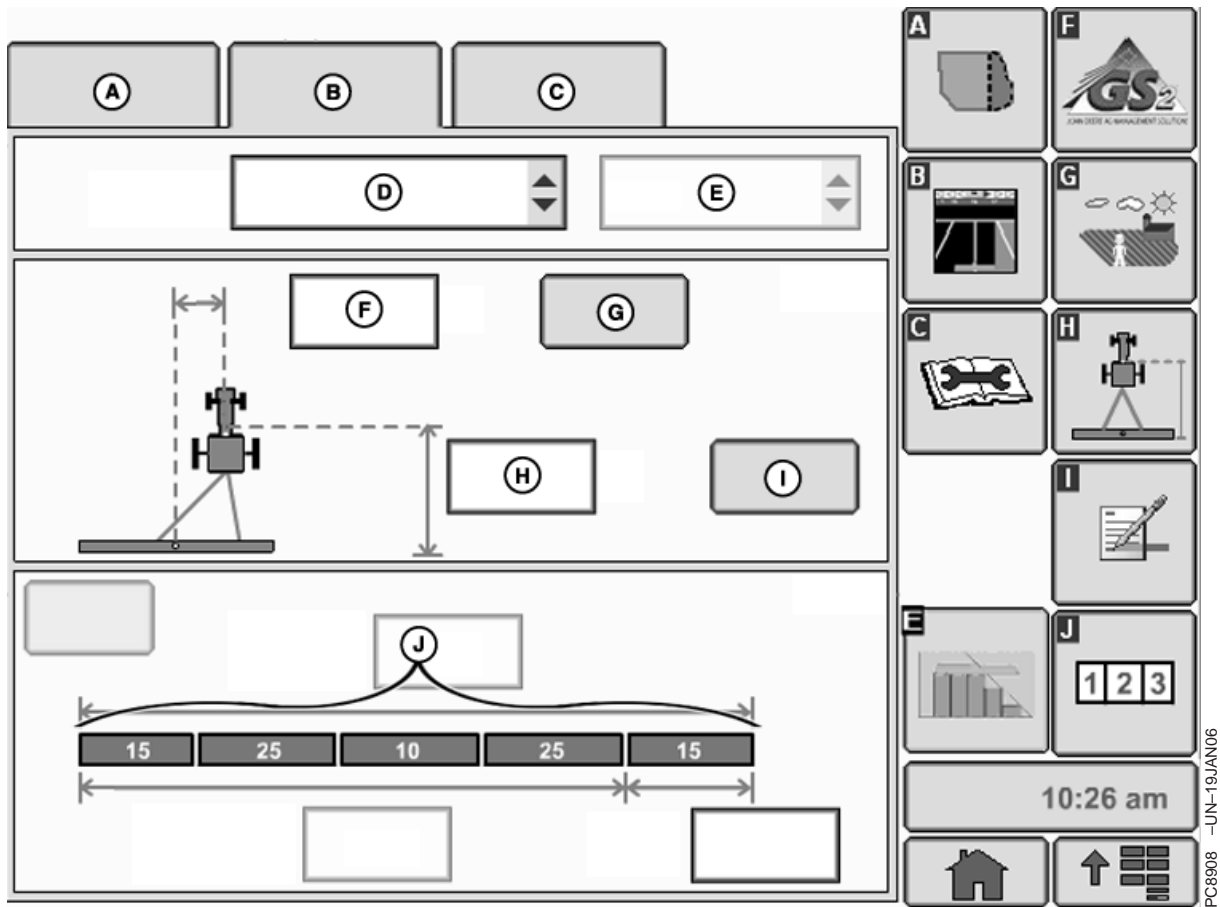
MACHINE tab

1. Verify machine box (D) is displaying sprayer.
Should be detected automatically when pulled into sprayer.

2. Enter machine model (E) if desired (not required).

Continued on next page

OUO6050,00017EE -19-19JAN06-2/4



BOOM tab

A—Machine
B—Boom
C—Swath Control
D—Implement

E—Model
F—Lateral Offset input box
G—Lateral Offset toggle
(left/right)

H—Inline Offset input box
I—Inline Offset toggle
(front/back)

J—Boom Sections and
Spacing

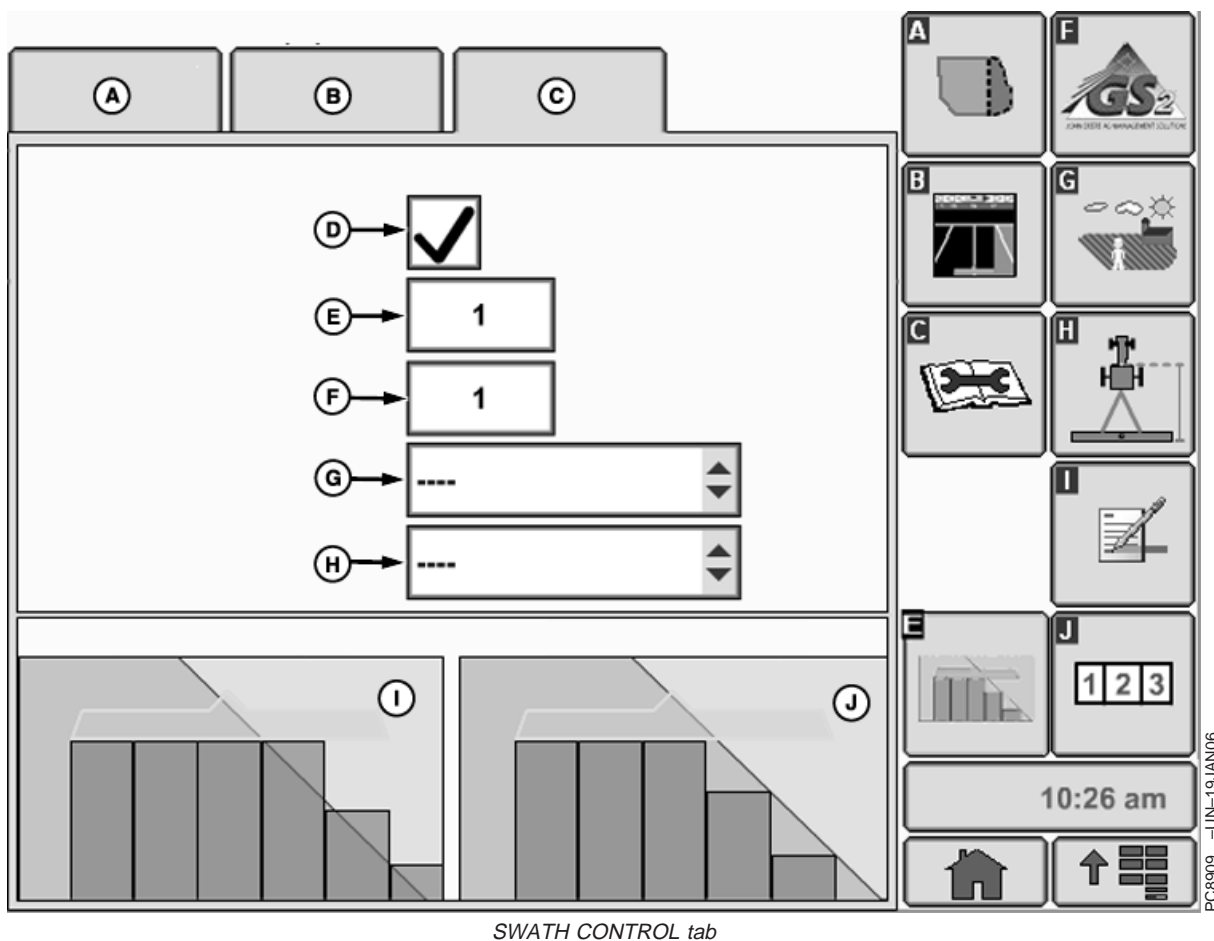
BOOM tab

NOTE: Inline offset is automatically filled in on 4X20 sprayers.

1. Verify proper inline offset is entered.
2. Verify proper number of boom sections and spacing. (This is setup in the SprayStar)

Continued on next page

OUO6050,00017EE -19-19JAN06-3/4



A—Machine
B—Boom
C—Swath Control

D—Swath Control ON:
checkbox
E—Turn on (sec):

F—Turn off (sec):
G—Exterior Boundaries
H—Interior Boundaries

I—Minimize Skips
J—Minimize Overlap

SWATH CONTROL tab

(D) Swath Control ON check box

—To turn swath control on—check Swath Control ON check box

—To turn swath control off—uncheck Swath Control ON check box

(E) Turn On time (sec): defaults to 1, but can be changed from 0 to 5.

(F) Turn Off time (sec): defaults to 1, but can be changed from 0 to 5.

(G) Exterior boundary has the option of minimizing skip or overlap (default to minimize skips)

(H) Interior boundaries have the option of minimizing skip or overlap (default to minimize overlaps)

(I) Minimizing skips will insure product coverage extends over field boundaries, interior boundaries and as-applied area reducing skips.

(J) Minimizing Overlap will insure product coverage does not extend over or out of field boundaries. It will also insure product coverage does not extend into an interior boundary. This setting could cause skips along field boundaries or interior boundaries depending on the angle a boundary is crossed.

Swath Control Pro—Coverage Map

IMPORTANT: Data card must be in display during operation or system functionality will deteriorate.

NOTE: This softkey will only show if sprayer is selected in EQUIPMENT softkey.

Coverage Map

The coverage map is used to show where the vehicle has been and what sections have been applied in the field. The coverage map can be turned on and off in a number of different ways. The coverage map will be turned on/off automatically with recording source.

PC8663 –UN–05AUG05



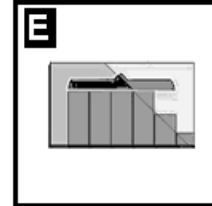
MENU button

PC8661 –UN–02NOV05



GREENSTAR2 PRO button

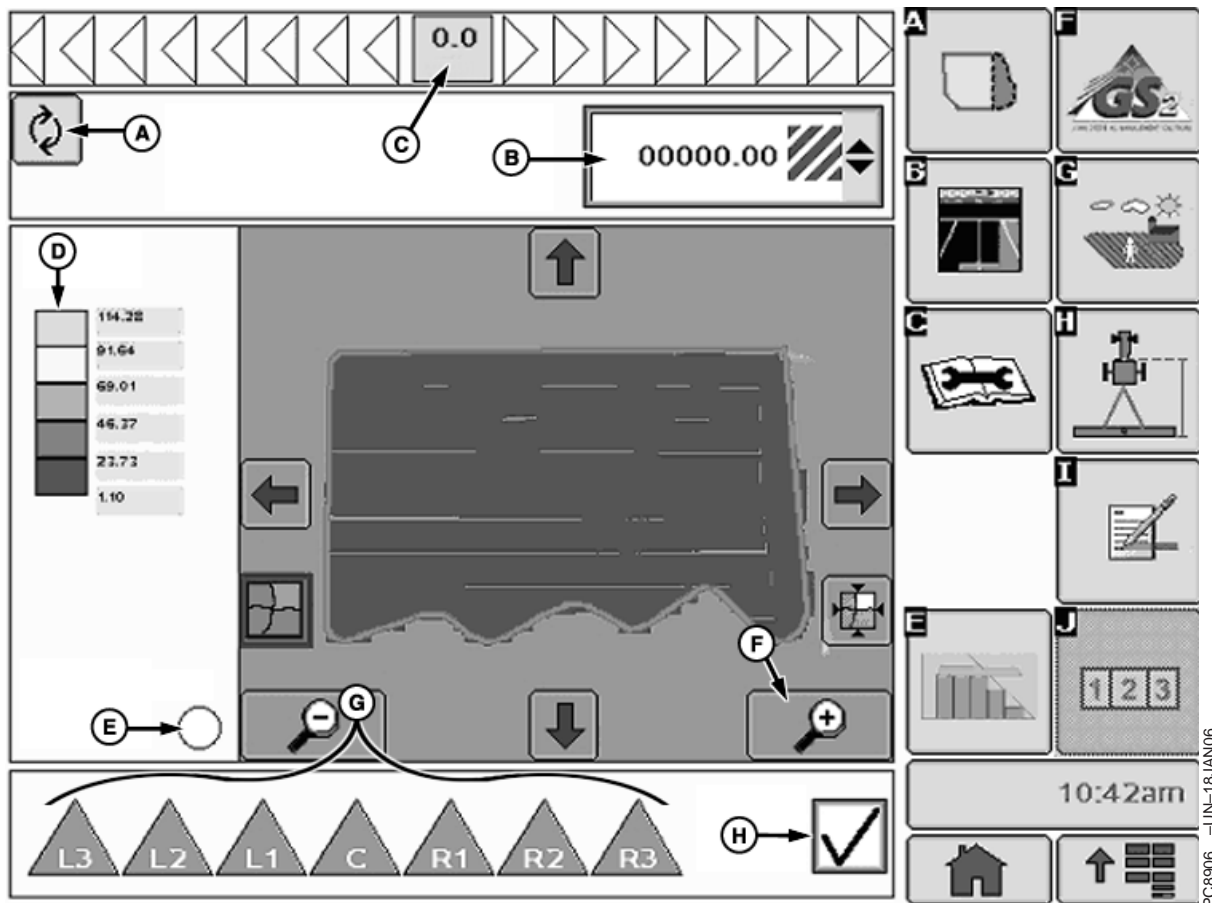
PC8905 –UN–18JAN06



SWATH CONTROL PRO Softkey

Continued on next page

OUO6050,00017EC –19–18JAN06–1/3



View (Swath Control Pro)

A—Toggle button
B—Documentation Totals
C—Path Accuracy Indicator

D—Legend
E—Recording Status

F—Zoom buttons
G—Section Status bar

H—Swath Control ON: check box

Although the above items are not required for system operation, they could enhance and provide additional features to the system while operating.

Mapping – Is a visual indication of coverage while spraying real-time. The overhead map view will allow operator to see covered area for each boom section.

(A) Toggle button – Is to increase/decrease map to take up full data mask or back to original data mask (Make sure operator can still see boom section box and status

(B) Documentation Totals – Are visual indicator of rate applied vs. target rate and third user defined total updated every second during operation. The third total indicator has the option to show the following with operating: Area covered (Changeable from drop down

list. Here is a list options to choose from: Average Rate Applied, Total Amount Applied, Length of Time, Average Productivity (ac/h), & Total Fuel Used)

(C) Path Accuracy Indicator – Is a visual indicator of off-track error. The indicator consists of eight arrows on each side of the off-track error box. The arrows will light up indicating the direction the vehicle must be steered to get back on the A-B line. Each arrow represents a distance. This distance is defined in the Guidance Settings tab under Accuracy Bar Step Size.

(D) Legend will automatically define rate increments for five different colors.

(E) Recording Status

(F) Zoom buttons

Continued on next page

OOU6050,00017EC –19–18JAN06–2/3

(G) Section Status bar Detected boom sections will be displayed here from your SprayStar setup. The ON status will be green and the OFF status will show gray.

NOTE: This status bar will only show if Swath Control Pro is activated and a sprayer is detected.

(H) Swath Control ON: check box will allow Swath Control to be turn On and Off by checking or unchecking box.

OUO6050,00017EC -19-18JAN06-3/3

Original GreenStar Monitor

PC8663 -UN-05AUG05

Compatible Systems

Press: MENU button >> ORIGINAL GREENSTAR MONITOR button

The following section explains operation of Original GreenStar Monitor software. Original GreenStar Monitor can be used to display information from controllers that are designed for use with original GreenStar display.

NOTE: The original GreenStar Monitor is only viewable as a full screen.

Compatible Systems

Original GreenStar Monitor application is compatible with following John Deere 2.5 v controllers:

- SeedStar Gen 1 Seed Monitor and Variable Rate Drive
- SeedStar Gen 2 Seed Monitor and Variable Rate Drive
- SeedStar Air Cart
- SprayStar
- Accu-Depth
- Original StarFire Receiver
- TCM
- European Drill
- European Sprayer
- European Spreader
- European Wrapping Baler
- Rauch Axera Fertilizer Spreader
- Harvest Monitor
- Self Propelled Forage Harvester



PC8657 -UN-05AUG05



ORIGINAL GREENSTAR MONITOR button

OUC6050,000173B -19-16JAN06-1/1

Operating Original GreenStar Monitor

IMPORTANT: If dual monitors are being used with an Original GreenStar Display on the system along with a 2100/2600 display, the Original GreenStar Monitor application will not be available and will not appear on menu.

Once in Original GreenStar Monitor application, operator interface will function the same as the Original GreenStar Display. See vehicle or implement Operator's Manual for more information.

OUC6050,000173C -19-16JAN06-1/1

Harvest Monitor—Combine

Original GreenStar Monitor

PC8663 -UN-05AUG05

Press: MENU button >> ORIGINAL GREENSTAR MONITOR button

Harvest Monitor is only available through the ORIGINAL GREENSTAR MONITOR application on the 2100/2600 displays. Once in the Original GreenStar Monitor application, operator interface will function the same as the Original GreenStar Display.

NOTE: The original GreenStar Monitor is only viewable as a full screen.

IMPORTANT: If dual monitors are being used with an Original GreenStar Display on the system along with a 2100/2600 display, Harvest Monitor will automatically function on the Original GreenStar Display and the Original GreenStar Monitor application will not be available and will not appear on menu.



PC8657 -UN-05AUG05



ORIGINAL GREENSTAR MONITOR button

OUO6050,000177A -19-08DEC05-1/1

Starting

Screen: SETUP - HARV MON - PAGE 1

Press: SETUP >> HARVEST MONITOR

Operator will need to setup information in HARVEST MONITOR on SETUP - HARV MON - PAGE 1 screen:

1. Header Type
2. Yield Calibration
3. Moisture
4. Recording

OUO6050,0001761 -19-08DEC05-1/1

Defining Header

Screen: SETUP - HEADER

Enter row spacing mm (inches) using numeric keypad.

Press: SETUP >> HARVEST MONITOR >> HEADER TYPE

Row Change

Screen: SETUP - HEADER

Press: SETUP >> HARVEST MONITOR >> HEADER TYPE >> ROW CHANGE

Set increments (in rows) for cut width to change on RUN - PAGE 1 screen. Use numeric keypad to enter number.

Platform/Belt Pickup

Screen: SETUP - HEADER

Press: SETUP >> HARVEST MONITOR >> HEADER TYPE >> WIDTH CHANGE

NOTE: If row crop (i.e. soybeans) are being harvested with a platform, and row spacing does not allow use of full header width, adjust header width to crop width being cut. For example; 7.6 meter (25 ft) platform may be 7 meters (24 ft) depending on row spacing.

Platform = Actual field cutting width in meters (feet)

Belt Pickup = Actual width of grain cut to produce windrow in meters (feet).

Set increments (in m (ft)) for cut width to change on RUN - PAGE 1 screen. Use numeric keypad to enter number.

Change increments (in meters or feet) for cut width to change on RUN - PAGE 1 screen. Use numeric keypad to input correct header width in meters or feet.

IMPORTANT: Make certain header type is correct when changing from one header to another. The wrong header selection will result in an inaccurate information.

NOTE: To change from feet to meters see SETUP GreenStar DISPLAY.

Depending on which type of header is selected, there are additional items to be setup.

HEADER TYPE button will toggle between corn head, row crop, platform and belt pickup.

Select desired header type.

Corn Head/Row Crop Head

IMPORTANT: Make certain row spacing is correct when header types are changed. The wrong row spacing will result in inaccurate area calculation.

Header Width

Screen: SETUP - HEADER

Press: SETUP >> HARVEST MONITOR >> HEADER TYPE >> HEADER WIDTH

Enter header (in rows) width using numeric keypad.

Row Spacing

Screen: SETUP - HEADER

Press: SETUP >> HARVEST MONITOR >> HEADER TYPE >> ROW SPACING

Calibration

General Calibration Information

Screen: SETUP - YIELD CALIBRATION

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION

Mass flow sensor must be calibrated in order to achieve accurate grain weight measurements. Standard Calibration procedure must be performed in every crop that is harvested. In addition, optional Low Flow Compensation procedure may be performed to obtain an improved level of accuracy in situations where there are large variations in grain flow rate.

The following paragraphs describe different screens that are used in calibration procedure.

Calibration In Progress or System Not Calibrated Cell

This section displays if mass flow sensor has been calibrated to desired crop.

If system has not be calibrated a message displaying "System NOT Calibrated" will be displayed.

If standard calibration has been performed a bar graph indicating flow rate sensor has been accurately calibrated.

If a standard and low flow calibration has been completed, bar graph will expand to show an increased area of accuracy.

Calibration Mode Cell

This screen indicates whether Standard Calibration procedures or optional Low Flow procedure is to be performed.

Press CALIBRATION MODE button to switch between STANDARD CALIBRATION and optional LOW FLOW CALIBRATION.

Yield Calibration Cell

This screen allows calibration procedure to be started or stopped.

Harvested Weight Cell

This screen indicates approximate weight of grain that has been harvested during calibration process.

Scale Weight Cell

This screen allows scale weight to be entered after a calibration run is complete (during calibration run, indicates approximate weight of grain that has been harvested).

Calibration Factor Cell

Value shown here allows mass flow sensor to read accurately. This value will be updated automatically by Calibration procedure. This value can also be adjusted manually.

Continued on next page

OUO6050,0001763 -19-08DEC05-1/2

IMPORTANT: Before calibrating be sure that combine grain tank and unloading auger tube are empty. Be sure that wagon or truck hauling grain away from combine is empty.

NOTE: Message with the following information may appear on screen: "Low Cal Flow Comp NOT required". If this message appears, flow rate during calibration was very low. Therefore, it is neither necessary nor possible to perform optional Low Flow Compensation procedure. Standard Calibration procedure is sufficient.

Yield monitor system can be accurate only if operator follows correct calibration procedures.

The following procedures should be performed at maximum ground speed which operator expects to run in this crop and condition, and in an area that is reasonably level and of uniform yield.

1. Press CALIBRATION MODE button to select desired calibration.
2. Press START/STOP button. Display will change to YIELD CALIBRATION IS RUNNING.
3. Begin harvesting. Weight displayed in HARVESTED WEIGHT cell should increase while harvesting.
4. Harvest known amount of grain (i.e. grain tank full, truck load, wagon load, etc.).
5. When known load is completed, stop machine and allow all harvested grain to enter grain tank.

6. Press STOP button to stop calibration. Display will change to YIELD CALIBRATION IS STOPPED.

IMPORTANT: Be sure to empty grain tank completely and be certain all grain is on one vehicle (wagon or truck).

7. Have known amount of grain weighed. While waiting for scale ticket to return, you may continue by pressing RUN button.
8. When scale ticket returns to combine, go to Yield Calibration Page.
9. Press SCALE WEIGHT button to change weight value.
10. Using numeric keypad, input NET WEIGHT OF GRAIN from scale ticket.

IMPORTANT: Standard calibration procedure will not change data already saved. After changes are made, all harvest information collected from that point on will reflect changes.

NOTE: If scale ticket weight is more than 50% higher or lower than displayed weight, system will NOT allow entry of scale weight.

11. Press SCALE WEIGHT button to enter new value. CALIBRATION FACTOR will change automatically when grain weight is entered.

OUO6050,0001763 -19-08DEC05-2/2

Low Flow Compensation Procedure—Optional

NOTE: *DO NOT perform a manual adjustment of calibration factor if you intend on using Low Flow Compensation procedure.*

The following procedure should be performed only after Standard Calibration procedure has been performed for this crop and condition. While procedure is optional, it will produce accurate results only if it is followed carefully.

The procedure should be performed at approximately one-half to two-thirds of ground speed at which Standard Calibration procedure for this crop and condition was run and in an area that is reasonably level and uniform in yield.

Screen: SETUP - YIELD CALIBRATION

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION

IMPORTANT: **Be sure combine grain tank and unloading auger are empty. Be sure wagon or truck hauling grain away from combine is empty.**

1. Press CALIBRATION MODE button and select LOW FLOW.
2. Press START/STOP button and display will change to YIELD CALIBRATION IS RUNNING.

NOTE: *There is a delay after changing ground speed before moving indicator responds. Therefore, after making a ground speed adjustment, wait 10 to 20 seconds and observe effect of moving indicator before making another adjustment.*

3. Begin harvesting and adjust ground speed until moving indicator stabilizes in target range.
4. Weight displayed HARVESTED WEIGHT cell should increase while harvesting.
5. Harvest known amount of grain (grain tank full, truck load, wagon load, etc.).

6. When known load is completed, stop machine and allow all harvested grain to enter grain tank.

NOTE: *Message with the following information may appear: Comp Flow Too High. Repeat Comp Run. If this message appears, it will not be possible to enter scale weight. Repeat optional Low Flow Compensation procedure, paying special attention to keep moving indicator in target range (A).*

7. Press START/STOP button again to stop calibration. Display will change to YIELD CALIBRATION IS STOPPED.

IMPORTANT: **Be sure to empty grain tank completely and make sure all grain is on one vehicle (wagon or truck).**

8. Have known amount of grain in truck or wagon weighed. While waiting for scale ticket to return, you may continue by pressing RUN button.
9. When scale ticket returns to combine, go to YIELD CALIBRATION screen
10. Press SCALE WEIGHT button to change weight value.
11. Using numeric keypad, input net weight of grain from scale ticket.

IMPORTANT: **Calibration procedures will not change data already saved. After changes are made, all harvest information collected from that point on will reflect changes.**

NOTE: *If scale ticket weight is more than 50% higher or lower than displayed weight, system will NOT allow entry of scale weight.*

12. Press SCALE WEIGHT button to enter new value. FLOW COMP NUMBER will change automatically when grain weight is entered.

Manually Adjusting Calibration Factor

Screen: SETUP - YIELD CALIBRATION

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION

NOTE: Do not perform a manual adjustment of Calibration Factor if you intend on using Low Flow Compensation procedure.

If scale weight is more than 50% higher or lower than displayed weight, system will not allow entry of scale weight.

A new calibration factor can also be entered manually. To calculate calibration factor, divide weight shown on display by new weight on scale ticket. Multiply result by displayed calibration factor (see example below). This is the new calibration factor.

To manually enter a calibration factor:

1. Press CALIBRATION FACTOR button to change calibration factor.
2. Using numeric keypad, input calibration factor.
3. Press CALIBRATION FACTOR button to enter a new value.

Displayed Calibration Factor (950) X Weight of grain shown on display (27,643 lb) / Net weight of grain from scale ticket (27,022 lb) = New Calibration Factor (971)

Displayed Calibration Factor = 950

Weight of grain shown on display = 27,643 lb

Net weight of grain from scale ticket = 27,022

New Calibration Factor = 971

OUO6050,0001765 -19-08DEC05-1/1

SETUP - MOISTURE CORRECTION

IMPORTANT: Changing moisture correction in the “Moisture Correction” cell will not change the data already saved. After changes are made, all harvest information collected from that point will reflect the changes.

SETUP - MOISTURE screens are used to setup moisture correction, moisture alarm (on/off) and moisture curves.

Screen: SETUP - MOISTURE

Press: SETUP >> HARVEST MONITOR >> MOISTURE

Moisture correction screen is used to set moisture correction to match reading from a customer or elevator certified moisture sensor as shown on RUN - PAGE 1 screen.

OUO6050,0001766 -19-08DEC05-1/1

Moisture Correction

NOTE: Harvesting, recording is "ON", determine how many points the moisture correction needs to be added or removed from the instantaneous moisture.

Not harvesting, recording "OFF", will display average moisture of crop. Average moisture does not need to be corrected. If average moisture is corrected, the instantaneous moisture could be over corrected.

1. **Screen:** SETUP - MOISTURE CORRECTION

Press: SETUP >> HARVEST MONITOR >> MOISTURE >> MOISTURE CORRECTION

NOTE: "Crop" cell displays the selected crop.

2. MOISTURE CORRECTION button and FIXED MOISTURE VALUE button allow the operator to correct the moisture reading on RUN - PAGE 1 screen by toggling to FIXED MOISTURE VALUE, moisture sensor will be disabled and forces moisture value to what was entered.
3. If using MOISTURE CORRECTION: Press MOISTURE CORRECTION button and using numeric keypad input a number value to be added to reading displayed on RUN - PAGE 1 screen.
4. Press MOISTURE CORRECTION button again to save this value.
5. If using fixed moisture value; Press FIXED MOISTURE VALUE button and using numeric keypad, input a number value (%) to be displayed on RUN - PAGE 1 screen.

Advanced Moisture Correction

NOTE: This procedure is used to determine moisture correction when elevator readings do not agree with combine moisture readings.

Do not use this procedure if crop moisture levels are above 16%. For crops above 16% enter moisture correction manually.

1. Collect 1 L (1 qt) grain sample from the grain tank and place in a sealed container and have tested by elevator.

IMPORTANT: To finish this procedure the combine engine must be turned OFF.

2. Press ADVANCE MOISTURE CORRECTION button on SETUP - MOISTURE CORRECTION screen.
3. Press ELEVATOR GRAIN MOISTURE button on SETUP - ADVANCED CORRECTION screen.
4. Using numeric keypad, enter value from elevator.
5. Press ELEVATOR GRAIN MOISTURE button to save value.
6. To start sampling press START button.

NOTE: Screen will prompt operator to POUR SAMPLE IN MOISTURE SENSOR.

Make sure moisture sample chamber is fully filled and is free of air pockets. Air pockets will cause inaccurate moisture readings.

7. Pour sample into moisture sensor.
8. Screen will display CALIBRATION IN PROGRESS.
9. MEASURED MOISTURE IS cell will display the moisture of the sample in the moisture sensor.
10. Press ACCEPT button to save this value or press DECLINE button to decline this value.

Moisture Alarm

This screen is used to determine the set points (minimum and maximum) for activation of the moisture alarm.

Press MOISTURE ALARM button on SETUP - MOISTURE screen and SETUP - MOISTURE ALARM screen will appear.

Press MINIMUM MOISTURE button and using numeric keypad enter a new minimum setting.

Press MAXIMUM MOISTURE button and using numeric keypad enter a new maximum setting.

Press MOISTURE ALARM button to toggle ON/OFF.

OUO6050,0001768 -19-08DEC05-1/1

Moisture Curve

Three moisture curve choices are:

- Enter New Curve — This would be used when a new curve has been developed for a new crop.
- Update Curve — This would be used when a better curve has been developed for a current crop.
- Restore Curve Defaults — This would be used when to reinstate the original curve.

Refer to MOISTURE CURVE CALIBRATION CODES later in this section for the latest available codes.

This screen is used to enter new moisture curves that may be provided by the factory.

Use the following to enter a new curve as directed.

1. Press MOISTURE CURVE button on SETUP - MOISTURE screen and SETUP - CROP - PAGE 1 screen will appear.

NOTE: If needed press page button until desired crop appears.

2. Press desired crop to be updated.

NOTE: To view current moisture curve, go to INFO Harvest Monitor section.

3. Press CROP button to toggle between ENTER NEW CURVE, UPDATE CURVE or RESTORE CURVE DEFAULTS.

4. If ENTER NEW CURVE is selected press letter button next to a blank cell and using numeric keypad enter the new moisture curve number.

5. Press SAVE THIS CURVE button.

NOTE: To update an existing curve, toggle to UPDATE CURVE on SETUP - MOISTURE CURVE screen.

6. Press letter button next to blank cell and using numeric keypad enter update.

7. Press SAVE THIS CURVE button .

8. To restore default curves, press CROP button to toggle to RESTORE CURVE DEFAULTS.

9. Press SAVE THIS CURVE button to restore default curves for the selected crop.

OUO6050,0001769 -19-08DEC05-1/1

Selecting Recording

Selected recording will be boxed and in capital letters.

OUO6050,000176C -19-08DEC05-1/1

Setting Yield/Area Units

This screen is a continuation of SETUP - HARV MON - PAGE 1 screen.

This screen allows operator to choose Yield Units and Area Units that will be displayed on RUN pages. It also allows operator to configure RUN pages and turn on and off printer functions.

Yield Units

NOTE: See Standard Weights Chart section for standard weights of corps.

To select units of measure for yield readings, press YIELD UNITS button and SETUP - YIELD UNITS - PAGE 1 screen will appear.

Press desired unit.

Area Units

To select units of area press AREA UNITS button: on SETUP - HARV MON - PAGE 2 screen. AREA UNITS button will toggle between ACRES and HECTARES. Selection will appear boxed in capital letters.

OUO6050,000176D -19-08DEC05-1/1

Harvest Monitor—Picker

Original GreenStar Monitor

PC8663 -UN-05AUG05

Press: MENU button >> ORIGINAL GREENSTAR MONITOR button

Harvest Monitor is only available through the ORIGINAL GREENSTAR MONITOR application on the 2100/2600 displays. Once in the Original GreenStar Monitor application, operator interface will function the same as the Original GreenStar Display.

NOTE: The original GreenStar Monitor is only viewable as a full screen.

IMPORTANT: If dual monitors are being used with an Original GreenStar Display on the system along with a 2100/2600 display, Harvest Monitor will automatically function on the Original GreenStar Display and the Original GreenStar Monitor application will not be available and will not appear on menu.



PC8657 -UN-05AUG05



ORIGINAL GREENSTAR MONITOR button

OUC6050,000178F -19-07JAN06-1/1

Flow Chart

Setup					
Harvest Monitor					
Page 1					
Yield Units	Area Units	Set Number of Rows and Spacing	Yield Calibration	Run Page	Recording ON/OFF
Bales	Acres	Total Width	Quick Cal		Material
Pounds	Hectares	Spacing	Standard Cal		Header
Kilograms		Active Rows	Manual Cal		Combination
Hundred wt.		Machine Model	Row Correction Cal		Manual
Metric Tonnes					
Tons					

OUC6050,000176E -19-08DEC05-1/1

Setting Yield Units

Screen: SETUP

- Bales
- Pounds
- Kilograms
- Hundred Wt
- Metric Tonnes
- Tons

Press: SETUP >> HARVEST MONITOR >> YIELD UNITS:

NOTE: See standard weight chart section for standard weights of crops.

OUO6050,000176F -19-08DEC05-1/1

Setting Area Units

Screen: SETUP - HARVEST MON

Press AREA UNIT button to toggle between ACRES and HECTARES. Selection will appear boxed in and capitalized.

Press: SETUP >> HARVEST MONITOR

OUO6050,0001770 -19-08DEC05-1/1

Setting Rows and Spacing

Screen: SETUP - ROWS & SPACING

Press: SETUP >> HARVEST MONITOR >> SET ROW & SPACINGS

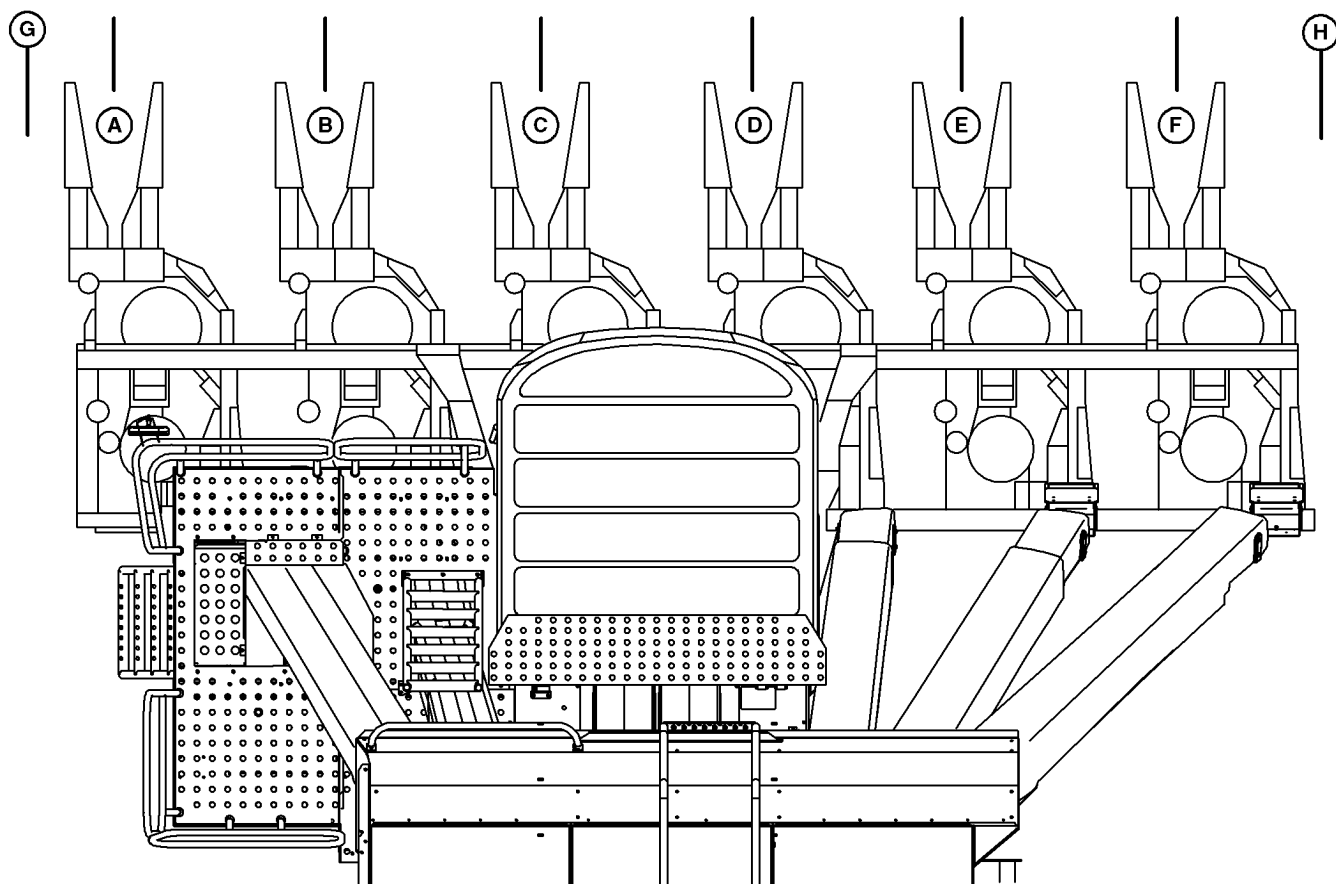
IMPORTANT: Make certain rows and spacings are correct. Wrong row spacing will result in inaccurate area calculation.

1. Press NUMBER OF ROWS button.
2. Enter number of rows and press NUMBER OF ROWS button again to enter value.

NOTE: A caution will be displayed in section G to state limits for row spacings.

Continued on next page

OUO6050,0001771 -19-08DEC05-1/3



PC8135 -UN-12MAR04

A—Row #1
B—Row #2

C—Row #3
D—Row #4

E—Row #5
F—Row #6

G—Row Left of First Row
H—Row Right of Last Row

3. Enter row spacing for all rows starting with LEFT OF FIRST ROW. Press SELECTED ROW SPACING button to toggle from one row spacing to next. Press ROW SPACING button to enter distance between rows.

Example: You have a 9996 cotton picker, which is setup to pick 6 rows of 30 (in) cotton. To setup up the right spacing in the Display for area to be calculated properly you will need to enter the following:

- Enter 6 for the number of rows.
 - Next enter 30 (in) for each selected row spacing.
 - To enter row spacing you will need to toggle between selected rows
- Left of first Row should = a row spacing of 30 (in)
 - Between first and second row should = a row spacing of 30 (in)
 - Between second and third row should = a row spacing of 30 (in)
 - Between third and fourth row should = a row spacing of 30 (in)
 - Between fourth and fifth row should = a row spacing of 30 (in)
 - Between fifth and sixth row should = a row spacing of 30 (in)
 - Right of last row should = a row spacing of 30 (in)
 - Total width should now show 15 (ft).

Continued on next page

OUO6050,0001771 -19-08DEC05-2/3

NOTE: Picker setup for skip row cotton will vary from above example.

4. Verify TOTAL WIDTH: is shown correctly after entering all row spacings.
5. To make a row inactive press ROW SELECT button until number of desired row appears boxed in.

Press ROWS ACTIVE button to toggle selected row between ON/OFF. When a row is inactive its number will appear on display with a slash through it.

6. Press MACHINE MODEL button to toggle to proper machine model. There may be only one machine model available depending on software version.

OUO6050,0001771 -19-08DEC05-3/3

Calibration

NOTE: Always read the text to the left of the START/STOP arrow. This explains the current status of calibration. Arrow changes back and forth between START and STOP. When yield calibration is stopped, START arrow is shown. When yield calibration is running, STOP arrow is shown.

STOP arrow—CALIBRATION IS RUNNING.
Push button to STOP CALIBRATION.

START arrow—CALIBRATION IS STOPPED.
Push button to START CALIBRATION.

Screen: SETUP - YIELD CAL

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION

Mass flow sensors must be calibrated in order to achieve accurate cotton weights. Calibration should be performed when necessary as condition and maturity of crop change or at least once a season.

Quick Calibration: Easiest calibration procedure when there is no scale available for weighing harvest samples.

Standard Calibration: Used when actual weights can be obtained from a scale for harvest samples.

Manual Calibration: Only used if previous procedures do not work because calibration is off by more than 50%. Before performing manual calibration, check to make sure all components in yield monitoring system are installed and performing correctly, and that sensors are unobstructed.

Post Calibration: Done with desktop software. There is no post calibration procedure to be performed in field or on display. This is recommended method for best results. Desktop software allows post calibration using weight of crop from whole field or weight of crop from each module, depending on level of detail wanted.

Are you a customer that is using Harvest Monitor Cotton for the sole purpose of seeing your yield as you go across the field?

If you believe it is important for the Harvest Monitor Cotton system to be as accurate as possible at all times in the field (on display in cab), the following recommendation can help you achieve this expectation: Mass flow sensors need to be calibrated to achieve more accurate seed cotton weights shown on the display in the field. This is done by performing a QUICK CAL or STANDARD CAL after a Row Compensation Calibration is performed in uniform crop. STANDARD Cal, which uses actual scale weights, is the best form of calibration to use in order to attain more accurate cotton weights. Once calibrated, additional calibration may be used for any substantial changes in types of cotton, variety change, moisture, crop management, quality of defoliation, weeds, irrigated vs. non-irrigated, crop conditions, etc. Any of these condition changes in cotton could cause shift in accuracy of the system. Throughout the season it is recommended to check accuracy by weighing the cotton. Recalibration is suggested if you find that the system is not accurate.

OUO6050,0001772 -19-16JAN06-1/1

Row Compensation

Screen: SETUP - STANDARD CAL

NOTE: Sample must be of a uniform yield for all rows being harvested.

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION >> STANDARD CALIBRATION >> ROW CORRECTION

NOTE: Only perform once. This only needs to be performed after system has been installed or if sensor attachment has changed in any way.

1. Press START button to begin procedure.

2. Harvest a yield sample—30.5 m (100 ft) or 1/4 basket.

3. Press STOP button.

4. Accept or decline run made.

5. A date will be displayed if successful.

OUO6050,0001773 -19-08DEC05-1/1

Quick Calibration

Screen: SETUP - YIELD CAL

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION

IMPORTANT: Before calibrating be sure that harvester basket is empty. Be sure boll buggy or cotton module is empty.

Procedure should be performed at maximum ground speed which operator expects to run in this crop and condition, and in an area that is reasonably level and of uniform yield.

If standard calibration is running estimated yield will be adding up because they are tied together.

If standard calibration has been performed operator does not need to run quick calibration process.

NOTE: Always read the text to the left of the START/STOP arrow. This explains the current

status of calibration. Arrow changes back and forth between START and STOP. When yield calibration is stopped, START arrow is shown. When yield calibration is running, STOP arrow is shown.

STOP arrow—CALIBRATION IS RUNNING.
Push button to STOP CALIBRATION.

START arrow—CALIBRATION IS STOPPED.
Push button to START CALIBRATION.

1. Press START button.

NOTE: Pay close attention to area next to button C. When the black arrow states start, that means you have to press the button to start calibration. Area left of the arrow states if calibration is running or stopped.

2. Harvest a yield sample.

3. Press STOP button.

4. Enter yield estimate for sample just harvested.

OUO6050,0001774 -19-08DEC05-1/1

Standard Calibration

Screen: SETUP - STANDARD CAL

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION >> STANDARD CALIBRATION

NOTE: Always read the text to the left of the START/STOP arrow. This explains the current status of calibration. Arrow changes back and forth between START and STOP. When yield calibration is stopped, START arrow is shown. When yield calibration is running, STOP arrow is shown.

STOP arrow—CALIBRATION IS RUNNING.
Push button to STOP CALIBRATION.

START arrow—CALIBRATION IS STOPPED.
Push button to START CALIBRATION.

1. Press START button.

NOTE: If Quick Calibration Procedure is started (on prior page) weight will count up on SETUP - STANDARD CAL screen.

2. Harvest a yield sample.

3. Press STOP button to end procedure.

4. Enter scale weight for sample just harvested.

Harvested Weight—Approximate weight of grain that has been harvested during calibration process.

Scale Weight—Allows scale weight to be entered after a calibration run is complete. During calibration run, indicates approximate weight of grain that has been harvested.

Calibration Factor—Allows mass flow sensor to read accurately. Value will be updated automatically by calibration procedure. This value can also be adjusted manually.

OUO6050,0001775 -19-08DEC05-1/1

Manual Adjustment of Calibration Factor

Screen: SETUP - STANDARD CAL

Press: SETUP >> HARVEST MONITOR >> YIELD CALIBRATION >> STANDARD CALIBRATION

NOTE: *If scale weight is more than 50% higher or lower than displayed weight, system will not allow entry of scale weight. It is recommended that you review harvesting procedures and verify vehicle hauling cotton away from picker is also following correct procedures. At that time, repeat calibration procedures.*

Do not change calibration factor in the middle of a field.

Always read the text to the left of the START/STOP arrow. This explains the current status of calibration. Arrow changes back and forth between START and STOP. When yield calibration is stopped, START arrow is shown. When yield calibration is running, STOP arrow is shown.

STOP arrow—CALIBRATION IS RUNNING.
Push button to STOP CALIBRATION.

START arrow—CALIBRATION IS STOPPED.
Push button to START CALIBRATION.

A new calibration factor can also be entered manually. To calculate calibration factor, divide weight shown on

display by new weight on scale ticket. Multiply result by displayed calibration factor (see example below). This is the new calibration factor.

To manually enter a calibration factor:

1. Press CALIBRATION FACTOR button to change calibration factor.
2. Using numeric keypad, input calibration factor.
3. Press CALIBRATION FACTOR button to enter new value.

Displayed Calibration Factor (800) X Weight of cotton shown on display (5125) / New weight of grain from scale ticket (4830) = New Calibration Factor (754)

Example:

Displayed Calibration Factor = 800

800 is factory default value for calibration factor.

Weight of cotton shown on display = 5125

New weight of grain from scale ticket = 4830

New Calibration Factor = 754

Recording

Screen: SETUP - RECORDING ON/OFF

Header—Raise/Lower Picking Units

Press: SETUP >> HARVEST MONITOR >>
RECORDING ON/OFF BY:

Combination—Raise/Lower Picking Units and Material
Flow Detected

This screen allows operator to setup recording on/off
using follow methods::

Manual—On/Off by operator from RUN page,

Material—Flow of Cotton

OUO6050,0001779 -19-08DEC05-1/1

Performance Monitor

Setup Performance Monitor

PC8663 -UN-05AUG05



Performance Monitor will

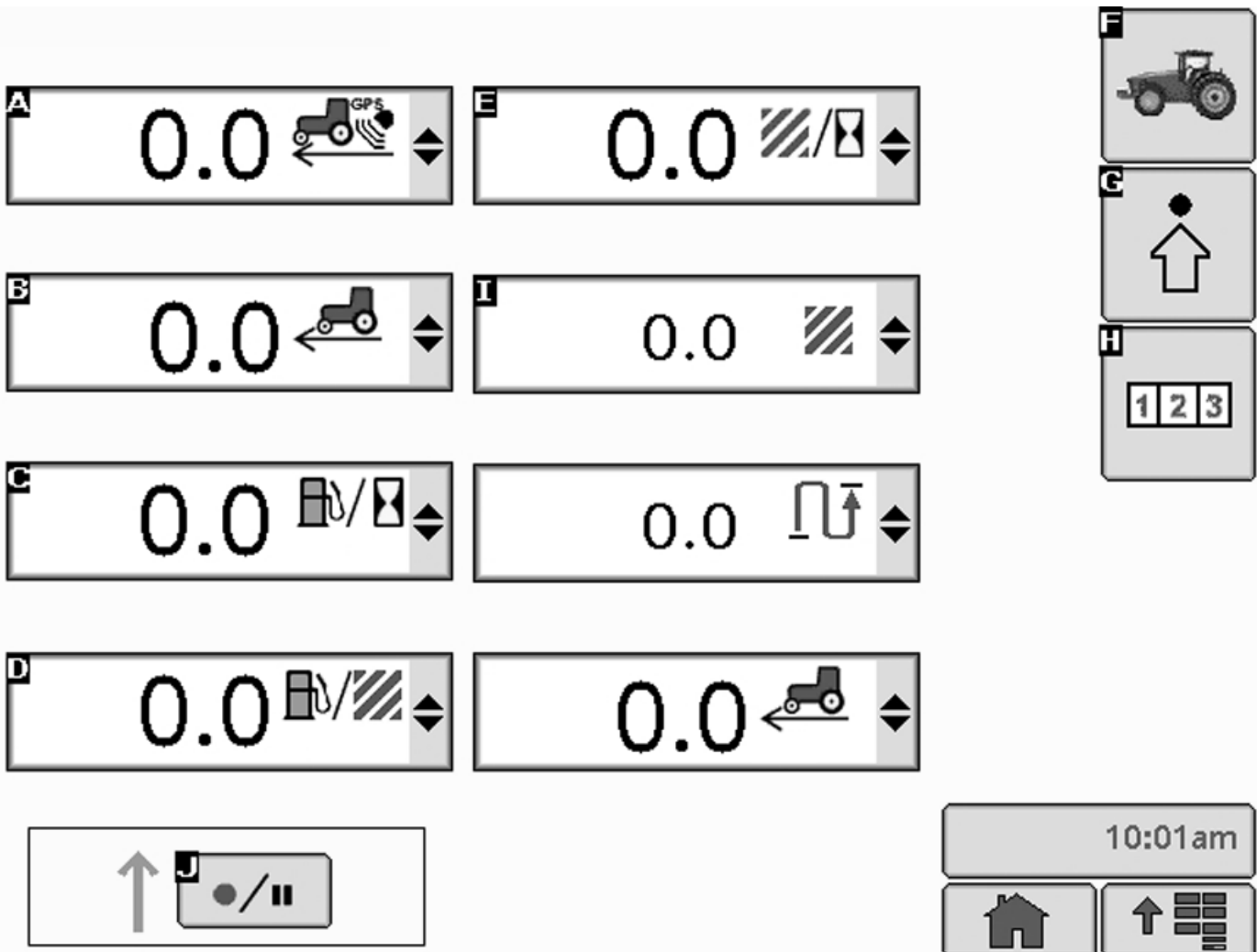
PC8658 -UN-05AUG05

- TECU-based Performance Monitor detection (to disable the internal Performance Monitor)
- Vehicle Detection (tractor, sprayer, combine, self-propelled forage harvester, etc.)
- Radar Calibration



Continued on next page

OUO6050,000173D -19-18JAN06-1/4

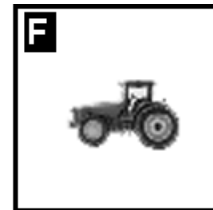


Performance Monitor - Main
PC8791 -UN-18OCT05

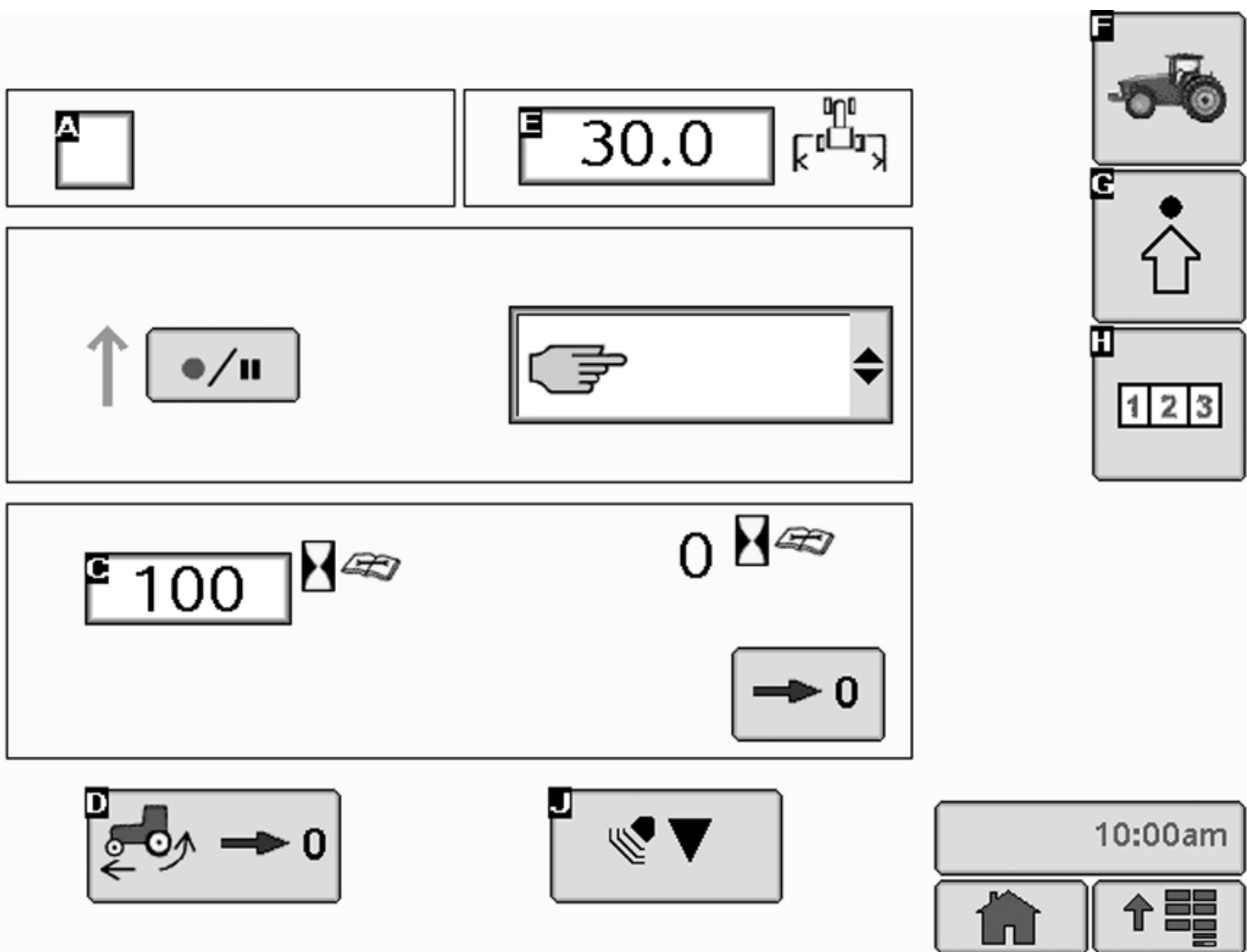
NOTE: If the vehicle that you are operating does not have a radar make sure that the radar check box is not checked or inconsistent readings will be displayed.

This screen allows operator to view:

- Speed determined by wheel travel
- Speed determined by radar
- Fuel consumption per hour
- Fuel consumption per area
- Area covered per hour
- Area covered
- Distance traveled



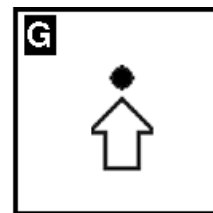
Performance Monitor - Main



Performance Monitor - Settings
PC8792 -UN-18OCT05

This screen allows operator to adjust:

- Radar connection to display
- Width of implement
- Device used to turn on/off area counter
- Service intervals
- Time since service interval was last set
- Calibrate speed determined by wheel travel
- Calibrate speed determined by radar



Performance Monitor - Settings

Continued on next page

OOU6050,000173D -19-18JAN06-3/4

StarFire iTC Receiver

STARFIRE ITC softkey

The STARFIRE ITC - MAIN screen contains four tabs:

INFO tab

SETUP tab

ACTIVATIONS tab

SERIAL PORT tab

NOTE: If StarFire iTC is hooked into the CAN Bus with an Original GreenStar display and either a GSD2100 or 2600, the StarFire iTC will always be displayed on the GSD2100 or 2600.

NOTE: If an Original StarFire receiver is hooked to a GSD2100 or 2600, the setup and information pages are displayed through Original GreenStar Monitor. MENU >> ORIGINAL GREENSTAR MONITOR. To view or change setup information, SETUP >> STARFIRE RECEIVER. To view GPS information INFO >> STARFIRE RECEIVER.

PC8663 -UN-05AUG05



MENU button

PC8659 -UN-05AUG05



STARFIRE ITC button

PC8680 -UN-05AUG05



STARFIRE ITC softkey

OUO6050,000173E -19-08DEC05-1/1

INFO tab

The INFO tab shows information and status of incoming GPS and differential correction signals. No information on this screen can be changed. It is for viewing only:

- **Position Mode:** Indicates whether receiver is calculating a 3D position, 2D position, or no position (No Nav). It also shows status of differential signal: SF1 (StarFire 1 differential), SF2 (StarFire 2 differential).
- **Differential Mode:** Indicates status of GPS signal: 2-D (two dimensional with latitude and longitude of vehicle) or 3-D (three dimensional with altitude, latitude, and longitude of vehicle).
- **Lat:** Displays vehicle location latitude coordinates with respect to Equator (north or south).
- **Lon:** Displays vehicle location longitude coordinates with respect to Prim Meridian (east or west).

NOTE: TOGGLE button allows operator to change the way latitude and longitude are displayed from degrees/minutes/seconds to decimal degrees.

- **Altitude:** displays height of receiver, measured from top of dome, in feet (meters) above sea level.
- **GPS course:** Displays direction of travel, in degrees relative to true north (zero degrees) as measured by receiver. Angle is measured in clockwise direction

NOTE: Course and speed normally show small speeds and various courses even when machine is not moving.

- **GPS speed:** displays ground speed of machine in miles per hour (kilometer per hour) as measured by receiver.
- **GPS Accuracy Indicator (GPS AI):** GPS AI gives indication of GPS position accuracy achieved by receiver, and is displayed as a percentage (0-100%)

When receiver is initially powered, GPS AI will display 0%. As receiver acquires satellites and calculates a

position, GPS AI will increase as accuracy improves. Acceptable guidance performance for Parallel Tracking and AutoTrac is achieved when GPS AI displays 80% or greater. This may take up to 20 minutes. GPS accuracy is affected by many factors. If 80% accuracy or greater is not achieved within 25 minutes, consider the following possibilities:

- Unobstructed view of sky – trees, buildings, or other structures may block receiver from receiver signals from all available satellites.
- L1/L2 signal to noise ratio (SNR) – radio interference from 2-way radios or other sources may cause low SNR (check satellite button – Graph)
- Satellite position in sky – poor GPS satellite geometry can reduce accuracy (check satellite button – SkyPlot)
- Number of satellites above elevation mask – this is the total number of GPS satellites available to receiver that are above 7 degrees elevation mask (check satellite button – SkyPlot).
- Number of satellites in solution – this is total number of satellites that are being used by receiver to calculate a position (check satellite button– SkyPlot).
- **GPS Signal Quality:** Displays quality of signals being received from constellation of GPS satellites.
- **Differential Signal Quality:** Displays quality of differential correction signal being received by receiver.
- **TCM (Terrain Compensation Module):**
 - **Roll Angle:** Is both a graphical and numerical representation of amount of roll TCM is measuring, relative to calibrated zero degree reference. A positive roll angle means vehicle is rolled to right (depicts what horizon would look like from cab).
 - **Yaw Rate:** This gives a graphic representation and a numeric figure for amount of rotation TCM is measuring. Positive yaw rate means vehicle is turning to right.

SETUP tab

The SETUP tab allows for setup of the following:

- Correction Mode
- Correction Frequency
- Mount Direction
- Fore/Aft
- Height
- QuickStart

- Hours ON After Shutdown
- TCM Calibration

Differential correction is the process by which GPS accuracy is improved. (See OVERVIEW: SF1/SF2 Activations, SF2 Subscription under Activations section.)

OUO6050,0001740 –19–08DEC05–1/1

Correction Mode

Contains available StarFire corrections that the receiver is licensed for. SF1 and OFF will always appear, however, SF2 will only appear with a valid SF2 license (See Activations section). RTK appears when a RTK mode is selected from RTK softkey.

NOTE: By selecting OFF, StarFire receiver will not receive SF1 or SF2 correction signals, but will receive WAAS/EGNOS correction signals.

OUO6050,0001741 –19–08DEC05–1/1

Correction Frequency

This is the frequency that is used to receive differential correction signals. The default frequency is a view only field when default check box is checked. By de-selecting default check box a correction frequency can be manually entered.

IMPORTANT: DO NOT change default StarFire Correction Frequency unless instructed to do so by a John Deere Dealer or by John Deere AG Management Solutions.

OUO6050,0001742 –19–08DEC05–1/1

Mount Direction

NOTE: Receivers attached to tractors, sprayer, and combines are typically in FORWARD position. Receivers attached to GATORS are typically in BACKWARD position.

Mounting direction options

- FORWARD
- BACKWARD

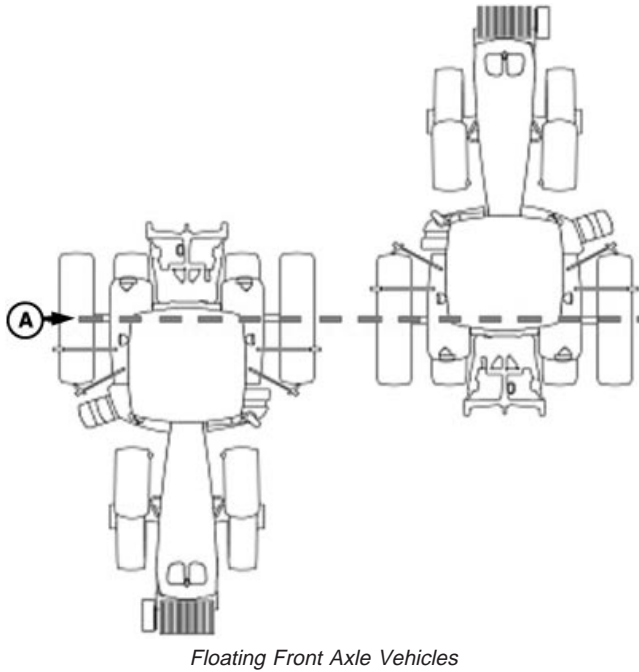
Mounting direction is direction receiver is facing.

Select desired mounting direction.

This setting defines mounting orientation of receiver. TCM uses this setting to determine correct direction of vehicle roll.

OUO6050,0001743 -19-08DEC05-1/1

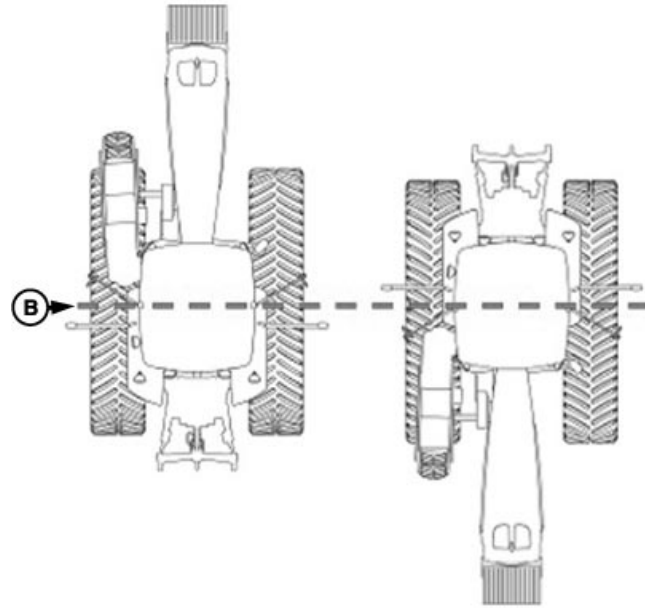
Fore/Aft



PC8278 -UN-22JUN04

Floating Front Axle Vehicles

A—Pivot Point—Floating Front Axle Vehicles-



PC8277 -UN-22JUN04

Fixed Axis Wheels or Tracks Vehicles

B—Pivot Point—Fixed Axis Wheels or Tracks Vehicles

The fore/aft value is the distance that receiver is located from pivot point of tractor.

On some AutoTrac-equipped vehicles, fore/aft value will be automatically detected and entered during power up.

- Fore/Aft value is shown and input box is disabled – value has been automatically set and cannot be changed.
- Fore/Aft value is shown and input box is enabled – value must be entered manually.

To enter Fore/Aft value:

- Select FORE/AFT input box

- Enter value using numeric keypad

Recommended StarFire Fore/Aft values For John Deere Vehicles	
John Deere Vehicle	StarFire Fore/Aft cm (in.)
6000 Series Tractors	75 cm (29 in.)
7000 Series Tractors	75 cm (29 in.)
8000 Series Tractors	75 cm (29 in.)
8000T Series Tractors	3 cm (1 in.)
9000 Series Tractors	-51 cm (-20 in.)
9000T Series Tractors	3 cm (1 in.)
4700 Series Sprayers	203 cm (80 in.)
4900 Series Sprayers	257 cm (101 in.)
Combine	140 cm (55 in.)

Height

Height is measured from ground to top of StarFire Dome. Select input box and use numeric keypad to enter height.

IMPORTANT: Under or over compensation for vehicle roll angles will occur if height is incorrectly entered during setup.

Example: On a 10 degree slope with a StarFire height error of 30.5 cm (12 in.) will result in a position offset of 5 cm (2 in.) on ground).

Factory default setting is "126". On some AutoTrac-equipped vehicles, height value will be automatically detected and entered during power up. Because this dimension is critical for proper operation of TCM and can vary due to vehicle configuration and tire sizes, operator should still measure actual distance

to be entered each time TCM is installed on a different vehicle.

NOTE: Use chart for example StarFire Height values.

Chart figures are approximate heights.

John Deere Vehicle	StarFire Height cm (in.)
6000 Series Tractors	280 cm (111 in.)
7000 Series Tractors	305 cm (120 in.)
8000 Series Tractors	320 cm (126 in.)
8000T Series Tractors	320 cm (126 in.)
9000 Series Tractors	361 cm (142 in.)
9000T Series Tractors	356 cm (140 in.)
4700 Series Sprayers	389 cm (153 in.)
4900 Series Sprayers	396 cm (156 in.)
Combine	396 cm (156 in.)

NOTE: Actual height may vary depending on tire size or inflation.

OUO6050,0001745 -19-08DEC05-1/1

QuickStart

Reduces amount of time required before full accuracy is achieved. If QuickStart is enabled (check box checked) and receiver has SF1 or SF2 when it is powered down a position is saved for future QuickStart. If power is restored to receiver within time period defined under Hours On After Shutdown, QuickStart won't be needed since receiver power was never disrupted. If duration has exceeded Hours On After Shutdown, QuickStart will be initiated. Saved

position will be used to bypass startup warm up period that is usually required. Receiver cannot move while this QuickStart is taking place. It may take up to 6 minutes for QuickStart to complete. User will be notified on screen when it is done.

To enable QuickStart mode select check box so that a check appears. To disable, select check box until check disappears.

OUO6050,0001746 -19-08DEC05-1/1

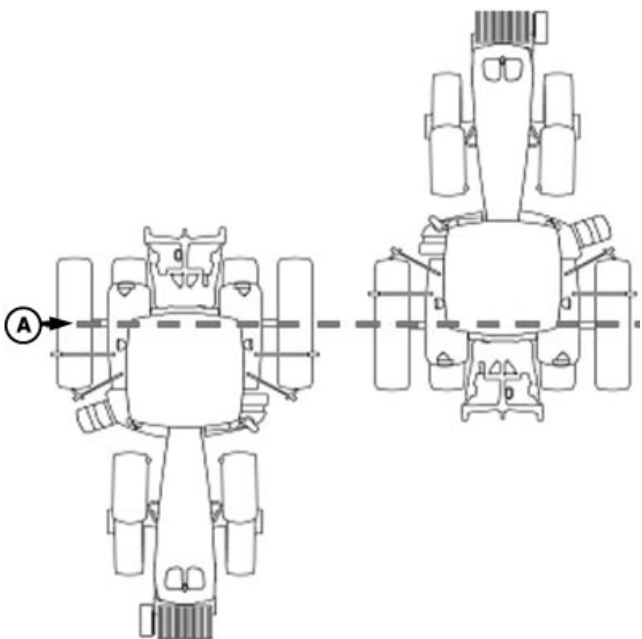
Hours On After Shutdown

Defines how long receiver remains powered up after ignition is turned off (0, 3, 6, 12, 24 hours). If ignition is turned on within number of hours defined, receiver will re-establish full SF1 or SF2 accuracy within a few seconds (assuming it had SF1 or SF2 when ignition was turned off).

Define desired number of hours by selecting drop-down box.

OUO6050,0001747 -19-08DEC05-1/1

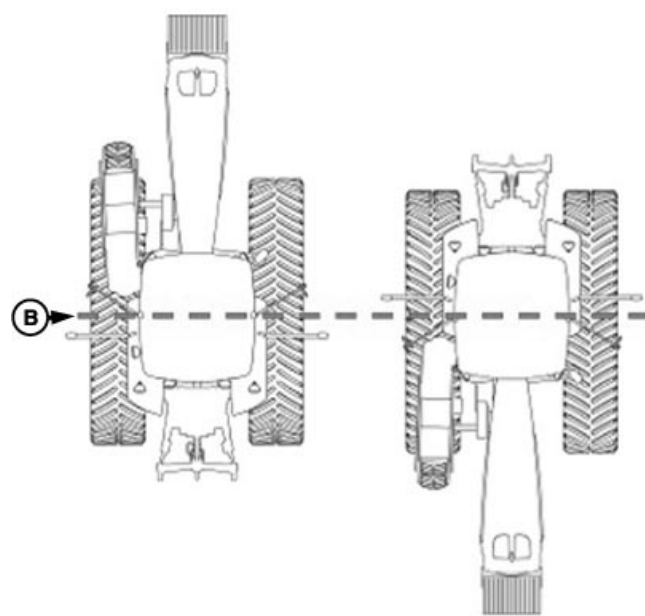
TCM Calibration



Floating Front Axle Vehicles

A—Rear Axle

PC8278 -UN-22JUN04



Fixed-Axis Wheels Or Tracks Vehicles

B—Vehicle Pivot Point

PC8277 -UN-22JUN04

TCM can be toggled ON or OFF by selecting TOGGLE button. When TCM is turned off, StarFire GPS message will not be corrected for vehicle dynamics or side slopes. TCM will default to ON when cycling power.

NOTE: TCM must be turned on for AutoTrac to activate.

TCM must be calibrated so receiver can determine zero degree roll angle.

Continued on next page

OUO6050,0001748 -19-08DEC05-1/4

NOTE: Calibrate receiver when it is attached or reattached to machine. Receiver does not require recalibration until removed from machine and reattached.

Positioning Machine during Calibration

IMPORTANT: When calibrating, it is important that TCM is at same angle when facing either direction. If roll angle is a positive 2 degrees when facing one direction, vehicle needs to be a negative 2 degrees when facing opposite direction. To position TCM at same angle it is important when turning vehicle around and facing other direction that tires are placed in correct location. Once vehicle is parked on a hard flat surface, note

location of tires on ground. When turning around use following instructions:

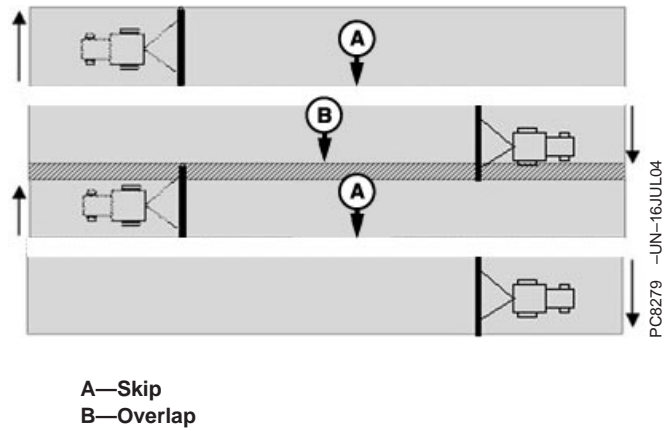
- **Floating Front Axle Vehicles (MFWD, ILS, TLS)**—put rear axle/wheels in same location when performing 2 point calibration. See above diagram for Floating Front Axle Vehicles.
- **Fixed-Axis Wheels Or Tracks Vehicles (Track Tractors, 47X0 and 49X0 Series Sprayers, 9000, And 9020 Series Wheel Tractors)**—Place all in same location when facing either direction. See above diagram for Fixed-Axis Wheels Or Tracks Vehicles.

Continued on next page

OUO6050,0001748 -19-08DEC05-2/4

Calibration Surface

IMPORTANT: Vehicle must be on a hard, flat level surface for calibration. If TCM is not calibrated on a level surface or TCM mounting angle is not level in relation to vehicle angle (StarFire mounting bracket or vehicle cab being slightly offset, uneven tire pressures from one side to other, etc.) operator may see offset during operation. This offset could look like a consistent skip (A) or overlap (B) in pass-to-pass operation. To eliminate offset, re-calibrate on a level surface, drive down a pass, turn around and drive down same pass in opposite direction. If vehicle does not follow same pass, measure offset distance and enter in implement offset. After initial calibration of TCM, it is not necessary to calibrate again unless TCM angle in relation to vehicle has changed. For example, tire pressure has been lowered on one side of vehicle causing vehicle angle in relation to ground to change.



Calibration Procedure:

1. Press CALIBRATION button.
2. Park vehicle on a hard, level surface and come to a complete stop (cab is not rocking).
3. Press ENTER button.
4. Calibrating Status bar will appear. Once status reaches 100% it will automatically advance.
5. Turn vehicle 180 degrees to face opposite direction. Ensure that tires are in proper location for fixed or floating front axle and vehicle has come to a complete stop (cab is not rocking).
6. Press ENTER CALIBRATION button.
7. Calibrating Status bar will appear. Once status reaches 100% it will automatically advance.
8. Once finished, a calibration value will be displayed. 0 degree calibration value is the difference between factory calibration value and actual calibration value which was just determined.

Continued on next page

OUO6050,0001748 -19-08DEC05-3/4

9. Press ENTER button to return to SETUP tab.

OUO6050,0001748 -19-08DEC05-4/4

ACTIVATIONS tab

ACTIVATIONS tab contains the following:

- Valid activations for receiver:
 - SF1 – activated on every StarFire iTC.
 - SF2 Ready – receiver has to be ordered SF2 Ready or an upgrade to SF2 ready from SF1 World Solution must be purchased.
 - RTK – activated with valid RTK activation (requires receiver to be SF2 Ready).
- SF2 License: Displays status of receiver's SF2 License.
 - Yes-Enabled – A valid SF2 license exists and SF2 is the differential correction mode selected.
 - Yes-Disabled – A valid SF2 license exists, but SF2 is not the differential correction mode selected.
 - No – Appears when no valid SF2 license exists or SF2 license has expired.
- SF2 End Date: Displays date at which SF2 License will expire.
- StarFire SN: StarFire serial number

Activation Code

NOTE: Activation Codes are needed to obtain SF2 Ready and RTK Activations, and SF2 license subscription.

ENTER button is used to enter 24-digit codes for SF2 Ready and RTK Activations, SF2 license subscription and deactivation codes for transferring all StarFire activations and licenses mentioned above.

1. Upon selecting ENTER button an Activation Code box appears with three input boxes.

NOTE: If more than 8 digits are entered into an input box, "99999999" will appear. Reselect box and type only 8 digits into input box.

2. Select first input box labeled Digits 1-8 and enter first 8 digits of 24-digit code.
3. Select second input box labeled Digits 9-16 and enter second 8 digits of 24-digit code.
4. Select third input box labeled Digits 17-24 and enter last 8 digits of 24 digit code.
5. Press ENTER button.
6. If 24-digit code is valid and entered correctly a confirmation message will appear.

7.Deactivation Code input

This input will only appear when a deactivation code has been entered following procedure listed above. It will display 6-digit deactivation codes for SF2 License, SF2 Ready and RTK activations. These codes are needed when transferring the above mentioned activations or license to another receiver.

Activation/License Status Window

Displays messages when SF2 License has expired and provides user with option to use a Grace Period.

NOTE: Three 24 hour Grace periods are available when current license expires. This is provided to allow sufficient time for operator to renew a license. Grace period signal will be SF2 differential correction signal.

Using a Grace Period

1. Select USE 1 button from status window
2. Select YES button

OUO6050,0001749 -19-16JAN06-1/1

SERIAL PORT tab

Configure RS232 and NMEA message information.

Rates:

- Define Baud Rate by selecting list input
 - Baud Rates: 4800, 9600, 19200, 38400

- Define output rate by toggling
 - 1Hz or 5Hz

Messages:

- Allows for output of 5 different NMEA strings:
 - GGA, GSA, RMC, VTG, and ZDA

OUO6050,000174A –19–08DEC05–1/1

RTK softkey

Allows for setup and display of RTK information

- Operating Mode
- RTK Network Configuration
- Base Station Data
- Radio Data

RTK can be operated in five modes

- Vehicle
- Vehicle Repeater
- Quick Survey Base
- Absolute Base
- OFF

Vehicle Mode Select for receiver on vehicle.

Vehicle Repeater Mode Allows for the vehicle to accept and repeat RTK corrections..

Quick Survey Base Mode

Select if exact location of guidance tracks do not need to be stored for future applications. If Quick Survey Base Mode is used to establish rows or paths that will be used at a later date, location or Track 0 must be stored using Current Track 0 in Guidance Setup – Set Track 0. When Track 0 is recalled, a one-time use of Shift Track feature will be needed to align vehicle on previous tracks. See Setup Quick Survey Base Mode section.

PC8663 –UN–05AUG05



MENU button

PC8659 –UN–05AUG05



STARFIRE iTC button

PC8681 –UN–05AUG05



RTK softkey

Continued on next page

OUO6050,000174B –19–08DEC05–1/2

Absolute Survey Base Mode Select if exact location of guidance tracks need to be stored for future guidance applications without relying on visual reference for track position to align using Shift Track feature. Track 0 must be stored using Current Track 0 in Guidance Setup – Set Track 0 in order to follow previously used tracks. Absolute Base Mode requires 24-hour self survey to be conducted on location before first use. After survey is completed, base station will then transmit corrections. If base station is moved to another position and then returned to original surveyed position, it is very important that base station is mounted in exact same position. Any difference between original surveyed position and mounted position will result in offset of corrected position. For this reason, it is important to mount receiver to a fixed position like a building or post mounted in concrete.

OFF Mode This mode disables all RTK functionality in receiver. RTK Operating Mode must be OFF for normal SF2 operation on SF2-licensed receiver.

OUO6050,000174B –19–08DEC05–2/2

Vehicle

IMPORTANT: Base station receiver and vehicle receiver must be setup before operating RTK. See RTK Setup sections.

Press: MENU button >> STARFIRE iTC button >> RTK softkey >> OPERATING MODE drop down box >> VEHICLE

When vehicle receiver is powered-up, No GPS, No Diff will be displayed on Guidance View or home page screen until an initial position is determined. When base station transmits correction signal, 3D RTK will be displayed.

NOTE: If communication loss is WITHIN first hour of base station operation, Extend Mode will provide RTK accuracy for two minutes.

Communication loss AFTER first hour of base station operation, Extend Mode will provide RTK accuracy for 15 minutes.

Extend Mode (RTK-X)

If communication between base station and vehicle radio is lost for more than 10 seconds, vehicle receiver will automatically switch to Extend Mode and will maintain RTK accuracy for a period of time. If base station has been powered for less than one hour, Extend Mode will be available for 2 minutes. If base station receiver has been powered for more than one hour, 15 minutes of Extend Mode will be available. If base station communication is not re-established after Extend period, receiver will default to WAAS in North America, or NO DIFF where WAAS is not available. To re-establish communication move vehicle to a location where line of sight to base station can be established.

Base Station Data (Information)

NOTE: Information that will be displayed when in Quick Survey Base or Absolute Base Mode.

Operator can view the following:

- Status
 - OK – Base Station is transmitting correction.
 - No Stored Base – 24 hour self survey is required for current location.
 - Initializing – Receiver is initializing radio, acquiring GPS signal.
 - Self Survey – 24 hour self survey in progress.
- Sat. Corrections – Indicates number of GPS satellites for which base station is transmitting correction.
- Distance – Difference between base station location (known position) and location indicated by uncorrected GPS. Displayed in miles (kilometers).
- Direction – Direction from base station location (known position) to location indicated by uncorrected GPS. Displayed in degrees with true North as 0 degrees.
- Base Battery – Base Station voltage. Displayed in volts.

Radio Data and Connection

Noise Level – Level of noise, interference, which is detected at radio. Press Refresh button to refresh noise level.

Vehicle Mode – Base Station Data

NOTE: Information that will be displayed when in Vehicle Mode.

- Status
 - OK – Base Station is transmitting correction.
 - No Stored Base – 24 hour self survey is required for current location.
 - Initializing – Receiver is initializing radio, acquiring GPS signal.
 - Self Survey – 24 hour self survey in progress.
 - No Signal – Vehicle RTK radio is not receiving signal from base station.
- Sat. Corrections – Indicates number of GPS satellites for which base station is transmitting correction.
- Distance – Difference from base station to vehicle receiver. Displayed in miles (kilometers).

- Direction – Direction in degrees to base station. Displayed in degrees with true North as 0 degrees.
- Base Battery – Base Station voltage. Displayed in volts.

Radio Data and Connection

- Noise Level – Level of noise, interference, which is detected at radio. Press REFRESH button to refresh noise level.
- Data Received (%) – Percent of received correction to vehicle from base station.

NOTE: For Data Received (%): Value less than 100% indicates an obstruction between base station radio and vehicle radio.

ONLY 10% IS REQUIRED FOR NORMAL OPERATION

If percent of received correction is 0, and noise level is higher than 30, check for potential radio interference sources such as two-way radios, power lines, etc.

Radio Connection

Indicates source of correction. If there is no correction, this will toggle between base and repeater. There is also a TOGGLE button for manual toggle between two sources.

OUO6050,000174C –19–16JAN06–2/2

Vehicle Repeater

Press: MENU button >> STARFIRE iTC button >> RTK softkey >> OPERATING MODE drop down box >> VEHICLE REPEATER

When vehicle receiver is set to Vehicle Repeater, it allows for the vehicle to accept RTK corrections as well as repeat the RTK signal to other rovers.

Other rovers that are operating in the same field or a nearby field that do not have line of sight to the base station and can not receive corrections from the base station can receive RTK corrections from the vehicle that has its RTK radio configured as a vehicle repeater.

NOTE: It is not recommended to have more than one vehicle set to Vehicle Repeater in a given field.

OUO6050,00017EA –19–16JAN06–1/1

Quick Survey Mode

NOTE: Display is not required after base station receiver has been configured to operate in Quick Survey Mode and RTK Radio Channel/Network ID have been set.

Connect display to base station

Press: MENU button >> STARFIRE ITC button >> RTK softkey

Select Quick Survey Base from Operating Mode list box.

NOTE: Quick Survey Base Mode allows base station to broadcast corrections after receiver calculates GPS position.

If power is removed from base station (but not moved) power can be restored and same base station position will be used for corrections. If previously used Track 0 is recalled no Shift Track will be needed.

If power is removed and base station is moved a new position will be calculated when power is restored. If previously used Track 0 is recalled, Shift Track will have to be used to center Track 0 on previous vehicle track.

OUO6050,000174D -19-08DEC05-1/1

Absolute Base Mode

IMPORTANT: Absolute Base Mode requires base receiver to be mounted in a rigid position. Tripod is not recommended.

NOTE: Display is not required after base station receiver has been configured to operate in Absolute Survey Base Mode and RTK Radio Channel/Network ID have been set.

Connect Display to Base Station

Press: MENU >> STARFIRE ITC button >> RTK softkey

Select Absolute Survey Base from Operating Mode drop-down box.

A 24-hour survey has to be performed and saved to a RTK Base Location (1-20). See Edit Stored Base Station Section.

NOTE: Enter unique location number each time base station is moved to new mounting location (i.e. location 1 = West 40, location 2 = Farm Shop). Edit Stored RTK Base: Allows operator to setup Absolute Base Station Locations and conduct 24-hour survey or enter in known location coordinates. Unknown Coordinates: Press START button located under Edit Stored RTK Base. NOTE: After (24 hour) self survey is complete, base station coordinates will automatically be stored and associated with base location number (1 - 20). Verify base station coordinates, Press START button located under Edit Stored RTK Base while in

Absolute Base operating mode and choose base location from base location drop-down box.

Start 24 hour Self Survey

1. Press START button located under Survey RTK Base Location.
2. Select Storage location from drop-down box (1 - 20)
3. Press START button (Starts 24 hour survey)

NOTE: Display can be removed while survey is in progress.

After 24 hour survey is complete, base station will automatically store surveyed coordinates and begin transmitting corrections. Manually record coordinates and elevation and store in safe location. These coordinates may be used to enter previously surveyed base station location into different receiver.

NOTE: Absolute Base Mode, coordinates may be manually entered, if know from previous survey. See Know location section below.

Known Location

Press START button located under Edit Stored RTK Base.

1. Select desired Base Location from drop-down box (1-20)
2. Select Base Latitude – enter value (deg)
3. Select Base Longitude – enter value (deg)
4. Select Base Altitude – enter value (ft)
5. Press ENTER button

OUO6050,000174E -19-08DEC05-1/1

RTK Network Configuration

Radio Channel – RTK

NOTE: 14 channels are available, default channel is 1.

Press input box and enter value (1 - 14)

Radio Channel may be changed if other RTK systems are operating in area interference is causing decreased base station communication performance.

Network ID – RTK

NOTE: 4000 network ID's are available, default ID is 1.

Press input box and enter value (1 - 4000)

Network ID for base station and vehicle receiver must match. If more than one base station with same Network ID numbers are within range, vehicle may lock on to either one of the base stations. To prevent this from happening, be sure to use unique network ID.

Repeater – RTK

NOTE: Radio can be configured to act separately as repeater. A repeater is required if obstructions (i.e. trees, hills, etc) exist between base station and vehicle(s).

A repeater consists of

- Radio (configured as a repeater)
- Harness
- Mounting Bracket
- 12 volt Power Source

To configure radio as repeater:

Press: MENU button >> STARFIRE ITC button >> RTK softkey

Select RTK Operating Mode (Vehicle, Quick Survey Base or Absolute Base)

NOTE: A radio can be configured as a repeater from any RTK Operating Mode.

1. Disconnect original radio from receiver
2. Connect radio to be configured to receiver RTK harness.
3. Check that receiver has GPS position calculated.
4. Check that base station, vehicle, and repeater have same radio channel and network ID.
5. Press CONFIGURE button next Repeater Radio
6. Press START button located under Configure Repeater Radio
7. Radio will configure as repeater
8. Disconnect repeater radio from receiver and wiring harness
9. Reconnect original radio

OUO6050,00017EB -19-16JAN06-2/2

PC8663 -UN-05AUG05

SATELLITE INFORMATION softkey

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

The StarFire iTC - Satellite Information screen contains four tabs:

SKY PLOT tab

GRAPH tab

Sky Plot

Illustrates where satellites are in relation to vehicles receiver. This allows 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.
- Grey 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/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



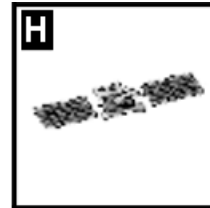
MENU button

PC8659 -UN-05AUG05



STARFIRE ITC button

PC8682 -UN-05AUG05



SATELLITE INFORMATION softkey

Continued on next page

OUO6050,000174F -19-08DEC05-1/2

- 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
 - 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 7 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
- 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.

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.

DIAGNOSTIC softkey

The StarFire iTC - Diagnostic screen contains two tabs:

READINGS tab

DATA LOGS tab

READINGS tab has detailed information about receiver.

- Unswitched voltage
- Switched voltage
- CAN High voltage (Vehicle Bus)
- CAN Low voltage (Vehicle Bus)
- Software Part Number
- Software Version Number
- Hardware Part Number
- Hardware Serial Number
- Receiver Hours (h)

The following reading will only appear when receiver has a RTK activation.

- RTK Software Number
- RTK Serial Number
- RTK Status
- RTK Search Time (sec)
- RTK Satellites in Search (above 100 elevation)

DATA LOGS tab has graphed GPS data, logged over the previous 60 minutes.

There are 7 data logs:

- GPS Accuracy – GPS Accuracy Indicator is a relative indication of overall differential GPS performance
- PDOP – Position Dilution of Precision is a combination of vertical and horizontal error (or three dimensional). Lower PDOP is better. A value below 2 is considered optimal.
- Satellites in Solution – Number of satellites that receiver is using in current position solution. Satellites are not used in solution until they get above 7 degrees elevation mask for WAAS/EGNOS, SF1, or SF2 (10 degrees for RTK), and satellites are used until they drop below 7 degrees elevation mask for WAAS/EGNOS, SF1, SF2 or RTK.

PC8663 –UN-05AUG05



MENU button

PC8659 –UN-05AUG05



STARFIRE ITC button

PC8683 –UN-05AUG05



DIAGNOSTIC softkey

- GPS Signal Quality – GPS signal quality shows quality of signals being received from GPS satellites. Unlike GPS Accuracy Indicator, Signal Quality doesn't include WAAS/EGNOS, SF1, SF2 or amount of time signal is received.
- Differential Signal Quality – Differential signal quality is strength of StarFire network signal (SF2 or SF1). Normal range is from 5 to 15, but maximum reading on indicator is 10. Numerical value is displayed to right of indicator. Any value above 5 is normal.
- Nav Mode - Position Mode is represented as three different types; No Nav, 2D and 3D. This helps determine if GPS position has been dropped in last 60 minutes.
- Differential Mode – Shows level of differential signal that receiver has received over past 60 minutes. Level of signal that was purchased on receiver will determine highest point on bar graph that operator will see.

OUO6050,0001750 -19-08DEC05-2/2

Connecting RS-232 GPS Receivers

Connecting RS-232 GPS Receivers

NOTE: AutoTrac requires CAN GPS messages from an original StarFire receiver or StarFire iTC receiver.

Non-John Deere GPS receivers that output correct NMEA 0183 standard messages can be used for documentation and manual guidance on GreenStar application. It is critical that receiver is setup to output following messages:

- GGA
- GSA
- RMC setup at 19200 baud (This is fixed and Non-adjustable)

- Data Bits 8
- Parity none
- Stop 1
- Flow Control none
- 1 or 5 Hz output rate (Recommend operation at 5 Hz. Guidance requires 5 Hz.)

Without these messages, receiver will not function with GreenStar application.

A harness and installation instructions are available to connect DB9 port of receiver to correct pins of display connector. See a John Deere dealer for more information.

OUO6050,0001751 -19-16JAN06-1/1

ISO Implements

ISO Implements

ISO compliant implements can be mapped to ISO compliant controls using display.

Example:

The display has been set up in a tractor that is attached to a sprayer.

A switch box has been installed in the tractor containing two switches: Switch 1 and Switch 2.

The sprayer has two functions that can be controlled by the switch box: turning the pump on and off, and turning the nozzles on and off.

The operator can choose which switch will turn the pump on and off and which switch will turn the nozzles on and off.

The tractor could be attached to a different implement and the switches could be assigned to control functions of that implement.

A different input device, such as a joystick, could be installed and that device could be assigned control over the sprayer's functions.

Press MENU button >> DISPLAY button >> AUXILIARY CONTROLS softkey To assign an input function to an implement function using the Auxiliary screen:

1. **Press:** MENU button >> DISPLAY button >> AUXILIARY CONTROLS softkey to reach the Auxiliary screen:
2. Choose the implement and implement function.
3. Choose an input device from the drop-down box.
4. Choose an input device function from the second drop-down box.

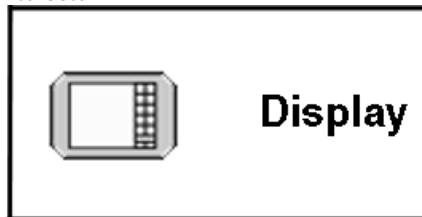
Device function is assigned to auxiliary control function.

PC8663 -UN-05AUG05



MENU button

PC8654 -UN-05AUG05



DISPLAY button

PC8691 -UN-09AUG05



AUXILIARY CONTROLS softkey

Operating ISO Implement

IMPORTANT: Before using display to control ISOBUS implements, read operator manual provided by implement manufacturer and observe all safety messages in manual and on implement prior to use. When used

with ISOBUS implements, information and control functions placed on this display are provided by implement and are the responsibility of implement manufacturer.

OUO6050,0001755 -19-08DEC05-1/1

Troubleshooting and Diagnostics

Message Center

Message Center screen can be reached by pressing MESSAGE CENTER button (showing time) or MENU button then MESSAGE CENTER button (With Info Icon).

PC8664 -UN-05AUG05



MESSAGE CENTER button (showing time)

PC8663 -UN-05AUG05



MENU button

PC8655 -UN-05AUG05

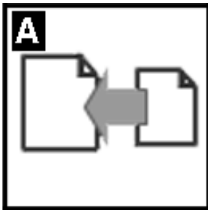


MESSAGE CENTER button (With Info Icon)

Continued on next page

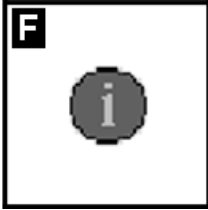
OUC6050,000175F -19-18JAN06-1/7

PC8665 -UN-05AUG05



COMPONENTS AND SOFTWARE VERSIONS softkey

PC8667 -UN-05AUG05



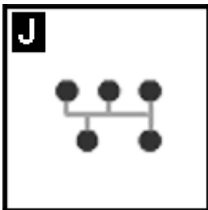
MESSAGES softkey

PC8669 -UN-05AUG05



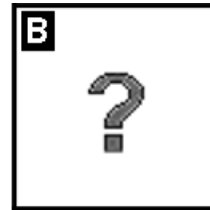
TROUBLE CODES softkey

PC8671 -UN-05AUG05



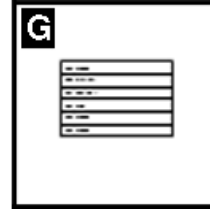
BUS INFORMATION softkey

PC8666 -UN-05AUG05



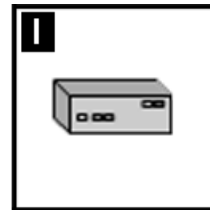
SOFTWARE INFORMATION softkey

PC8668 -UN-05AUG05



DIAGNOSTIC ADDRESSES softkey

PC8670 -UN-05AUG05



Electronic CONTROL UNIT INFORMATION softkey

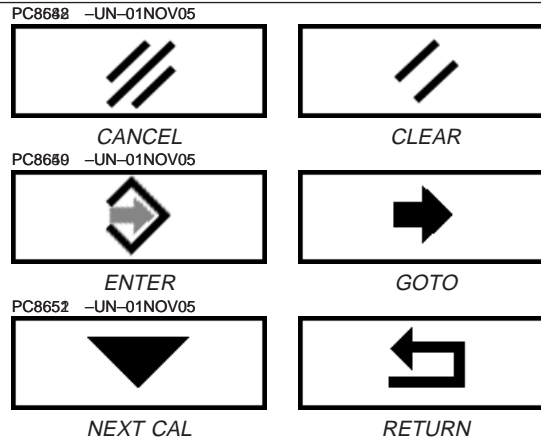
Message center will display all active warning, alert messages and icons.

Continued on next page

OUC6050,000175F -19-18JAN06-2/7

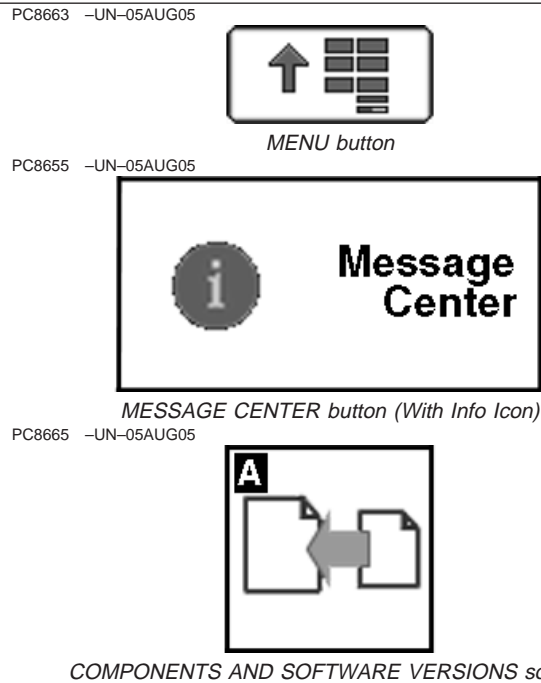
Message Center Icons

These icons are used throughout Message Center.



OUC6050,000175F -19-18JAN06-3/7

COMPONENTS AND SOFTWARE VERSIONS softkey will allow users to view all components on the network and the software versions loaded to them. You may also use the reprogram device button to reprogram a specific controller if necessary.



Continued on next page

OUC6050,000175F -19-18JAN06-4/7

Diagnostic Addresses

NOTE: Diagnostic addresses are available to access specific diagnostic information. This information can assist the John Deere Dealer in diagnosing problems. Different device controllers can be selected from drop-down box, as shown.

Select DIAGNOSTIC ADDRESSES button. The number of devices available will depend upon machine configuration. The list of addresses can be scrolled up or down with rotary thumb wheel. Selecting an address will show data for that address.

PC8663 -UN-05AUG05



MENU button

PC8655 -UN-05AUG05



MESSAGE CENTER button (With Info Icon)

PC8668 -UN-05AUG05



DIAGNOSTIC ADDRESSES softkey

OUC6050,000175F -19-18JAN06-5/7

Trouble Codes

Select TROUBLE CODES button, a list of controllers will appear and controllers with diagnostic codes are indicated.

Individual controllers can be accessed by navigating with rotary thumb wheel and selected by pressing ENTER button, to view codes for that controller.

Codes can also be displayed for all controllers by selecting SHOW ALL button with rotary thumb wheel and pressing ENTER button. Codes can be relayed to a John Deere dealer to assist in diagnosing machine problems.

PC8663 -UN-05AUG05



MENU button

PC8655 -UN-05AUG05



MESSAGE CENTER button (With Info Icon)

PC8669 -UN-05AUG05



TROUBLE CODES softkey

Continued on next page

OUC6050,000175F -19-18JAN06-6/7

Device Info and Bus Status

When DEVICE INFO softkey is selected, controllers communicating on CANBUS communication system will be indicated. Message counts indicate quantity of communications from controller. When BUS STATUS softkey is selected, status of various communication networks will be indicated.

PC8663 -UN-05AUG05



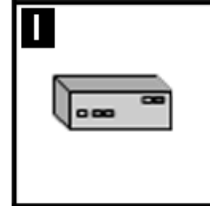
MENU button

PC8655 -UN-05AUG05



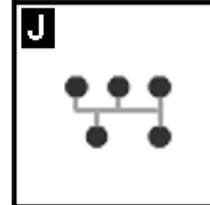
MESSAGE CENTER button (With Info Icon)

PC8670 -UN-05AUG05



Electronic CONTROL UNIT INFORMATION softkey

PC8671 -UN-05AUG05



BUS INFORMATION softkey

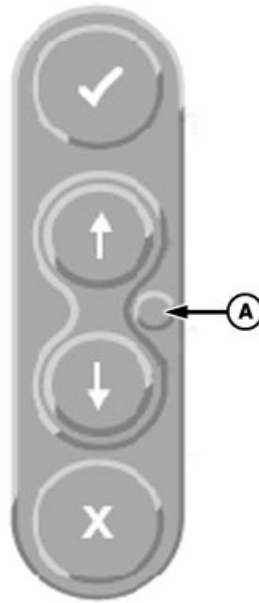
OUO6050,000175F -19-18JAN06-7/7

Resetting Display

IMPORTANT: All setup data entered since power up could be lost when using reset button.

Should display fail to respond to operator inputs, system can be reset by pressing and holding the reset button for 3 seconds (until the light on the front of the display starts blinking). This will reboot system and restart all applications on display. If resetting the display is frequently required, contact a John Deere dealer. It is recommended to turn power off before attaching or removing implements and other electrical components on CAN Bus communication system.

A—DISPLAY RESET button



PC8705 -UN-17AUG05

OUO6050,0001756 -19-08DEC05-1/1

Warning Screens

SPN.FMI	Applicable Failure Mode	Recommended Solutions
158.3	VTI Switched Supply Voltage Too High	The voltage level of the switched power is greater than the nominal. Turn off the ignition key, then turn it back on. If this diagnostic code shows up again, check power supply wiring. Please contact your John Deere dealer.
158.4	VTI Switched Supply Voltage Too Low	The switched power voltage is below the nominal. Turn off the ignition key and turn it back on. If this diagnostic code shows up again, check the battery. Please contact your John Deere dealer.
168.3	Unswitched Supply Voltage Too High	The voltage level of from the battery power supply is greater than the nominal. Cycle power on the display. If this diagnostic code shows up again, check wiring. Please contact your John Deere dealer.
168.4	Unswitched Supply Voltage Too Low	The voltage level from the battery is lower than the nominal. Cycle power on the display. If this diagnostic code shows up again, check battery power and recharge it as needed. Please contact your John Deere dealer.
1386	Display Unit Temperature Too High	The LCD backlight was not turned off when the temperature was above the highest limit. Please contact your John Deere dealer.
1386.1	Display Unit Temperature Too Low	The LCD backlight was not turned off when the unit temperature was below the lowest limit. Contact you John Deere Dealer.
3597.2	Regulate Voltage 5.0 v Abnormal	The 5.0 v regulated power is out of range. Click Cancel if it occurs occasionally. If it occurs continually, contact your John Deere Dealer.
3598.2	Regulated Voltage 1.5 v Abnormal	The 1.5 v regulated power is out of range. Click Cancel if it occurs occasionally. If it occurs continually, contact your John Deere Dealer.
3599.2	Regulated Voltage 3.3 v Abnormal	The 3.3 v regulated power is out of range. Click Cancel if it occurs occasionally. If it occurs continually, contact your John Deere Dealer.
523310.12	Non-Volatile Memory Read/Write Failure	Failed to read/write from/to the NOR flash. See your John Deere dealer.
523771.3	CCD+ Line Voltage Too High	The voltage on the CCD_HIGH line of the CCD network is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring.
523771.3	CCD+ Line Voltage Too Low	The voltage level on the CCD_HIGH line of the CCD network is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring.
523772.4	CCD- Line Voltage Too High	The voltage on the CCD_Low line of the CCD network is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring.
523772.4	CCD- Line Voltage Too Low	The voltage level on the CCD_Low line of the CCD network is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring.
523773.3	Vehicle CAN+ Line Voltage Too High	The voltage on the CAN_HIGH line of the Vehicle Bus (Tractor Bus) is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring.
523773.4	Vehicle CAN+ Line Voltage Too Low	The voltage level on the CAN_HIGH line of the Vehicle CAN Bus (Tractor CAN Bus) is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring.
523774.3	Vehicle CAN- Line Voltage Too High	The voltage on the CAN_LOW line of the Vehicle Bus (Tractor Bus) is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the wiring.

Continued on next page

OUO6050,0001757 -19-18JAN06-1/2

523774.4	Vehicle CAN- Line Voltage Too Low	The voltage level on the CAN_LOW line of the Vehicle CAN Bus (Tractor CAN Bus) is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring.
524050.12	Real Time Clock Malfunction	Real Time Clock malfunctioned. It may be caused by the damage on the RTC chip or no power applied to the chip.
524215.3	Implement CAN+ Line Voltage Too High	The voltage on the CAN_HIGH line of the Implement Bus is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring.
524215.4	Implement CAN+ Line Voltage Too Low	The voltage on the CAN_HIGH line of the Implement Bus is below 0.5 v Cycle power on the display. If this diagnostic code shows up again, check the battery power and recharge the battery as needed.
524217.3	Implement CAN+ Line Voltage Too High	The voltage on the CAN_HIGH line of the Implement Bus is above nominal. Cycle power on the display. If this diagnostic code shows up again, check wiring.
524217.4	Implement CAN+ Line Voltage Too Low	The voltage on the CAN_LOW line of the Implement Bus is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery power and recharge the battery as needed.

OUC6050,0001757 -19-18JAN06-2/2

Diagnostic Addresses

MESSAGE CENTER button >> DIAGNOSTIC
ADDRESSES softkey >> DEVICE drop down box >>
"VT;.001 Implement"

PC8655 -UN-05AUG05



MESSAGE CENTER button

PC8668 -UN-05AUG05



DIAGNOSTIC ADDRESSES softkey

Continued on next page

OUC6050,0001758 -19-16JAN06-1/3

Address Number	Address Name
008	Unswitched Power Supply Voltage
009	Switched Power Supply Voltage
010	Unit Internal Temperature
011	Vehicle CAN - Bus Status
012	Vehicle CAN - CAN HIGH Voltage
013	Vehicle CAN - CAN LOW Voltage
015	Implement CAN - Bus Status
016	Implement CAN - CAN HIGH Voltage
017	Implement CAN - CAN LOW Voltage
018	Flash Wear Count
019	Hours of Operation
020	1.5 v Regulated Power Supply Voltage
021	3.3 v Regulated Power Supply Voltage
022	5.0 v Regulated Power Supply Voltage
023	Radar Input Status
024	Implement Switch Status
025	External Analog Input Voltage
026	Compact Flash Drive Status
028	CCD Bus - Bus Status
029	CCD Bus - Positive Voltage
030	CCD Bus - Negative Voltage
031	Bezel Key Status
032	Real Time Clock (RTC)
033	Maximum Sleep Time
038	Synchronize Brightness
039	Daytime Luminance
040	Daytime Luminance Balance Ratio
041	Nighttime Luminance
042	Nighttime Luminance Balance Ratio
043	Internal Speaker Volume
044	Display ISO Function Instance
045	Settings - Country Code
046	Settings - Language Code
047	Settings - Numeric Format
048	Settings - Date Format
049	Settings - Time Format
050	Settings - Units of Distance
051	Settings - Units of Area
052	Settings - Units of Volume

Continued on next page

OUC6050,0001758 -19-16JAN06-2/3

Address Number	Address Name
053	Settings - Units of Mass
054	Settings - Units of Temperature
055	Settings - Units of Pressure
056	Settings - Units of Force
057	Settings - GPS Time Sync
058	Settings - Current Date
059	Settings - Current Time
060	Radar Calibration Constant
227	Boot Block Program Part Number (Software)
228	Boot Block Program Version Number (Software)
231	Board Service Package Part Number (Software)
232	Board Service Package Version Number (Software)
233	Virtual Terminal Part Number (Software)
234	Virtual Terminal Version Number (Software)
235	Device Part Number (Hardware)
236	Device Serial Number (Hardware)
247	Current Vehicle Model Number
248	Current Vehicle Serial Number
249	Original Vehicle Model Number
250	Original Vehicle Serial Number

OUO6050,0001758 -19-16JAN06-3/3

Guidance Warnings

Warnings	
SSU Communication Error	No communication with vehicle steering controller (SSU). Check vehicle for diagnostic codes and contact your John Deere Dealer.
Turn Predictor Turned On	Turn predictor is turned ON. Use the check box to turn it OFF
AutoTrac Disengaged	AutoTrac system disengages when operator is out of seat for more than 5 seconds
AutoTrac	The operator is responsible for collision avoidance. Turn AutoTrac OFF before entering roadways.
Data Card Problem!	A data card must be inserted in the compact flash drive with the door closed to use the GreenStar2 Pro application.
No Setup Data!	Setup data for the GreenStar2 Pro application could not be found on the data card. The GreenStar2 Pro application will not be available until a data card with setup data is inserted
AutoTrac SSU Software Incompatible	See your John Deere Dealer for SSU update.
Communication Error	Communication problem with controller. Check connections to controller.
Mobile Processor Detected	Mobile Processor Detected on CAN Bus. GreenStar Application is disabled. Remove mobile processor and cycle power to enable GreenStar application.
GPS Communication Problem	No communication with GPS receiver. Check connections at GPS receiver.
Tracking Inaccurate	The GPS receiver must be set to report at the 5Hz message output rate. Confirm settings on GPS receiver and change output to 5Hz,
Invalid Boundary	An invalid boundary has been recorded. You may continue recording or clear the current boundary and start recording again.
Activation Error	Invalid activation code. Please reenter activation code.
Invalid Filter	All the fields that are required to be filled out based on the Totals Type Selected have not been filled out.
Flags of Same Selection	Selected the Flags of same name and mode.
Name Already Exists	The name you have entered already exists in this list. Please enter a new name.

Continued on next page

OUO6050,0001759 -19-08DEC05-1/2

INFO	
GPS Communication Problem	No communication with GPS receiver. Check connection at GPS receiver and perform operation again.
Curve Track Memory Full	Internal memory available for Curve Track is full. Data must be cleared to continue Curve Track Operation. Clear curved track data from system
AutoTrac Disabled	AutoTrac SF1 license cannot operate with current StarFire software. Update StarFire software to operate AutoTrac.
AutoTrac Disabled	AutoTrac SF1 license cannot operate while SF2 corrections are turned on. Turn SF2 corrections off to operate AutoTrac.
License Problem	No license available for the selected tracking mode. Previous tracking mode will be selected.
Duplicate Name	Name already exists. Select another name.
Curve Track Recording	Curve Track recording in progress. Cannot perform operation until recording is turned off.
Circle Definition Problem	There was an internal error during Circle definition. Redefine the circle.
Circle Definition Problem	Communication with GPS receiver was lost during circle definition. Redefine the circle once communication has been re-established.
Circle Definition Problem	Center point is too far. Select another center point.
A-B Line Definition Problem	There was an internal error during A-B line definition. Redefine the A-B line.
A-B Line Definition Problem	A timeout occurred during A-B line definition. Redefine the A-B line.
A-B Line Definition Problem	A and B points of the A-B line are too close. Perform operation again.
Loss of GPS While Recording Boundary	GPS has been lost while recording the boundary. Point logging will resume when the GPS signal returns. This may result in an inaccurate boundary.
Data Card Full	Unload and cleanup data card or insert new data card.
Data Card 90% Full	Unload and cleanup data card or insert new data card.
No Memory	No Memory available for Curve Track. Unload and cleanup data card or insert new data card.
Low Memory	Low Memory available for Curve Track. Unload and cleanup data card or insert new data card.
No Memory	No Memory available for Straight Track. Unload and cleanup data card or insert new data card.
No Memory	No Memory available for Circle Track. Unload and cleanup data card or insert new data card.
Circle Definition Problem	The distance from the vehicle to the center point is greater than 1 mile. Select another center point or drive another circle.
Zero All Totals	You have decided to zero all totals for the selected filter.
Incorrect RS232 Controller Model Selected	The RS232 controller model selected is incorrect. Please verify and reenter manufacturer and model number.
Prescription Error	Controller is not setup to accept prescriptions.
Prescription Error	Controller is setup to accept prescriptions. No controller prescription has been selected.
Prescription Error	Prescription rate is out of controller range.
Controller Unit of Measure Error	Controller will only operate when using metric units.
Controller Unit of Measure Error	Controller will only operate when using English (US) units.
Controller Unit of Measure Error	Controller will only operate when using metric or English (US) units.
Controller Operation Error	Invalid operation selected for controller.
Prescription Warning	Out of field prescription rate is now being applied.
Prescription Warning	Loss of GPS signal has occurred. Loss of GPS prescription rate is now being applied.
Prescription Warning	Controller does not support selected prescription.

Trouble Code Pop-Up Boxes—Platform Core Software

Platform Core Software FAULT CONDITION	FAULT DESCRIPTION	ALARM TEXT
	CAN bus inbound communications overload.	CAN bus communications overload. Reset the display or turn the power off and then back on.
	When an implement's object pool is rejected by the VT	There is a technical problem preventing proper operation of the display with the following implement. Please contact implement manufacturer with this information:
	A valid card is inserted that contains bad setup data.	The setup data on the compact flash card is invalid. Please resave the setup data to the card from your computer.
	A valid card is inserted that contains bad setup data that cannot be read by this version of the display software.	The setup data on the compact flash card can not be read by the display. Please update your display software.
	A card is inserted that can not be used by the display	The compact flash card is not compatible with the display. Please use a different card.
	If the user is in the middle of setting up a new operation and they switch to the homepage, the apps on the homepage would be disabled in that case. Similarly, if the user was changing the status of a job, the apps on the homepage would be disabled. In both of these cases there is no error	There is a warning or pop-up within the GreenStar 2 application that requires your attention.
	Data Card 90% Full	Unload and cleanup data card or insert new data card soon..
	Data Card Full	Unload and cleanup data card or insert new data card.
	VI Implement is removed	Communication lost with ISO implement. If implement was not disconnected, check connections and cycle power.
	Internal Memory Full--From VI Object Pools	Internal memory dedicated to ISO implements is full. Remove implements to free memory space.
	Internal Memory Full-From Documentation and Curved Track data	Internal memory is full.
	New software found for display	New software found for display. (This warning will re-appear at every power cycle or if card is re-inserted.)
	The following VI(s) are no longer communicating with the display. Check the indicated device(s) and CAN bus wiring.	Some device(s) are no longer communicating with the display. Check the CAN Bus wiring.
	CAN bus inbound communications overload.	CAN Bus communications overload. Reset the display or turn the power off and then back on.
	A failure has been detected in the display's internal memory. (Reprogramming)	An error occurred during reprogramming. Perform reprogramming process again. If problem reoccurs contact your John Deere dealer.
	Legacy device reprogramming error. Device not reporting version info	An error occurred during reprogramming. Perform reprogramming process again. If problem reoccurs contact your John Deere dealer.
	Legacy device not found while programming product	Device not found while programming product. Check wiring and connectors.
	Attempt to copy the setup data to a "new" card that already has setup data on it	Prior setup data found on card. Press "Continue" to overwrite this data. Press "Cancel" to abort the copy to card operation. (If the user decides to continue, there will be a second popup)"Are you sure you want to overwrite?"
	Wrong activation code	Invalid activation code. Please reenter activation code.

Continued on next page

OUC6050,00017D8 -19-19JAN06-1/2

FAULT CONDITION	FAULT DESCRIPTION	ALARM TEXT
	Customer attempts to record boundary when one already exists	Are you sure you want to redefine the boundary?
	All New/Edit Screens: User attempts to create a duplicate name in any of the New/Edit screens	This entry is already being used. Please select a new entry or cancel to modify the entry.
	This alarm will be shown after we have received a touch event for 60 seconds.	The touch screen is malfunctioning. Try to reboot the device, utilize an external display control, or the bezel keys on the backside of this display for screen response. If problem persists, please contact your John Deere Dealer.
	This alarm will be shown after we have received a touch event for 60 seconds.	A button is malfunctioning. Try to reboot the display. If the problem persists, please contact your John Deere Dealer.
	GPS Warnings For GreenStar Basic/Deluxe	
	200 GPS communications failure	No communication with GPS receiver. Check connections at GPS receiver.
	No GPS. Tracking Disabled	No GPS position available. Verify GPS receiver has clear view of sky.
	No Diff. Tracking Disabled.	No GPS differential correction available. Verify GPS receiver has clear view of sky.
	2D GPS in use.	2D GPS in use. Verify GPS receiver has clear view of sky.
	Tracking Inaccurate The GPS receiver must be set to report at the 5Hz. Rate. Confirm settings on receiver.	The GPS receiver must be set to report at the 5Hz message output rate. Confirm settings on GPS receiver and change output to 5Hz. (For Non-Deere GPS)
	Language Loading Errors:	
	CRC bad, missing a colon, bad prep header, etc.	Language load detected corrupt file. Reload software to data card.
	Hardware compat. version mismatch.	Invalid hardware for language file. Reload software to data card.
	Software version mismatch.	Language file incompatible with application. Reload software to data card.
	Timeout waiting for CAN62 Response To Request	Device failed to start programming language. Reload software to data card.
	Target sent FAIL in CAN62 Response To Request	Device failed to continue programming language. Reload software to data card.
	Timeout waiting for CAN62 Response To Checksum	Device failed to report a language checksum. Reload software to data card.
	Target sent FAIL in CAN62 Response To Checksum	Device reported an invalid language checksum. Reload software to data card.
	Timeout waiting for CAN62 Response To Remove	Device didn't respond to the request to remove language. Reload software to data card.
	Target sent FAIL in CAN62 Response To Remove	Device failed to remove a language. Reload software to data card.
	Flash Write Failure.	Device failed while writing language to memory. Reload software to data card.
	Timeout waiting for CAN62 Response To New Data	Device stopped programming language prematurely. Reload software to data card.
	Product ID mismatch	Language is incompatible with loaded product. Reload software to data card.

OUO6050,00017D8 -19-19JAN06-2/2

Trouble Code Pop-Up Boxes—Guidance Software

FAULT CONDITION	FAULT DESCRIPTION	ALARM TEXT
	Issued once (at power up) the first time an SSU is detected, when an AutoTrac key is activated. (Any guidance mode with AutoTrac key and AT capable SSU.)	The operator is responsible for collision avoidance. Turn AutoTrac OFF before entering roadways.
	Loss of SSU Communication for more than 1 second	No communication with vehicle steering controller (SSU). Check vehicle for diagnostic codes and contact your John Deere Dealer.
	Within 5 seconds away of a gap in Curved Track data	Gap in Guidance Path
	Within 5 seconds away from a curve of more than 30° between consecutive segments	Approaching Sharp Curve
	The operator leaves the seat for more than 7 seconds while in a tracking mode that supports Turn Predictor and TP is off (valid SSU, AT licence, and seat switch	Turn predictor is turned ON. Uncheck the box to turn it OFF.
	SF1 AT Key with SF2 corrections turned on.	AutoTrac SF1 license cannot operate while SF2 corrections are turned on. Turn SF2 corrections off to operate AutoTrac.
	SF1 AT Key with old SF1 StarFire software.	AutoTrac SF1 license cannot operate with current StarFire software. Update StarFire software to operate AutoTrac.
	The user attempts to switch to a tracking mode for which there is no valid license available.	No License available for the selected tracking mode. Defaulting to previous tracking mode.
	The user attempts to perform an operation that requires a GPS signal (presses SetA, SetB, Curve Track recording, or Circle Track recording buttons).	No communication with GPS receiver. Check connection at GPS receiver and perform operation again.
	The GPS signal is lost during definition of a circle using the driving method.	Communication with GPS receiver was lost during circle definition. Redefine the circle once GPS communication has been re-established.
	The user inputs an A or B point that is too close to the other while defining an AB Line (can occur using A+B and Lat/Long methods).	A and B points of the AB Line are too close. Must have 30 ft (10 m) between point A and B. Perform operation again.
	The user defines a circle with the center point at a distance greater than 1 mile from the vehicle location. This warning can also occur if the user selects a circle with a center point that is far away.	The distance from the vehicle to the center point is greater than 1 mile. Select another center point or drive another circle.
	A timeout (user has not reached the minimum AutoB distance within 45 sec) occurs during AB Line definition using the AutoB method.	A timeout occurred during AB Line definition. Redefine the AB Line.
	The user attempts to change the tracking mode while recording in Curve Track.	Curve Track recording in progress. Cannot perform operation until Curve Track recording is turned off.
	Press clear all shifts button	Clearing all shifts will restore original guidance track locations for the current field. Are you sure you want to proceed?
	Incompatible AutoTrac SSU Software. AutoTrac Deactivated (SSU exit code)	AutoTrac has detected an incompatible SSU (Vehicle Controller) version. Contact your John Deere Dealer to obtain the latest software updates for your SSU in order to operate AutoTrac.
	AUTOTRAC DEACTIVATION MESSAGES	

Continued on next page

OUO6050,00017D9 -19-11JAN06-1/2

FAULT CONDITION	FAULT DESCRIPTION	ALARM TEXT
	Text Message on Display	
SSU Exit Code Description		Text Message on Display
Steering wheel moved		Steering Wheel Moved
Speed too slow		Speed Too Slow
Speed too fast		Speed Too Fast
Incompatible gear		Invalid Gear
Track number changed		Track Number Changed
GPS not dual frequency		Invalid GPS Signal
SSU fault		SSU Fault
No GSD messages		Invalid Display Messages
No PT Operational bit		Invalid Display Settings
No Keycard		No AutoTrac Activation
Heading Error too large		Heading Error Too Large
Lateral Error out of bounds		Off-Track Error Too Large
No Operator Presence		Out of Seat
Oil Temp too low		Oil Temp Too Cold
TCM not installed or turned off		No TCM Corrections
Invalid Activation Code		Invalid SSU Activation Code
Diagnostic mode has control of valve		SSU In Diagnostic Mode
Combine Header Switch not on		Header Off
Combine Road/Field Switch is on		Road Mode
Voltage is not yet stable		Invalid SSU Voltage
Max Curvature Exceeded		Curve Too Sharp
AS_EX_REVERSE_TOO_LONG		Reverse Timeout
AS_EX_TOO_LONG_BELOW_LOW_SPEED_THRESHOLD = 23, // AutoTrac was active below the LOW_SPEED_THRESHOLD for too long.		Vehicle Too Slow
AS_EX_INCORRECT_DIRECTION		Vehicle not traveling in the forward direction
AS_EX_SHUTTING_DOWN		Vehicle shutting down
AS_EX_BAD_GEAR_DATA_RECEIVED		Gear data error
AS_EX_BAD_RESUME_DATA_RECEIVED		Resume switch error
AS_EX_NO_KEYSWITCH		Keyswitch error
AS_EX_AT_RG_SWITCH		SPFH AutoTrac switch is not on
AS_EX_QUICKSTOP_SW		SPFH Quick Stop switch is on

OUO6050,00017D9 -19-11JAN06-2/2

Trouble Code Pop-Up Boxes— Documentation Software

FAULT CONDITION	FAULT DESCRIPTION	ALARM TEXT
	Task selected, recording is on, the operation mandatory details are not defined.	No operation details defined. Go to GreenStar setup and enter operation info.
	Invalid prescription	Prescription file is invalid. -Verify rate units on prescription are correct.
	Totals: Client Undefined	Warning issued stating that the user must select a Client to view totals.
	Totals: Client and Farm defined, Field undefined.	Warning issued stating that the user must select a Field to view Field, Task, or Load Totals.
	Totals: CFF, Task, and Operation defined, Crop/Product Type undefined.	No warning. Operation defaulted to "[shy]" and Task Totals are listed.
	Totals: CFF and Crop/Product Type defined, Task and/or Operation undefined.	Warning issued stating that the user must select a Task and Operation to view Field or Load Totals.
	Totals: Client, Crop and Task defined, Farm and Field undefined.	No warning. Task and Operation defaulted to "[shy]" and Crop Totals are listed.
	Reset totals to zero	Are you sure you want to zero the totals listed below?
	In order to record a product application, you must choose a product type and product name on one of the "Add Product" boxes. Choices will be "Change", which takes the user to the product summary screen, or "Remove Operation" which will flash up the "Are you sure you want to delete this operation" message.	In order to record a product application, you must choose a product type and product name on one of the "Add Product" boxes.
	When no products are specified in an application	No products are specified, please select a product.
	A warning shall be issued if there is a prescription selected in Field Doc but not selected in the planter/sprayer setup.	Prescription available but not selected. Go to implement setup to select the prescription as the rate.
	A warning will be issued if Field Doc has a prescription selected, but the planter/sprayer is outside the field boundary for the prescription. "Default Rx Rate Used.	Machine outside the field boundary for the prescription. Default Prescription rate being used.
	At power-up, A warning will be issued if a prescription is being used and the prescription multiplier for an operation is not set to 100%.	Prescription Multiplier not 100%.
	Implement width set to zero.	Implement width is set to zero. Implement width is required to record data.
	Anywhere: User presses the documentation soft key before filling out CFFT	You must choose a Client, Farm, Field, Task from the Resources softkey
	Communication lost with a connected controller.	Communication lost with controller. If controller was not disconnected, check connections and cycle power. If controller was disconnected please review operations selected.
	Field Doc didn't get some periodic messages	Communication lost with controller. If controller was not disconnected, check connections and cycle power. If controller was disconnected please review operations selected.
		Prescription available but not selected. Check setup on the implement to ensure prescription is selected as the rate.
	Air Cart Setup: Air cart is on the bus, 1st tank has been defined with an operation, Second tank is created with the same operation type as the first tank.	You are creating another seeding (application) operation. Would you like this to be the same as the Front (Middle)(Rear) Tank seeding (application) operation?
	Air Cart Setup: User presses enter for the previous message	Please enter the tank ratios for each tank. (if applicable)

Continued on next page

OUC6050,00017DA -19-11JAN06-1/2

FAULT CONDITION	FAULT DESCRIPTION	ALARM TEXT
Air Cart Setup:	User enters tank ratios that do not add to 100	Tank ratios must add to 100
SeedStar selects Rx but Documentation doesn't have Rx selected.		No prescription file for selected field. -Verify field and operation are correct. -Verify prescription is on card. -Resave prescription to card if necessary.
Tank Mix Screen:	User attempts to add a second ingredient in a tank mix without a carrier or base solution rate	You must enter a carrier and base solution rate before building a tank mix
Incorrect model is possibly selected		The RS232 controller model selected is incorrect. Please verify and reenter manufacturer and model number.
Recording is not currently allowed		Recording is not currently allowed. Verify settings on RS232 controller.
Warning for manual controller when target rate changes		Target rate has changed. Warning for manual controller.
Warning when Raven is communicating everything but an actual rate		Raven controller not communicating actual rate. Verify Raven controller settings and connections to the display.
Special handling will be needed for each controller to monitor the health of the connection		Communication problem with controller. Check connections to controller.

OUO6050,00017DA -19-11JAN06-2/2

AutoTrac Universal

Symptom	Problem	Solution
Tractor turns right or left unexpectedly when the resume switch is pressed and the vehicle is already lined up on the line.	Encoder out of range when wheels are pointed forward	With front wheels pointed forward encoder should be +/- 500. Drive forward with wheels pointed straight ahead until encoder is in limit.
AutoTrac Universal disengages	Anti-rotation device too tight – causing misalignment of AutoTrac Universal with the steering shaft.	Re-position AutoTrac Universal so it slides easily on steering shaft then adjust anti-rotation device
	Steering Wheel speed too high on a vehicle with high steering resistance.	Lower Steering wheel speed
	Looseness or rotation in the Steering console	Insert shims to take out tolerance in Steering console
	Steering Wheel turns hard after AutoTrac Universal installed.	Lubricate Steering Shaft where it goes through console
	Disengagement force set too low for a vehicle with high steering resistance.	Set disengagement force setting from normal to high.
AutoTrac Universal unstable when entering track	Acquire sensitivity too high	Decrease acquire sensitivity
AutoTrac Universal takes too long to enter next track	Acquire sensitivity too low	Increase acquire sensitivity

Continued on next page

OUO6050,000175A -19-08DEC05-1/2

Symptom	Problem	Solution
AutoTrac Universal constantly weaves in the row (Erratic steering)	StarFire Height or Fore-Aft not properly set	Enter correct StarFire Height and Fore-Aft dimension
	StarFire Receiver not in front of or even with Fixed Axle (Even with or Behind for Articulated)	Position StarFire in front of or even with Fixed Axle (Even with or Behind for Articulated)
	On-line sensitivity too high	Decrease On-Line Sensitivity
	StarFire mount direction in SETUP different from actual mount direction	Correctly match TCM SETUP mount direction to actual mount direction
	Too much play in steering mechanism	Check steering cylinder bushing; tie rod ends, etc. for proper tolerance.
	AutoTrac Universal did not establish direction correctly	Drive forward at a speed greater than 1 mph and turn steering wheel greater than 45 degrees
	Looseness or rotation in the Steering console	Insert shims to take out tolerance in Steering console
AutoTrac Universal drives too far off line when in row	Loose Soil	Add Ballast
	On-line sensitivity too low	Increase on-line sensitivity
AutoTrac Universal won't engage. AutoTrac will not resume.	Stop Code encountered	See list of stop codes to find issue
AutoTrac Universal does not appear on INFO or SETUP screens	System not recognizing AutoTrac Universal on CAN bus line	Ensure AutoTrac Universal is connected to GreenStar Harness and receiving power
		Check for blown fuses in AutoTrac Universal wiring harness
Direction can not be determined	Old TCM Software	Update TCM Software to newest software (Version 1.08 or greater)
	No differential Correction	Establish differential correction
	No GPS	Establish signal

AutoTrac Universal Stop Codes

Stop Code	Description	Solution
None	Nothing has been checked yet	
Steering Wheel	Steering wheel has moved to disengage AutoTrac	Press resume switch to re-engage AutoTrac
Too Slow	Vehicle speed too slow to use AutoTrac	Increase speed over 0.5 km/h (0.3 mph)
Too Fast	Vehicle Speed too high to use AutoTrac	Reduce Speed below platform limit Tractor - 30 km/h (18.6 mph) Sprayer - 37 km/h (23 mph) Combine - 22 km/h (13.7 mph) Reverse speed on all machines – 10 km/h (6 mph)
Unknown Direction	Unknown direction	Drive forward greater than 1.6 km/h (1 mph) and turn steering wheel greater than 45 degrees
Track Changed	Track number changed	Align vehicle on desired track and press resume
Lost Dual GPS	SF1, SF2, or RTK signal was lost	Establish signal
SSU Error	A SSU fault severe enough to disable AutoTrac	Cycle power on the AutoTrac Universal unit and the GSD
OK	Last state upgrade was successful	
No GSD	Bad GSD messages.	Cycle power on GSD to try and establish communication
PT Turned Off	Tracking not turned on.	Turn tracking on in set up AutoTrac
No KeyCard	AutoTrac Keycard or AutoTrac Key missing.	Insert AutoTrac KeyCard
Heading Error	Heading error is out of range.	Align tractor within heading limit (80° of track)
Lateral Error	Lateral error is out of range.	Align tractor within lateral limit (40% of track spacing)
No Operator	Operator presence switch is open.	Operator in seat or press resume for activity monitor to reset time
No TCM	Either no TCM present or TCM is turned off.	Turn TCM on, or install TCM
Voltage Unstable	Voltage Too Low	Check harnessing
Reverse Timeout	Reverse Timeout (greater than 45 seconds)	Cycle direction forward before resuming in reverse
0 Speed Timeout	0 Speed Timeout	Increase speed greater then 0.5 km/h (0.3 mph)
Curvature	Curve Track radius tighter than AutoTrac will allow	Manually drive through tight radius curves

GreenStar Diagnostics

Required Items for Documentation

The following items are required for documentation to function:

- Client, Farm and Field
- Task
- Operation
- Operation Details
- Product Type/Name
- Target Rate/Rate Units
- Recording Source
- Implement Width/Offsets
- Controller Setup (when using non-Deere controllers)

Required Items for Guidance

The following items are required for guidance to function:

- Tracking mode set to Straight Track, Curve Track, Circle Track (only available with optional PivotPro module) or Row Finder
- Track spacing (See equipment section of GreenStar Basics/Pro General Setup)
- Track 0 (Except for Curve Track and Row Finder)
- GPS signal (StarFire signal required)

OUO6050,000175C -19-16JAN06-1/1

Fault Codes—StarFire iTC

Stored fault codes indicate that a problem has been detected. Stored fault codes will remain in memory until they are cleared by operator. It is possible that fault condition is no longer active.

Continued on next page

OUO6050,000175D -19-08DEC05-1/3

Fault Code	Description	Problem	Solution
523319.18	Low switched voltage	low voltage on key switched power supply.	Check battery voltage, check grounds, check harness. Contact dealer if problem persists.
523792.18	Low unswitched voltage	TCM has detected low voltage on unswitched battery power supply.	Check battery voltage, check grounds, check harness. Contact dealer if problem persists.
523792.1	No unswitched voltage	TCM has detected no voltage on unswitched battery power supply. TCM is unable to save setup changes when key is turned off.	Check battery voltage, check grounds, check fuses and harness. Contact your John Deere dealer.
2028.12	No STARFIRE communication	TCM has lost communication with STARFIRE receiver	Check TCM harness to ensure proper connection between STARFIRE Receiver and TCM. Check CAN voltages. Contact your John Deere dealer.
523773.3	StarFire CAN voltage out of range	StarFire CAN High signal voltage is out of range high.	Check TCM harness to ensure proper connection between STARFIRE Receiver and TCM. Check CAN STARFIRE voltages. Contact your John Deere dealer.
523773.4	StarFire CAN voltage out of range	StarFire CAN High signal voltage is out of range low.	Check TCM harness to ensure proper connection between Receiver and TCM. Check CAN voltages. Contact your John Deere dealer.
523774.3	StarFire CAN voltage out of range	StarFire CAN Low signal voltage is out of range high.	Check TCM harness to ensure proper connection between STARFIRE Receiver and TCM. Check CAN voltages. Contact dealer.
523774.4	StarFire CAN voltage out of range	StarFire CAN Low signal voltage is out of range low.	Check TCM harness to ensure proper connection between STARFIRE Receiver and TCM. Check CAN voltage. Contact your John Deere dealer.
956.16	Roll Sensor out of range	Internal Roll Sensor is out of normal operating range. TCM cannot correct position for roll angles.	Contact your John Deere dealer.
2146.14	Temp Sensor out of range	Internal Temperature Sensor is out of normal operating range.	Contact your John Deere dealer.
523309.7	Yaw Sensor not responding	Internal Yaw Sensor is not responding. TCM cannot compensate for terrain changes.	Contact your John Deere dealer.
523309.16	Yaw Sensor out of range	Internal Yaw Sensor is out of normal operating range. TCM cannot compensate for terrain changes.	Contact your John Deere dealer.
523310.2	Memory Error	An internal memory error has occurred.	Contact your John Deere dealer.
523442.31	No StarFire Fore/Aft setting	StarFire Fore/Aft setting has not been entered for this vehicle. Please go to SETUP TCM.	See FORE/AFT in TCM or StarFire iTC section.
523441.31	No StarFire Height setting	StarFire Height setting has not been entered for this vehicle. Go to SETUP TCM.	See HEIGHT in TCM or StarFire iTC section.

Continued on next page

OU06050,000175D -19-08DEC05-2/3

Fault Code	Description	Problem	Solution
2146.13	TCM not calibrated	TCM has not been calibrated for this vehicle. Please go to SETUP TCM to calibrate.	See Calibrating in TCM or StarFire iTC section.
523572.31	Unsafe Shutdown-parameters not stored	TCM was unable to save SETUP changes when key was turned off. Must have unswitched battery voltage after key off to save changes.	Check battery voltage at TCM with key off, check harness. Contact John Deere dealer.

OUO6050,000175D -19-08DEC05-3/3

Diagnostic Trouble Codes—StarFire iTC

SPN.FMI	SPN Name FMI Description	Tractor Warning Light Level 1 Text
523442.3	antenna location (X axis) (523442) Not Available or Condition Exists (31)	Info No StarFire Fore/Aft Set
523441.3	antenna location (Z axis) (523441) Not Available or Condition Exists (31)	Info No StarFire Height Dimension
523773.3	CAN High line (523773) Voltage Above Normal, or Shorted to High Source (3)	No Lamp CAN HI voltage too high
523773.4	CAN High line (523773) Voltage Below Normal, or Shorted to Low Source (4)	No Lamp
523774.3	CAN Low line (523774) Voltage Above Normal, or Shorted to High Source (3)	No Lamp CAN LO voltage too high
523774.4	CAN Low line (523774) Voltage Below Normal, or Shorted to Low Source (4)	No Lamp CAN HI voltage too low
2854.31	Communications Carrier (2854) Not Available or Condition Exists (31)	No Lamp RTK Rover loss of radio link
232.2	DGPS Differential Correction (232) Data Erratic, Intermittent or Incorrect (2)	Info Corrected GPS position is not available
232.14	DGPS Differential Correction (232) Special Instructions (14)	NA RTK Extend will be lost in # minutes
523572.3	ECU power shutdown error (523572) Not Available or Condition Exists (31)	Info Unsafe Shutdown - parameters not stored
523792.2	ECU Power Supply Voltage #1 (523792) Data Valid but Below Normal Operating Range - Moderately Severe Level (18)	Info Low Unswitched Voltage
523319.2	ECU Power Supply Voltage #1, Switched (523319) Data Valid but Below Normal Operating Range - Moderately Severe Level (18)	Info Low Switched Voltage
168.18	Electrical Potential (Voltage) (168) Data Valid but Below Normal Operating Range - Moderately Severe Level (18)	NA RTK Base Station Low Voltage
841.31	Global Positioning System (GPS) (841) Not Available or Condition Exists (31)	Service Alert Signal interference (from jammer)
522339.3	GPS differential corrections license (522339) Not Available or Condition Exists (31)	Info GPS corrections license has expired
522552.1	Navigation Bus 1 (522552) Root Cause not Known (11)	Service Alert StarFire Network Problem
701558.2	Navigational system position data (701558) Data Erratic, Intermittent or Incorrect (2)	Info GPS position is not available
523310.2	Non-volatile memory read/write (523310) Data Erratic, Intermittent or Incorrect (2)	Info Non-volatile Memory Read/Write Failure
524210.2	Number of Satellites Visible (524210) Data Valid but Above Normal Operating Range - Moderately Severe Level (16)	No Lamp RTK Base Station not using visible satellites
522338.1	Receiver secondary differential correction source (522338) Out of Calibration (13)	Service Alert Receiver not receiving on alternate frequency

Continued on next page

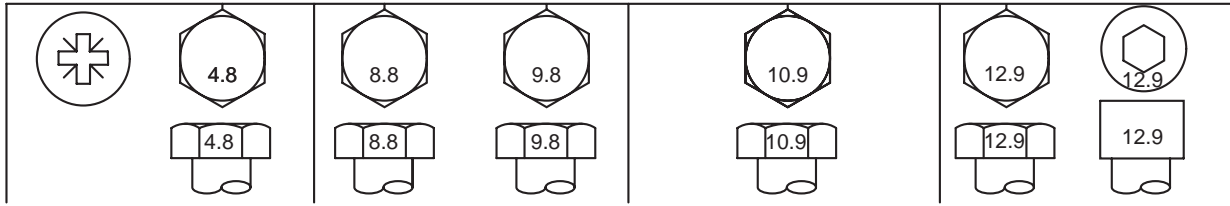
OUC6050,000175E -19-08DEC05-1/2

SPN.FMI	SPN Name FMI Description	Tractor Warning Light Level 1 Text
956.16	Rollover Sensor (956) Data Valid but Above Normal Operating Range - Moderately Severe Level (16)	Service Alert Roll Accelerometer out of range
524257.1	RTK base station location (524257) Special Instructions (14)	No Lamp RTK Base Station Position Survey in progress
524257.2	RTK base station location (524257) Data Valid but Above Normal Operating Range - Moderately Severe Level (16)	Service Alert RTK Base Station relocation
524209.2	RTK Rover relative distance (524209) Data Valid but Above Normal Operating Range - Moderately Severe Level (16)	No Lamp RTK Rover too far from Base Station
2146.13	Source Address 146 (2146) Out of Calibration (13)	Info TCM not calibrated
2146.14	Source Address 146 (2146) Special Instructions (14)	Service Alert Temp sensor out of range
523309.7	Yaw Gyro (523309) Mechanical System not Responding or Out of Adjustment (7)	Service Alert Yaw Gyro not responding
523309.2	Yaw Gyro (523309) Data Valid but Above Normal Operating Range - Moderately Severe Level (16)	Service Alert Yaw Gyro out of range

OUO6050,000175E -19-08DEC05-2/2

Specifications

Metric Bolt and Screw Torque Values



TS1670 -UN-01MAY03

Bolt or	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
Screw	Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b	
Size	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N•m	lb-ft														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

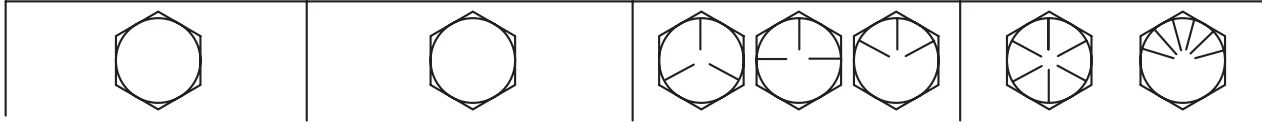
Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^a"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C zinc flake coating.

^b"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B zinc flake coating.

Unified Inch Bolt and Screw Torque Values

TS1671 –UN-01MAY03



Bolt or Screw	SAE Grade 1				SAE Grade 2 ^a				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c	
Size	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N•m	lb-ft	N•m	lb-ft
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N•m	lb-ft	N•m	lb-ft				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N•m	lb-ft														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^aGrade 2 applies for hex cap screws (not hex bolts) up to 6. in (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

^b"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C zinc flake coating.

^c"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B zinc flake coating.

Index

Page

Page

A

Auxiliary Controls 25-4, 30-7

A + B

Track 0 Setup
Straight Track Mode 45-14

A + Heading

Track 0 Setup
Straight Track Mode 45-14

ABOUT softkey. 25-2

Absolute Base Mode

RTK 75-16

Accuracy Bar Step Size 45-8

Activating AutoTrac 45-18

Activating System

AutoTrac Combines 45-29

AutoTrac Sprayers 45-27

AutoTrac Tractors 45-24

Activation Code 30-2

Activations 30-1

ACTIVATIONS tab

GreenStar 2 40-1

StarFire iTC 75-10

Addresses 90-8

Area Flags 40-18

Area Units

Combine 60-9

Cotton 65-2

Auto B

Track 0 Setup
Straight Track Mode 45-14

AutoTrac

Activation 45-18

Combine

Start-Up Screen. 45-32

Status Pie 45-18

Universal Stop Codes 90-21

AutoTrac Combines

Activating System 45-29

Deactivating System 45-30

Enabling System 45-28

AutoTrac Deactivation Message 45-3, 45-8

AutoTrac Sprayers

Activating System 45-27

Deactivating System 45-28

Enabling System 45-26

AutoTrac Status Pie 45-3

AutoTrac Tractors

Activating System 45-24

Deactivating System 45-25

Enabling System 45-23

AutoTrac Universal

Troubleshooting 90-19

B

Background Selection. 40-15

Backlight Button 30-3

Boot-up 15-3, 20-1

BOUNDARIES tab

Exterior Boundary 40-17

Headland Boundary 40-17

Brightness 30-3

BUS INFO softkey 25-2

Button. 20-2

Buttons

Backlight 30-3

Cancel 20-2

Contrast 30-3

Dim 30-3

Display 25-4

Enter 20-2

Menu 20-2

buttons

Message Center 25-2

ABOUT softkey 25-2

BUS INFO softkey 25-2

DIAGNOSTIC ADDRESSES softkey 25-2

ELECTRONIC CONTROL UNIT INFO

softkey 25-2

MESSAGE CENTER softkey 25-2

REPROGRAM DEVICE softkey 25-2

TROUBLE CODES softkey 25-2

Performance Monitor

PERFORMANCE MONITOR softkey 25-1

SETTINGS softkey 25-1

TOTALS softkey 25-1

Buttons

Short Cut 20-2

Volume 30-3

C

Calibration

Adjust Manually

Combine 60-6

Cotton 65-8

Combine 60-3

Cotton 65-5

Quick Calibration 65-6

Row Correction 65-6

	Page		Page
Standard Calibration	65-7	Date	
TCM		Setting Format	30-6
Machine Position	75-8	Daylight/Nightlight.	30-3
CAN High voltage (Vehicle Bus).	75-21	Deactivating System	
CAN Low voltage (Vehicle Bus)	75-21	AutoTrac Combines	45-30
Cancel Button.	15-4, 20-2	AutoTrac Sprayers	45-28
Secondary Navigation	15-5	AutoTrac Tractors	45-25
Center Point		Diagnostic Addresses.	90-8
Track 0 Setup		DIAGNOSTIC ADDRESSES softkey	25-2
Circle Track Mode	45-16	Diagnostic Information	30-8
Challenge Code	30-1	Diagnostic Trouble Codes	
Check Box	20-2	StarFire iTC	90-25
Checkbox		Diagnostics.	25-4
Focus Color	30-3	Dickey-John	50-16
Highlight Color	30-3	Dim Button	30-3
Sync with Cab.	30-3	Display	
Circle Track	45-37	Buttons	25-4
Circle Track Mode	45-3	Power Light.	15-3
Track 0 Setup		Reset	90-6
Center Point	45-16	Secondary Navigation	15-5
Drive Circle	45-16	Display Connector	15-4
Clear Coverage		Display Control	
Map Data	40-15	Cancel Button	15-4, 20-2
Client	40-2	Enter Button	15-4, 20-2
Comar Order Number.	30-1	Menu Button	15-4, 20-2
Combine		Short Cut Buttons	20-2
AutoTrac		Shortcut Buttons	15-4
Start-Up Screen.	45-32	Thumb Wheel	15-4, 20-2
Combines		Display Reset Button	15-5
Activating AutoTrac.	45-29	Display Settings	
Deactivating AutoTrac.	45-30	Country	25-4
Enabling AutoTrac	45-28	Language	25-4
Compact Flash Door	15-4	Numeric Formula	25-4
Contrast Button	30-3	Units	25-4
Controllers	50-8	Documentation softkeys	50-2
Non-Deere	50-16	Drive Circle	
Corn Head	60-2	Track 0 Setup	
Correction Frequency		Circle Track Mode	45-16
StarFire iTC	75-3	Drop Down List.	20-2
Correction Mode			
StarFire iTC	75-3		
Country	25-4		
Country Setting.	30-6		
Coverage Map	50-15		
Crop Growth Stage.	40-2		
Curve Track	45-40		
Curve Track Mode	45-3		
Track 0 Setup	45-15		
D		E	
Data Card.	15-6	ELECTRONIC CONTROL UNIT INFO softkey . .	25-2
		Enabling System	
		AutoTrac Combines	45-28
		AutoTrac Sprayers	45-26
		AutoTrac Tractors	45-23
		Enter Button	15-4, 20-2
		Secondary Navigation	15-5
		Entering Offsets	40-6

	Page		Page
EQUIPMENT softkey		Guidance Mode	45-8
Hitch Type	40-3	GUIDANCE SETTINGS tab	
Machine	40-3	Accuracy Bar Step Size	45-8
Model	40-3	AutoTrac Deactivation Message	45-8
Receiver Offset	40-3	Guidance Mode	45-8
Recording Source	40-3	Lead Compensation	45-8, 45-12
Exterior Boundary	40-17	Tracking Tones	45-8
		Turn Predictor	45-8, 45-9
		Turning View	45-8
F		GUIDANCE softkey	
Farm.	40-2	GUIDANCE SETTINGS tab	
Fault Codes		Accuracy Bar Step Size	45-8
StarFire iTC	90-22	AutoTrac Deactivation Message	45-8
Field	40-2	Guidance Mode	45-8
Fixed Field View	40-15	Lead Compensation	45-8, 45-12
Flags		Tracking Tones	45-8
Area	40-18	Turn Predictor	45-8, 45-9
Line	40-18	Turning View	45-8
Point	40-18	IMPLEMENT SETTINGS tab	45-1
FLAGS tab		SHIFTTRACK SETTINGS tab	45-12
Area Flags	40-18	VIEW tab	
Line Flags	40-18	Set Track 0	45-3
Point Flags	40-18	Guidance Warnings	90-11
Flow Chart			
Harvest Monitor		H	
Cotton	65-1	Half Screen	35-1
Focus Color	30-3	Hardware Part Number	75-21
Fore/Aft		Hardware Serial Number	75-21
StarFire iTC	75-5	Harvest Monitor	
Foreground Selection	40-15	Flow Chart	
Formatting		Cotton	65-1
Date	30-6	Harvest Monitor with Harvest Doc	
Measurements	30-6	Combine	60-1
Time	30-6	HDOP	75-19
Full Screen	35-1	Header	
		Corn	60-2
G		Platform, Belt Pickup	60-2
GGA	80-1	Row Crop	60-2
GPS Indicator	45-3	Setup	60-2
GreenStar 2		Headland Boundary	40-17
ACTIVATIONS tab	40-1	Headland Warning	45-3
MEMORY tab	40-1	Height	
SUMMARY tab	40-1	StarFire iTC	75-6
VIEW tab	40-1	Highlight Color	30-3
GreenStar2 Pro	25-8	Highlight/Focus	30-3
GSA	80-1	Hitch Type	40-3
GS2 Software Update	10-1	Home	15-8
GS2LiveUpdateSetup	10-1	Home Page Layout	35-1

	Page		Page
Hours On After Shutdown		L	
StarFire iTC	75-7	Language	25-4
Humidity	40-2	Language Setting	30-6
		Lateral Offsets	40-6
I		Lat/Lon	
Icons	25-1	Track 0 Setup	
Display	25-4	Straight Track Mode	45-14
icons		Layout	35-1
Message Center	25-2	Lead Compensation	45-8, 45-12
ABOUT softkey	25-2	License	40-2
BUS INFO softkey	25-2	Light	
DIAGNOSTIC ADDRESSES softkey	25-2	Display	15-3
ELECTRONIC CONTROL UNIT INFO		Line Flags	40-18
softkey	25-2	Live Update	10-1
MESSAGE CENTER softkey	25-2	Loading Software	10-1
REPROGRAM DEVICE softkey	25-2	Low Flow Compensation	
TROUBLE CODES softkey	25-2	Combine	60-5
Performance Monitor		L1/L2 GRAPH	75-19
PERFORMANCE MONITOR softkey	25-1		
SETTINGS softkey	25-1	M	
TOTALS softkey	25-1	Machine	40-3
Implement Offsets	40-6	MACHINE tab	40-3
Implement offsets	40-6	Map Based Prescriptions	50-13
IMPLEMENT tab	40-6	Map Data--Clear Field	40-15
Implement Offsets	40-6	Map Settings	40-15
Inline Offsets	40-6	MAPPING softkey	40-13
Lateral Offsets	40-6	BOUNDARIES tab	
Widths	40-6	Exterior Boundary	40-17
Implement Widths	40-6	Headland Boundary	40-17
Implements		FLAGS tab	
ISO	85-1	Area Flags	40-18
Operating	85-2	Line Flags	40-18
INFO tab		Point Flags	40-18
StarFire iTC	75-2	MAPS tab	
Inline Offset	40-6	Background Selection	40-15
Input Box	20-2	Fixed Field View	40-15
Input Fields		Foreground Selection	40-15
Button	20-2	Map Settings	40-15
Check Box	20-2	Moving Map View	40-15
Drop Down List	20-2	On-Screen Map	40-15
Input Box	20-2	Track Lines on/Off	40-15
ISO Compliant		MAPS tab	
Auxiliary Controls	30-7	Background Selection	40-15
Implement Functions	30-7	Fixed Field View	40-15
ISO Implements	85-1	Foreground Selection	40-15
Operating	85-2	Map Settings	40-15
ISO Standard Icons	25-1	Moving Map View	40-15
		On-Screen Map	40-15

Page

Page

Track Lines on/Off	40-15
Measurements	
Setting Units of Measure	30-6
MEMORY tab	
GreenStar 2	40-1
Menu	15-8
Menu Button	15-4, 20-2
Message Center	15-8, 90-1
ABOUT softkey	25-2
BUS INFO softkey	25-2
DIAGNOSTIC ADDRESSES softkey	25-2
ELECTRONIC CONTROL UNIT INFO	
softkey	25-2
MESSAGE CENTER softkey	25-2
REPROGRAM DEVICE softkey	25-2
TROUBLE CODES softkey	25-2
MESSAGE CENTER softkey	25-2
Metric	
Setting Units of Measure	30-6
Model	40-3
Moisture Alarm, setup	60-8
Moisture Curve, setup	60-8
Mount Direction	
StarFire iTC	75-4
Moving Map View	40-15

N

New Leader	50-16
Non-Deere Controllers	50-16
Numeric Format	30-6
Numeric Formula	25-4

O

Offsets	40-6
On-Screen Map	40-15
Operating Vehicle	
RTK	75-13
Operations	50-3
Operator	40-2
Original GreenStar Monitor	55-1

P

Page Layout	35-1
Panel Dim	30-3

Path Accuracy Indicator	45-3
PDOP	75-19
Performance Monitor	70-1
PERFORMANCE MONITOR softkey	25-1
SETTINGS softkey	25-1
TOTALS softkey	25-1
Platform, Belt Pickup	60-2
Point Flags	40-18
Power-up	20-1
Prescriptions	50-13

Q

Quarter Screens	35-1
Quick Calibration	
Cotton	65-6
Quick Survey Mode	
RTK	75-15
QuickStart	
StarFire iTC	75-6

R

Raven	50-16
Rawson	50-16
RCM setup	80-1
Receiver Hours (h)	75-21
Receiver Offset	40-3, 40-6
Recording	
Combine	60-9
Cotton	65-9
Recording Source	40-3, 40-6
Region	30-6
REGIONAL tab	30-6
REPROGRAM DEVICE softkey	25-2
Reset Button	15-5
Resetting Display	90-6
RESOURCES/CONDITONS softkey	
Client	40-2
Crop Growth Stage	40-2
Farm	40-2
Field	40-2
Humidity	40-2
License	40-2
Operator	40-2
Sky Condition	40-2
Soil Moisture	40-2
Soil Temperature	40-2
Task	40-2

Page	Page
Temperature	40-2
Wind Direction	40-2
Wind Speed	40-2
Resume Switch	45-18
Row Correction Calibration	
Cotton	65-6
Row Crop Head	60-2
Row Finder Mode	45-3
Track 0 Setup	45-17
Row Spacing	
Cotton	65-2
RS-232 GPS Receivers	80-1
RTK	25-6, 75-11
Absolute Base Mode	75-16
Operating Vehicle	75-13
Quick Survey Mode	75-15
Satellites in Search (above 100 elevation)	75-21
Search Time (sec)	75-21
Serial Number	75-21
Software Number	75-21
Status	75-21
S	
SATELLITE INFORMATION	75-19
Above Elevation Mask	75-19
In Solution	75-19
L1/L2 GRAPH	75-19
SKY PLOT	75-19
TRACKING CHART	75-19
TRACKING INFORMATION	75-19
Scale Weight	
Calibration	
Combine	60-3
Screen Layout	15-8, 35-1
Secondary Navigation	15-4
Cancel Button	15-5
Enter Button	15-5
Up/Down Arrows	15-5
Serial Number	30-1
SERIAL PORT tab	
StarFire iTC	75-11
Set Track 0 button	45-3
SETTINGS softkey	
Performance Monitor	25-1
Setup	
Cornhead	60-2
Harvest Monitor	
With Harvest Doc	
Combine	60-1
Header	60-2
Platform	60-2
Row Crop Header	60-2
SETUP - HARV MON - PAGE 1	
Combine	60-1
SETUP - HARV MON - PAGE 2	
Combine	60-9
SETUP - Harv Mon, moisture correction	60-7
SETUP - Moisture Correction	60-6
SETUP - YIELD CALIBRATION	
Calibration Factor	
Adjust Manually	
Combine	60-6
Cotton	65-8
Low Flow Compensation	
Combine	60-5
SETUP - YIELD MON - PAGE 2	
Area Units	
Combine	60-9
Yield Units	
Combine	60-9
SETUP tab	
StarFire iTC	75-3
SETUP, moisture alarm	60-8
SETUP, moisture curve	60-8
ShiftTrack	45-3
Short Cut Buttons	20-2
Shortcut Buttons	15-4
Sky Condition	40-2
SKY PLOT	75-19
softkey	
Equipment	
Hitch Type	40-3
Machine	40-3
Model	40-3
Receiver Offset	40-3
Recording Source	40-3
Resources/Conditions	
Client	40-2
Crop Growth Stage	40-2
Farm	40-2
Field	40-2
Humidity	40-2
License	40-2
Operator	40-2
Sky Condition	40-2
Soil Moisture	40-2
Soil Temperature	40-2
Task	40-2
Temperature	40-2
Wind Direction	40-2
Wind Speed	40-2

	Page		Page
softkeys	15-8	Steer Sensitivity	45-3
Display	25-4	Steering Sensitivity	45-21
Message Center	25-2	Stop Codes	
ABOUT softkey	25-2	AutoTrac	90-21
BUS INFO softkey	25-2	Straight Track Mode	45-3
DIAGNOSTIC ADDRESSES softkey	25-2	Track 0 Setup	
ELECTRONIC CONTROL UNIT INFO		A + B	45-14
softkey	25-2	A + Heading	45-14
MESSAGE CENTER softkey	25-2	Auto B	45-14
REPROGRAM DEVICE softkey	25-2	Lat/Lon	45-14
TROUBLE CODES softkey	25-2	SUMMARY tab	
Performance Monitor		GreenStar 2	40-1
PERFORMANCE MONITOR softkey	25-1	Switched voltage	75-21
SETTINGS softkey	25-1	Sync With Cab	30-3
TOTALS softkey	25-1	Sync with Cab Checkbox	30-3
Software			
Activations	30-1		
Challenge Code	30-1		
Loading	10-1		
Serial Number	30-1		
Software Part Number	75-21		
Software Update	10-1		
Software Version Number	75-21		
Soil Moisture	40-2		
Soil Temperature	40-2		
Sprayers			
Activating AutoTrac	45-27		
Deactivating AutoTrac	45-28		
Enabling AutoTrac	45-26		
StarFire iTC	25-6, 75-1		
ACTIVATIONS tab	75-10		
Correction Frequency	75-3		
Correction Mode	75-3		
Diagnostic Trouble Codes	90-25		
Fault Codes	90-22		
Fore/Aft	75-5		
Height	75-6		
Hours On After Shutdown	75-7		
INFO tab	75-2		
Mount Direction	75-4		
QuickStart	75-6		
SERIAL PORT tab	75-11		
SETUP tab	75-3		
TCM Calibration	75-7		
Trouble Codes	90-25		
Start-up	20-1		
Start-Up Screen			
AutoTrac			
Combine	45-32		
Status Pie			
AutoTrac	45-18		
Steer On/Off	45-3, 45-18		

Page

Tractors

Activating AutoTrac 45-24

Deactivating AutoTrac 45-25

Enabling AutoTrac 45-23

Trouble Codes

StarFire iTC 90-25

TROUBLE CODES softkey 25-2

Troubleshooting

AutoTrac Universal 90-19

Turn Predictor 45-3, 45-8, 45-9

Turning Points 45-8, 45-9

Turning View 45-8

U

Units 25-4

UNITS OF MEASURE tab 30-6

Universal Stop Codes

AutoTrac 90-21

Unswitched voltage 75-21

V

Vanguard 50-16

VDOP 75-19

VIEW tab

GreenStar 2 40-1

Volume Button 30-3

W

Warning Screens 90-7

Warnings

Guidance 90-11

Weather 40-2

Wind Direction 40-2

Wind Speed 40-2

Y

Yield Units

Combine 60-9

Cotton 65-2

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:

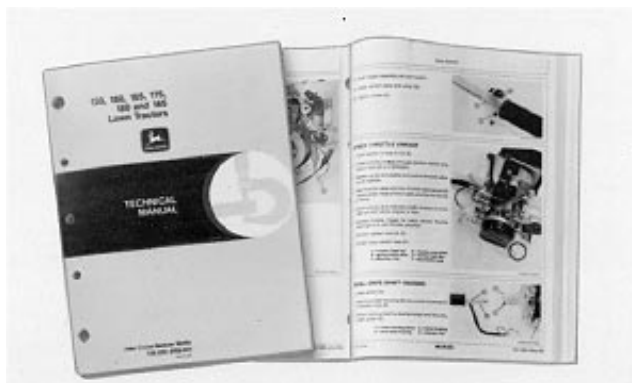
- **PARTS CATALOGS** list service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.
- **OPERATOR'S MANUALS** providing safety, operating, maintenance, and service information. These manuals and 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.



TS189 -UN-17JAN89



TS191 -UN-02DEC88



TS224 -UN-17JAN89



TS1663 -UN-10OCT97

Continued on next page

DX,SERV LIT -19-31JUL03-1/2

- Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.

DX,SERVLIT –19–31JUL03–2/2

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.

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 agriculture@johndeere.com.



TS201 –JUN-23AUG88

DX,IBC,2 –19-09DEC05-1/1

